

# America's Getting in the Hearing Loop

**Presenter: Stephen O. Frazier**

**Chair: Advisory Committee for Hearing Loss Awareness in New Mexico**

**Co-Chair: Committee for Communication Access in New Mexico**


**Hearing Loss Support Specialist**

**Director: Loop New Mexico**

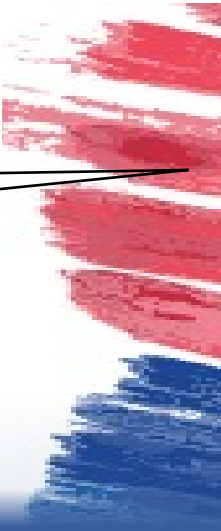
**Freelance Writer**



# GETTING YOU IN THE LOOP

- Some facts about hearing loss
  - What's an assistive listening system?
  - The story of electromagnetic induction
  - What's a hearing loop?
  - What's a telecoil?
  - Hearing loops are happening in America
  - Hearing loops abroad
- 

# About questions...



# Some facts about hearing loss

**There are 48 million in US with a measurable hearing loss**

**65% of people with hearing loss are under age 65.**

**20% of school age children have a hearing loss.**





# Some facts about hearing loss

<b>Cause of Hearing Loss</b>	<b>Percent Due to Cause</b>
At birth .....	4.4%
Ear Infection .....	12.2%
Ear Injury.....	4.9%
Loud brief noise.....	10.3%
Other Noise.....	23.4%
Getting Older.....	28.0%
Other.....	16.8%


*Source: Ntnl. Center for health statistics, data from the National Health Interview Survey Series 10, Number 188, Table 16, 1994.*

When you can't hear in a  
"place of assembly"  
what's the solution?

An assistive listening system (ALS)  
may resolve the problem



**The ADA defines an Assistive Listening System as “an amplification system utilizing transmitters, receivers, and coupling devices to bypass the acoustical space between a sound source and a listener by means of induction loop, radio frequency, infrared, or direct wired equipment.”**



# Types of large venue assistive listening systems



**RF - radio frequency aka FM**

**Requires borrowing a receiver and headset/neckloop**



**Infra Red - AKA IR uses light beams to transmit sound**

**Requires borrowing a receiver and headset/neckloop**



**AFILS - audio frequency induction loop system (hearing loop)**

**No receiver needed for users with telecoils**



**Wi-Fi - signal is transmitted using radio waves  
and digital signal processing (DSP)**

**No headset needed for users with a receiver or smart phone  
and app using Bluetooth® or a neckloop**

# Why is an ALS needed



**Sound level of speech**

**Speech to noise ratio**

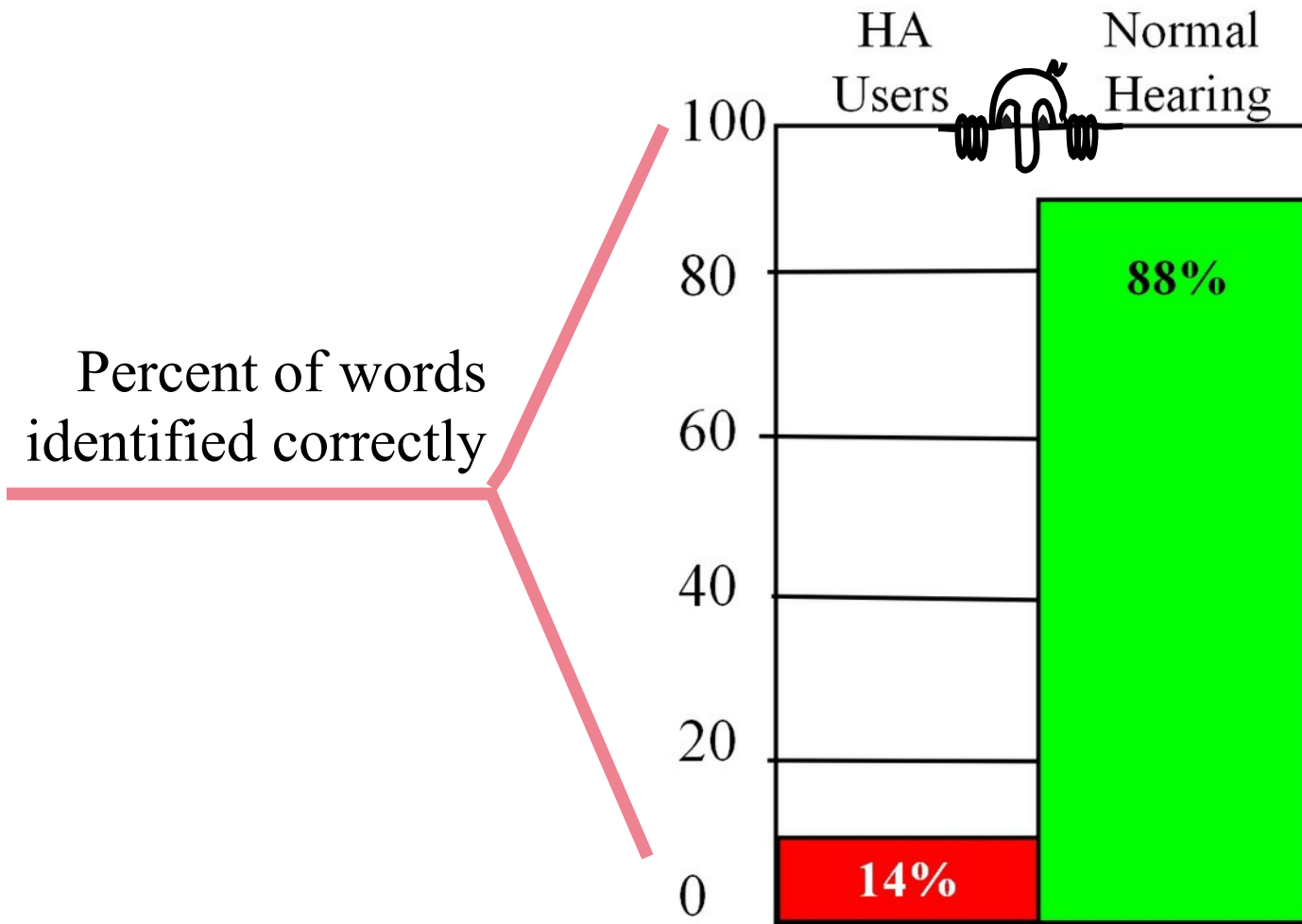
**Ambient noise**

**Reverberation**

**Unfriendly PA system**

**Covid 19 mask**

# Sound level of speech



Average scores for hearing aid users and normal hearing listeners under identical conditions

# Sound level of speech

**Normal speech is 60-65 decibels**

Most HA mics only effective 6 to 8 feet out

**Distance decreases sound level**

Sound pressure level decreases 6 dB every time distance is doubled.

**High pitch sounds have less strength**

Consonant sounds needed to understand speech are high pitched



# Speech to Noise Ratio

**Normal hearing 10 dB difference OK**

Speech 70 dB - noise 60 dB (Window AC)

70 dB perceived as twice as loud as 60 dB

**Some HOH 20 TO 25 dB needed**

70 dB - noise 45-50 dB (3 ft. From running refrigerator)





# Issue of Ambient Noise

**Ambient Noise** (also known as background noise) can be caused by variety of sources such as others coughing or talking, papers rustling, footsteps, children fussing...

These sounds "cover" the voice of the speaker.

People talking

Fussy child

coughing

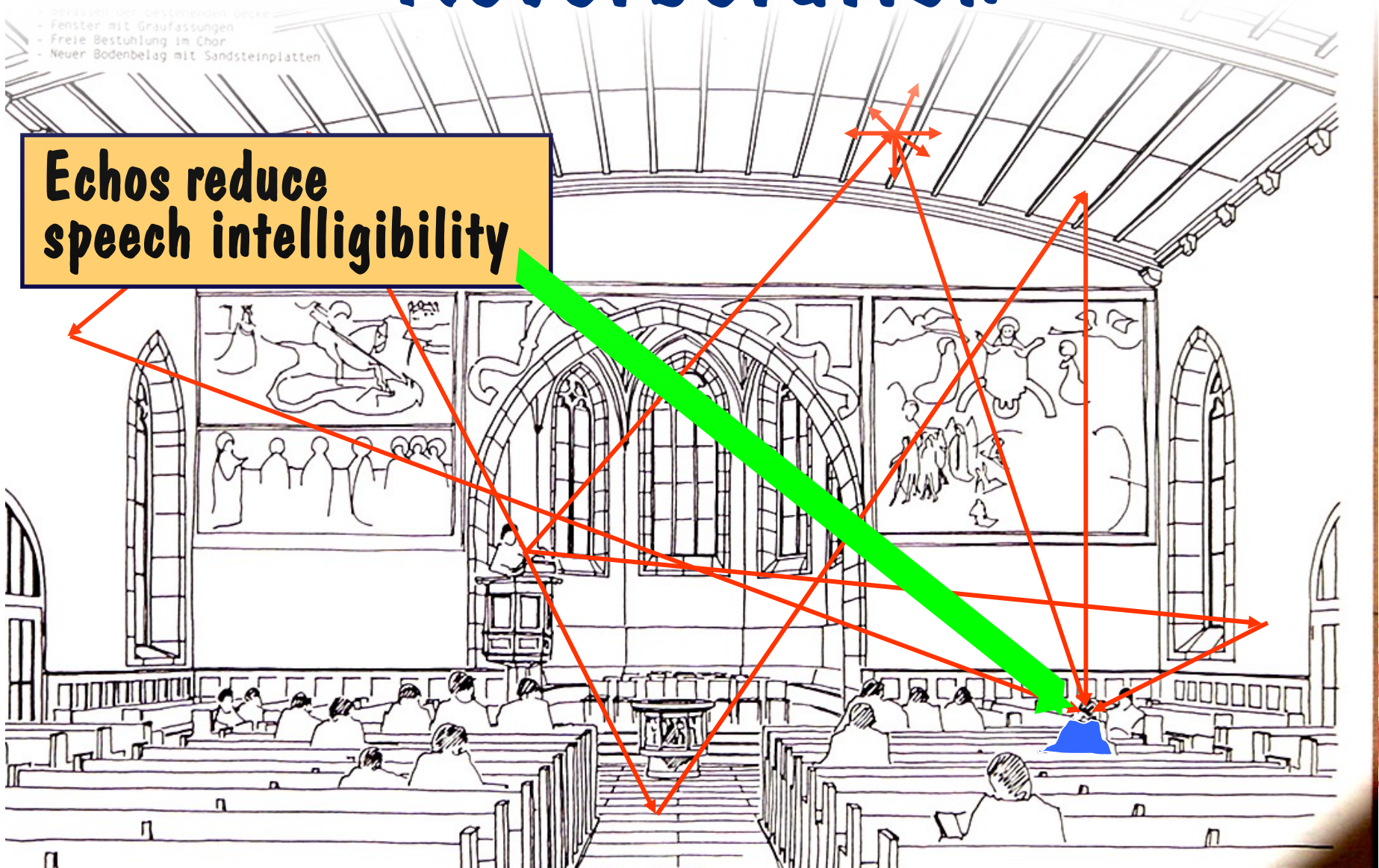
People talking

Hum from ventilation system running.

