

How to Hear Better in Movie Theaters, Lecture Halls and in Other Public Areas



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Why it's Difficult to Hear in Large Rooms

If you experience difficulty understanding speech in public areas, you will be happy to learn that there are several technologies that can enhance your ability to hear in these venues. These technologies are free as they are mandated by the Americans with Disabilities Act (ADA). Before discussing them, let's back up for a moment and explain why you may need technologies other than your hearing aids or implants when listening in large rooms.

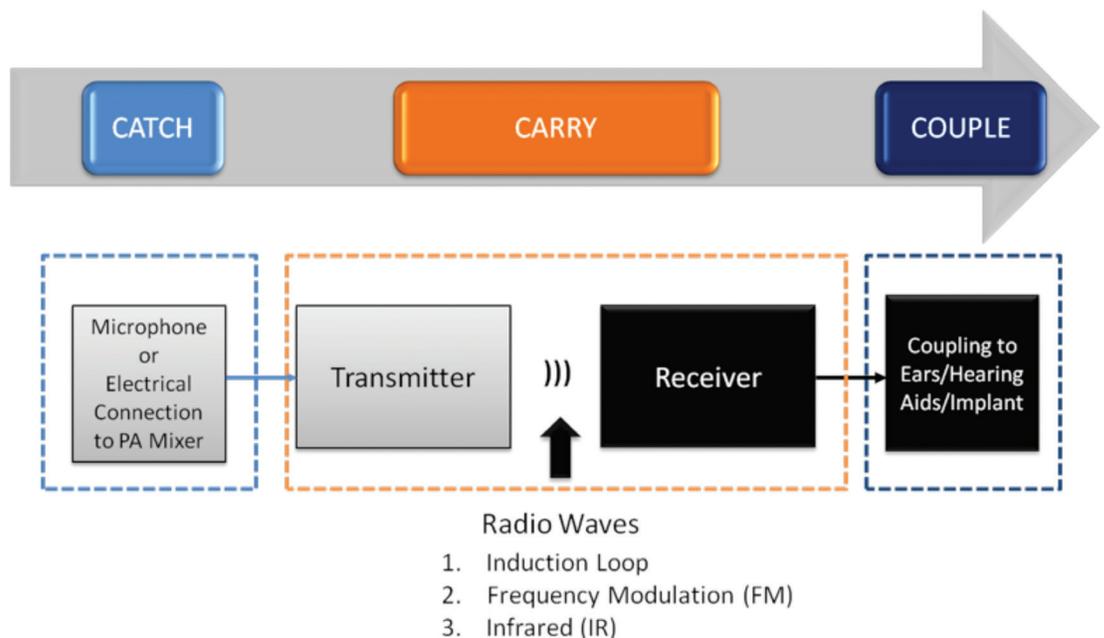
Speech is a complex, fast-moving target. How audible it is at your ears depends on how loud the other person is talking (vocal effort) and how far away you happen to be from the person talking (the farther away you are from the talker or the loudspeaker, the softer the voice will be). It also changes in pitch depending upon gender/emotion and the various sounds uttered. Speech can be spoken in a quiet room or in a noisy room. In large rooms, even if there is

no noise, speech will be smeared due to room reverberation (echo) caused by sound bouncing off the hard surfaces of the room (floor, ceiling, walls, furniture, etc). How well you hear and understand speech depends on all of these factors, as well as the exact degree, configuration (shape) and nature of your hearing difficulty.

If fitted properly, today's hearing aids and implants should provide you with sufficient audibility to hear speech in quiet, provided you are close to the talker. You may even hear fine in noise if you are close, your hearing aids/implants have directional microphones, and noise is spatially separated behind you. However, in large rooms (movie theaters, concert halls, lecture halls, etc), you are usually seated at a distance from the talker. Even if the room has a public address (PA) system, you may be seated too far from the loudspeaker(s). What happens in these spaces is that

continued

Figure 1.
How large area wireless ALDs work



the talker's voice bounces around as it is reflected off of the various surfaces of the room. This causes the microphones of your hearing aids/implants to pick up these reflections which cause speech to sound smeared and thus difficult to understand. You can try moving closer to the talker/loud-speaker(s), but that does not always help. In addition, may not be practical (or even possible) to move closer.

