ADA AUDIO
Conference
ADA National Network

ADA Audio Conference Series
August 26, 2014

This session is scheduled to begin at
2:00pm Eastern Time

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4

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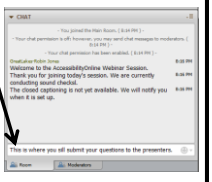

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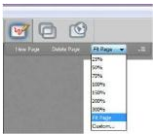
Customize Your View

- Resize the Whiteboard where the Presentation slides are shown to make it smaller or larger by choosing from the drop down menu located above and to the left of the whiteboard. The default is "fit page"



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Customize Your View *continued*

- Resize/Reposition the Chat, Participant and Audio & Video panels by "detaching" and using your mouse to reposition or "stretch/shrink". Each panel may be detached using the ☰ icon in the upper right corner of each panel.

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Technical Assistance

- If you experience any technical difficulties during today's session:
  1. **In webinar platform:** Send a private chat message to the host by double clicking "Great Lakes ADA" in the participant list. A tab titled "Great Lakes ADA" will appear in the chat panel. Type your comment in the text box and "enter" (Keyboard - F6, Arrow up or down to locate "Great Lakes ADA" and select to send a message); or
  2. **By Email** webinars@ada-audio.org ; or
  3. **Call** 877-232-1990 (V/TTY)

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Helping People with Hearing Loss Hear in Public Places Through the use of Hearing Loop Technology

ADA Webinar
August 26, 2014
Juliette Sterkens & Don Bataille

Presenter

Don Bataille, AIA CCS

HEARING LOOPS UNLIMITED
Enjoy the sounds of life.

Bachelor of Architecture - University of Kentucky
Past President - Hearing Loss Association of America, Rochester NY Chapter
Hearing Aid user since 1994 for sudden & progressive hearing loss
Promotes better workplace acoustics through his "Hear to Work" series of workshops at 2007, 2008, and 2009 HLAA National Conventions
Recipient Hearing Loss Association of America **Presidents Award**

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Presenter

Juliette Sterkens, AuD

Hearing Loss Association of America

Doctor of Audiology - Arizona School of Health Sciences
HLAA Hearing Loop Advocate
Recently retired from private practice in Oshkosh WI after 30+ years
Recipient of multiple professional awards for advocacy efforts on a state, national and international level
Fostered nearly 400 hearing loop installations in Wisconsin
Grew up with father who suffered significant HL while in military service

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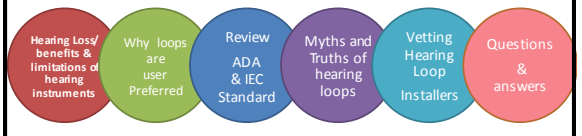
Topics Covered:



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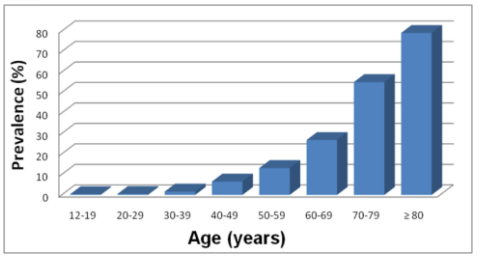
Prevalence of Hearing Loss in the United States, 2001-2008



Hearing loss defined as a better-ear PTA of 0.5-4kHz tones > 25 dB

Lin et al., Arch Int Med. 2011

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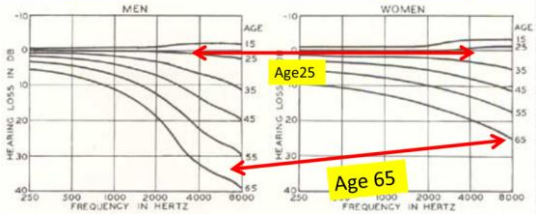
Hearing thresholds changes over time Males vs. Females

Men

Women



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What Hearing Loss might look like Visually

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The number of people with Hearing Loss is expected to increase

Changing US demographics - Baby Boomers

- Nearly 70 Million will turn 65 to 85 by 2030
- High incidence of Noise Induced Hearing Loss
- "Aging in Place" Movement

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Benefits of Hearing Instruments

Increase audibility of all sounds

(But hearing devices don't "know" which sounds are the most important for the user)