# Reverberation

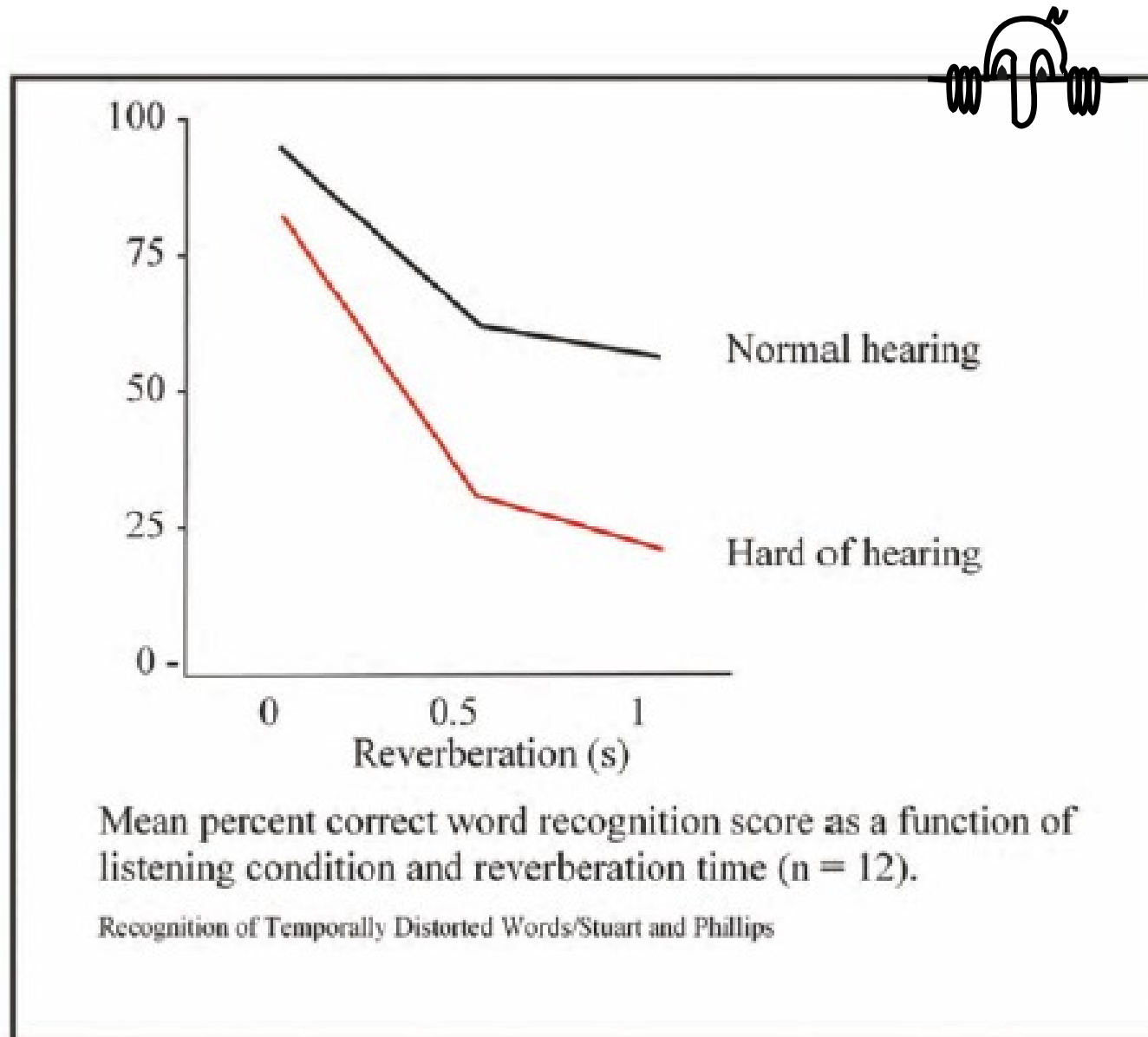
- Ursachen der bestehenden Leckage
- Fenster mit Graufassungen
- Freie Bestuhlung im Chor
- Neuer Bodenbelag mit Sandsteinplatten

**Echos reduce  
speech intelligibility**



**Unaided or hearing aid assisted sound in such settings is problematic.**

# Reverberation

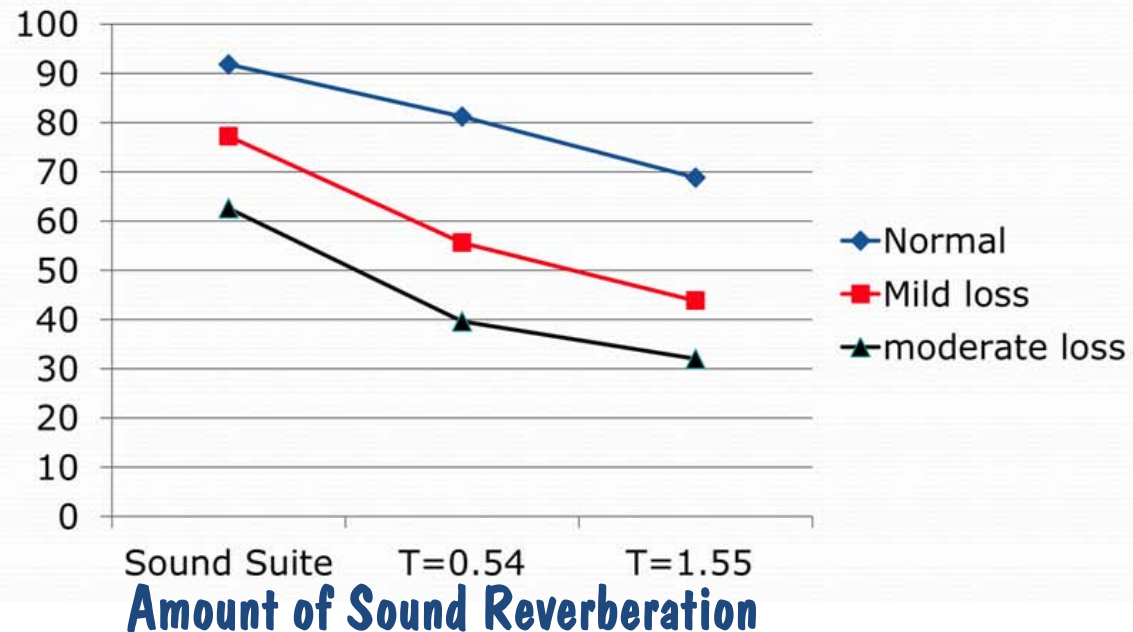


# Reverberation plus ambient sound

Speech recognition by degree of loss with reverberation plus background noise  
(+10dB SNR)

(R. Harris & D. Swenson 1990)

Percentage of words  
understood



Source: R Harris & D. Swenson 1990



# Unfriendly PA system

Too much bass

Too little treble

[www.sofnabq.com](http://www.sofnabq.com)

