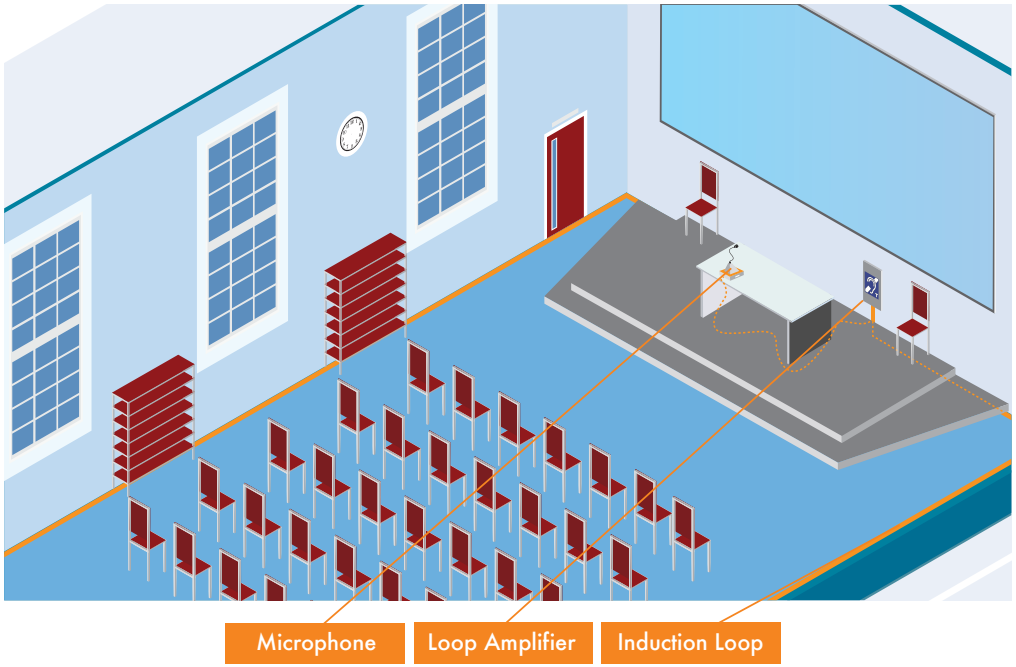
A Basic Induction Loop Setup



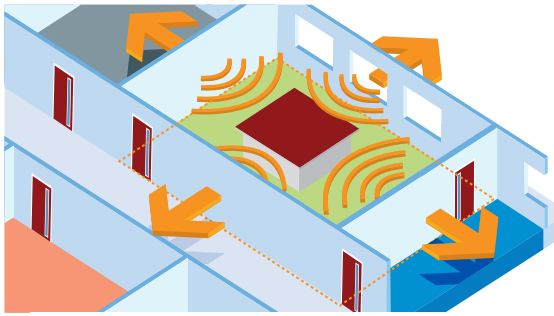
In its very basic form, an induction loop consists of three key components, a microphone, an amplifier and a loop of cable around the room. Audio from the microphone enters the amplifier which drives a current around the loop which in turn creates the magnetic field for the hearing aid to pick up. As the system is wireless for reception, a user can generally pickup sound anywhere within the loop coverage area and benefit from clear, direct speech.

Potential Installation Issues

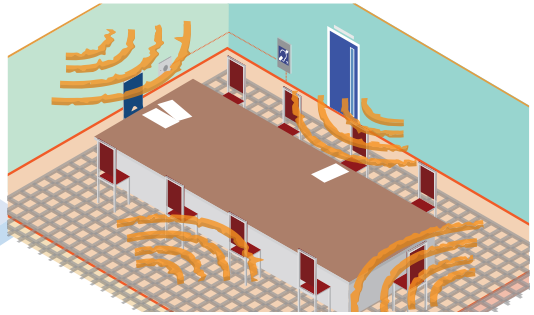
There are a number of key installation issues which can cause problems which in turn will seriously affect the effectiveness of an induction loop. Careful planning and design may be required for certain loop installations which are a function of building construction and room locations.

