Understanding Hearing Loops

Beginner's Guide

Sommaire

Introduction: Assistive listening

The French Interdepartmental Delegation for People with Disabilities defines the concept of accessibility as allowing "*[...] autonomy and participation of persons with disabilities, reducing or even eliminating discrepancies between their abilities, their needs and their wishes on the one hand, and the different physical, organizational and cultural components of their environment, on the other. Accessibility requires the implementation of complementary elements, necessary for any person with permanent or temporary disability to move and freely and safely access the living environment and all places, services, products and activities. By becoming part of this accessibility process, society is also improving the quality of life of all its members*." [1]

This observation forces us to think about the difficulties encountered by people with disabilities, whatever it may be, in their daily lives. Whether they suffer from reduced mobility, visual or auditory disorders, for example, must be able to access and enjoy public venues and their equipment in the same way as all the others.

Opus Technologies is a French brand that strives to meet the needs of people with hearing loss by providing solutions adapted to the accessibility of Establishments open to the public and so facilitate their daily lives.

One of the flagship products of the Opus range is the hearing loop amplifier for the hearing impaired, 100% developed and manufactured in France.

This guide aims to provide explanations on the operation of a hearing loop system to people seeking information. Unfortunately, this device is still sometimes unknown in France and Europe even if it facilitates access to culture and the information of people with hearing loss

It is also important to note that establishment owners who decide to equip their venues with a system that is suitable for people with hearing loss can and should make it a communication asset in order to attract a larger and more significant audience. In addition, the establishment will enjoy a positive image and solidarity with its customers or users

[1] Délégation interministérielle aux personnes handicapées, *Définition de L'accessibilité : Une Démarche Interministérielle* (Paris : Éditions Sicom, 2006)

The challenges of hearing-impaired people

Why are systems that facilitate hearing accessibility needed?

Despite its invisibility, hearing loss is considered as a true handicap. The daily life of people with hearing disability can be very difficult as the loss of decibels, the difficulty in distinguishing between high and low sounds and sorting out all the surrounding noises make some everyday situations stressful. During telephone conversations, at school, at work or during a visit to the post office, the "Can you repeat" questions become quickly annoying for the hearing impaired, who can became isolated towards the society.

In train stations, airports, festivals or in shopping malls the high level of noise can create unbearable situations for people with hearing loss. Consequently, they end up avoiding going to such public places and therefore enjoying certain events or services to which they should profit in the same way as the others.

According to the EuroTrak 2018 Report on behalf of the European Association of Hearing Instrument Manufacturers, the EHIMA, in Europe nearly 74 million people, or 10% of the population with a hearing loss, 49% of between them are fitted with a hearing aid.

The hearing loop (also known as Loop AFILS to Audio Frequency Induction Systems) overcomes this problem and reduce or even completely eliminate the hubbub. It allows people to distinguish useful information, communicate with a staff member or follow a live concert. Thanks to this system, users find themselves less discriminated, safer, and gain in comfort and listening pleasure.

What are hearing loops?

A hearing loop is an assistive listening system for hearing-impaired people that can broadcast an audio signal through the creation of a magnetic field.

The sound from the microphone, a sound equipment, a television set or other, is transmitted wirelessly to the hearing aid of the person who will be able to hear it without being disturbed by any surrounding noise.

This system is mainly used in places open to public (conference rooms, cinemas, courts, churches, counters, etc.) but can also be installed at home.

In many countries of Europe, to meet the obligations stipulated in the framework of the Disability Act, institutions are obliged to put in place available systems allowing accessibility to people with hearing loss to receive information at the way. As all others.

