



AURACAST | THE FUTURE IS HEAR!



## GETTING TO KNOW: JASON RUDE

- President of Simeon | Supportive Hearing Systems
- Grew up in Montana, but have never been to Oregon (until now)



# GETTING TO KNOW: AMY BRADBURY, AU.D. CCC-A

Educational Audiologist at CiTi BOCES located in Mexico,  
New York

Clinical Audiologist at Syracuse University

VP Publications EAA

Fun Fact: Worked in Rural Appalachia (Kentucky) as an  
audiologist and hiked 25 miles on the Appalachian Trail.

# FINANCIAL AND NON-FINANCIAL DISCLOSURES

Amy Bradbury, Au.D. CCC-A:

Financial Disclosures: NONE

Non-Financial Disclosures: VP Publications for EAA

Jason Rude, BSIE, MEEI

Financial Disclosures: President of Simeon – Sponsor of EAA Welcome Reception

Non-Financial Disclosures: NONE

Let's have some fun while we learn!

Menti.com

Game ID: 8622-8691



MENTI!



# CAPTIONING

Streamer.Center

Login: eaa

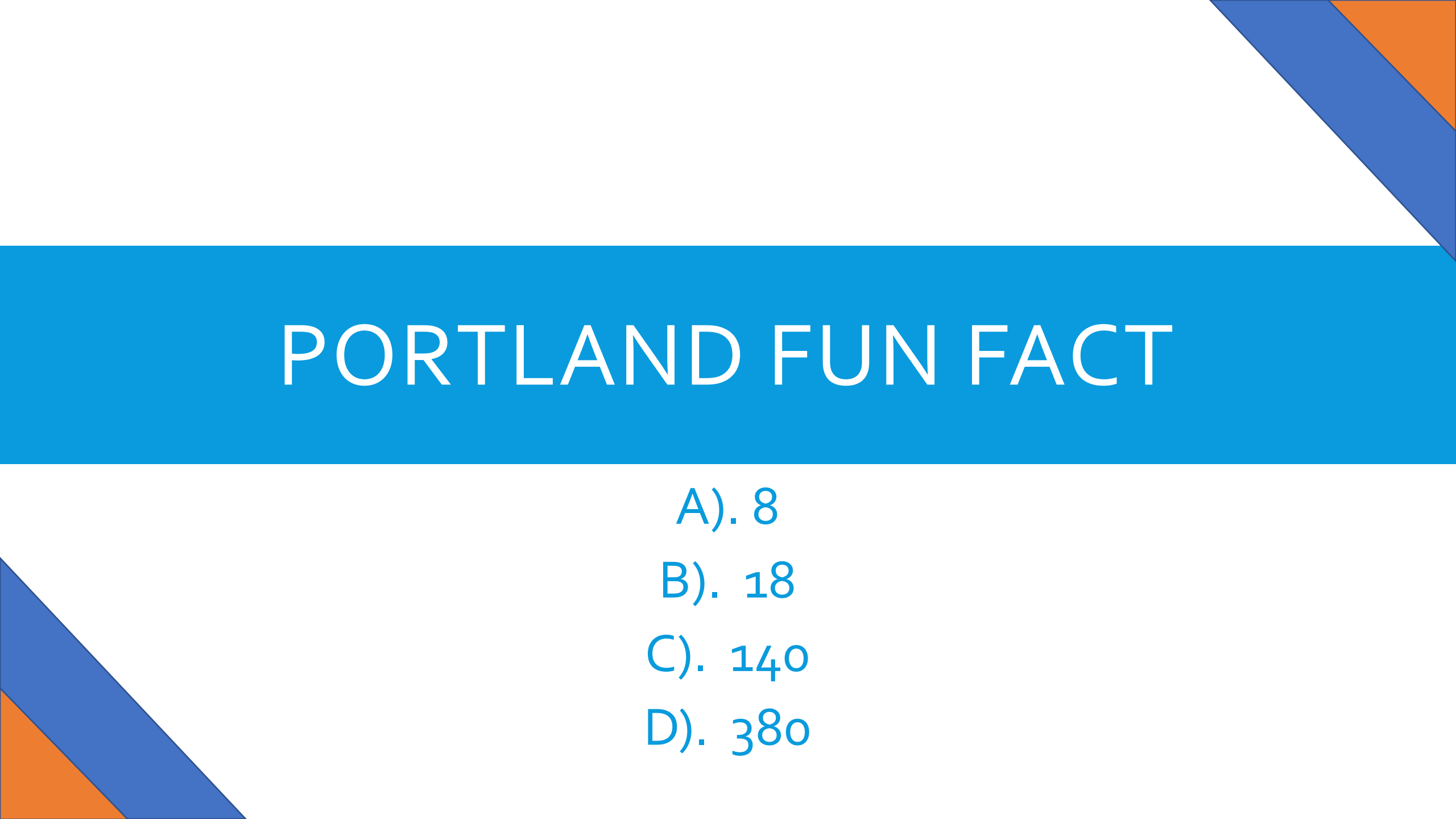
Password: Portland

Click on room: Simeon-o6



# PORTLAND FUN FACT

Portland, and the area along the banks of the Columbia River, is the original home to over \_\_\_\_\_ recognized Native American Tribes that have inhabited the land for over 11,000 years



