Dope from Hope ©

Being a sporadic publication of the engineering department of Klipsch and Associates, Inc.

Vol. 17, No. 1
March, 1978

SPEAKER WIRE

The controversy over "speaker wire" is a Tempest in a Teapot, but still a Tempest.

One manufacturer of speaker wire claims lower inductance which purports to reduce loss at high audio frequencies.

Our tests show that the inductive loss is negligible, and that the essential property of loudspeaker line wire is its ohmic resistance. The inserted line resistance should be of the order of one ohm or less to avoid degrading the damping effect of the amplifier on direct-radiator loudspeakers.

The resistance of a 40 ft. sample of one brand of speaker wire was compared to a similar length of one or more pairs of "zip cord".

A sample of speaker wire 40 feet long measured 0.315 ohm. Forty feet of double #18 zip cord measured 0.295 ohm.

The test recommended by one manufacturer of speaker wire was to use a stereo system with one speaker fed with speaker wire, the other with zip cord. With the selector in the "mono" mode, one may choose either wire by rotating the balance control. The trouble is that the test may be "slanted" by a simple adjustment of the individual volume controls, or by moving the "balance" control less than full sweep.

Certainly no two speakers are identical, nor will two locations in any room produce equal responses from the same speaker, let alone different speakers. The results can be "fudged".

We tried the "recommended" test and found it impossible to obtain an exact balance. The demonstration is easily slanted at the will of the one setting up the demonstration.

A better comparison is to feed a mono signal to both cables, and switch a single speaker to the output of one or the other cables.

This method of test showed no audible difference on guitar or octave bands of pink noise between 40 foot lengths of "speaker wire" or #18 zip cord.

To exaggerate the effect we compared 40 feet of speaker wire with 83' of zip cord. Again, no audible difference was observed on disk program material. With pink noise and an octave-band filter (7,500-15,000 Hz) a barely discernible difference was found, using only a piezo tweeter for the speaker.

Finally, response curves were run on speaker wire and on zip cord to show a negligible frequency discrimination. The damping factor change would be negligible for horn speakers; it is found to be negligible even for direct radiator speakers also.

The top curve in Fig. 1 shows the input to the cable at the output terminals of the amplifier and the bottom 2 curves (yes, there are 2!) show the output of 40 feet of "speaker cable" and the output of 40 feet of double #18 zip cord. The scale is one dB per major division.

Fig. 2 shows 2 curves (yes, there are again 2) of the output of "speaker wire" and double zip cord at 10 dB per major division, the way we run loudspeaker response curves. If you will sight along the curve, you will see it is not exactly a straight line. The curve was made with the X-Y Recorder, not with a straight edge.

We hope this dispells the fantasy about "high frequency definition" as well as any other claim of superiority of "speaker wire". Can you see the 0.04 dB difference in response droop at 20 KHz?

Remember that a 3 db change is barely audible on ordinary program material.

Overkill?

KLIPSCH AND ASSOCIATES, INC.

APPENDIX

For reference, different sizes of wire have the following resistances (from wire tables: actual wire may differ from tabular values by minus zero to plus 10%).

WIRE SIZE AWG	100 LOOP FEET (200 Total Feet)	40 LOOP FEET (80 Total Feet)
22	3.2 ohms	1.28 ohms
18	1.28 ohms	.52 ohms
15	0.636 ohms	.25 ohms
12	0.318 ohms	.13 ohms

Obviously one would not use #22 wire for a distance of 100 feet from amplifier to speaker, but just as obviously #22 would get by for a distance of up to 10 feet.

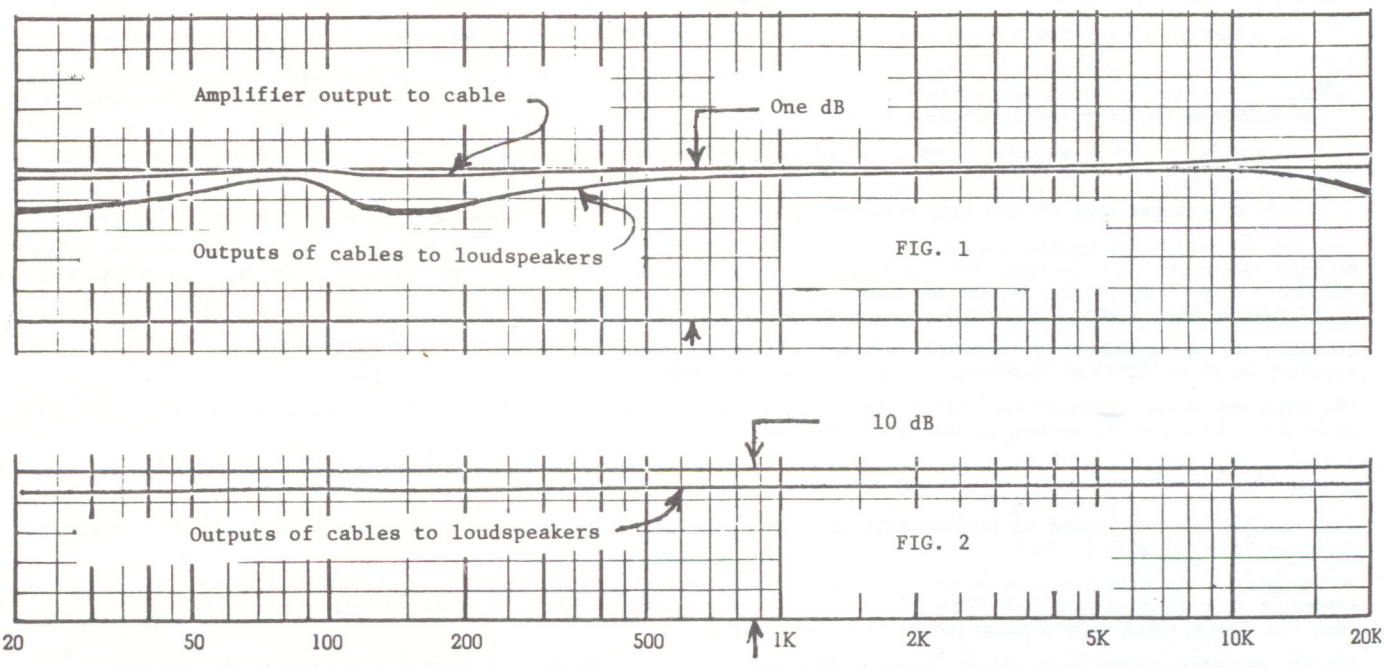

Fig. 1: Response of amplifier and output of cables feeding a direct radiator loudspeaker; vertical scale 5 divisions = 1 dB.

Fig. 2: Same as Fig. 1 except 5 divisions = 10 dB.