

Telephones and Hearing Aids: 2008

Douglas L. Beck Au.D.
Director of Professional Relations
Oticon Inc, Somerset NJ

Christopher Passarella
Software & BlueTooth Specialist
Oticon Inc, Somerset, NJ

Introduction:

Telephones and technologies used to couple telephones to hearing aids have changed dramatically. Nonetheless, despite a multitude of obstacles over the last 60 years, one could consider the T-coil (used to couple magnetically telephones and hearing aids) the first true “wireless” connection between telephones and hearing aids.

T-Coils:

T-coils (also known as telecoils, telephone coils and induction coils) are the most common way to connect hearing aids and telephones. T-coils are, in essence, mini magnetic antennas and they’ve been commercially available since 1947 – more than 60 years (Levitt, 2007).

T-coils are manufactured in a variety of sizes, styles and strengths to fit within modern, tiny hearing aids. T-coils were included in more than half of all hearing aids sold in 2005 and 2006 (Kirkwood, 2006). In addition to the most common “T” (telephone) and “MT” (microphone and telephone) switches installed on most hearing aids, automatic T-coils are available on many hearing aids. As the name implies, automatic T-coils switch from environmental microphone to T-coil input/source, when a local magnet triggers the change (see “Magnetic Reed Switch” in Beck & Brunved, 2006).

Programmable T-coil circuits with dedicated pre-amplifiers are the preferred T-coil technology. Programmability allows the hearing professional to adjust gain, as well as characteristics relating to sound quality (i.e., spectral response) too, within the hearing aid’s T-coil settings. Programmability allows the wearer to maximally perceive speech sounds originating within the telephone, without background noise, without acoustic feedback and without distortion from the telephone’s speaker, or the hearing aid’s microphone.

Loop Systems:

When a hearing aid wearer has a T-coil within their hearing aids, this can be highly advantageous in public venues, too. Although somewhat rare in the USA, classrooms, houses of worship, auditoriums and lecture halls are “looped” – to broadcast speech sounds within a given area directly into the hearing aid’s T-coil. Looped venues are more common in Europe and across the UK and include theaters, taxi cabs, transportation hubs and offices, houses of worship and other public gathering areas. T-coils have vast and varied application and can deliver a wealth of audio-sources directly to the hearing aid (Bauman, N. 2005).

T&M Ratings:

To help consumers and professionals figure out which hearing aids and phones work best together, descriptive T & M ratings were devised. Ratings range from 1 (worst) to 4 (best). T ratings describe the compatibility with a hearing aid T-coil, while M ratings describe the compatibility with a hearing aid microphone, measured for a particular phone. Ratings of 1 and 2 are below the FCC standard,

a rating of 3 meets the standard and a rating of 4 exceeds the FCC standard (see Beck and Brunved, 2006).

Federal Guidelines:

In September, 2006, the Federal Communications Commission (FCC) required manufacturers of digital cell phones to offer hearing aid compatibility in at least two cell phone models. The FCC also stated that by 2008, one-half of all cell phones would have to meet hearing aid compatibility guidelines (see the FCC website for complete details <http://www.fcc.gov/cgb/consumerfacts/hac.html>). As specified in the 2008 FCC publications, significant quantities of cell phones will need to meet or exceed T3 and M3 ratings.

Bluetooth and Telephone:

Bluetooth is a short range wireless technology that facilitates data and voice transmission between two devices. Bluetooth technology allows hearing aids to have connectivity to wireless devices such as telephones (Levitt, H., 2007). Nonetheless, Bluetooth is too large for most hearing aid applications. Bluetooth chips are often 9 x 9mm, plus the size of the antenna (CETECOM). Further, Bluetooth's weight and power issues are prohibitive in hearing instruments.

The synergy realized via Oticon's Streamer allows Bluetooth and magnetic technologies (Schum, 2007) to facilitate wireless communication between hearing aids and other audio-based technologies, such as MP3 players, CD, DVD, cell phones and more, while keeping the hearing instrument itself, tiny.

Conclusion:

Barriers such as the interface between telephones and hearing aids are being addressed and managed effectively through the use of combined and revolutionary technologies. The combination of hearing aids, magnetic, wireless, Bluetooth and telephone technologies allows hearing impaired people to successfully use phone systems to enhance their quality of life while maximizing communication.

References:

Bauman, N., (2005): Using T-Coils to Couple Your Hearing Aids to Various Audio Devices
<http://www.hearinglosshelp.com/articles/tcoils.htm>

Beck, D.L. and Brunved, P. (2006): T-Coils - Beyond the Telephone.
http://www.oticonusa.com/eprise/main/SiteGen/Oticon/Content/Professionals/Library/News_From_Oticon/T_Coils_Beyond_the_Telephone.html

CETECOM ICT Services:
http://www.cetecom-ict.de/more_bluetooth_eng.php

Federal Communications Commission (FCC, USA) 2008:
http://www.fcc.gov/cgb/consumerfacts/hac_wireless.html

Federal Communications Commission (FCC, USA) 2006
www.fcc.gov/cgb/consumerfacts/hac.html

Kirkwood, D.H. (2006): Survey: Dispensers Fitted More Hearing Aids in 2005 at Higher Prices. April, 2006. VOI 59, No 4.

Levitt, H. (2007): "Historically, the paths of hearing aids and telephones have intertwined." Hearing Journal. November, 2007. Vol 60, No 11. Pages 20-24.

Schum, D.J. (2007): Redefining the Hearing Aid as the User's Interface With the Near and Far Worlds. May 2007. The Hearing Journal.

http://www.audiologyonline.com/theHearingJournal/pdfs/hj2007_05_p28-33.pdf