Metal Loss

The importance of designing Induction Loop systems correctly to cope with losses due to metal structures within the fabric of buildings cannot be over-emphasised. It is absolutely critical to allow for signal loss caused by metal structures during the system planning phase of any installation. If this is not done, the installed loop system is most likely to suffer from a range of problems – insufficient signal strength, uneven signal strength – loud in places and inaudible in others, lack of high frequency detail / clarity or other problems. These problems can be overcome, but only by proper design and attention to detail.



Loop signal extending outside it's designated space



Compromised Loop Signal Strength caused by steel mesh reinforced flooring

Overspill

Loops also create a magnetic field that is fairly consistent within the loop and extends outside of the space. Outside of a simple rectangular loop there is still an audible signal as far as 4 times the width of the room away from the loop.

Planning a Loop System

Before all else it needs to be considered if the location and manner of use for the proposed AFILS system is in fact, practical. There are many induction loops being specified for buildings and construction projects to satisfy DDA requirements, where there would be little to no practical benefit for an actual user. Ensuring the proposed system is in fact a benefit is important to ensure a complex, costly and time consuming installation does not prove to be an expensive waste of time.

What actual speech content or source needs to be enhanced?
A church minister, court judge, performer on stage, speaker in a lecture are all great examples of suitable content for an induction loop system.

For what length of time would a user listen to the content?
Someone sat for some time listening to someone speaking will benefit far more than someone stopping briefly at a point and switching their hearing aid.

How can a perimeter loop cable be installed within the room or space?
A simple loop requires a cable to be installed around the room in a safe and discrete manner.

Is confidentiality of any spoken word in the system a requirement?
Standard loops will overspill outside of the room being covered and could be monitored by unauthorised individuals, therefore a low overspill loop is a requirement.

How could a multiple loop array be laid across the floor or ceiling of the room for low overspill?
Low overspill loops require a complex arrangement to contain overspill and this needs to be arranged in a practical manner

Is confidentiality of any spoken word in the system a requirement?
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Is there a large metal content in close proximity of the room?
Metalwork can seriously effect the performance of loop systems by absorbing the magnetic field strength – result is a poorly performing loop of no benefit to anyone.

Is there a presence of sodium or metal halide lighting in the immediate area of the proposed loop?
Some light fittings (particularly with ballast) create interference which is audible to hearing aid users and creates noise which impairs the audio quality on the loop.

Would infra-red be an alternative solution?
Infra-red systems offer a wireless transmission means which eliminates many of the issues of metal loss and low overspill problems.

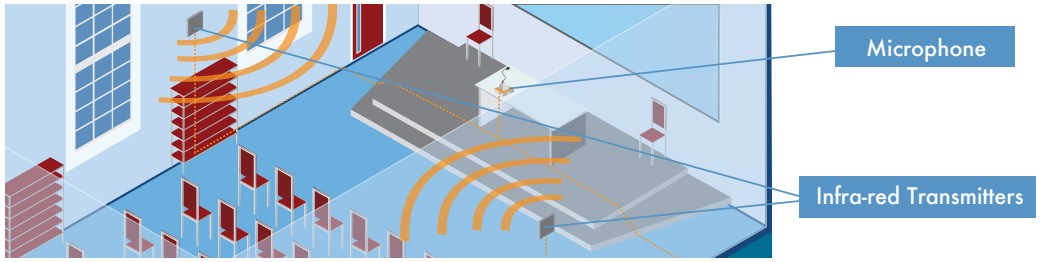
Is the venue capable of managing the issue, retrieval and maintenance of IR receivers and their batteries?
Infra red systems need to be used with dedicated receivers which need managing, conventional AFILS loops need little attention apart from periodic checking.

Infra-red Loop Systems

Infra-red light technology provides an alternative in certain applications to AFILS systems in order to satisfy the requirement for assisted hearing facilities. In principle it provides the means for wireless audio to be communicated to a listener to assist them in participating in the proceedings somewhere.

