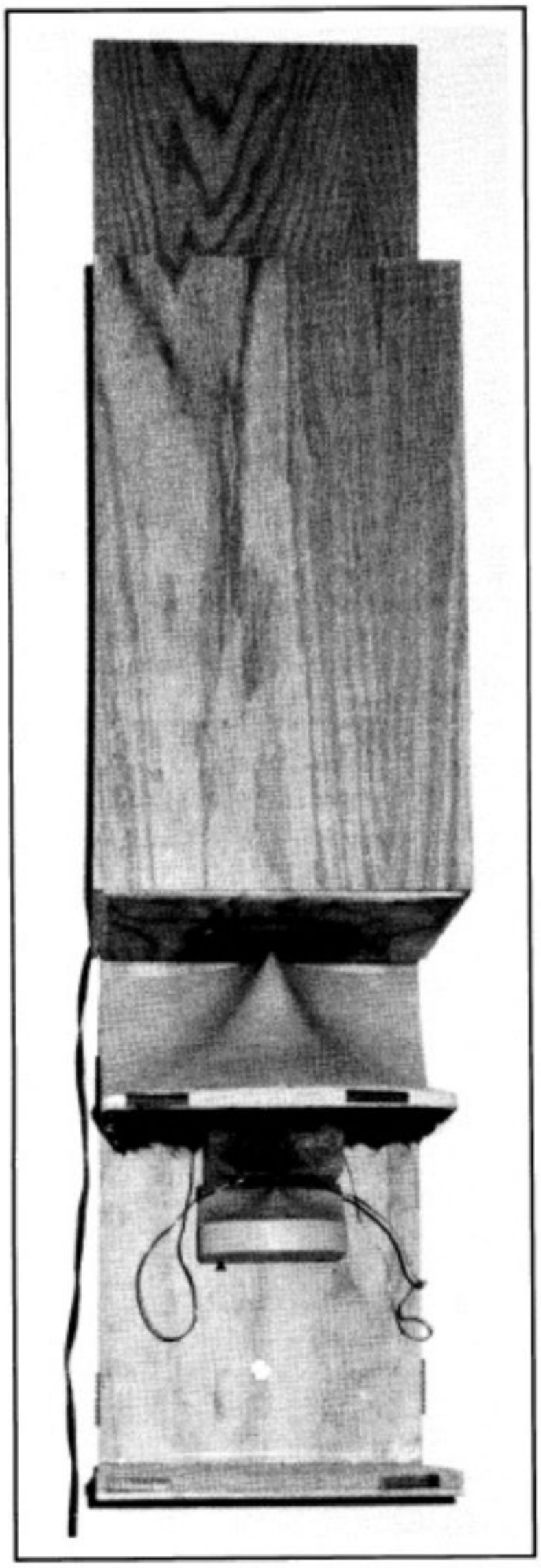

PHOTO 3: The speaker mounted on the wall.

two 6½" woofers in an Isobarik alignment. The amount of flawless bass that can be produced in this alignment always amazes me. I've also discovered that the Isobarik design is forgiving about the woofer quality. As long as the driver with a Q_{TS} of about 0.70 and a power rating between 30 and 50W is used, you will have no problems. Woofers with these characteristics are fairly common and can be obtained as generic products from any electronics mail-order catalog. Unfortunately, using two 8Ω drivers in parallel means a 4Ω system.

I used a Polydax MHD12P25 FSM rated at 50W and with a 4Ω resistance for the midrange.[2] For experimentation, it's cost-effective, as is the tweeter I employ, a 4Ω Polydax TW60A.