Improve hearing in quiet environments

(but less so for those with more severe hearing loss)

Improve communication in 1:1 situations and small groups

Improve quality of life

1999 Study by Nat'l Council on Aging: Untreated Hearing Loss Linked to Depression, Social Isolation in Seniors

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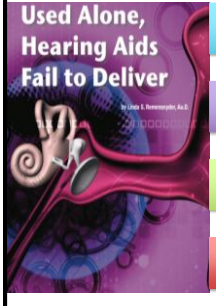
Limitations of Hearing Instruments



Hearing instruments do not work well in difficult listening environments

Individuals with hearing loss need +15-25 dB SNR

Hearing Instruments provide, roughly, +5 dB SNR

Hearing instrument in a classroom (demo)

(Demo courtesy Linda Thibodaux, PhD)

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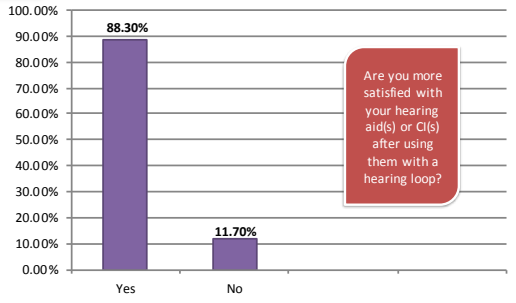
HLAA/AAA Surveys 556 HI and CI Users (2006)



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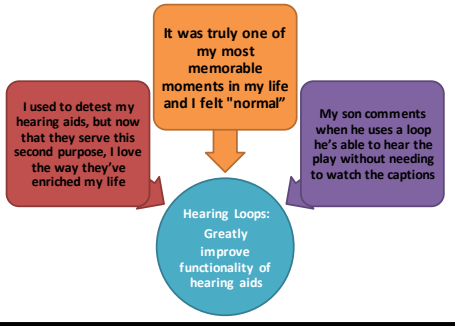
Hearing Instrument Users' Perspective on Loops



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Hearing Instrument Users' Perspective on Loops

Audiologists' Perspective on Loops


Are we missing an incredible opportunity to help our patients hear—and to grow our industry?

By Juliette Starkens, AuD

Hearing Loops reduce the barriers to access that many people with hearing loss experience on a daily basis.

It has been my experience that hearing loops offer patients significantly improved hearing & understanding.

This is good news for the hearing industry: the greater the functionality of and satisfaction with hearing instruments, the more likely people are to buy them.

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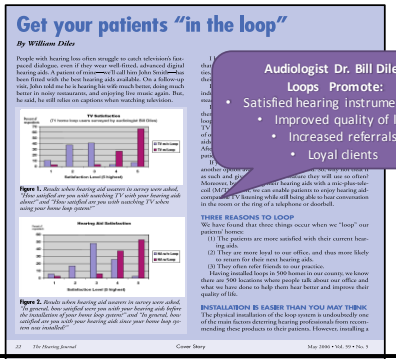
Audiologists' Perspective on Loops


Get your patients "in the loop"

By William Diles

Audiologist Dr. Bill Diles Loops Promote:

- Satisfied hearing instrument users
- Improved quality of life
- Increased referrals
- Loyal clients

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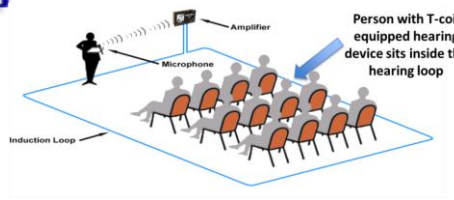
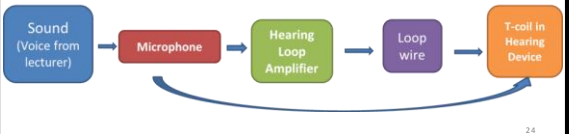
Hearing Loops Improve SNR Wirelessly





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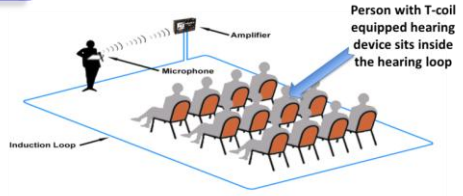
Hearing Loops Improve SNR Wirelessly



