

Auracast – den nye streaming standard

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Principal Engineer



Civilingeniør

Standardisering og ny teknologi

Hos ReSound siden 2005

Formand for EHIMA tekniske komité

Ekspertgruppe under EU kommissionen

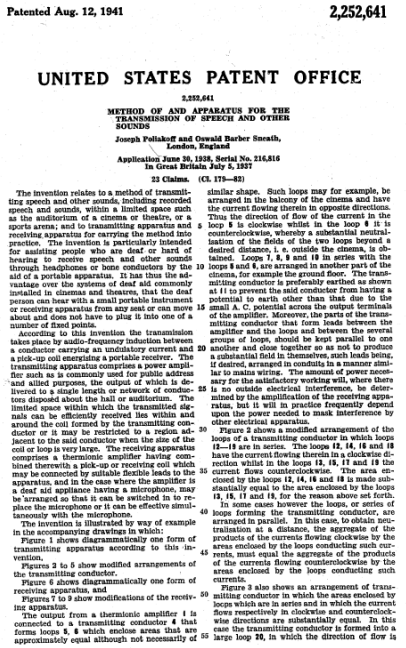
Medlem af Bluetooth organisation

30 år med “connecting people”

35 år med trådløs teknologi

Teleslyngesystemet

- Ingeniørerne ledte efter metoder til bedre signal-støjforhold
- Patentet på teleslyngesystemet er fra 1938 og streaming bliver mulig.
- I dag er det stadig en god løsning på offentlige steder som kirker osv.



Patented Aug. 12, 1941 2,252,641

UNITED STATES PATENT OFFICE

2,252,641

METHOD OF AND APPARATUS FOR THE TRANSMISSION OF SPEECH AND OTHER SOUNDS

Joseph Poliakoff and Oswald Barber Sneath, London, England

Application June 30, 1938, Serial No. 216,816
In Great Britain July 5, 1937

23 Claims. (Cl. 179—82)

The invention relates to a method of transmitting speech and other sounds, including recorded speech and sounds, within a limited space such as the auditorium of a cinema or theatre, or a sports arena; and to transmitting apparatus and receiving apparatus for carrying the method into practice. The invention is particularly intended for assisting people who are deaf or hard of hearing to receive speech and other sounds through headphones or bone conductors by the aid of a portable apparatus. It has thus the advantage over the systems of deaf aid commonly installed in cinemas and theatres, that the deaf person can hear with a small portable instrument or receiving apparatus from any seat or can move about and does not have to plug it into one of a number of fixed points.

According to this invention the transmission takes place by audio-frequency induction between a conductor carrying an undulatory current and a pick-up coil energizing a portable receiver. The transmitting apparatus comprises a power amplifier such as is commonly used for public address and allied purposes, the output of which is delivered to a single length or network of conductors disposed about the hall or auditorium. The limited space within which the transmitted signals can be efficiently received lies within and around the coil formed by the transmitting conductor or it may be restricted to a region adjacent to the said conductor when the size of the coil or loop is very large. The receiving apparatus comprises a thermionic amplifier having combined therewith a pick-up or receiving coil which may be connected by suitable flexible leads to the apparatus, and in the case where the amplifier is a deaf aid appliance having a microphone, may be arranged so that it can be switched in to replace the microphone or it can be effective simultaneously with the microphone.

The invention is illustrated by way of example in the accompanying drawings in which:

Figure 1 shows diagrammatically one form of transmitting apparatus according to this invention,

Figures 2 to 5 show modified arrangements of the transmitting conductor.

Figure 6 shows diagrammatically one form of receiving apparatus, and

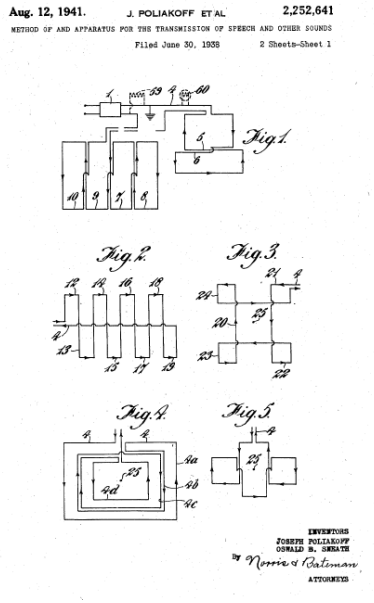
Figures 7 to 9 show modifications of the receiving apparatus.

The output from a thermionic amplifier 1 is connected to a transmitting conductor 4 that forms loops 5, 6 which enclose areas that are approximately equal although not necessarily of similar shape. Such loops may for example, be arranged in the balcony of the cinema and have the current flowing therein in opposite directions. Thus the direction of flow of the current in the loop 5 is clockwise whilst in the loop 6 it is counterclockwise, whereby a substantial neutralisation of the fields of the two loops beyond a desired distance, i. e. outside the cinema, is obtained. Loops 7, 8, 9 and 10 in series with the loops 5 and 6, are arranged in another part of the cinema, for example the ground floor. The transmitting conductor is preferably earthed as shown at 11 to prevent the said conductor from having a potential to earth other than that due to the small A. C. potential across the output terminals of the amplifier. Moreover, the parts of the transmitting conductor that form leads between the amplifier and the loops and between the several groups of loops, should be kept parallel to one another and close together so as not to produce a substantial field in themselves, such leads being, if desired, arranged in conduits in a manner similar to mains wiring. The amount of power necessary for the satisfactory working will, where there is no outside electrical interference, be determined by the amplification of the receiving apparatus, but it will in practice frequently depend upon the power needed to mask interference by other electrical apparatus.

Figure 2 shows a modified arrangement of the loops of a transmitting conductor in which loops 12—15 are in series. The loops 12, 14, 16 and 18 have the current flowing therein in a clockwise direction whilst in the loops 13, 15, 17 and 19 the current flows counterclockwise. The area enclosed by the loops 12, 14, 16 and 18 is made substantially equal to the area enclosed by the loops 13, 15, 17 and 19, for the reason above set forth.

In some cases however the loops, or series of loops forming the transmitting conductor, are arranged in parallel. In this case, to obtain neutralisation at a distance, the aggregate of the products of the currents flowing clockwise by the areas enclosed by the loops conducting such currents, must equal the aggregate of the products of the currents flowing counterclockwise by the areas enclosed by the loops conducting such currents.

Figure 3 also shows an arrangement of transmitting conductor in which the areas enclosed by loops which are in series and in which the current flows respectively in clockwise and counterclockwise directions are substantially equal. In this case the transmitting conductor is formed into a large loop 20, in which the direction of flow is



Aug. 12, 1941. J. POLIAKOFF ET AL 2,252,641

METHOD OF AND APPARATUS FOR THE TRANSMISSION OF SPEECH AND OTHER SOUNDS

Filed June 30, 1938 2 Sheets-Sheet 1

Fig. 1.

