

# Webinar FAQs

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## Starkey CROS, BiCROS, and AmpCROS Solutions

Andrea Hannan Dawkes, Au.D.

### How to Ask a Question

Click Q & A, type your question, and Send

### Where to get the handout

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Use the Q&A window



# Risks and Benefits

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The applicability and accuracy of the course content may vary by the clinical, geographical, and cultural context; you should evaluate the course accordingly.

As healthcare is rapidly evolving, new findings may change the validity of the information presented in this course. Providers should always consult the latest research and guidelines from professional associations.

The interventions discussed in this course may be limited in generalizability, requiring practitioners to consider specific individual and population factors.

The course may not cover all possible risk factors, diagnostic methods, or treatment options, and complex cases may require additional considerations.

Healthcare providers should apply cultural competence and sensitivity to ensure effective and respectful care based on their patients' diverse needs.

Providers should always evaluate the limitations of diagnostic and screening tools, considering their potential for false results as well as any ethical implications.

It is the responsibility of course participants to critically evaluate the evidence from multiple sources to guide professional practice.

# Learning Outcomes

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1

List the Edge AI products for treating single-sided deafness

2

Identify the microphone configuration options for CROS and BiCROS fittings within the Pro Fit software

3

Explain how to configure an AmpCROS solution



A photograph of an older couple walking a black dog on a paved path along a beach. The man is wearing a blue hoodie and the woman is wearing a white hoodie and brown pants. They are walking away from the camera towards the ocean. In the background, there are palm trees and a modern building.

**EDGE<sup>AI</sup>**

# Starkey CROS, BiCROS and AmpCROS Solutions

**Andrea Hannan Dawkes, Au.D.**

Senior Audiologist of Education & Training



# Agenda

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Single-sided deafness

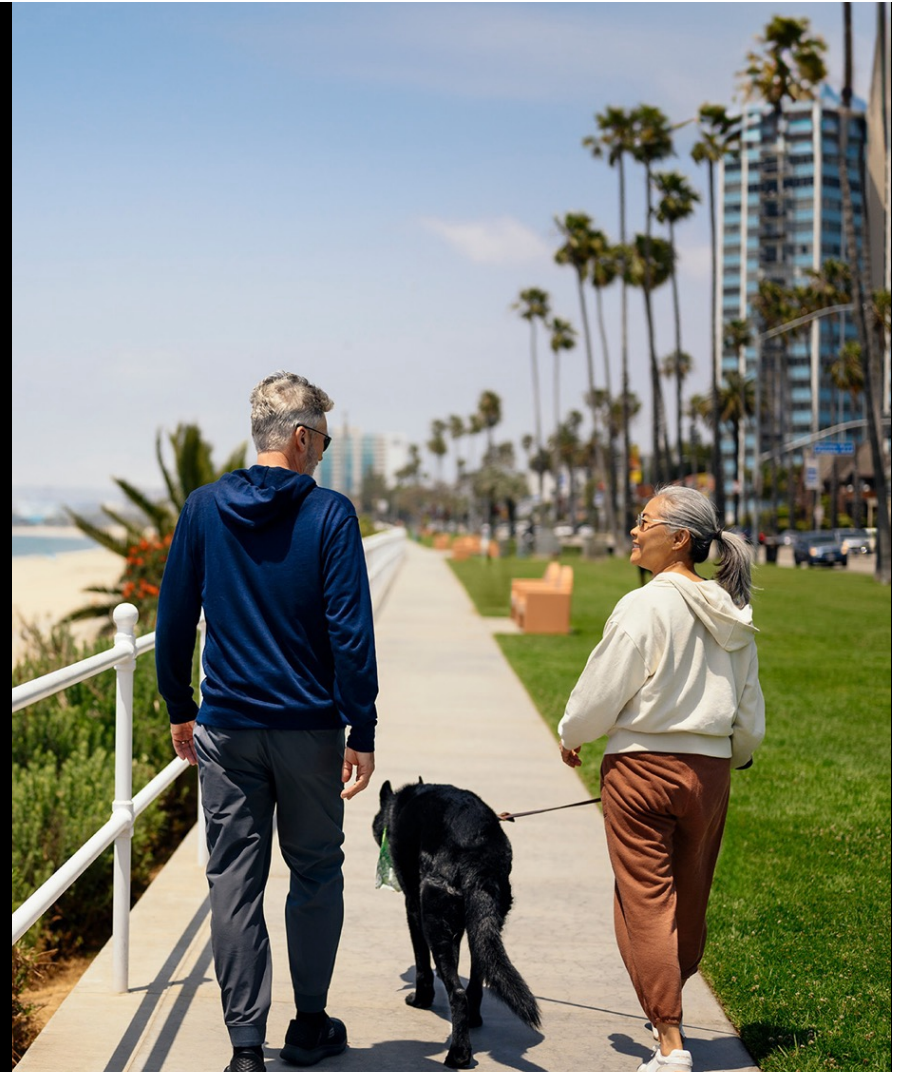
CROS, BiCROS and AmpCROS solutions

Programming considerations

CROS verification and validation

Wireless accessories

Good to know's





## SSD Single-Sided Deafness

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Significant or total hearing loss in one ear that does not benefit from hearing aid use

A close-up, profile view of a woman with short, dark hair, smiling and looking towards the right. She is wearing a white shirt and large hoop earrings. The background is blurred, suggesting an outdoor setting.

# Etiologies

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Acoustic neuroma

Genetic/hereditary

Head injury or trauma to the ear

Sudden idiopathic sensorineural hearing loss

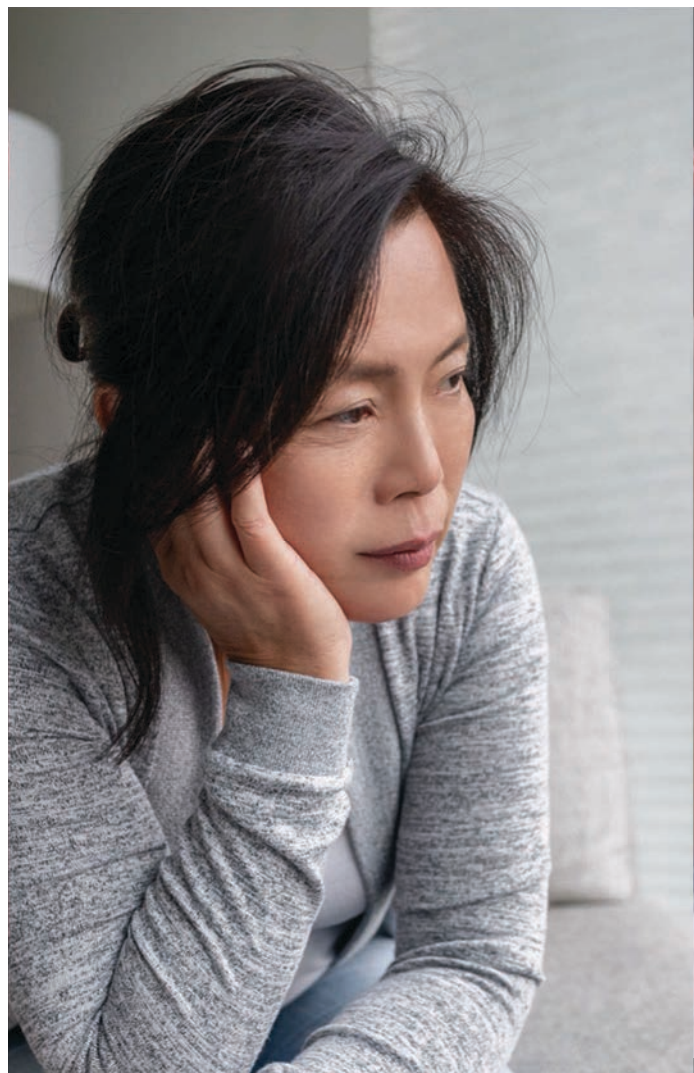
*Viral infection or vascular*

Meniere's disease

CVA/stroke

Labyrinthitis

Ear or brain surgery



# Impacts

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Spatial orientation or localization errors

Reduced speech understanding in noise

Psychosocial effects

*Fletcher, 1953; Shaw, Newman, & Hirsh, 1947; Taylor, 2010; Tillman, Kasten, & Horner, 1963; Valente, Valente, Enrietto, & Layton 2002*

A photograph of a smiling woman with short hair, wearing a yellow sleeveless top, sitting at an outdoor restaurant table. The background is blurred, showing green trees and warm, glowing lights, suggesting a pleasant evening setting.

# Auditory Localization

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“The auditory system’s remarkable ability to determine the spatial origin of a sound, which is a fundamental aspect of how we interact with our environment. Unlike vision... auditory localization requires the brain to compute the location of sounds based on the differences in how sound waves reach each ear.

This complex process allows us to perceive whether a sound is coming from the left, right, front, back, above, or below us.”

– *Michael Filimowicz, PhD*

# Localization

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## Binaural Cues

The placement of the two ears on roughly opposite sides of the head allows the auditory system to simultaneously sample the sound field from two different spatial locations

*Interaural Time Difference (ITD)*

*Interaural Level Difference (ILD)*

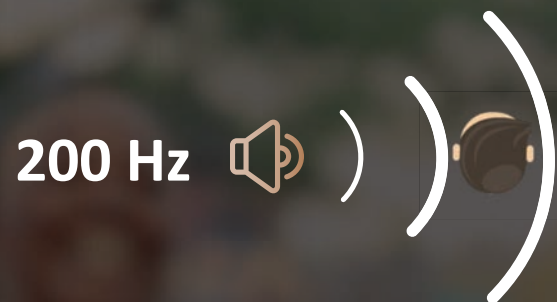
## Monaural Cues

The convoluted shape of the outer ear produces a complex pattern of sound resonances and diffractions that boost and reduce different frequencies

*Head-Related Transfer Function (HRTF)*

# Interaural Time and Level Differences

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## Interaural Time Difference (ITD)

Greatest contribution at lower frequencies



## Interaural Level Difference (ILD)

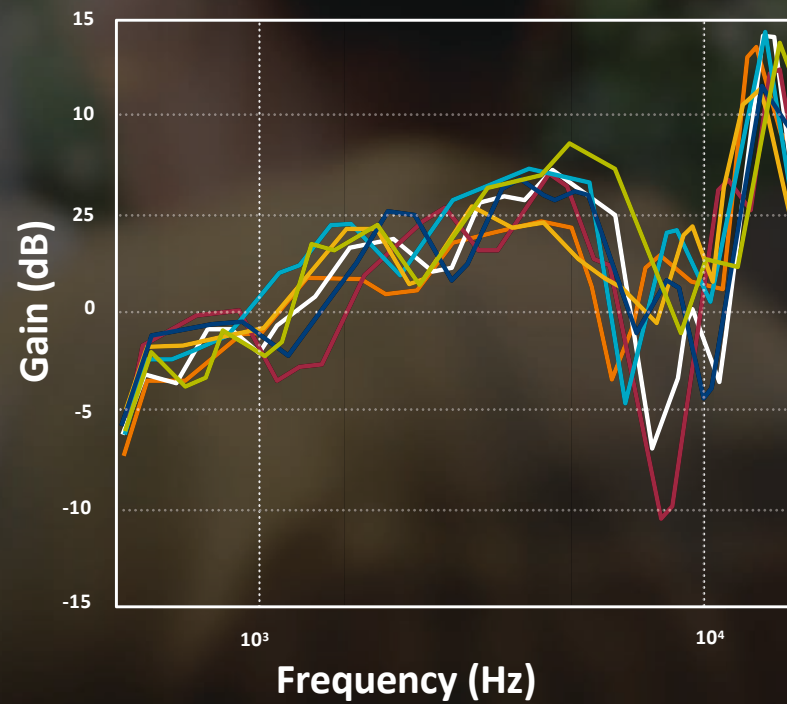
Head Shadow Effect

Largest at higher frequencies

# Monaural Cues



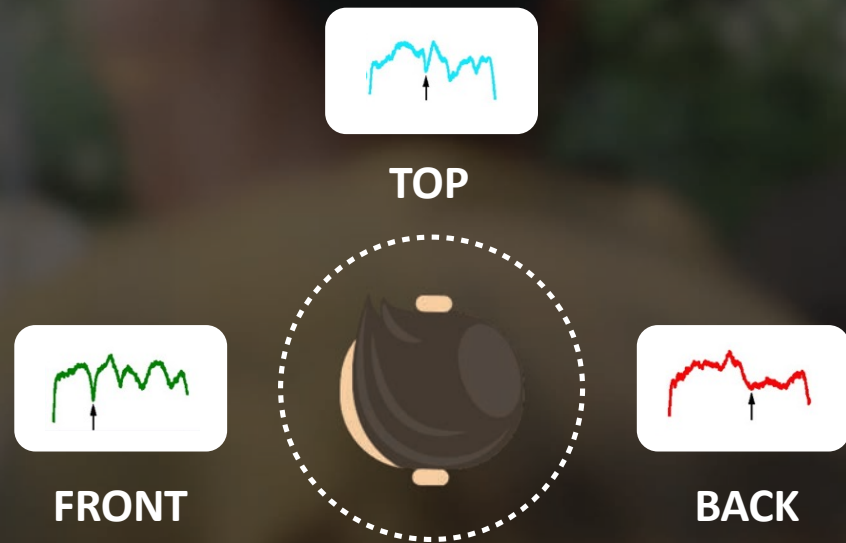
Unique Acoustic Signatures



# Monastral Cues

Identical ITDs and ILDs  
at the two ears

Unique Head Related Transfer  
Functions (HRTFs) for all 3  
different positions



# Speech Understanding in Noise

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Speech recognition in noise improves when speech and noise sources are separated in space

