Tempus platform for Government Services

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Why do patients come to see you?

#1

Complaint of the majority of people with hearing loss is speech-in-noise

Conversations in noise and crowds are the listening situation they struggle with the most.

MarkeTrak 9

48% of people with hearing loss have trouble distinguishing speech from noise.

Harris Poll survey of 2,018 adults

Even perfectly loud speech can be hard to understand in a noisy room. This is because background noise doesn't just cover up conversation — it may scramble brain activity.

Research at University of Florida College of Medicine

Listening in noise is arguably the major complaint of most people with hearing loss.

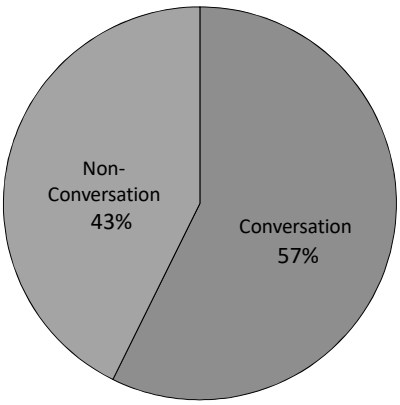
Andrea Pittman, PhD, audiologist, author, associate professor

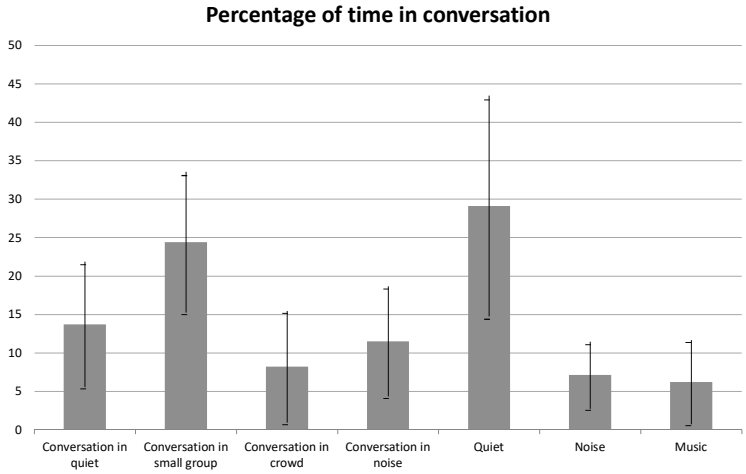
People who wear hearing instruments spend almost two thirds of each day connecting through conversations.

Hayes, D. (2017) "How much do you really know about your patient?" Hearing Review,24(4):22-23.

Conversations dominate

Across the globe, age, gender, and population density

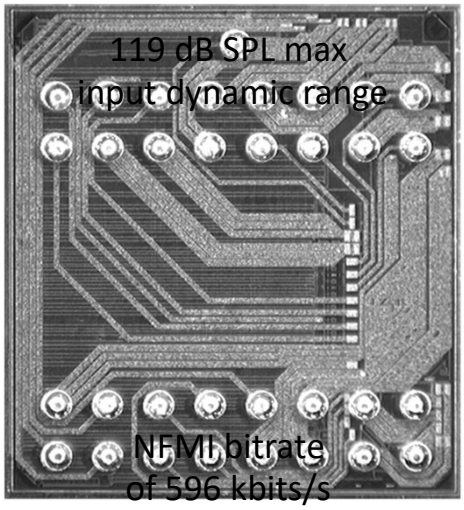




Hayes, D. (2017)

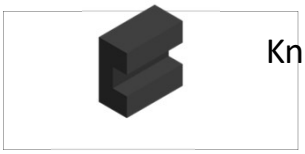
Sonova

64 frequency band resolution



65 nm technology

Tempus™

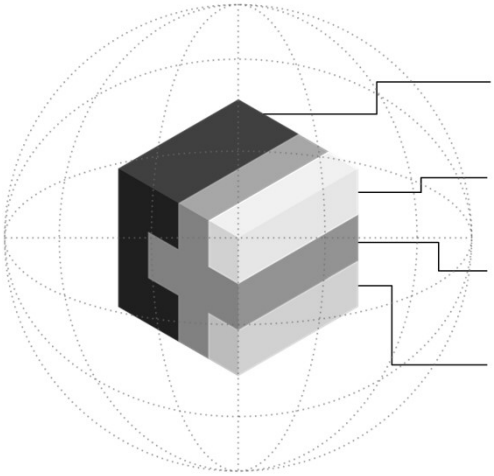


Know the environment

Get the right balance

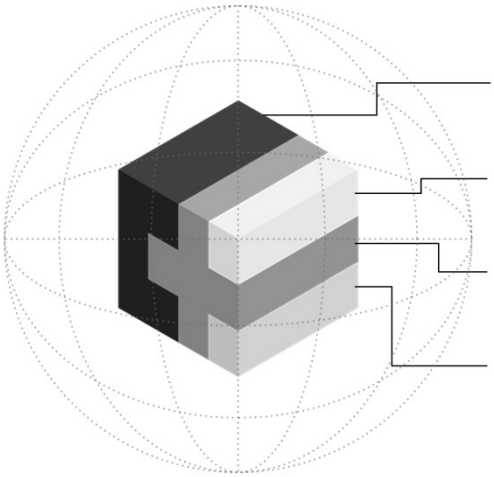
Keep it real

Put speech in its place



SoundCore™

Best in conversations

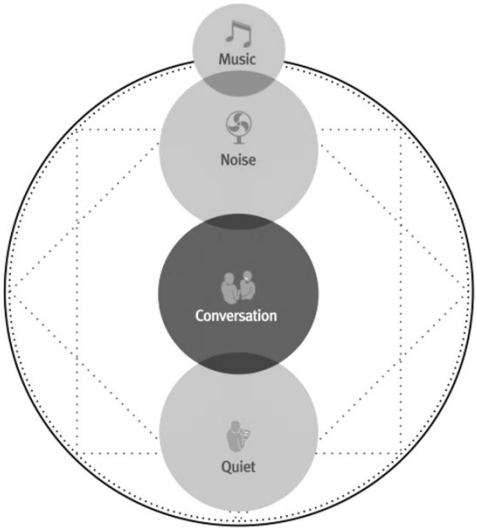


Know the environment

SoundCore™

Best in conversations

SoundNav analyzes the environment 689 times per second



Know the environment

Music

Scenario:
Listening to live jazz.

Acoustic environment:
Jazz vocalist with background instruments.

Tempus hearing aids are great in music

No input distortion

- 24 bit ADC = high resolution providing faithful reproduction without distortion

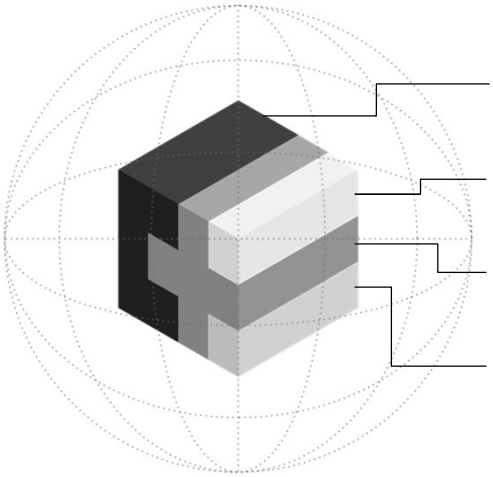
Full range of sound from quiet to loud

- 119dB SPL max input dynamic range

MyMusic

- Frequency shaping to enhance preferred music genre

Binaural synchronization



SoundCore™

Best in conversations

Getting the combination right

Sound Conductor controls the balance of:

