

3-Way Bass Module Assembly Instructions

What You'll Need

At a minimum:

1. Screw Driver
2. Hammer or Mallet
3. Solder and Soldering Iron
4. Wire Cutters/Strippers
5. Wood Glue
6. Tape or Glue for the Port

You might also find it beneficial:

1. Clamps
2. Electric Drill
3. Wire Crimpers

Things to note:

This is a 3-way design which utilizes the same driver (CSS W5-06) for both midrange and woofer duty. In the steps below, the W5-06 used in the separate, small air volume will be referred to as the midrange, and the W5-06s used in the larger main air volume will be referred to as woofers.



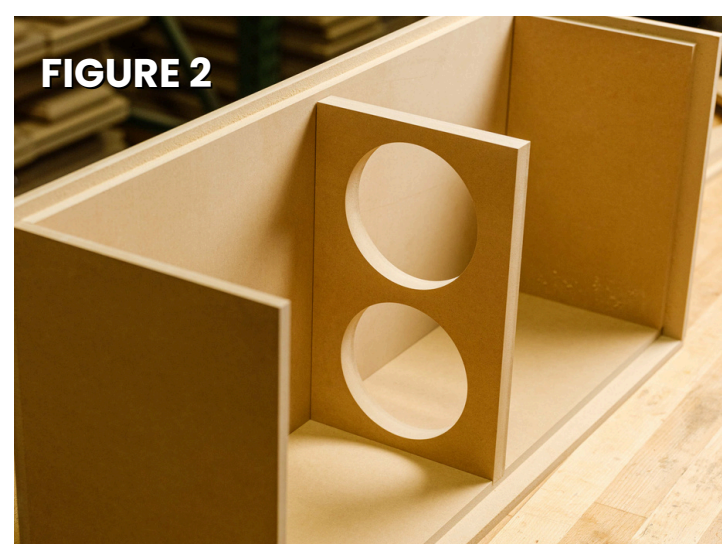
Flat Pack Enclosure Assembly

1. Verify all cabinet parts were received. (See figure 1)

2. Clear dust from the corners of all panels. Any debris in the joints will prevent you from getting a tight, flush surface when gluing up the cabinet.

3. Assemble the cabinet WITHOUT glue to ensure all panels fit together (figures 2 & 3).

NOTE: Due to regional and seasonal humidity differences, some sanding may be required to insert braces into appropriate slots.



4. Disassemble the cabinet and place the panels on a clean surface, arranged for easy assembly. Note the recommended assembly order in the pictures (*figures 2 - 4*). Make sure the front baffle is placed with the woofer flange recess facing out, and that the midrange chamber faces the midrange and woofer. The side with the brace cutout should be on the back of the cabinet. Also, ensure the rear baffle is placed so the terminal cup opening faces downward.

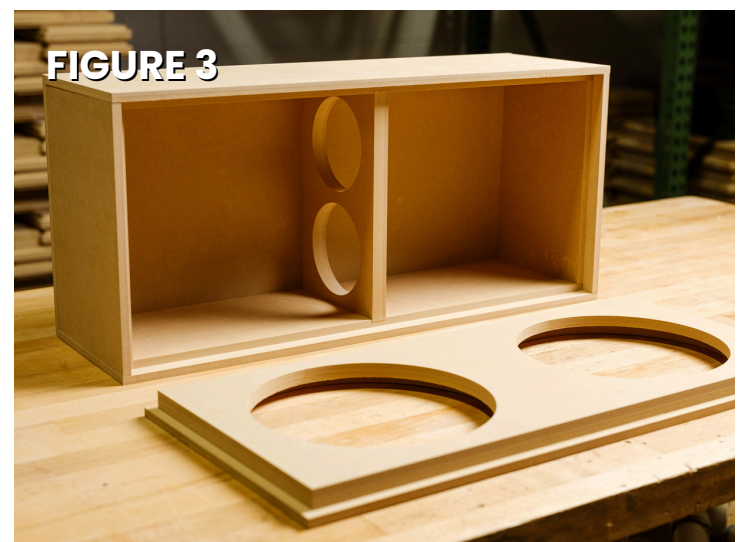


FIGURE 3

5. (OPTIONAL) Before assembly, you may drill pilot holes for mounting the crossover board using the board as a template. Use caution to avoid drilling through the panel. The crossover board should be mounted on the side panel of the woofer enclosure (*figure 5*). This step is optional, but it will make installing the board easier once your cabinet is fully assembled. Screws can be pressed into the MDF cabinet without drilling if desired.