This is best suited to situations where the listener will be stationary for a period of time and there is either a need for confidentiality (such as a court room) or a conventional AFILS system will be impractical to install. (High metalwork presence, no available cable route etc.)

The audio can be received by two types of receiver, one which allows anyone, regardless of hearing ability to listen (a Stethoset receiver) and another which converts the received audio into a magnetic field via a small neck worn induction loop.



Testing & Maintaining an Induction Loop System

One of the most common causes of failure in hearing loops and other assisted systems is poor maintenance and incorrect operation.

To ensure your system is providing a worthwhile benefit and you meet your obligations under the disability legislation, you must carry out regular maintenance checks.

As a minimum this should be a weekly test with a basic loop test and visual inspection.

It is recommended that a full test and setup is carried out by a competent loop specialist such as PAS, once a year with calibrated test equipment.

> “We only use **calibrated test equipment**, **approved test methods** and **documentation** on all visits.”

PAS have successfully supplied and installed over one thousand induction loop systems in all manner of public buildings across the last three decades. Choosing us to advise you on the correct assisted hearing solution takes out any doubt over a correctly functioning system. Call us today!

WWW.PAS-SOUND.CO.UK

T: 0845 430 0546
E: sales@pas-sound.co.uk

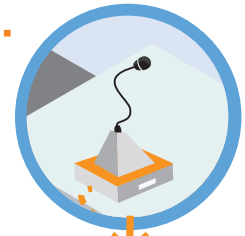
PAS Sound Engineering Ltd,
Senator Point,
South Boundary Road,
Knowsley Industrial Park,
Merseyside,
L33 7RR.

pas sound engineering

THE PRINCIPLES OF INDUCTION LOOPS

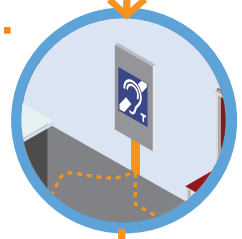
Audio induction loop systems, also called audio-frequency induction loops (AFILS) or hearing loops, provide assistance for the hard of hearing. They comprise of a loop of cable around a designated area, usually a room or a building, which when driven by a dedicated induction loop amplifier fed by an audio signal, generates a magnetic field picked up by a hearing aid thereby generating clear audio directly into the ear.

1.



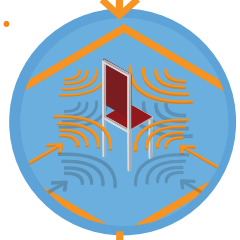
The signal from an audio source is fed into an induction loop amplifier, which amplifies and sets the signal level in the same way as a conventional amplifier....

2.



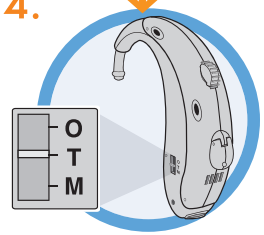
...The amplified signal, instead of going to a loudspeaker, is fed to a closed loop of cable that is normally placed around the perimeter of the room. Employing a constant current amplifier ensures the current is maintained at the set level whilst providing a flat frequency response without the need for equalization circuitry.

3.



The current flowing through the loop generates a magnetic field that radiates in the space around the loop cable. Any lines of magnetic flux that pass through the telecoil in a receiver, such as a hearing aid, will generate a current in the coil that is then converted back to audio and fed into the listener's ear. It is important to remember that the magnetic field will 'bleed' outside the perimeter of the loop and therefore a loop system cannot be considered confidential.

4.



Audio Frequency Induction Loop Systems are designed to work in conjunction with a hearing aid. When the switch is in the "T" position the hearing aid microphone is switched off and the user only hears the sound from the induction loop system.

There are a number of factors which need to be considered before undertaking an installation of an induction loop. The key points on the next page need to be considered before proceeding too far with a scheme which ends up failing to perform correctly.