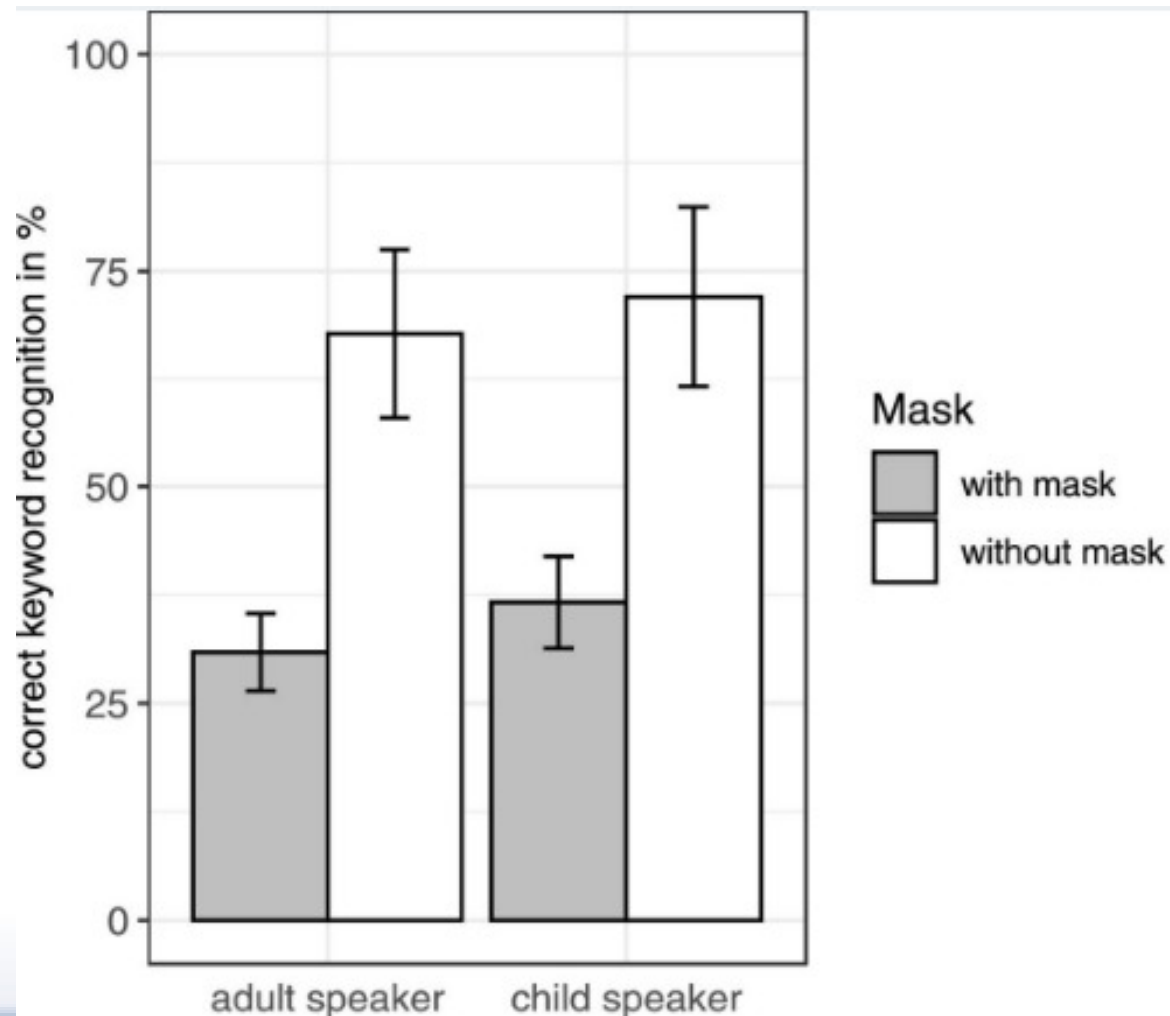
*"Louder Isn't Necessarily Better"*  
*Sound and Communications*



# Face Masks

## Reduce sound level by up to 10 dB

10 dB perceived by human ear is half as loud



# Why a hearing loop?

**Serves 1 or 100**

**Discrete**

**Simple touch of a button**

**No borrowed equipment**

**No hygienic concerns**

**No last minute rush**

**No dead batteries**

**Survey - 3 times more likely to be used**



“Loops and telecoils are old technology...”

Well, so what?



The wrist watch



Electric cars



The Telephone





# The beginning

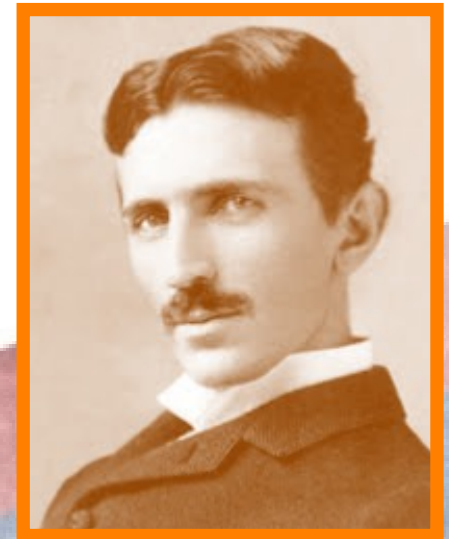


1831 British scientist  
Michael Faraday discovers  
electromagnetic induction that,  
as time passed, came to be  
used in electrical components  
such as transformers, generators, electric  
motors and...induction (hearing) loops.

# The beginning

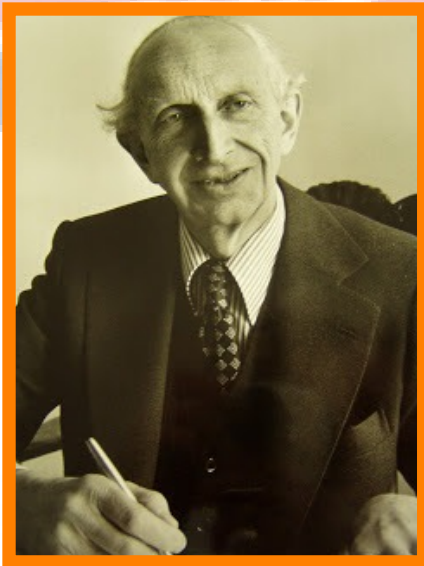


1885 - Italian Galileo Ferraris invents the first electromagnetic induction motor and



then Serbian American Nikola Tesla re-invents it in 1888. Old technology that's still in use.

# The beginning



1937 - The electromagnetic induction loop system was invented by Russian born British telephone and sound engineer

Joseph Poliakov, the founder of Multitone Electric Company in Great Britain.

# The beginning

The first wearable hearing aid that worked with a hearing loop was worn in a chest pocket.



It was made by the  
Multitone Electric Co.  
in England in 1938.



# Not surprisingly, telecoils and hearing loops are a primary assistive listening technology in the UK.

**“Over the last 30 years induction loops/hearing loops have become the default assistive listening solution in Europe, Scandinavia and Australasia, and are now becoming increasingly prevalent in America.”**

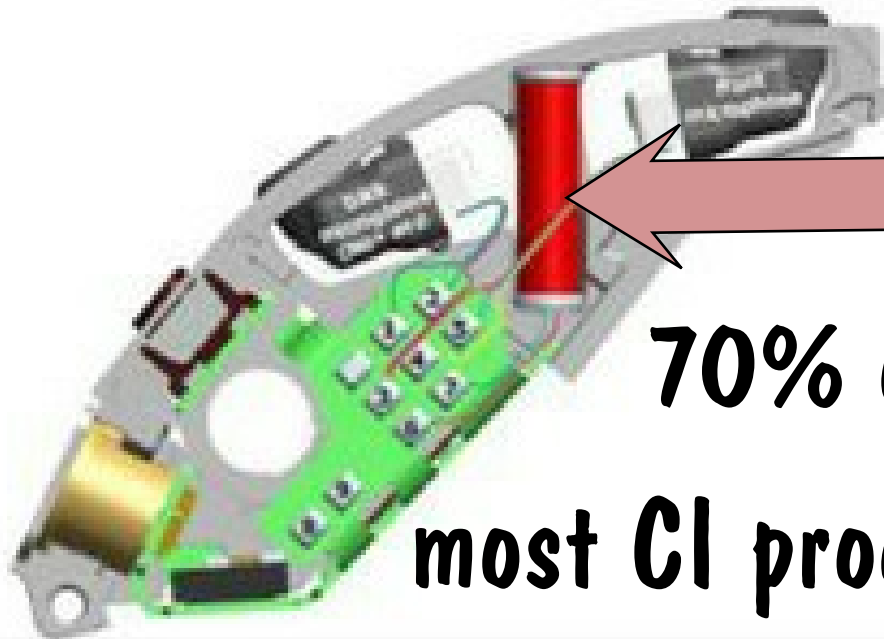
**Ampetronic**

# What's a Telecoil?



**Telecoils are tiny copper receivers for sound transmitted as an electromagnetic signal.**

# Telecoils in the UK



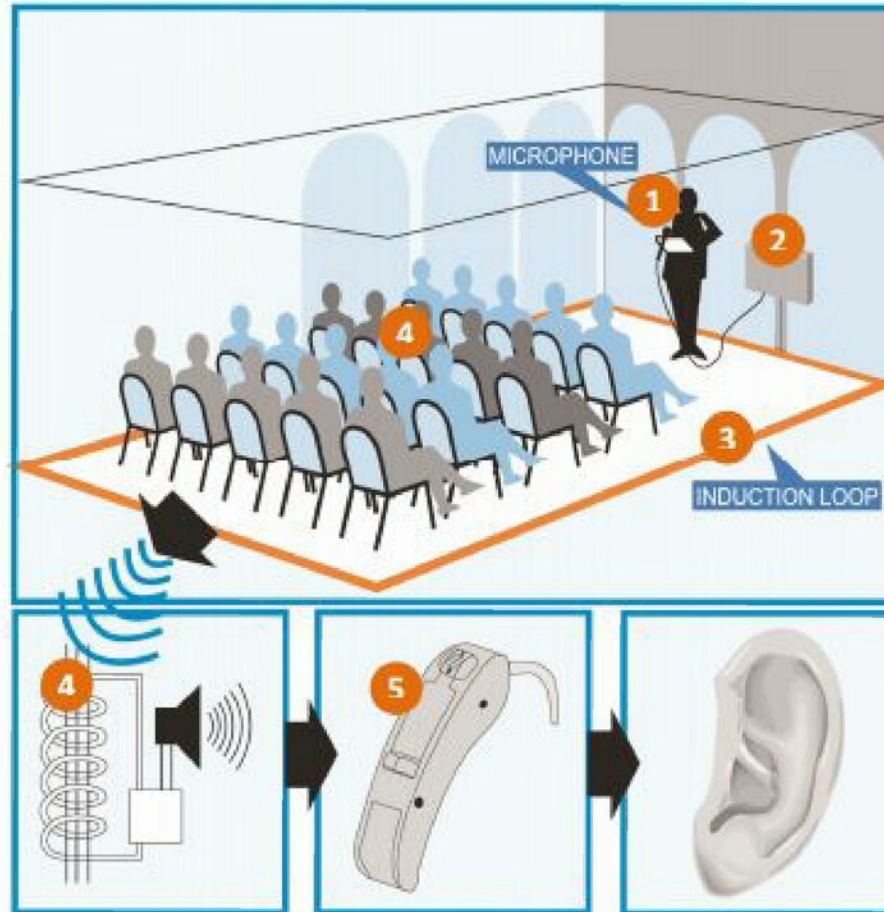
T-coil

70% of all HA models

most CI processors

95% of HAs in England

# What's a Hearing Loop?



**Perimeter Loop**



# Why Not Bluetooth?

**Does not serve 1 or 100**

# Why Not FM or IR?

- **Must borrow a receiver and return it.**
- **May need to remove hearing aids to use earphones or ear buds.**
  - **Sound not customized to match audiogram pattern**

