

## Phonak CROS II

What's new for you?



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## Disclosure in accordance with CEU Requirements

**Sun Me Gille, AuD**

### **Clinical Trainer**

- Sun Mi Gille is a customer trainer for Phonak. She earned her B.S. (2005) and Au.D. (2011) from the University of Texas at Austin. She completed her externship at the National Center for Rehabilitative Auditory Research at the Portland VAMC. Her clinical experience includes comprehensive audiometric testing and hearing aid evaluation and fitting for adult, pediatric, and special populations.
- Financial-Phonak employee who receives a salary for employment
- Nonfinancial-No relevant nonfinancial relationships exists

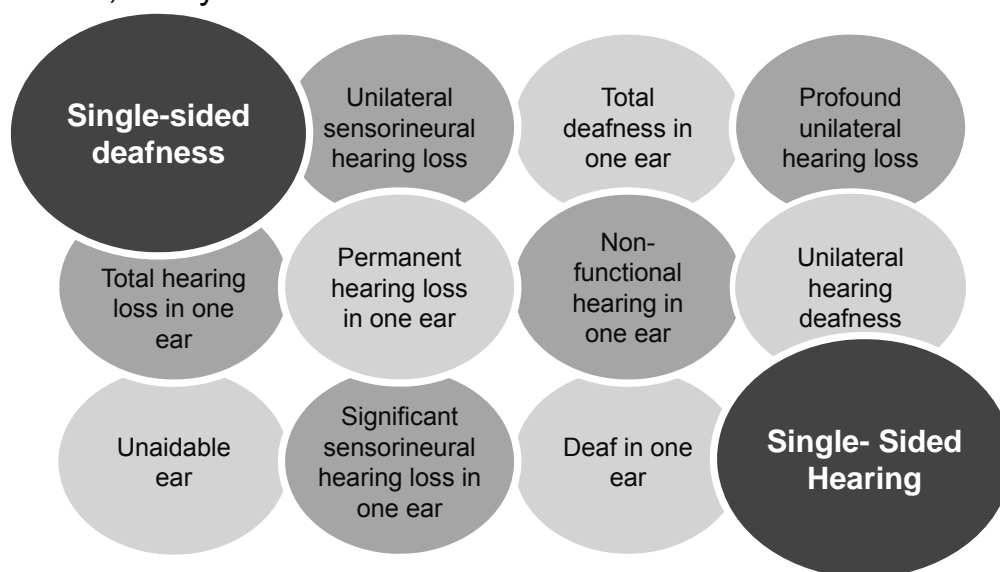
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## Learner Objectives

- Participants will be able to describe the different wireless CROS/BiCROS solutions available from Phonak
- Participants will be able to describe candidacy for a CROS/BiCROS fitting
- Participants will be able to describe how to perform a first fitting of the Phonak CROS in the Phonak Target™ fitting software.

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## One problem, many names



4

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## The situation:



Unaidable ear

Normal  
hearing  
or hearing loss

5

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## CROS: What and Why?

### Single-Sided Deafness

- Caused by
  - Viral Infections
  - Ototoxicity
  - Auto Immune
  - Idiopathic
  - Acoustic Neuroma (Fayed, et. al, 2003)

### Side Effects

- Monaural hearing
  - makes filtering noise difficult
  - does not allow for binaural summation
  - makes focusing on a single speaker in noise more difficult

### Potential Difficulties

- Decreased acuity in noise
- Localization
- Difficulty at work
- Strategic placement in social settings
- Emotional repercussions (Dimmelow, et. al, 2003)

### Treatment

- Nothing
- Bone Conduction Aid
- Bone-Anchored Hearing Aid
- CROS hearing aid
- Cochlear Implant

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## What is a CROS/BiCROS?

A non surgical solution for single-sided deafness

### CROS



### BiCROS



7

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## Goal of CROS intervention

- Overcome head shadow effect
- Restore sound awareness
- Preserve pinna cues
- Provide speech recognition for speech originating on the side of the poorer ear in quiet and in moderate noise
- Improve hearing in diffuse noise, regardless of where the noise originated

(Giolas and Ward, 1967)

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## Original CROS technology (circa 1968)



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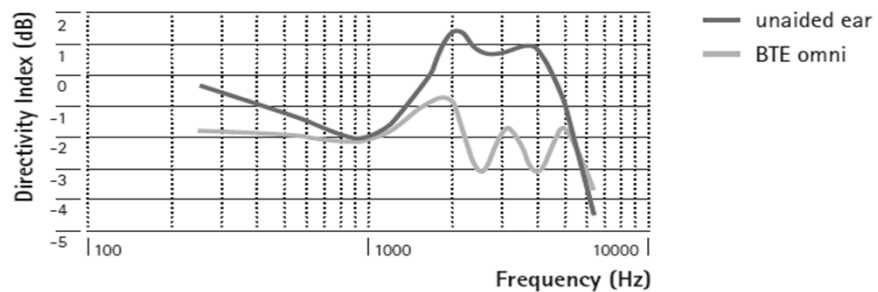
## Goal of CROS intervention

	Original CROS	Quest / CROS	Venture / CROS II
Overcome head shadow effect	☑		
Restore sound awareness	☑		
Preserve pinna cues			
Speech towards poorer ear in quiet and limited noise			
Hearing in diffuse noise			

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## Pinna Effect

Microphones



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## The success of Phonak CROS

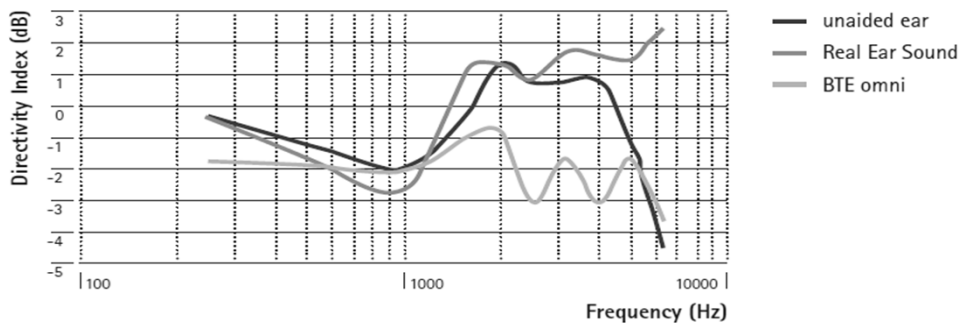
Phonak was the first to introduce a fully integrated and wireless CROS solution



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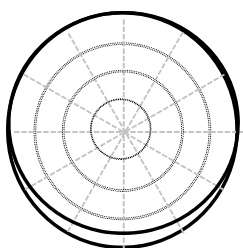
## Pinna Effect/Real Ear Sound

