



**THE CONSUMER HANDBOOK ON  
HEARING LOSS  
& HEARING AIDS**

**A Bridge to Healing**

**THIRD EDITION**

**Edited by Richard E. Carmen, Au.D.**



## CHAPTER ELEVEN

# Telecoils And Wireless Assistive Listening

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Imagine a future in which hearing aids had doubled usefulness. While they would serve as sophisticated microphone amplifiers (today's common use), they would also serve as customized in-the-ear speakers for the wireless broadcast of television, PA systems, and telephone sound.

Although that second possibility may sound like a futurist's dream, it actually describes the present world in which I live. My office phone can broadcast "binaural" sound (to both my ears), even if I set it on my desk while taking phone messages. When I watch the TV nightly news this evening, my TV speakers will be broadcasting normally for anyone else in the room. Although that sound is too faint for me to hear clearly, it's not a problem. At the touch of a button my hearing aids become the TV loudspeakers, broadcasting crystal clear sound customized just for my ears.

When I worship at my church next Sunday (or at nearly any one of my community's main churches), I need only press that same button and the minister's voice will be broadcast privately by my hearing aids, which receive wireless sound signals rather like my laptop receiving wi-fi signals.

Although most American readers of this book will have no clue what technology enables this doubled functionality for hearing aids,

hearing aid wearers in Britain would immediately know what I'm talking about (as would most such people in Denmark, and many in Australia). The simple technology has two parts. The first is the tiny and very inexpensive *telecoil* (or *t-coil*) that now comes with at least half of new U.S. hearing aids, including most of the behind-the-ear hearing aids worn by those with the greatest need for assistive listening. These little coils of copper detect magnetic signals transmitted by telephones (see Figure 11-1 below).

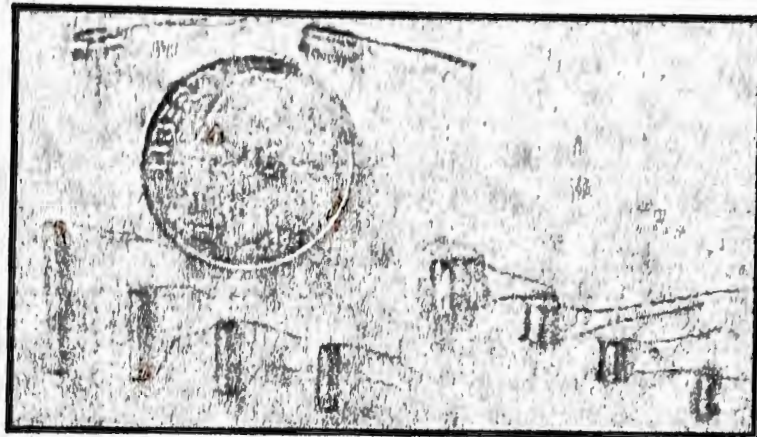


Photo courtesy of Global Coils SAGL

Figure 11-1: Assorted telecoils

### **Telecoils and Telephones**

Unbeknownst to most people, telephone handsets transmit not only sound, but also a magnetic signal. By federal mandate, all wired, landline telephones manufactured in the United States since 1989 are "hearing aid compatible." That means they transmit an interference-free magnetic signal to telecoil-equipped hearing aids. The hearing aid wearer simply activates the telecoil by pushing a button (on a remote device or on the hearing aid) that changes its setting. Suddenly, the hearing aid becomes an ear plug, receiving no room sound. Instead it receives and broadcasts a strengthened phone signal. For this reason alone, more and more hearing aids of all sizes and cost levels are now coming with telecoils.

Moreover, under new FCC regulations, more and more wireless cell phones are telecoil-compatible. So, when I talk on any wired phone, and now on my new cell phone, I need only switch "on" the hearing aid telecoil to enjoy noticeably stronger and clearer sound. Figure 11-1 shows how small telecoils are.



## Hearing Loops

Enhanced phone listening was reason enough back in the late 1990s for my audiologist and hearing aid manufacturer to include telecoils in my hearing aids (for no additional charge). "I would strongly recommend that just about every hearing aid include one," says the influential audiology researcher-writer and American Academy of Audiology Career Award winner, Mark Ross. "It is the position of [HLAA] that telecoils be given the prominence they deserve as a valuable hearing aid feature that will allow the expanded use of assistive listening devices," concurs the Hearing Loss Association of America. In Britain, where virtually all hearing aids distributed by the National Health Service come with telecoils, the assistive listening use of telecoils is well understood and, as I have witnessed during my annual sojourns there, widely applied.