How Large Area Assistive Listening Devices Can Help

For listening situations where distance, noise, and/or reverberation make listening difficult, special large area Hearing Assistance Technology (HAT)—also known as Assistive Listening Devices (ALDs)—can be used along with hearing aids/implants to provide sufficient audibility for maximal understanding/enjoyment of the desired signal. These systems serve as a wireless link or bridge between the sound source and the listener. Just as binoculars make a far away image appear larger and easier to see, ALDs function in much the same way. These binoculars for the ears™ pick up the desired signal at its source and, wirelessly send it directly to your ears, preserving its loudness and clarity despite noisy and/or reverberant surroundings. People who use large area assistive listening systems report their listening experiences to be almost magical.

Figure 2.
Example of an IR or FM system and how to couple to it

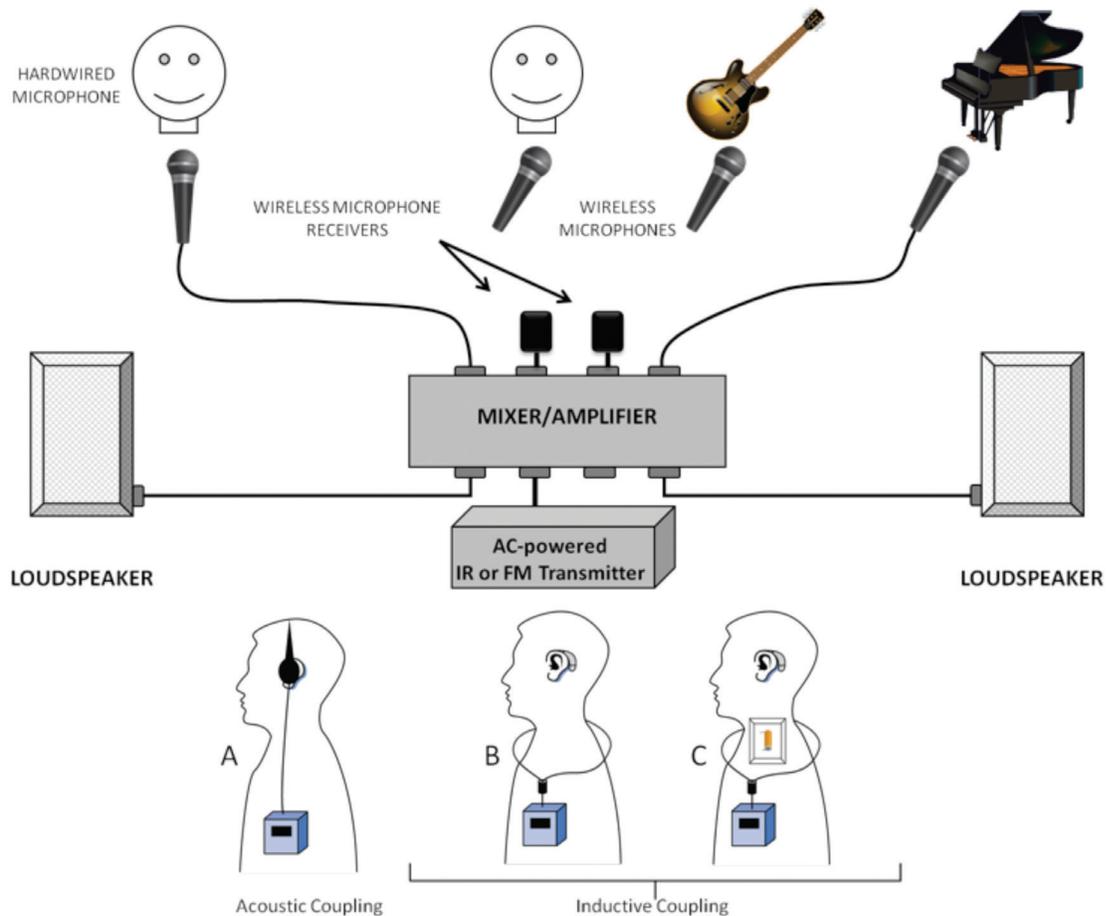


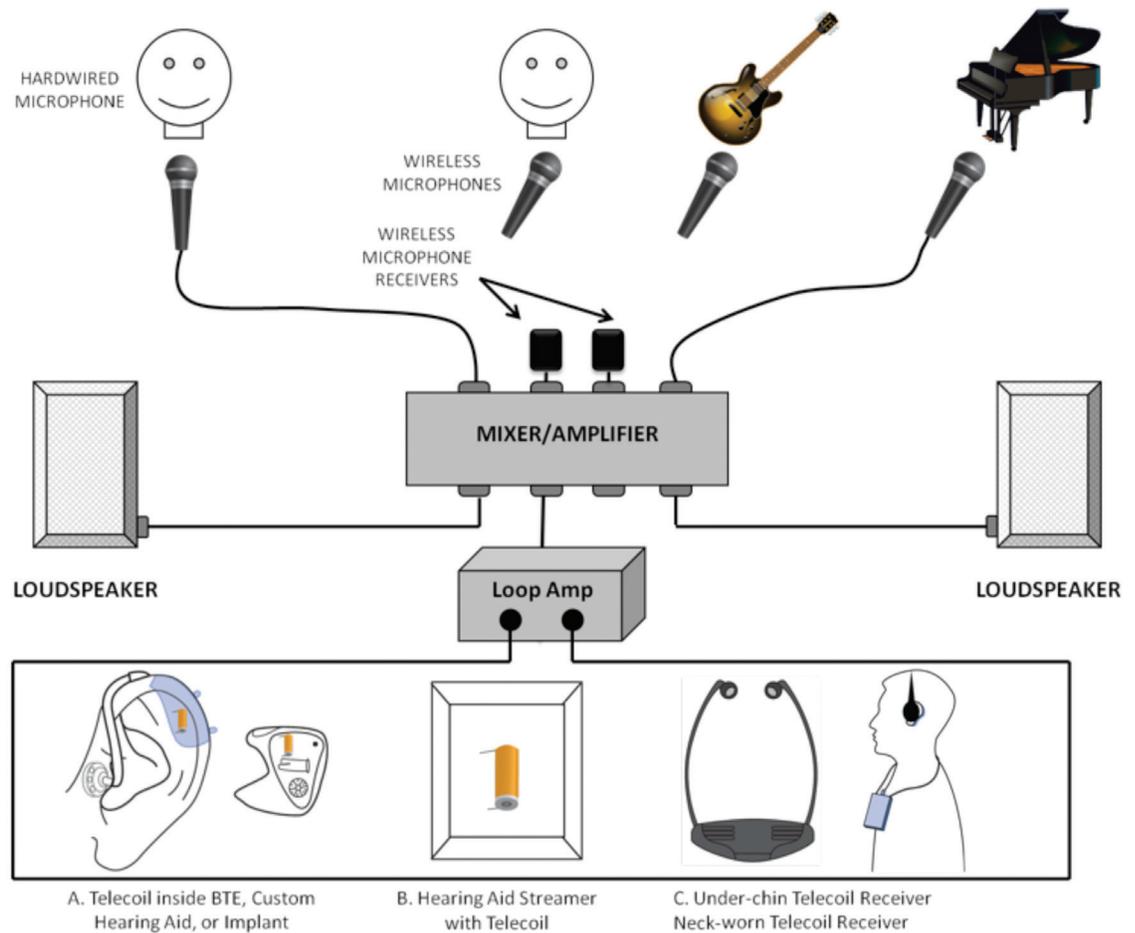
Figure 1 shows how large area wireless ALDs work via the “three Cs” principle: Catch, Carry, and Couple. A microphone catches the sound you want to hear at its source and changes it into electrical energy. In the case of a pre-recorded sound track, the sound is already in the form of an electrical signal. The electrical signal from the microphone or recording is then led to the room’s public address (PA) system’s amplifier/mixer. A wireless transmitter is then plugged into the output of the mixer. It is the wireless transmitter that broadcasts or carries the sound across the room to a receiver that you wear. The receiver is then coupled to your ear, hearing aid, or cochlear implant.

There are three basic types of wireless systems in use in public areas today: (1) Infrared (IR) (2) FM, and (3) loop. IR and FM transmitters attach to the output stage of the room’s public address system mixer. They then broadcast an IR or FM radio wave across the room to wireless, battery-powered IR or FM receivers that you borrow from the venue.