Microphones

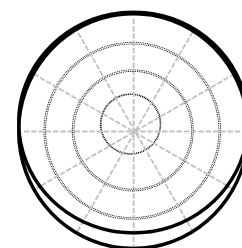


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## Quest/CROS: Quiet



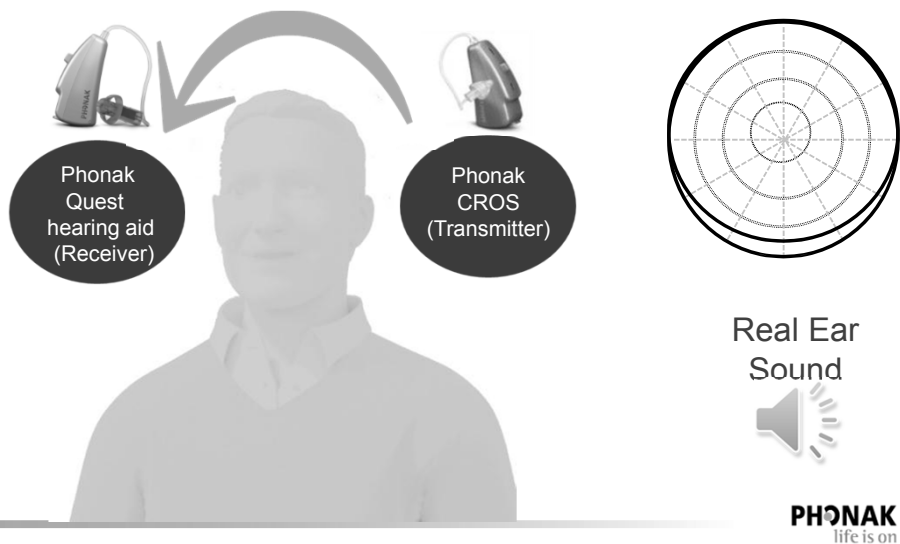
Real Ear Sound



Real Ear Sound

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## Quest/CROS: Noise



## Goal of CROS intervention

	Original CROS	Quest / CROS	Venture / CROS II
Overcome head shadow effect	✓	✓	
Restore sound awareness	✓	✓	
Preserve pinna cues		✓	
Speech towards poorer ear in quiet and limited noise		✓	
Hearing in diffuse noise			



## Introducing Phonak CROS II



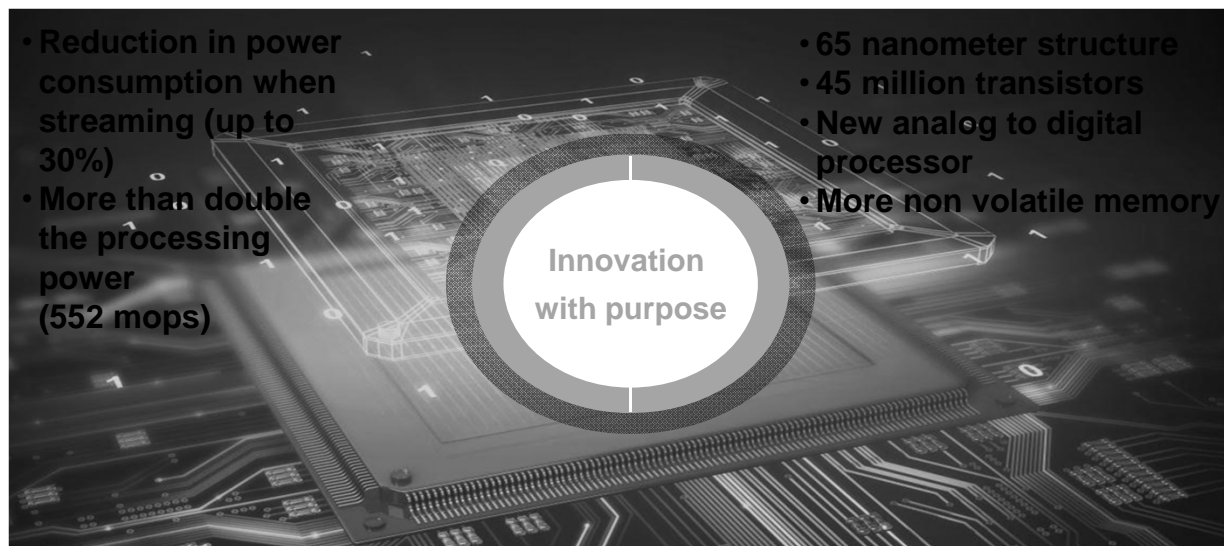
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## The Venture chip

- Reduction in power consumption when streaming (up to 30%)
- More than double the processing power (552 mops)

- 65 nanometer structure
- 45 million transistors
- New analog to digital processor
- More non volatile memory

Innovation  
with purpose



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Building on the success of Phonak CROS

Existing

- Binaural VoiceStream Technology
- Water resistant
- Fully integrated



Phonak CROS II-13  
Phonak CROS II-312

NEW

- Phonak Venture technology
- Improved performance in noise
- Easy to fit
- 30% longer battery life

Building on the success of Phonak CROS II

CROS II

- Venture Technology
- 30% longer battery life
- Improved performance in noise
- Easy to fit

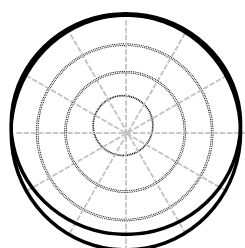


Phonak CROS II-312 Custom  
Phonak CROS II-13 Custom

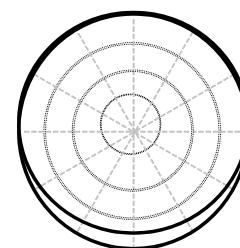
NEW

- New Virto V housings

### Venture / CROS II: Quiet



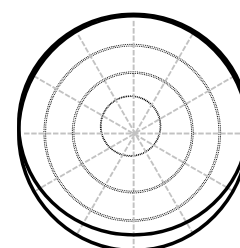
Real Ear Sound



Real Ear Sound

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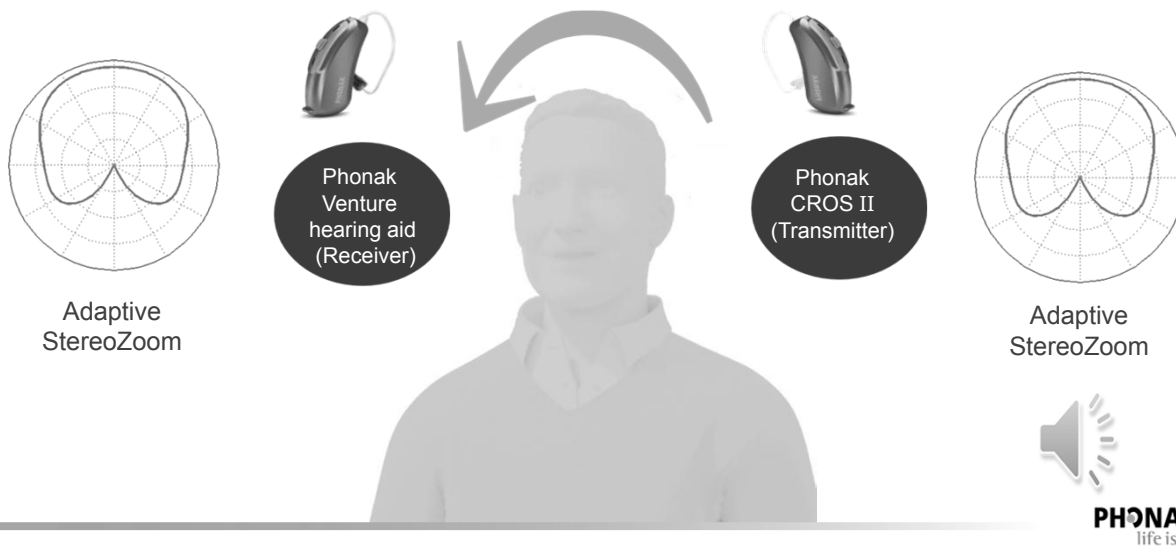
### Venture/CROS II: Moderate Noise



Real Ear Sound

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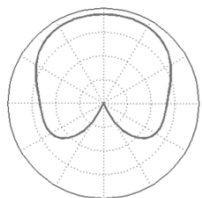
## Venture/CROS II: Loud Noise (Diffuse)



## Goal of CROS intervention

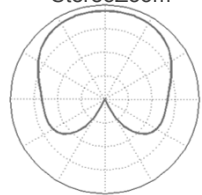
	Original CROS	Quest / CROS	Venture / CROS II
Overcome head shadow effect	✓	✓	✓
Restore sound awareness	✓	✓	✓
Preserve pinna cues		✓	✓
Speech towards poorer ear in quiet and limited noise		✓	✓
Hearing in diffuse noise			✓

