

SPECIAL FEATURE

Technologies Worship

AUGUST 2013

Get in the Loop!

Why Hearing Loops Make a Difference

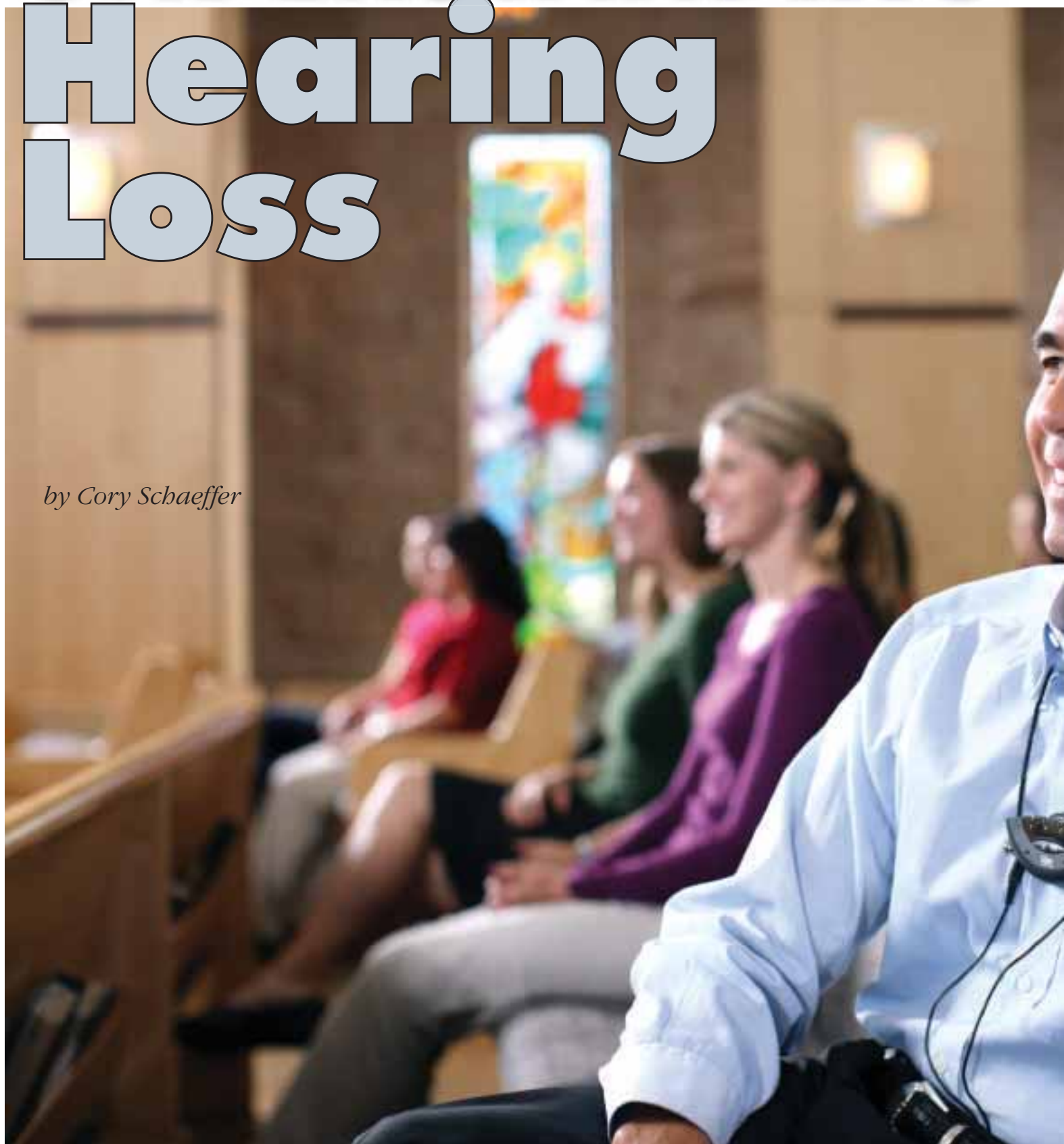


FEATURING:

How to Install a Hearing Loop System, Understanding Hearing Loss, Questions Every HoW Should ask About Hearing Loops, Top 10 Things You Should Know about Hearing Loops, Hear the Difference

UNDERSTANDING Hearing Loss

by Cory Schaeffer



Hearing loss is often referred to as “the invisible disability” even though over 17% of the population has some degree of documented hearing loss. Compare this to those with a physical disability which is at 2%. The numbers are staggering and due to lifestyle choices and the aging of the general population, they are on the rise.