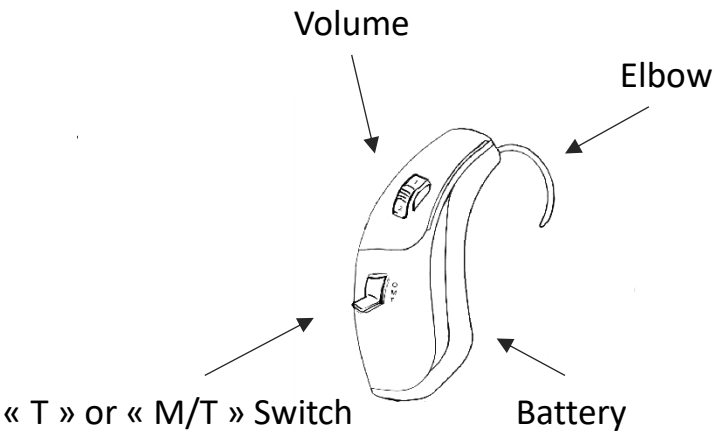
The equipped places are recognizable all over the world thanks to this pictogram:

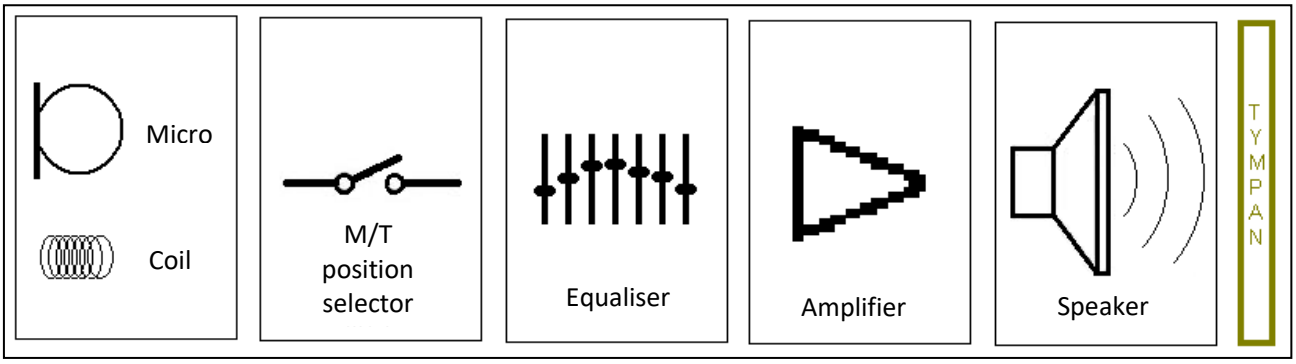
How a hearing aid works?

To understand how a hearing induction loop works, we first need to understand how a hearing aid works.

The hearing aids are designed to amplify the external sound thanks to an integrated microphone ("M" position and frequency correction according to the needs of the user, but distinguishing the various sound sources is not always obvious for him, especially in spaces where the background noise is important (store, station hall, concert, etc.) This means that the paired person will have difficulty following conversations, hearing music or a vocal alarm in an environment that is too noisy and therefore saturated. The hearing impaired will hear nothing but an unbearable hubbub.

Thanks to the built-in coil, commonly called "T-Position", the hearing instrument will be able to pick up an isolated audio signal transmitted by the magnetic field. The position "M / T" allows to capture both an isolated signal but also the surrounding sound.





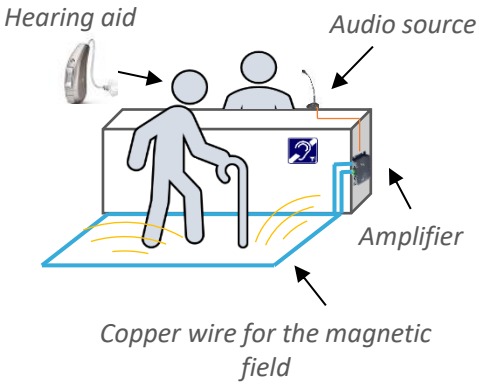
Hearing loops working principles?

The purpose of the magnetic induction loop is to create a magnetic field in a defined area where hearing-impaired people will be able to place themselves and receive an isolated and clear signal through the coil of the "T" or "M / T" position of their hearing aids.

The magnetic field is generated by a dedicated amplifier that feed electrical current on a copper wire, thus radiating the magnetic field around it. (Illustration below)

A hearing loop is composed of the following elements:

- An audio source
- Audiofrequencies amplifier
- The copper wire forming a loop around the desired listening surface (shown in light blue)
- Receiver: hearing impaired with hearing aid with "T" or "M / T" position, or loop receiver for others.