## CROS II: Technology Level Directionality



V90

Automatic Adaptive StereoZoom



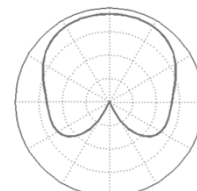
V70

Manual Adaptive StereoZoom



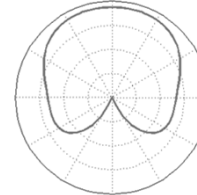
Phonak Venture hearing aid (Receiver)

Phonak CROS II (Transmitter)



V90

Automatic Adaptive StereoZoom

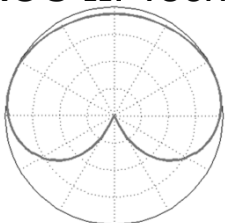


V70

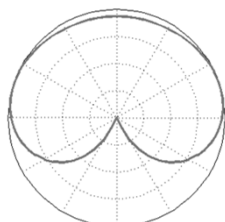
Manual Adaptive StereoZoom

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## CROS II: Technology Level Directionality



V50-UltraZoom

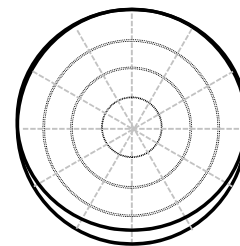


V30 - UltraZoom Essential

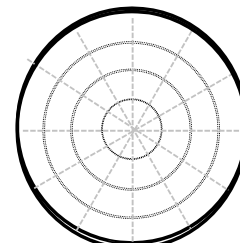


Phonak Venture hearing aid (Receiver)

Phonak CROS II (Transmitter)



V 50- Real ear sound



V30 - Omni Directional

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## Phonak CROS II

CROS → CROS II-312



- Audéo V-312 housing
- IP57
- Push button

CROS H2O → CROS II-13

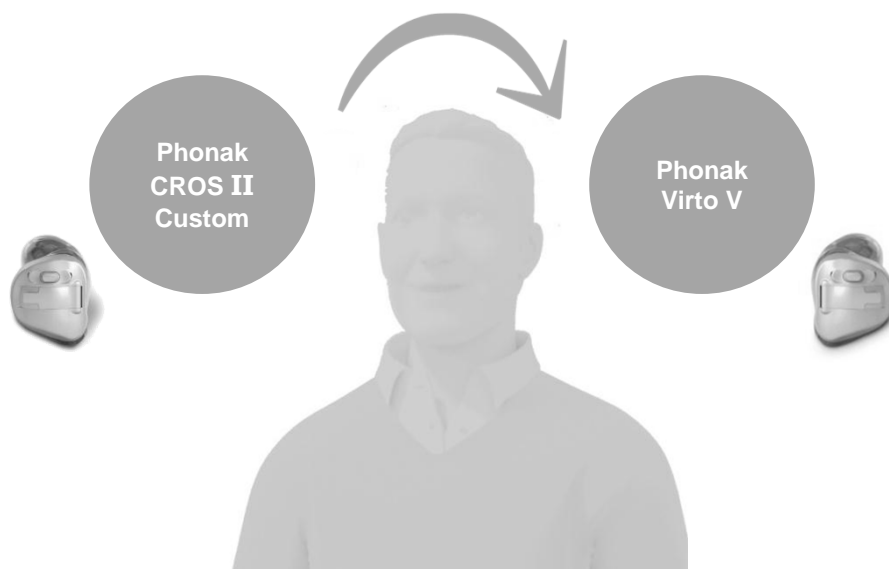


- Audéo V-13 housing
- IP67
- Push button and Volume
- Optional ear hook included

27

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## Phonak CROS II Custom



28

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## CROS II Custom Compatibility



**CROS II-312  
Custom**



**CROS II-13  
Custom**



**V-10**

(90/70/50/30)



**V-312**

(90/70/50/30)



**V-13**

(90/70/50/30)

Only compatible with  
Virto V custom products  
with directional microphones

Not compatible with  
BTEs or RICs

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## Phonak CROS II 312: (IP 57)

	First digit: Solid Objections	Second digit: Liquids
<b>4</b>	>1mm	Splashing water •Water splashing from any direction has no harmful effects
<b>5</b>	Dust protected •Any ingress of dust does not interfere with satisfactory operation of the equipment	Water jets •Water projected by a nozzle (6.3mm) has no harmful effects
<b>6</b>	Dust tight •No ingress of dust	Powerful water jets •Water projected in powerful jets (12.5mm) has no harmful effects
<b>7</b>		Temporary immersion •Immersion at 1m for 30 minutes doesn't damage the equipment beyond repair
<b>8</b>		Continuous immersion •Enclosure can withstand continuous immersion in water; usually airtight

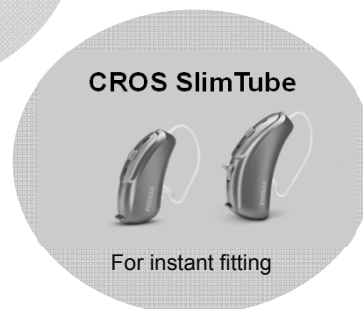
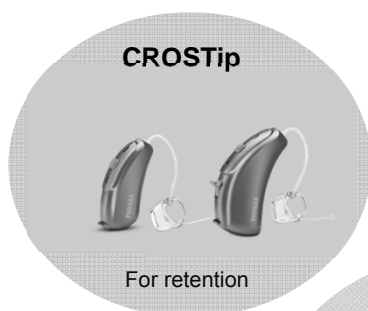
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## Phonak CROS II 13: (IP 67)

	First digit: Solid Objections	Second digit: Liquids
4	>1mm	Splashing water •Water splashing from any direction has no harmful effects
5	Dust protected •Any ingress of dust does not interfere with satisfactory operation of the equipment	Water jets •Water projected by a nozzle (6.3mm) has no harmful effects
6	Dust tight •No ingress of dust	Powerful water jets •Water projected in powerful jets (12.5mm) has no harmful effects
7		Temporary immersion •Immersion at 1m for 30 minutes doesn't damage the equipment beyond repair
8		Continuous immersion •Enclosure can withstand continuous immersion in water; usually airtight

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## Phonak CROS II Coupling Options

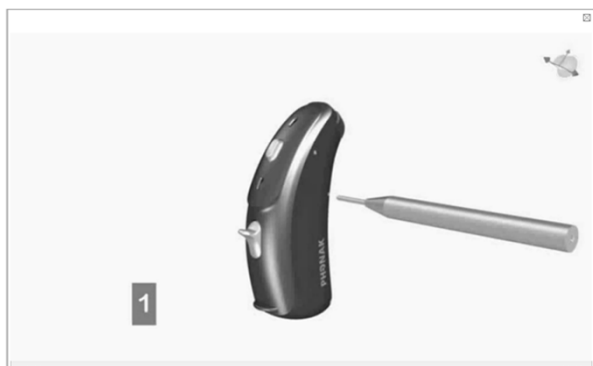


\*only for CROS II-13

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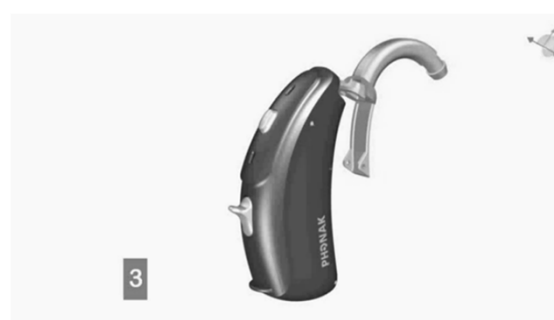