Sound (Voice from lecturer) → Microphone → Signal to Noise improvement **of 10-25 dB** → T-coil in Hearing Device

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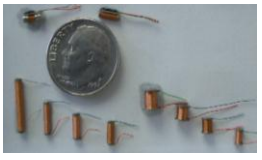
All that is needed to hear in a Loop: Hearing device w/ a telecoil



- Estimated at 40% of all instruments on market & on the increase
- Newer devices (within last 4 yrs.) >60%
- 100% of Cochlear Implants
- Some MFRs offer telecoils in streamers or remote controls

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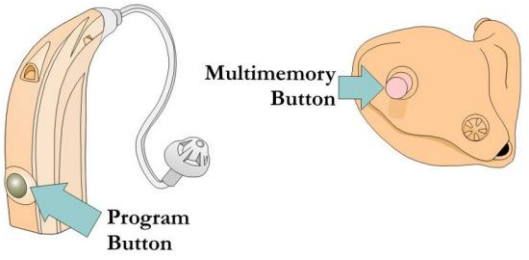
How do you now if a hearing aid is equipped with a telecoil?



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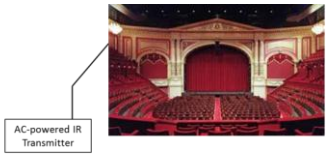
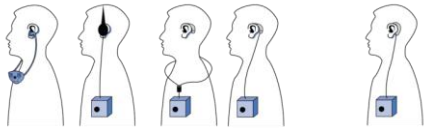
Compare Loop to FM or Infrared



AC-powered IR Transmitter



Receivers must *always* be used

1. Acoustic Coupling 2. Inductive Coupling 3. DAI

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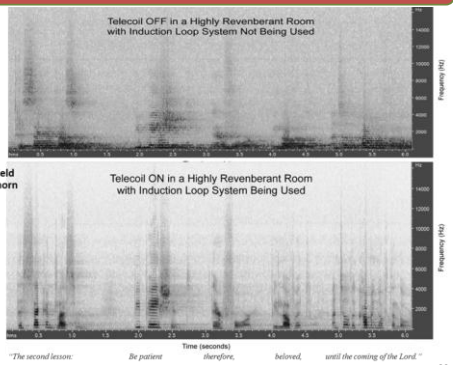
Sound recordings & Spectrograms (Out vs. In Loop)



Recording: LeRoy Maxfield
Montage: Richard Einhorn
Images courtesy:
Sam Atcherson, PhD

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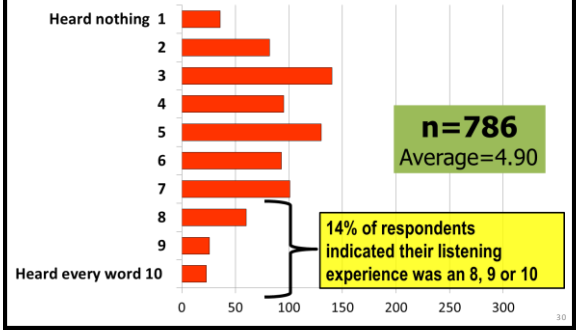
On a scale from 1 to 10 rate your ability to hear in the venue using your hearing devices only (no telecoil)?

1 = "I heard nothing" 10 = "I heard every word"



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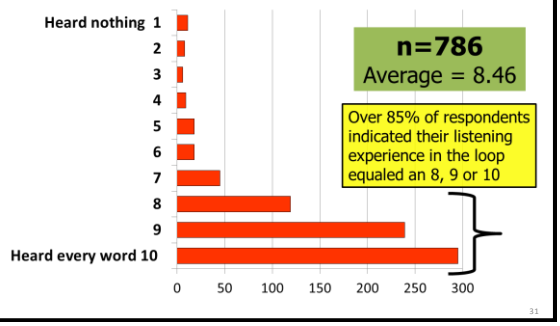
On a scale of 1 to 10, rate your ability to hear in the venue using the Telecoil in the Loop?