Different spectral, temporal, and intensity cues between competing sources create useful interaural time and level differences





> 2KHz

15-20 dB  
attenuation

## Head Shadow Effect

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Benefit in speech recognition obtained when target and masker originate from different sources

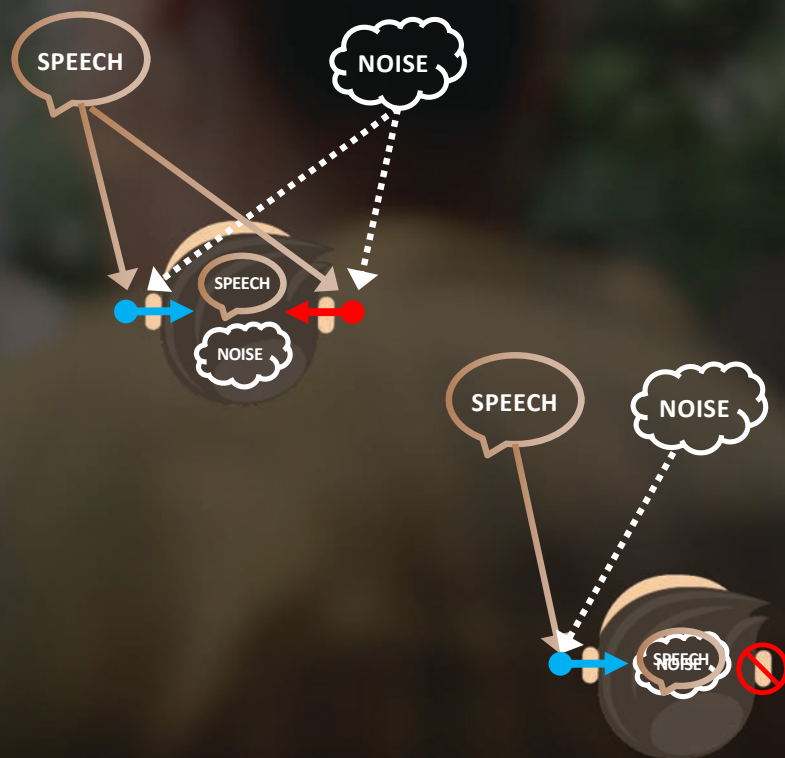
Ear farther away from the noise source has a better signal-to-noise ratio (SNR) as the head acts like an acoustic barrier and attenuates the sound

# Speech in Noise

Person with binaural hearing can differentiate speech signals in surrounding noise

Ability is lost in unilateral hearing loss making speech understanding in noise difficult

SSD patients **need an additional 13 dB increase in signal-to-noise ratio (SNR)** to achieve speech recognition in noise performance similar to that of individuals with normal hearing



# Psychosocial Impacts

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**Anxiety**



**Frustration**



**Difficulty  
multitasking**



**Social isolation**



## Prevalence of Asymmetric Hearing Loss

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# Options for Patients

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Do nothing/behavioral adaptations

CROS/BiCROS/AmpCROS

MultiCROS

Bone conduction hearing aid

Bone anchored hearing aid

Cochlear implant



# EDGE<sup>AI</sup>



CIC

ITC/HS R

ITE R

mRIC R

RIC RT

RIC 312

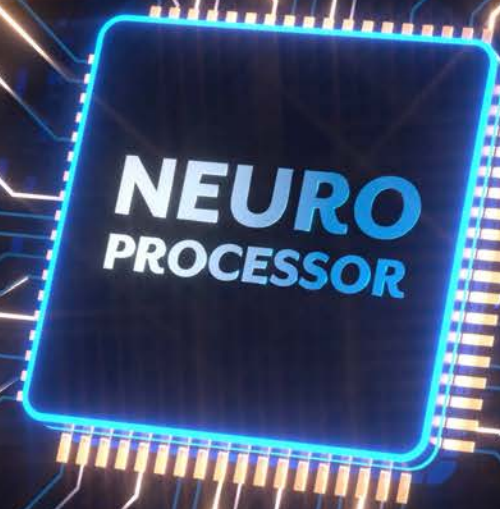
**Tech tiers**  
24 | 20 | 16

**Superpower-full**

**100X** more  
**DNN processing**

*than Genesis AI*

**2.4 GHz Radio with LE Audio**





**30%**

**MORE ACCURATE**  
AT IDENTIFYING SPEECH

**6dB**

**ADDITIONAL  
REDUCTION**  
IN LOW-LEVEL NOISE

**APPROPRIATELY CLASSIFIES  
MULTI-TALKER BABBLE**

**13<sup>UP TO</sup>dB**

**SNR  
IMPROVEMENT**  
IN NOISY ENVIRONMENTS

**CLEANER**

**PURER SIGNAL**

# Wireless CROS System

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CROS  
BiCROS  
AmpCROS

Transmitter and Receiver  
styles must match



## RIC RT

Up to  
**29 hours**  
on a single charge



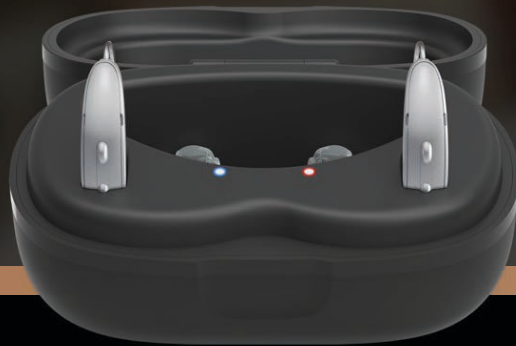
## RIC 312

Up to  
**4 days**  
Zinc Air 312

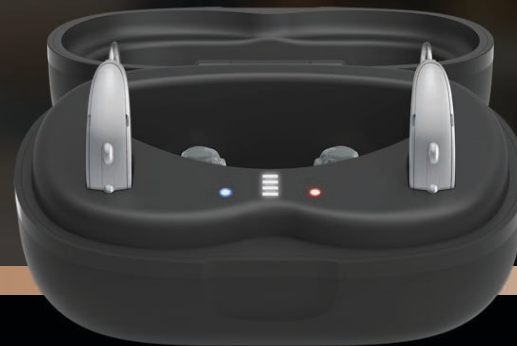
Battery life estimates based on 50 gain receivers

# StarLink Charger 2.0

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**StarLink Charger 2.0**  
*Default*



**StarLink Premium Charger 2.0**  
**with on-board battery**  
*Orderable*



# CROS Transmitter

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Non-functional

# CROS System

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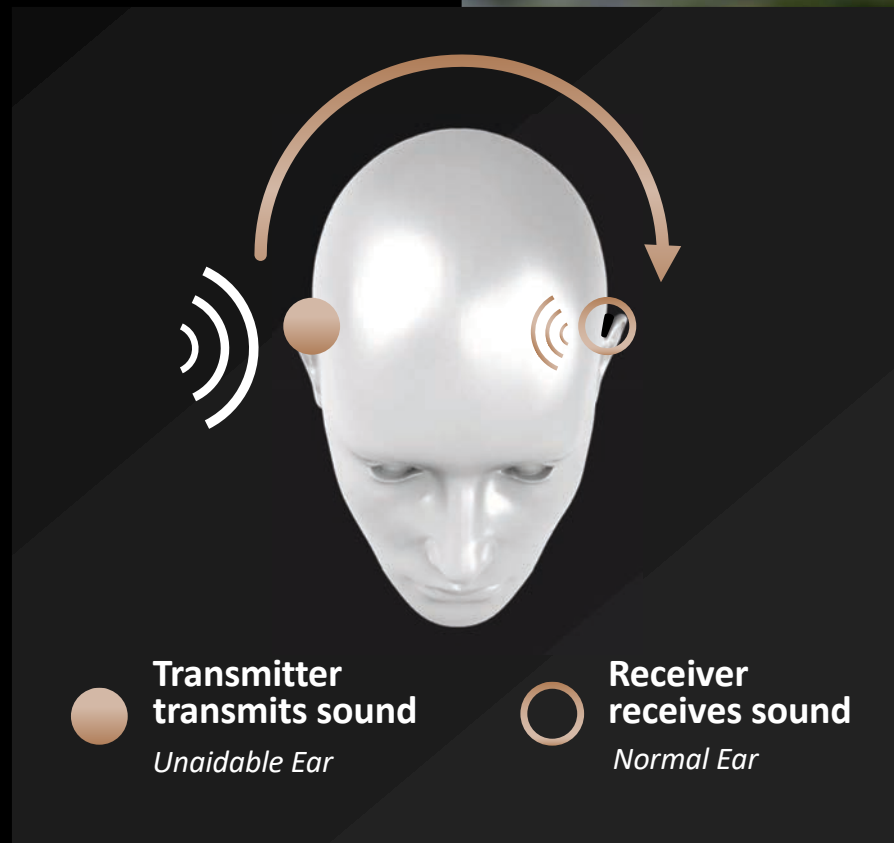
## **CROS** Contralateral Routing of Signals

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Designed for unaidable  
unilateral hearing loss

Transmitter on ear with  
hearing loss and Receiver on  
normal hearing ear

Acoustic signal routed from  
poorer ear to normal  
hearing ear



# CROS Candidacy

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**One normal hearing ear**

**One ear with hearing loss that does not benefit from amplification**

**Total Unilateral Hearing Loss**

*Single Sided Deafness*

Congenital

Acquired

Very poor WRS combined with hyperacusis or degraded WRS with binaural presentation on the affected side  
*no amplification benefit*



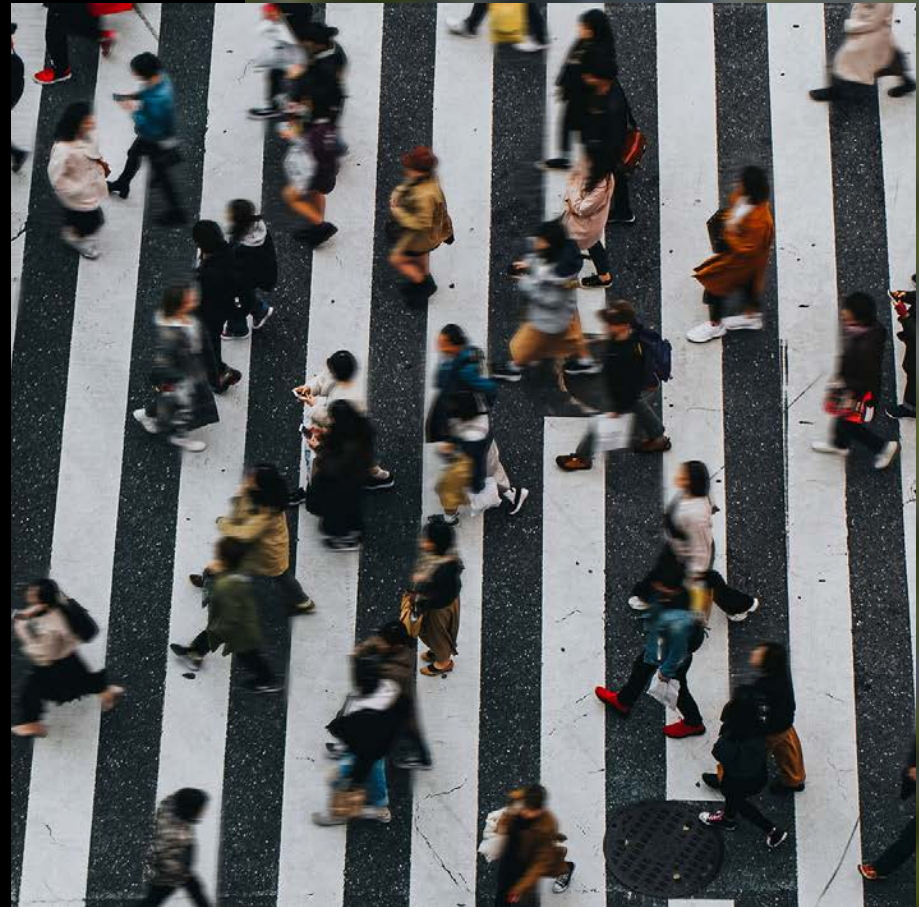
# Incidence of Unilateral Hearing Loss

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**1.7 Million\***

\*Individuals reporting hearing trouble  
resulting from moderate to severe  
unilateral hearing loss in the U.S.

