

TRASH CAN SPEAKER SYSTEM

By Barry Flick

Every loudspeaker requires a baffle. In the most general terms, the baffle can be described as the structure that surrounds the "raw driver" and makes it sound right in the listening room. Here is an idea for a speaker system that was suggested to me back in the late 1960's at a time when "omni-directional" speakers were more popular than they are now.

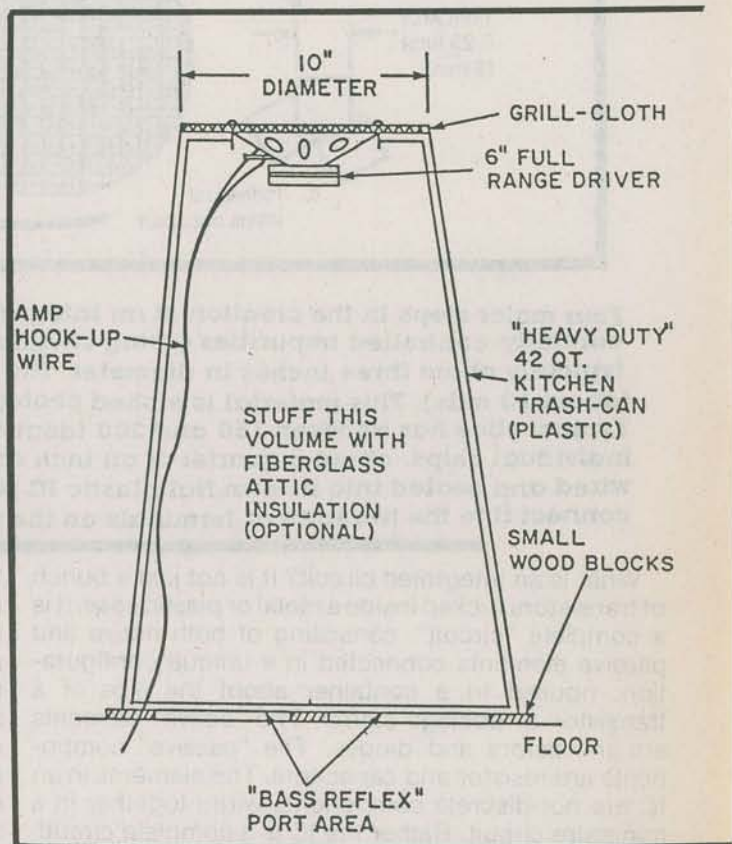
Omn-directional speakers differ from more conventional direct-radiating speakers in that they do not have a flat baffle board on which the drivers are mounted facing the listener thus radiating the sound directly at the listener. Instead, "omnis" radiate the sound into the room as a whole: toward the ceiling, toward the floor, or all the walls at once. Many people think this gives the sound a "laid back" ambient quality with a smooth pleasing response. Others think it has a tendency to blur the sound coming from the two stereo channels, thus causing an indistinct and confusing stereo image. The history of high fidelity has always been full of such controversies.

In any event, here are some plans for constructing an inexpensive, quick, and easy-to-build "omni" system. This speaker system will work best when coupled to the relatively "low-cost" department store variety stereo system which normally comes with a pair of relatively poor quality, four or five-inch, limited range speakers. If you own a state-of-the-art hi-fi system with high quality speakers to begin with, you probably won't want to go this route.

First, you will need a pair (for stereo) of decent quality six-inch wide-range raw speakers. Radio Shack catalog #40-1242, priced at \$5.95 each is a good choice. Next, visit your local department or hardware store, tape measure in hand, and look for a pair of heavy duty kitchen-type plastic trash cans. These cans are round and usually have a capacity of 30 to 40 quarts. The only "critical" dimension of our trash cans is the diameter of the bottom. It must be at least large enough to accommodate the cut out hole of the six-inch speaker, and still retain considerable strength. A diameter of about ten or more inches should be satisfactory; measure to be sure. The trash cans should be as thick and dense a material as you can find and I prefer "rubbery-flexible" kind of plastic to the "hard-brittle" kind because of possible vibration problems. The overall dimensions of the trash cans are not critical, however they should have a partial conical shape as practically all trash cans of this type do, and not a perfect cylindrical shape. This is to prevent a resonant peak in the bass response and

I think it makes the finished system look better.

Cut a round hole in the top of the speaker enclosure (the bottom of the trash can) marking it with a compass or other suitable round object of the proper diameter to accommodate the six-inch speaker. An old soldering iron works very well to melt the hole, however, be very careful to end up with a smooth edge. With the holes finished use small carriage bolts or similar fasteners to mount the speakers on the inside of the enclosure pointing straight up. It's a good idea to solder the speaker hook-up wire (amp connection) to the speakers before installing in the enclosures.



Cut a couple of pieces of grill cloth material and epoxy cement them over the top of the enclosures to protect the drivers. You can buy grill cloth material from Radio Shack or use any cloth that has a very loose weave. If you can see through it when it is held up to the light, it is probably suitable.

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Our speaker systems are now almost complete, however, one more step remains, which demonstrates how sometimes science merges into art. Look at the accompanying diagram. Notice that the speakers sit slightly off the floor, on wood blocks. This is not for cosmetic reasons. What we have constructed here is a bass-reflex speaker system. That little bit of space between the floor and the bottom of the speaker enclosure (the top rim of the trash can) is a tuned-port, although we have not tuned it yet. Cut varying thicknesses of wood blocks to set the speakers on. Three blocks per speaker should be sufficient. Now, hook up the two speakers to your amp and put on program material that has good strong bass. Pipe organ or string bass is best. Electric

bass guitar is not as good because the bass really doesn't go down as low. Using blocks of different thicknesses ($\frac{1}{4}$ " to $\frac{3}{4}$ ") play the music over and over and notice which thickness of the block makes the bass sound loudest. When the bass seems loudest, the port is optimally tuned.

As an additional improvement, you might try stuffing the enclosure full of fiberglass sheet insulation. The kind used in attics, without the aluminum foil backing. Hold it in place with vinyl electrical tape. This will have the effect of smoothing the response and should eliminate any stray vibrations you may be getting. Or you may decide that you like the less-smooth response better and leave it out. Let your ears be your guide.