

Georgia Tech Audio Lab Vifa 3-Way Loudspeaker Plans

Drivers:

Woofer: Vifa M26WR09 (10-inch woofer, \$89.70)
Midrange: Vifa P13WH00 (5-inch midwoofer, \$39.60)
Midrange Chamber: Vifa M13IC (1.8 liter chamber, \$4.00)
Tweeter: Vifa D25AG35 (1-inch tweeter, \$30.65)

Port or Vent:

3 in internal diameter tube cut to a 5 in length

Crossover Network:

(All inductors #18 wire air core, all capacitors 100 V or greater, all resistors 10 W or greater)

$L_1 - 5 \text{ mH}$

$L_2 - 5 \text{ mH}$

$L_3 - 0.2 \text{ mH}$

$L_4 - 0.4 \text{ mH}$

$C_1 - 25 \mu\text{F}$

$C_2 - 16 \mu\text{F}$

$C_3 - 30 \mu\text{F}$

$C_4 - 55 \mu\text{F}$

$C_5 - 5 \mu\text{F}$

$R_1 - 5.8 \Omega$

$R_2 - 3.3 \Omega$

$R_3 - 2 \Omega$

$R_4 - 10 \Omega$

$R_5 - 3 \Omega$

$R_6 - 10 \Omega$

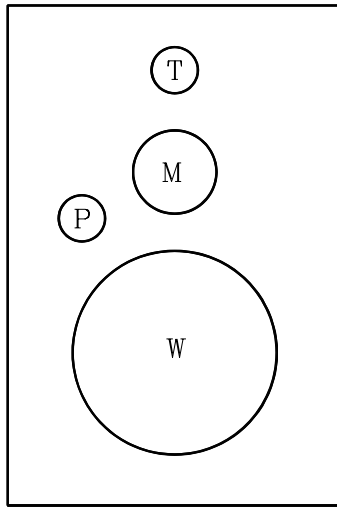
Midrange Chamber:

The midrange chamber should be mounted from the inside of the box, not through a hole on the front panel. It must be filled with uncompressed fiberglass up to the back of the midrange magnet structure. A thin ring of fiberglass should be put around the midrange magnet before installing it in the chamber. This ring of fiberglass is important. It damps a resonance that can occur in the air between the midrange magnet and the chamber. The ring of fiberglass should be thin enough so that it is not compressed when the midrange is put into the chamber.

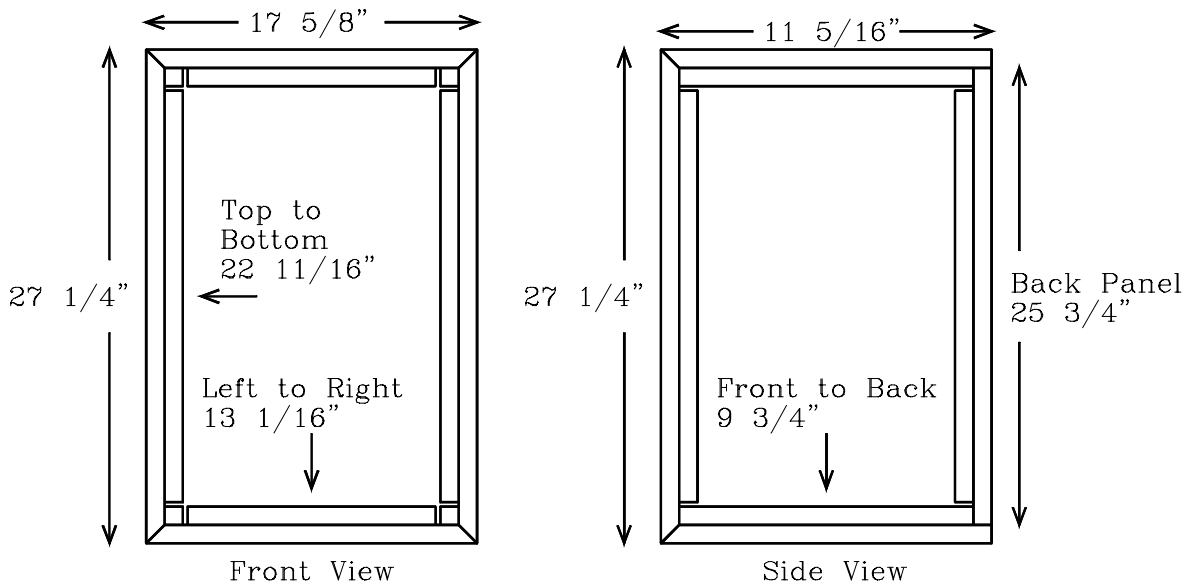
Box Construction:

Use 3/4 in veneered plywood. Bracing is 2 in by 2 in. After the boxes are built, seal all inside joints and the gaps between the bracing with caulk. Clear unpaintable silicon is best, but it is the most expensive. Put 1 in wide by 3/16 in closed-cell “camper” tape around the back panel bracing so that the back panels will seal when they are screwed on. I recommend at least 10 screws in the back panel, two at the top and bottom and 3 on each side. Staple 1 in thick fiberglass on all internal walls. The fiberglass should not come near the woofer or

the port. The length of the bracing is reduced by $1/16$ in so that it will not have to be forced into place in the box.



Front Panel



Circuit Diagram of the Crossover Network:

(This can be assembled on a commercially available 3-way crossover network printed circuit board. The circuit board will not be designed for this crossover network. With a bit of skill, all the parts can be put on it. Do not mount any inductors on top of each other. Note the electrical polarity of the drivers. It is important to reverse the midrange and tweeter.)