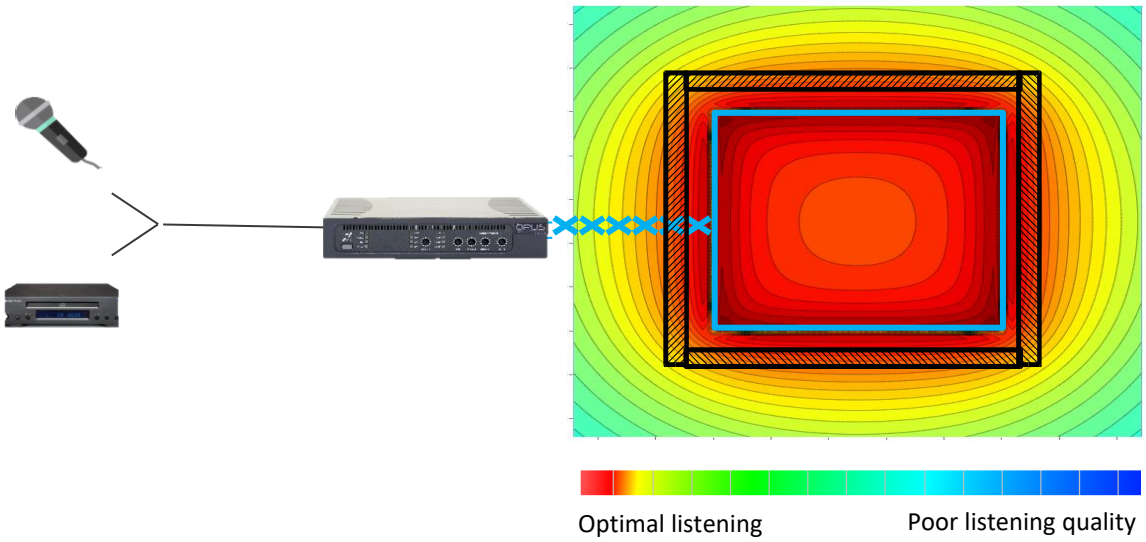


Illustration of the operation and radiation of the magnetic field of a magnetic induction loop installed in a room

Application domains?

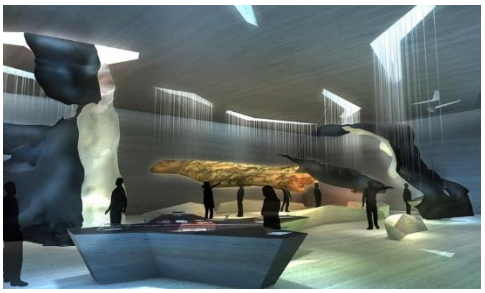
Being a universal system that has existed since the 1950s, BIM can be installed at home as well, but especially in public spaces.

Applications and integrations are therefore numerous:

Places of worship

Auditoriums

Tourist and cultural places



Public transport

Shops

Education

Offered solutions by Opus Technologies

Thanks to a team of specialists in the development of hearing accessibility solutions such as hearing loop amplifiers or HF systems, Opus Technologies products have been designed to meet the needs of smooth operation and the performance that require hearing loop installations.

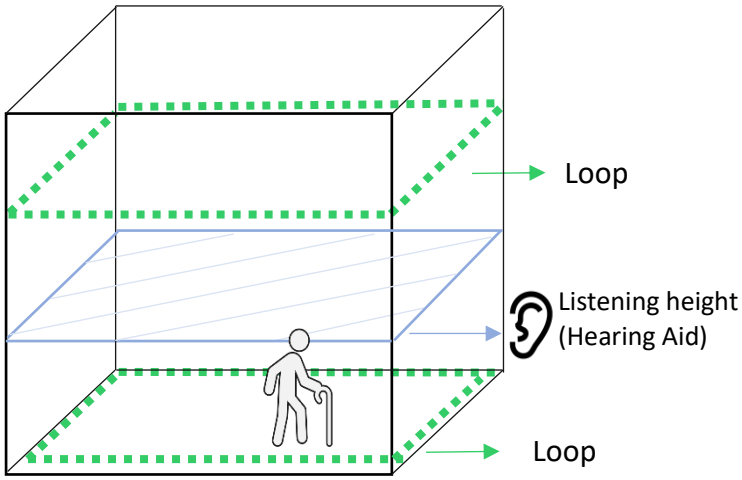
Manufactured in France, and the result of an innovative technical development in proprietary Class D amplification, Opus Technologies loop amplifiers are among the most compact and efficient on the market.