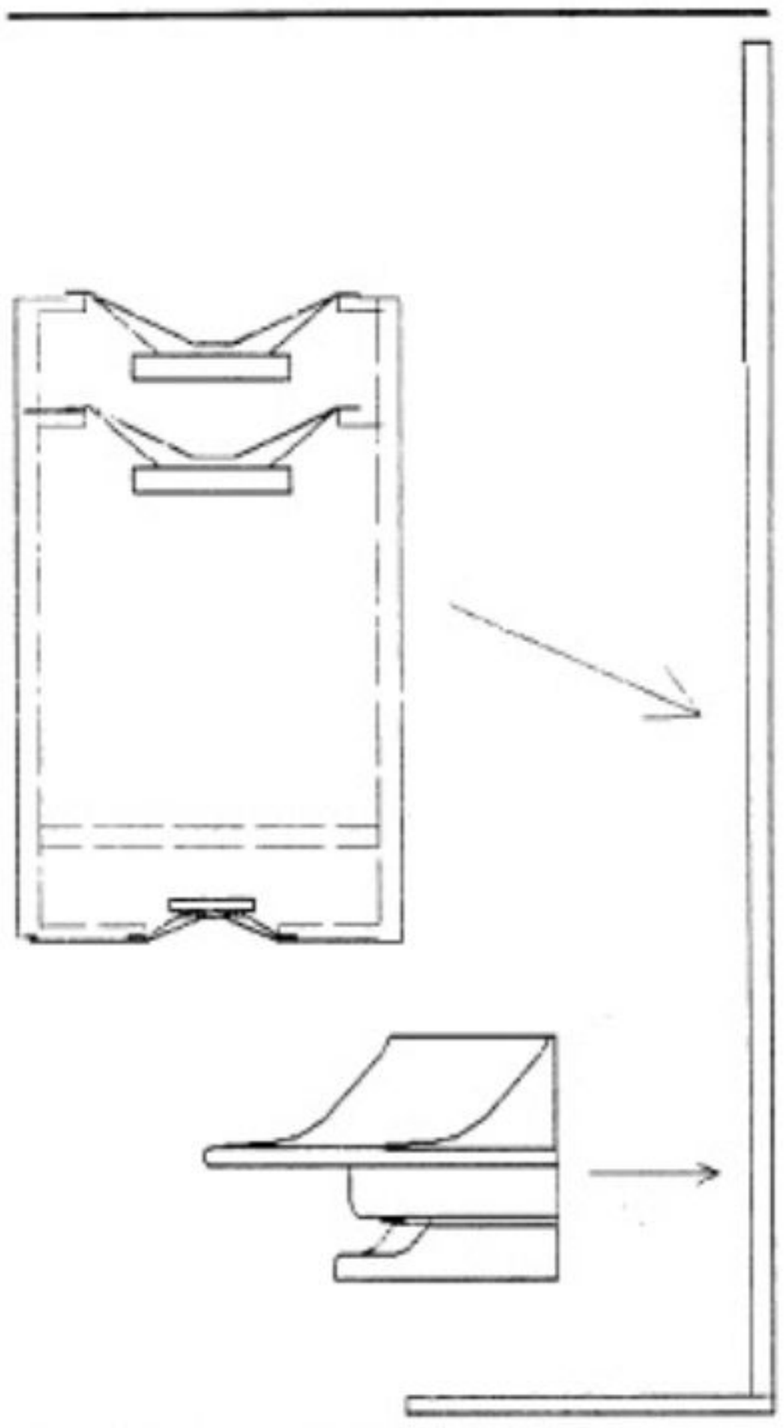

FIGURE 11: The cabinet modules.

A three-way, 12dB slope crossover, which crosses at 800Hz and 5kHz is used for the passive filtering. (Unfortunately, I have never been able to find the article, or book, from which I obtained it.) *Figure 10*, the schematic, displays the attenuation circuit necessary not only because of different driver efficiencies and the room environment, but also because of the drivers' orientation.

The enclosure uses an upward firing woofer. This resulted in an attenuation of 3.5dB for the midrange driver (R4 = 12Ω, R3 = 2Ω) and 1dB for the tweeter (R2 = 37Ω, R1 = 0.5Ω). A simple attenuation circuit taken from *The Loudspeaker Design Cookbook* (p. 50) took care of this.[3]

I made an axially aligned system with the centers of all the drivers on the same vertical axis and kept the lens right side up. An upright lens necessitates mounting the speaker on the wall near the ceiling, with the woofer facing the ceiling and the tweeter and the midrange driver pointing toward the floor. As you look at the speakers on the wall, the lowest part is the lens for the tweeter, followed by the tweeter mounted in a spacer, which itself is attached to the midrange lens (*Photo 3*). A spacer is necessary to prevent reflections of the tweeter's output off the back of the midrange lens. The midrange is placed over its respective lens and attached to the bottom of