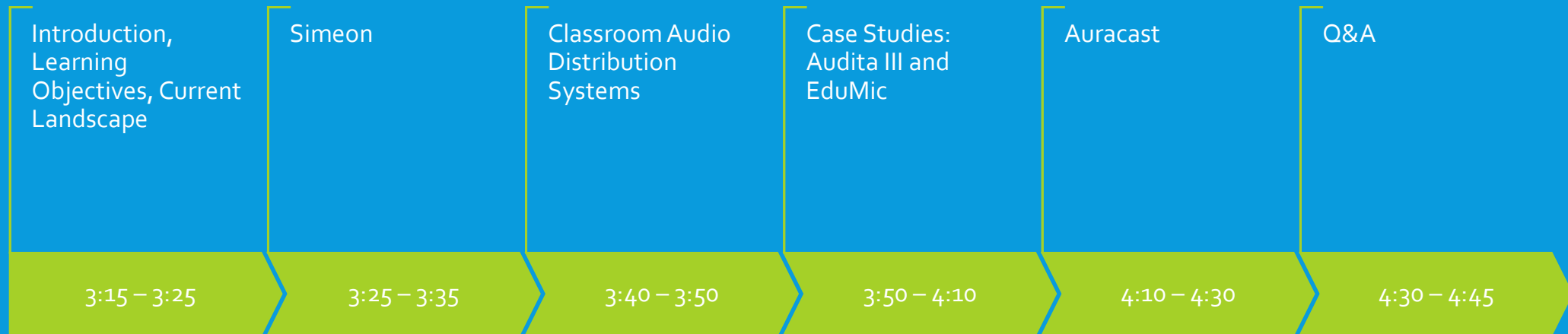
# PORTLAND FUN FACT

- A). 8
- B). 18
- C). 140
- D). 380

# LEARNING OBJECTIVES

1. Review updates to using Remote Microphone HAT when integrated with CADS
2. Introduce Auracast as a transformative broadcast audio transmission standard
3. Learn how Auracast can simplify connectivity to HAT and reshape the inclusive classroom

# TIME ORDERED AGENDA



# PORTLAND FUN FACT

- What is Portland Famous for?
  - A). The world's shortest bridge
  - B). The World's smallest park
  - C). The United State's rainiest city
  - D). The most seafood consumed per capita in the USA

AMERICAN  
ACADEMY OF  
AUDIOLOGY

MAY/JUN  
2025

# AUDIOLOGY

TODAY

The magazine of, by, and for audiologists

## Connectivity

for Children with Hearing Loss

### INTEGRATING GENERATIVE AI

Into Audiology Practice  
and Education

### ANIMAL AUDIOLOGY

Understanding Hearing  
Across Species

### ACEN

A Streamlined  
Approach to  
Externships

[www.audiology.org](http://www.audiology.org)

# AUDIOLOGY TODAY



# Who We Are

EDUCATIONAL AUDIOLOGISTS

# What do we all have in common?



# Consistent Audibility, Access, and Connectivity all Contribute To Promoting and Maintaining

Speech and Language  
Environmental Sounds

Auditory Instruction

Human Connections  
Home, Community, School



# FROM THE PERSPECTIVE OF:

| Clinical Audiologist                                                                                        | Educational Audiologist                                                                                     | Family, Child, Educational Team                                                                             |
|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>▪ Audibility</li><li>▪ Accessibility</li><li>▪ Connectivity</li></ul> | <ul style="list-style-type: none"><li>▪ Audibility</li><li>▪ Accessibility</li><li>▪ Connectivity</li></ul> | <ul style="list-style-type: none"><li>▪ Audibility</li><li>▪ Accessibility</li><li>▪ Connectivity</li></ul> |

# FROM THE PERSPECTIVE OF:

| Clinical Audiologist                                                                                                                                                                                                                      | Educational Audiologist                                                                                                                                                                                                | Family, Child, Educational Team                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>▪ Verification of hearing aids-prescribed settings are meeting targets</li><li>▪ Speech and environmental sounds</li><li>▪ Personal remote mic: home, community, sports, activities, etc.</li></ul> | <ul style="list-style-type: none"><li>▪ FLE with hearing aids or hearing devices (CI/BAHA)</li><li>▪ Auditory instruction in the classroom (improve SNR)</li><li>▪ HAT (personal/CADS), classroom technology</li></ul> | <ul style="list-style-type: none"><li>▪ Child/student can hear and respond to me at home and school</li><li>▪ In more challenging listening situations, notice improvement with use of personal remote mic, check for understanding, preferential seating, reducing background noise</li><li>▪ Child/Student: ensuring child has the requirements to use home/school devices.</li></ul> |



Audibility



Connectivity



Accessibility

# DOES THIS SOUND FAMILIAR?

- Ryan: Age 11: 5th grade
  - Audibility: Ear molds are plugged with wax
  - Accessibility: Personal remote mic connected to hearing aids-Good
  - Connectivity: Personal remote mic with aux cord to computer-Good
- Alexis: Age 8: 2nd grade
  - Audibility: Hearing aids-check: Good/Ling sound check: Good
  - Accessibility: Remote mic not charged/remote mic poor sound quality
  - Connectivity: Personal remote mic with aux cord to computer
- Oliver: Age 17: 11th grade
  - Audibility: Hearing aids-check: Good/Ling sound check: Good
  - Accessibility: Personal remote mic connected to hearing aids: Good
  - Connectivity: Personal remote mic with aux cord to computer-not working/student lost



# TAKE ANOTHER STEP FURTHER



- Ryan: Age 11: 5th grade
  - Audibility: Hearing aid check: Good/Ling sound check: Good
  - Accessibility: Personal remote mic connected to hearing aids-Good
  - Connectivity: Personal remote mic with aux cord to computer-Good
- PEER COMMENTS QUESTIONS  
CONVERSATIONS: Limited audibility and accessibility in large group instruction

# TAKE ANOTHER STEP FURTHER

- Alexis: Age 8: 2nd grade
  - Audibility: Hearing aids-check: Good/Ling sound check: Good
  - Accessibility: Remote mic not charged/remote mic poor sound quality-Good
  - Connectivity: Personal remote mic with aux cord to computer-Good

BUT:

Alexis has another student in her classroom, Josie, with Cochlear N8s/Multi- Mic

Both Alexis and Josie have connectivity to their classroom teacher, but are struggling to hear their peers and the audio for the instructional video played on the SMART board.