- Speech enhancement
- Noise reduction
- Directionality

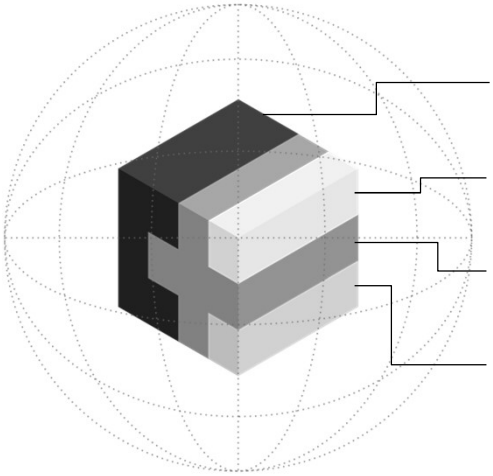
Get the right balance

SJ3

Get the right balance

Slide 18

SJ3 Bring it back to the color wheel...
Storhaug, Jan, 2/20/17



SoundNav
knows the environment

SpeechPro
puts speech in its place

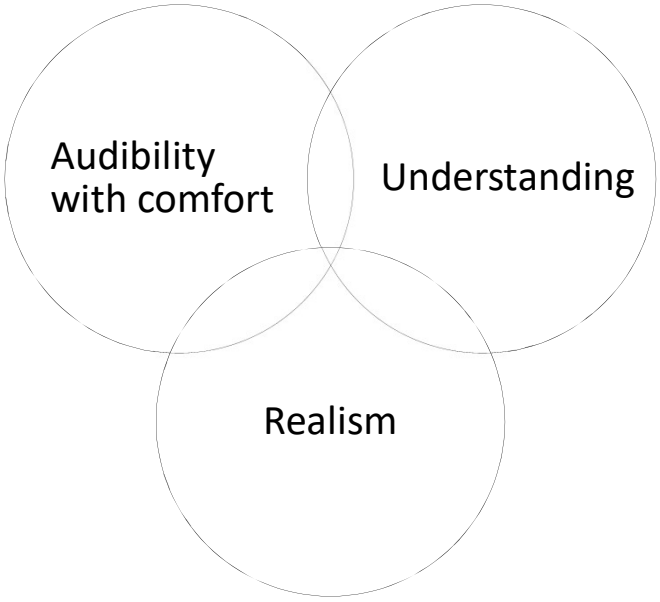
Sound Conductor
gets the right balance

Spatial Awareness
keeps it real

Keep it real

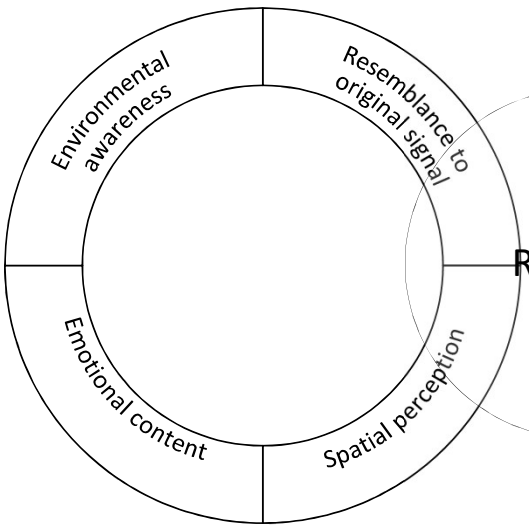
SoundCore™

Best in conversations



Keep it real

4 aspects that make up realism



Why is realism important?

"We need to consider localization as a major aspect of auditory functioning and the quality of auditory experience."

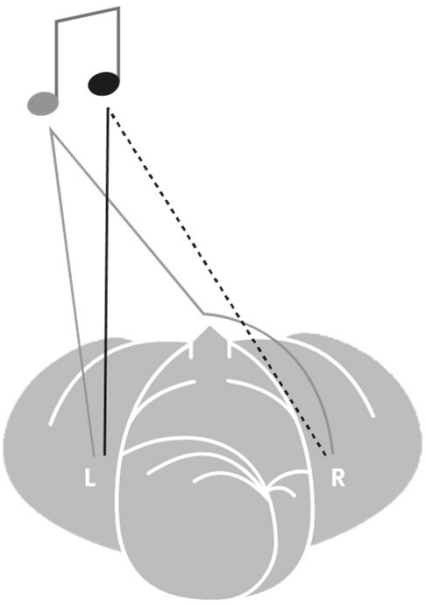
Byrne and Noble

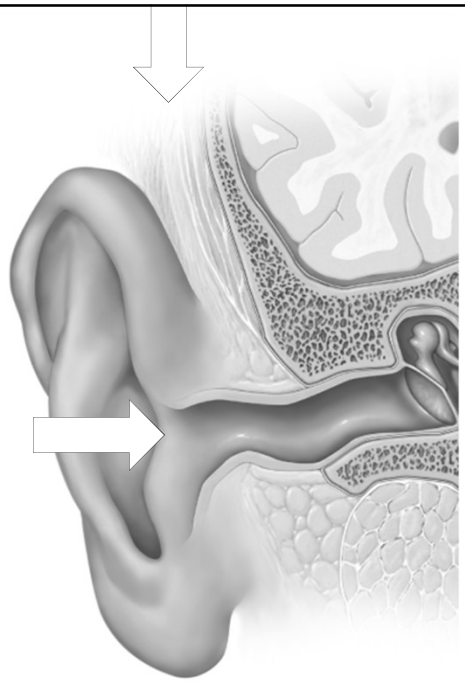
"People may not report localization problems but they are present in older adults…" (Eddins, 2016)

Dr. Ann C. Eddins, WCA, 2016

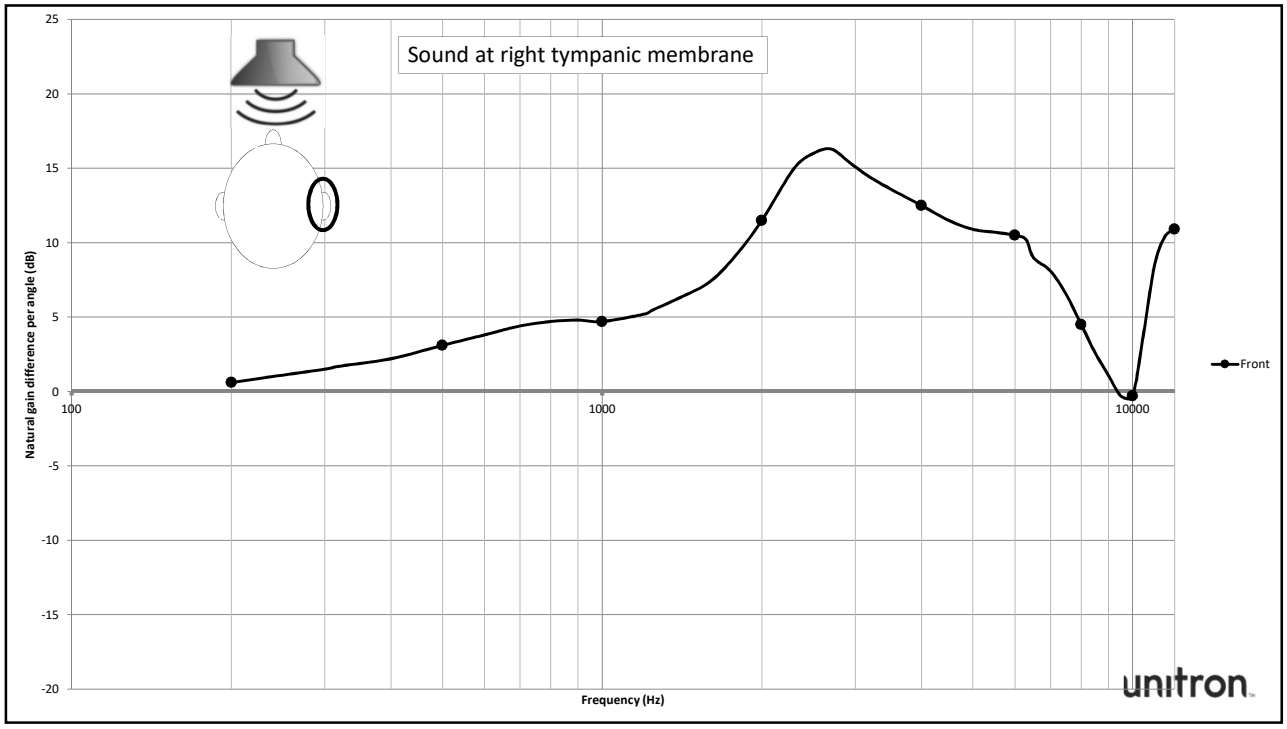
I can’t find my cell phone when it’s ringing

