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A Guide to Induction Loop Systems

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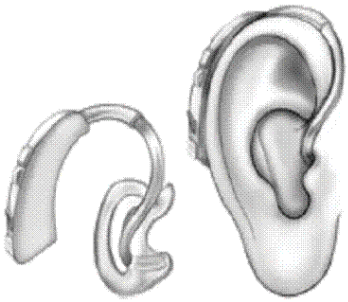
AUDIO VISUAL SPECIALISTS FOR OVER 50 YEARS

The Induction Loop Principle

The history of Induction Loops in this country begins effectively in 1974 when the NHS made available a new range of hearing aids of the type worn behind the ear.



These hearing aids have a switch to select 'M' (Microphone) and 'T' (Telecoil).

The problems faced by the hearing impaired are rarely appreciated by those with normal hearing. A hearing aid user attending a church service, concert or play may rely on the in built microphone ('M' position) within the device and simply turn up the volume in an attempt to improve intelligibility. However, this also results in an increase in nearby coughs, rustles, etc. sometimes to painful levels. Many users give up at this point, turn their hearing aids off and try to use what limited natural hearing they have.

The 'T' position was originally provided for use with a telephone handset. The speaker coil inside a telephone's earpiece radiates a small electro-magnetic field which varies in line with the sound in the earpiece. When in the 'T' position, the telecoil inside a hearing aid picks up this field and amplifies it, producing a much clearer sound for the user.

The 'T' position is also ideal for use with an Induction Loop.

The size of the loop required varies depending on the application, ranging from 1 square meter for ticket booths or bank counters to 600 square meters for churches, theatres or cinemas, etc.

'Presently around 2 million people in the UK are fitted with a hearing aid'

The Disability Discrimination Act (1995)

Induction loop systems are used to assist the hearing impaired by transmitting amplified sound, i.e. music, speech, etc. to NHS hearing aids. Demand for them is increasing due to new legislation aimed at preventing discrimination against disabled people. The following provides a brief summary of all new and existing legislation/standards relating to induction loop systems and their installation.

The Disability Discrimination Act

The aim of the Disability Discrimination Act (1995) is to stop discrimination against disabled people including the hearing impaired. The Act, which already covered education in schools and colleges, was strengthened further in October 2004 when the Disability Rights Commission's (DRC) new Code of Practice came into effect.

Service providers, i.e. companies or organisations offering foods, facilities and services to the general public, must make 'reasonable' adjustments to ensure that they do not unlawfully discriminate against disabled people. Employers must also take measures to ensure that existing and potential employees are not disadvantaged in the workplace.

Under the Act, 'reasonable adjustments' include the provision of various auxiliary aids, including temporary induction loop systems, to enable a deaf or hard of hearing person to access goods, facilities or services available to the general public. From October 2004, service providers have been required to install permanent induction loops and infra-red systems where it is 'impossible or unreasonably difficult' for a deaf or hard of hearing person to make use of a service.

Some examples of service providers covered under the Act are:

- Telecommunications and broadcasting organisations
- Public utility companies, such as gas, electricity and water suppliers
- Leisure centres, football stadia, national parks and health clubs
- Bus and railway stations, airports and travel agents
- Shops, hairdressers, post offices, banks and building societies
- Hotels, waiting rooms, clinics
- Solicitors offices, courts, churches and mosques

Other legislation includes:

- **BS8300 (2002)** – the code of practice for the design of new buildings and their approaches to meet the needs of disabled people.
- **Building Regulations (1992)** – which state that newly erected or substantially reconstructed non domestic buildings must provide aids for the hearing impaired.
- **The Care Standards Act (2002)** – these new regulations demand that care homes provide certain adaptations and equipment for residents – specifically communication aids.

'Service providers are now required to make adjustments to ensure that the hard of hearing are not unlawfully discriminated against'

Common Questions

How do Induction Loops work?

An induction loop system, in its most simple form, is a loop of cable which is placed around the perimeter of a room or a specific area. This cable is then attached to an induction loop amplifier which supplies it with a current. An audio source is then plugged into the input of the amplifier and this signal – be it speech through a microphone or music from a CD player, etc. produces a magnetic field within the loop. This magnetic field varies in direct relation to the input sound. It can then be picked up by anyone positioned within the loop who is wearing a hearing aid (or other loop listening device).

Then the reverse happens in the hearing aid. The magnetic field produces a current in the device which is then reproduced in the loudspeaker of the hearing aid making audio clearer for the user.

Are induction loop systems secure?

Care should be taken when installing induction loop systems in situations where confidential conversations may be taking place. For example, Fairbank Harding Ltd would not recommend installing a fixed loop around the perimeter of a GP's consultation room. In this instance a small counter or portable loop would be better suited. This is due to walls and ceilings not blocking the magnetic field generated by an induction loop. Therefore, conversations may be heard by hearing aid users in an adjoining room.