*(Golub, Lin, Lustig & Lalwani, 2018)*



# BiCROS System

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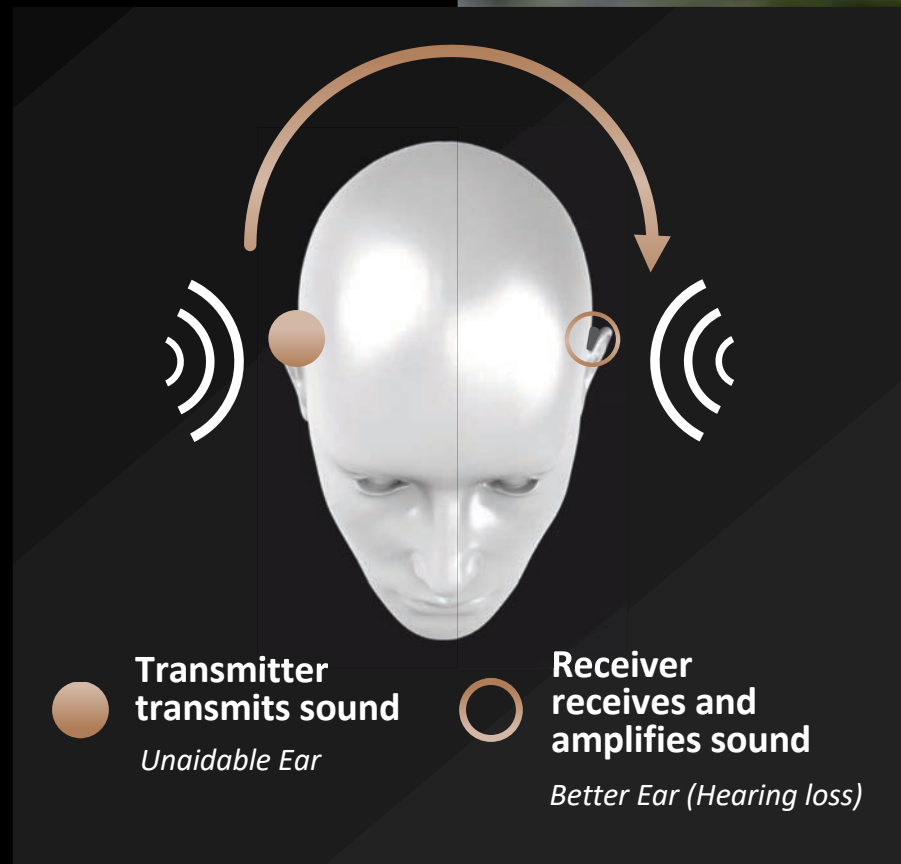
## **BiCROS** Bilateral Contralateral Routing of Signals

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Designed for people with hearing loss in both ears including one ear that does not benefit from amplification

Transmitter worn on unaidable ear and Receiver worn on ear with better hearing

Acoustic signal routed from poorer ear to better hearing ear where input from both microphones is amplified



# BiCROS Candidacy

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## **Bilateral hearing loss**

One ear that can benefit from amplification and one that cannot



# AmpCROS System

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## AmpCROS

# Amplification CROS

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Designed for people with hearing loss in one or both ears

Poorer ear has reduced word recognition ability but appreciates sound for spatialization

Two hearing aids are worn AND signals are also sent from the poorer ear to the better hearing ear



Hearing aids worn bilaterally

Signal also sent from poorer ear to better ear

# AmpCROS Candidacy

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Unilateral or bilateral hearing loss

Poorer ear has reduced word  
recognition ability but  
appreciates amplification for  
sound spatialization



# Valuable Features

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# CROS Modes

## Hearing Aid Only Mode

*Transmitter Microphone OFF*

*Receiver Microphone ON*

Target signal on better side/poor ear by noise

## CROS Mode

*Transmitter Microphone ON*

*Receiver Microphone OFF*

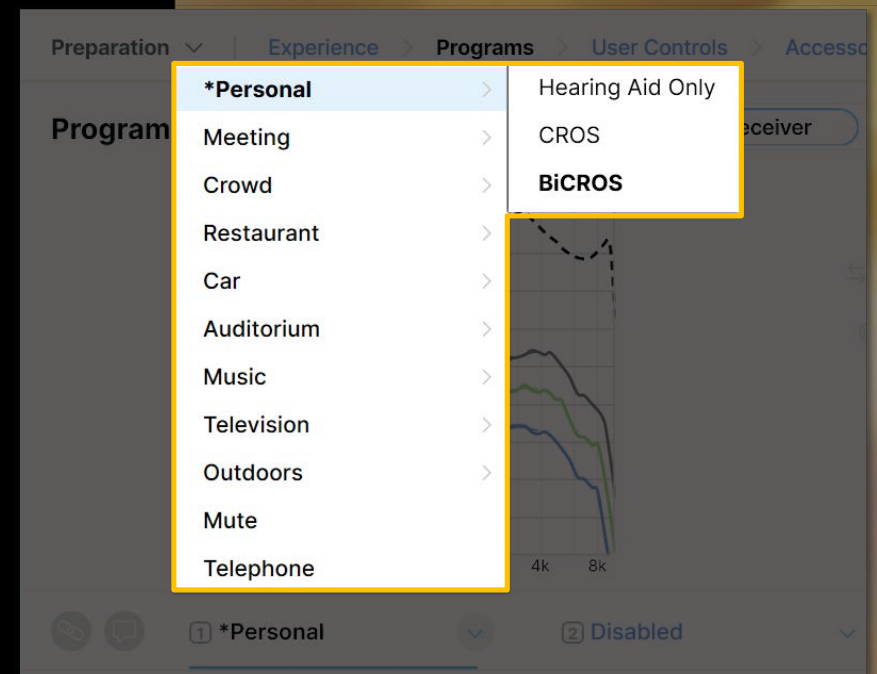
Target signal on poor side

## BiCROS Mode

*Transmitter and Receiver Microphones both ON*

Target signal on both sides

## Personalization



# Hearing Aid Only Mode

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## Transmitter Mic OFF / Receiver Mic ON

Signals from transmitter are NOT sent to receiver on better hearing ear

May be helpful to CROS or BiCROS patients

In the car with the transmitter by the window or when in noisy situations

*Mute, Loop, and all Telephone programs are automatically set to Hearing Aid Only and cannot be changed*

### Mode

(for selected program)

- ☒ **Hearing Aid Only**
- ☐ **CROS**
- ☐ **BiCROS**

# CROS Mode

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## Transmitter Mic ON / Receiver Mic OFF

Signals from transmitter sent to receiver worn on better hearing ear

Typical configuration for a CROS patient

### Mode

(for selected program)

- ☐ Hearing Aid Only
- ☒ **CROS**
- ☐ BiCROS

# BiCROS Mode

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## Both Transmitter and Receiver Mics ON

Signals from transmitter sent to receiver worn on better hearing ear

Receiver mic also active and amplification applied

Typical configuration for a BiCROS patient

### Mode

(for selected program)

- ☐ Hearing Aid Only
- ☐ CROS
- ☒ BiCROS

Can a CROS  
patient benefit  
from BiCROS mode?

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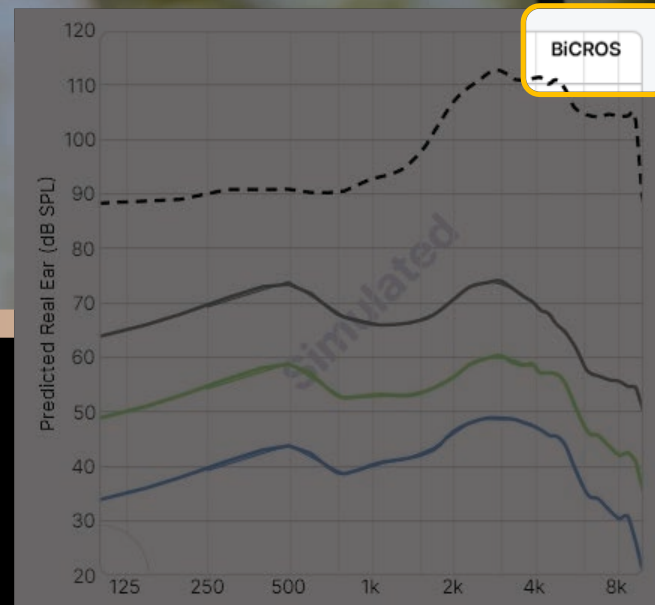
**Yes**

*Independent directionality  
and noise control in the  
receiver and transmitter*

Can provide an advantage  
in dynamic /noisy  
environments like in a  
restaurant or at a party



# Mode Displayed on Fitting Graphs

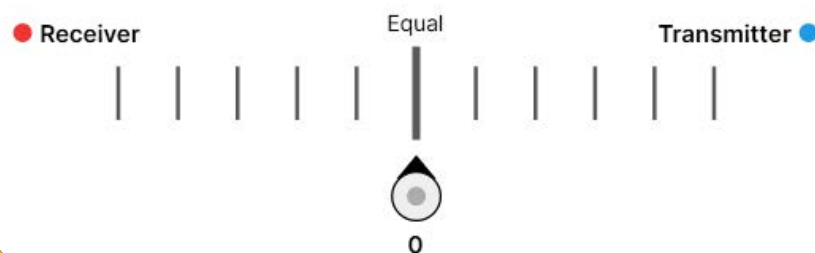


# BiCROS Mode Balance Control

Balance control adjusts the level of sounds coming from the Transmitter relative to the Receiver in BiCROS mode

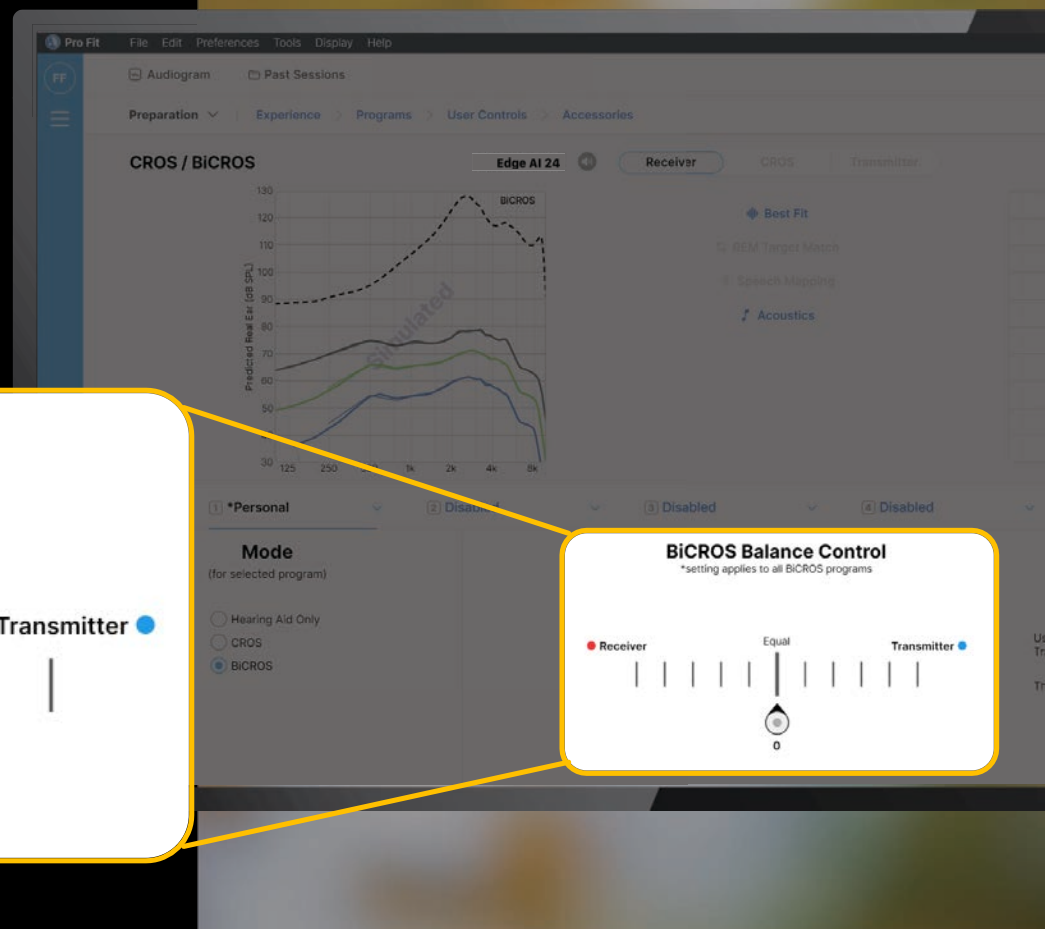
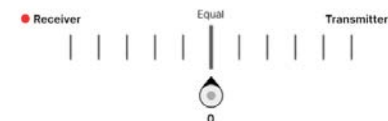
## BiCROS Balance Control