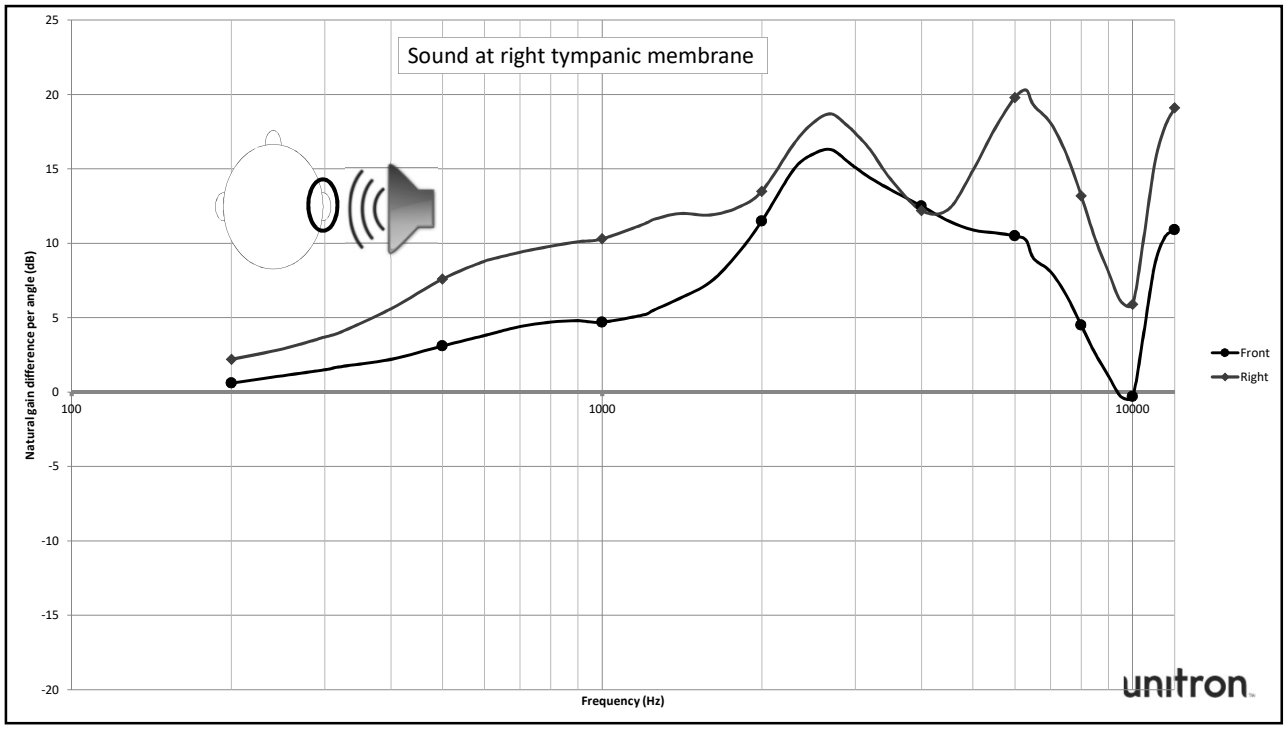
Spatial Awareness

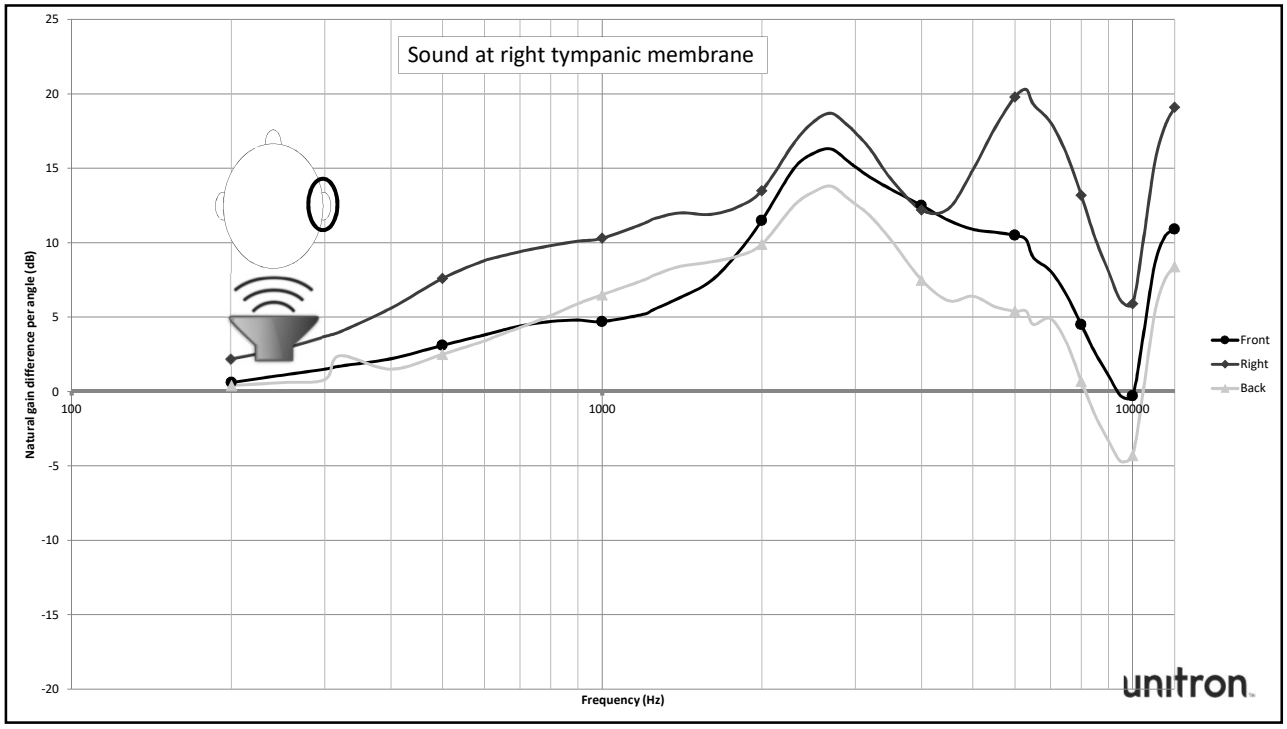

L
R



Different angles result in different responses




Sound at right tympanic membrane
Natural gain difference per angle (dB)
25
20
15
10
5
0
-5
-10
-15
-20
100
1000
10000
Frequency (Hz)
Front
Right
unitron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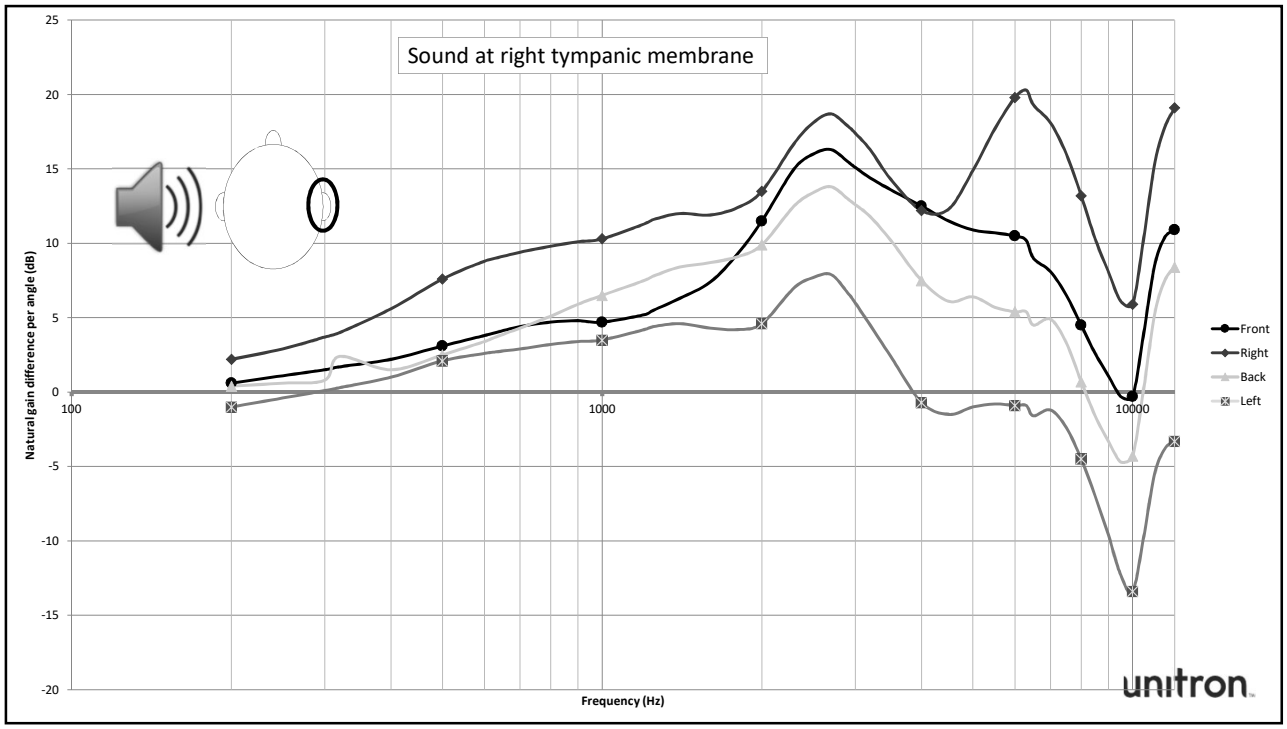
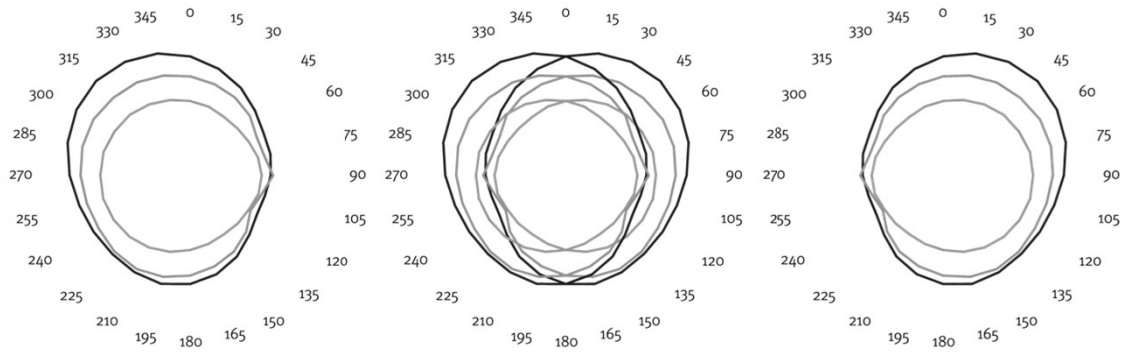


Binaural listening
Average head related transfer functions (HRTFs)