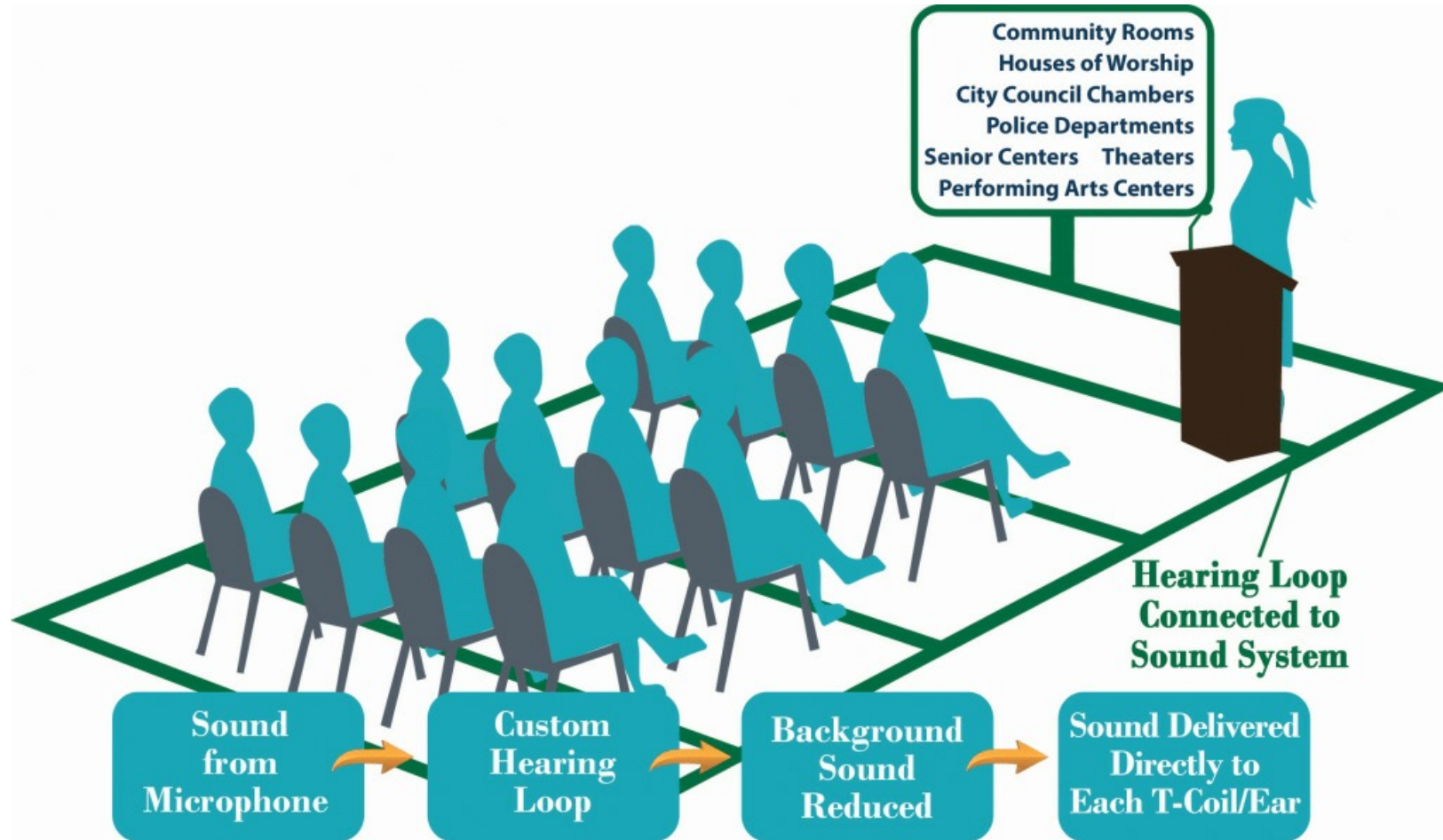
# Many types of loops

- ✓ Perimeter room loops
- ✓ Phased array loops
- ✓ Portable loops
- ✓ Neckloops
- ✓ More...

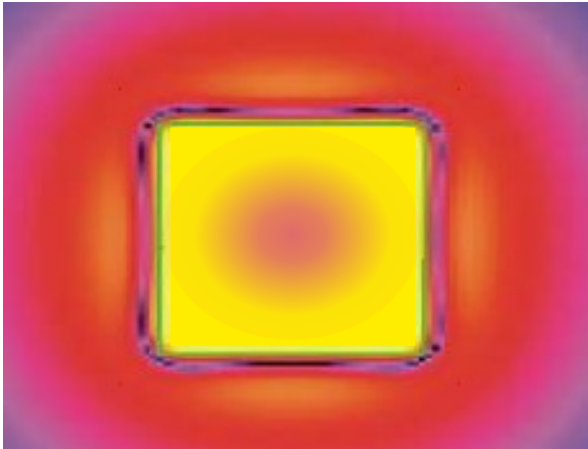


Let's look at some of them...

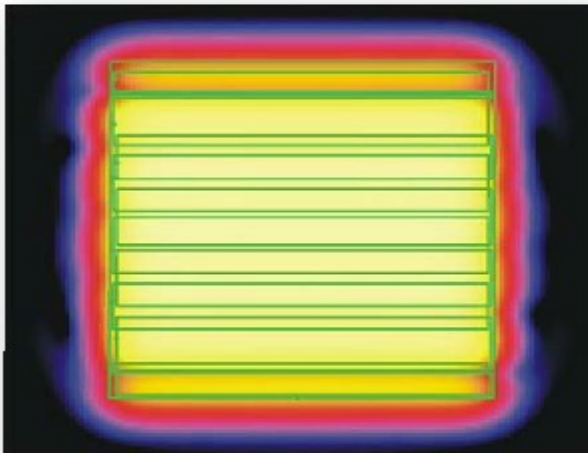
# The Phased Array Loop



# Benefits of a phased array



Perimeter loop has spillover and weak center.




Phased array contains signal and consistent strength.

**Both must meet IEC 60118-4 standard.**

# IEC 60118-4

## International Electrotechnical Commission

**This standard specifies requirements for the field strength of hearing loops for hearing aid purposes, which will give adequate signal-to-noise ratio without overloading the hearing aid. The standard also specifies the minimum frequency response requirements for acceptable intelligibility. Methods for measuring using a magnetic field strength meter are specified.**



# Trained Installers

**Questions to ask:**

**Where/how was installer trained?**

**What loop systems has he/she  
designed and installed?**

**Will installer provide Certificate of Conformity  
to IEC 60118-4?**

**See "Best practices" sheet at HLAA/GITHL**





# What else is a Hearing Loop?

## Counter Loop



# What else is a Hearing Loop?



**Portable Loop**



# What else is a Hearing Loop?



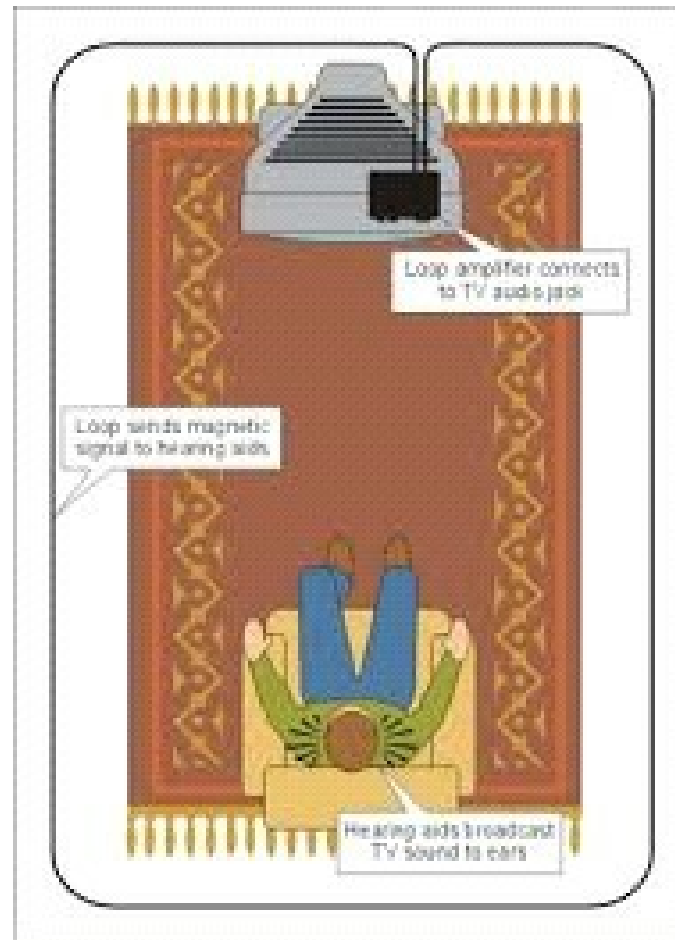
**Window Intercom with built in loop**

# What else is a Hearing Loop?



**Loop Mat**

# What else is a Hearing Loop?



## Home TV Loop

# What else is a Hearing Loop?



- Amplifier plugged into TV just like a room loop with a wire discreetly strung to TV viewing chair and hooked to loop pad that goes under the chair's cushion (can also be used under the mattress in a bed).

## Chair Loop

# What else is a Hearing Loop?



**Microphones**

**Looped card table**



# What else is a Hearing Loop?

## Looped clipboard

Think of it as a personal amplifier  
for use on the job...