\*setting applies to all BiCROS programs



## BiCROS Balance Control

\*setting applies to all BiCROS programs

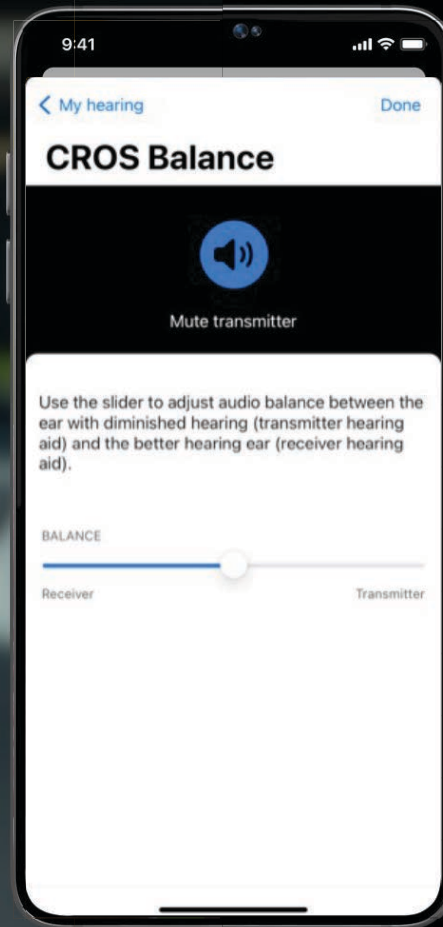
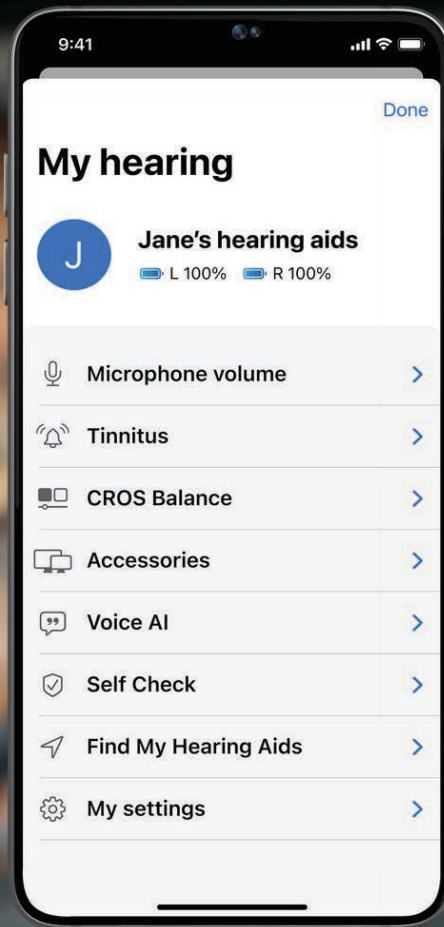




# CROS

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**My Starkey app detects  
Receiver and Transmitter**  
*Smartphone detects Receiver only*



# CROS Balance

Tap **My hearing** > **CROS Balance** to adjust the balance between Receiver and Transmitter with BiCROS mode



# CROS Transmitter

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## **Auto-Shutdown**

Battery life is preserved if the user removes the Transmitter from their ear and sets it down

# CROS and BiCROS Programming Considerations

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# Wireless Programming

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Compatible wireless programmers include  
Noahlink Wireless Programmers 1 and 2



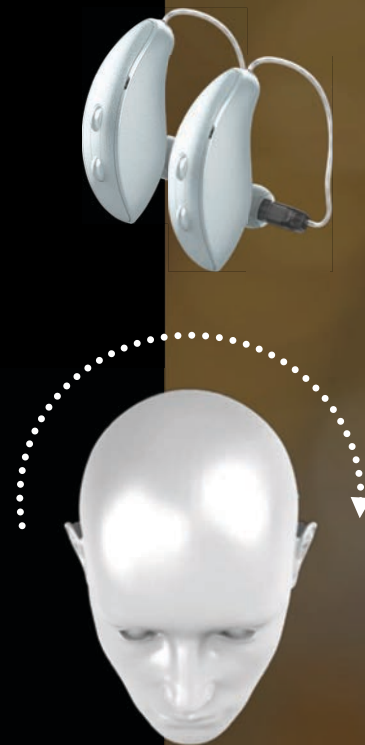
EDGE<sup>AI</sup>

# Pro Fit Connect Screen and Streaming

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CROS Receiver and Transmitter must be paired and programmed together at the initial fitting

The stream from Transmitter to Receiver is **always ACTIVE** during programming



# Pairing

Pairing automatically occurs when a Transmitter and Receiver are brought into the fitting

### Connect

**Patient:** Jane Doe [Audiogram](#)

Select the patient's hearing aids to connect. [View programmers](#)

Noahlink Wireless 2 [refresh](#)

**Jane Doe**

CROS-Receiver Edge AI 24

SN: 242313464R

FW: 10.2.0

R 100%



**Jane Doe**

CROS-Transmitter Edge AI

SN: 242313430

FW: 10.2.0

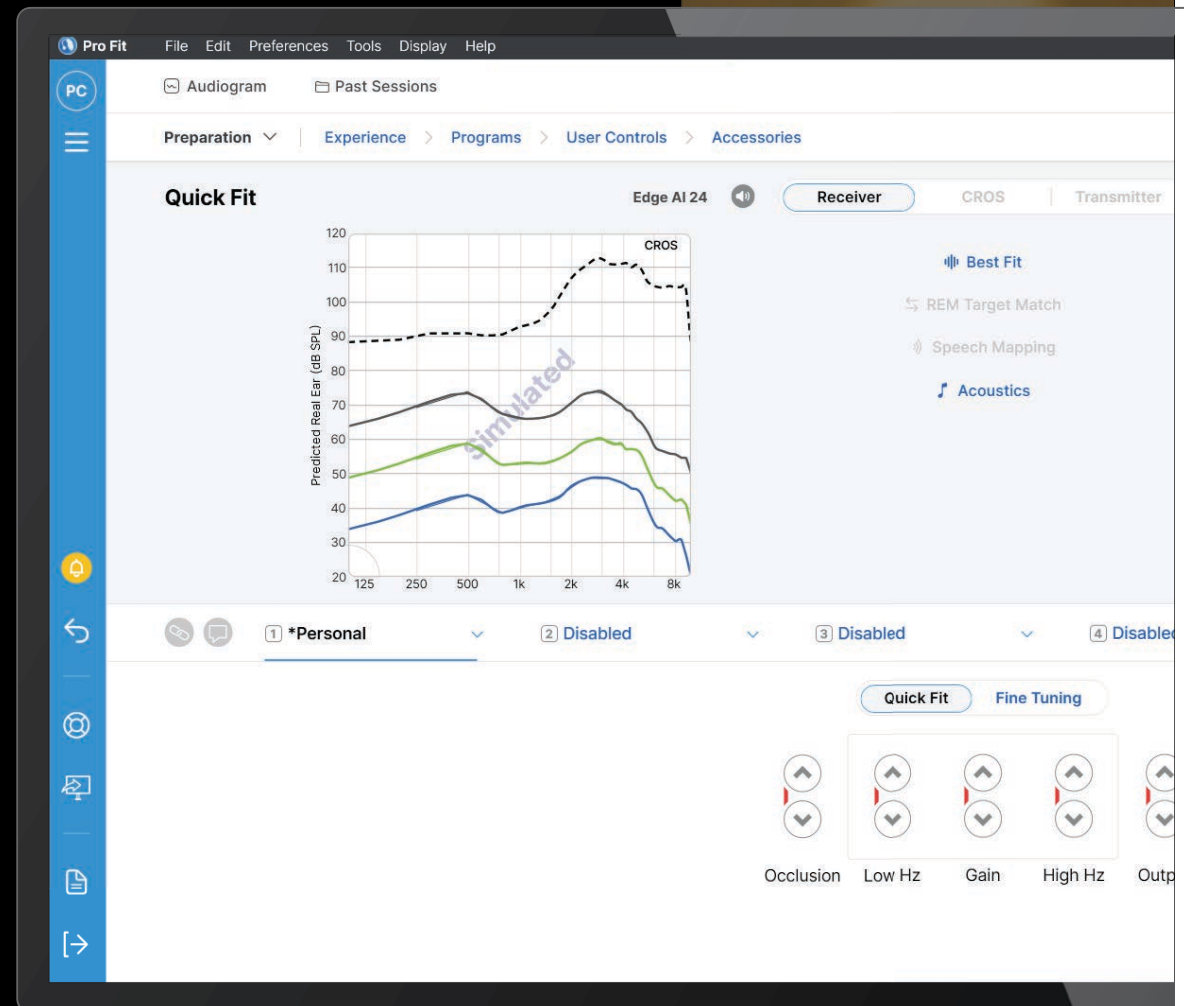
L 100% R L



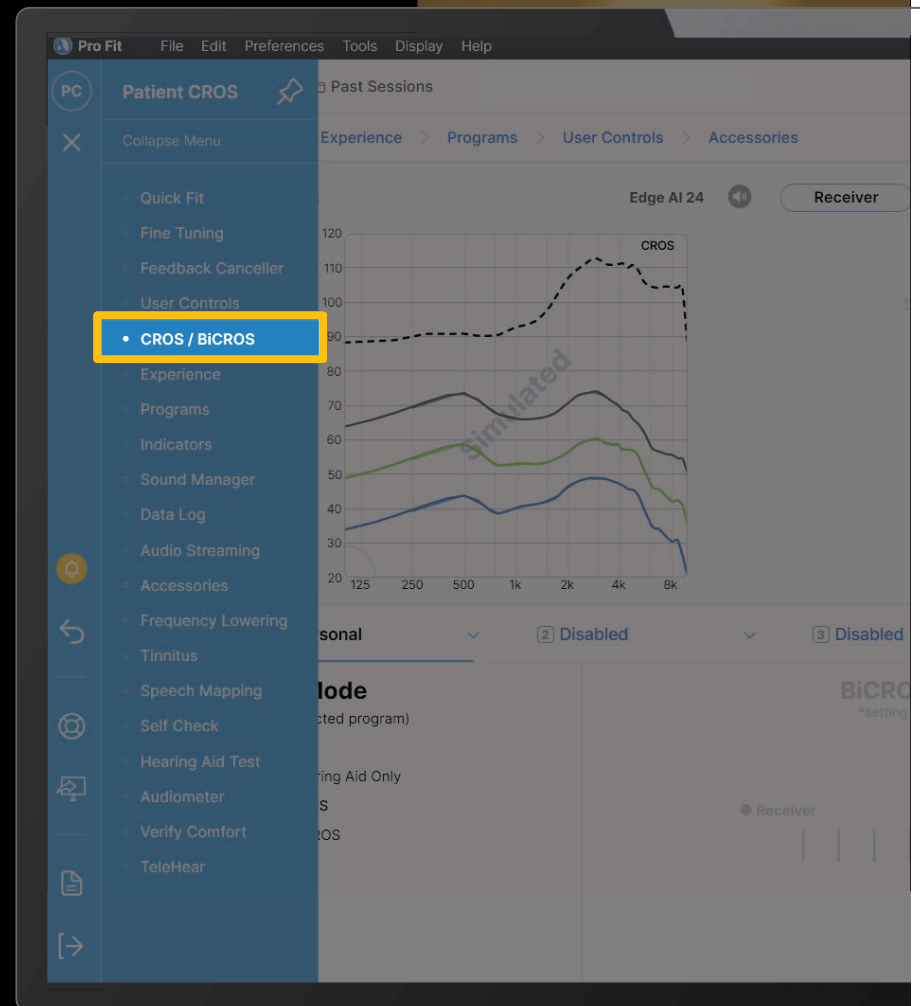
[Connect](#)