## Attaching Phonak CROS II Hook



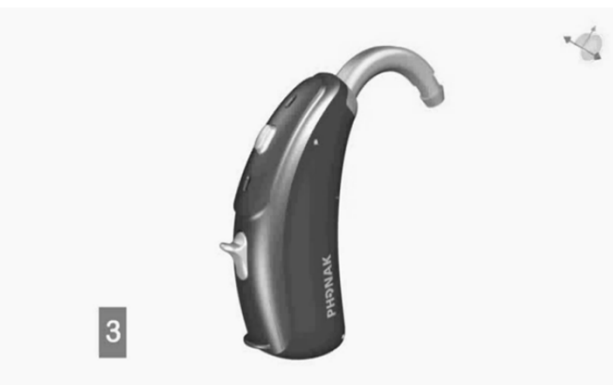
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## Attaching Phonak CROS II Hook



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### Attaching Phonak CROS II Hook



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### Attaching Phonak CROS II Hook



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## Battery consumption in days

12 hours of use per day



**UP TO 30% IMPROVEMENT!**

### Phonak CROS II 312



### Phonak CROS II 13

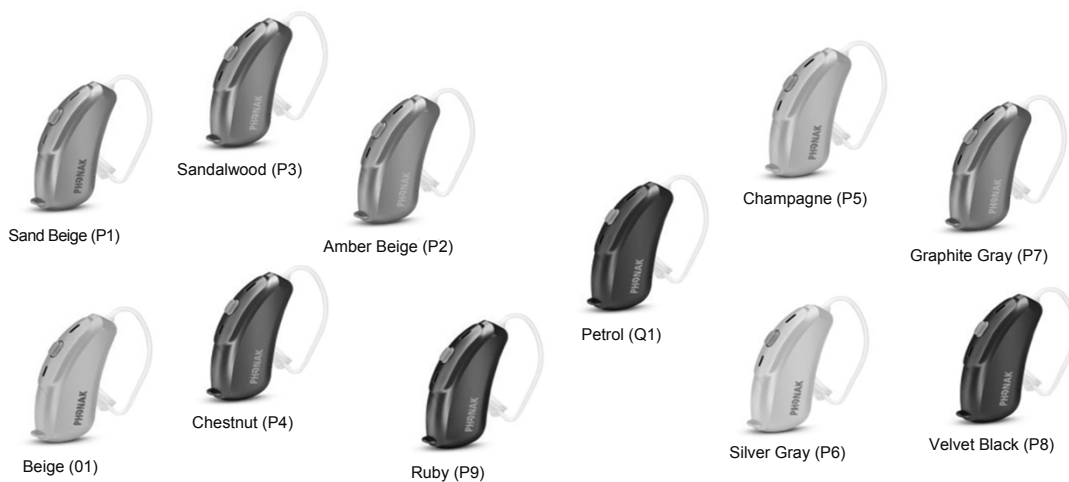


37

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## Phonak CROS II colors

CROS II has the same color options as Audéo V and Bolero V to provide the perfect match.



38

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## The beauty of Phonak CROS II Custom

### Shell colors



Tan Cocoa Pink Brown White



Clear Transparent Red Transparent Blue Transparent

### Faceplate colors










Tan Cocoa Pink Brown



39

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## Phonak CROS Compatibility

		 <b>Spice+</b>	 <b>Quest</b>	 <b>Venture</b>
	Phonak CROS II-312			✓ V90-V30
	Phonak CROS II-13			✓ V90-V30
	Phonak CROS	✓	✓	
	Phonak CROS 13	✓	✓	

40

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## New CROS volume and mute function

- CROS volume adjusts the volume of the Phonak CROS II side
- Optional long press attenuates the Phonak CROS II side by 30 dB



41

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## Benefits for Phonak CROS II streaming **while fitting**

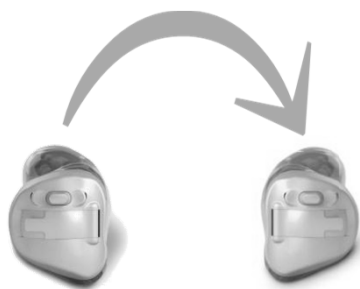
- Instantly show the benefits of Binaural VoiceStream Technology™
- Active CROS II microphone during fitting
- Faster balancing of the Phonak CROS II system
- Only available with iCube II – mandatory firmware update

Connect	
<p>✓ Connection successful</p> <p>Ⓜ Audéo V90-13 SN: 1445H06EJ</p> <p>Hearing instrument is muted.</p> <p>▶ Click to unmute</p>	<p>✓ Connection successful</p> <p>Ⓛ CROS II-13 SN: 1447X1V2C</p> <p>Microphone is active.</p> <p>🎤</p>
<p>Close</p>	



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## Easy to fit and demonstrate with iCube II



Phonak Target 4.2 and newer is required



43

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## Updating iCube II

The screenshot shows the Phonak Target 4.2 software interface. At the top, there is a menu bar with 'Phonak Target 4.2', 'File', and 'Help'. Below the menu bar is a 'Tools' section with a list of options: 'Test settings', 'Firmware update' (highlighted with a dashed box), 'Reset to factory settings', 'Warranty', 'Device pairing', and 'Device language'. The main content area is divided into three columns:

- Hearing instruments:** Use this assistant to update hearing instruments. [Update...](#)
- iCubes:** Use this assistant to update iCube or iCube II. [Update...](#)
- Roger products:** Use this assistant to update Roger products. [Launch "Roger Upgrader"...](#)
- Accessories:** Use this assistant to update accessories. [Update...](#)
- Lyric3 programming wands:** Use this assistant to update Lyric3 programming wands. [Update...](#)

At the bottom of the interface is a navigation bar with icons for 'Clients & sessions', 'Media', 'News', 'Tools' (highlighted with a dashed box), 'Updates', and 'Setup'.

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## Phonak CROS II Simplified fitting approach

45

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### Step 1 Connect

- Detect and connect the devices
- Recommended fitting device is iCube II
- Mandatory firmware upgrade for Audéo V hearing aids



Client: CROS Instruments: CROS II-312 / Audéo V90-312 Fitting: i) Calm situation

Connect

CROS II-312 Audéo V90-312 (xS)

Gain 46 (2cc) MPO 114 (2cc) Receiver xS (Standard)

Family: Ambra, Audéo Q, Audéo S, Audéo V

Audéo V90-312 (Premium 63/131 (2cc))

POWER LEVELS: xS (Standard) 46/114 (2cc), xP (Power) 57/127 (2cc), xSP plus (SuperPower plus) 63/131 (2cc)

DESCRIPTION: Premium Water-Resistant external receiver instrument (312) for mild to severe hearing loss. Wireless.

FEATURES: AutoSense OS premium, Speech in wind, FlexControl, Speech in loud noise, UltraZoom premium, SoundRecover, Speech in 360°, DuoPhone, SoundRelax, Tinnitus balance

46

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## Step 2 Fitting workflow

- Fit like a binaural fitting session
- No need to choose a CROS or a BiCROS fitting

Client: big\_guy | Instruments: CROS II-312 / Audeo V90-312 | Fitting: Calm situation

Navigation: Feedback & real ear test | AudiogramDirect | Global tuning | Fine tuning | DataLogging | Device options

Message: "Feedback & real ear test" was successful

Graph: Muted (Frequency response plot)

Options:
 

- Use estimated RECD and vent
- Allow gain to exceed feedback threshold by max. 5 dB
- WhistleBlock is enabled in all programs

Buttons: Turn all on | Turn all off

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## Step 3 Global tuning

- Adjust the balance and overall volume of the CROS fitting
- Present an acoustic sound to the left and right clients ear to see if the loudness levels are the same

Client: big\_guy (71 years) | Instruments: CROS II-312 / Audeo V90-312 | Fitting: Calm situation

Navigation: Feedback & real ear test | AudiogramDirect | Global tuning | Fine tuning | DataLogging | Device options

FITTING FORMULA: Adaptive Phonak Digital

Controls:
 