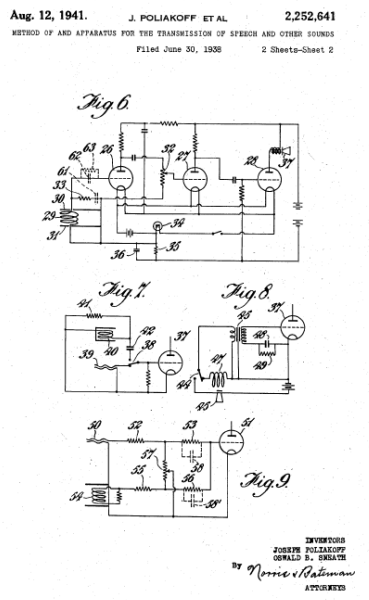
Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

INVENTORS
JOSEPH POLIAKOFF
OSWALD B. SNEATH
By Norris & Bateman
ATTORNEYS



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Filed June 30, 1938 2 Sheets-Sheet 2

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

INVENTORS
JOSEPH POLIAKOFF
OSWALD B. SNEATH
By Norris & Bateman
ATTORNEYS



Teleslynge v2

- Vi lever i en digital verden
  - Identitet verificeres digitalt
  - Vi bruger digitale medier dagligt
  - Selvangivelsen laves digitalt
  - Covid-19 ændrede måden vi holder møder på – Teams, Zoom, Webex osv.
  - Selv lommetyvene er flyttet over på nettet
- EU bliver mere digitaliseret
  - ”EU Digital citizen”
  - “Vi har nået slutningen af den digitale begyndelse”
- Vi har brug for en teleslynge 2.0 og det haster!



Digital parathed er høj i Skandinavien

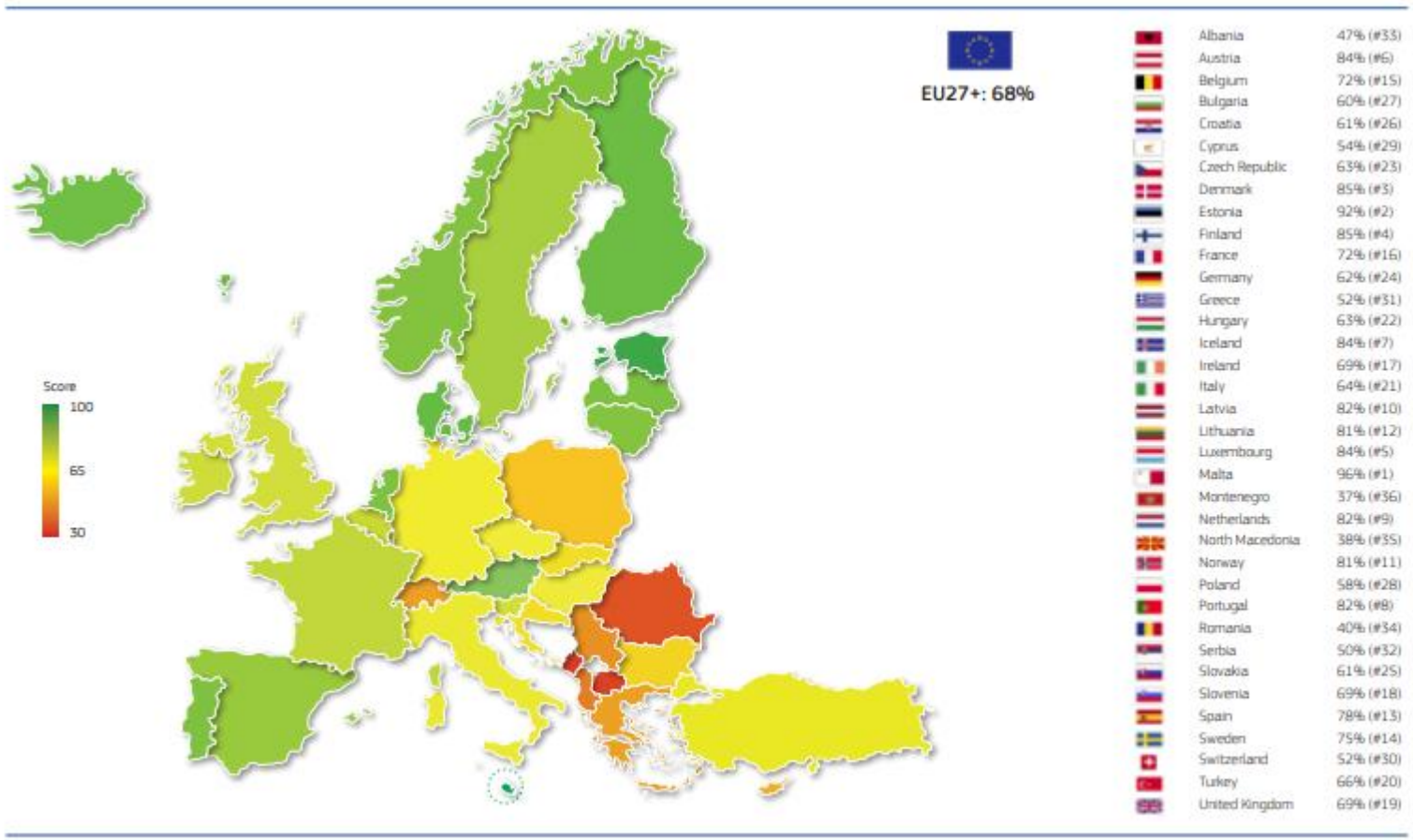


Figure 2.1 Country overall eGovernment performance

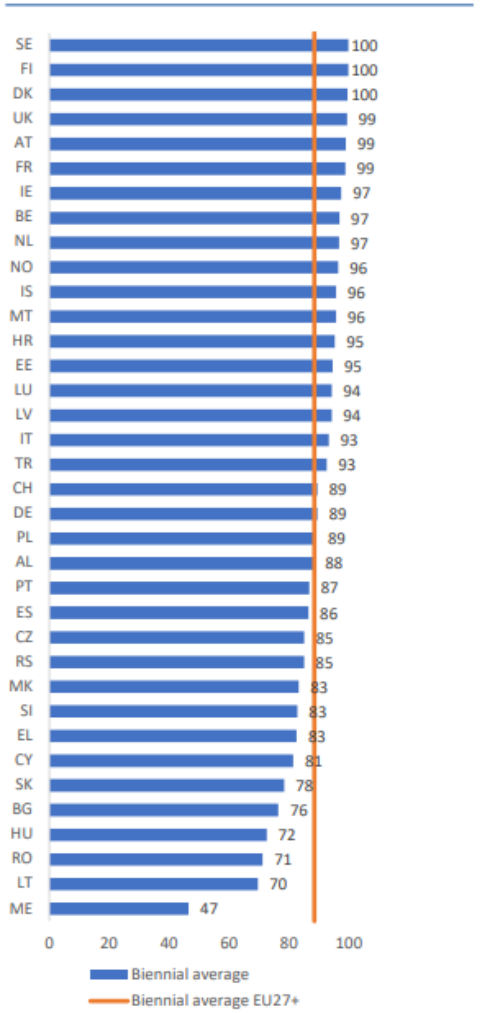


Figure 2.8 Mobile Friendliness per country

Trådløse forbindelser nu



Auracast



Direct TV



Direct PC, laptop og tablet



Direct multiple brands

Hvilken type standard?

