

The ASU Speech and Hearing Center Assistive Listening Device Center

FREQUENTLY ASKED QUESTIONS

Is an assistive listening device the same as a hearing aid?

An ALD is not a hearing aid. However, hearing aids and some ALDs have similar components (e.g., microphone, amplifier, etc.), but a hearing aid combines all of these components into one device that is worn on the person's body or in the person's ear. Some ALDs, depending on their application, have a microphone that can be placed directly near the sound source picking up more of the targeted sound and less of the background noise. The user then listens to the amplified signal through speakers, headphones, or through their hearing aid or cochlear implant (with or without a coupling device).

Can a hearing aid or a cochlear implant and an ALD be used at the same time?

Some ALDs are designed for use with hearing or cochlear implants, while others are designed to be used alone. Hearing aids typically require using the built-in telecoil ("T" coil) switch with other equipment such as an ALD or a telephone to reduce or eliminate feedback or squeal. Cochlear implants can be used with ALDs by connection through a patch cord (DAI or Direct Audio Input) or by using the "T" coil switch (if available).

Is a telecoil ("T" coil) considered an ALD?

Some people consider "T" coils to be ALDs. "T" coils may be incorporated in body-worn, behind-the-ear (BTE), in most in-the-ear (ITE) hearing aids, and in some newer cochlear implants. Few in-the-canal (ITC) and none of the completely in-the-canal (CIC hearing aids) have sufficient space to include a "T" coils. When a hearing aid or cochlear implant is switched to the "T" coil position, it receives sound information from induction loop (IL) assistive listening systems. "T" coils can also pick up the electromagnetic signals coming from neckloops that are placed around the neck. Neckloops are plugged into the earphone jack of FM and infrared receivers and used with small and large-area assistive listening systems.

Who uses assistive listening devices?

Assistive listening devices are typically used by people who have some residual hearing or who are hearing impaired. People who have difficulty hearing speech or who need to hear certain sound information in noisy situations may benefit from using an ALD. Additionally, people who need to hear sound at a louder level than other people in the same area may use ALDs. These devices are essentially used for minimizing background noise, reducing the effect of distance between the sound source and person with hearing loss, and overriding poor acoustics such as echo.

What types of ALD and accessories are available?

There are several types of systems depending on the environment, the need for privacy, and how the user will interface with the system. There is not one system that is good for all environments, and for each system, there are pros and cons regarding its uses and features. Assistive listening device technology can be integrated into an existing standard public address (PA) or sound amplification system to transmit the sound signals directly to a person. There are four general types of systems: induction loop (IL), FM (frequency modulation), infrared (IR), and soundfield amplification systems.

Induction Loop (IL) Systems

IL systems use a wire around the room to transmit an electromagnetic signal that is picked up by a receiver with a "T" coil. Hearing aid or cochlear implant users with "T" coils can simply switch to the "T" setting and adjust the volume of the hearing aid, if necessary. If your hearing aid doesn't have a telecoil, or if you don't wear an aid, you can still use an IL system by wearing a headset or earpiece with a "T" coil in it.

- *Advantages of Induction Loop Systems*

IL systems transmit directly to hearing aids or cochlear implants equipped with "T" coils, no receiver required. They are unobtrusive with "T" coil hearing aids or cochlear implants. Additionally, fewer receivers are required than with FM and IR systems.

- *Disadvantages of Induction Loop Systems*

IL systems cannot use loop systems in adjacent rooms due to spill-over effect. There are room size restrictions and loops may be difficult or impossible to install at some facilities.

FM Systems

FM (frequency modulation) systems are small scale variations on the commercial FM radio. An FM transmitter connected to the facility's sound system broadcasts radio signals. The radio signals are then received by individual "radios" - small, pocket-sized receivers tuned to the specific frequency used in the transmission. The features of receivers vary; the type of facility will help determine what receiver characteristics are necessary. Some are fixed frequency receivers, while others are tunable; some include environmental microphones that enable you to hear nearby sounds while others do not; some have rechargeable and some have disposable batteries; and, some permit individual ear adjustments, while others do not.

An FM system can be used by people who wear hearing aids and cochlear implants (with or without "T" coils) and by those who don't. A person using a cochlear implant can connect a patch cord from the FM receiver to the external processor for the implant. If the hearing aid or cochlear implant has a "T" coil, a neckloop or silhouette inductor can plug directly into a pocket-type receiver and couple the aid to the FM system. A neckloop fits around the neck like a loose necklace. A silhouette inductor is embedded in a thin plastic shape similar to a behind-the-ear hearing aid. Silhouettes can be very useful for people with severe hearing loss. Non-hearing aid users and hearing aid users without "T" coils can use headphones or earbuds, either monaural (not recommended) or stereo (preferred), which are connected to a pocket-type FM receiver. These systems can also connect to the hearing aid if it has Direct Audio Input (DAI) capabilities.

- *Advantages of FM Systems*

FM systems are portable, less restrictive, easy to install and generally work well with direct auditory inputs (DAI) of hearing aids. Additionally, they can be run in adjacent rooms if they are transmitting on different frequencies. They have transmission ranges of up to 1,000 feet.

- *Disadvantages of FM Systems*

FM receivers are required to hear the transmission, even if the hearing aid has a "T" coil. Both acoustic output and teleloop options must be available at public facilities. Also, systems must operate on different channels (frequencies) when used simultaneously in nearby rooms. It is possible that outside listeners tuning into the same frequency can overhear the transmissions.