# TAKE ANOTHER STEP FURTHER

Oliver: Age 17: 11th grade

- Audibility: Hearing aids-check: Good/Ling sound check: Good
- Accessibility: Personal remote mic connected to hearing aids: Good
- Connectivity: Personal remote mic with aux cord available and working
- BUT OLIVER HAS ANOTHER STUDENT: JOCELYN: IN HIS AP BIO CLASS with a CAD system as part of management to improve SNR for APD



# U.S. SCHOOL DISTRICTS FUN FACT

- Approximately how many school districts are currently in the U.S.?
  - A). 10, 771
  - B). 13,452
  - C). 18, 221
  - D). 19,045

# AUDIOLOGISTS IN THE US

- Approximately how many audiologists are currently working in the U.S.?
  - A). 13, 880
  - B). 14,229
  - C). 17, 390
  - D). 18,045

# EDUCATIONAL AUDIOLOGISTS IN THE U.S.

- How many ASHA certified Educational Audiologists according to 2024 ASHA survey:
  - A. 250
  - B. 315
  - C. 809
  - D. 921

# SIMEON – QUICK ORIGIN STORY



- Supportive Hearing Systems, Inc. (Legal name) Founded by Paulie Toner
  - Quickly established a reputation for manufacturing high quality sound field products
  - Several generations of sound field products – current flagship model = Audita II
  - Launching Auracast-enabled Audita IIIs later this year
- Ownership change – Jason Rude, President
  - US Expansion – 2024 – Melrose Park, IL - distribution center



# Menti Question: How old is Simeon?

- A). 5 years
- B). 10 years
- C). 15 years
- D). 30 years

# WHY UTILIZE A CLASSROOM AUDIO DISTRIBUTION SYSTEM (CADS)?

- Universal Design for Learning (UDL)
  - Accommodations provided to everyone
- Improved academic performance – all students
- Enhanced student engagement (pass-around mic in classroom)
- Instant quality control for connectivity and audio gain levels

## Built-in vs Portable CADS

- 📁 Built-in usually installed in the ceiling = poor acoustics
- 📁 Built-in harder to maintain and service
- 📁 Built-in integrates poorly with remote mics
- 📁 Portable CADS less expensive with better SNR and fewer sound gaps



# CADS APPLICATIONS

- Any student who needs improved SNR
  - **Auditory Processing** Deficit
  - Unilateral Hearing Loss
  - Un-aided students
    - Chronic otitis media
    - Fluctuating hearing loss
    - Minimal or Mild hearing loss
- Aided students
  - Integrating Transmitters with a Sound field - **Oticon EduMic** or **Cochlear MiniMic**

# SOUND FIELD RESEARCH – 30+ YEARS OF RESEARCH

## Impact on academic results in the classroom

- Rationale
  - 1994 Crandell & Smaldino – majority of classrooms don't meet recommended acoustical standards – updated many times with little change
  - 1992 Ray – Mainstream Amplification Resource Room Study (MARSS) – minimal hearing loss
  - 2012 Ayala; 2009 Millett – UDL – Universal Design for Learning
  - 2004 Inglehart – Cochlear-aided students do better with a Sound Field than without
  - 2007 Rubin – sound field compared to control group – measured student engagement
  - 2002 Bennetts & Flynn – students with developmental delays
  - 1994/1996 Crandell – ESL learners
  - 1997 McSporran – Auditory Processing (APD) using CHAPPS
  - 2007 Maag & Anderson – ADHD – measured response to teacher's instructions
  - 2004 Chelius. Trost Amplification Study – Oregon – Literacy/Reading Scores

# SOUND FIELD RESEARCH – LITERATURE REVIEW

## Research by Dr. Pam Millett – York University

- Vastly improved expressive vocabulary scores
- More effective use of teacher/student microphones – instant feedback on volume of pass-around mic
- Un-aided hearing loss – mild, unilateral, etc. – Improved SNR
- Helps all students and especially the teacher! (voice fatigue)
- Literacy – increase in reading at grade level > 5.3%
- Auditory Processing – simplest solution
- Improves acoustically poor classrooms – and most classrooms are poor!

# ACADEMIC PERFORMANCE AND CLASSROOM SOUND FIELD SYSTEMS

## *Noteworthy studies comparing CADS-outfitted classrooms vs un-amplified*

- *Chelius (2004) - Oregon – Literacy and Reading – 21% higher DRA*
- *Gertel, McCarty, & Schoff - Longitudinal study – +10% standardized tests*
- *Millet P & Purcell N (2010) – Effect of sound field amplification –*
  - *By EOY*
    - *amplified classrooms +5.3%*
    - *un-amplified classrooms – 6.7%*

# THE INCLUSIVE CLASSROOM

"I CAN FINALLY HEAR MY CLASSMATES!"