- CROS MICROPHONE: ±0 steps
- MICROPHONE: Muted
- CROS: ±0
- HEARING INSTRUMENT: ±0
- CROS balance: ±0

Bottom Bar: Gain level | CROS balance | Occlusion compensation | Compression | Tinnitus balance

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## Step 4 Fine tuning

- Add more manual programs if needed

49

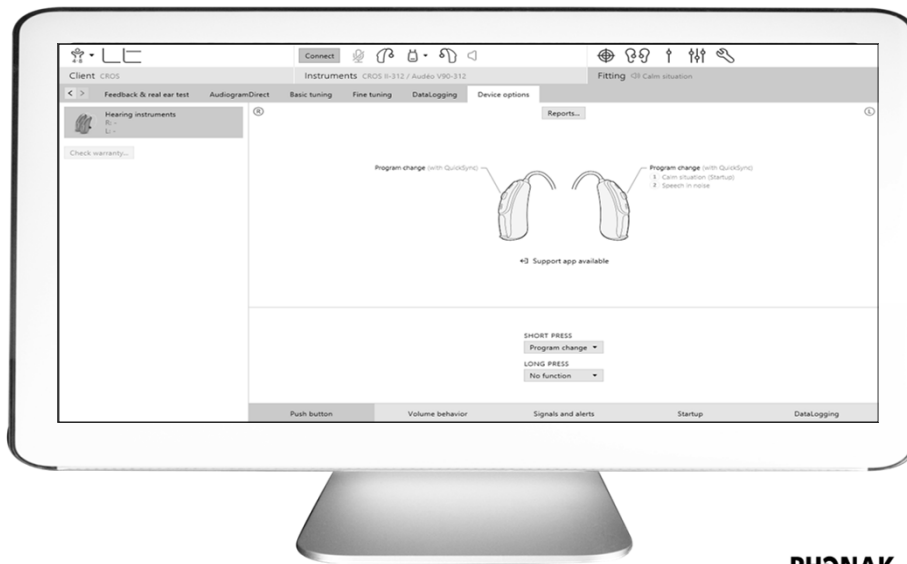
## Step 5 Device options

- Set volume control and push button options
- Save and close

50

## Phonak CROS II volume

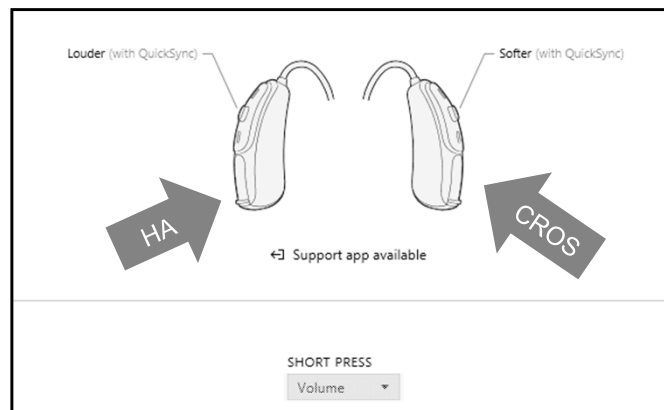
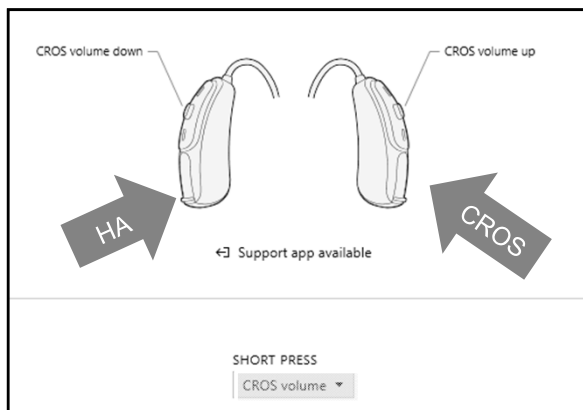
- 2 volume modes:
  - CROS volume
  - Volume
- CROS volume changes only the CROS signal
- Volume changes the system volume (hearing aid + CROS signal)



51

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## VC options for CROS II



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## VC options for CROS II

Program change (with QuickSync)  
 A AutoSense OS (Startup)  
 1 Speech in loud noise  
**Long press**  
 Mic. attenuation (None)

Program change (with QuickSync)  
**Long press**  
 Mic. attenuation (-30 dB)

FlexControl

CROS volume

← Support app available

SHORT PRESS  
 Program change ▾

LONG PRESS  
 Mic. attenuation ▾



## VC options for CROS II Custom

AudiogramDirect Global tuning Fine tuning DataLogging Device options

Reports...

ⓑ CROS II-13 Custom

Program change (with QuickSync)  
 A AutoSense OS (Startup)  
**Long press**  
 Mic. attenuation (-30 dB)

Ⓛ Virto V90-13 (FS, M)

Program change (with QuickSync)  
 A AutoSense OS (Startup)  
**Long press**  
 Mic. attenuation (-12 dB)

CROS balance (+/-5 steps)

FlexControl

← Support app available

STARTUP PROGRAM  
 A AutoSense OS ▾

STARTUP DELAY  
 No additional delay ▾  Startup melody

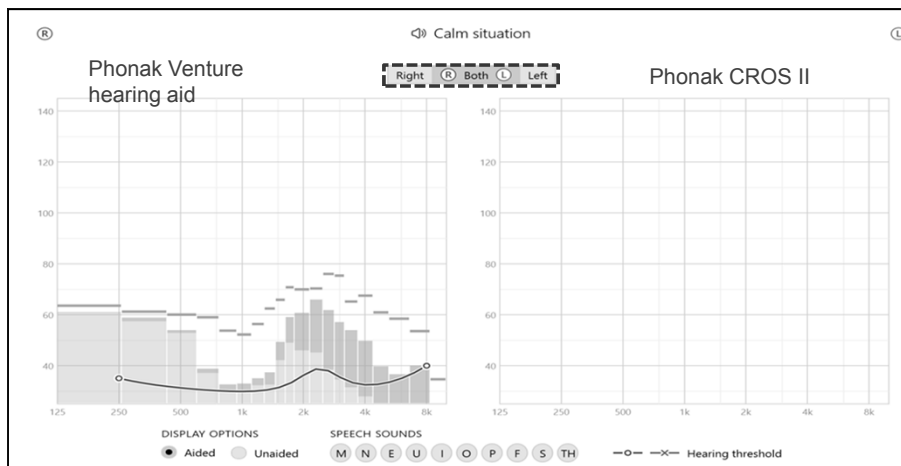
PUSH BUTTON ACTIVATION  
 6 sec after startup ▾

Push button Volume button Volume behavior Signals and alerts Startup DataLogging



## Real Time Display

- Signal presented on the CROS side is seen on the hearing aid side



55

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## Phonak Venture performance levels with CROS II

- 90 – Premium**
- Speech in Car\*\*
  - Speech in Loud Noise\*\*
  - Comfort in Echo\*\*
  - Music\*\*
  - Comfort in Noise\*\*
  - Speech in Noise\*\*
  - Calm Situation\*\*
  - **Speech in Wind\***
  - **Speech in 360°\***
  - **StereoZoom\***
  - EchoBlock
  - WindBlock
  - SoundRelax
  - SNR-Boost
  - FlexControl
  - FlexVolume
  - **DuoPhone\***
  - Real Ear Sound
  - WhistleBlock
  - NoiseBlock
  - QuickSync
  - SoundRecover
  - Tinnitus Balance