1 = "I heard nothing" 10 = "I heard every word"



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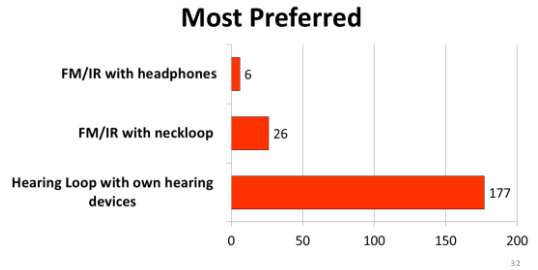
When offered assistive technology which do you prefer?

FM/IR with headphones, FM/IR with neckloop or a hearing loop with own hearing devices? n=218



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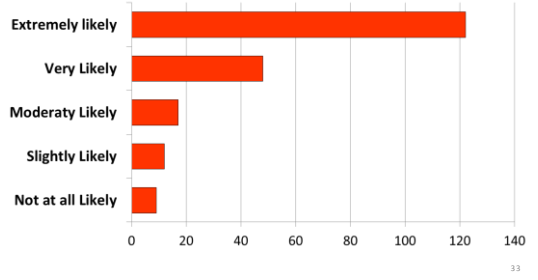
Would you be more likely to purchase tickets to attend local entertainment, such as movies and live theatre, if hearing loop assistance is provided? n=208



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In large venues such as auditoriums, meeting rooms, movie theaters etc. rate the following hearing assist technology

	Most Preferred	Somewhat Preferred	Do Not Prefer	Never Used	Total
FM/IR with Headset	3%	10%	48%	39%	218
FM/IR with Neckloop	12%	30%	25%	33%	218
Hearing Loop with Own hearing devices	81%	7%	6%		218

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2010 ADA STANDARDS For ACCESSIBLE DESIGN

- American Disabilities Act of 1990 - ADA
  - 1991 Standard, enacted July 26, 1990, effective January 26, 1992.
- 2010 ADA Standards for Accessible Design

  - "2010 Standards" or "Standards"
  - ADAAA – ADA Amendments Act
  - Enacted September 15, 2010 – Effective March 15 2012.
  - Combines Title II and III into one Standard.
  - Includes new, and/or altered government facilities, public accommodations and commercial facilities.
  - Adopts 2004 ADAAG – ***added "…communicating,…"***
- Section 219.2 & 706 - Communication Elements and Features – (ALS)

http://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm

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2010 ADA STANDARDS

- Sections 219 and 706 - Communication Elements and Features – (ALS)
- Scoping requirements:
  - **What?**
  - **Where?**
  - **How Many?**

- Minimum requirements!
- **There are exceptions!!!**

http://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm

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2010 ADA STANDARDS

- DOJ - Department of Justice
  - CFR - Code of Federal Regulations
- ABA - Architectural Barriers Act, 1968, Federally funded
- ADA - American Disability Act, 1990 and 2010 ADA
- ADAAG - 2004 ADA Accessibility Guidelines for Buildings and Facilities
- ADA - Access Board - Independent Federal Agency, enforces ABA.
  - Devoted to accessibility - has expanded to be a leading source on accessible design criteria, technical assistance, telecommunications, electronic and information technology.
- IBC - ANSI

http://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm

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2010 ADA STANDARDS

- What:
- SECTION 706 Assistive Listening System (ALS)
  - "Assistive Listening Device. A permanent system that reinforces sound transmission within an area from a source to a receiver/transducer to be used by the hearing impaired within that area."(acoustical space)

http://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm

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2010 ADA STANDARDS

- What:
  - Appendix – ALS Performance Standard
    - Hearing Loop System
    - Infrared System
    - FM System

LOUDER IS NOT BETTER!

http://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm

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2010 ADA STANDARDS

- What: ALS OPTIONS

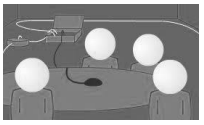

Hearing Loop


FM System


Infrared System


Neck Loop (706.3)


Active Environment


Passive Environment

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2010 ADA STANDARDS

- What:

- Hearing Loop / Induction Loop --T-Coil
  - Least discriminatory
  - Privacy by design – Serves every one equally
  - User enabled – User friendly technology.
  - May experience 60 Hz interference degradation but is usually correctable.
- Infra-red
  - User wears battery operated receiver with loop transmitter to T-Coil.
  - Line of sight, very good privacy, sunlight degradation.
  - Equipment, system, and batteries to maintain – Users limited to number of devices
- FM
  - User wears battery operated receiver with loop transmitter to T-Coil.
  - Equipment, system, and batteries to maintain – Users limited to number of devices
  - Large systems expensive.
- Captioning
  - Requires media format, typically internet connection, everyone benefits.
  - Open or Closed captioning.

http://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm

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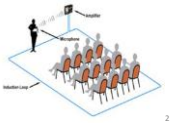
2010 ADA STANDARDS

- Where:
  - Section 706 – Special Occupancies
    - Section 219 - Assistive Listening Systems.
      - "…where audible communications is integral to use of the space"…space shall have ALS,…comply with Appendix I ALS Performance Standards"



http://www.ada.gov/regs2010/2010ADAStandards

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2010 ADA STANDARDS

- How Many:

Capacity of Seating in Assembly Area	Minimum Number ofRequired Receivers	Minimum Number of Required Receivers Required to be Hearing-aid Compatible
50 or less	2	2
51 to 200	2, plus 1 per 25 seats over 50 seats	2
201 to 500	2, plus 1 per 25 seats over 50 seats	1 per 4 receivers
501 to 1000	20, plus 1 per 33 seats over 500 seats	1 per 4 receivers
1001 to 2000	35, plus 1 per 50 seats over 1000 seats	1 per 4 receivers
2001 and over	55 plus 1 per 100 seats over 2000 seats	1 per 4 receivers

http://www.ada.gov/regs2010/2010ADA Standards/2010ADAstandards.htm

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2010 ADA STANDARDS

- Exceptions:
  - ALS is not required if audio amplification is not provided, except for courtrooms.
  - Number of HA Compatible Receivers: Where all seats in an assembly area are served by an induction 'hearing' loop, the minimum HA compatible receivers does not apply.
  - ADA Safe Harbor
    - *Does not predude a consumer* from requesting the facility provide effective communication
  - Except places of worship and private clubs: unless…
  - Building with more than one assembly area: Calculation may be based on total seats, provided all receivers are usable with all systems, and under one management.

http://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm

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2010 ADA STANDARDS

Sound Level Comparisons

http://www.ada.gov/regs2010/2010ADA Standards/2010ADAstandards.htm

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2010 ADA STANDARDS

- IBC-ANSI:
- 706.3 Receiver Hearing Aid Compatibility
  - Receivers required to be hearing-aid compatible shall interface with telecoils in hearing aids through the provision of neck loops.
- 706.4 Sound Pressure Level.
  - Assistive listening systems shall be capable of providing a sound pressure level of 110 dB minimum and 118 dB maximum with a dynamic range on the volume control of 50 dB.
- 706.5 Signal-to-Noise Ratio (SNR).
  - The signal-to-noise ratio for internally generated noise in assistive listening systems shall be 18 dB minimum.
- 706.6 Peak Clipping Level.
  - Peak clipping shall not exceed 18 dB of clipping relative to the peaks of speech.

http://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm

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2010 ADA STANDARDS

- IBC-ANSI:
- Signs
  - Identification of communications
    - 216.10 – Assistive Listening Systems
      - Information of availability.
      - At each assembly area.
    - Conventional form,
      - Script, Decorative, Italic Forms are prohibitive.

http://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm

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Loops Can Be Installed Anywhere

Amtrak, Penn Station, NYC

Grand Rapids Airport, MI

Indian Trails Bus Co

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Loops Can Be Installed Anywhere

(Graceland – Memphis TN)

Parking Attendant

The porch at Graceland

A bed on Elvis' plane

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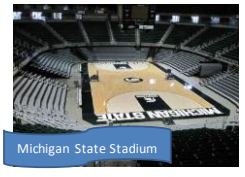
Loops Can Be Installed Anywhere

New York City Taxi

Office Reception Desk

House of Worship



Michigan State Stadium

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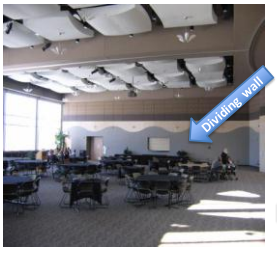
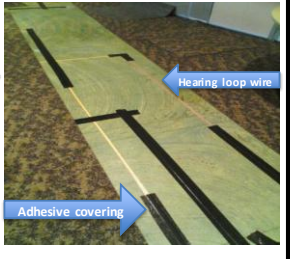
Loops Can Be Installed Anywhere

(Dividable rooms at Meijer Garden, Grand Rapids MI)





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Loops Can Be Installed Anywhere

(Grand Rapids Airport Arrivals Waiting Area)

Arrows point to a scored groove in the floor.