I first experienced hearing aid compatible assistive listening at the 800-year-old Iona Abbey, off Scotland's west coast. Knowing that I was challenged to understand the spoken sound, and noticing a hearing assistance sign similar to the one in Figure 11-2, my wife nudged me to activate the telecoils that my audiologist had given me. The result was dramatic, the audiological equivalent of going from a rough gravel road to fresh asphalt. Suddenly the speaker's voice seemed to be coming from the center of my head. It was what we psychologists call an unforgettable "flashbulb" experience.



Figure 11-2: Symbol for availability of hearing assistance



On a recent visit to London, I ventured on my first afternoon over to nearby Buckingham Palace, where the gift shop checkout counter displayed a prominent sign indicating that hearing aid wearers may activate their telecoils to receive the cashier's enhanced voice via a small counter hearing loop (a magnetic induction loop which picks up the person's voice from a microphone (mic) and sends the hearing aid wearer a magnetic signal similar to that from a phone).

Leaving the shop, I ambled into Westminster Cathedral, where a Saturday afternoon mass was underway. The priest's voice was indecipherable to me after bouncing around the cathedral's vast, ancient stone walls. But not a problem, for when I activated my telecoils the priest's voice suddenly was broadcast by loudspeakers that were inside my ears. There was no need for me to locate and wear a conspicuous, hearing aid incompatible headset. Few people with hearing loss will take the trouble to do so, which means that most such units (which in the United States are mandated under the Americans with Disabilities Act) sit unused in theater, auditorium, and worship center closets.

The next morning I worshiped at Westminster Abbey. Once again, the sung and spoken words were a verbal fog, until I switched on my telecoil receivers. With utter convenience and invisibility, the deliciously clear sound transmitted wirelessly via my own hearing aids. When the 50<sup>th</sup> anniversary of Queen Elizabeth's coronation was celebrated there, the program's first words were: "The whole of the church is served by a hearing loop. Users should turn their hearing aid to the setting marked T."

On an ensuing evening, a taxi drove me to a drop-off point near a theater. As I sat in the back of the taxi, the driver, from the other side of a plastic screen, gave me walking directions. I heard them clearly, because all London taxis (and now many in Edinburgh, I've discovered) have induction loops that broadcast the driver's voice to telecoil-equipped hearing aids. As I paid the driver, I marveled at the technology and asked him where the microphone was. He smiled, and pointed to a little dashboard hole.

After experiencing this new use of hearing aids in many British venues, from churches to the Royal Society of Edinburgh's auditorium and seminar room, I thought why not the USA? To begin bringing the technology home, I did what you can easily do. I obtained and installed a simple home TV room loop. (These can be purchased for \$200 or a little more from vendors listed at [hearingloop.org/vendors.htm](http://hearingloop.org/vendors.htm).) One simply (a) plugs the little loop



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amplifier into a power outlet, (b) connects it using the patch cord provided to the television's audio out port, and (c) runs the loop wire around the seating area. The wire can be run under the carpet, around the edge of the room, at the ceiling or attic level, or, as in my case, by dropping it through the baseboard and then stapling it to the basement ceiling studs. For even greater simplicity of installation, one can purchase a thin pad that slips under the cushion of one's favorite chair, which effectively loops not the room but just the chair.

Once installed, I turned on the TV, activated my telecoils, and found the corners of my mouth approaching my ear lobes. Even with the TV volume set low, sharp, strong sound was broadcasting from inside my ears, at a volume (for me alone) that I set on the loop amplifier. Unlike my previous infrared TV listening headset, which required removing my hearing aids, the new loop system harnessed my hearing aid technology, which includes a Mic + Telecoil (M/T) setting. Rather than blocking out the sound of the phone or doorbell ringing, or my wife speaking, the M/T setting welcomes such sounds alongside the TV signal. Figure 11-3 shows how this is set up.