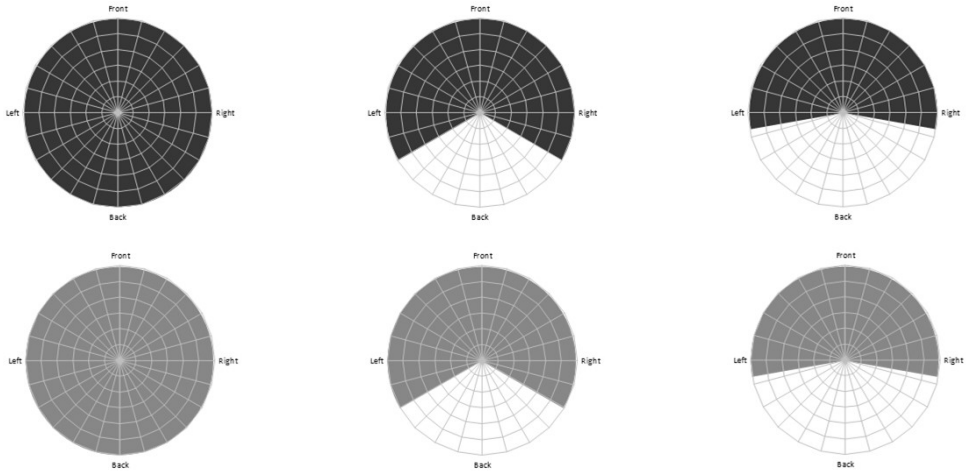
Left ear

Left ear / right ear combined

Right ear

Low frequencies Mid frequencies High frequencies

Pinna Effect



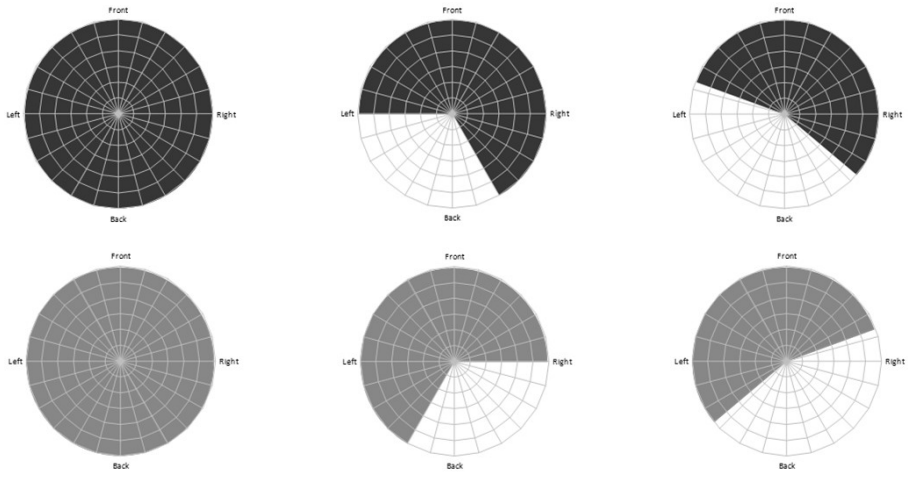
Low frequencies

Mid frequencies

High frequencies

unitron

Advanced digital beamforming

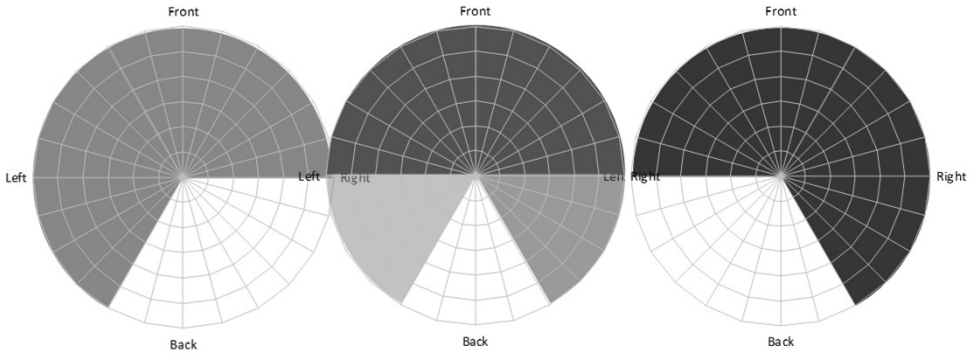


Low frequencies

Mid frequencies

High frequencies

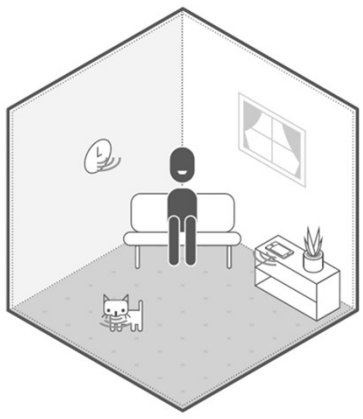
Spatial Awareness



The magic is restoring the cues the brain needs to localize sounds

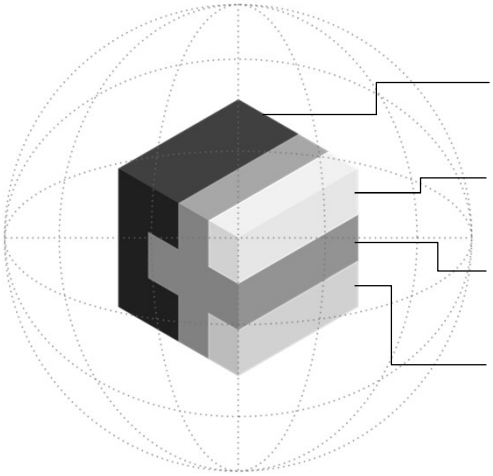
Without Spatial Awareness

Keep it real



With Spatial Awareness

Keep it real



SoundNav
knows the environment

SpeechPro
puts speech in its place

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SoundCore™

Best in conversations

Put speech
in its place

SpeechPro

Step 1 Know the location of speech

Step 2 Separate speech from noise

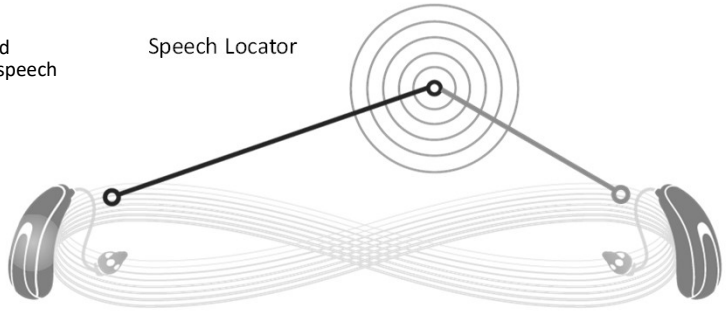
Step 3 Keep it real

Put speech
in its place

SpeechPro
Step 1: know the location of speech

50% more accurate and
36% faster at locating speech

Speech Locator



Put speech
in its place

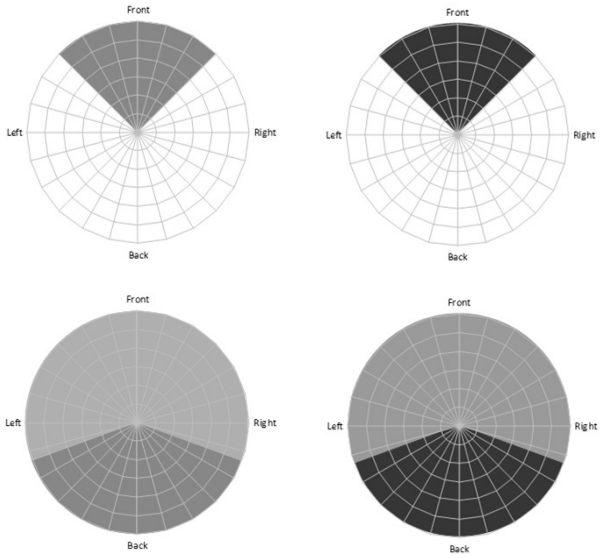
SpeechPro
Step 2: separate speech from noise

Speech Focus is the intelligent steering of the beamforming system based on the analysis of Speech Locator

Put speech
in its place

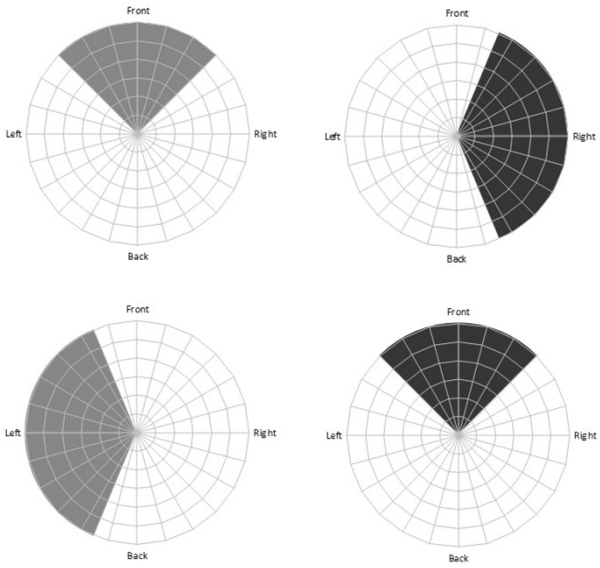
unitron

Speech Focus: front and back



Put speech in its place

Speech Focus: right and left



Put speech in its place

SpeechPro is more than a microphone strategy!

Put speech
in its place

Traditional approaches use directionality to improve speech intelligibility in noise.

The unintended consequence is that directionality disrupts spatial awareness.