Type of surface to equip	Width of the room	Amplifier
Reception points, counters with intercoms, welcome desks	Close conversations	DCL20
Meeting Rooms, Classrooms	Until 50m²	DCL20-SA
TV room	Until 50m²	DCL20-TV
Conference Room, Places of Worship	Until 250m²	LD1.0
Museums, Amphitheaters	Until 450m²	LD2.0
Large theaters	Until 1000m²	LD3.0
Side-by-side rooms, large areas or presence of metal parts	From 250m2 until 1000m²	LD1.2, LD2.2, LD3.2

Hearing loop installation

The copper wire needed to create the magnetic field can be placed on the floor, under the carpet or in height, under a false ceiling for example.

The magnetic field then diffuses up to listening height so that the coil integrated into the hearing aid is optimally induced.



However, despite its universal character and ease of installation, the magnetic induction loop is a system that requires consideration of certain factors before installation. It is therefore necessary to check:

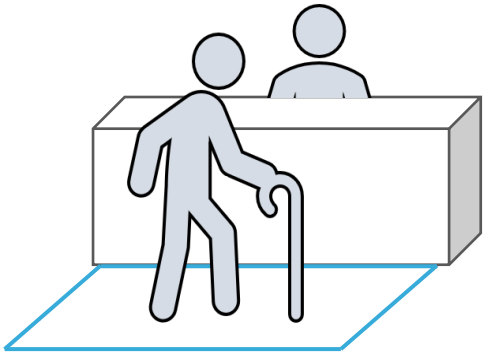
- The presence of metal parts (under concrete in the case of a new construction for example)
- The presence of transformers, electrical panels
- The presence of dynamic microphones (Larsen effect), musical instruments or weak current network (audio, video, computer)
- The presence of other magnetic induction loops
- The need for confidentiality (the radiation of the magnetic field propagates outside the room)

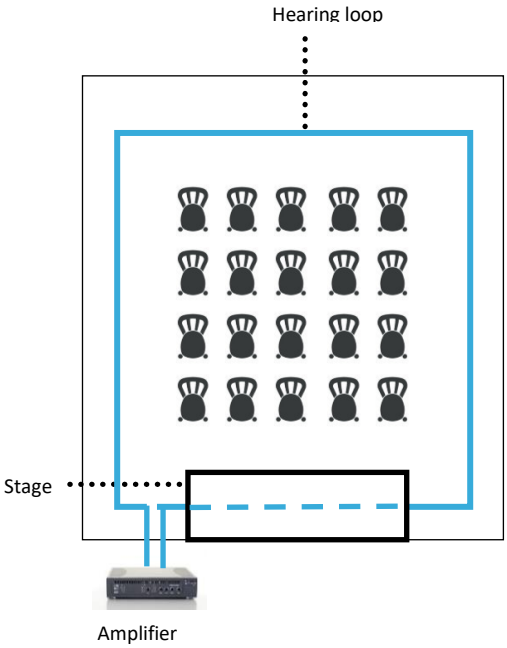
Thanks to previous studies, it is possible to control the radiation and correct unwanted interference in order to have a high-performance installation that will meet standards and provide listening comfort.

Do not hesitate to consult a specialist to be advised or to contact us on contact@opus-technologies.fr

Most common hearing loop layouts

The so-called "proximity loop » is installed in reception counters or reception desks to help the hearing impaired communicate with staff members in a discreet and comfortable manner.