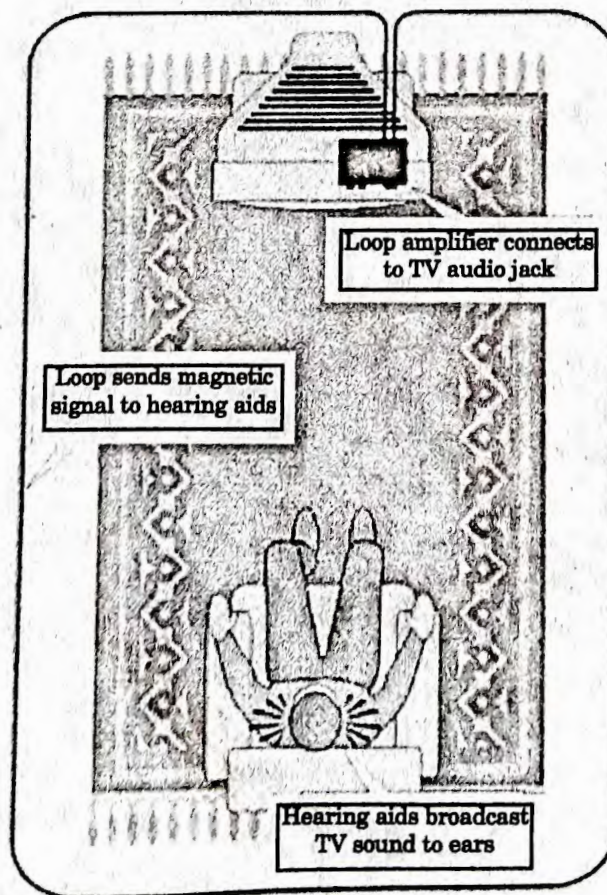


Figure 11-3: Infrared signals encompass room for TV reception



And it's not just me benefiting from this home technology. A California audiologist I know now offer a free home TV room loop with every hearing purchase. (The installations initially were done by his 17-year-old son, using fish tape to snake wire under carpet.) While looping more than 1500 homes, his practice has flourished thanks to word of mouth from his happy patients, who are enjoying doubly useful hearing aids. When he surveyed samples of his patients with and without the home loop system, he found markedly higher satisfaction with both TV listening and with hearing aids among those with the home loop. Given home loops, 63 percent indicated the highest level of satisfaction with TV listening, as did 53 percent regarding their hearing aids. For patients without a home loop system, the corresponding figures were 7 percent and 3 percent.

### **Looping West Michigan**

Having experienced the spread of hearing aid compatible assistive listening throughout the UK in my annual visits there since a mid 1980s sabbatical year, I have wondered why not the USA? Here the prevalent assistive listening systems are hearing aid *incompatible*. They require us to locate, check out, wear, and return receivers which often come with conspicuous headsets (which, by the way, loop systems can also provide for those without telecoil-equipped hearing aids).

Your local movie theaters have these. Under the Americans with Disabilities Act, public venues with fixed seating for 50 or more people must provide these receiver/headset units. But rarely if ever do you see them used. People with hearing loss *should* be willing to undergo the hassle and mild embarrassment of using these headsets. But because few of us are willing, they mostly sit unused in closets. One manager at my city's seven-screen theater complex estimated that their units are checked out about once per month per theatre. A past president of Michigan's Hearing Loss Association told me that after her city's biggest public auditorium installed one of these hearing aid incompatible systems she became the first person to use it—a year later. (They unwrapped it from the box, just for her.)

The Rochester (NY) Hearing Loss Association of America appreciates this reality: "Many people do not extend themselves to identify their need, collect personal receivers ahead of time, or wear rather noticeable headsets. Such receivers are always required for FM and infrared systems." My own church offers an example. Our



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old infrared assistive listening system was used by one severely hard of hearing person. Within a few months after installing a new hearing loop system, I knew of ten people who were invisibly using it (most of whom approached me to express their delight).

After I launched a community initiative (see [hearingloop.org](http://hearingloop.org)), with support from two local companies and our community foundation, most of my city's major worship and public facilities became looped, including our library auditorium, senior citizen center auditorium, city council chambers, college auditoriums, funeral homes, and so forth. Word of mouth and media publicity has since spread the technology to surrounding cities such as Muskegon and Grand Rapids, where the city convention center, performance hall, and airport concourses and gate areas are now all looped. Figure 11-4 shows a bank drive-up teller window with signage indicating loop capability. (See [hearingloop.org](http://hearingloop.org) for listings of West Michigan loop installations.)