People come to their place of worship to be part of the congregation, to be connected and enriched by the worship community, and hearing the message is a key element. However, those with hearing disabilities are often unable to clearly hear the service. Not only are they at a disadvantage because their hearing is already compromised, reverb, poor acoustics, inadequate sound systems and meager mic coverage make it an even greater challenge to hear and understand the message being delivered. For many congregants with hearing loss, the above factors play an important role in what - if any - portion of the service they are even able to hear.

LOUDER IS NOT ALWAYS BETTER

Many houses of worship think improving their sound systems or turning them up will help those with hearing disability, but louder is not always better. To understand why this is the case and why hearing aids don't always help, you need to realize that hearing aids amplify all sounds - not just those coming from the sound system.

They are ideal when used one on one and in quiet settings. However, once a person with a hearing aid is surrounded by people or enters an amplified venue, the hearing aid is simply another sound system that augments EVERYTHING, making it very difficult to focus on the intended content or source. Hearing aids by themselves cannot filter out all the reverb, poor acoustics and ambient noise. People who have hearing loss need more signal than noise, and having the sound source sent directly to the ear is the best way to block out ambient noise and reverb.

DIRECT DELIVERY

This is where Induction Loop technology (also known as a Hearing Loop) comes into play. Hearing Loops don't just pump up the volume; instead, they deliver an intelligible signal direct to the hearing aid without all the ambient noise distractions, allowing people to hear clearly.

Hearing Loops are increasing in popularity because they offer individuals with hearing loss the ability to experience full, rich interactions in just about any setting with little more than the push of a button. A Hearing

According to the National Institute on Deafness and Other Communication Disorders “approximately 17 percent (36 million) of American adults report some degree of hearing loss”. According to a 2011 report based on audiometric testing of Americans 12 and older in the National Health and Nutritional Examination Surveys (NHANES), 30 million Americans have at least a 25 db hearing loss in both ears and 48 million in one or both ears. Unlike those challenged by mobility or vision loss, people challenged by hearing loss are often an invisible and forgotten minority. About 1 in 4 (8.4 million) have hearing aids, a number that would surely increase if hearing aids could double as wireless, customized loudspeakers.

Loop solution delivers high quality sound directly to an individual's T-Coil equipped hearing aid. Many houses of worship and users alike enjoy this type of assistive listening system because it offers those with hearing aids a discrete solution to receiving audio signal. There is no need to ask for a receiver or to wear something that draws attention to their hearing disability. Over 60% (and growing) of hearing aids on the market now offer the T-coil technology needed to work with Hearing Loop systems, and 100% of cochlear implants will work with them. And, for those without T-coil hearing aids, Hearing Loop receivers can be added to an induction loop system for them as well.

Hearing Loops can be installed in a variety of settings, from new construction to retrofits. Ideally this technology should be introduced early on, as the system may need to be put into the floor, under the carpet, or even in the ceiling. Because Hearing Loops use an induction field, metal can pull and distort the signal. Understanding how much metal is in the designated space will often determine the type of Hearing Loop system introduced and the power of the Hearing Loop driver.

The costs of a Hearing Loop system vary depending on the application and considerations noted above. Smaller installations can run \$2,500 - \$5,000 and the more complex Phased Array systems can range above \$10,000. If there is extensive carpet work or wire installation in hard surfaces, additional costs will need to be considered.

A properly designed, installed and operating Hearing Loop solution delivers real tangible benefits not only for the user, but also for your House of Worship. By implementing this vital tool you ensure that congregants with hearing loss not only hear the message, but remain a valued and vital part of your worship community.

Cory Schaeffer is a Founder and VP of Sales Worldwide for Listen Technologies. She is also a strong advocate for hearing loss education and prevention.

10 Things You Should Know About Hearing Loops

by Richard Einhorn

- Hearing loops are one of the most dignified forms of hearing assistance.
- Hearing loops are flexible and can be used in many places that will work with no other assistive device.
- Hearing loops are easy to maintain.
- Hearing loops are actually used by people with hearing loss, unlike many other systems that require the rental or loan of ugly, unhygienic devices.
- Hearing loops are easy to install in small venues, but require qualified installers for larger spaces.
- Hearing loops provide sound quality roughly equivalent to a hearing aid.
- Hearing loops are extremely popular in Europe and growing in popularity in the US.
- A majority of hearing aids are hearing-loop-compatible.
- If hearing loops are turned off before a service, you will quickly learn that a lot of people depend upon them when they all call you to complain!
- Hearing loops will work with any hearing aid with a t-coil, regardless of manufacturer.