Infrared and FM Systems

Figure 2 shows an example of how an IR or FM system might be used in a concert hall and how you might couple to the system. When you look at the box that entitled

Figure 3.
Example of a large area loop system and how to couple to it



“AC-powered IR or FM Transmitter” remember that the system you will encounter in real life will be either an FM or an IR transmitter, not both. This figure is just for explanation purposes. Note that both hardwired and wireless microphones can be used to pick up voices and/or instruments. Also note that the system has loudspeakers.

There are two ways you can use the IR or FM reliever. If you have enough hearing, you can use the receiver along with earphones (Figure 2-A). However, if you use hearing aids and/or implants equipped with telecoils, then you ask the venue to loan you a neckloop that you place around your neck and plug into the FM or IR receiver (Figure 2-B). You then turn on the IR or FM receiver and switch your hearing aids/implants to the telecoil mode. The neckloop takes the signal from the infrared or FM receiver and re-broadcasts it to your hearing aid/implant telecoil(s) where it eventually changed to sound (in the case of hearing aids) or electrical energy (in the case of implants). Important: If you have a wireless hearing aid that does not contain a telecoil but you use a personal streamer that DOES contain a telecoil, then you would place your streamer inside of the neckloop and activate the streamer’s telecoil (Figure 2-C).

Loop Systems

Loop systems have been around for many years but are enjoying a renaissance thanks to the efforts of the Hearing Loss Association of America and interested citizens who appreciate the ease of use that comes with this type of system. As with the infrared and FM systems, a public address system picks up the sound using a microphone or direct connection. Unlike the other two technologies, the transmitter in a loop system consists of a wire placed around the room (or a grid of wires placed under the carpet) and plugged into a second amplifier that plugs into the PA system’s main amplifier/mixer (see Figure 3). The wire placed around the room serves at the wireless transmitter because it sends electromagnetic energy throughout the room that is then picked up by a telecoil receiver located inside of your hearing aids, implants, streamer, or inside of a special receiver that you use without hearing aids (Figure 3-A, B, and C).

If your hearing aids/implants are equipped with telecoils and the large area venues of your community are equipped with loop systems, then you will enjoy the convenience (and dignity) of being able to walk into the room,

continued

flip your hearing aids/implants to telecoil mode and hear. There is no need to borrow a receiver because, as shown in Figure 3-A, the telecoil in your hearing instrument IS your receiver. If your hearing aids do not have telecoils but you own a personal telecoil-equipped streamer, then you would activate it and wear it to receive the loop signal (Figure 3-B). If you do not have telecoils or if you do not own hearing aids, then you can borrow a loop receiver that you wear around your neck (or under your chin) with earphones (Figure 3-C).

Important Telecoil Options

In order to get the most from your hearing aids or implants, you might want to see if your audiologist can fit you with a hearing instrument that not only provides you with telecoil (T-only) mode but also with a telecoil plus microphone (M + T) mode.

Why is this important? Well, if you have a severe loss and are in the T-only mode, then you hear the sound coming through the large area ALD, but you will not be able to hear your own voice or the voice of your companion because your hearing aid/implant microphone is turned off when in the T-only mode. When you cannot hear your own voice, you will tend to speak more loudly than normal, thus disrupting the other patrons. To have a conversation and monitor your voice, you will have to switch from T to M and then back again to T. However, if you have the M + T option, then you will be able to hear through the ALD and

simultaneously through your environmental microphone. Thus you can monitor your voice, hear your companion and enjoy the show. If you have any feedback issues with this mode, then talk to your audiologist to see if adjustments need to be made.

Final Notes

There are pros and cons to each of the three systems. However, when installed and maintained properly all three systems sound great and can help you hear better in large rooms, provided that you know how to couple correctly. The big advantage of loops is that you do not need to borrow a receiver, provided that you wear hearing aids or implants equipped with telecoils.

Not all public areas are required to install large area listening systems. For example, houses of worship are exempt from the law. But, this does not mean that your community should join together to raise funding for such a system.

For large area solutions that require simultaneous two-way communication, language interpretation, team teaching, portability, encryption and many other features and applications, the Williams Sound Digi-Wave system can be used (see: williamssound.com/digiwave/)

With today's technology there is no reason why you should not be able to go out on the town and enjoy a good movie or lecture.