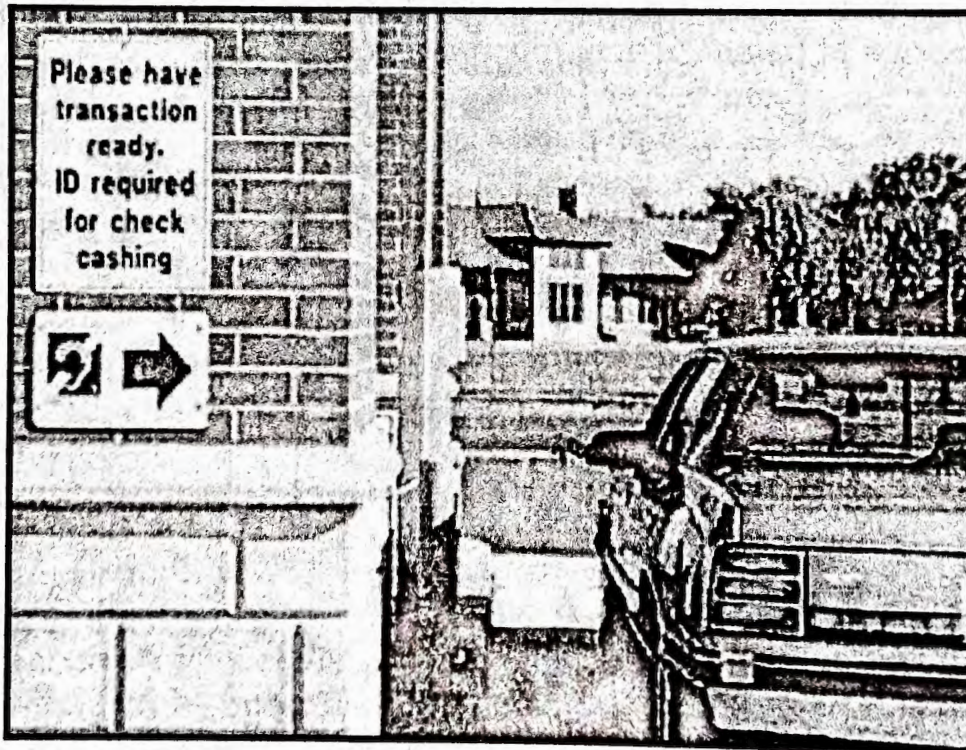


Figure 11-4: Driver making bank transaction at drive-up teller window can see signage indicating loop capability and thereby can switch hearing aid from "M" to "T" for clear reception

Countless unsolicited anecdotes reveal the initiative's human impact. One woman, who refused to use her church's headsets, said, "It's actually fun to go to church, and it hasn't been that way for a



long time." After switching on her telecoil and hearing sound "like I hadn't in years," another woman burst into tears of joy.

One pastor was initially let down when his church's new loop system had no known users. Within eight months, however, three long absent hard-of-hearing parishioners had returned and three newcomers had sought out his newly accessible church.

The enhanced functionality of hearing aids has motivated many people to visit our area's hearing professionals, who in turn have been supportive of West Michigan becoming a cool place for people with hearing loss. The former owner of Holland, Michigan's largest audiology practice observed that, "Never in my audiology career has something so simple helped so many people at so little cost." Another audiologist I know told me that, "Nearly everyone I've seen who has the loop system has had favorable results."

### **Looping America**

The West Michigan effort is being extended by hearing loss consumer groups in other communities, including Tucson, Phoenix, Albuquerque, New York City, Williamsburg, Racine (WI), St. Joseph/Benton Harbor (MI), and Silicon Valley. Speaking for consumers, the Hearing Loss Associations of California and Michigan are now recommending hearing aid compatible assistive listening. "In all new and extensively remodeled buildings, wherever there is a public address system, a loop should be permanently installed," declares the California association. With support from both hearing professionals and consumer groups, the Arizona legislature recently passed and Governor Janet Napolitano signed a bill that requires hearing professionals to explain the usefulness of telecoils to people purchasing hearing aids.