- Proprietær – få fabrikanter: MFI, ASHA



- Industri standard – mange fabrikanter: Bluetooth, ZigBee



- International standard – fabrikanter og myndigheder: IEC, ETSI

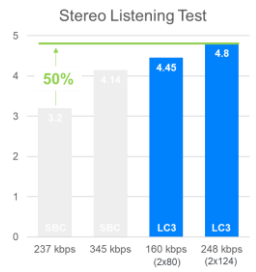


- Harmoniseret standard – lovgivende reference: EN, ISO



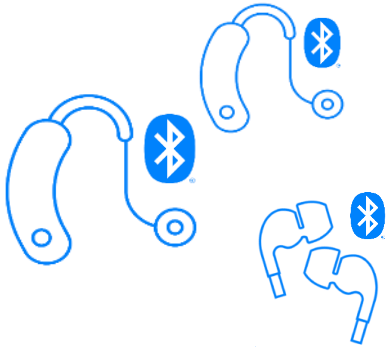
BT LE Audio | Næste generation Bluetooth® audio

New Modern Codec (LC3)



Høj lyd kvalitet
Bedre performance
Lavt batteriforbrug

Multi-Stream Support



Standard earbuds
Binaurale høreapparater
Lokal lydindstilling

Standardized Hearing Aids



Brugeren styrer lyden
Lang batterilevetid
Global Interoperabilitet

Broadcast Audio

AURACAST
A BLUETOOTH® TECHNOLOGY

Alle kan lytte med
Udvalgte kan lytte med

Næste generation
”teleslynge”
Stereo
Parallelle lydstrømme
(og mere på vej)

Hvad er Auracast™ broadcast audio?

Auracast™ broadcast audio er en ny Bluetooth funktionalitet som giver en bedre lydoplevelse for alle – udbygger trådløs forbindelse til omgivelserne.



Del din lyd

Del lyd og skærm fra din PC



Hør informationerne

Annoncering fra offentlige steder



Sæt lyd på verden

Få lyd fra ”Silent” skærme i det offentlige rum

Mange muligheder for installation i det offentlige rum

Næste generation audio

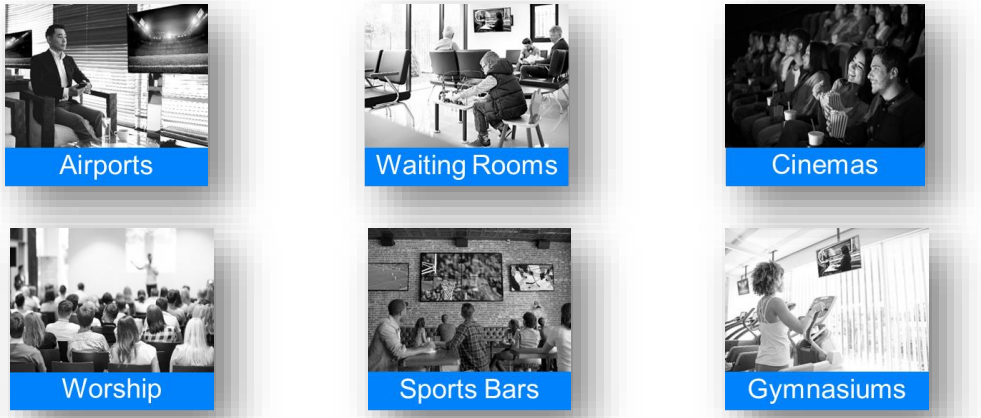
Nemt at installere – forøger tilgængeligheden

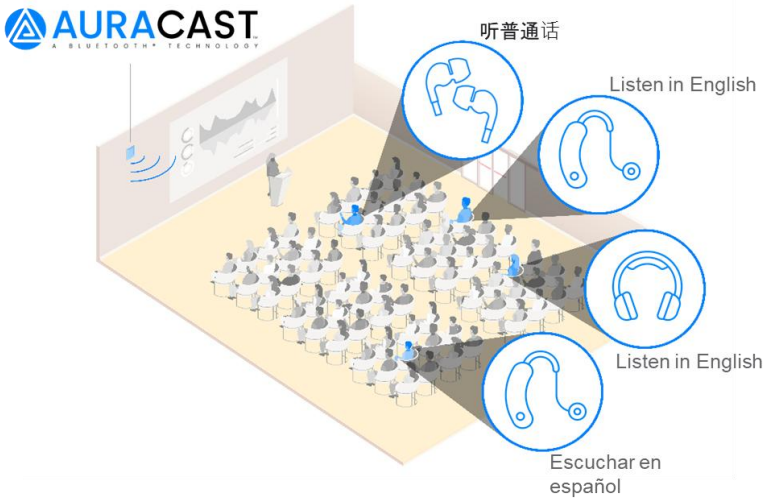
- Virker godt sammen med eksisterende systemer

Forbedret brugeroplevelse

- Supporterer alle brugere også normalt hørende
- Multi-kanal / multi-broadcast

Flere muligheder – forbedrer lydoplevelsen hvor du er





Stort økosystem der bakker op omkring Auracast



Webinars for audiologer, brugere og ingeniører

- Pro Audito, (CH) & ETH



Auracast: So war das Webinar und das sind die Ergebnisse

Donnerstag, 20. Juni 24

Endlich war es so weit: Gestern haben der Aura Experte Beat Graf und die beiden ETH Master-S tinnen Rahel Kaufmann und Anna Brasser vorg was beim Pro Audito Auracast-Test (wir haben it tet) herausgekommen ist. Das Interesse war riet über dreihundert Menschen hatten sich für das nar angemeldet. Trotz hochsommerlicher Wärm ten die Teilnehmenden viele Fragen, so dass Pro dito kurzerhand in die Verlängerung ging und e halbe Stunde anhängte.

Webinar am 19. Juni: Beat Graf erklärt Auracast.

Hier das Wichtigste vom Webinar in Kürze:

Was kam beim Test-Tag heraus?



Auracast-Test an der ETH-Zürich: Die besten Bilder

Dienstag, 14. Mai 24

Der neue Bluetooth Auracast Standard wird die Wel der drahtlosen Audioübertragung, und somit der Hö versorgung, grundlegend verändern. Pro Audito Schweiz hat zusammen mit über vierzig Interessierte und der ETH Zürich die ersten verfügbaren Auracast Geräte der Schweiz getestet.

Hier geht's zur Bildergalerie:

Impressionen vom Auracast-Test an der ETH Zürich



Auracast-Test: Wir legen los!

Mittwoch, 08. Mai 24

Endlich ist es so weit! Diese Woche steht unter dem Stern von Bluetooth Auracast. Pro Audito Schweiz testet die ersten verfügbaren Geräte auf Nutzerfreundlichkeit und mehr. Zudem findet am Samstag unser grosser Auracast-Test an der ETH statt.

Der neue Bluetooth-Standard Auracast verspricht viele spannende Features für Menschen mit Schwerhörigkeit. Niedrige Zeitverzögerung (Latenz), einfaches Mithören an lagen sind nur einige davon. Im Mai testet Pro Audito Schweiz die ersten Auracast-Geräte, die auf dem Schweizer Markt erhältlich sind. Dazu gehören Smartphones von Samsung, Hörgeräte von GN ReSound und Oticon, sowie diverse Sender und Empfänger von Ampetronic und Humantechnik.

Wir testen dabei die Nutzerfreundlichkeit der Geräte, also wie leicht sie sich einrichten und verwenden lassen, sowie wichtige technische Anhaltspunkte wie Latenz und Frequenzgang, also die Leistung der Auracast-Übertragung in verschiedenen Frequenzbereichen. So finden wir heraus, ob diese erste Generation von Auracast-Produkten schon etwas taugt, und wo die Hersteller noch nachbessern müssen.

- Vingstedkonference.
- Danish Sound cluster.
- Sveriges hörselsvård.

Nye Auracast produkter

Ny arbejdsform:

- Skolesystemer bliver mere integrerede. Fokus på enkelhed.
- Arbejdspladstilpasning.