# Pro Fit

Only the Receiver populates



# CROS / BiCROS Screen



## CROS Modes

# Two ways to Access

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### Hearing Aid Only Mode

*Transmitter Microphone OFF*

Target signal on better side/poor ear by noise

### CROS Mode

*Transmitter ON / Receiver OFF*

Target signal on poor side

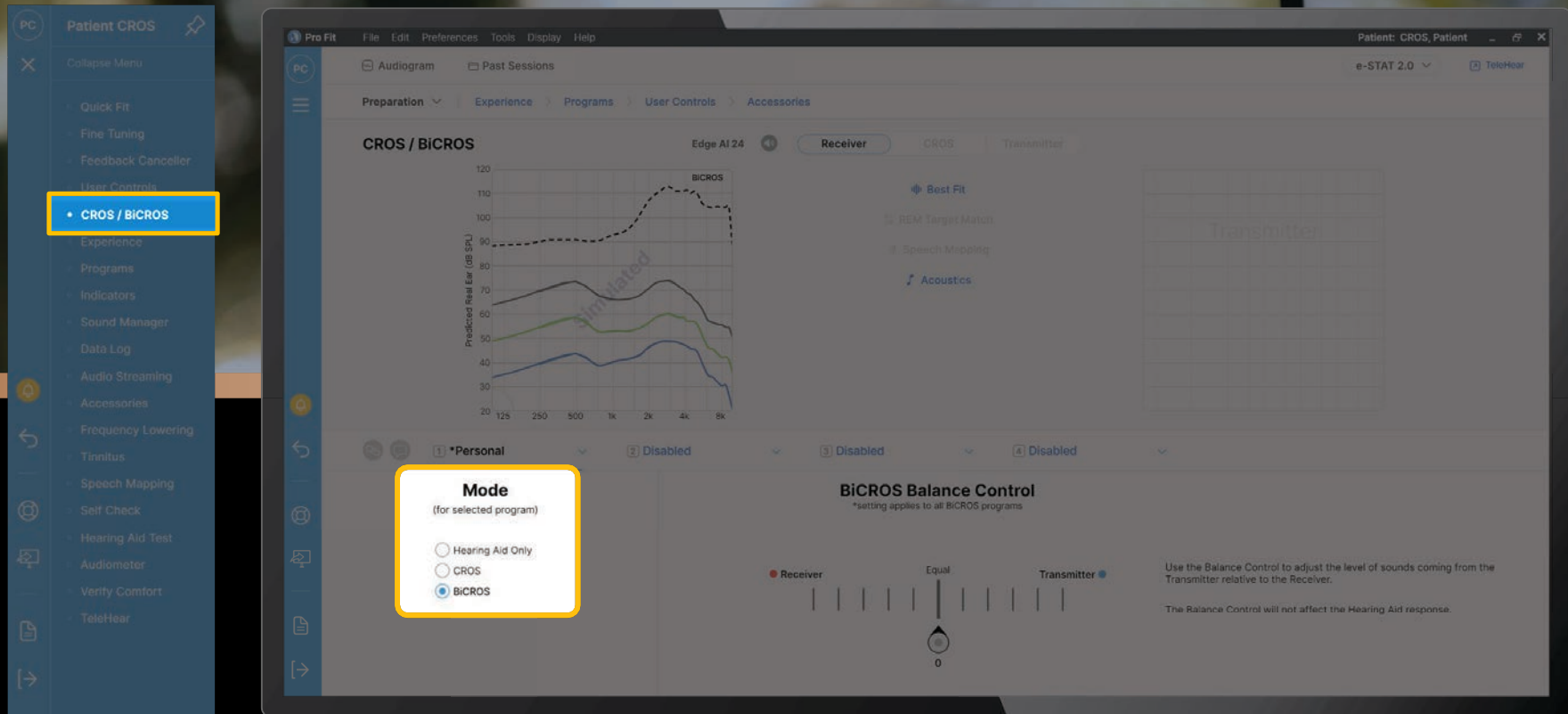
### BiCROS Mode

*Transmitter and Receiver both ON*

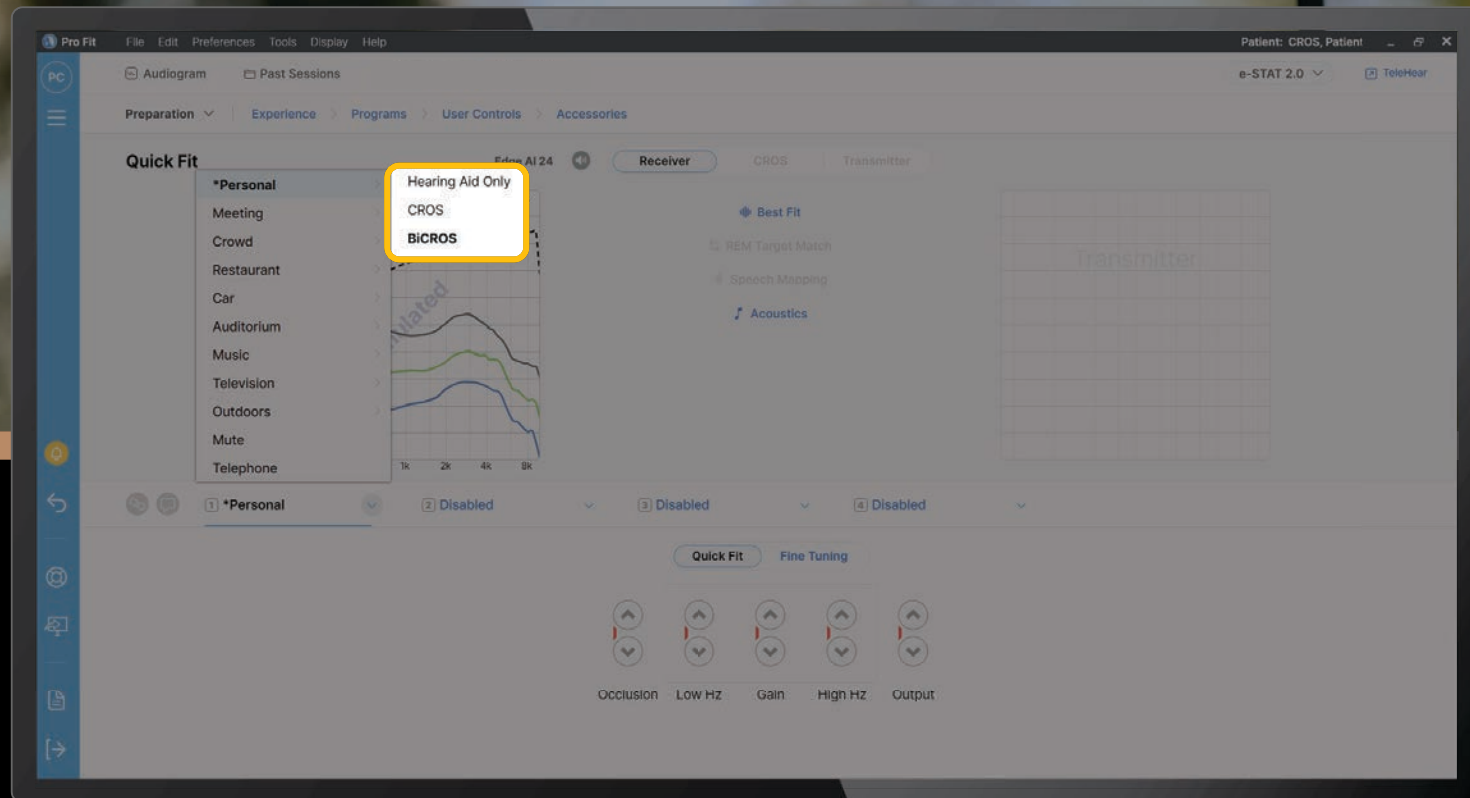
Target signal on both sides

- 1 CROS/BiCROS Screen
- 2 Program Drop Down Menu

# CROS/BiCROS Screen



# Program Drop Down Menu

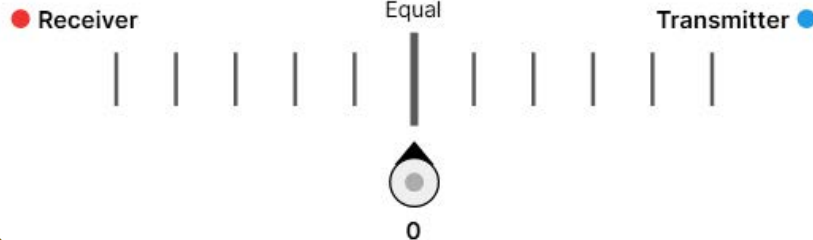


# BiCROS Mode Balance Control

Balance control adjusts the level of sounds coming from the Transmitter relative to the Receiver in BiCROS mode

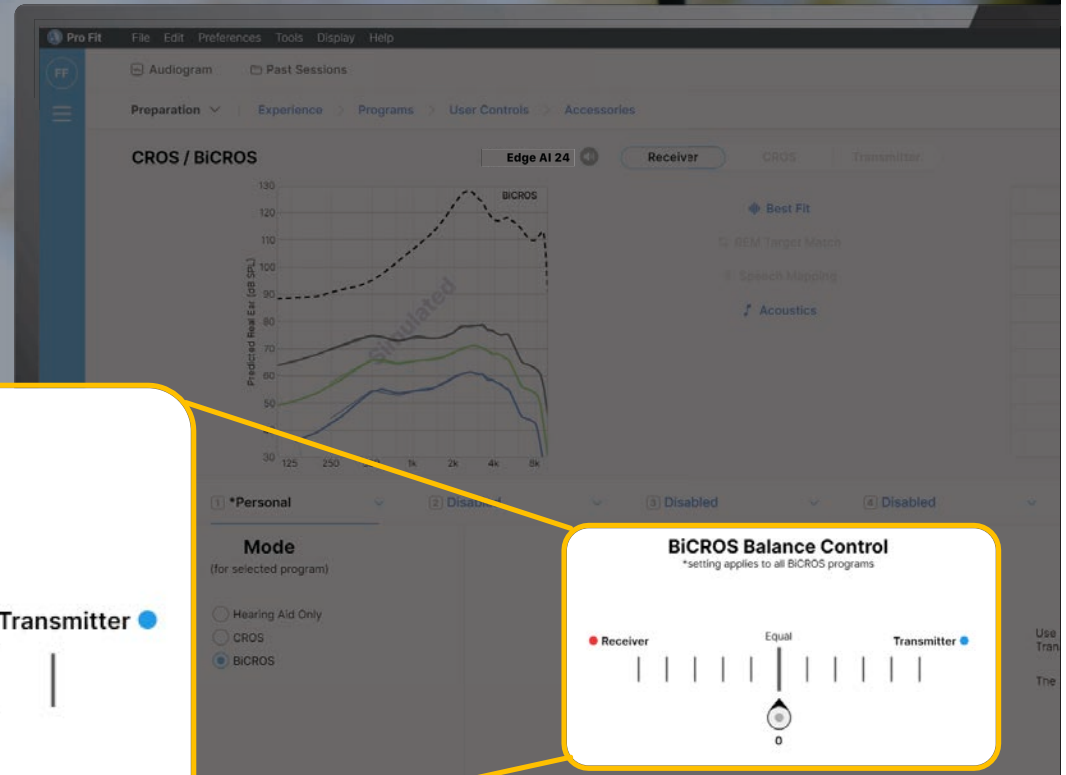
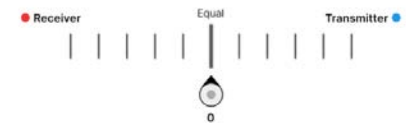
## BiCROS Balance Control

\*setting applies to all BiCROS programs



## BiCROS Balance Control

\*setting applies to all BiCROS programs



# User Controls

User controls are available for both the Receiver and Transmitter

Ear to Ear functionality applies automatically so buttons are grayed out

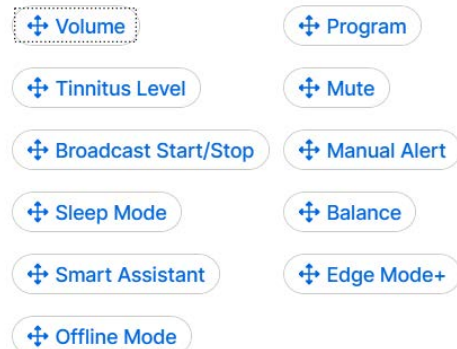
Double Tap is only available for the Receiver

Mute on the Receiver mutes the entire system

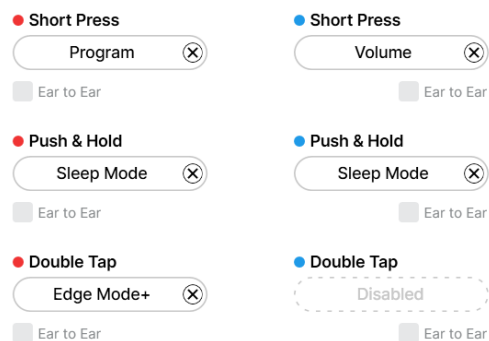
*Rechargeable hearing aids will have the Push & Hold user control configured as "Sleep Mode" when shipped*