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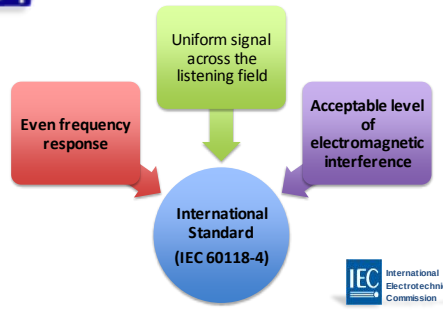
Good Hearing Loops



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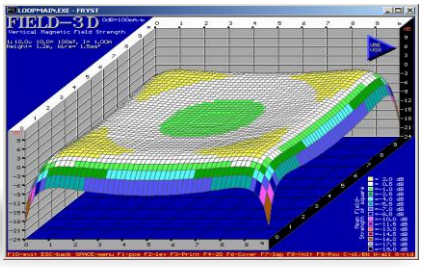
Good Hearing Loops: Uniform Signal Strength



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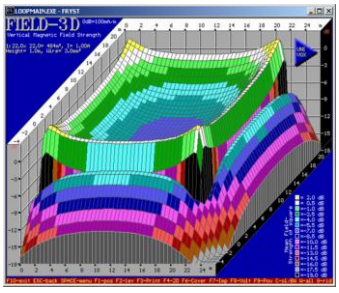
Perimeter Loop out of Spec
(Due to metal effects in building or too wide of a loop)



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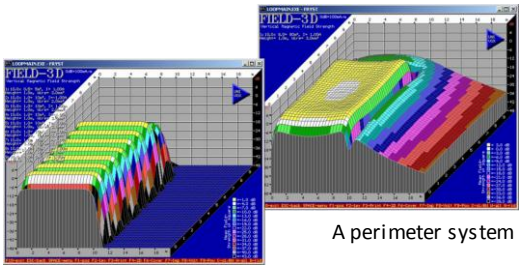
Metal & overspill can be controlled with a properly engineered phased array of loops



A perimeter system

A phased array system

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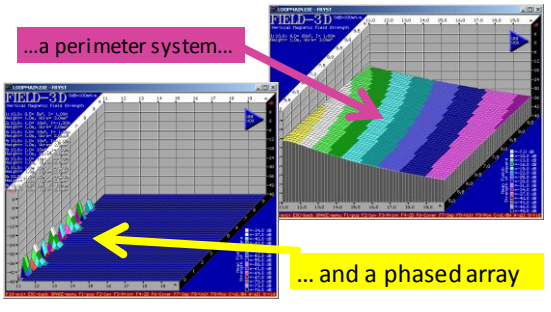
Overspill can be controlled



…a perimeter system…

… and a phased array

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Good Hearing Loops: Possible Sources of EMI

Source	Status	Potential issue	Source removed
Florescent lighting	New FCC rules	If very old lighting	YES
Tube TV/monitors	No new production	Only if still using an old tube monitor	YES
Dimmers	Dramatic improvements	Could still be wired improperly	YES
Electrical wiring issues	Ground loops	Yes but can and should be detected and repaired	It can be
Distortion on Power lines	IEEE 519 is in place	Can be and one should try to work it through with the power company	Not a common issue

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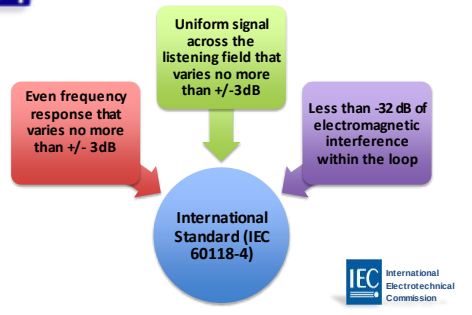
Summary of Good Hearing Loops