Any time you see this symbol, you know you are in a hearing loop assisted facility.

Richard Einhorn is the composer of “Voices of Light,” an oratorio in celebration of Joan of Arc. He is also a well-known advocate for improved public access for people with hearing loss. richardein@mac.com



Hear the Difference for Yourself!
HEAR A CHURCH WITHOUT A LOOP SYSTEM
HEAR THE SAME CHURCH WITH A LOOP

Samples provided by DRS Sound, Inc.

How to Install a Hearing Loop System in Your HoW

by Dave Scroggins



Prince of Peace Lutheran Church in Appleton, Wisconsin. Photo: DRS Sound

The first thing your integrator needs to do when installing a Hearing Loop system in your House of Worship is run a site assessment. This assessment will measure EMI background noise and tests for field strength and frequency response to determine adverse effects from metal or steel in the floor or building. The installer uses these readings to determine the loop width and design needed to meet the IEC60118-4 standard for hearing loops and determine the size of the loop wire and driver required.

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"Using a hearing loop is an absolutely moving experience. The difference of hearing the sermon and the full service clearly in my ear is amazing! I wish there were loops everywhere."

— Vincent Cleola,
United Methodist Church

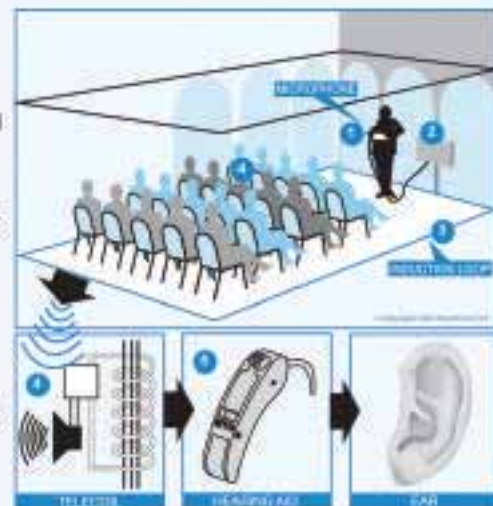
Members of a congregation come to their places of worship for words of encouragement and enlightenment and to experience every word, every moment. A Hearing Loop solution delivers intelligible sound directly to an individual's T-Coil hearing aid helping you better deliver both the message and the emotion that inspires it.

Users can enjoy a discreet listening experience without background noise, competing sounds, reverberation and other acoustic distortions that reduce clarity of sound.

How A Hearing Loop System Works

Audio inputs (1), either from an existing audio source such as a P.A. system or from dedicated microphone inputs feed an audio signal into an **Induction Loop Amplifier** (2). The amplifier drives a current into a **Loop** (3) or series of loops. As the current flows through the cable it creates a **Magnetic Field** (4) in the required area - careful loop and amplifier design ensures that the vertical component of the field is even and free of dropouts and dead zones wherever the user might be. Inside most **Hearing Aids** (5), a small coil known as a **Telecoil** (6) picks up the magnetic field signal, which is amplified into a high quality audio signal delivered directly to the ear of the Hearing Aid user.

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SETTING THE STANDARD: IEC 60118-4

Now the main specification for international use, the IEC 60118-4 standard is based on the principle that the long term average of the field strength at a typical listening location must be 100mA/m, \pm 3dB. To determine this long term average requires a measurement over 60 seconds or more. The standard therefore sets a more pragmatic requirement for determining the short term peaks of the signal. Short term peaks need to be 12dB (x4) higher than the long term average, based on the fact that peaks of speech are approximately 12dB higher than the long term average level of speech. Therefore an induction loop system must be capable of delivering field strength peaks of 400mA/m \pm 3dB (280 to 560mA/m). Peaks must be measured using fast RMS measurement (125ms averaging time). In addition, the IEC 60118-4 standard sets limits on acceptable background noise, and requires that the system delivers frequency response of \pm 3dB from 100 Hz to 5 kHz relative to the field strength at 1 kHz. All measurements must be made with a coil that picks up only the vertical component of the magnetic field, the component that is picked up by the telecoil of a hearing aid.

The readings also help determine if an engineered phased array or perimeter design is required to meet the seating requirements (fixed or movable) and assure your installer can meet the IEC standards for frequency response and field strength.

From this testing, a final design based on test results will be created. The length of the install depends on the options available for running the wires. If wire needs to be placed under existing carpeting, make sure you have a professional do any cutting that needs to happen.