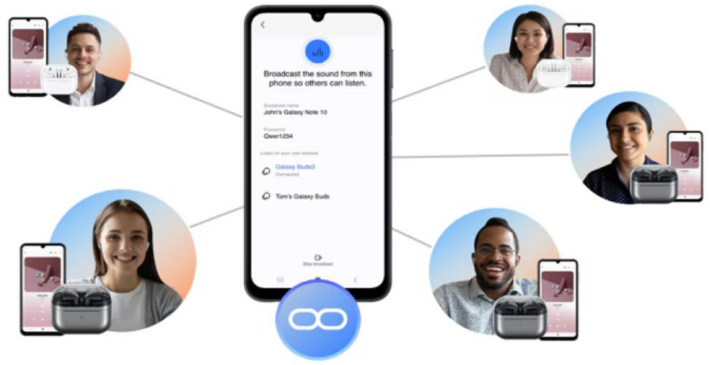




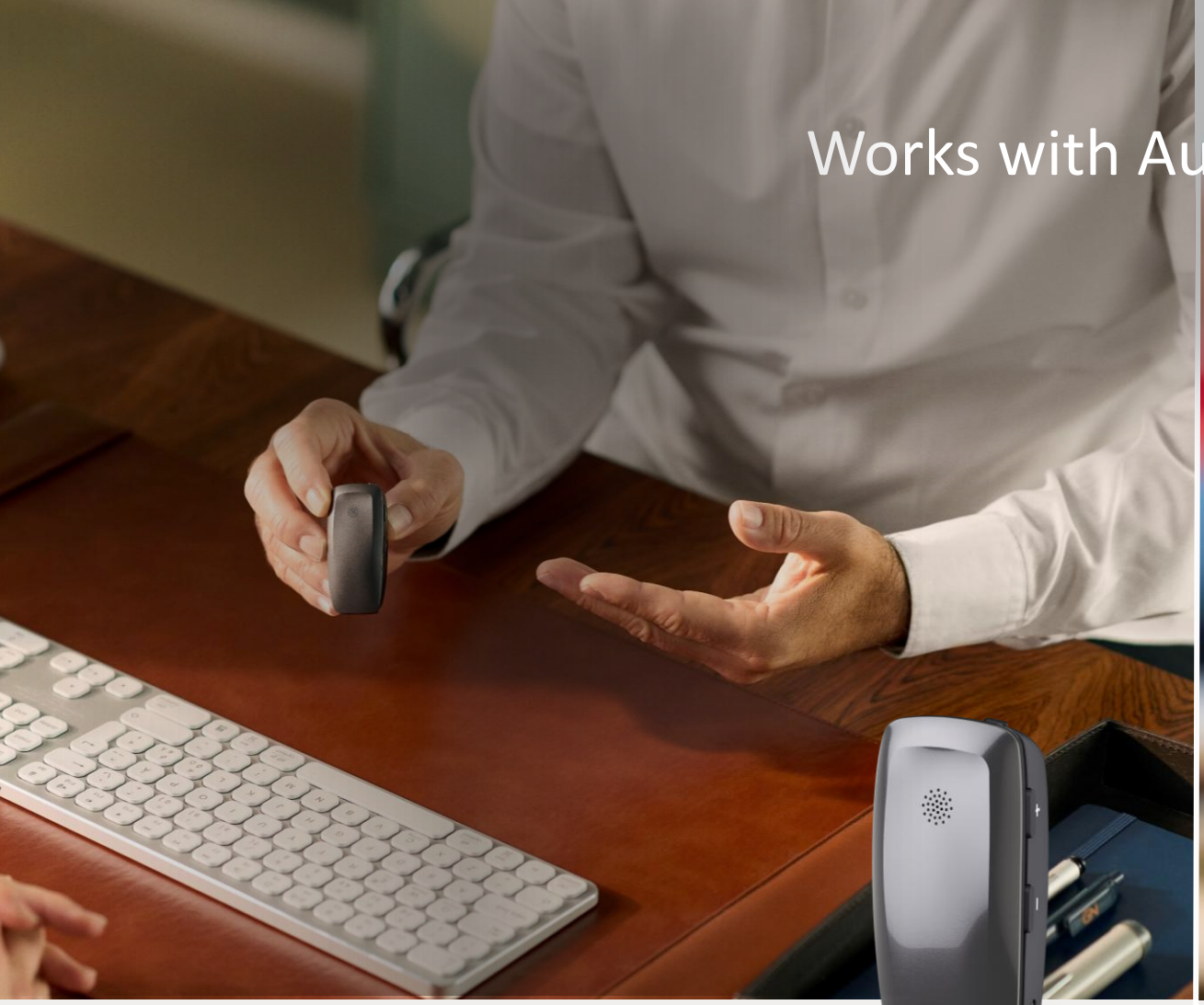








Works with Auracast now



Multi-Mic+

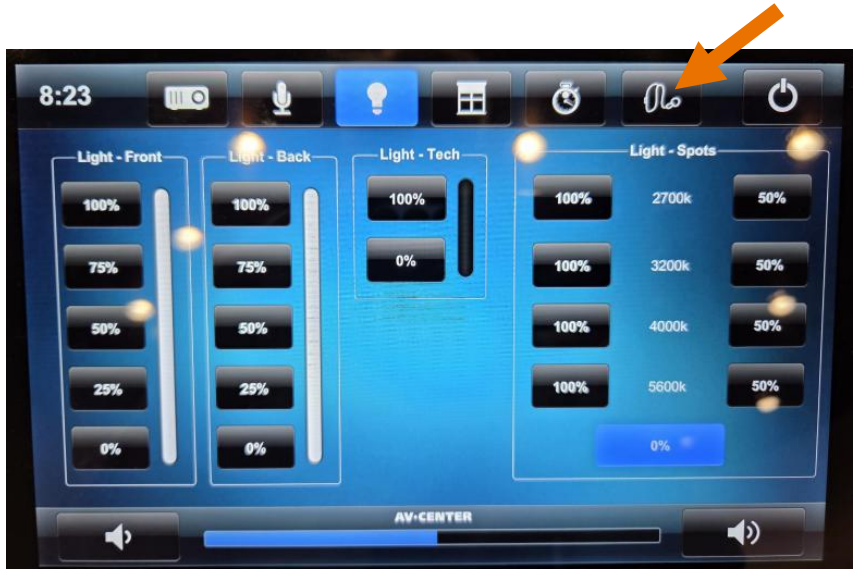
With the world’s first remote mic featuring Auracast, educators, presenters, event hosts, and tour guides can broadcast their voice to multiple listeners.