# What else is a Hearing Loop?

## Looped cars

**Some people have actually had their car looped in order to hear conversations while traveling...**



**Tesla Model S**



# What else is a Hearing Loop?



Amplified with  
microphone



Unamplified

**Neck Loop**  
Think of it as a headset



# A few of the uses of the neckloop...

- ✓ Stereo and Surround Sound systems
- ✓ Computers or tablets
- ✓ Phones (Cell and home)
- ✓ MP3 Players
- ✓ On a TV equipped treadmill at the gym
- ✓ On your TV at home or while traveling



# Loops in America-the beginning




**Rocky Stone, retired CIA agent and founder of HLAA (then known as SHHH - Self Help for Hard of Hearing People) first introduced hearing loops to SHHH chapter leaders in the early 1980's.**

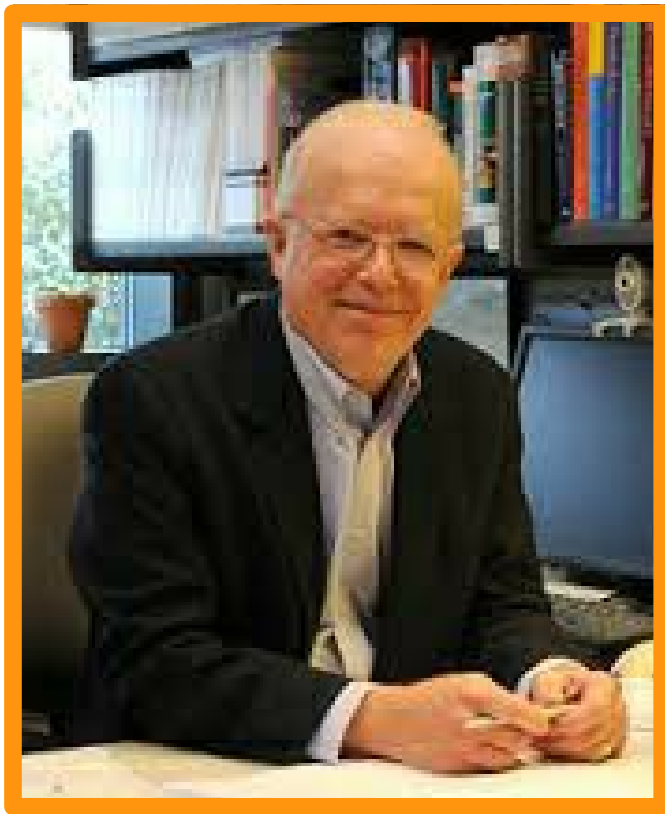
# The beginning

**The Albuquerque SHHH chapter acquired a loop in the early 1990's and used it for well over a decade, setting it up and taking it down each month.**

**Christ United Methodist Church, looped shortly thereafter, was the only other known loop in operation in Abq. for many years.**



# The beginning



## Prof. David G. Myers

Professor of Psychology at  
Hope College in Holland, Michigan.

Author of 17 books, including popular  
textbooks entitled *Psychology*, *Exploring  
Psychology*, *Social Psychology* and of books  
dealing with such issues as scientific  
psychology, Christian faith and hearing loss.

# Iona Abbey, Scotland

FACTS: SEPTEMBER 0945-1900  
OCTOBER-EASTER 0945-1700  
SUNDAYS 1230-1430 & 1600-1700  
At other times on Sundays  
entry is for services only.

The Dean and Chapter regret that occasionally  
the Cathedral or parts of it may be closed to visitors  
occasionally, without prior notice.

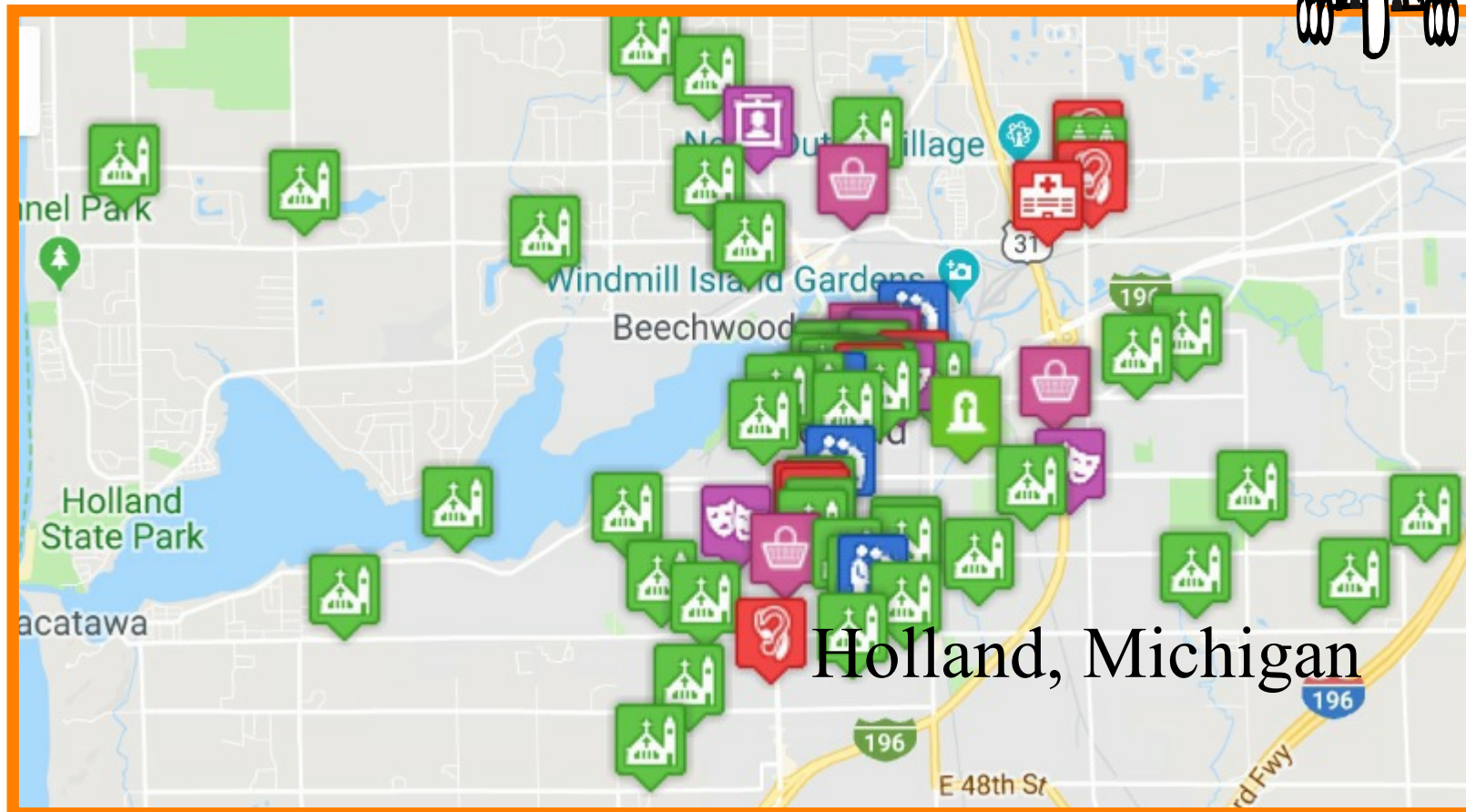
The Cathedral Welcome Centre  
(opposite main Cathedral entrance)  
For all information





# The looping of Michigan



Now Over 900

# Loops in America-the beginning

## Another Looping Pioneer

Dr. Bill Diles, Santa Rosa, CA bundles small home hearing loops with each pair of HAs sold. He has looped more than 3000 homes, dozens of churches, and 9 movie theaters.

In 2006 he presented at all day Loop NM loop/telecoil workshop for providers in the state at his own expense.

Was US distributor for Danish HA maker's Phonic Ear® Field Teleloop System



Receiving award for community service from the Academy of Doctors of Audiology

How you can help your patients and help yourself.....