For conference and boardrooms where a fixed loop is unavoidable it is possible to combat this 'overspill' with careful calculation and consideration to the placement of the cabling.

Alternatively, an infra-red system could be considered.

Are there any situations where Induction Loop systems are not suitable?

In buildings where there is a high level of magnetic background noise it may be impossible to receive a clear signal from the induction loop. This noise can be created by florescent tube lighting or fire alarm cabling. Induction loops are also affected if there is a large amount of metal in the building structure. Fairbank Harding Ltd's trained engineers always check for any possible magnetic noise when conducting a site survey prior to quoting for a loop system.

'Induction Loop systems provide clearer sound for the user'

Portable Induction Loops

Contacta IL-PL20

The Contacta system consists of two components, the main unit, stylishly constructed from robust ABS plastic, and a plug-in power adaptor.

It incorporates a rechargeable battery system to maintain performance at its peak and will give a minimum of 24 hours use. The battery life is monitored at all times using standby mode, incorporating a two colour display to show battery status. The display also shows that the unit is operational as it flashes in conjunction with any sounds present.

The unit is fully operational at all times and may still be used when recharging becomes necessary. An in-built socket allows for expansion using optional boundary microphones, etc. The IL-P20 Portable Induction Loop is easy to carry and can be easily set up for use in a matter of seconds.

Specifications:

- Weight: 500g
- Dimensions: 275 x 250 x 110 mm
- Battery Life: 24 hours (min)

Optional extras:

External Boundary Microphone

InfoLoop Soft Carrying Case:

Contacta IL-CL10

Designed for highly discreet communication with those with hearing difficulties who wear a hearing aid featuring the 'T' facility.

Ideal for small group and one-to-one applications such as schools, colleges, and training rooms, as well as interview rooms, doctors surgeries, customer service counters in retail, banking and public buildings.

Made from high impact ABS the unit is lightweight and includes internal battery (lasts up to 8 hours on a single charge), microphone and LED indicators which show if the unit is active or needs recharging.

Fixed Induction Loops

AVX – PDA101

The PDA101 induction loop amplifier is ideal for any application requiring restricted or small area coverage. It includes two easily adjustable mixed microphone or line level inputs for the connection of desktop microphones, television SCART leads, CD players, etc. and comes in a variety of kit formats to aid specification and installation.

It's state-of-the-art audio processor features an automatic compressor/limiter which compensates for poor microphone techniques and helps suppress loud noises from the output stage. The 'soft start' facility prevents excessive start-up noise entering the loop when the unit is switched on and the amplifier's true current drive amplification circuitry guarantees excellent and consistent sound quality for the hearing impaired.

The amplifier is designed to be free-standing or wall-mounted using the keyholes provided.

Specifications:

- Weight: 785g
- Dimensions: 110 x 520 x 133 mm

Available in the following kits:

PDA101C – Counter Loop
Includes everything for a high quality stand alone counter loop system for a reception counter or ticket booth type installation.

PDA101L – Small Room
The perfect small room induction loop system for meeting rooms, council chambers, waiting rooms and reception areas.

PDA101S – TV/Music Room Kit
Designed for use in areas such as nursing home TV lounges.

Signet DL50/K

This domestic loop kit includes everything you need to create a high quality induction loop system for a bedroom, living room, TV or study.

Carefully designed to sit discreetly alongside all types of audio-visual equipment, the amplifier features one set of phono inputs and an alert input (for connection to fire alarms, doorbells, etc.)

Screwdriver-adjustable controls are provided, allowing the system to be tailored to suit the exact requirements of any room, installation is made easy by the inclusion of an easy-to-follow installation guide.

Fixed Induction Loops

AVX – PDA200E

The PDA200E has revolutionised the induction loop marketplace by bringing the ability to understand, install and appreciate the technology involved to a whole new client base.

By following the simple set-up procedure, no further adjustments are necessary, allowing a top quality assistive listening system for the hard of hearing to be set-up in its entirety by new and experienced installers alike.

It provides four easy-to-access inputs; Balanced/Unbalanced microphone (with phantom power), Balanced/Unbalanced Line, Alert tone switch and 100V line.

The amplifier's state-of-the-art current drive audio processing circuitry includes an automatic compressor/limiter which maintains the loop signal with a small dynamic range to improve intelligibility. Manual adjustments can also be made using the amplifier's internal tampering-resistant drive, level and tone controls, allowing the system to be tailored to suit the exact requirements of any room.

Available in the following kit formats:

- Meeting/Seminar room
- Waiting room
- TV/music lounge
- Lecture room
- Place of worship (2 versions)
- Retail Unit
- Health and Fitness club

AVX – PDA200/800 Amplifiers

The PDA 200 and 800 are highly efficient audio frequency induction loop amplifiers specially designed for buildings such as offices, factories, churches and nursing homes where ease of installation and simple operation are just as important as sound quality.