- Aided students have difficulty hearing their peers
  - Classmates not facing student/direction of sound/poor projection (elementary school)
  - Afraid to ask a question for fear that it may have already been asked
  - Worried about following class discussion and sharing ideas
- With remote mic alone –
  - Teacher must remove it to share with students who wish to speak/ask questions
  - Teacher must repeat student participation (questions, comments, ideas, etc.)

# DIFFERENT CADS MANUFACTURERS

## Primary Vendors

- Phonak
  - Roger Digimaster-5000/7000
- Lightspeed
  - RedCat/TopCat
- Front Row
  - Juno/Lyric
- Simeon
  - Audita II/Audita III



# PRE-AURACAST – EXAMPLE

- Educational Audiologist in the Midwest
- Special Education classroom – primarily students with hearing loss
- Connected:
  - Phonak transmitter
  - EduMic for multiple Oticon aided students
  - (2) Cochlear Kanso students
  - (1) Cochlear Nucleus 8 student



# PRE-AURACAST CASE STUDIES

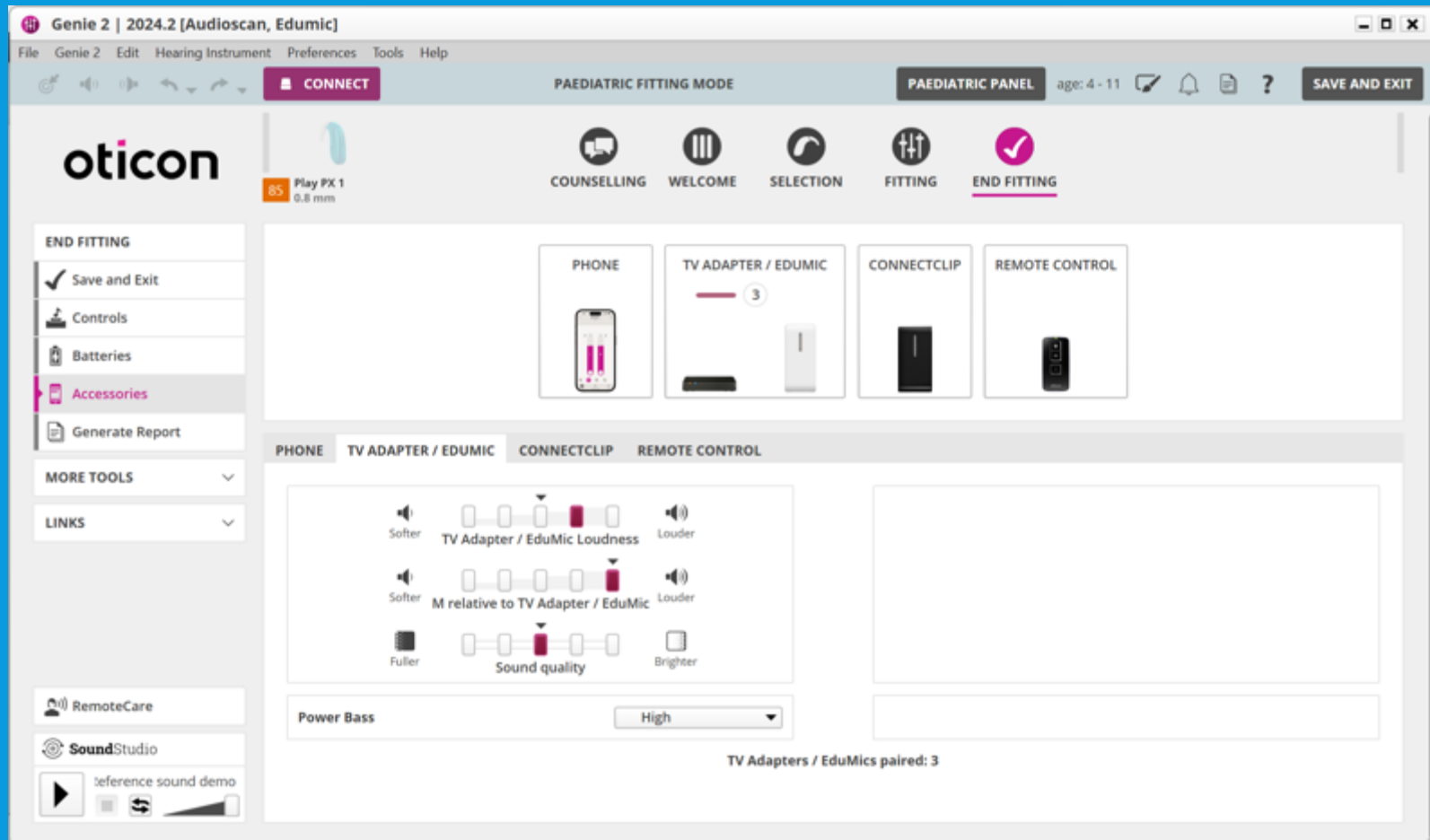
- Simeon Audita II – acoustically transparent integrated with EduMic
- CADS system with 2 mics (teacher and pass-around student mics)
- Achieves all of the benefits of CADS with ear-level amplification
- New Hampshire, New York, Ontario



# Case Study Set-up

- Hardware
  - EduMic
  - Audita II
  - Aux cable – connected to Audita II Aux out port
- Verification
  - 65dB curve – test box – 1. with HA only 2.with HA/EduMic 3.with HA/EduMic connected to Audita II
- Questionnaires (Pre & Post)
  - LIFE-R (Teacher & Student)
  - SIFTER (Teacher)
  - Vanderbilt Listening Fatigue Scale (Teacher/Student)
  - Student Listening Performance Questionnaire