The **INDUCTION LOOP**  
and the **TELECOIL**

Sponsored by

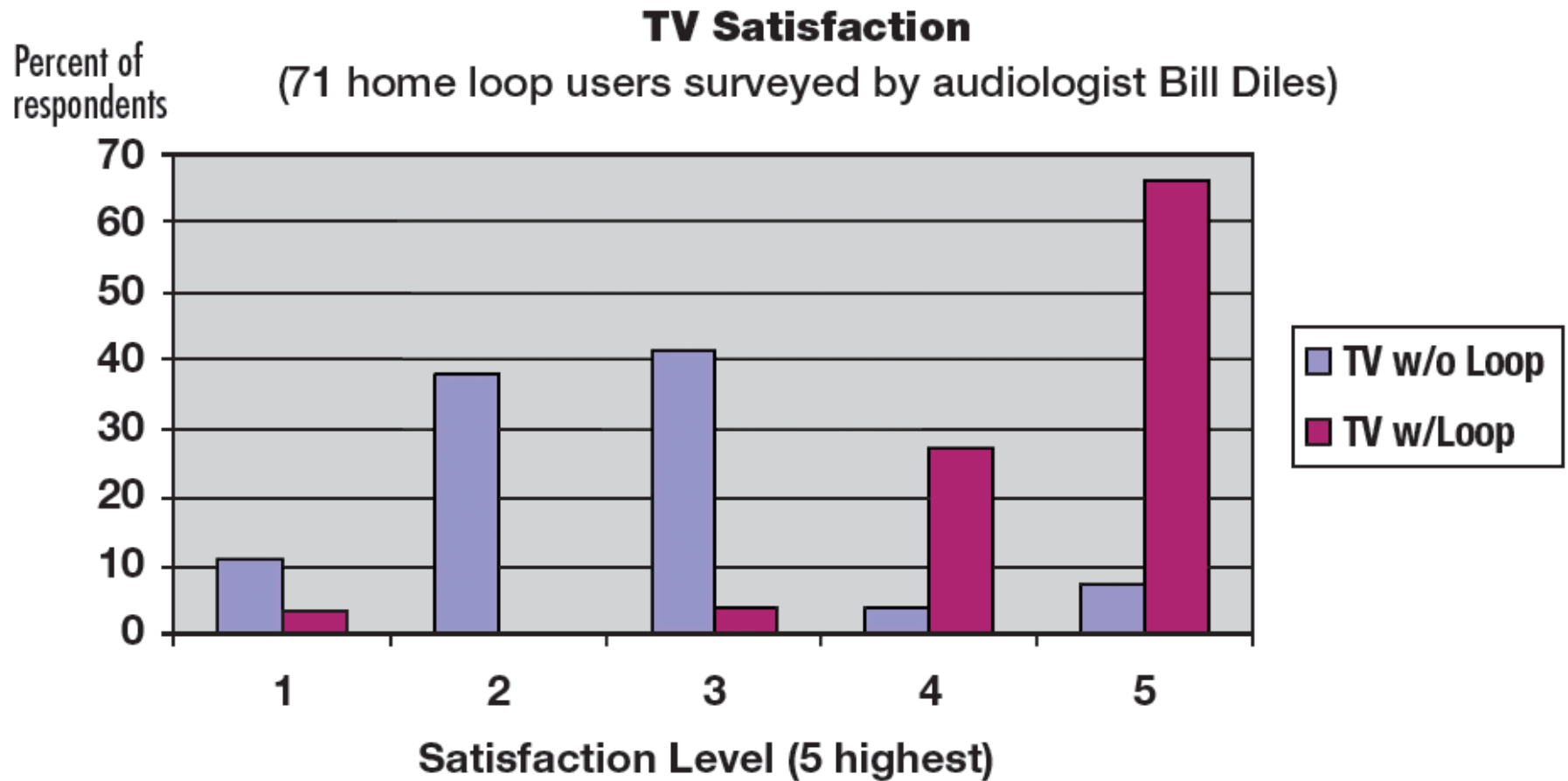


HEARING LOSS ASSOCIATION OF ALBUQUERQUE  
AND  
NEW MEXICO COMMISSION FOR DEAF AND  
HARD OF HEARING PERSONS





# Diles' 2008 Client Satisfaction Survey as reported in Hearing Journal.



# Loop New Mexico Formed

An initiative of Albuquerque SHHH



Created 2005 by Jim Ogle  
Los Alamos Engineer, HLAAbq member

# Let's Loop Tucson Formed



An initiative of the Adult Loss of Hearing Association that has, since then, become

# Let's Loop Arizona



# Loop Wisconsin Formed

In 2008 Audiologist Juliette Sterkens attends hearing loss expo and hears Dr. Myers tell about the looping of Western Michigan.



**2010 -**

**A watershed year for looping**

**The ADA**

**The Americans with Disabilities Act**

**GITHL**

**Get In the Hearing Loop**



# In 2010

## The ADA Revisions

- 👍 **Assistive Listening Systems Required**
- 👍 **Hearing Aid Compatible Required**  
(Defined as must work with telecoils)
- 👍 **Neckloops Required**
- 👍 **Adequate Signage**



# In 2010

## Get in the Hearing Loop

*Proud supporter of*

**Get in the  
Hearing Loop**

A Joint Project of the  
Hearing Loss Association  
of America and the  
American Academy  
of Audiology



# In 2011



**HLAA hosted 2nd International  
Looping Conference in Washington, DC**

# In 2011

Looping campaigns started up all  
over the U.S.....



# Today

**Over 3 dozen HLAA Chapter/State campaigns**

**Arizona**

**Michigan**

**Oregon**

**Delaware**

**New Mexico**

**Rhode Island**

**California**

**New Jersey**

**Washington**

**Colorado**

**New York**

**Wisconsin**

**Florida**

**North Carolina**

**Utah**

# Today

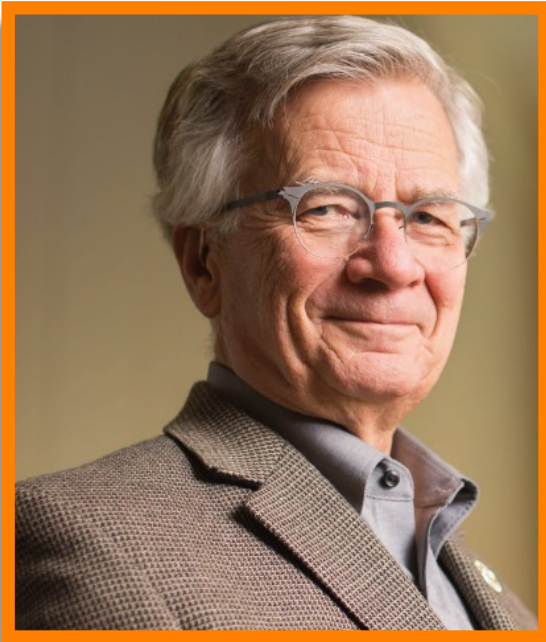
## Other Looping Campaigns





# Today

## Individual advocates



**Dr. Richard Meidinger**  
**Lawrence, KS**



**Prof. Carol Lomicky**  
**Kearney, NE**



# Hearing Care Providers




# State and city governments

**9 states mandate telecoil counseling  
plus efforts in CA, CO, IO, WI**

**NYC mandates loops in city buildings**

**Minnesota mandates loops in state buildings  
Maryland and Indiana pending**



# Where will you find loops?

## Places of worship

Room Loops and Neckloops



# Where will you find loops?

## Movie Theaters





# Where will you find loops?

## Performance Spaces



**Oshkosh Grand Opera House**



**Albuquerque Little Theater was the first of 6 local theaters to loop their auditorium**

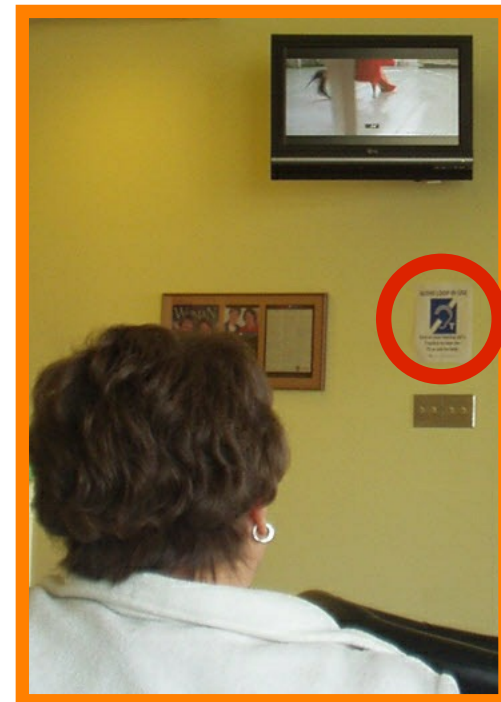


**Van Wezel  
Auditorium  
Sarasota**

**HLAA has compiled a list of over 300 performing arts venues known to have loops and many more feature neckloops.**

# Where will you find loops?

## Offices and waiting rooms





# Where will you find loops?

Banks and retail stores



# Where will you find loops?

A growing number of drug and grocery stores



Wegmans Food Markets has begun installing induction hearing loop stations at pharmacy counters and check out lanes in all 88 of their stores in the Northeast.

Each of the 101 Kinney Drug store locations have been equipped with a counter-top or point of service hearing loop and a specifically designed directional microphone that eliminates back ground noise.



# Where will you find loops?

## Transportation hubs



**Gerald Ford Airport**



**Union Station, Washington D.C.**



**Milwaukee Intermodal Station**



# Where will you find loops?

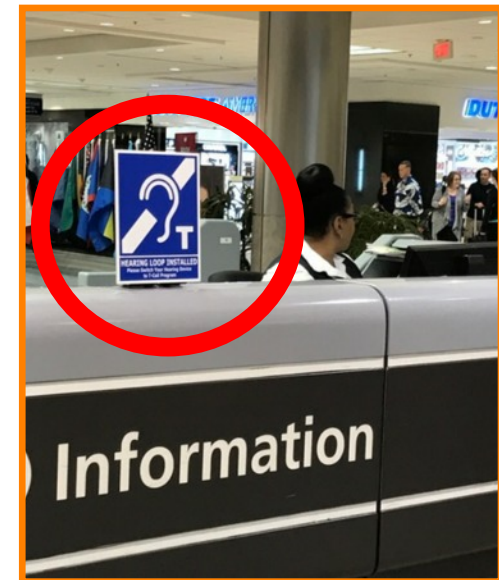
## Airports



A concourse at Gerald Ford airport, Grand Rapids, MI



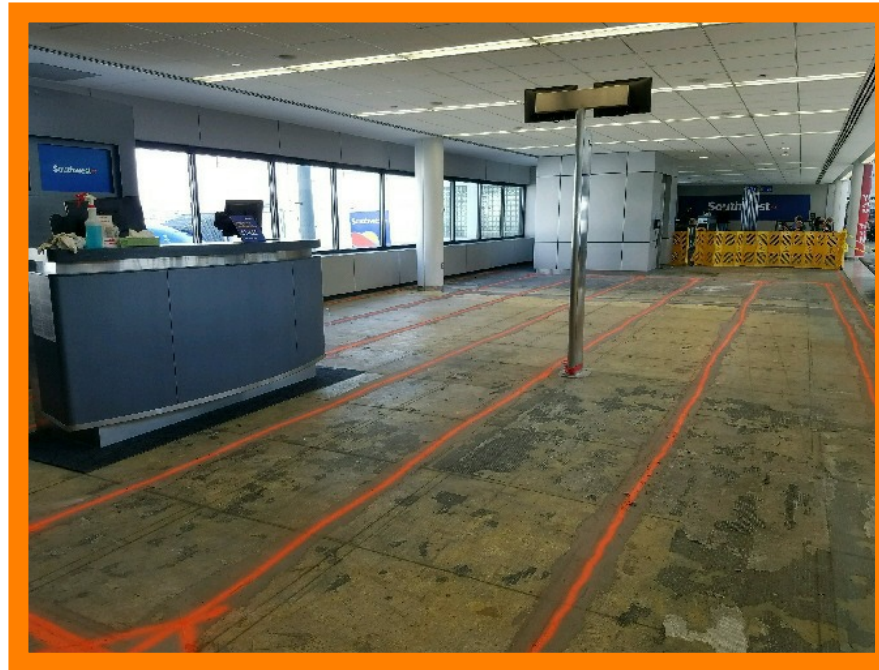
Delta Airlines gate at Detroit Metropolitan Wayne County



Information counter at Hartsfield-Jackson Atlanta

Where will you find loops?