Infrared (IR) Systems

Operate on infrared light that is beamed from one or several IR transmitters (IR emitting panels) to small, specialized receivers. Receiver choices include a stethophone that dangles from the ears, a headset type that fits over the ears, and a small pocket-size type similar to the FM receiver. The stethophone and headset have all of the needed electronics built in and can receive the IR signal directly. The pocket-size receiver is similar to the FM receiver and can be used by people who wear hearing aids or cochlear implants (with and without "T" coils) and by those who don't. Additionally, a cochlear implant can connect to the IR receiver through a DAI patch cord.

- *Advantages of Infrared Systems*

Adjacent rooms can operate the IR systems simultaneously without interference which ensures confidentiality (cannot be tapped outside the room). Personal systems are easy to install and there is no size limitation as emitter panels may be connected for longer distances (room size restrictions are minimal).

- *Disadvantages of Infrared Systems*

As with FM systems infrared systems receivers are required to hear the transmission, even if the hearing aid has a "T" coil. They are not practical for outdoor applications because of sunlight interference. There are some installation challenges required for large area systems. Electronic ballast for fluorescent lights can interfere with 95 kHz systems. There can be some "shadowing" or loss of signal occur in areas of room that do not have direct line of sight with the IR transmitter.

Soundfield Amplification Systems

Soundfield amplification systems (SAS's) amplify and broadcast the speaker's voice through wall- or ceiling-mounted loudspeakers. The system consists of a microphone/FM transmitter, amplifier, and one or more loudspeakers. The soundfield speakers should be strategically placed in order for the individual to achieve the most benefit from the system.

- *Advantages of Soundfield Amplification Systems*

SASs are often portable and installation is not always required. They can be used to benefit all listeners. No receivers required.

- *Disadvantages of Soundfield Amplification Systems*

The placement of the speakers is critical. Level of sound output required by individual with hearing impairment may not be comfortable or others. They may not help individuals with more than a slight hearing loss.

Personal Systems

The two main types of personal ALDs are hard-wire devices and personal FM systems. These systems are portable and enable a one-to-one interaction with a person (or people) speaking. An individual can use a personal ALD in various environments independent of other available technology. To listen to the transmitted sound, an individual can wear earphones, use the "T" coil option on his/her hearing aid or cochlear implant, or directly connect his/her hearing aid or cochlear implant through DAI (if available).

Hardwire devices are comprised of headphones attached (hardwired) to a small microphone and amplifier device (about the size of a cassette tape). The microphone is placed close to the person speaking and usually can be adjusted for the preferred loudness level.

Personal FM systems work in the same manner as the FM systems for large spaces. These systems consist of a microphone that wirelessly sends sound to the listener via FM transmission and a receiver that sends the sound to the individual via earphones, "T" coil with neckloop or silhouette inductor, or DAI.

Television/Radio

In addition to portable systems for listening to a person speaking, there are ALDs specifically for TV and radio transmissions. These systems are based on IR (infrared), FM and IL (inductive loop) technology. They typically require a coupling device to the listener.

Coupling Device

A coupling device, such as headphones, takes the signal from the receiver and brings it directly to the ear. Coupling devices are used in conjunction with the ALD to bring the sound to the user. There are several options, depending on personal preference and type of hearing aid, if any. Options for coupling devices depend on whether or not the listener uses a hearing aid and if they want to include the hearing aid into the system. Unaided users may wear a headset or earbuds. Hearing aid users without "T" coils may wear a headset. This may cause feedback with some hearing aids, so the hearing aid can be removed to eliminate the feedback. Hearing aid users with "T" coils can wear neckloops or silhouettes. These devices produce a magnetic induction loop that transmits wirelessly to the "T" coil on the hearing aid. A neckloop fits around the

neck like a loose necklace. A silhouette inductor is embedded in a thin plastic shape similar to a behind-the-ear hearing aid.

FM receiver boots can be used by individuals with certain hearing aids (mainly BTE). Some of the newer FM/BTE hearing aids have the FM receiver built into the aid. Receiver boots connect to the aid and receive the FM signals wirelessly.

DAI and patch cords enable individuals with hearing aids and cochlear implants to connect directly to ALDs.

Who should I talk with about getting an ALD?

The type of ALD needed in a public place should be provided by the facility. However, several different coupling options are available depending on the type of hearing aid or cochlear implant the individual wears. Typically an audiologist is the professional to counsel an individual on the best type of personal ALD or on the features/options available on hearing aids and cochlear implants.

What type of training is required?

Significant training is not required to learn how to use most ALDs. Training is related to how an individual's cochlear implant or hearing aid will interface with public and personal ALDs. It is sometimes helpful to have knowledge of how public systems work in order to educate facility personnel when troubleshooting or when dissatisfaction issues arise.

Who pays for ALDs?

The ADA specifies that ALD receivers be provided at no cost, unless the facility has proven an undue hardship for providing access to an ALD. Some employers will cover these systems as part of a workplace accommodation. Schools can be required to provide these systems if it is a part of a student's IEP. Personal systems may also be covered under private insurance benefits. Vocational rehabilitation (VR), the Veterans Administration (VA), and State Medicaid may also be options for funding.

Are ALDs required by law in certain places?

ALDs for public places are covered under Title III of the ADA (Americans with Disabilities Act of 1990), unless a facility can prove that it creates an undue hardship to provide them. Examples of public places include movie theaters, museums, and public classes. The ADA specifies that ALD receivers be provided at no cost and specifies the number of receivers that must be provided depending on the number of seats (4% rule). The provision of ALDs may also be included under ADA Title I (employment accommodations) and Title II (accommodations provided by state and local governments), Section 504 of the Rehabilitation Act (affecting federally funded agencies), and the Individuals with Disabilities Education Act (IDEA). The symbol below is often used at public places to indicate that ALDs are available.