- 70 – Advanced**
- Music\*\*
  - Comfort in Noise\*\*
  - Speech in Noise\*\*
  - Calm Situation\*\*
  - **Speech in 360°\***
  - **StereoZoom\***
  - WindBlock
  - SoundRelax
  - SNR-Boost
  - FlexControl
  - FlexVolume
  - **DuoPhone\***
  - Real Ear Sound
  - WhistleBlock
  - NoiseBlock
  - QuickSync
  - SoundRecover
  - Tinnitus Balance
  - auto Acclimatization

- 50 – Standard**
- Comfort in Noise\*\*
  - Speech in Noise\*\*
  - Calm Situation\*\*
  - SNR-Boost
  - FlexControl
  - FlexVolume
  - **DuoPhone\***
  - Real Ear Sound
  - WhistleBlock
  - NoiseBlock
  - QuickSync
  - SoundRecover
  - Tinnitus Balance
  - auto Acclimatization
  - UltraZoom Standard
  - User Preference Tuning

- \*\* AutoSense OS
- \* Binaural VoiceStream Technology™

**NEW**

- 30 – Essential**
- Speech in Noise\*\*
  - Calm Situation\*\*
  - WhistleBlock
  - NoiseBlock
  - QuickSync
  - SoundRecover
  - Tinnitus Balance
  - auto Acclimatization
  - UltraZoom Essential
  - User Preference Tuning
  - 8 channels
  - WCP compatible (only on the HI side)

56

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## Unavailable Features

- What is not included with CROS II
  - DuoPhone
  - Speech in Wind
  - Speech in 360°

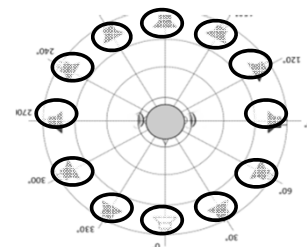
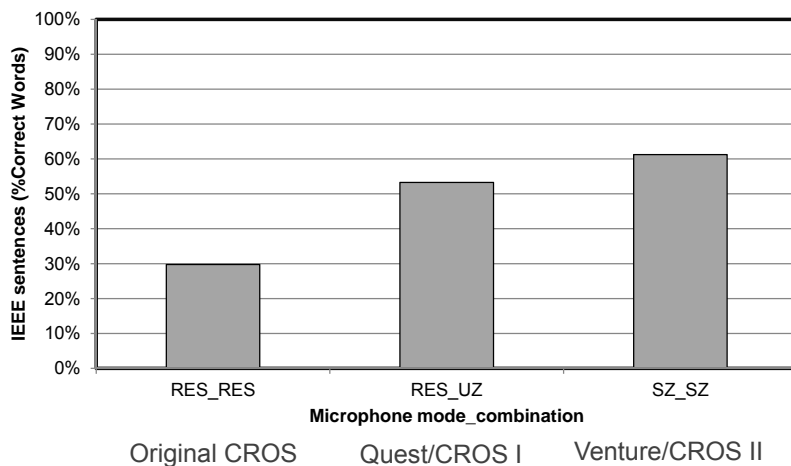
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## CROS II Validation Results



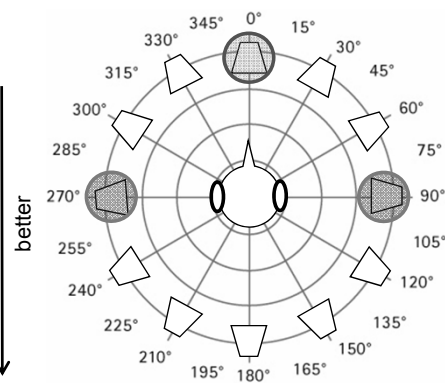
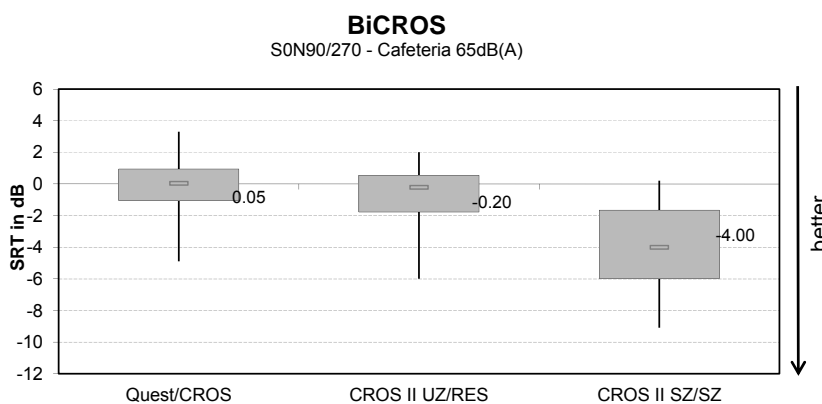
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## IEEE sentence performance in diffuse noise



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## CROS II BiCROS group Validation Results

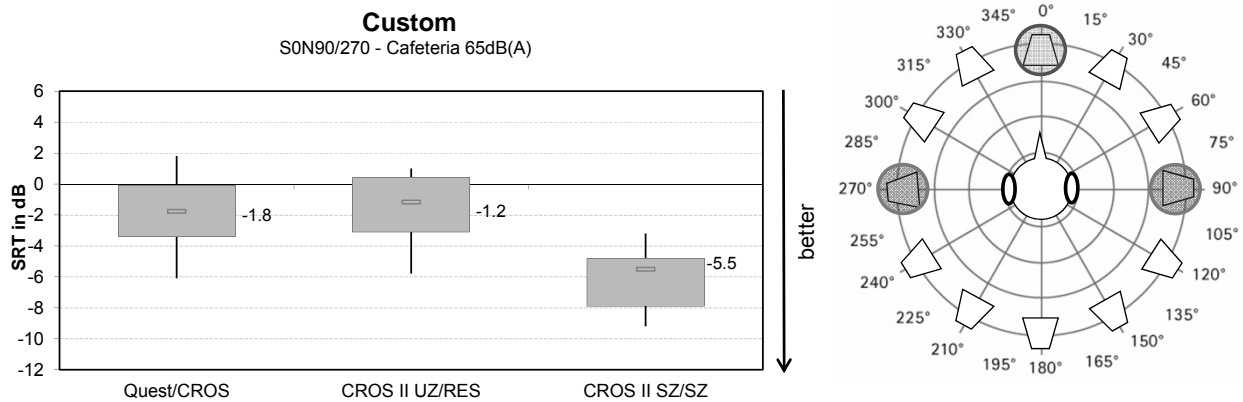


Field Study News – Phonak CROS II – Improved speech understanding thanks to binaural beamforming (July 2015)  
N=8

60

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## CROS II Custom BiCROS group Validation Results

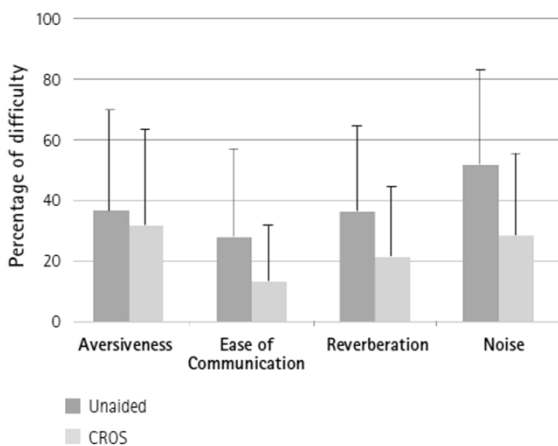


Field Study News – Phonak CROS II – Improved speech understanding thanks to binaural beamforming (July 2015)  
N=10