# SET UP: ADDITIONAL DETAILS



When setting up the Audita II with the EduMic

1. Audita II
2. EduMic is plugged into Aux-out port with 3.5 mm cable
3. Genie 2 Fitting Software: If noise floor is present adjust the following or recommend to clinical aud to adjust softer

# PRE/POST QUESTIONNAIRES

- Listening Inventory for Education: Teacher/Student Appraisal of Listening Difficulty
- Vanderbilt Listening Fatigue: Teacher/Student
- SIFTER: Screening Instrument for Targeting Educational Risk
- Student Listening Performance Questionnaire – (Post FM fitting)

| STUDENT<br>AGE & GRADE | REGION              | HEARING<br>LOSS      | HEARING<br>AID OR<br>HEARING<br>DEVICE | HAT                 | QUESTIONNAIRES<br>COMPLETED                                                           | LENGTH OF<br>TRIAL | CLASSROOM<br>TYPE |
|------------------------|---------------------|----------------------|----------------------------------------|---------------------|---------------------------------------------------------------------------------------|--------------------|-------------------|
| Age: 11<br>Grade: 5    | Central<br>New York | Mild SNHL            | Oticon Play<br>PX                      | EduMic<br>Audita II | TEACHER: LIFE-R<br>STUDENT: LIFE-R<br>VANDERBILT LISTENING<br>FATIGUE SCALE<br>SIFTER | 5 weeks            | Traditional       |
| Age: 7<br>Grade: 2     | New<br>Hampshire    | Bilateral HF<br>SNHL | Oticon Play<br>PX                      | EduMic<br>Audita II | SIFTER                                                                                | 6 weeks            | Traditional       |
| Age: 10<br>Grade: 5    | Ontario,<br>Canada  | Mild SNHL            | Oticon Play<br>PX                      | EduMic<br>Audita II | Durham Teacher Summary                                                                | 6 weeks            | Traditional       |
| Age: 11<br>Grade: 5    | Ontario,<br>Canada  | Mild SNHL            | Oticon Play<br>PX                      | EduMic<br>Audita II | Durham Teacher Summery                                                                | 6 weeks            | Traditional       |

# Case Study – New York

- Syracuse, NY – Grade 5 student
- SIFTER – Attention & Class Participation – noteworthy increases
- LIFE-R – Overall increase 61 -> 68
  - #3 – Understand verbal responses by other students – went from 3 to 5!
  - #4 - Listening to directions to entire class – 4 to 5
  - #6 – Ability to attend class activities – 4 to 5
  - #8 – Level of hesitation when volunteering – 4 to 5

# Case Study – New Hampshire

- New Hampshire – grade 2 student
- Teacher – described “Jovie” from the movie ELF with Will Ferrell as the CADS – “students were disappointed when case study ended and Jovie was taken away”
- SIFTER
  - – Attention: 5 -> 7 (Fail to Marginal)
  - - Class Participation: 6 -> 7 (Fail to Marginal)



=



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# Case Study – Ontario

- Durham, ON – Grade 5 student
- Student listening performance questionnaire:
  - Improvement over a broad range of categories relating to:
    - Class Participation
    - Comprehension during large group activities/instruction
    - Focus during teacher instruction
    - Reduced hesitancy with student participation

# GENERAL LEARNINGS – PRE-AURACAST CASE STUDIES - SUMMARY

- Teacher
  - QA-Audible confirmation – ensures equipment was actually working and unmuted
  - Don't have to be facing the classroom at every moment while speaking
  - Not necessary to repeat every question/comment from the class
  - Tricky to manage the hardware – EduMic connections
- Student
  - Less hesitancy when participating in class discussions
  - More engagement when teacher is addressing the entire class
  - Increased level of attentiveness

# WHAT CHANGES WITH AURACAST



Objective: Alternate for remote mic; turn on direct Auracast broadcast audio feed

Launch of Audita III with Auracast – broadcast audio to Oticon Pediatric hearing aids (dependent on launch of hearing aid and companion solution for connections)

Audita III/Auracast



Audita II



# AURACAST

Introduction Video: [https://www.youtube.com/watch?v=ViZ\\_ziLmy7Q&t=117s](https://www.youtube.com/watch?v=ViZ_ziLmy7Q&t=117s)