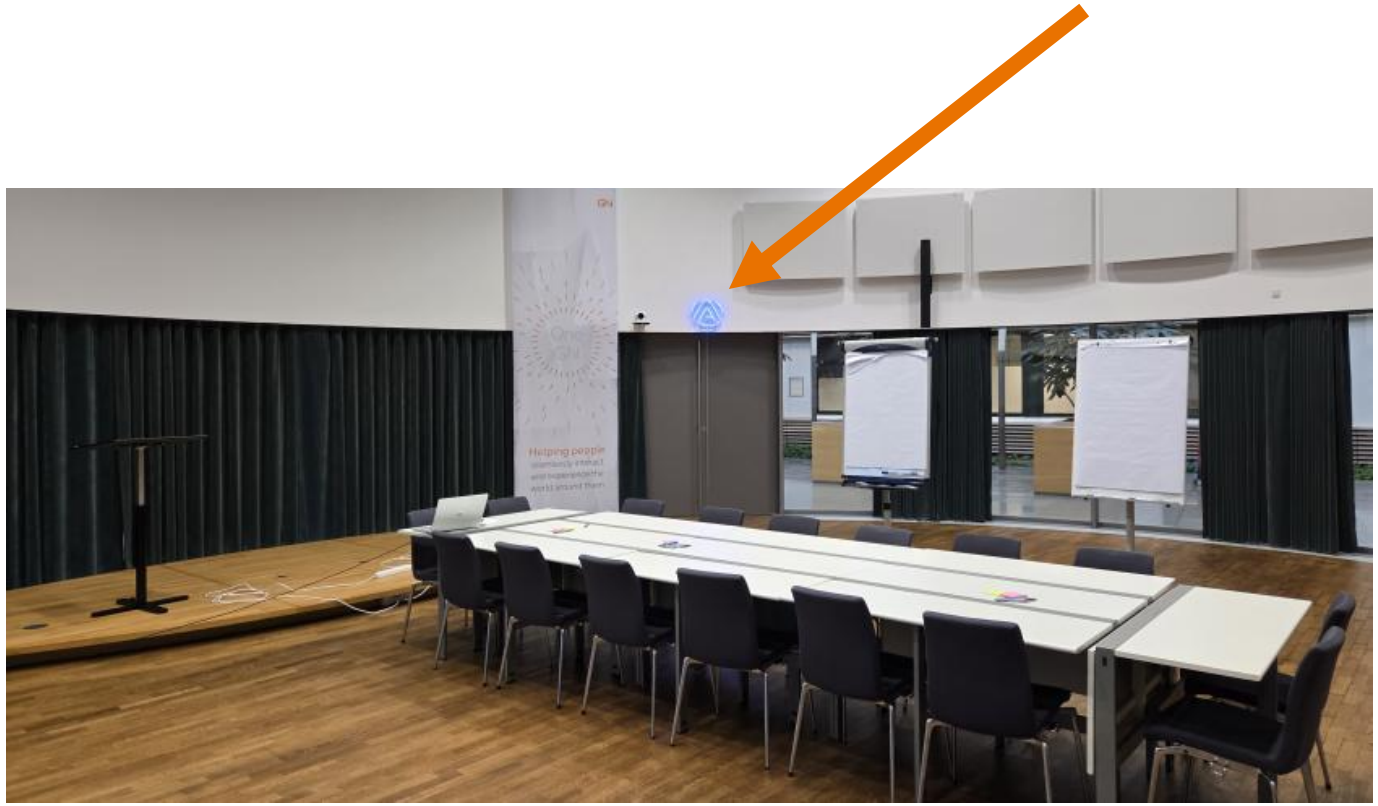
TV-Streamer+

The TV-Streamer+ supports Auracast, allowing an unlimited number of Auracast-enabled devices to listen to a TV audio stream.

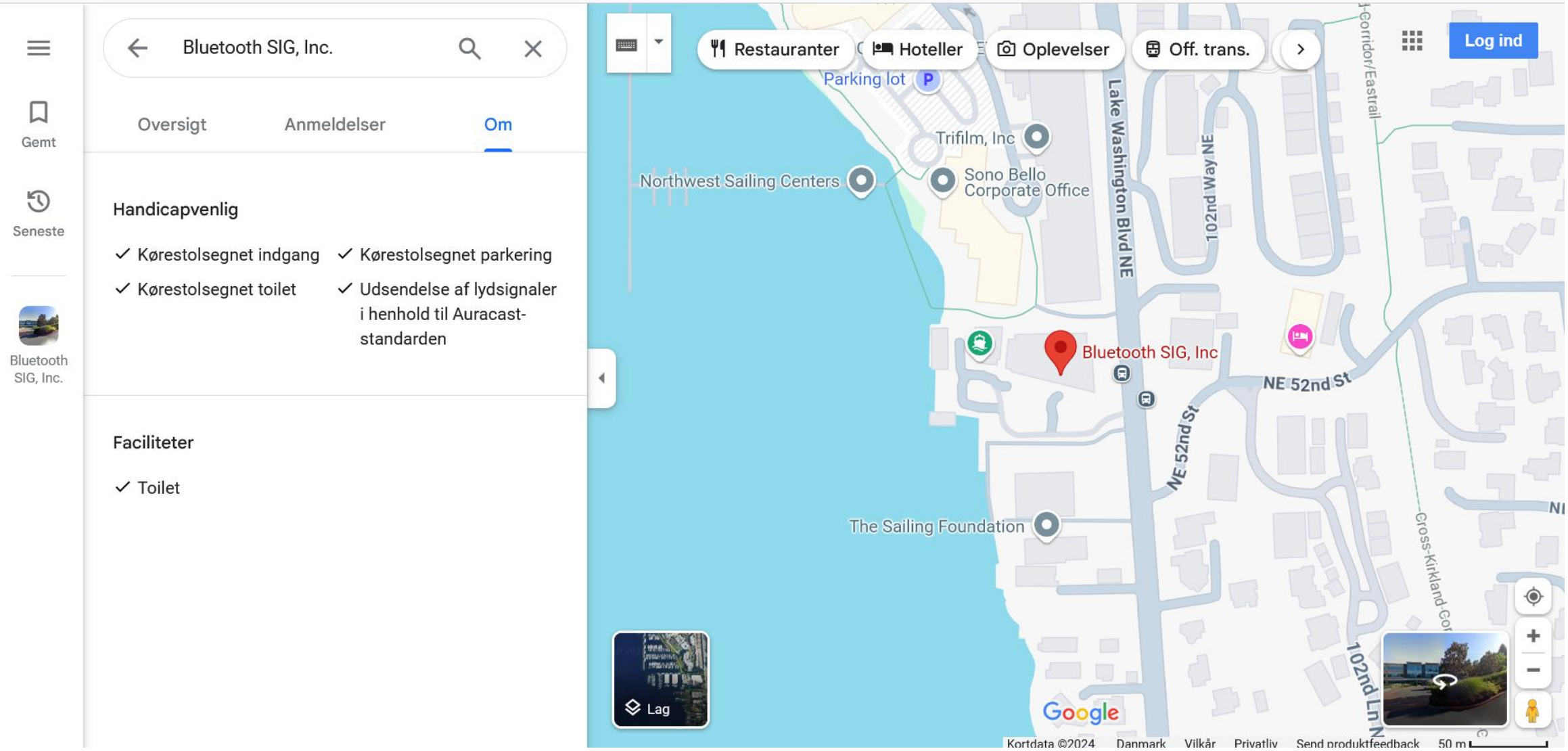
Møderum – et praktisk eksempel



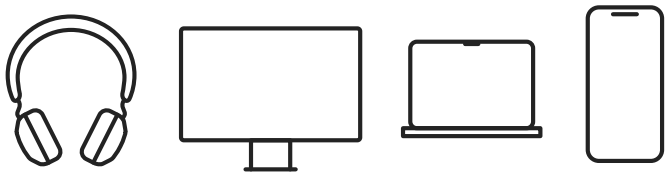




Google Maps viser Auracast tilgængelighed



Fremtidens streaming er allerede begyndt



Samsung Galaxy Buds2 Pro
Samsung S23 / 24 / 25
Samsung, Lenovo, HP, MSI PC
Google Pixel 7 / 8 / 9
& mange flere

Udstyr der allerede bruger
Bluetooth LE Audio

Oslo | Ny Teater



København | Folketingets kirke



Chicago | O'Hare lufthavn

Offentlige steder der tester eller planlægger
Auracast installation

Test og installationer.

Oslo | Ny Teater



Ampetronic Auri med
Samsung earbuds og ReSound.

London | Samsung experience center





MultiMic+ og
Samsung buds, headset og ReSound.