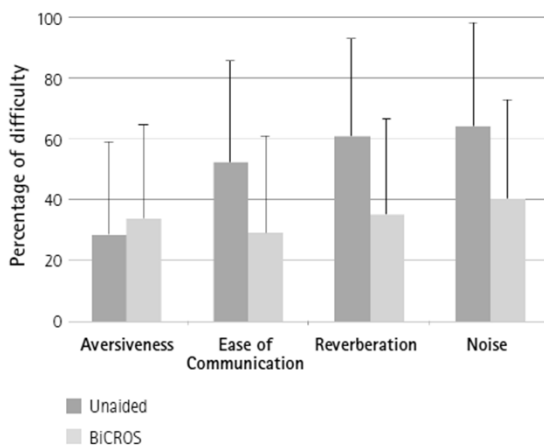
61

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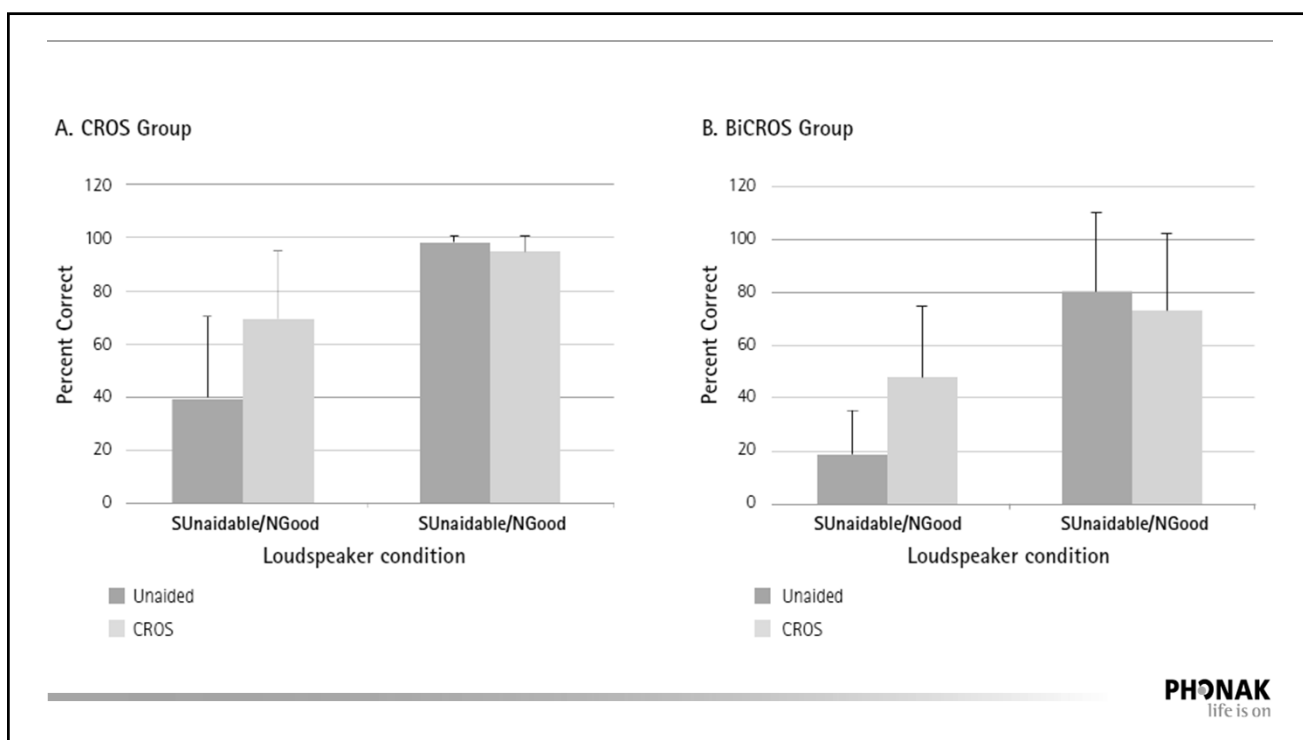
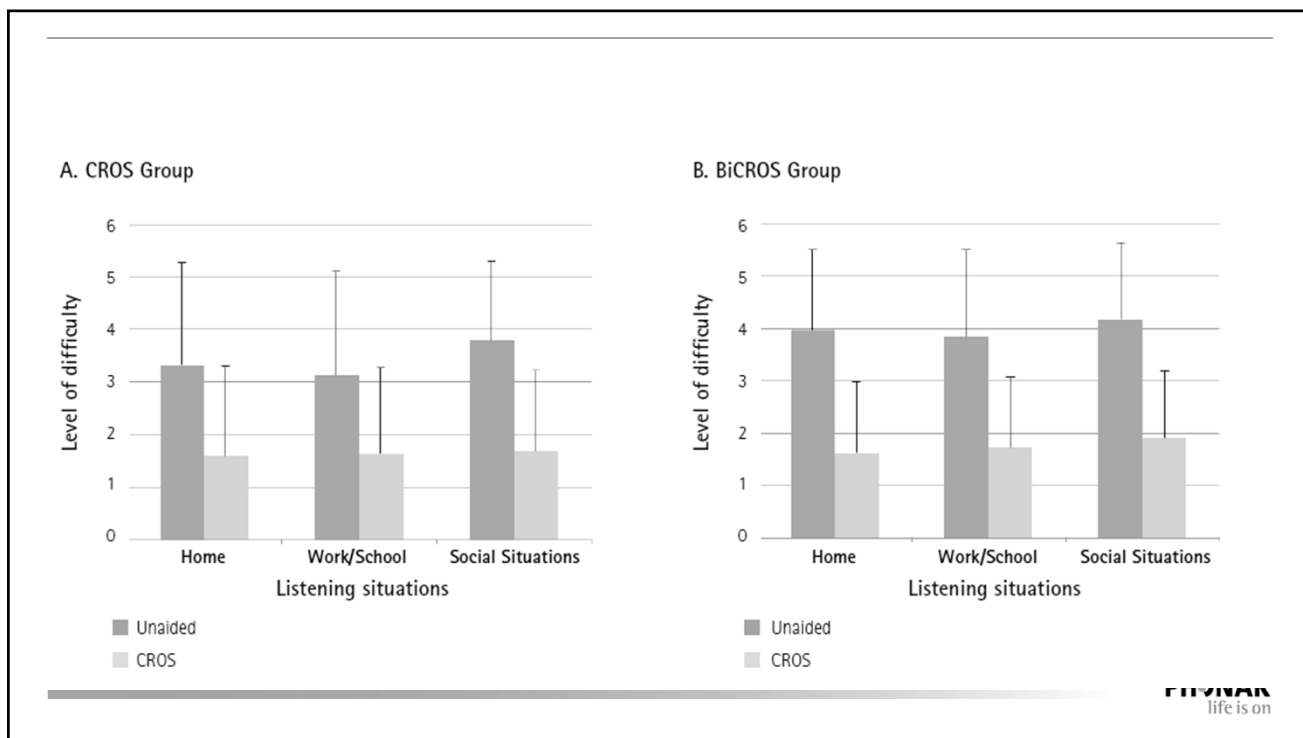
### A. CROS Group



### B. BiCROS Group



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## CROS II CROS group Validation Results

- No significant differences were found in the speech testing with StereoZoom active.
- Subjective preference for CROS II was clear with no negative consequences noted.

“Clearly hear and understand more compared to my current hearing aids and to without hearing aids.

They sounded more natural and I did not even notice I was wearing hearing aids.

This was what I have been always looking for.”

“Did not expect the improvements in speech understanding with CROS II.

All in all, wearing the CROS II devices means an improvement in the quality of life.”