# WHAT IS AURACAST



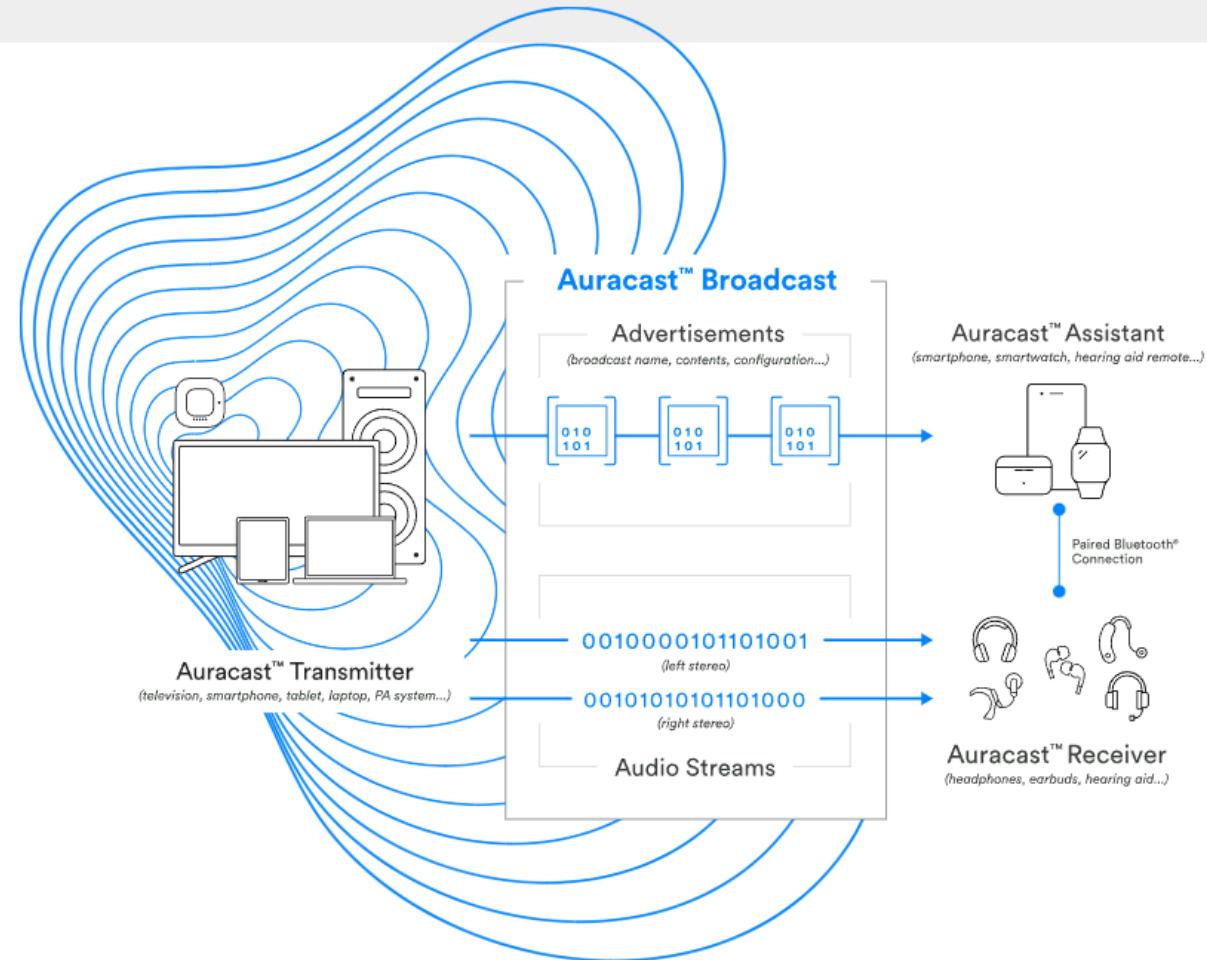
- Uses Bluetooth Low Energy – broadcast audio
- An unlimited number of in-range Auracast™ receivers will be able to join an Auracast™ broadcast from a nearby Auracast™ transmitter
- Public Venues such as airports, conference centers, gymnasiums, cinemas, houses of worship, etc.
- Designed for all. Market penetration will be much higher due to universal application
- Will be adopted by hearing aid manufacturers. Currently enabled in ReSound, Beltone. Auracast “ready” in Cochlear, Starkey, Signia, Oticon and others.

# Bluetooth LE Audio development timeline



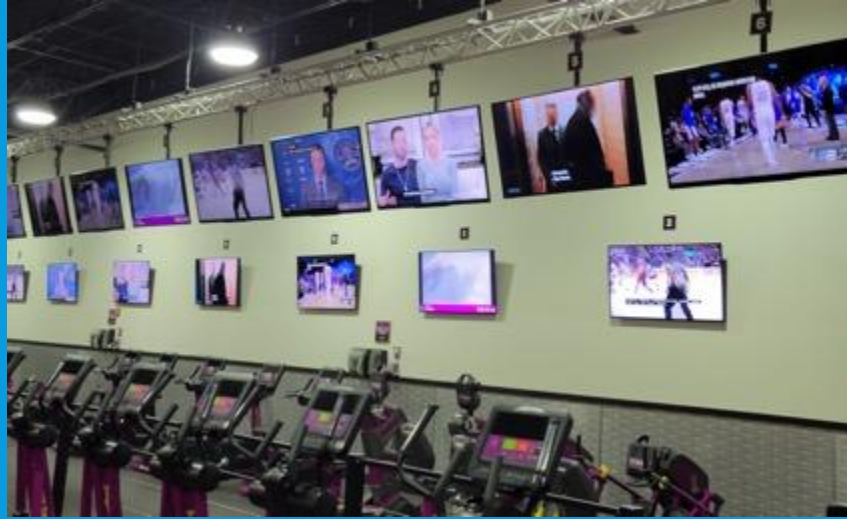
## How It Works

An unlimited number of in-range Auracast™ receivers will be able to join an Auracast™ broadcast from a nearby Auracast™ transmitter.