Put speech
in its place

Traditional approaches use directionality to improve speech intelligibility in noise.

The unintended consequence is that directionality disrupts spatial awareness.

Put speech in its place

SpeechPro
Step 3: keep it real

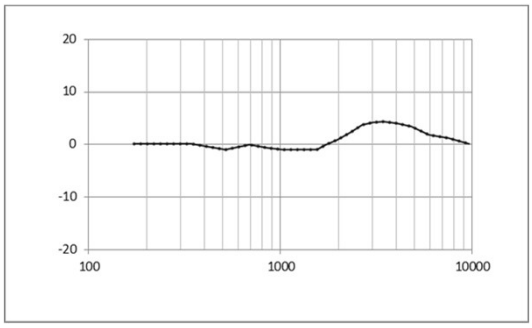
Dynamic Spatial Awareness restores the cues to localization based on the analysis of Speech Locator

Put speech in its place

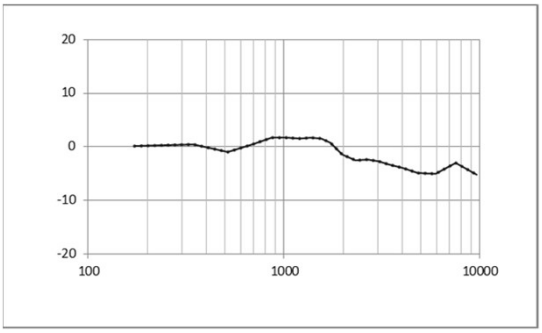
unitron

Dynamic Spatial Awareness: front and back

Front



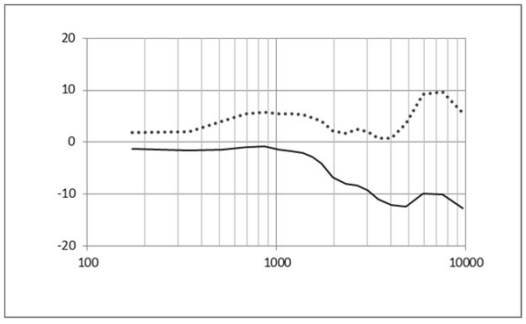
Back



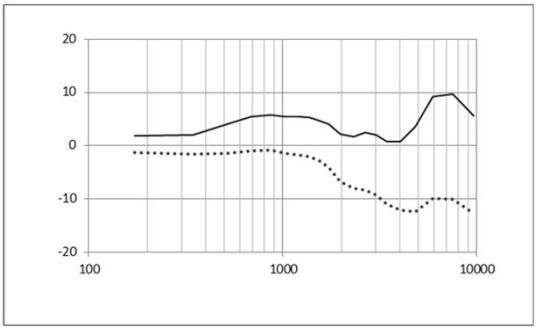
Put speech in its place

Dynamic Spatial Awareness: right and left

Right

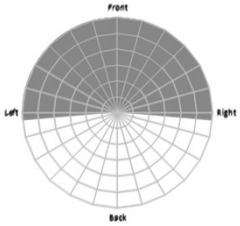


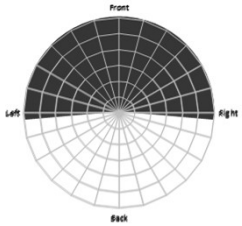
Left



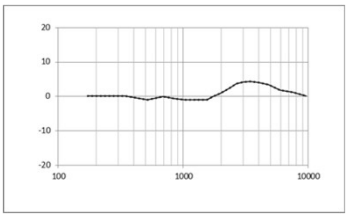
Put speech in its place

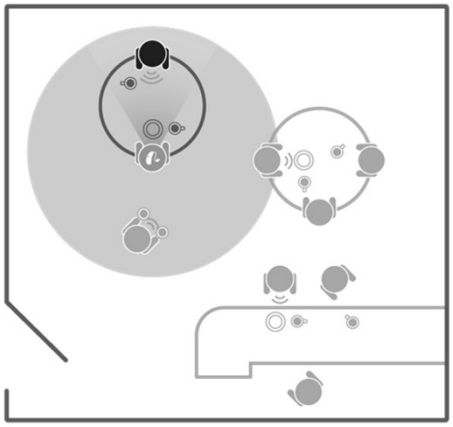
Speech Focus - Front





Dynamic Spatial Awareness - Front

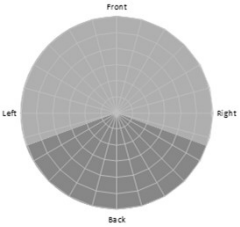


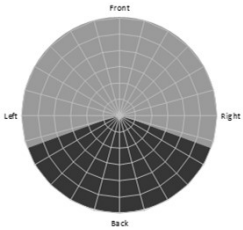


Front

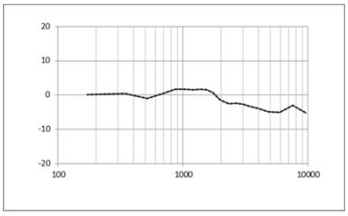
Put speech in its place

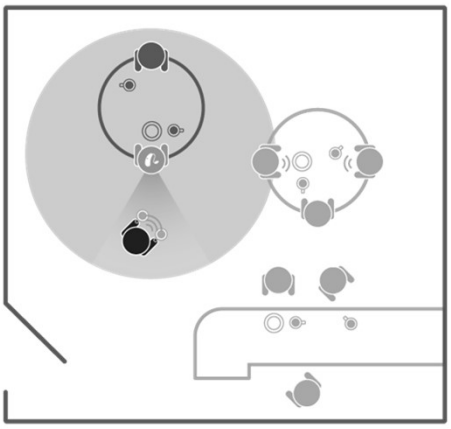
Speech Focus - Back





Dynamic Spatial Awareness - Back

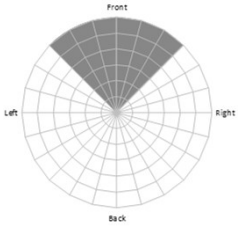


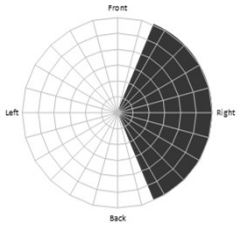


Back

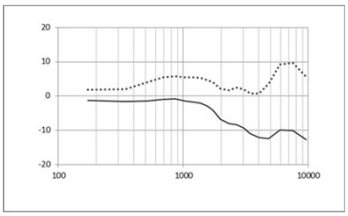
Put speech in its place

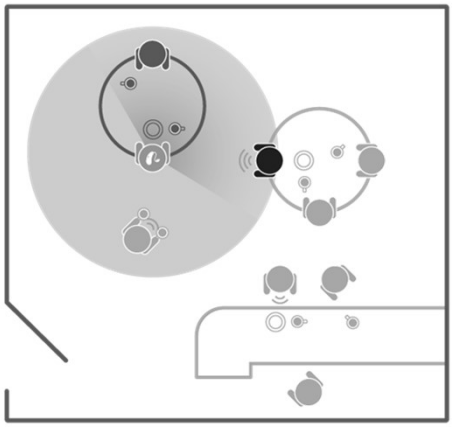
Speech Focus - Right





Dynamic Spatial Awareness - Right

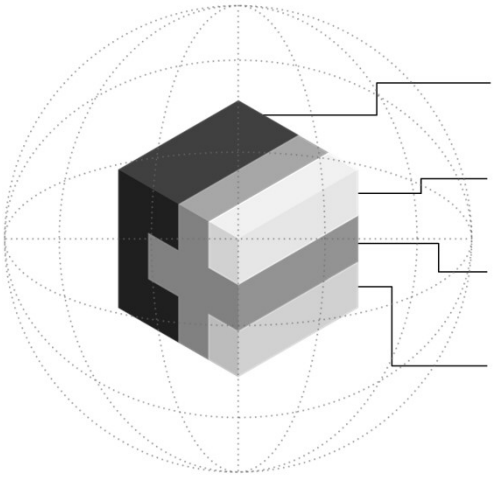




Side

Put speech in its place

SoundCore has 3712 possible unique responses



SoundNav knows the environment

SpeechPro puts speech in its place

Sound Conductor gets the right balance

Spatial Awareness keeps it real

SoundCore™

Best in conversations

"I enjoy them very much and have noticed I do better when in crowds and background noise"

Tempus Pro Stride P Dura

"I feel it takes less effort to hear conversations"

Tempus 800 Moxi Now

"I can hear my little girls talking to me in the back of the car when my head is turned. The hearing aids make me feel like I am not even wearing them. They fit effortlessly into my life".