Prince of Peace Lutheran Church in Appleton, WI, recently installed a hearing loop system. During this installation, a professional carpet installer had to open up the seams and pull back the carpet where the wire needed to run. A 3/4" wide adhesive was placed on the concrete followed by 13ga. flat wire with a vinyl 2mil cover over that in the shape and design required. Then the carpet was replaced and seams put back together like it was never opened up.

The loop amplifier was located in the audio rack with the main sound system, processing and amplifiers and tied into a balanced, line level feed from the audio/video recorder, which included an ambient mic in this feed. It is important to include an ambient mic in the hearing loop mix if it is available so users don't feel closed in or miss out on the many unmic'd aspects of the service. There is a delicate balance between hearing responses or ambient sounds loud enough and the organ being too loud when played.

A 4 wire (star quad) feeder was run through the wall from the loop amplifier to the loop in the sanctuary and tied into the appropriate loop wires. Using the star quad wiring insures there is no EMI or interference from the feeder/hearing



Professional carpet installer Dave Pethan carefully peels back the carpeting under which the hearing loop will run.



Hearing loop wire placed and taped down to the floor before the carpet is placed back in position.



Sometimes more than one wire placement is needed to ensure the entire sanctuary is hearing loop capable.

loop in the audio rack as it crosses mic lines or video cables.

When the loop was completed, it was tested with the installed loop driver, and a Certificate of Conformity was given to Price of Peace verifying that the install met the IEC 60118-4 standards documenting the readings.

While every install is different, the basic process is the same. Your HoW should work with an installer that guarantees the IEC 60118-4 standard is met and that any carpet and pre-existing structures within the facility will not be damaged.

Installing a hearing loop in your facility provides allows hearing impaired congregants to actively participate in weekly services, and also assures them that they are a vital part of your church community.

Dave Scraggins and his partner, Jean Luloff, work with churches of all sizes installing hearing loops through their company DRS Sound. Email drssound@lakefield.net or visit their website at www.drssound.com to learn more.

Questions Every HoW Should Ask About Hearing Loops



What do Westminster Abbey, the Opera House in Sydney Australia, and main chamber of the US House of Representatives have in common?

THEY ALL HAVE HEARING LOOPS INSTALLED.

by Leo Garrison

How much do Hearing Loops cost?

Hearing loops range from \$2k to \$35k based on complexity of the design. There is no way to estimate the cost without obtaining venue information, audio system information, and performing two main tests:

- 1) Metal testing, which lets the integrator know how much loss to expect due to metal within the facility
- 2) EMI (Electro Magnetic Interference) testing, which determines the amount of electrical noise already present in the room (mainly caused by older systems and fixtures)

When contacting a loop integrator, have photos, room layouts, equipment gear lists and room capacities per room you are interested in looping, and research whether your venue has metal within the structure. All these components together help determine cost.

Can I still introduce a loop system if our facility has EMI or metal?

Yes. For EMI, you will require an electrical specialist to come to your facility and narrow down the cause or causes. They will perform several tests within the space that will identify the problem and determine the solution.

As a rule of thumb metal networks are what really effect loop systems: metal that is connected to several pieces of metal within the room you want to loop. Metal I-Beams, rebar, metal reinforced concrete floors, drop ceiling grids, etc., can all be overcome by sending more power and some equalization through the system.

Am I required to have a Hearing Loop?

You are required to provide an assistive listening device if you rent your facility out to the general public. This is how the ADA (Americans with Disabilities Act) classifies HoW.

How much does the loop system rely on the sound system?

The saying "Garbage in, garbage out" does apply here. A loop system requires a good clean signal in order to sound good. The majority of installs will have the loop systems mimic what comes out of the main speakers. The mix to the loop system should be a dry (no effect) output of your main speakers minus unnecessary ambient noise. It's important to remember if you don't have a vocal or instrument mic'd the end user will not be able to hear that individual.

Do you have to have a T-Coil hearing aid to use the system?

No! There are loop receivers that have the t-coil built in that you can plug a regular set of headphones to.

How far do loop systems spread?

Loop systems can spread three times their size. There will be signal loss as it expands outside of its designed parameters, but that can be compensated within the hearing aid or loop listener as they generally have around 10db gain built in.

Are there guidelines the integrator has to follow?

Yes, the ADA adopted the standards that the IEC (International Electrotechnical Commission) has specified within 60118-4:2006. All integrators at completion should provide a Certificate of Conformity to hold themselves responsible for the installation they have provided.

Leo Garrison is a Senior Integration Specialist at Metro Sound Pros.