Example of a room equipped with a simple hearing loop

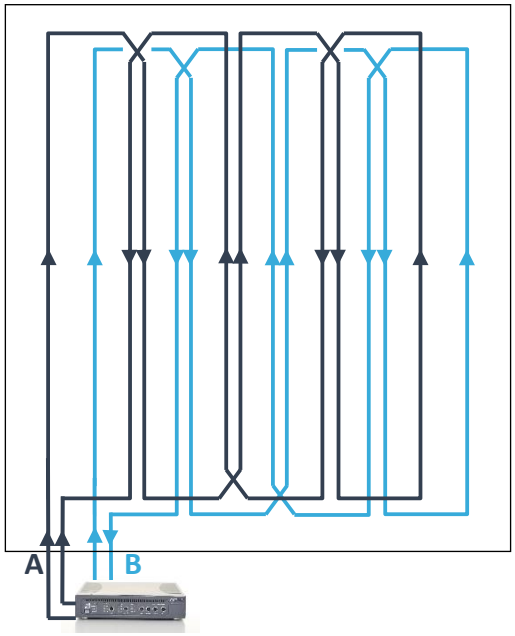
The perimeter loop also called "simple loop" is installed in any area not subject to metallic interference. The magnetic field is then uniform across a small room.

It is an ideal installation for a TV lounge, meeting rooms, conferences, schools, media libraries or places of worship.

To correct the interference or to avoid the overspill of the magnetic field and therefore the listening crosstalk, it is sometimes necessary to install more complex loops.

The installation of "double loops" makes it possible to correct these phenomena. These are used mainly in large theaters, in places where metal structures are very present or any other type of installation in adjacent rooms.

Example of a room equipped with a double hearing loop



Loops vs UHF systems: alternatives to hearing loops

Given certain constraints to be taken into account for the installation of a hearing loop as well as the need to carry out preliminary studies, it is sometimes difficult to set up this type of system (old constructions or too much metallic interference for example)

In this case, there are some relatively effective opportunities to make public venues accessible to the hearing impaired.

The solution then recommended is the UHF wireless system. This solution is easier to install. It is a system that adapts to all situations and can also be used during guided tours. Opus Technologies' UHF systems can transmit a person's voice to one or more receivers. Our transmitters and receivers can cover up to 16 channels and offer superior audio quality.

Hearing amplifier	UHF
Pros	
No receiver management	Easy installation
Low radiation and possibility of mastering it	Important coverage
Independent hearing impaired	Simple settings
Universal technology (fits all hearing aids with a T position)	Excellent listening quality
Possibility of providing helmets for non-fitted persons	
Reduced maintenance after installation	
Excellent listening quality	
Cons	
Strict and rigorous installation and implementation	Management required for receivers and accessories
Mandatory preliminary study	Significant external radiation
Complex implementation in an existing building	Impose hearing impaired to report for headphones and accessories

Opus Technologies expertise

With a long experience in the field of hearing accessibility, Opus Technologies is now a major player in France and abroad and recognised among the world manufactures of hearing loops amplifiers, as a member of IHLMA (International Hearing Loops Manufacturers association)

To meet the needs of the market and to bring an innovative product, Opus Technologies' products have been designed according to strict specifications in order to integrate all the necessary functions and to offer a unique quality of production, fruit of a knowledge and French know-how.

However, selling only products is not enough, since it is sometimes difficult to design hearing loop implantations. Preliminary field studies, precise measurements of listening areas and magnetic interferences that can pollute the space require special expertise.

Expertise is the strength of Opus Technologies. Thanks to a design office and its modelling software that has made it possible to project some of the most complex magnetic induction loop installations in France. Among them we can for example mention famous sites such as the Lascaux 4 caves or the Rothschild hospital in Paris where not more than 40 loop amplifiers were installed in the different floors.

In an effort to democratize hearing accessibility and to meet the challenges of hearing-impaired people in their daily lives, Opus Technologies is attentive and ready to implement its expertise and advice to support any type of project.