Tempus Pro Moxi Fit

"best I've tried to date"

Tempus Pro Moxi Fit

SoundCore		TPro	T800**
SoundNav Automatic program identifies and classifies sounds across environments, with a focus on conversations	Music	•	•
	Noise	•	•
	Conversation in a crowd	•	•
	Conversation in a small group	25% •	• 57%
	Conversation in quiet	•	•
	Conversation in noise	•	•
	Quiet	•	•
	Total environments	7	7
SpeechPro * Provides optimal speech understanding and localization, even in the most challenging environments.	SpeechPro	•	SpeechZone2
	Speech Locator	•	•
	Speech Focus	•	
	Dynamic Spatial Awareness	•	
Sound Conductor Dynamically balances the appropriate features to provide speech understanding, comfort and natural sound.	Speech enhancement	•	•
	Noise reduction	•	•
	Adaptive directionality	Multiband	Multiband
Spatial Awareness * Locates where sound is coming from to provide a more natural, realistic listening experience.	Spatial Awareness	Dynamic	Personalized
	Pinna Effect	•	•

** T800 available only in CIC

* Not available on 10A and 312 non-wireless omni products

Stride™

Moxi™

Full range of award-winning options

All Tempus devices except Moxi Kiss are IP68

Smallest wireless RIC in the world

unitron

Putting patients first made us the design leader

Unitron's patient-centric design philosophy has garnered five Red Dot design awards

Stride BTE family

Style:	Stride M	Stride P	Stride P Dura
Peak output / gain (2cc) **filtered** earhook	132/63	134/66	132/63
Peak output / gain (2cc) slim tube	125/56	129/58	126/55
Battery size	312	13	13
IP rating	IP68	IP68	IP68

Moxi RIC family – solutions for every patient

Style:	Moxi Now	Moxi Kiss	Moxi Fit	Moxi Dura
Peak output / gain xS receiver	114/46	113/47	113/47	113/47
Peak output / gain xP receiver	127/57	127/57	127/57	127/57
Peak output / gain xSP(xSP+) receiver	–	131/63	131/63	134/67
Battery size	10A	312	312	13
IP rating	IP68	IP57	IP68	IP68

Stride Insera™ Moxi™

Insera does not simply deliver Tempus technology in custom hearing instruments

Now is the time for...

Our sophisticated EarMatch™ process optimizes directional performance by compensating for individual differences in external ear geometries

EarMatch™

1

Characterize

A 3D model of the individual's ear is generated from an impression. Based on this model EarMatch analyzes a multitude of anatomical parameters.

2

Recognize

Our recognition algorithm identifies ears by analyzing their unique features, then searches our comparative database to select a match.

3

Customize

Our modeling process then customizes the beamformer's calibration to create a directional response optimized for the individual's ear.

EarMatch™

1 Characterize

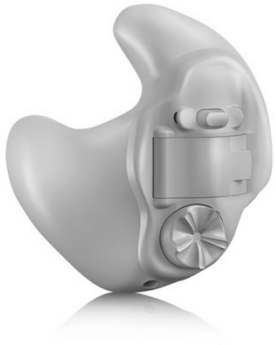
2 Recognize

3 Customize

The optimal directional performance created by EarMatch is necessary so that Tempus features provide maximum benefit for each individual

Freshly designed inside and out
with expanded possibilities,
customized for comfort

13 wireless directional



13 battery

Standard shell style: full shell
Optional shell styles: half shell & canal

Volume control standard
(option to order “no VC”)

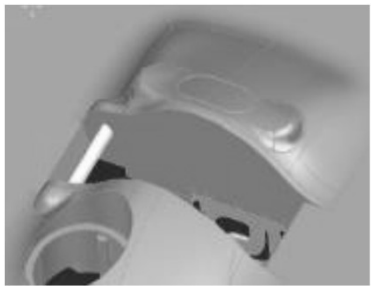
Push button standard
Option to order “no push button” (NEW!)

Telecoil, easy-t standard

M, P, HP and SP power options

Push button cover

- Optional Push button hole cover available for directional custom products
- Allows for the push button to be removed
- Push button cover matches faceplate cover



312 wireless directional

312 battery

Standard shell style: half shell and canal
Optional shell styles: full shell and mini canal

Volume control standard
(option to order “no VC”)

Push button standard
Option to order “no push button” (NEW!)

Easy-t standard

Telecoil optional

M, P, HP and SP power options

10A wireless directional

10A battery

Standard shell style: mini canal
Optional shell styles: full shell, half shell and canal

Volume control standard
(option to order “no VC”)

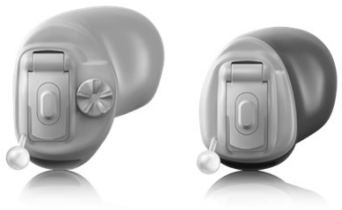
Push button standard
Option to order “no push button” (NEW!)

Easy-t standard

Telecoil optional

M, P and HP power options

10A wireless omni



10A battery

Standard shell style: mini canal
Optional shell styles: full shell, half shell and canal

Redesigned faceplate with slit microphone (NEW!)

Sealed battery boot (NEW!)

Push button battery door standard

Easy-t standard

Telecoil optional

M, P and HP power options

New codification markers for 312 and 13

- 312 and 13 battery doors will get improved codification markers

13 Battery door

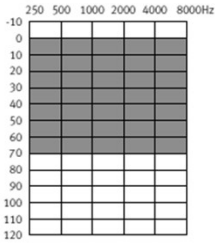
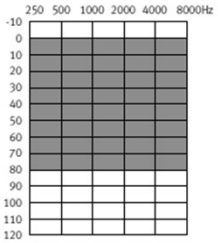
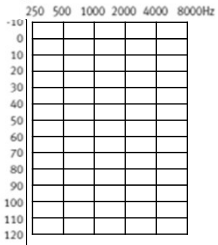
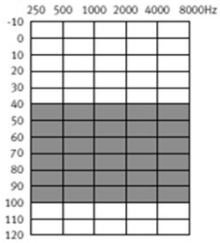
312 Battery door

New 10A battery door without push button

- Flat new design for better handling
- Colored bottom for better codification visibility
- Available mid-October 2017