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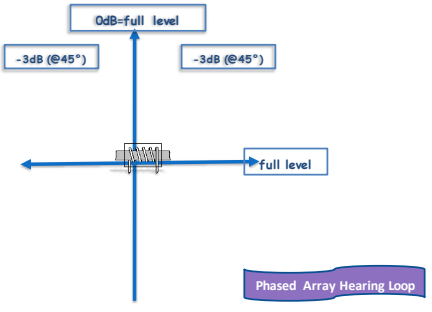
Good Hearing Loops Are Not Affected by Head Tilt



If head tilt is an issue: A Phased Array Loop is a Must

Outdoor Theatre at the Getty Villa, California

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Benefits of hearing loops *at the moment*

- ***Simple:*** For people of all ages to operate - (No need to pair and charge special equipment)
- ***Dignified and easy to access:*** No need to locate, check out, and wear special equipment
- ***Affordable***: Loops don't add to the cost of already-expensive devices
- ***Available:*** Telecoils are offered in nearly all but smallest of instruments and now also in remotes

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Benefits of hearing loops *at the moment*

- ***Flexible:*** The hearing instrument mic can be simultaneously off or on (as with the T and the M+T settings programmed for the user
- ***Energy efficient****:* Telecoils do not decrease battery life
- ***Scalable:*** Loops can be applied in public spaces both small and vast including transient situations (counters)
- ***Universal****:* The same signal serves everyone, no matter their location or hearing instrument manufacturer.
- ***Double the usefulness of hearing aids***
- ***Exceed hearing instrument user expectations***

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Why not Bluetooth?

- HA MFRs have *yet* to develop a universal standard
- Experts predict this will take 10+ years (if ever)
- Major issues as the moment:
  a) Time delays
  b) Quality of Sound – reduced frequency response
  c) Power consumption
  d) Takes up valuable space inside hearing aids

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Interesting development?

1. **Smart phones or earphones equipped with Telecoils**
2. **Apps that correct for the person's hearing loss**

1 and 2 combined would make the perfect loop listener for persons with (beginning) hearing loss and will decrease need for # of ALS devices

3. A recent study at NIU showed that normal hearing students would use a loop if it were available

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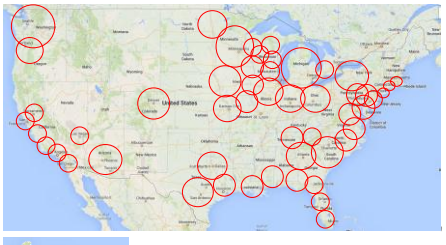
Hearing Loops: Installed Across the US



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Fun Fact: Hearing Assistance Technology Signage

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Hearing Loop Truths and Myths

- Hearing assist is the law. — Truth
- Bluetooth is the way to go. — Myth
- Hearing loops are expensive. — Myth
- Spillover can not be controlled. — Myth
- You can install a loop anywhere. — Truth
- Just run a loop wire around the room. — Myth
- Hearing loops perform better than any other HAT. — Myth
- Good hearing loop installers can't be found. — Myth

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Vetting Hearing Loop installers

- Is the installer trained in IEC 60118-4 standard?
- Does the installer offer a website which lists installations (aka references)?
- Site visits are not optional
- Who will integrate the PA system with the loop if two different vendors are used?
- Signage offered? Who trains the staff?
- Will a certificate of IEC conformity be issued?
- Commissioning of the loop (recommended)

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Resources

Loop Advocacy sites: www.hearingloop.org & www.LoopWisconsin.com

Hearing loop vendors by state: www.hearingloop.org/vendors.htm

Hearing Loop installations nationwide: www.aldlocator.com

Unique loop installation technique photos: www.drssound.com

Find trained installers in your area contact:
www.contactaglobal.com & www.listentech.com

For a Generic US Hearing Loop Specification
(aka Audio Frequency Induction Loop or AFILS)
www.loopwisconsin.com/PDFFiles/US_Hearing_Loop_Specification.pdf

Special thanks to
Karen MacLennan, AuD & Cynthia Compton-Conley PhD
Richard McKinley , Cory Schaefer and Conny Anderson and others

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Questions?

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