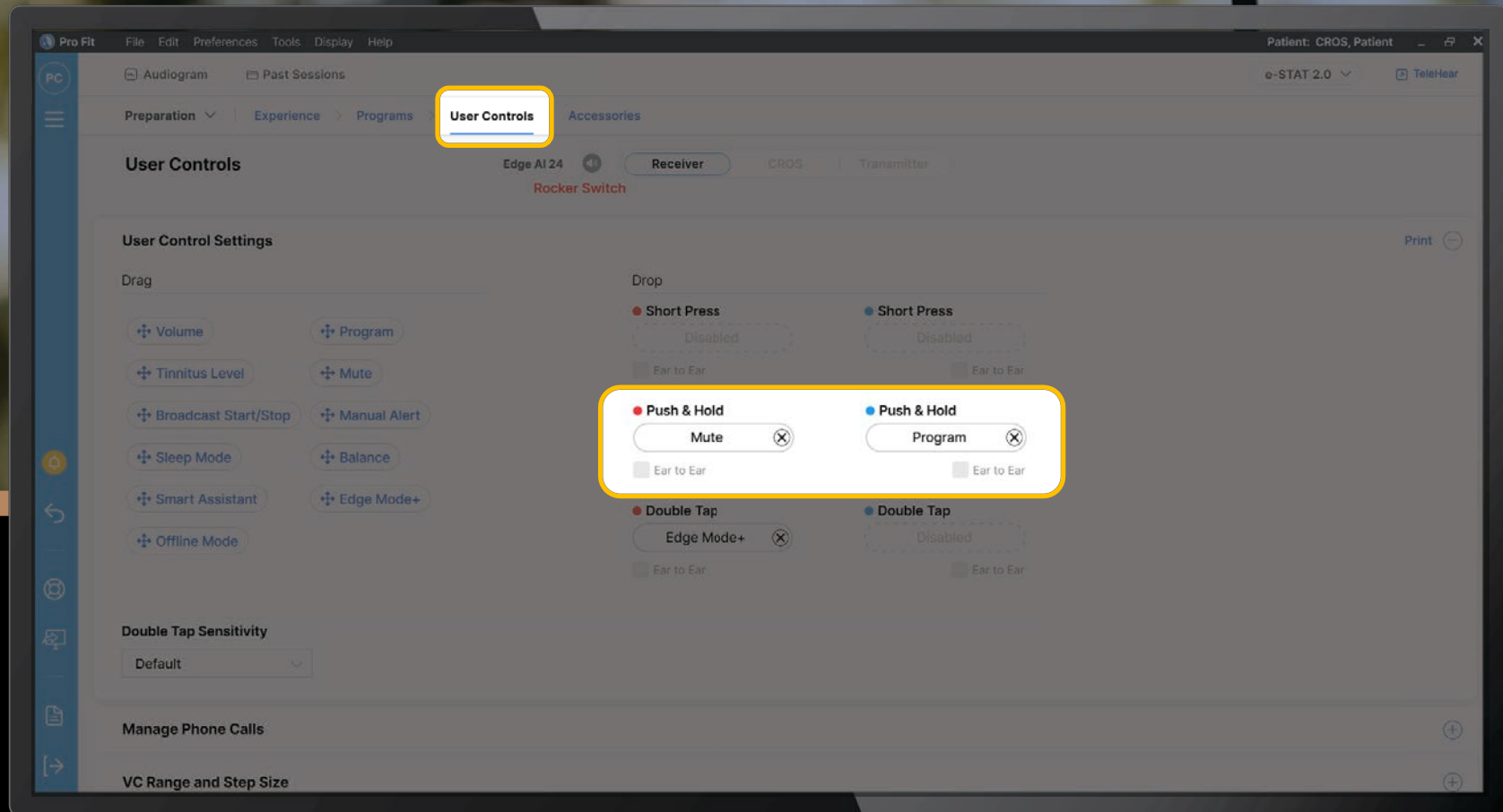
## User Control Settings

Drag

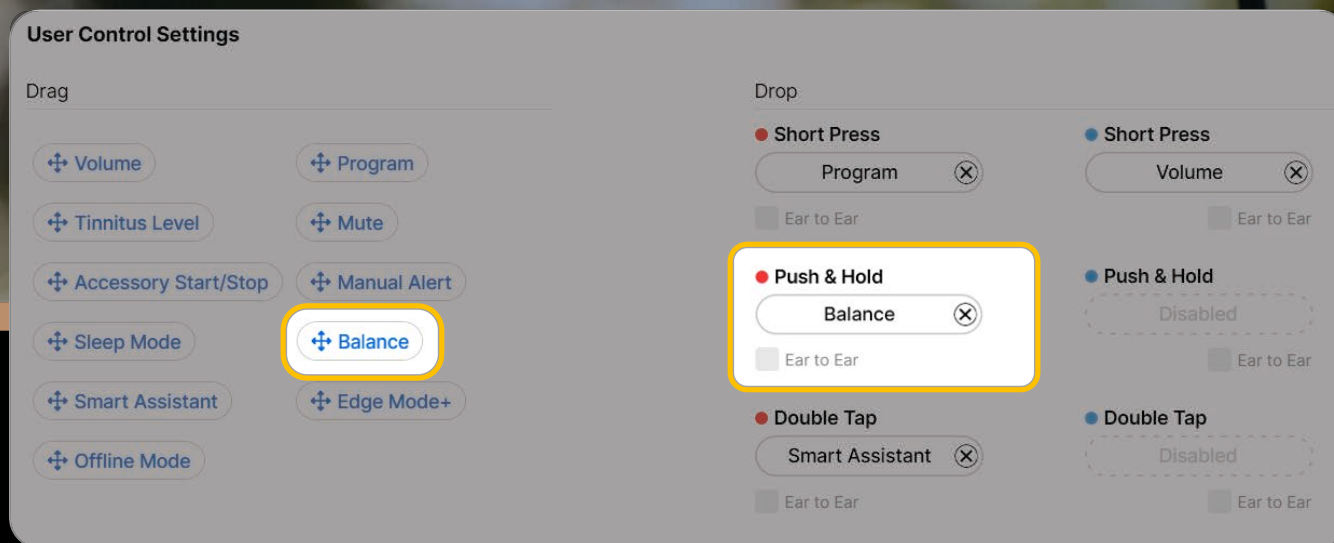


Drop





# Balance Control as User Control



# CROS Indicators

CROS Stream Start

CROS Stream Stop

Individual indicators for  
**Low Battery** and **Mute**

Indicators

All Indicators

|                   |                                     |
|-------------------|-------------------------------------|
| Low Battery       | <input checked="" type="checkbox"/> |
| Startup Sound     | <input checked="" type="checkbox"/> |
| Sleep Sound       | <input type="checkbox"/>            |
| Program / Home    | <input checked="" type="checkbox"/> |
| CROS Stream Start | <input checked="" type="checkbox"/> |
| CROS Stream Stop  | <input checked="" type="checkbox"/> |
| Telephone         | <input type="checkbox"/>            |
| Volume            | <input type="checkbox"/>            |
| Balance           | <input type="checkbox"/>            |
| Tinnitus Level    | <input type="checkbox"/>            |
| Accessory Stream  | <input checked="" type="checkbox"/> |
| Mute              | <input checked="" type="checkbox"/> |
| Manual Alert      | <input type="checkbox"/>            |
| Assistant         | <input checked="" type="checkbox"/> |

Low Battery

Tone  
- + Reset

Speech  
- +0 dB + Reset

Device  
Receiver Transmitter

Stimulus  
Low Battery "Battery" "Battery" Tone Series

Demo

## Maximum

Sound coming from transmitter is louder than the receiver

## Default

Sound coming from the transmitter and receiver are equal

## Steps

## Minimum

Sound coming from the receiver is louder than the transmitter

# BiCROS Balance Control Indicators

**Balance**

**Tone**

-

+0 dB

+

 Reset

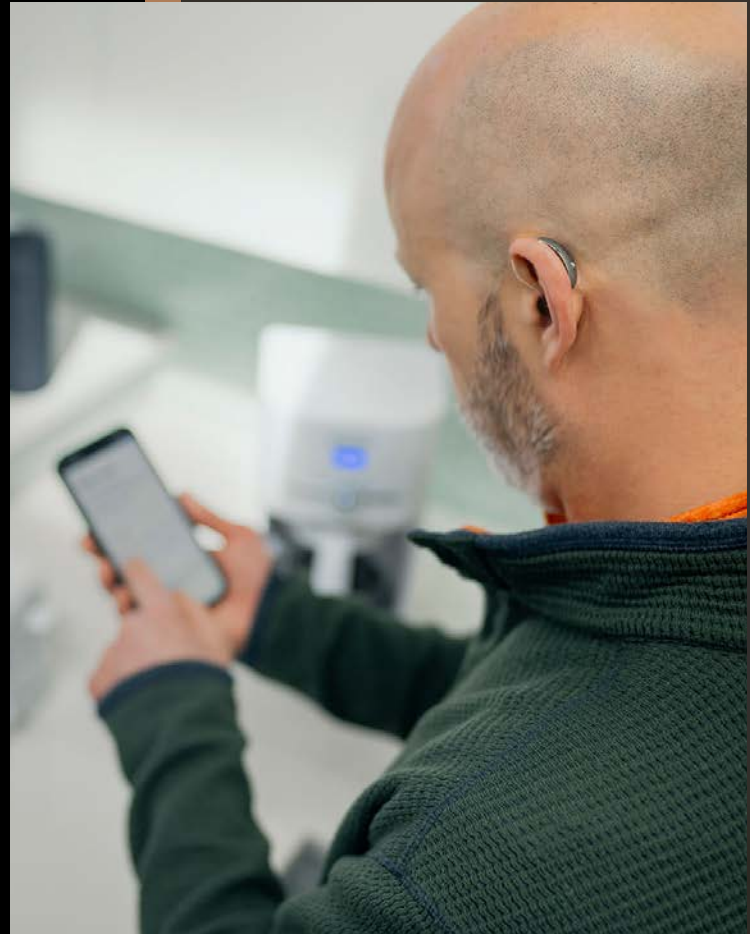
|                   |                                     | Stimulus               | Demo                                                                                                                                                                                  |
|-------------------|-------------------------------------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Max (Transmitter) | <input checked="" type="checkbox"/> | <div>Tone Series</div> | <div></div>     |
| Default           | <input checked="" type="checkbox"/> | <div>Tone Series</div> | <div></div> |
| Steps             | <input checked="" type="checkbox"/> | <div>Tone Series</div> | <div></div> |
| Min (Receiver)    | <input checked="" type="checkbox"/> | <div>Tone Series</div> | <div></div> |

# Telephone Use

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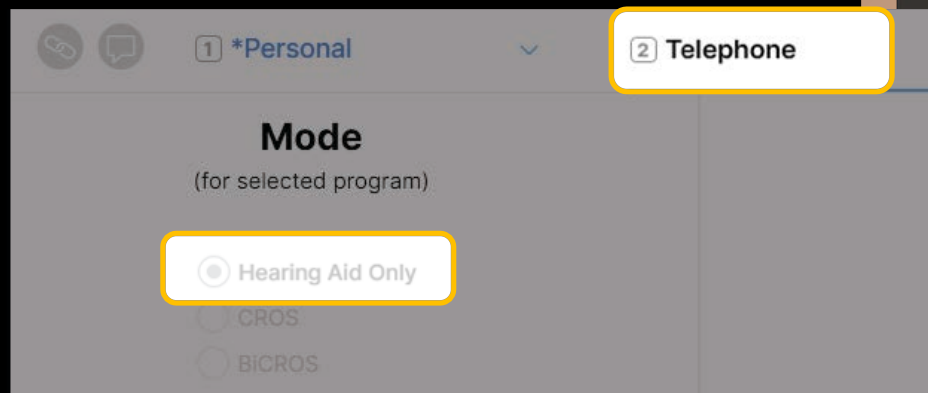
Call streaming to the receiver is available with compatible smartphones

Holding the telephone up to the Transmitter in any CROS or BiCROS program will allow the transmitter to send the acoustic signal to the receiver



# Dedicated Telephone Programs

Default Mode: Hearing Aid Only  
Cannot be changed



- Personal
- Meeting
- Crowd
- Restaurant
- Car
- Auditorium
- Music
- Television
- Outdoors
- Mute
- Telephone**
- Telecoil
- Loop
- Disabled

**RIC RT Options**

## Good to Know

# CROS / BiCROS

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### Pro Fit

After initial fitting, Pro Fit does not need to communicate with the Transmitter

Receivers may be programmed with or without the Transmitter present after the initial fitting

### Auto Sleep

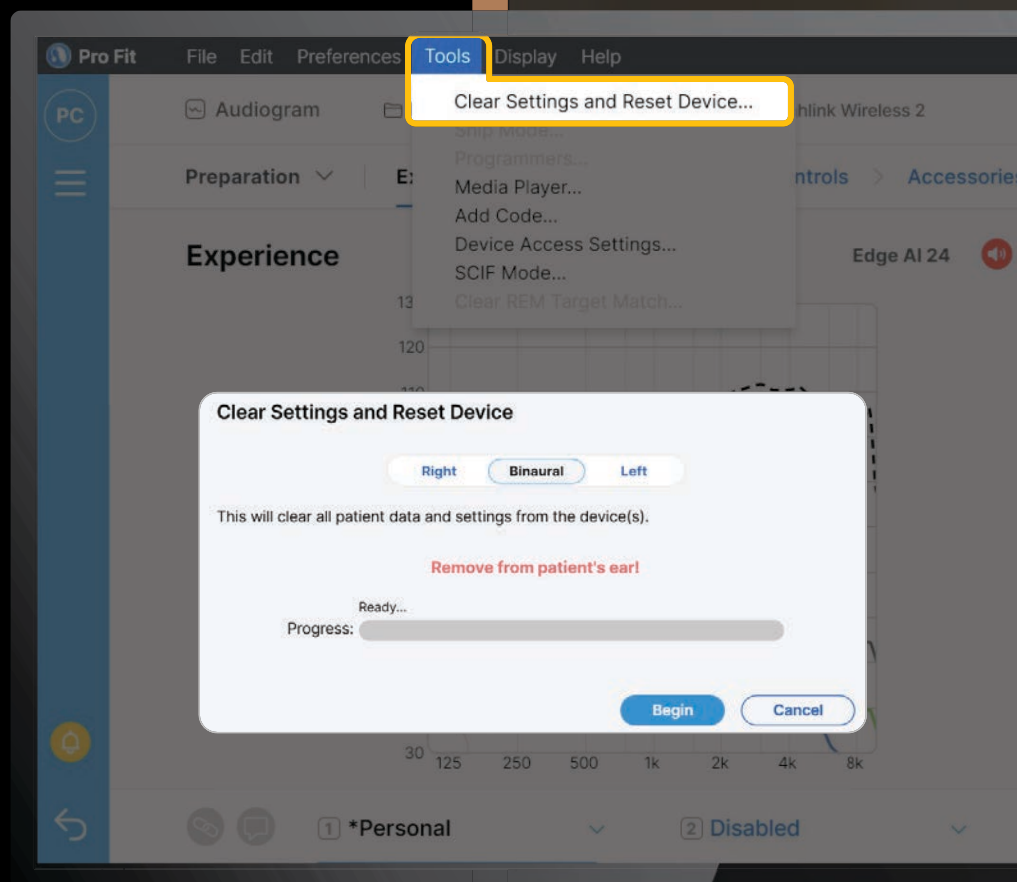
Battery life is preserved if the user removes the Transmitter from their ear and sets it down



# Removing the Transmitter

Receiver can be converted back to a monaural hearing aid

Select Tools > Clear Settings and Reset Device



# CROS System Initial Fit Protocol with Pro Fit



# CROS and BiCROS Validation

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# Verification and Validation

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## Verification

**Real Ear Measurements**

*Working as designed*

## Validation

**Subjective outcome measures**

**Aided speech testing**

*Working as desired*

# Quick Tip Verification

## CROS System Verification Protocol

Our wireless CROS System takes audio from an ear-level microphone and wirelessly transmits it to the opposite ear via Near-Field Magnetic Induction (NFI) technology, optimizing patients' hearing experience. Real ear verification is an important step in the fitting process as it ensures the CROS system is providing adequate gain for optimal performance.