**Silent Screens**



**Multi-language Support**



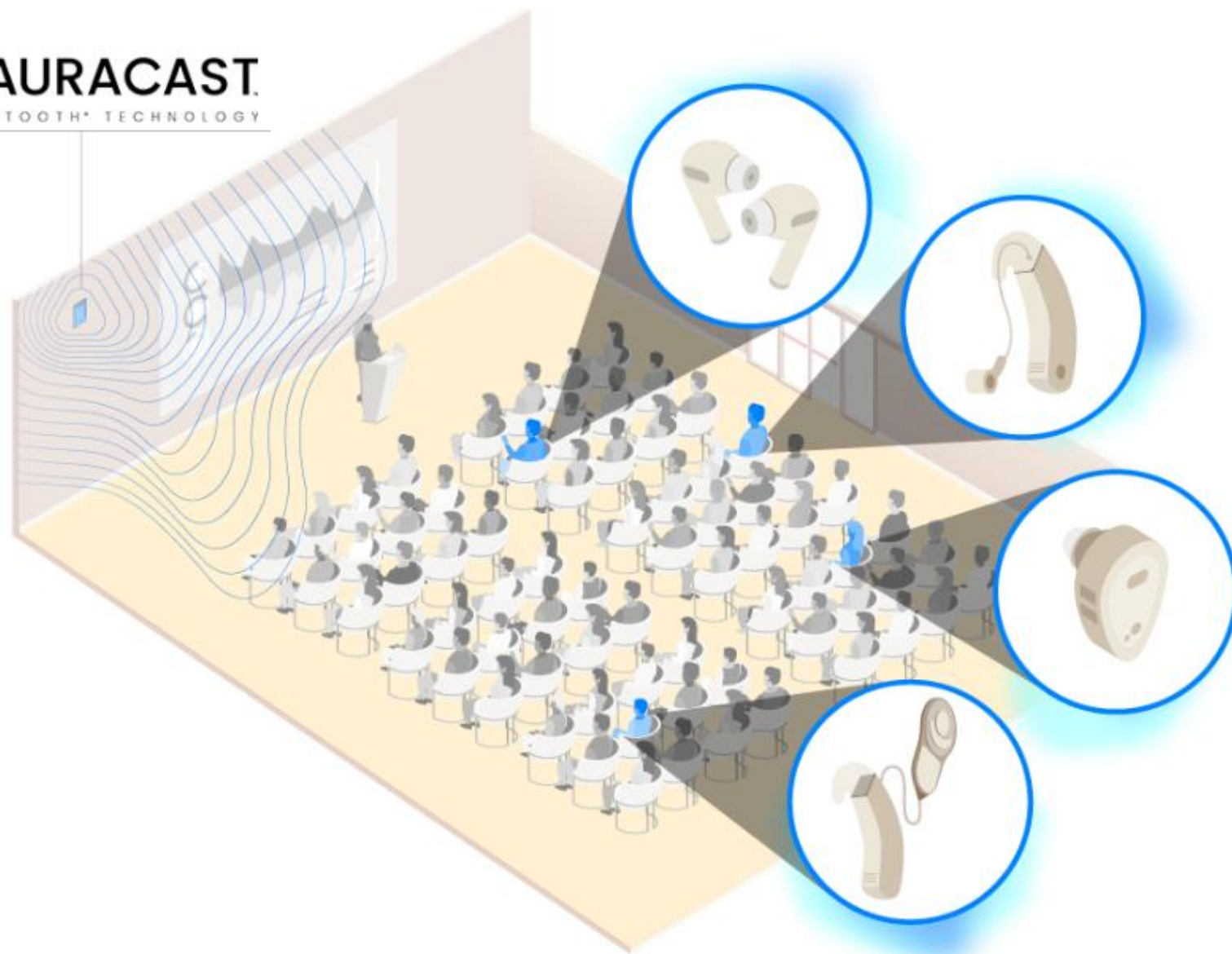
**Tour Systems**

Airports – connect to gate announcements  
- then wander to the food court and beyond

Demonstration – Chicago O'Hare – Terminal 1



 **AURACAST.**  
A BLUETOOTH® TECHNOLOGY



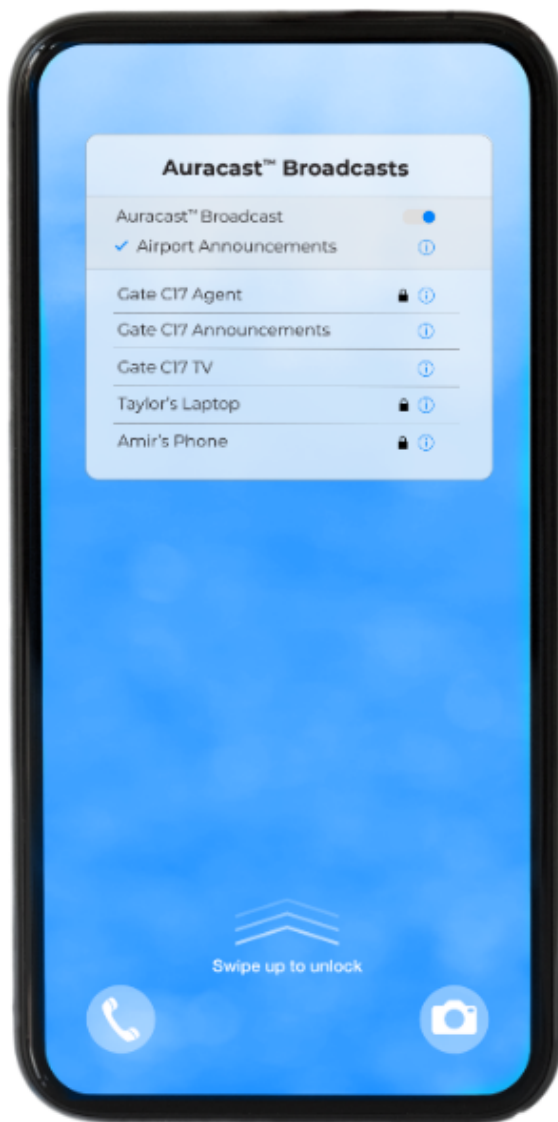


## Augmented/Assistive Listening

Locations that deploy public address (PA) systems such as airports, cinemas, lecture halls, conference centers, houses of worship, and more will provide a significantly higher quality audio experience by enabling visitors to receive the PA audio directly into their own Bluetooth® earbuds with Auracast™ broadcast audio or hearing device.