# Airports



**This is a departure gate marked for the installation of a loop at the Rochester, NY airport.**

# Where will you find loops?

## Airports

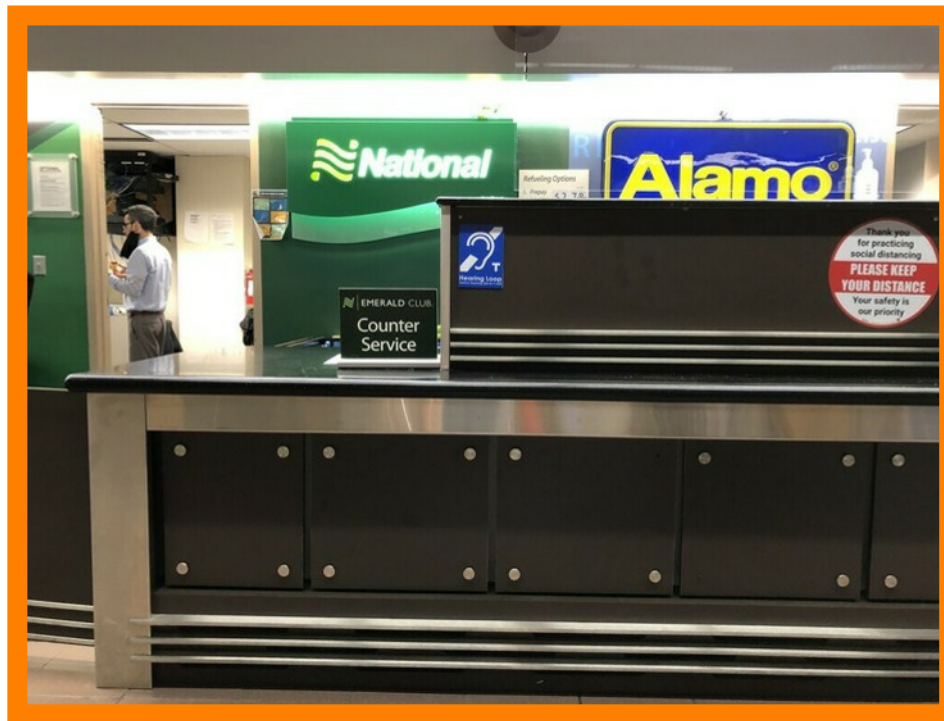


**This is a portable loop at a counter in the  
Seattle/Tacoma, WA airport.**



Where will you find loops?

# Airports



Here's a counter loop built into the car rental counter  
at the Eugene, OR airport.

# 20 US Airports

**Atlanta, GA .**

**Austin , TX**

**Charlotte, NC**

**Detroit, MI**

**Eugene, OR**

**Ft. Wayne, IN**

**Grand Rapids, MI**

**Kalamazoo/Battle Creek, MI**

**Los Angeles, CA ( LAX)**

**Memphis, TN**

**Minneapolis/St. Paul, MN**

**Muskegan, MI**

**New York City, NY (LaGuardia)**

**Oshkosh, WI**

**Phoenix, AZ**

**Rochester, NY**

**Sarasota/Bradenton, FL-**

**Seattle, WA**

**South Bend, IN**

**Syracuse, NY**



Where will you find loops?

# Neckloops and airplanes



Virgin Atlantic now offers their international travel passengers a choice of ear buds or a NECKLOOP.

