Neckloops, Telecoils, and Bluetooth, Oh, My!

Confusion Abounds
There’s a lot of confusion about neckloops, telecoils and Bluetooth and even newer technology that uses 2.4 Ghz to pair with accessories. In this article, we’ll try to clear up some of that confusion.

Many hearing aids have standard analog telecoils in them. Some have special proprietary receivers than can “hear” a digital magnetic signal from a Bluetooth pendant that looks like a standard neckloop, but these can’t communicate to a standard telecoil. In both cases, the communication to the hearing aid or CI, is magnetic (not Bluetooth). In the case of Bluetooth pendants, Bluetooth is only used to communicate between the audio source and the pendant. The Bluetooth pendant then uses a neckloop to communicate to your hearing device via a digital electromagnetic signal. A standard neckloop communicates to your hearing device via an analog electromagnetic signal. While they may look similar, they are different.

Many new hearing aids and one CI model also now include embedded 2.4 Ghz receivers that can be paired with accessories including remote microphones, TV transmitters, and phone clips. Similar technology is likely to be found in more hearing aids and CIs in the future. These are similar to Bluetooth, and must be one-to-one paired with a source for your personal use, though some remote microphones do include a telecoil for use in a looped situation.

Telecoil
First, let’s look at what a telecoil is. The picture at the right is a telecoil, shown many times actual size. It’s nothing but a tiny coil of wire wrapped around a metal core that’s connected into the processor of your hearing aid the same way your hearing device’s microphone(s) are connected. About 70% of hearing aids sold today have telecoils in them. But many have not been activated by your audiologist and set to your needs. You can ask your audiologist to activate, adjust and demonstrate your telecoils if you have them. If you are buying new hearing aids, then you should make sure you choose a model that has a telecoil.

Based on the way your hearing device’s programs are set up, it can hear either the signal from the microphones, the telecoil or some mixture of both. The telecoils can be used to hear better in many different situations.

You can plug a neckloop into a sound source, such as a smart phone, a TV, or a computer or tablet, and switch your hearing device’s program to listen to the magnet signal that the telecoil can hear. When you’re in telecoil mode, you can
hear a room loop if one is installed. There are room sized loops installed in some churches, theatres, and meeting rooms. See the image at the right. Most HLAA meetings use a room loop to let everyone with telecoils hear better in meetings. Some banks, checkout lines in some grocery stores, and pharmacies also have table top loops you can use to hear better while dealing with them.

The telecoil can make a huge difference in your ability to hear, because (if you choose), you can have a program that turns OFF your hearing device’s microphones so that the telecoil is the only source of sound, and that can help you hear better in noisy situations. It overcomes distance, noise and reverberation by bringing the sound directly into your hearing device(s).

Telecoils are terrific and (in my opinion) should be in every hearing aid, but there are some limitations:

- They are not true stereo. You can hear the signal in both ears if you have telecoils in both hearing devices, but it’s a single monaural merged channel
- They can also hear stray electromagnetic interference (EMI) if it’s present. EMI is generated by several sources such as nearby dimmer switches, fluorescent lights, automobile motors, and heavy electronic equipment.

**Standard Analog Neckloops**

A standard analog neckloop is shown at the right. These have a 3.5 mm plug that can be inserted into any source like a personal amplifier, an iPod, tablet, computer, smart phone, stereo, or TV that has a compatible 3.5 mm jack. A simple adapter may be required to plug them in to sources such as the iPhone 7, older stereos, home phones or TVs that don’t have a 3.5 mm jack. These neckloops emit an electromagnetic field that will induce a signal representing the sound from the source into the standard telecoil in your hearing device(s).

If you have two standard analog telecoil equipped hearing aids or CIs, both will "hear" the signal, so these neckloops can do binaural but not stereo. Some stereo sources, like smart phones, allow you to merge both stereo channels. To hear merged channels, other sources need a stereo to mono adapter to merge both channels into one signal.
There are also other "neckloops" that don't have a plug at all, but instead have a Bluetooth "pendant". These can be paired with Bluetooth sources so you can hear wirelessly. What's confusing is that there are two types of Bluetooth pendant neckloops.

1) Some emit a standard analog electromagnetic field that can induce a signal into standard analog telecoils. So they work exactly like standard neckloops except instead of a plug, they pair with audio sources via Bluetooth. The most common Bluetooth pendant that emits a standard analog electromagnetic signal is a brand called "Quattro". There are two Quattro models, one with a remote microphone (top) and one without a remote microphone (bottom).

2). Some are called "gateways" or "streamers", and are proprietary accessories that work with specific hearing aid models. These also use Bluetooth to pair with Bluetooth compatible sources. These emit a DIGITAL electromagnetic signal that induces a signal into special "Near Field Magnetic Interface" (NFMI) receivers in the hearing aids. These NFMI devices cannot be used with standard analog telecoils, though some hearing aids do have both NFMI receivers and standard analog telecoils.

There are some advantages to the NFMI pendants:

- They do not hear electromagnetic interference that affect standard analog neckloops
- They can (for some brands) do true stereo, so each ear gets the correct stereo channel.
- Some also include a telecoil in the pendant, so the pendant can hear a room loop and transmit the sound via NFMI to your hearing aids, even if the hearing aids don’t have telecoils.

But, there are also some problems with Bluetooth:

- Some earlier models have a significant latency. The sound you hear is delayed compared with the source. That doesn't matter for phone calls or listening to things where speechreading might help, but it can be disconcerting when watching a video or when using for face-to-face communication. Later Bluetooth models have reduced the latency somewhat.
- Bluetooth is for personal listening; you have to pair your pendant to a Bluetooth sound source; except for those that also include telecoils in the
pendant, the pendants can only be used for one-to-one communication not for broadcast audio.

- They are powered by rechargeable batteries, so they only work as long as the battery is charged.

I think all hearing aids should have standard telecoils and come with a standard neckloop that's been demonstrated to the customer. But, that will probably never happen. Technology moves rapidly and we're likely to see most hearing aids and CIs come with embedded receivers that many will say mean standard telecoils are unnecessary. They are wrong, since such options usually don't support universal broadcast communications, but only support one-to-one pairing to a source.

To get around that broadcast limitation, I think you'll see standard telecoils in some hearing aids and CIs in the future, but also in accessories that use other transmission protocols, too. So, if you have a pendant or remote mic that has a standard telecoil, you can receive a broadcast signal from a room loop, even if your hearing aid doesn't have its own on-board telecoil.

**It’s Up To You**

There are many things you can do to improve how well you can hear.

If you have hearing aids and don’t know about the advantages of telecoils, find out if you have telecoils already, and if so, then ask your audiologist to activate, adjust and demonstrate them for you. If you are buying new hearing aids, be sure to demand models with telecoils, and make sure they are activated, adjusted and demonstrated. Don’t let anyone tell you that it’s “old” technology ... it’s true, that it’s old, but it’s also GREAT.

It’s up to you to educate yourself ... or learn from other more experienced people with hearing loss. One of the best ways to meet more experienced people is by joining Hearing Loss Association of America and attending meetings of a local chapter ... or attending the national convention. See www.hearingloss.org.

-Steve Barber, Wake Chapter, HLAA-NC.