



# Q & A

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## Audio Induction Coil

**Q** I am 90 years old and have been reading *Gernsback electronics magazines* for many years. I once learned from your magazine how to hook up a Morse code key to a Model T spark coil to make a radio transmitter. It worked then, but today it would mess up a lot of people's TV reception.

My problem now is different. I need a schematic for a device to take the signal from a telephone circuit, amplify it, and feed it into a loop around a room. This should set up a magnetic field that can be detected by hearing aids with T coils. I know it has been done before. If you can be of any help on this, I and many of my senior friends would appreciate it.—H. B. A., Bay Village, OH

**A** What you describe is called audio induction. A large coil around the room and a small coil on the pickup unit form a big transformer, transferring the audio signal from one to the other magnetically. This isn't radio; little or no electromagnetic radiation is produced. (The coil is a monstrously inefficient antenna at audio frequencies.) Instead, what you're doing is exactly what goes on in transformers.

Some hearing aids use induction coils to pick up the signal from telephone receivers—it's more reliable than picking up the sound. Not having one of these hearing aids handy, we're not sure how sensitive they are, but Fig. 1 shows an audio induction circuit we've experimented with. The big coil has a resis-

tance of about 16 ohms and is fed with a few watts of audio, just as if it were a speaker. The small coil picks up a tiny audio-frequency signal, which is stepped up by the matching transformer and then fed to the microphone input of an amplifier. Pickup coils with substantially more turns may not need the transformer.

We trust you can adapt this circuit to your needs; you'll be using a hearing aid with an induction pickup in place of the pickup coil and amplifier. Others will find it useful as a way to transmit audio without wires to listeners who are free to move around and may even be on the other side of a wall.

## Remote Control Repeater

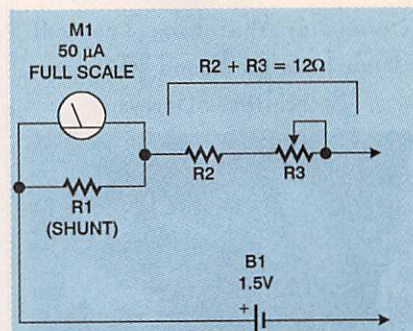
**Q** I'm sitting in my living room in my favorite chair trying to find the right angle at which to bounce the infrared remote control signal off the ball mirror and change the CD. What I need is a remote control extender. I tried to use the RadioShack IR receiver to modulate an IR emitter but I had no luck. What am I doing wrong?—T. P., St. Albert, Alberta, Canada

**A** The solution to the mystery is that the IR signal is chopped (turned on and off) at about 40 kHz to distinguish it from ambient IR light. The receiver module supplies un-chopped output, so you have to chop it again if you want to use it to control an IR-emitting LED. We published a circuit that does this in

the December, 1995 installment of this column.

## Sick Ohmmeter

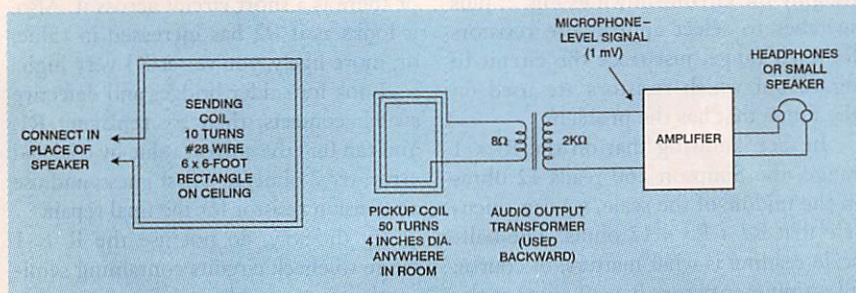
**Q** I recently dusted off my Simpson 260-5 (circa 1965) volt-ohm-milliammeter (VOM) and I'm having some trouble with the  $R \times 1$  scale readings. Fresh batteries and clean battery connections allow a full-scale 0 reading when I short the test leads, but the readings seem to be high by a factor of 4: 50-ohm resistors read 200 ohms, and so forth. I verified the test resistors with a DMM, VTVM, and another VOM. They all concur—the Simpson is off. The  $R \times 100$  and  $R \times 10K$  scales read normally, as do all voltage and current scales.



**FIG. 2**—THIS IS THE BASIC CIRCUIT of an ohmmeter that reads 12 ohms at half scale. The value of R1 is determined by the resistance of M1, the meter movement.

If anyone recognizes this anomaly, or has service experience with the 260, I would greatly appreciate any suggestions. It's a great meter that's worth saving. Also, I'd like to get a schematic and owner's manual for it; any ideas on where or how? Thanks.—J.A., Stony Point, NY

**A** Your second question is easy: Simpson Electric Company is still in business and still making the 260, although they're now up to model 260-8 instead of 260-5. You can reach them at 8853 Dundee Ave., Elgin, IL 60120, Tel: 847-



**FIG. 1**—AN INDUCTION LOOP transmits audio a few feet without wires. Experiment with different pickup coils; some might not need a transformer.