# Neckloops and airplanes



**No need for bad sound from poor quality earbuds,  
your own neckloop will work on many airliners.**

# Where will you find loops?

## San Francisco BART



**#1 of 45 possible looped stations**

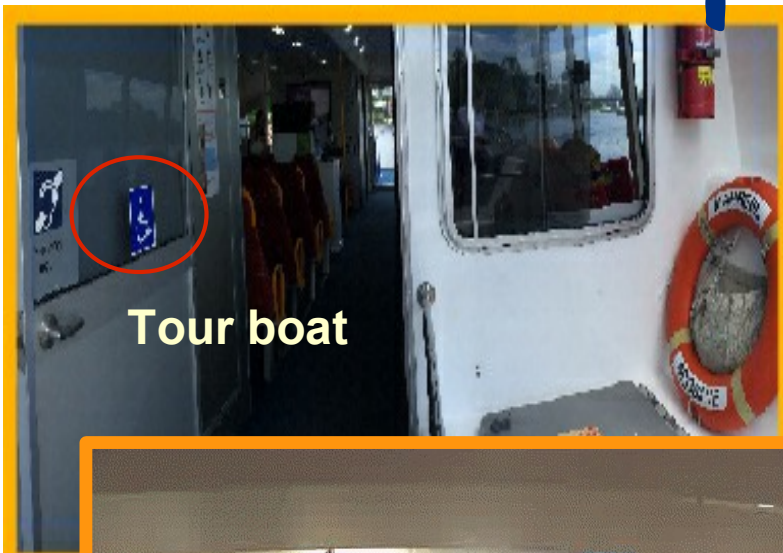


**1,081 new train cars,**



# Where will you find loops?

## Unexpected places



Tour boat



Disneyland



City council chamber



Bart station



# Where will you find loops?

## Unexpected places



**FIRST IN THE NATION**

**Breslin Center at Michigan State University**

# Where will you find loops?

Unexpected  
places



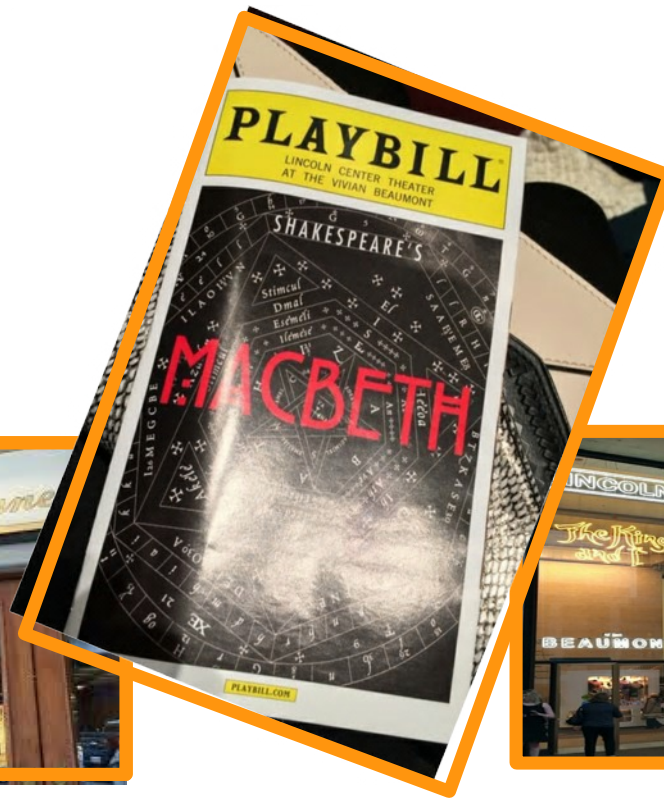


# New York City - In the loop



**All new/renovated city financed  
assembly areas to be looped.**

# Broadway Theaters



# New York City Taxi Cabs



**By law...all new NYC taxis must be hearing loop equipped like this "Taxi of Tomorrow".**



# Grand Central Station - NYC



**With help from the NYC Human Rights Commission loops have been installed at some ticket windows.**



# Lincoln Center for the Performing Arts



**Mitzi Newhouse and Vivian Beaumont Theaters**

**Geffen Hall (Avery Fischer hall) promises loops as part of current complete renovation.**

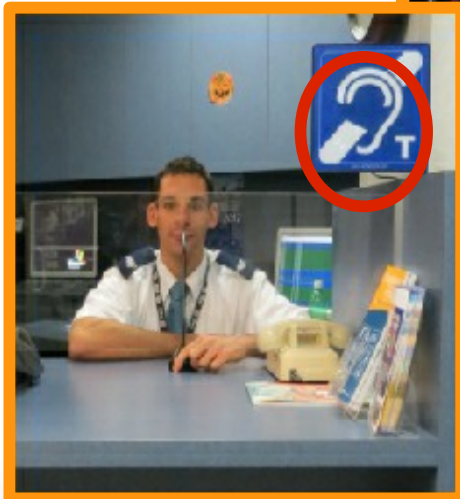
# Madison Square Garden



**Hearing loops are installed at the box office  
and guest services.**

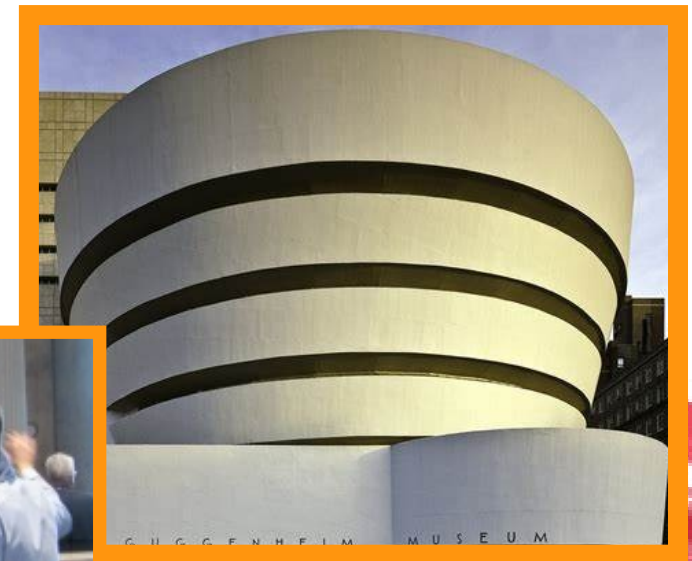
# Other New York City looped venues

**Penn Station  
information booth**



**Bronx Botanical  
Gardens**

**Metropolitan  
Museum**



**Guggenheim  
Museum**



# New York City subway



**Over 600 NYC subway fair/information booths looped,  
emergency help point on platform.**



# New York City MTA

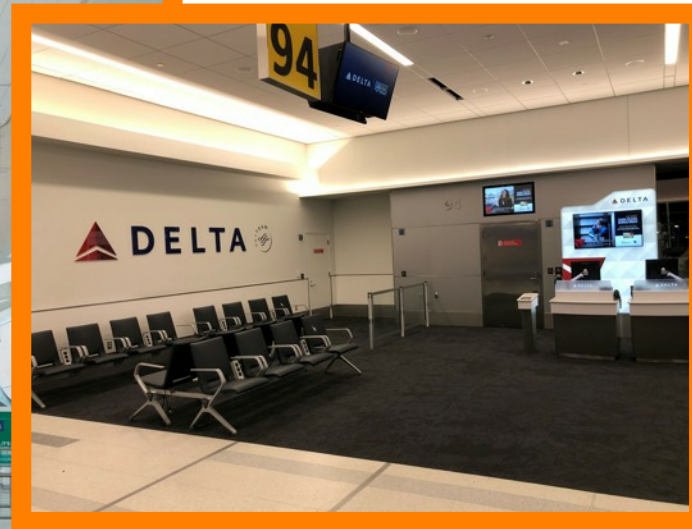
1000 looped  
subway cars



Testing on buses

# LaGuardia Airport New Delta Airlines Terminal

All gates looped





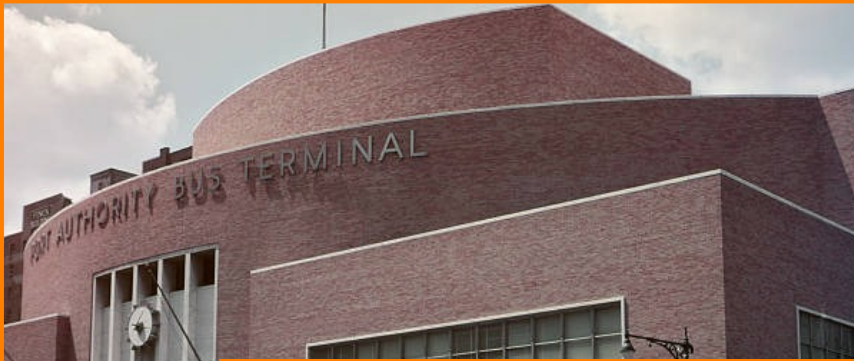


# NEW Accessibility Requirements

**All new or significantly renovated airport terminals must have hearing loops at departure gates and at information counters.**



# Information counters at all bus, train and ferry terminals



# Amtrak



**83 "trainsets" (500 cars) on order with  
option for 800 more cars - all with loops**



# More examples of hearing loops in transportation



**Seattle city bus terminal  
information counter.**

**Entire fleet of Indian Trails  
buses looped.**

# Loops abroad...

## Loop technology in England



Heathrow Express Sign:  
"For users of hearing  
aids, we've fitted our on  
board PA system with an  
induction loop."



Heathrow waiting area



Newcastle airport in England



# Loops abroad...

## Train travel in England



Looped waiting room in a London suburban station



Loop on train platform



Looped emergency help point in parking

# Loops abroad...

## Looped buses in England



London Metrolink buses  
with hearing loop and text  
to speech digital signage  
technology.

# Loops abroad...

## Looped taxicabs in England



Red Light Indicates  
Your Voice May Be  
Heard By The Driver



Hearing Loop  
Switch Hearing Aid To T-Position



# Loops abroad...

## The London Underground





Loops abroad...

## Westminster Abbey



*~The very first sentence in the program for the 50th anniversary celebration of Queen Elizabeth's coronation in 2003~*

*The whole of the church is served by a hearing loop. Users should turn their hearing aid to the setting marked "I."*

# Loops abroad...

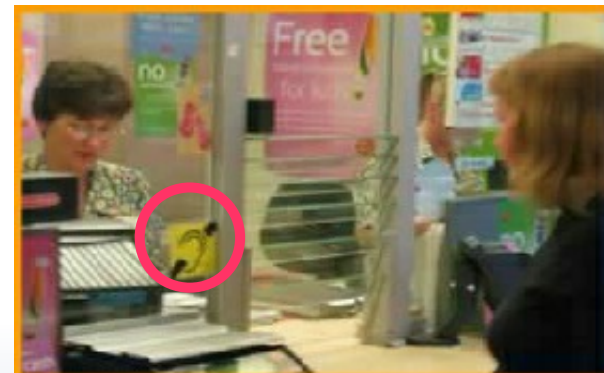
## Loop technology in England



Canterbury Cathedral



Bank teller

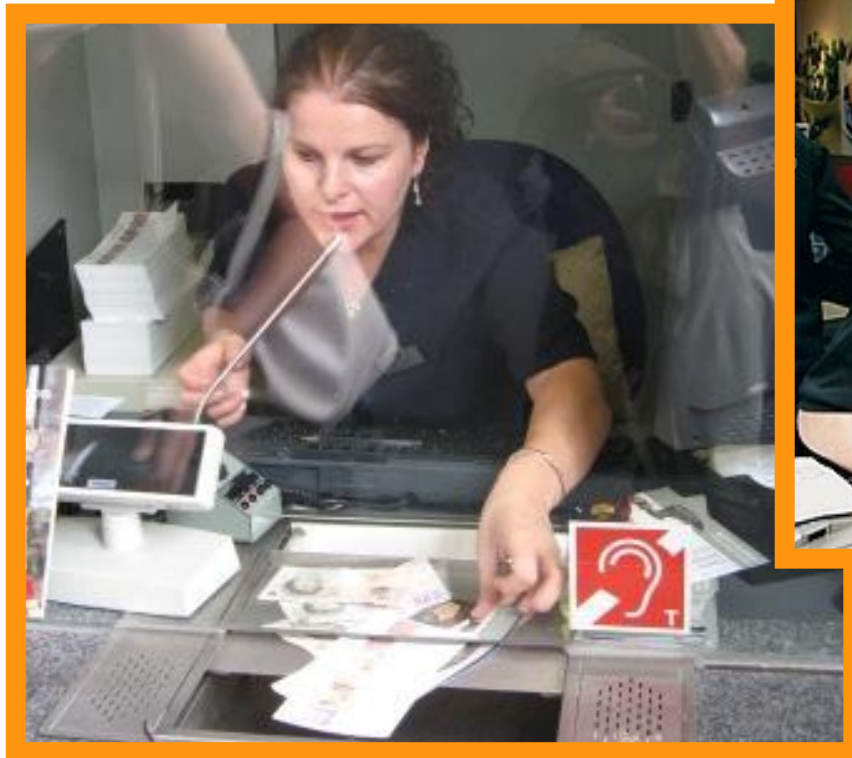


Ticket window



# Loops abroad...

## Loop technology in England



**Ticket window at the Tower of London**



**Hearing loop at Marks & Spencer - it reads,  
"To use the induction loop facility, switch  
your hearing aid to "T" and stand here."**

## Loops abroad...

# Unusual loop installations in the UK



**Iona Abbey, Scotland**



**The Lord Nelson**



# Loops abroad...

## Loop technology in France



The Louvre



Notre Dame



Les Eyzies

# Loops abroad...

## Loop technology in Germany and Austria



Der Kölner Dom, Cologne



The Danube boat tours



# Loops abroad... Foreign airports



Domodedovo airport, Moscow



Stockholm-Arlanda  
Airport



Suvarnabhumi Airport, Bangkok



Christchurch, New Zealand Airport



Dublin airport in Ireland

# Loops abroad... Foreign airports



Incheon Airport, Seoul, South Korea



# Loops abroad...

## Loop technology in Australia



All major airports feature hearing loop technology



Melbourne train platforms

Sydney commuter trains were recently looped.

## Loops abroad...

# Loop technology in Australia

### Sydney Opera House



### Sydney Observatory



## Loops abroad...

### Loop technology in Australia






**Bus stop totem with route schedule plus announcements via loudspeaker and hearing loop.**



## **Loops abroad...**

# **Loop technology in Australia**

### **A sampling of other installations**

-  **Australian Taxation Offices – various sites**
-  **Melbourne Cricket Ground (Melbourne)**
-  **Brisbane City Council Town Hall (Brisbane)**
-  **La Trobe University – Bendigo Campus, Victoria**
-  **Cochlear Global Headquarters (Sydney)**





**How can you find loops  
when you're traveling?**

**[www.time2loopamerica.com/loop-locator/](http://www.time2loopamerica.com/loop-locator/)**

**[www.aldlocator.com](http://www.aldlocator.com)**

**Europe:**

**[www.letshear.ihlma.org/](http://www.letshear.ihlma.org/)**

**GOOGLE ???**

# Where will you find INFORMATION AND ADVOCACY MATERIAL FOR LOOPS?

[www.hearingloss.org/programs-events/  
get-hearing-loop/](http://www.hearingloss.org/programs-events/get-hearing-loop/)



# MORE RESOURCES FOR INFORMATION

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

[www.sofnabq.com](http://www.sofnabq.com)

[www.loopnm.com](http://www.loopnm.com)

[www.ampetronic.com](http://www.ampetronic.com)

[www.contactainc.com](http://www.contactainc.com)



In case you thought I was never going to stop...

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**QUESTIONS?**







**Time's up... thanks for  
attending this presentation  
on hearing loops.**

**Unanswered Questions?**

**Send them to me at:**

**CCAnm@juno.com**