Both units are supplied in free-standing cases with two 5-pin DIN input connections (mic or line level selectable depending on the pin connectors used) and an Alert input which can be set-up to generate a tone when a fire alarm, doorbell or emergency stop button is activated. The two mic/line level inputs are easily adjustable using tamper-resistant level controls provided on the front of each unit and both also include an input peak indicator, an output drive control and an output current meter.

PDA 200 – provides max. square room coverage of 120m² or max. rectangular room coverage of 300m²

PDA 800 – provides max. square room coverage of 400m² or max. rectangular room coverage of 600m²

Alternative Assistive Listening Devices

Infrared Systems

Infrared systems use invisible infrared light to carry sound to receivers worn by listeners.

The complete system consists of infrared radiators, a pre-amplifier or mixer unit and a microphone or other audio input source. Sound - perhaps the voice of someone talking into a microphone - is fed into the pre-amplifier or mixer, where it is processed and passed to the radiator for transmission as invisible infrared light. Radiators cast infrared light over the listening area, rather like floodlights. You may need one or more of these infrared radiators, depending on the size of the venue.

People who want to use the system borrow receivers from your organisation. They can sit anywhere in the area covered by the radiators. The infrared produced by the radiators usually reflects off walls and surfaces in, and around, the coverage area. Listeners should therefore be able to receive the sound even if they are not directly facing the infrared radiators. However, some wall coverings absorb infrared light so that the receivers will only work when they are pointed towards the radiators. This can be a problem, as the listeners may lose sound if they turn away slightly from the direction of the radiator.

The most widely-used kind of infrared receiver is worn without a hearing aid and a listener only hears the sound that comes from the infrared system. You can get a different kind of receiver to use with a hearing aid. You will need to stock both kinds of receiver for people who want to use the system and keep the batteries in the receivers fully charged. The ear tips must be cleaned or replaced after use.

Infrared systems are not usually prone to interference unless the receivers are in direct sunlight. The radiators do not radiate outside the room they are used in, so several systems can be used at the same time in rooms next to each other. Infrared systems are fairly easy to install and provide high quality sound. Stereo versions are available.

Personal FM Assistive Listening Devices

The Conversor is a wireless FM assistive listening device which is designed to improve and enhance the quality of sound received from a hearing aid. It features a unique patented technology that effectively filters out unwanted background noise and greatly improves sound level and clarity in a variety of listening situations.

The Conversor consists of a wireless FM microphone/transmitter and pendant receiver. The compact microphone/transmitter can be held in the user's hand and pointed at the sound source, or placed on a surface near a distant sound source for enhanced intelligibility up to 150 feet away. Users can focus on the sounds they want to hear by selecting their desired mode of hearing - either the zoom setting for one-to-one conversations or the Omni-Directional setting for group discussions. The lightweight receiver is worn by the user on a pendant around the neck, either above or beneath clothing (without compromising sound quality), and sends the improved sound received from the transmitter to a hearing aid switched to the 'T' setting. For users who do not wear a hearing aid, The Conversor can also be used with binaural headphones, which are easily plugged into the receiver.

Glossary

'microphone'	A microphone, sometimes called a mic (pronounced mike) is a device that converts sound into an electrical signal.
'SCART'	from *Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs)* A French standard 21-pin connector for connecting audio-visual equipment together.
'phantom power'	Invented in the mid-1960's, phantom power is a widely-used method for supplying current to devices over signalling cables, especially audio. This is most often used for condenser microphones, and occasionally microphones of other types.
'electret microphone'	An electret microphone is a relatively new type of condenser microphone. It is a dielectret material that has been permanently electrically charged or polarised. This name comes from *electro*static and magn*et;* a static charge is embedded in an electret by alignment of the static charges in the material, much the way a magnet is made by aligning the magnetic domains in a piece of iron.
'Hz (hertz)'	One hertz simply means 'one per second'. It is used in this context as a unit of frequency.
'ABS plastic'	An abbreviation of **A**crylonitrile **B**utadiene **S**tyrene which is a very common plastic used to make everything from automotive body parts to Lego bricks. The most amazing mechanical properties of ABS are resistance and toughness.
'boundary microphone'	A boundary microphone sits on the table, floor or wall and effectively uses the entire surface for pickup. Boundary microphones are extremely good at picking up large groups of people so are quite common in corporate boardrooms.
'microphone/line level inputs'	Microphone inputs have more 'gain' than Line level inputs. This is because microphones need more amplification than items such as CD players etc. If you plug a CD player, or a line level piece of equipment into a microphone input it will sound distorted as it will be amplified too much.