New 10A door with flat design for better handling

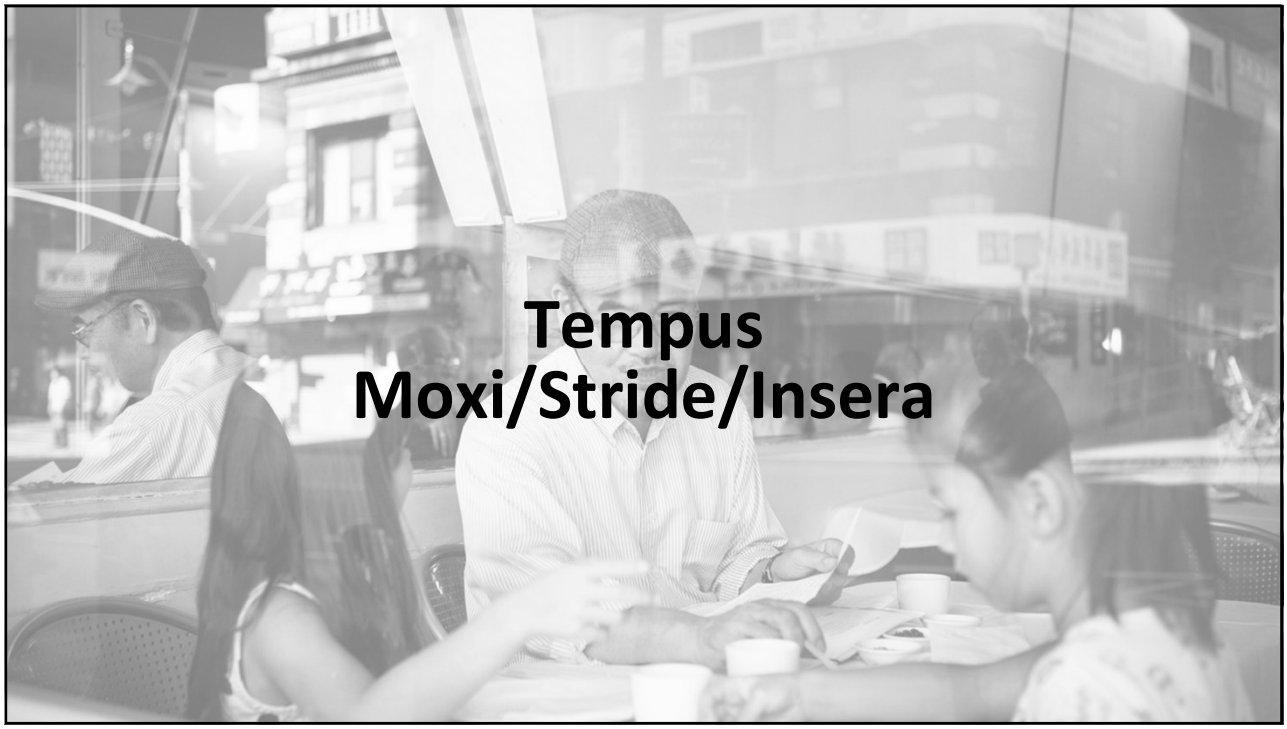
Current 10A door

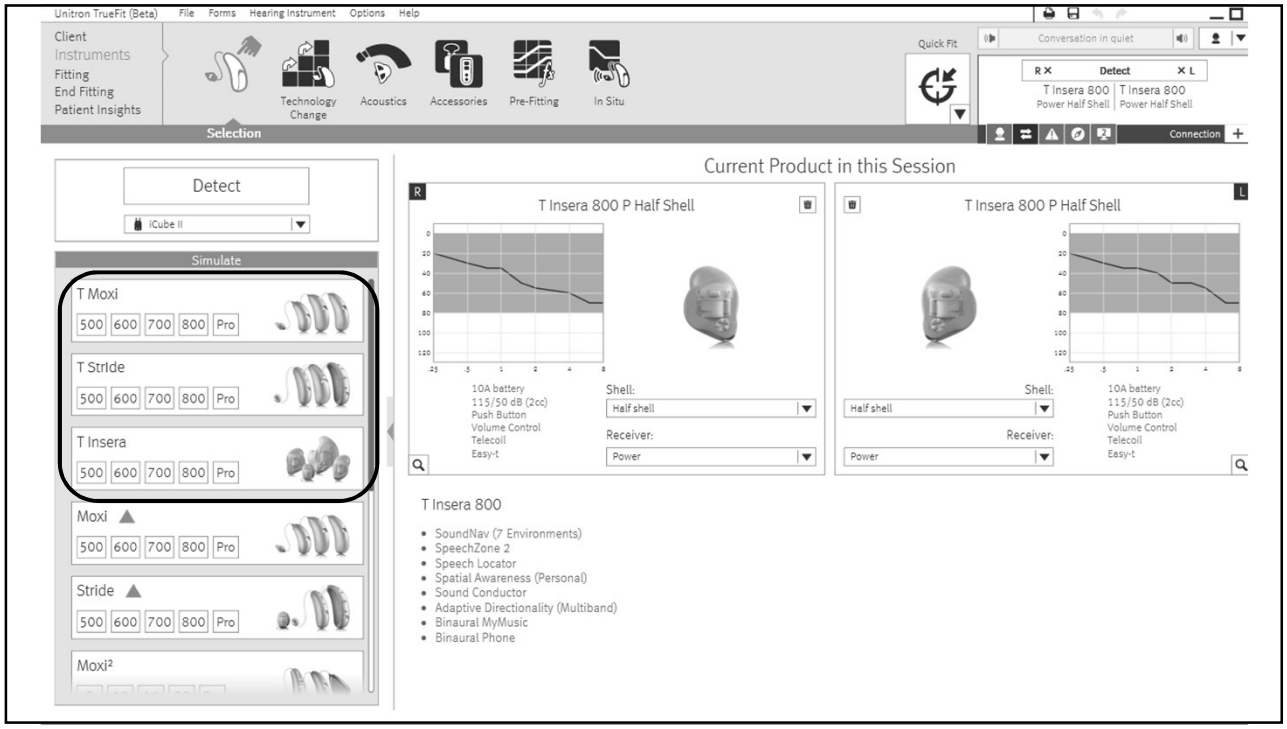
Moderate	Power	High power	Super power
			
109 / 40 dB	115 / 50 dB	119 / 60 dB	127 / 70 dB

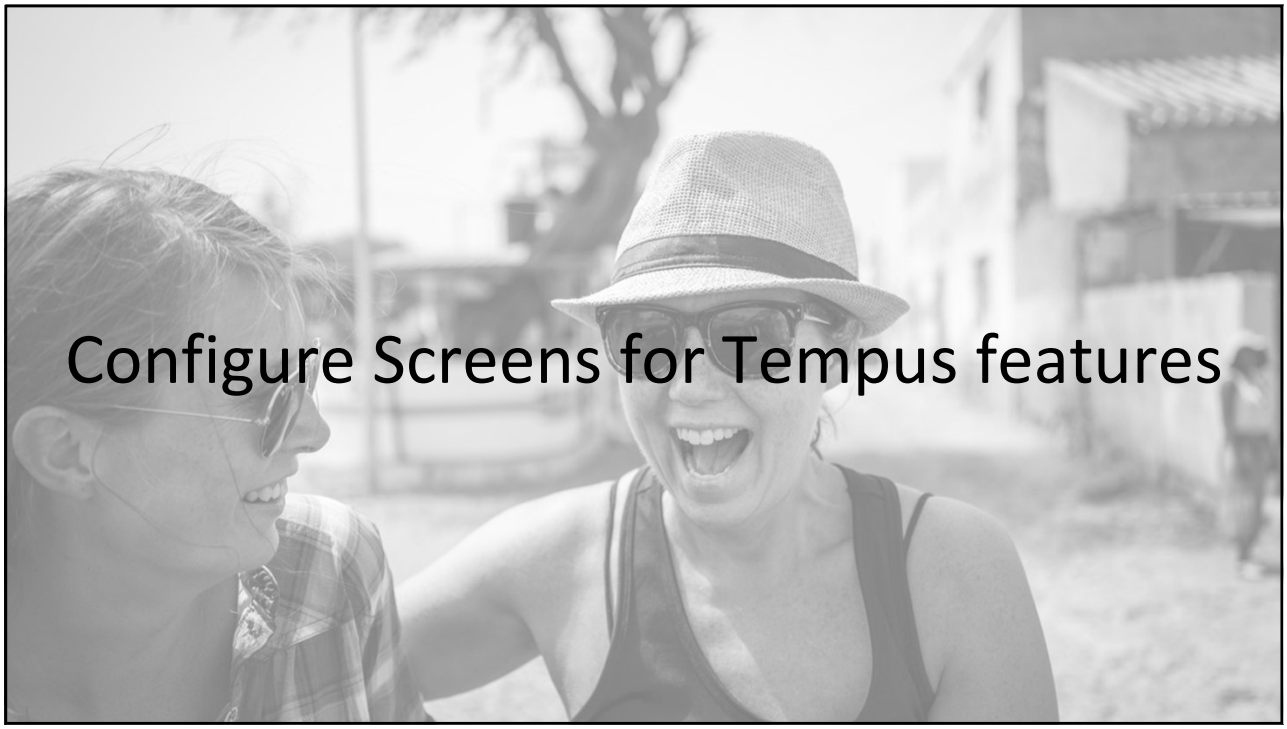
Accessory compatibility

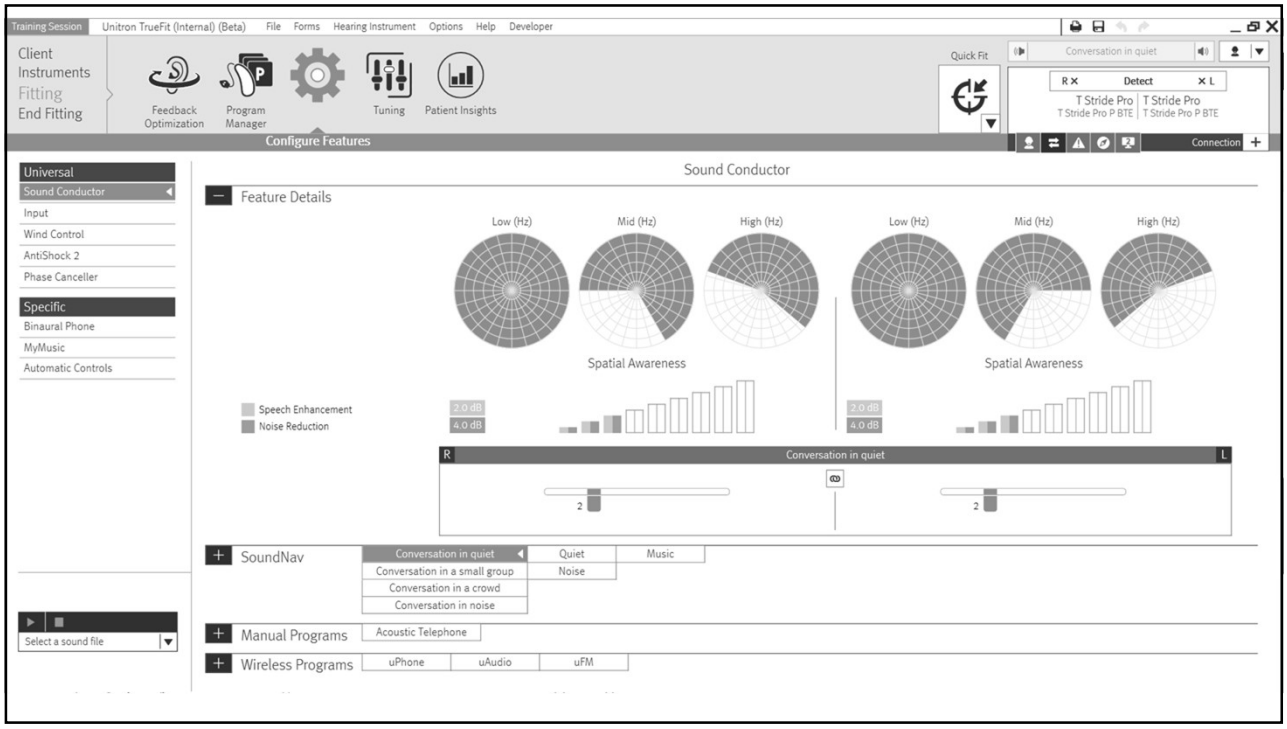
Style	iCube II	Remote Control 2	uDirect 3	uTV 3	uMic	uStream	uControl
13 W Dir	•	•	•	•	•	•	•
312 W Dir	•	•	•	•	•	•	•
10A W Dir	•	•	•	•	•	•	•
10A W Omni	•	•	•	•	•	•	•