New York | Lincoln center



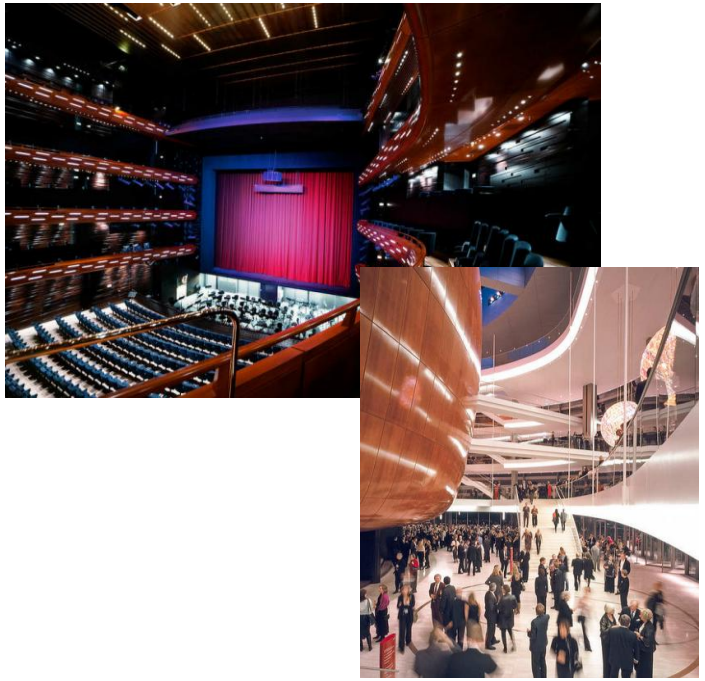




Tv Streamer+ med earbuds og
ReSound

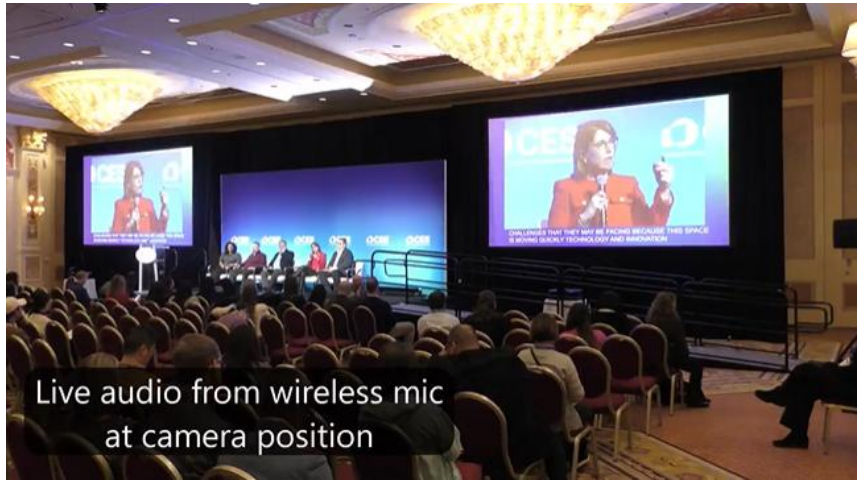
Test i stor skala

København | Operaen



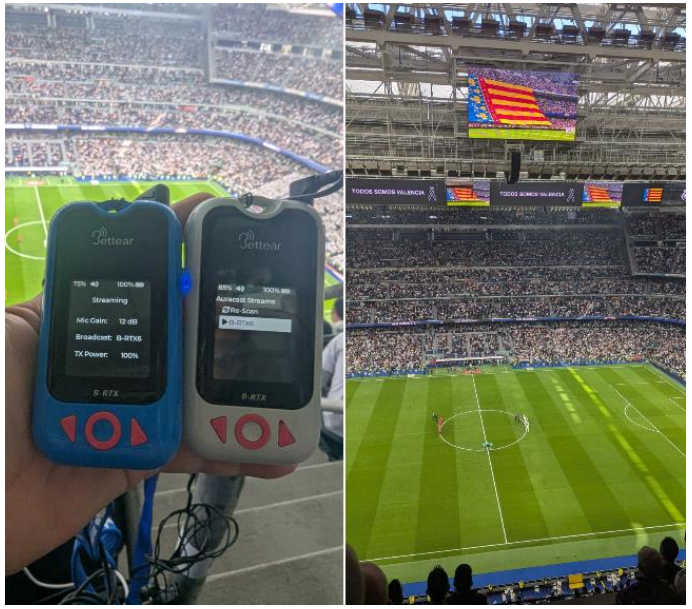
Streaming i 4 spor for syns- og hørehæmmede.

Las Vegas | CES 2025



Auracast hjælper med bedre taleforståelse

Madrid | Santiago Bernabéu stadium



Bettear streamer anvendt på fodboldstadium

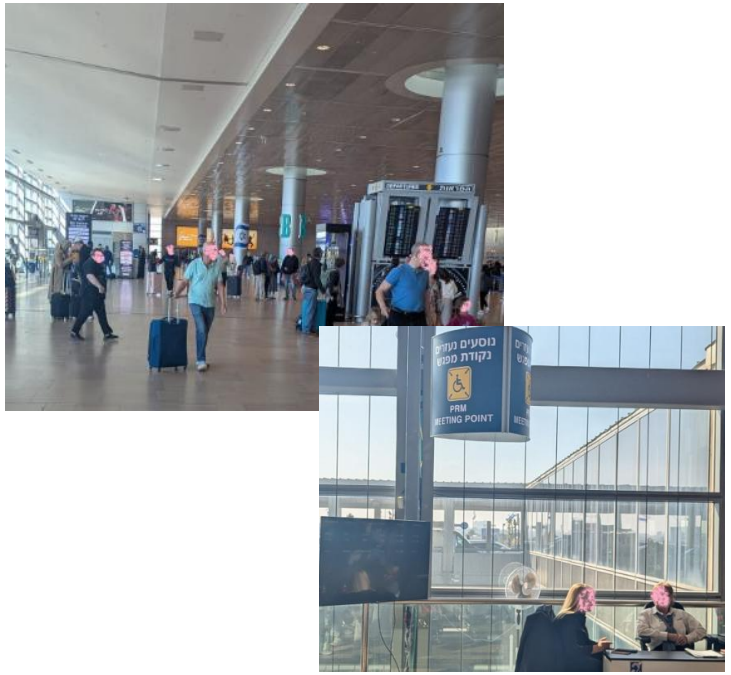
Trials in larger venues

In-flight | Delta airlines



Forbedret lydkvalitet via TV streamer+ på fly.

Tel Aviv | Ben Gurion Airport



Auracast streamer informationer direkte til høreapparater

Chicago | Kirke



Direkte streaming til høreapparater i kirke

Eksempel 1: Sydney operahus

Udfordringen: Installér det første permanente Auracast systems verdens mest kendte operahus.

Økosystem partnere: GN, Samsung, Google, Sydney operahus and Ampetronic.

Løsningen: Tværfagligt samarbejde og verificere god dækning samt indsigt i hvordan systemet virker i forhold til teleslyngen.

Den digitale fordel

Teleslyngen leverer kun mono hvorimod Auracast er stereo med bedre lydkvalitet.

Brugernes feedback

Let at installere. Simpelt at tilpasse til lejligheden. Stabil forbindelse med overraskende god lydkvalitet.







Eksempel 2: Kongelige opera

Udfordringen: En moderne streaming løsning for lyd til både syns- og hørehæmmede.

Økosystem partnere: GN, Dansk blindesamfund, Kongelige teater og Ampetronic.

Løsningen: Streaming af 4 parallelle spor med stereo, synstolkning og oplæsning af tekst.

