

Looping

HLA of AA
Hearing Loss Association
of Ann Arbor



There are two parts to this presentation

Part I (slides 2 – 11)

- What is HLA3?
- a non technical description of Looping
- HLA3's Looping track record

Part II (slides 12 – 19)

- Detailed steps for installing a loop

What is **HLA3**?

- ✓ HLA3:
 - **H**earing **L**oss **A**ssociation of **A**nn **A**rbor
- ✓ Local support group for hard of hearing and deaf people
- ✓ We meet once a month
- ✓ We also have social events throughout the year
- ✓ Our goals include
 - supporting each other in coping with reduced hearing
 - disseminating information useful to our members
 - making Washtenaw Co as accessible as possible to hearing impaired residents. This goal is the foundation of an ongoing project called Looping.

What is Looping?

- Looping is a technology that uses a magnetic field to enhance the use of hearing aids and cochlear implants that include a "t-coil"; many hearing aids and cochlear implants today include t-coils
- An entire room or a part of a room can be looped - for use by a group of people
- Or, there are table top loops for one on one use

Why Loop?

- Looping enhances the efficacy of hearing aids and cochlear implants:
 - The user hears more (increased quantity) and
 - hears more clearly (increased quality)

Who is affected by a loop?

- ☞ People who have turned on the t-coils in their hearing aids or Cochlear Implants hear the sounds from the microphone directly through their hearing devices, rather than through speakers.
 - This sounds more like listening to someone on the telephone than through speakers (distortion is much lower)
 - Amplification systems tend to distort, even for people with normal hearing; now the speaker system can be set for a reasonable volume for the majority of the crowd, with a private boost to those with t-coils
- ☞ An active loop is undetectable to people who do not have a t-coil assisted listening device enabled.

How is a room Looped?

- ✓ Looping is very simple and very unobtrusive
- ✓ A wire is placed around the room
 - preferably concealed in a drop ceiling
 - can also be under the carpet
 - can even be under a wood floor – in the lower level
- ✓ The two ends of the wire are attached to an amplifier

How is the Loop **used**?

- ☞ People wearing t-coils sit within the loop
- ☞ Their hearing aids or cochlear implants are switched to t-coil mode
- ☞ The person speaking speaks into a microphone (wired or wireless)
- ☞ **THAT'S IT!**

What does it **cost** to Loop?

- ☞ There are four components to looping:
 - the loop (simple wire) – approx \$15.00
 - the amplifier – approx \$150 - \$200
 - Microphones – approx \$40.00 - \$150.00
 - Labor

- ☞ Total cost (not including labor): \$300.00 - \$400.00 per site

Has HLA3 looped?

- ✓ Yes
- ✓ We looped the conference room at the Ann Arbor Center for Independent Living
- ✓ We looped a conference room at the Turner Senior Center in Ann Arbor
- ✓ We looped a meeting room at the Burns Park Senior Center
- ✓ We looped part of the sanctuary of a church in Dexter

What was the **result**?

- ☞ At these sites, those wearing t-coils can get more out of meetings and even social gatherings
- ☞ In fact some t-coils users were not even aware that they had this feature until they saw the sign and inquired about their own devices
- ☞ People using the looping system are more fully able to participate in and enjoy the events

Part II

How to Install an Audio Loop A "Best of BH" by Geodv@earthlink.net aka George DeVilbiss

Audio loops are easy to understand but their installation may require a lot of manual labor.

The following 6 slides provide detailed installation steps and pointers.

But before considering the installation of an audio loop someone with a T coil should walk around the area to be covered to determine if severe interference is picked up.

Amplifier Power

- First we need to know what power amplifier is required. Based on my experience, a 35 watt amplifier will cover a 25 x 25 foot square area nicely. For any area larger than this I would recommend a 100 watt amplifier with a limit of an area 100 X 35 feet. If solid coverage is required, I do not recommend installing a loop if the area is wider than 35 feet.
- How well a loop will operate will also depend upon the metal in floor ceiling or walls. Before making a permanent installation, I usually lay out a temporary loop around the area to be covered and using "T" coils explore the signal strength with my or someone else's "T" coil.
- There has been some experimenting done with various configurations of the loops to better cover a large area with less power but I am not familiar with this work and this is intended for those who wish to make a simple installation in a small meeting room, Church, or small auditorium.