Janice Schacter, who leads New York City's Hearing Access Program, reports that hearing loops are now in "the New York Historical Society, soon more than two dozen subway information booths and three buses in New York, the Museum of Modern Art's classroom, Temple Emanu-El (the world's largest Jewish house of worship), the Kentucky Derby Museum, the Dayton Aviation Center, and the Chrysler Museum. They're also coming to other places such as Ellis Island, Graceland, and a pilot program for the New York City Transit and Limousine Commission." Figure 11-5 is a picture of a New York City Transit Wall Street station ticket window. You can see the loop symbol indicating to riders the compatibility.



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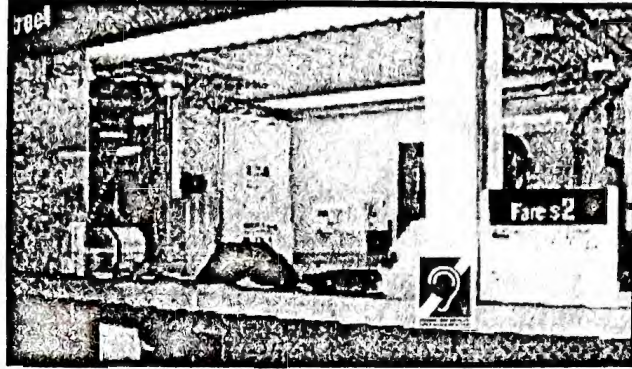


Figure 11-5: NYC Transit Wall Street station loop signage

In the UK, audio engineering firms routinely offer hearing aid compatible hearing loops to venues wishing assistive listening. Despite the growing consumer push for hearing aid compatible assistive listening, most American audio engineering firms continue to install assistive listening that is hearing aid incompatible. Doing this is easier and a bit less expensive to install (no need to run a wire), though it entails the additional long-term cost of purchasing receiver/headset units and maintaining live batteries in them. People with hearing loss, especially those who have experienced the alternatives, prefer hearing aid compatible loop systems because they —

- *do not require picking up, wearing, and return of external equipment;*
- *require purchasing and maintaining fewer receiving units and batteries;*
- *are used invisibly;*
- *work in transient situations* (ticket counters, drive-through stations, etc.);
- *entail no hygienic concerns* regarding multiple users of ear pieces;
- *enable flexible use*, including direct listening (Microphone), loop broadcast (Telecoil), or both (M/T);
- *deliver personalized sound*, customized for one's own hearing loss;
- *work with new generation cochlear implants*, which also are now coming with telecoils;
- *are hearing aid compatible*, and are, therefore
- *much more likely to be used*, and increasingly so after installation, which also makes them;
- *more cost-effective* on a per-user basis.



Such considerations led Terry Portis, Ed.D., past executive director of the Hearing Loss Association of America, to conclude that, "Our country will never be accessible for people who are hard of hearing unless we make hearing aid compatible assistive listening a reality." Better Hearing Institute director Sergei Kochkin also notes that the way to increase adoption of hearing aids is to increase their utility. Double their functionality—with simply-operated "miniaturized internal wireless receivers in every hearing aid"—and word-of-mouth advertising will promote hearing aids and the stigma of hearing instruments will decline.

### **New 21<sup>st</sup> Century Wireless Hearing Solutions**

Hearing loops are today's easily affordable wireless hearing solution. Other wireless technologies are now becoming available. One can, for example, purchase wireless FM transmitters which communicate with receivers attached to behind-the-ear aids, though at considerable expense. Might future alternative technologies offer assistive listening that, like telecoils and loops, is *miniaturized* (can work in all aids), run on *low power* (won't require large batteries), *inconspicuous* (unlike the headsets available with hearing aid incompatible assistive listening systems, as well as with loop systems), and virtually *free* (and thus affordable to anyone)?

The president of a major hearing aid manufacturer told me that, "Loop systems and telecoils have a tremendous advantage over current and upcoming technologies as regards cost of provisioning. I am hard pressed to come up with competing technologies that will seriously challenge the performance/price equation of loops in even the next five years. And from a cosmetics/stigma point of view, telecoils are even finding their way into micro-BTE's these days."

Why wait to work toward an American future where the functionality of hearing aids is doubled? Wireless assistive listening is available today! Looping America could increase the appeal and use of hearing aids, reduce their unit cost, decrease the stigma associated with hearing loss and hearing aids, and increase public support for Medicaid, Medicare, and insurance reimbursement for hearing aids. If consumers, hearing professionals, audio engineers, and facilities managers can mobilize around this vision, then perhaps the United States needn't forever lag other countries in supporting those of us with hearing loss.