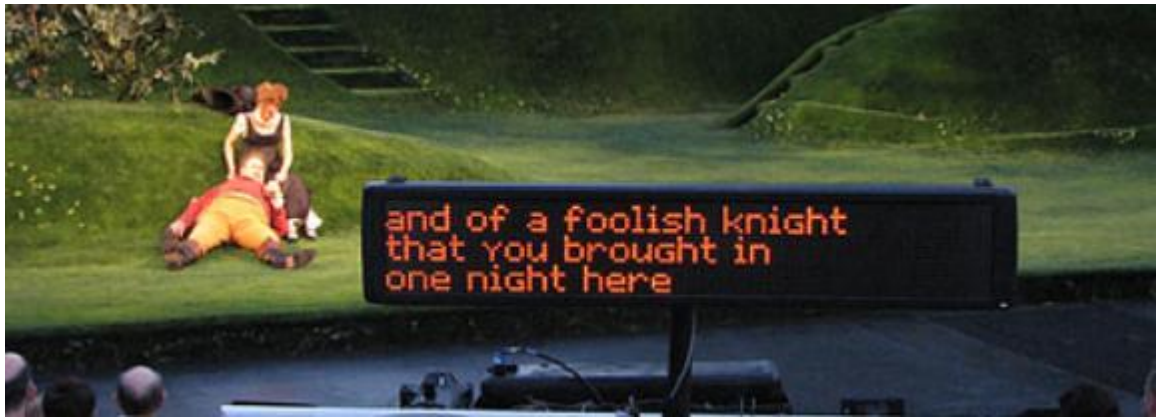
Den digitale fordel

Teleslyngen kan kun tilbyde en kanal. Auracast derimod kan levere mange kanaler, stereo og bedre lyd.

Brugernes feedback

Lyden er mere nærværende og med en bedre rummelig opløsning. Mixer man direkte og streamet lyd får man den optimale oplevelse.





Eksempel 3: Udendørs teater

Udfordringen: En moderne streaming løsning for lyd til både syns- og hørehæmmede. Udendørs

Økosystem partnere: GN, Dansk blindesamfund, Kongelige teater og Ampetronic.

Løsningen: Streaming af 4 parallelle spor med stereo, synstolkning og oplæsning af tekst.

Den digitale fordel

Teleslyngen kan kun bruges i begrænset område. Auracast derimod bredes ud til hele publikum

Brugernes feedback

Lyden er mere nærværende og med en bedre rummelig opløsning. Mixer man direkte og streamet lyd får man den optimale oplevelse.





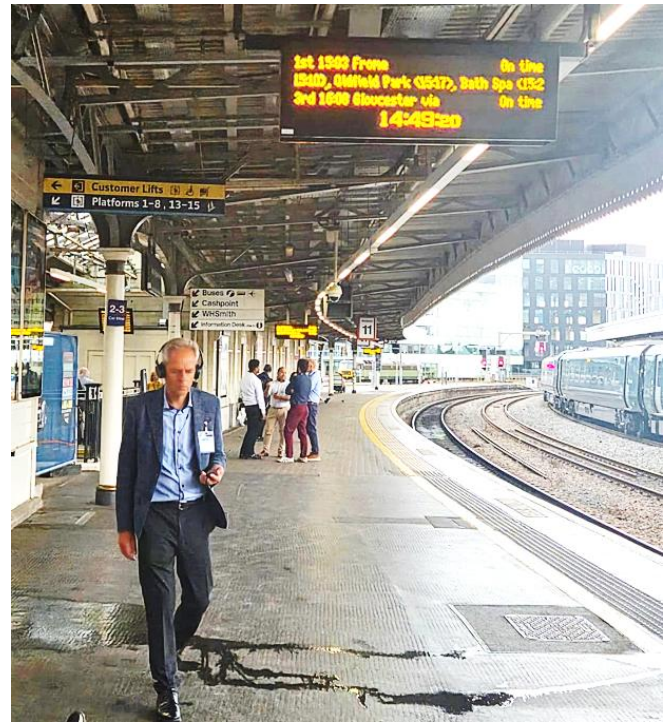
Eksempel 4: Bristol togstation

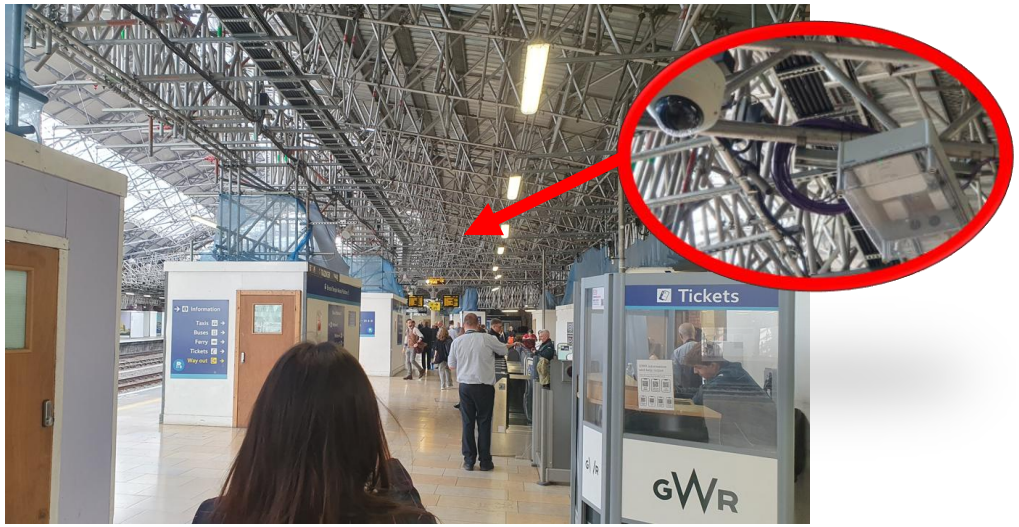
Tværfagligt erfaringsmøde:

Brugere, fabrikanter, operatører, myndigheder.









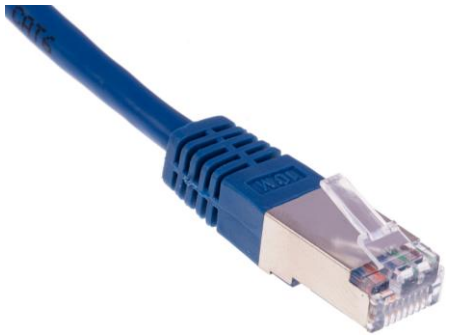


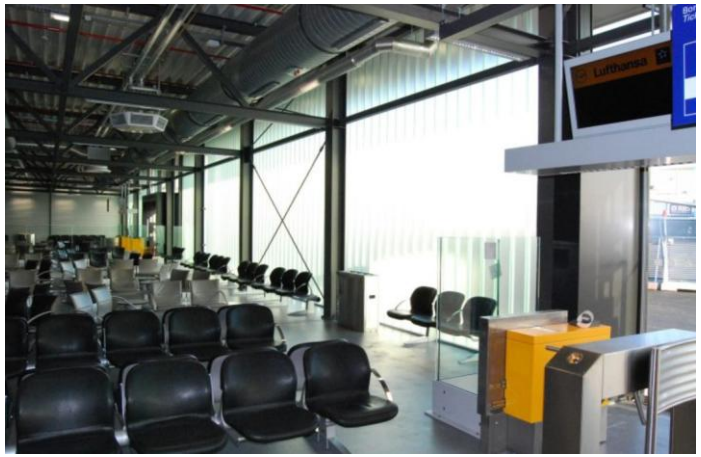
Eksempel 5: Frankfurt lufthavn

Første installation i Europa:

Fokus på at sænke stress og give god taleforståelse.