When used in this manner, Auracast™ broadcast audio will function as a high quality, low-cost, next-generation assistive listening system (ALS), improving the audio experience for visitors with and without hearing loss.



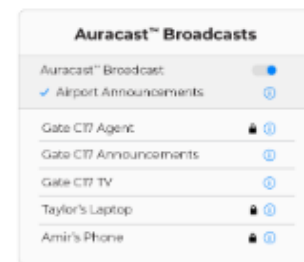


# Join In, Intuitively

Joining an Auracast™ broadcast will be as easy as 1, 2, or 3.

## 1. Searching

One way to find and join an Auracast™ broadcast will feel very similar to how you search for and connect to Wi-Fi networks today.



## 2. Scanning

A simple scan of a QR code will allow you to join an Auracast™ broadcast effortlessly.



## 3. Tapping

A tap is now all it takes to pay. In much the same way, tap-to-hear could make access to Auracast™ broadcasts quick and easy.



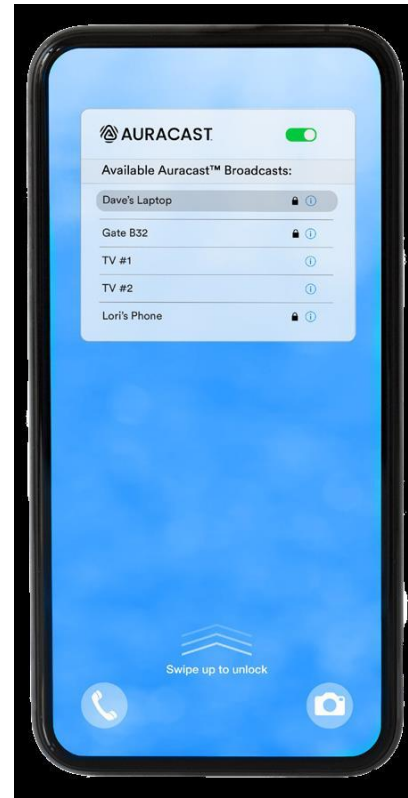
# Methods of connecting (not pairing)

## Auracast Assistant Application

- Smart phone
- Smart Watch
- Tablet

## Other ways to connect:

- Touch screen on charging case - JBL
- Tap mode on hearing aids (e.g.)
  - Tap RH – Connect Mode
  - Tap LH – Accept strongest signal



# AURACAST IN THE CLASSROOM

- Alternatives to traditional hardware – simplifies the set-up and eliminates complexity related to remote mics
- Teacher wears a single microphone
- Connecting to an Auracast signal (similar to Bluetooth)
  - Auracast assistant app – smartphone, tablet, smartwatch
  - Charging case
  - Tap connecting
- Range of Auracast signal
  - Audita III – 200'

# CONNECTING TO AURACAST

- Concerns about Auracast
- Complexity
  - Will hearing aids automatically connect to a known Auracast signal each morning?
  - When a student goes to the bathroom, will Auracast automatically reconnect?
  - Smartphone app – Auracast Assistant – if discouraged in schools?
    - Smartwatch apps for connecting – Android/ReSound
  - Low Latency – not zero latency – placement of CADS consideration
  - Privacy concerns by teachers
- Other considerations
  - Will Educational Audiologists recommend Auracast-enabled headphones/ear buds or bone conduction headphones for un-aided students?

# FOLLOW UP RYAN

- Classroom Set Up:
  - Audita II
  - EduMic with aux cord
  - Pass-around mic/talking stick for peers
- Field trips – Auracast-enabled hearing aids
  - Museum
  - Tours
  - Theatres



# FOLLOW UP ALEXIS AND JOSIE

- Splitter - two different students/two different HAT
- Sound field
- Edumic/Multi-Mic 2 +
- Peer conversations
- External Audio amplification
  - Pendant Audio-in Port (most convenient for teachers)
  - Cabled to Audita II
  - Bluetooth to Audita III
- Auracast-enabled morning announcements or assemblies
  - – audio feed connected to Auracast transmitter or Audita III



# FOLLOW UP OLIVER AND JOCELYN

- School Auditorium – Auracast transmitters connected to PA system
- Jocelyn uses Auracast enable ear buds in large lecture hall
- Oliver uses Auracast enable hearing aids in large lecture hall



# SUMMARY



For each student, think about what factors could be affecting audibility, accessibility, and connectivity within the school setting. Do you need to expand upon their current HAT to build and promote audibility, accessibility, and connectivity in their school day?



From this presentation, it can be determined that using a CAD system paired with personal remote mic can provide additional benefits for accessibility, promoting, building, and maintaining connections with peers and teachers.



From this presentation, as we look to the future, that is hear, we can be prepared to consider Auracast as another opportunity-within the school, home, and community to provide accessibility

# QUESTIONNAIRE REFERENCES

- Listening Inventory for Education-Revised (L.I.F.E.-R) 2011 by Karen L. Anderson, Ph.D., Joseph Smaldino, Ph.D. & Carrie Spangler, Au.D.
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- Vanderbilt Listening Fatigue Scale (Teacher) VFS-T ©2019 Vanderbilt University (Version 2.0 Revision Date: 05-22-2024)
- Vanderbilt Listening Fatigue Scale (Child) VFS-C ©2019 Vanderbilt University (Version 2.0 Revision Date: 05-22-2024)