OPUS Technologies

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In short

- The hearing loop, is a universal system, easy to implement and efficient that allows assistive listening in establishment open to public or at home.
- Thanks to the transmission of an audio signal via the magnetic field, people wearing a hearing aid with a "T" or "M / T" position can receive a clear and isolated sound from the surrounding hubbub directly in them hears.
- Hearing impaired people find comfort and independence on their daily lives. The applications are numerous: going to the post office, taking the train or attending a live concert becomes a pleasure again.
- The disadvantage of setting up a hearing loop is the interference of the metal parts with the magnetic field. To correct this problem, different types of loops and implementations can be studied by specialists.
- Accessibility of venues open to public is an obligation in some European countries following the recommendations of the European Disability Act for Equal Opportunities. All installations must comply with the international standard IEC608118-4 which guarantees the smooth operation of the loop and therefore the listening quality for users.
- Opus Technologies manufacturers its products in France. Thanks to innovative technology, the amplifiers of the LD series are now among the more efficient on the market.
- Opus Technologies' teams provide technical expertise to advice and guide installers and end-users on the installation and use of a magnetic induction loop.

FAQ

The following points are intended to answer some of the most common questions asked by people with hearing loss or those around them when it comes to using or installing a magnetic induction loop.

How do I know if my hearing aid is compatible?
Hearing aids are today mostly equipped with a "T" or "M / T" position, which allows to capture the signal emitted by the loop at the same time as the surrounding noise. Watch your device, if a switch is present then you are equipped. When buying a hearing aid, ask your hearing care professional for advice.

If I have a cochlear-type hearing implant, how I can take advantage of the system?
In order to minimize the size of the implant, the coil that acts as a "T" position is not always present on this type of aid. It is recommended that you consult your hearing care professional.

I do not have a hearing aid, does it work for me?
If you have hearing loss but do not have an aid with T-position, you can receive the signal through headphones and magnetic necklace. These helmets are available in places equipped with hearing loops.

Can I install a hearing loop at home? How to choose the right installation?
The hearing loop can be installed in your home. Usually people equip their living rooms, so they can watch TV without increasing the volume, disturb his family or have to read subtitles. A solution like the DCL20-TV is quite affordable, and easy to set up. Ask for advice from specialists such as Opus Technologies.

How to know if public venues are equipped?
The equipped premises are indicated by the international blue pictogram with the ear and the mention "T". Inquire at a tourist office or your communal reception. The sites are usually listed there.

Why are not all public venues equipped?
Despite the recommendations of the Disability Act, not all countries put in place strict legislation about assistive listening. Some places are equipped with alternative systems, but only the blue pictogram with the ear and the mention "T" proves the good accessibility of the space.

Sometimes hearing loop systems do not work well. Why?

In order to meet the requirements of the laws, specifications are made to verify that the installations meet the requirements of international standards. Unfortunately, the lack of strict control after installation results in poorly performed or damaged magnetic loop systems resulting in a non-audible installation. Opus Technologies' teams are working hard to ensure that all installations are compliant and recommend that its installer customers submit an EN60118-4 compliance report after each construction site.

Is the magnetic field dangerous to health?

Hearing loops does not present any health hazard. The magnetic field can never be powerful enough to present any danger for users, even those equipped with a pacemaker for example.

Why is this system not better known?

Hearing loops have existed since the 50s. With the technological evolution of hearing aids one might think that this would become the norm but other systems have taken over. Efforts to make public spaces accessible throughout the world have allowed these systems to come back in force thanks to its universal side. It is the most efficient, versatile and sustainable system to date.

How does it cost?

The price of an hearing loop is determined by the area to be equipped and interference that may put in trouble the radiation of the magnetic field. To overcome this problem, more complex loop systems are in place, and more sophisticated studies need to be done beforehand. The cost of these studies, the size of the cable or copper ribbon needed for the realization as well as the power of the amplifier necessary determine the final price. A loop can finally cost, in public price, 250 euros for a reception, small meeting room or TV lounge not exceeding a surface of 50m ^{2} or a few thousand euros for large projects such as live concerts arenas or large theatres.

Who makes the installations?

Today, most electricians and audio-visual technicians can install a magnetic induction loop. However, they sometimes must rely on distributors or manufacturers of equipment such as Opus Technologies and its teams to obtain advice or implementation studies to meet the requirements of the EN60118-4 standard.

Does a hearing loop requires maintenance?

Once the hearing loop is installed and the amplifier is set up, the system can be certified. If the configuration of the room does not change, and if the cables forming the loop are not cut during later work, only a few maintenance is necessary: periodical checking.

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