Installationer eller planer i DK

Liste opdateret september 2025

- Moesgaard museum (Tourguide som ekstra funktionalitet)
- Thisted kirke/sognegård
- Ny Stigsborg skole
- VIA Universitet (med fokuseret læring)
- Århus Universitet (med fokuseret læring)
- Ålborg Universitets Hospital Auditorium (med fokuseret læring)
- Ålborg Universitet (med fokuseret læring)
- Odder Rådhus – Byrådssalen
- Der leveres til ca 20 kirker
- Biograf – Hadsten Bio
- Egebjerg skole
- Odense Teater
- Randers teater – alle 4 sale
- Udlejning af streamning lyd og teleslynge (AV Center – Profox – Cipex)
- EUC NORD EVENT – Part of education program of AV technicians
- TEC på Frederiksberg – Part of education program for electricians

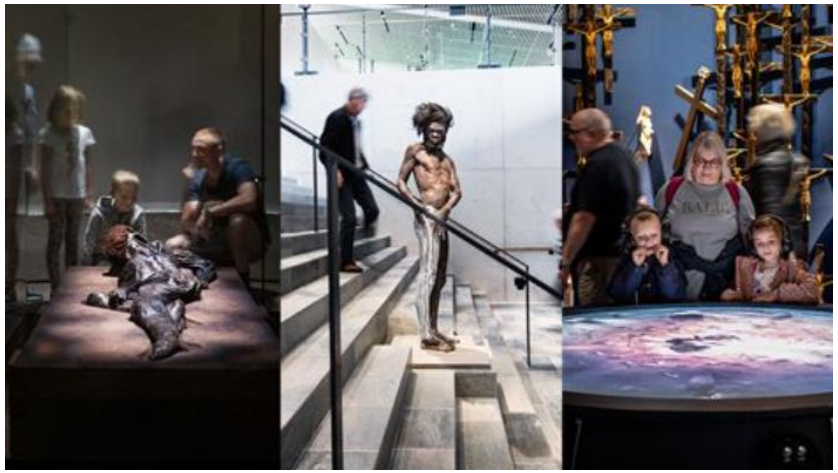
Nye projekter: Aarhus universitet, Moesgaard, Metro

Aarhus universitet: Auditorier med streaming til studerende.

Moesgaard museum: Udstilling samt guidet ture.

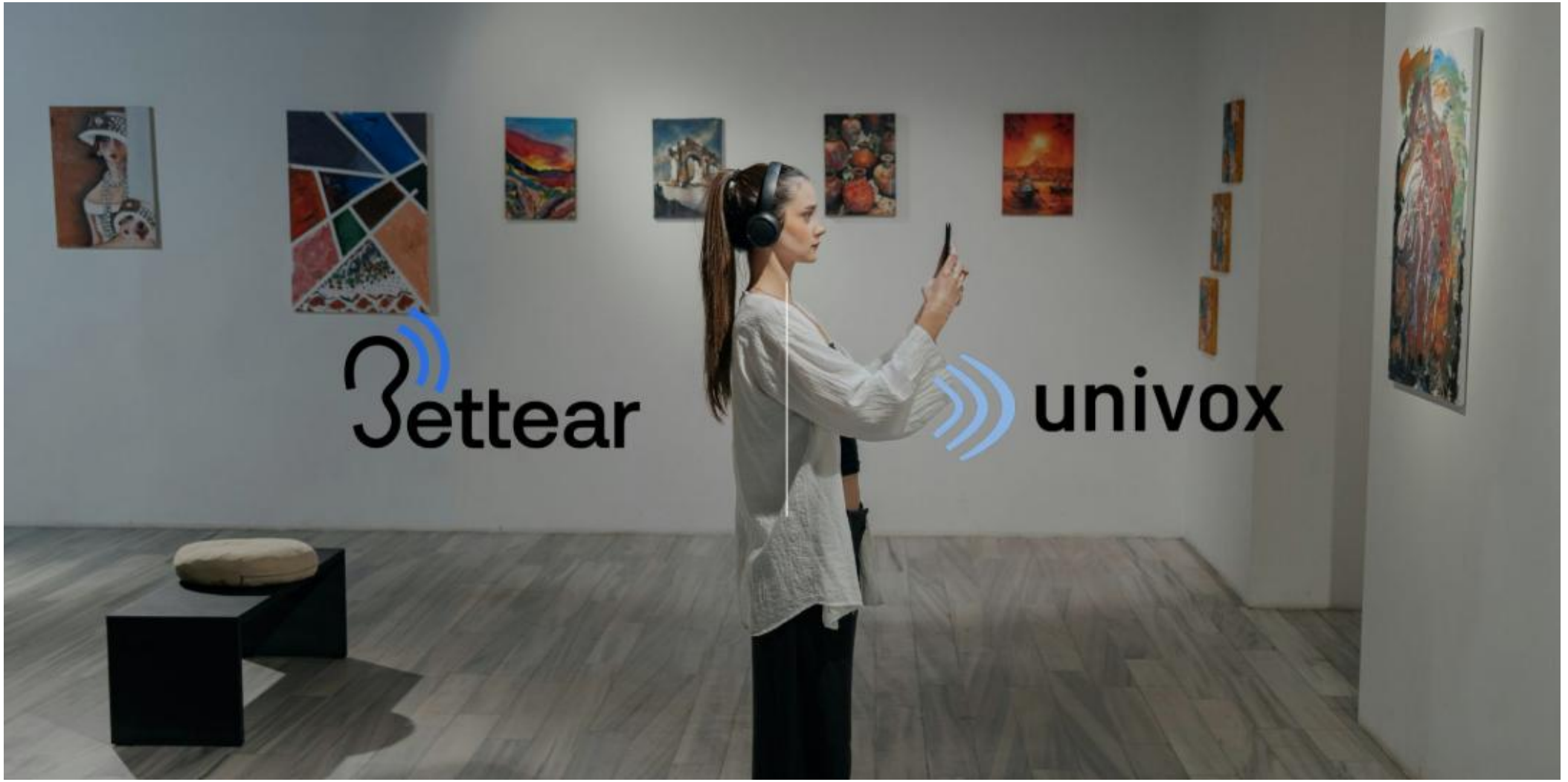
Metro i København: Kort og langsigtede installationer.







Nye samarbejdspartnere etableres



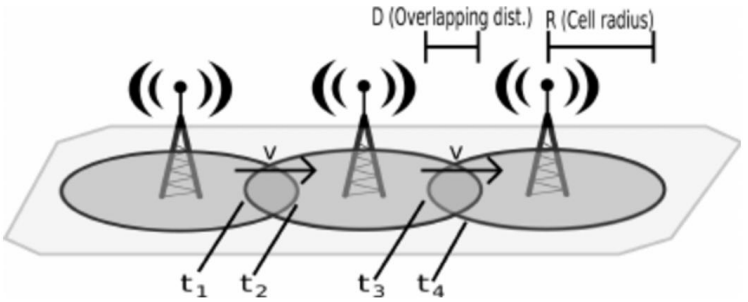
US Open ved billetlugen



Hvad bliver det næste for Auracast?

- Finpudsning af første udgave af standarden
- QR koder er nu vedtaget for Auracast

- Dækning over store områder: Automatisk omskiftning mellem Auracast sendere



Hvad bliver det næste for Auracast?

- Samtale mellem personer i mindre gruppe



- Personlig Auracast QR kode (Simple method to connect)








AURACAST™
A BLUETOOTH® TECHNOLOGY