Wire Size

- Wire size is not critical. My choice is 18 ga "zip" or lamp cord as it is readily available and least expensive. If an area is small 22 or 24 gage speaker wire will work nicely. This smaller wire has a higher resistance and may be necessary when the overall length of the loop is short. Unless one has a "constant current amplifier" it is necessary to have the D.C. resistance in the order of 2 ohms if the loop is to be connected to an amplifier with a 4 ohm output. Less resistance than this can result in amplifier damage.
- NOTE: do not confuse DC resistance with Impedance. Impedance can best be defined to the non-technical types as AC resistance and audio is AC whose impedance changes inversely with frequency. In other words, if the impedance of the loop is 4 ohms at 1000 Hz it will be only 2 ohms at 500 Hz, and 40 ohms at 10 kHz assuming zero resistance of the loop.

Number of Turns

- The magnetic field strength is a function of the number of turns and the amount of current flowing in the wire. Since the impedance of the loop increases with the number of turns and the current decreases as the impedance increases, increasing the number of turns does not always result in a higher field strength in the frequency range that we hard of hearing people need for best hearing.
- In most meeting rooms that I have encountered, churches, SHHH meeting rooms, etc. I have found that two turns is a happy compromise of cost, ease to install, and frequency range. Connecting the loop as explained later will result in a two turn loop when using two conductor cable or wire.

Ceiling or Floor?

- If the ceiling is suspended, even with the metal that is used to support the ceiling tile, installation is much simplified. Simply install the loop wire around the room. No nailing or gluing is required and the wire is not visible except where the lead exits to the amplifier.
- Clear insulation lamp cord can be placed around the top of the baseboard if it exists and glued in place with clear glue. My favorite glue is "Shoe Goo II", held in place with masking tape until it solidifies. Shoe Goo II is available at most shoe stores and usually at "K Mart". The wire can be placed over a doorway or, if a threshold exists and can be removed and replaced easily, the loop wire can be placed under the threshold. If the area is carpeted, run the wire under the carpet unless it is so firmly glued in place that that is impossible to put a wire underneath, in which case, the wire must be run over the door. Have the two ends of the loop wire end at a place close to the location of the amplifier. Leave a foot or two overlap of the two ends to facilitate connections.

Making the Connection

- After the loop is in place, it is time to consider the connection, which is really quite simple. I am going to try to explain this without a drawing. The clear insulation zip cord or speaker wire should have separate wires which are readily identified, usually, one wire will be silver colored and the other wire will be copper colored. Strip the insulation from the wires on both ends. Connect one silver colored wire from one end to a copper colored wire from the other end. The connection can either be soldered or twisted together and a wire nut used to hold them together. I prefer the wire nut so that no soldering is required and it is not necessary to provide any insulation such as electrical tape. You will now have a silver colored wire from one end and a copper colored wire from the other end of the loop wire.
- These two ends can either be connected directly to the amplifier or a two conductor wire such used in the loop can be connected to the two ends of loop wire, twisting the wires together and securing the joints again with wire nuts. Be sure to buy wire nuts designed to be used with 18 ga wire. The other end of this lead wire can now be connected to the amplifier.

Note: if Brown colored lamp cord is to be used, it may not have silver colored wire and both may be copper colored. In this case examine the insulation of the two wires making up the loop. You will find that one of the wires has some ridges and the other will be smooth. So, in this case you would join the two dissimilar wires as explained above.

Checking for Proper Resistance

Part 1

- If possible, borrow an ohmmeter from someone which will measure low resistance to determine the loop's D.C. resistance. To be sure it does not damage the amplifier it should be in the vicinity of two ohms. If it is too low obtain a 1 ohm, 10 watt resistor from a radio repair shop or Radio Shack and connect it in series with one of the leads to the amplifier, in other words connect one end of the resistor to one wire and the other end to the 4 ohm terminal on the output of the amplifier. Connect the other end of the wire to the COM terminal. If you buy your amplifier from the Radio Shack, the clerk can point out these terminals for you but they should be clearly marked.

Checking for Proper Resistance

Part II

- Radio Shack amplifiers are quite satisfactory for this use and I have had excellent luck with their use. Do not consider that because they are not expensive that they are cheaply made. I have not found this to be true. I have no connection whatever with Radio Shack. The amplifiers are readily available and for a small fee you can buy a 3 year warranty so that if they fail within three years they will be repaired or replaced at no charge.
- Good luck. If you have any questions, I can be reached at Geodv@earthlink.net

George DeVilbiss
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How can I learn **more**?

- ✓ Please visit the HLA3 web page
 - www.hearingloss-annarbor.org
 - for a link to looping information
 - and information about HLA3 itself

- ✓ Other sites:
 - <http://www.hearingloop.org/>

- ✓ Or email us:
 - HearingLossAnnArbor@gmail.com



Are there any **Questions?**