### Recommended process for measuring the head-shadow effect:

**Step One:** Measure the real-ear unaided response (REUR) for the better ear. [Fig. 1]

1. Position the speaker at 45° to the ear.
2. Position the reference microphone at the better ear (i.e. same side as speaker).
3. Insert the probe tube into the better ear.
4. Measure the better ear only.

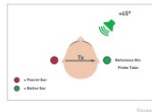


Figure 1

**Step Two:** Measure the REUR with sound directed towards the poorer ear. [Fig. 2]

1. Position the speaker at 45° to the poorer ear.
2. Position the reference microphone at the poorer ear (i.e. same side as speaker).
3. The probe tube remains in the better ear (i.e. opposite side as speaker).

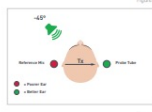


Figure 2

4. Collect the real ear measurement for sound on the poorer ear side.

The difference between the two measures (for the same input level) obtained in steps 1 and 2 represents an estimate of the head shadow effect for this patient. [Fig. 3]

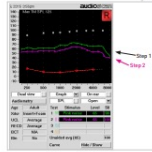


Figure 3



### Recommended steps for verifying CROS hearing aids:

**Step One:** Measure the real-ear aided response (REAR) for the better ear. [Fig. 4]

1. Position the speaker at 45° azimuth to the better ear.
2. Position the reference microphone and probe tube at the better ear (i.e. same side as speaker).
3. Position the CROS instruments (receiver/transmitter) in the ears and turn them on.
4. Measure the better ear only.

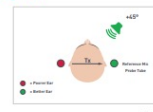


Figure 4

**Step Two:** Measure the response for signal on the poorer ear side [REAR]. [Fig. 5]

1. Position the speaker at 45° azimuth to the poorer ear.
2. Position the reference microphone at the poorer ear (i.e. same side as speaker).
3. The probe tube remains in the better ear.
4. The response measured in step 2 should match that obtained in step 1 for the same input level.

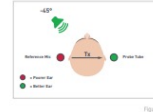


Figure 5

**Step Three:** Measure the REAR at 0° azimuth. [Fig. 6]

1. Position the speaker at 0° azimuth.
2. Position the reference microphone at the poorer ear or at the better ear.
3. The probe tube remains in the better ear.
4. The response measured in step 2 should match that obtained in step 1 for the same input level.



Figure 6

All measurements should be conducted with the same stimulus at the same level. Step 1 and step 2 curves should be close. If not, adjust the CROS response until the poorer side REAR matches the better side REAR. Step 3 should be consistent with other measures. [Fig. 7]

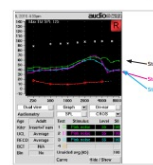


Figure 7

### Recommended steps for verifying BiCROS hearing aids:

**Step One:** Measure the REAR response for the better ear side. [Fig. 8]

1. Position the speaker at 45° azimuth to the better ear.
2. Position the reference microphone at the better ear side (i.e. same side as speaker).
3. Insert the probe tube into the better ear.
4. Position the BiCROS instruments (both receiver and transmitter) on the ears and turn them on.

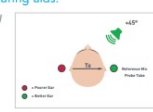


Figure 8

**Step Two:** Measure the response for the poorer ear. [Fig. 9]

1. Position the speaker at 45° azimuth to the poorer ear side.
2. Position the reference microphone at the poorer ear side.
3. The probe tube remains in the better ear.
4. The response measured in step 2 should match that obtained in step 1 for the same input level.



Figure 9

Step 1 illustrates the REAR of the hearing aid fit to the better ear and adjusted to target, or preferred level. Step 2 representing sound incident on the poorer ear side should approximate the levels determined for step 1. [Fig. 10]



Figure 10

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Measuring Head Shadow Effect

Verifying CROS

Verifying BiCROS

# Validation

**Client Oriented Scale  
of Improvement (COSI)**

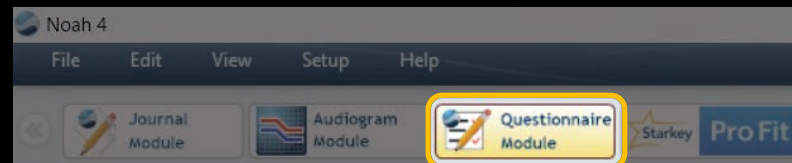
**Abbreviated Profile of  
Hearing Aid Benefit (APHAB)**

**Aided Speech Testing**

SRT

Word Recognition

QuickSIN



# AmpCROS Fitting

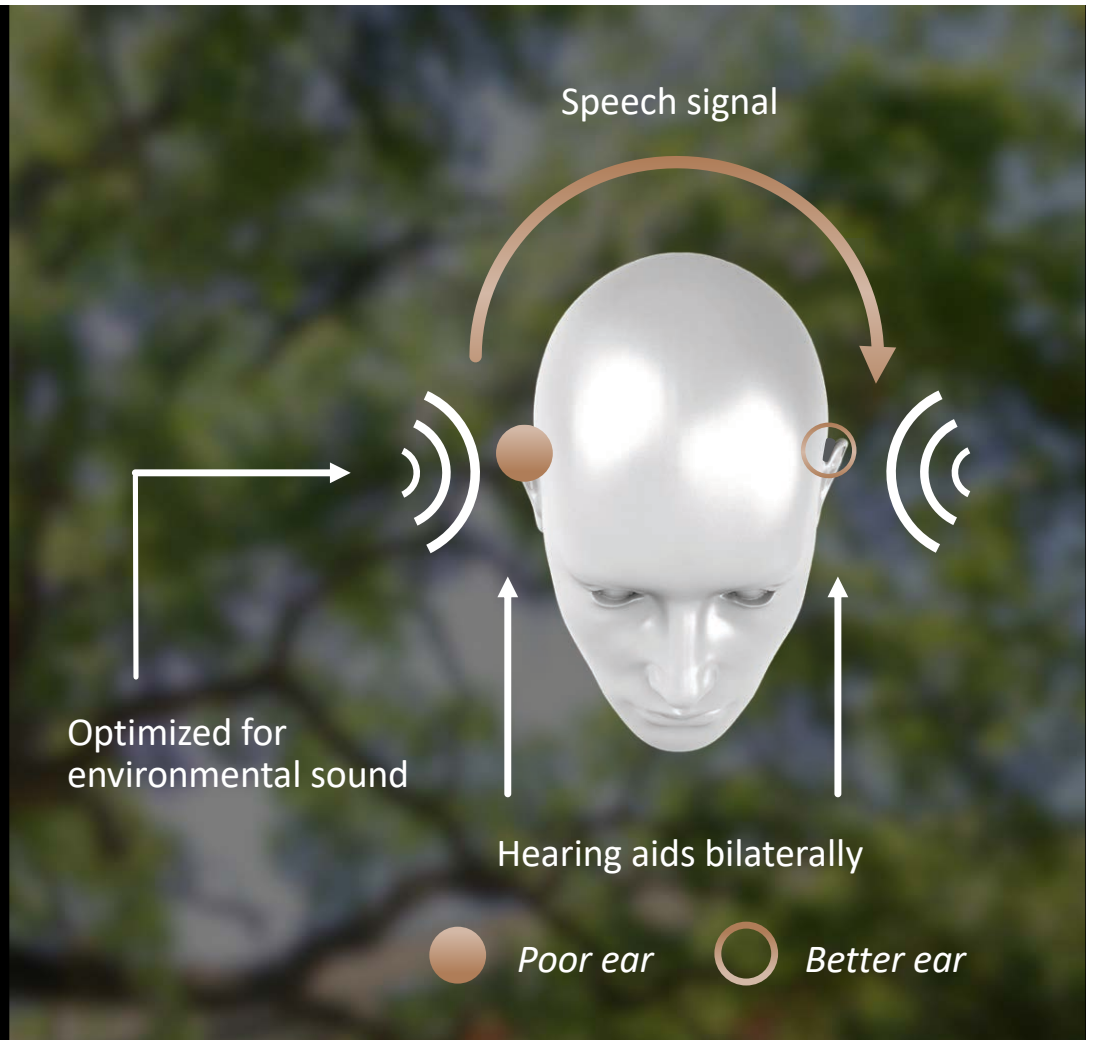
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# Amplified CROS

One ear with very poor WRS but able to extract localization cues from sounds

One normal or better hearing ear



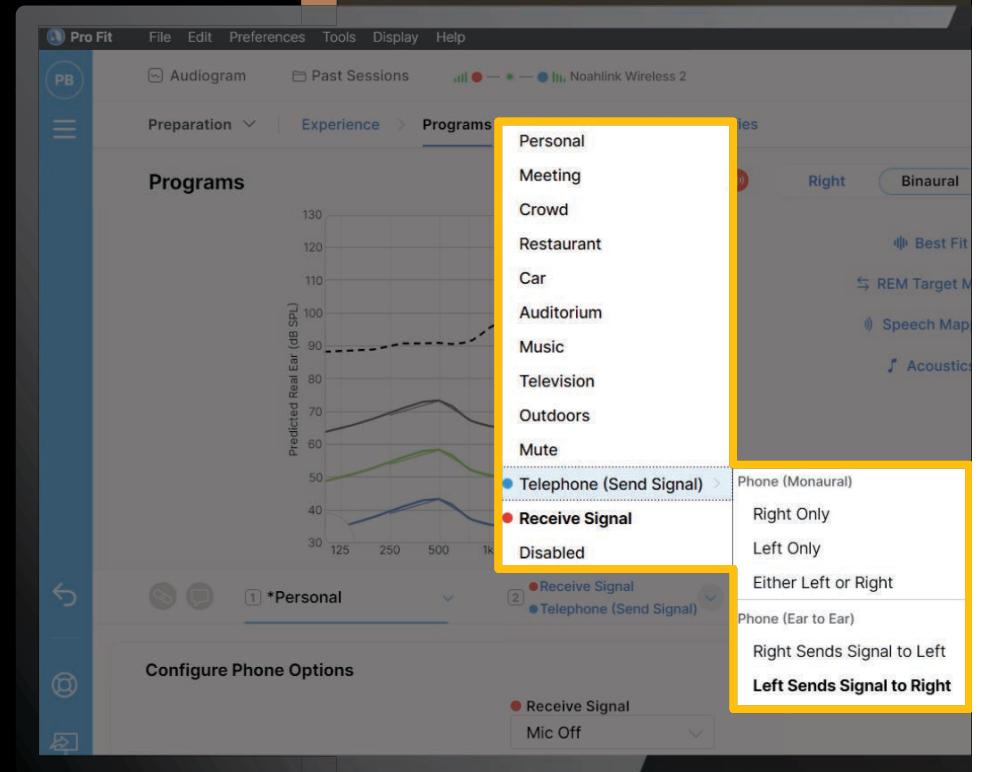
# Pro Fit

## AmpCROS Fitting

Select a Telephone program

Poorer ear - Telephone (Send Signal)

Better ear - Receive Signal



# Pro Fit

## AmpCROS Fitting

Programs > Configure Phone Options

Receive Signal - Mic On

0 dB from the drop-down menu

### Configure Phone Options

● Receive Signal

Mic On: 0 dB

Mic Off

Mic On: 0 dB

Mic On: -3 dB

Mic On: -6 dB

Mic On: -9 dB

### Additional Configuration Options

## Good to Know AmpCROS Fitting

Omnidirectional microphone only  
Restricted noise reduction capabilities

Neuro Processor

### QUICKTIP

## Setting Up AmpCROS

Some patients with bilateral hearing loss may have an ear that receives sound input for spatialization but has very poor word recognition. The AmpCROS is a binaural fitting method that uses a telephone program to transmit audio from the poorer side to the better ear while simultaneously stimulating the poorer ear.