Unitron TrueFit v3.5


Tempus
Moxi/Stride/Insera


Unitron TrueFit (Beta)
File
Forms
Hearing Instrument
Options
Help
Client
Instruments
Fitting
End Fitting
Patient Insights
Technology Change
Acoustics
Accessories
Pre-Fitting
In Situ
Selection
Quick Fit
Conversation in quiet
R ✕ Detect ✕ L
T Insera 800 Power Half Shell
T Insera 800 Power Half Shell
Connection
Detect
iCube II
Simulate
T Moxi
500 600 700 800 Pro
T Stride
500 600 700 800 Pro
T Insera
500 600 700 800 Pro
Moxi
500 600 700 800 Pro
Stride
500 600 700 800 Pro
Moxi²
Current Product in this Session
T Insera 800 P Half Shell
10A battery
115/50 dB (2cc)
Push Button
Volume Control
Telecoil
Easy-t
Shell:
Half shell
Receiver:
Power
T Insera 800 P Half Shell
Shell:
Half shell
Receiver:
Power
10A battery
115/50 dB (2cc)
Push Button
Volume Control
Telecoil
Easy-t
T Insera 800
SoundNav (7 Environments)
SpeechZone 2
Speech Locator
Spatial Awareness (Personal)
Sound Conductor
Adaptive Directionality (Multiband)
Binaural MyMusic
Binaural Phone


Configure Screens for Tempus features

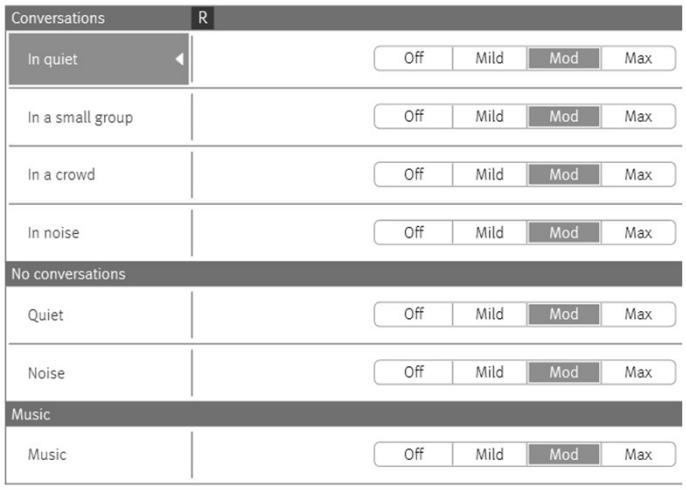

Training Session
Unitron TrueFit (Internal) (Beta)
File
Forms
Hearing Instrument
Options
Help
Developer
Client
Instruments
Fitting
End Fitting
Feedback Optimization
Program Manager
Tuning
Patient Insights
Quick Fit
Conversation in quiet
R ×
Detect
× L
T Stride Pro
T Stride Pro P BTE
Connection
Configure Features
Universal
Sound Conductor
Input
Wind Control
AntiShock 2
Phase Canceller
Specific
Binaural Phone
MyMusic
Automatic Controls
Select a sound file
Sound Conductor
Feature Details
Low (Hz)
Mid (Hz)
High (Hz)
Spatial Awareness
Speech Enhancement
Noise Reduction
2.0 dB
4.0 dB
R
Conversation in quiet
L
SoundNav
Conversation in quiet
Quiet
Music
Conversation in a small group
Noise
Conversation in a crowd
Conversation in noise
Manual Programs
Acoustic Telephone
Wireless Programs
uPhone
uAudio
uFM

Personalized Spatial Awareness

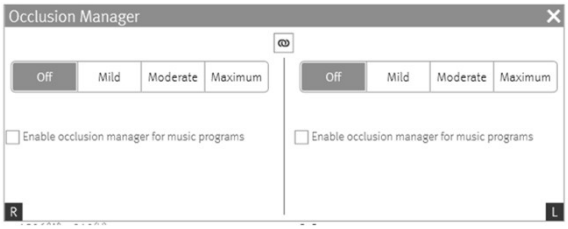
- Pro/800 technology levels only
- Applies only to the conversations in quiet and small group, quiet, and music environments
- Collapsed by default
- Parameters (tool tip on button hover over)
  - High (2600 Hz)
  - Average (2400 Hz)
  - Low (1500 Hz)

Feedback Manager Optimization

- Phase canceller has been optimized to reduce the incidence of feedback
- The optimization allowed the default setting to be reduced from “Max” to “Mod”

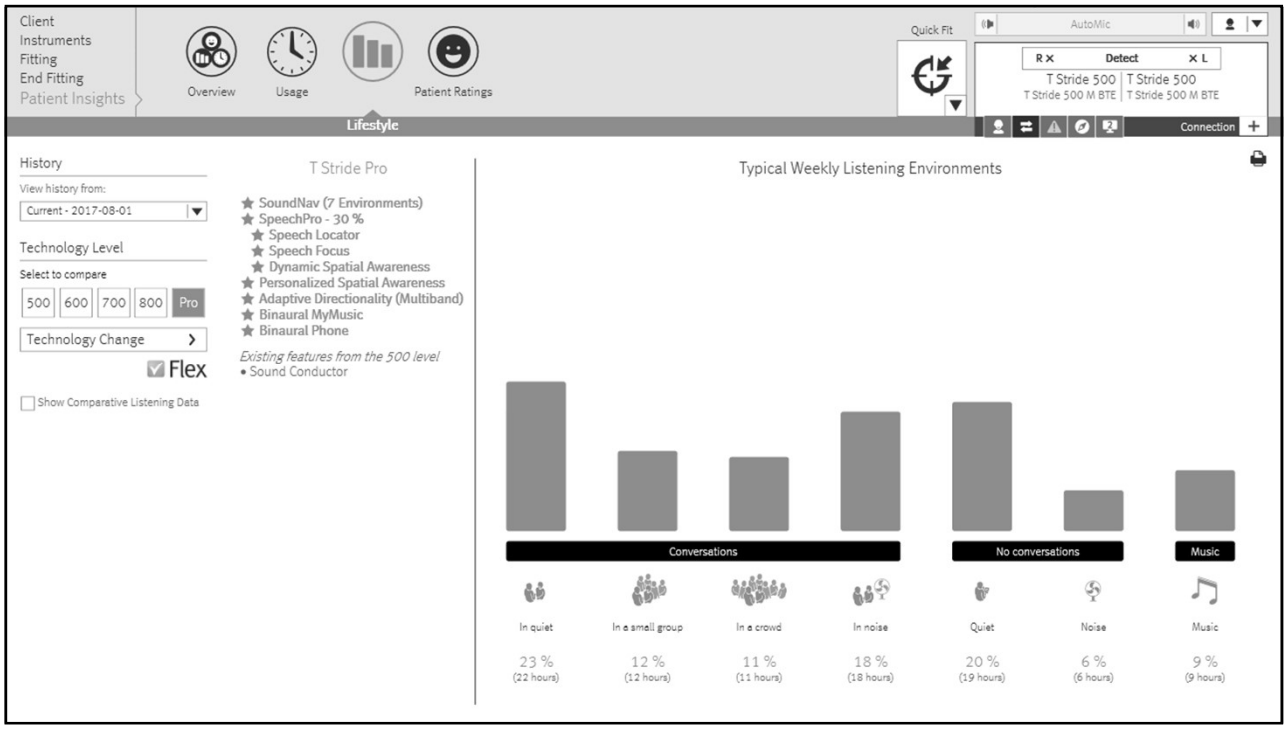


Changes to Occlusion Manager



unitron

Lifestyle screen improvements


Client
Instruments
Fitting
End Fitting
Patient Insights
Overview
Usage
Patient Ratings
Lifestyle
Quick Fit
AutoMic
R
Detect
L
T Stride 500
T Stride 500 M BTE
Connection
History
View history from:
Current - 2017-08-01
Technology Level
Select to compare
500
600
700
800
Pro
Technology Change
Flex
Show Comparative Listening Data
T Stride Pro
SoundNav (7 Environments)
SpeechPro - 30 %
Speech Locator
Speech Focus
Dynamic Spatial Awareness
Personalized Spatial Awareness
Adaptive Directionality (Multiband)
Binaural MyMusic
Binaural Phone
Existing features from the 500 level
• Sound Conductor
Typical Weekly Listening Environments
Conversations
No conversations
Music
In quiet
In a small group
In a crowd
In noise
Quiet
Noise
Music
23 %
(22 hours)
12 %
(12 hours)
11 %
(11 hours)
18 %
(18 hours)
20 %
(19 hours)
6 %
(6 hours)
9 %
(9 hours)

Typical Weekly Listening Environments
Conversations
No conversations
Music
In quiet
In a small group
In a crowd
In noise
Quiet
Noise
Music
23 %
(22 hours)
12 %
(12 hours)
11 %
(11 hours)
18 %
(18 hours)
20 %
(19 hours)
6 %
(6 hours)
9 %
(9 hours)

SoundCore makes conversations more enjoyable for your patients with 3712 unique responses.
With Spatial Awareness sounds and speech are realistic.
Tempus 50% more accurate and 36% faster at locating speech.
The best in conversations
Knowing the direction of speech, lets us focus in on it like never before.
SpeechPro conquers the most challenging conversations in noise and crowds.
Tempus is a game changer.

Now is the time for
Tempus