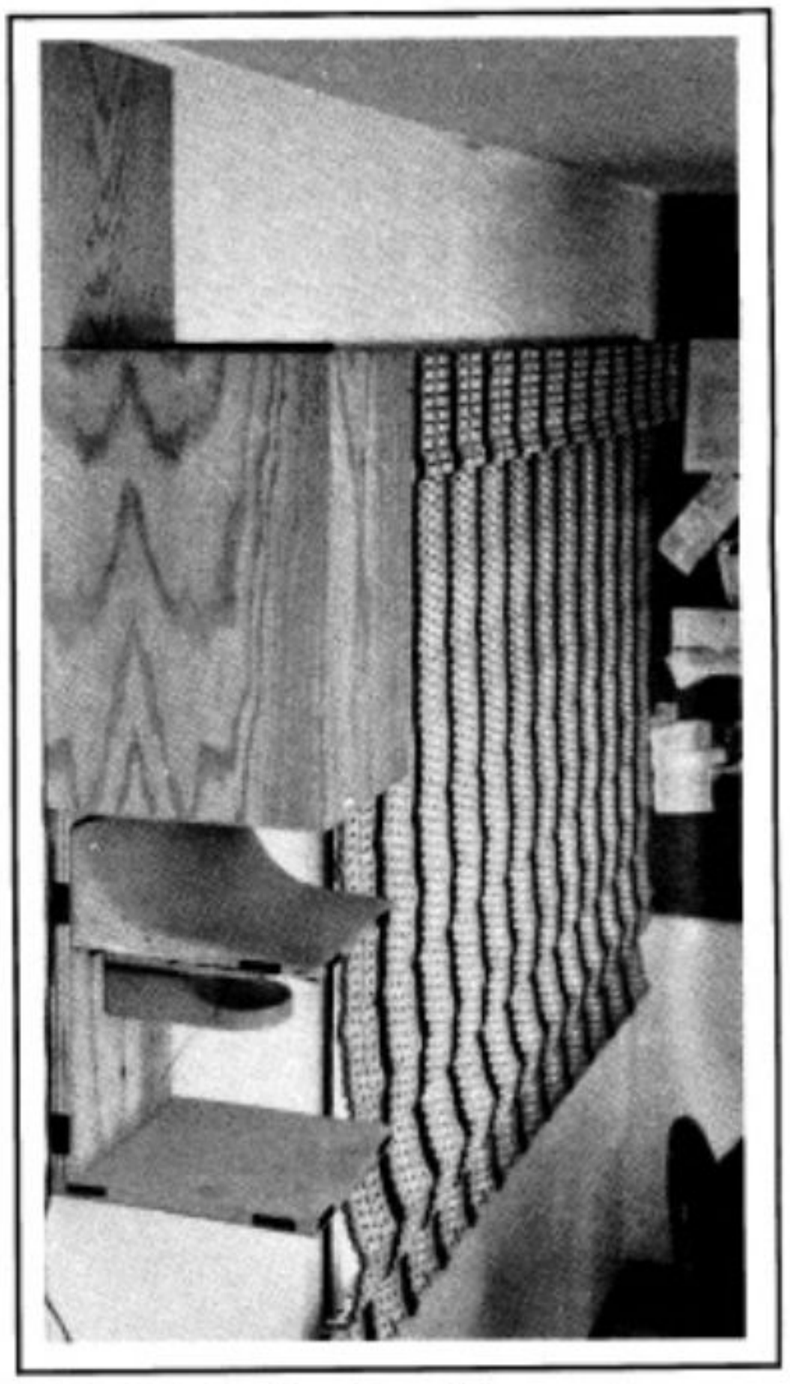

PHOTO 4: A side view of the speaker.

the woofer enclosure. The midrange has a compartment separate from the woofer, which it shares with the crossover. The top of the speaker is the 0.52 ft³ enclosure for the Isobarik woofer (*Photo 4*).

THE ENCLOSURE. The cabinet is made from 3/8" particle board covered with ¼" oak plywood. I made no attempt to construct a heavy nonresonating enclosure as it makes frequent removal from the wall for adjustments difficult. The cabinet is made of modules as can be seen in *Fig. 11*.

As stated earlier, the two lenses were screwed together with the tweeter and spacer assembly sandwiched in between. This was then fastened with screws to the speaker backbone (¾" plywood). The woofer and midrange enclosure is also a separate unit (albeit lacking a back), attached to the speaker backbone.

At the top of the speaker (near the woofer), the plywood was covered with the oak plywood while at the bottom (near the tweeters), a square piece of oak-covered particle board was added (*Fig. 12*). This square portion is smaller than the woofer and midrange enclosure by ¼" so the foam that hides the lens assembly fits snugly against the speaker. The foam is held securely with hook and latch adhesive strips.

This enclosure design has some drawbacks, the main one being accessibility to the crossover. To make adjustments,