Field Study News – Phonak CROS II – Improved speech understanding thanks to binaural beamforming (July 2015)

N=10

65

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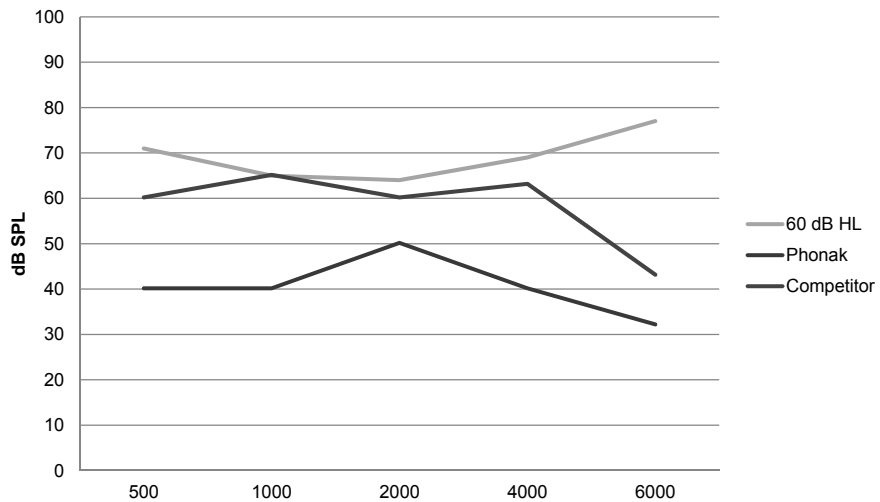


## CROS II vs. Competition

66

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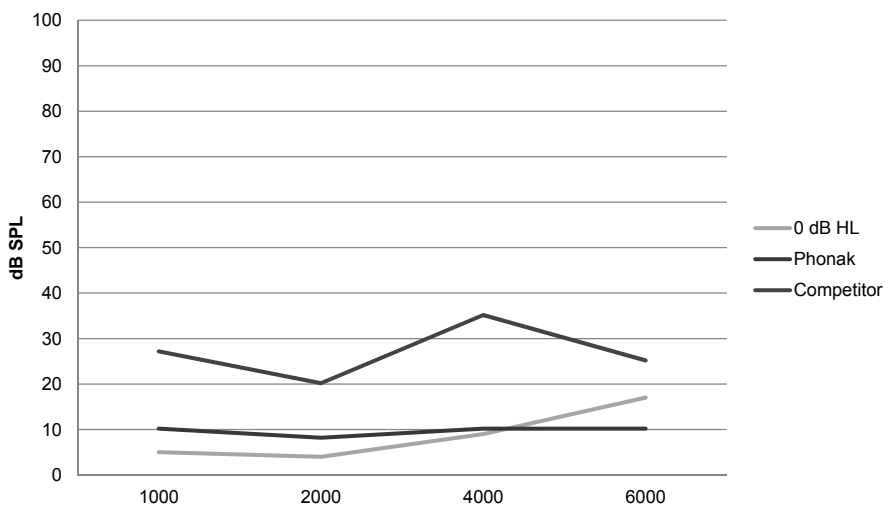
### Noise floor comparison – BiCROS setup



67



### Noise floor comparison - CROS setup

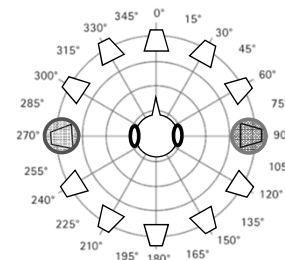


Field Study News – Phonak CROS II – Electroacoustic measurements look at key performance aspects of two wireless CROS systems (July 2015)

68



Listening Environment:  
Speech towards transmitter



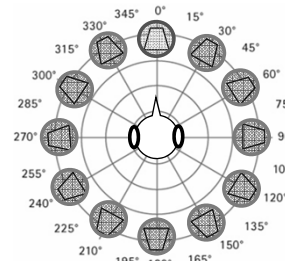
	Phonak	CROS competitor								
<b>Action Required</b>	None- works automatically	Patient must activate CROS mode								
<b>Outcome</b>	<table border="1"> <caption>Outcome Scores</caption> <thead> <tr> <th>System</th> <th>Score</th> </tr> </thead> <tbody> <tr> <td>Phonak</td> <td>4</td> </tr> <tr> <td>CROS ON</td> <td>1</td> </tr> <tr> <td>CROS OFF</td> <td>-0.5</td> </tr> </tbody> </table>		System	Score	Phonak	4	CROS ON	1	CROS OFF	-0.5
System	Score									
Phonak	4									
CROS ON	1									
CROS OFF	-0.5									

Field Study News – Phonak CROS II – Electroacoustic measurements look at key performance aspects of two wireless CROS systems (July 2015)

69



Listening Environment:  
Diffuse Noise (e.g. restaurant)



	Phonak	CROS competitor								
<b>Action Required</b>	None- works automatically	Patient must activate CROS mode								
<b>Outcome</b>	<table border="1"> <caption>Outcome Scores</caption> <thead> <tr> <th>System</th> <th>Score</th> </tr> </thead> <tbody> <tr> <td>Phonak</td> <td>3</td> </tr> <tr> <td>CROS ON</td> <td>2</td> </tr> <tr> <td>CROS OFF</td> <td>1</td> </tr> </tbody> </table>		System	Score	Phonak	3	CROS ON	2	CROS OFF	1
System	Score									
Phonak	3									
CROS ON	2									
CROS OFF	1									

Field Study News – Phonak CROS II – Electroacoustic measurements look at key performance aspects of two wireless CROS systems (July 2015)

70



## Phonak CROS II differences to CROS competitor

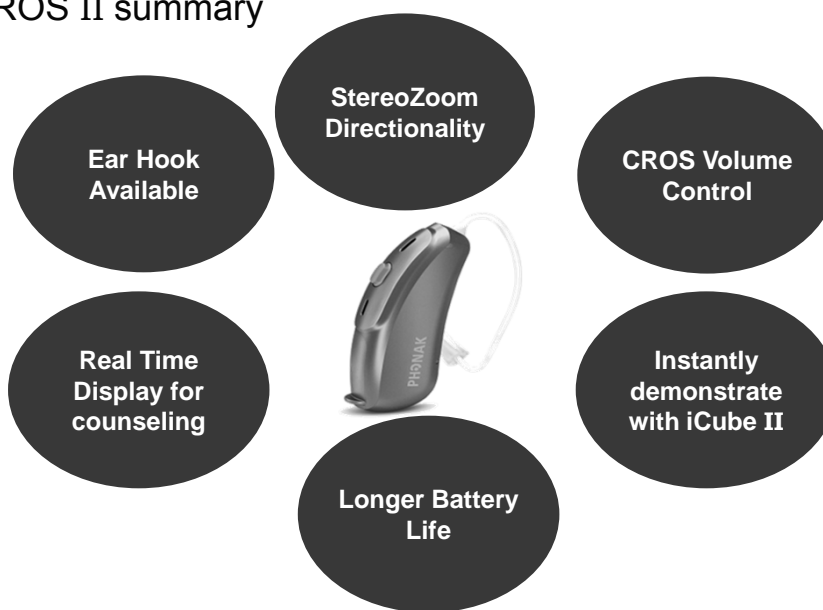
- Both CROS devices have the same transmission frequency of 10.6MHz
- Below are some differences

	<b>Phonak CROS II</b>	<b>CROS competitor</b>
Transmitter	Always active	Must be activated manually
Internal noise floor	Low (do an average of 5, 1 2)	High
Adaptive binaural directional microphone	StereoZoom	No
Styles	RIC and Custom (4 models)	RIC and BTE (2 models)
Active streaming while fitting	Yes with iCube II	No
Accessibility to wireless accessories	Automatic connection	User must activate on CROS device

71

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## Phonak CROS II summary









72

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## More speech understanding

Phonak CROS II automatically varies with the selected performance level of the hearing aid

	V90	V70	V50	V30
 Venture Hearing aid	 Speech in loud noise	 Speech in loud noise	 UltraZoom Standard	 UltraZoom Essential
 CROS II	Speech in loud noise (automatic)	Speech in loud noise (manual)	Real Ear Sound	Omnidirectional

## The smart solution for single-sided deafness





THANK YOU

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