- 1 Program the hearing aids using Pro Fit for optimal audibility and comfort in the poorest ear, and optimal audibility, comfort, sound quality and clarity in the better ear.
- 2 Select **Programs** from the **Preparation** session or from the **Flyout Menu**.
- 3 Assign a program as Telephone and assign the poorer ear to "Telephone (Send Signal)" and the better ear to "Receive Signal". This is a manual program that requires the patient to use either a program user control or the Remote Control 2.0 for engagement. [Fig. 1]
- 4 Under Configure Phone Options select **Mic on: 0 dB** from the dropdown menu. [Fig. 1]
- 5 Fine tune the acoustical parameters of the AmpCROS program for optimal comfort and clarity within the restrictions of the telephone program.

**NOTE:** The Telephone program defaults to omnidirectional.

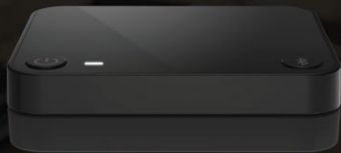


Figure 1

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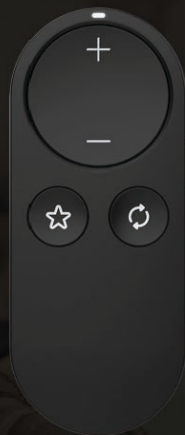


# Wireless Accessories



**StarLink Edge  
TV Streamer**

*Auracast Compatible*



**StarLink Remote  
Control 2.0**



## StarLink Edge TV Streamer

Automatically optimized for  
the monaural fit configuration

*Signal not split between hearing aids*



# StarLink Remote Control 2.0

---

## Favorite Button Options:

Home / Stop a stream

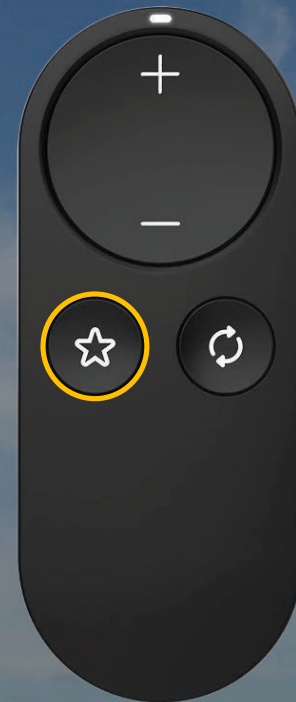
Broadcast Start/Stop

Edge Mode+

None

Jump to Program 4

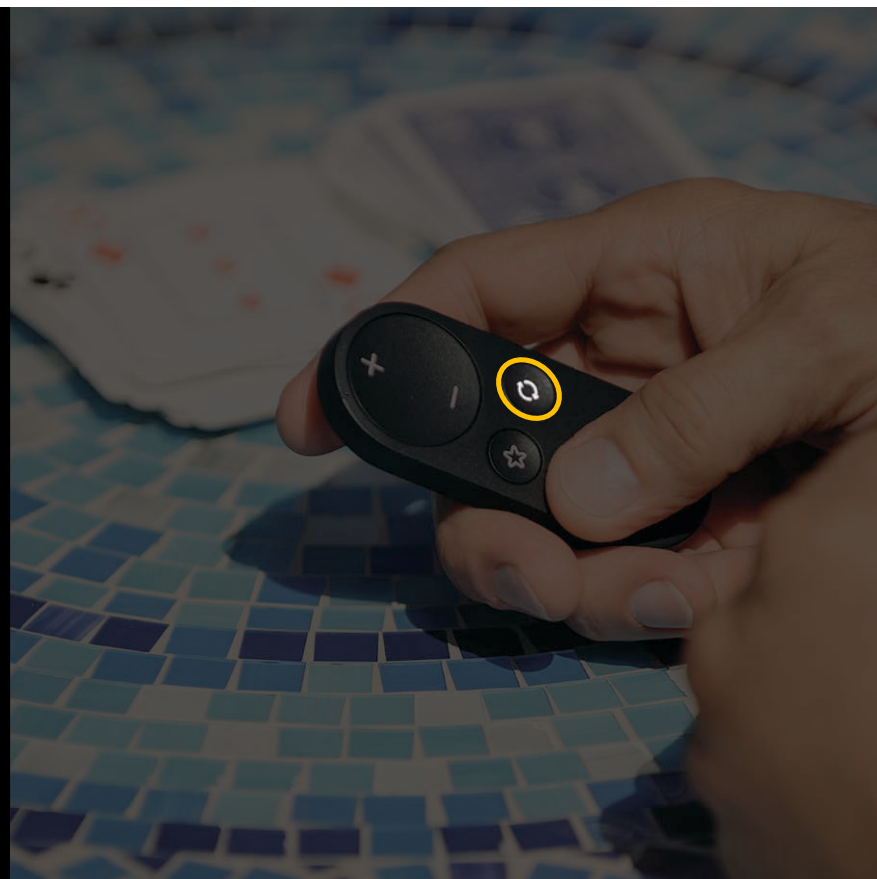
Tinnitus On/Off



# StarLink Remote Control 2.0

---

Long Press of the **Program Button** resets the hearing aids to “Home” setting the hearing aids to the Personal program



*Exclusive to Edge AI*

# Good To Know

---

Accessories pair and stream to the Receiver only

Transmitter and accessory/phone streaming will NOT be simultaneous



# My Starkey

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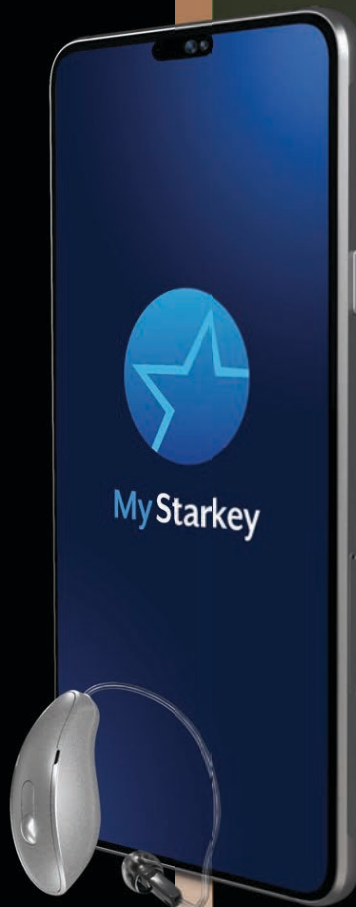
## Smartphone

### Apple iOS

Only the Receiver pairs to phone.  
Users will not see Transmitter  
listed in the phone's native  
controls/settings

### Android

Both Receiver and Transmitter  
need to be paired to phone



## My Starkey App

Home screen will appear as it does for  
a monaural fitting

“Find My Hearing Aid” will locate  
Receiver only

# Resources

Neuro Processor

QUICKTIP

CROS System Initial Fit Protocol with Pro Fit

Our wireless CROS System takes audio from an ear-level microphone and wirelessly transmits it to the opposite ear via Near-Field Magnetic Induction (NFI) technology, optimizing patients' hearing experience. The CROS System is available for the following styles: RIC RT and RIC 312.

Pro Fit will guide the hearing care professional through three fitting session types: Preparation, Fitting, and Follow-Up.

Wireless CROS System is Composed of:

| Transmitter                                                                                                            | Receiver                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>Worn on the unaided ear</li><li>Microphone enabled for CROS and BiCROS</li></ul> | <ul style="list-style-type: none"><li>Worn on the normal ear or better hearing ear</li><li>Microphone enabled for BiCROS</li><li>CROS-enabled hearing aids will become a Receiver when brought into a fitting session with a Transmitter on both sides.</li></ul> |

NOTE: The Transmitter and Receiver style must match (e.g., RIC 312 on both sides).

Wireless Initial Setup

NOTE: To power on rechargeable 2.4 GHz RIC hearing aids for the first time, briefly insert them into the appropriate charger for 3 seconds then remove.

- 2.4 GHz hearing aids can only be programmed wirelessly via the 2.4 GHz or NFIlink Wireless 1.0 or 2.0 programmer. Rechargeable hearing aids will ship with enough battery life to complete initial hearing aid programming, but not enough for a full day of use. Place hearing aids in the charger prior to the initial fitting to ensure there is enough battery life for use.  
NOTE: If the hearing aid battery charge is too low, a low battery warning will appear when reading devices. If this occurs, the fitting session can proceed, but a firmware update (if available) cannot. A turbo charge using the StarLink Chargers is enough to proceed with a firmware update.
- Attach SnapFit 2.0 receivers to RIC hearing aids.
- If programming the Zn-Air RIC 312, insert batteries into the hearing aids.

Setting Up AmpCROS

Some patients with bilateral hearing loss may have an ear that receives sound input for spatialization but has very poor word recognition. The AmpCROS is a bilateral fitting method that uses a telephone memory to transmit audio from the poorer side to the better ear while simultaneously stimulating the poorer ear.

- Program the hearing aids using Inspire X for optimal audibility and comfort in the poorest ear, and optimal audibility, comfort, sound quality and clarity in the better ear.
- Select **Memories** on the left navigation bar in the Inspire X software.
- Assign a memory as Telephone and assign the poorer ear to "Telephone (Send Signal)" and the better ear to "Receive Signal". (Fig. 1)
- Under Configure Phone and Loop Options select **Micro on 0 dB** from the drop down menu (Fig. 1).
- Fine tune the acoustical parameters of the AmpCROS memory for optimal comfort and clarity within the restrictions of the **telephone memory**.

NOTE: Omnidirectional microphones, and no Speech in Loud Noise processing



Figure 1



CROS System Verification Protocol

Our wireless CROS System takes audio from an ear-level microphone and wirelessly transmits it to the opposite ear via Near-Field Magnetic Induction (NFI) technology, optimizing patients' hearing experience. Real ear verification is an important step in the fitting process as it ensures the CROS system is providing adequate gain for optimal performance.

Recommended process for measuring the head-shadow effect:

**Step One:** Measure the real-ear unaided response (REUR) for the better ear. (Fig. 1)

- Position the speaker at 45° to the ear.
- Position the reference microphone at the better ear (i.e. same side as speaker).
- Insert the probe tube into the better ear.
- Measure the better ear only.

**Step Two:** Measure the REUR with sound directed towards the poorer ear. (Fig. 2)

- Position the speaker at 45° to the poorer ear.
- Position the reference microphone at the poorer ear (i.e. same side as speaker).
- The probe tube remains in the better ear (i.e. opposite side as speaker).
- Collect the real ear measurement for sound on the poorer ear side.

The difference between the two measures (for the same input level) obtained in steps 1 and 2 represents an estimate of the head shadow effect for this patient. (Fig. 3)

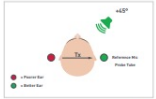


Figure 1

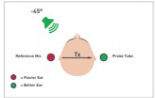


Figure 2

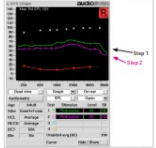


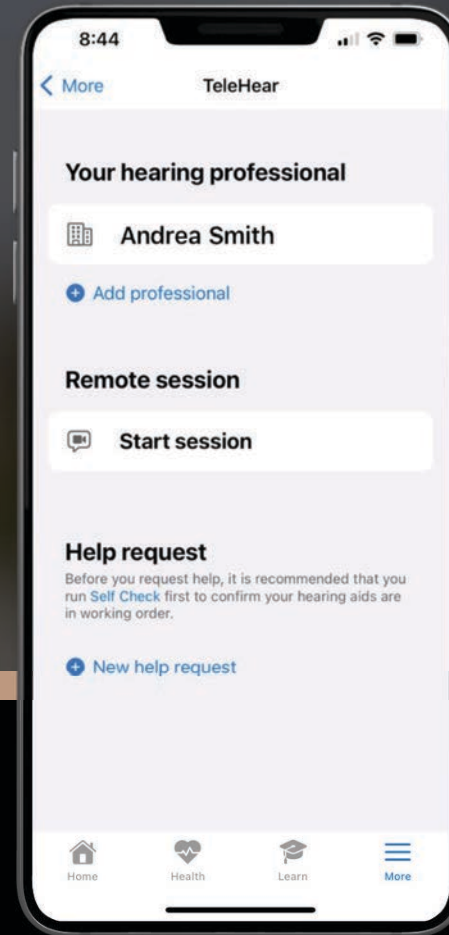
Figure 3



# TeleHear

**Offering both Synchronous and  
Asynchronous Remote Programming**

Making remote care even more  
convenient for you and your patients



# EDGE<sup>AI</sup>



A woman with grey hair, wearing a white t-shirt and an orange apron, is sitting at a wooden table in a cafe. She is smiling and looking to her right. On the table is a black bowl of food and a glass of water. The background is blurred, showing other people and cafe interior.

EDGE<sup>AI</sup>

300+

patents worldwide related  
to sound quality and noise  
management

---

85 patent applications  
since Genesis AI

# Wireless CROS System

---

CROS

BiCROS

AmpCROS



## RIC RT

Up to  
**29 hours**  
on a single charge



## RIC 312

Up to  
**4 days**  
Zinc Air 312

Battery life estimates based on 50 gain receivers