FIGURE 4

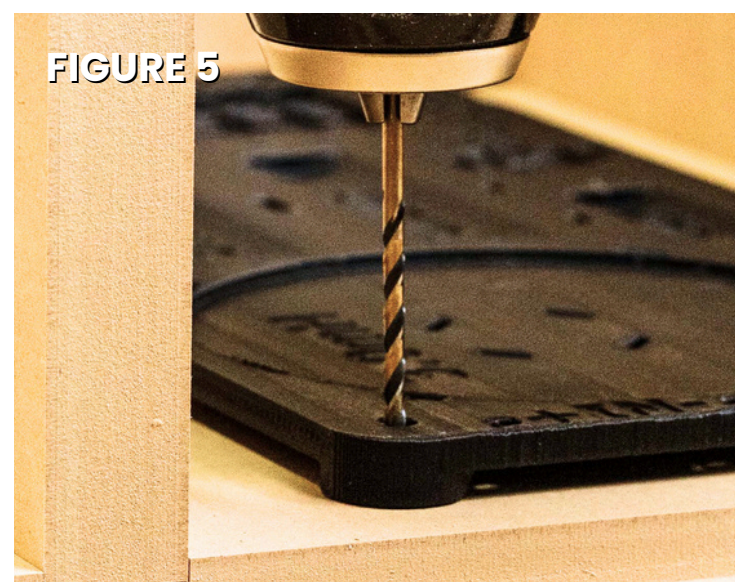


FIGURE 5

6. Apply wood glue to mating seams as shown in the pictures, pausing to let the glue dry before moving to the next set of panel glue application. The side panel that is **NOT** being glued in a given step can be used to keep panels aligned by dry-fitting them into the dadoes. (*figure 6*)

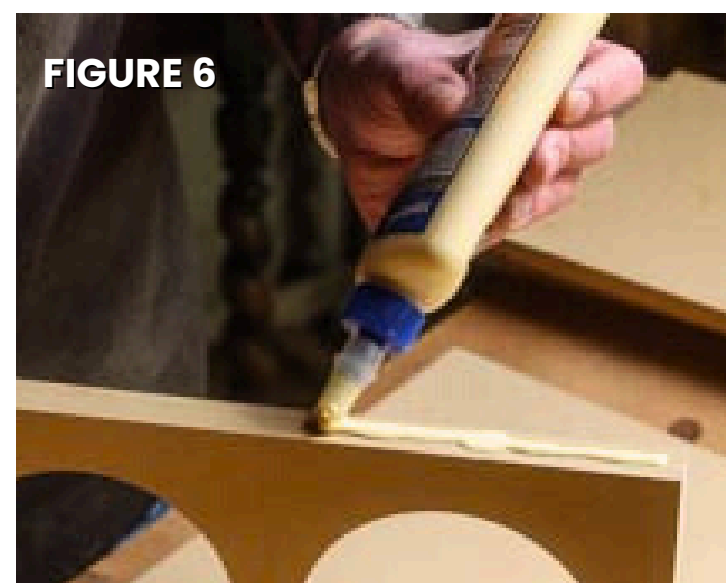


FIGURE 6

7. After the cabinet is fully assembled and the glue is fully cured, sand the cabinet flat. The front and back panels are intentionally designed with a 1 mm overhang to facilitate easier flush sanding. Fill any larger gaps with wood filler or Bondo and sand all surfaces flat again (*figure 7*).

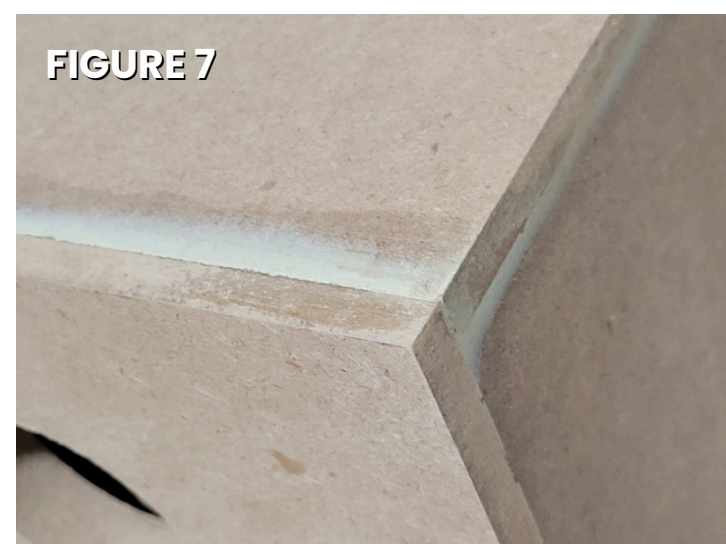


FIGURE 7

8. Finish as desired using veneer, vinyl, paint, etc. (see CSS blog post for ideas).



Crossover Assembly

1. Verify all crossover parts were received (*figure 8*)
 - 5mH Inductor (x2)
 - 150 μ F Capacitor (x2)
 - 200 μ F Capacitor (x2)
 - 20 Ω Resistor (x4)
2. Place each component in its labeled location on the SmartNode board by putting the lead wires through the holes for the associated board location.

Orientation does not matter as long as you can reach the through-holes.

3. Secure the components to the board with the supplied zip ties.

4. On the backside of the board, twist leads together that share common letters (e.g., A to A, or B to B to B) using supplied hookup wire where necessary to jumper between nodes. Ensure that no bare wires are touching unintentionally (*figure 10*).

5. Cut 8 lengths of wire per speaker as described below.
 - a. Qty 3 - 18" lengths to span from each of the top 3 woofers to the Woofer Circuit Board (+W-)
 - b. Qty 4 - 24" lengths to span from:
 - i. Terminal cup to Woofer Circuit Board (+IN-)
 - ii. Woofer Circuit Board (+W-) to bottom woofer
 - iii. T/M Circuit Board (+M-) to midrange
 - iv. T/M Circuit Board (+T-) to tweeter
 - c. Qty 1 - 30" length from terminal cup to T/M Circuit Board (+T-)



FIGURE 8

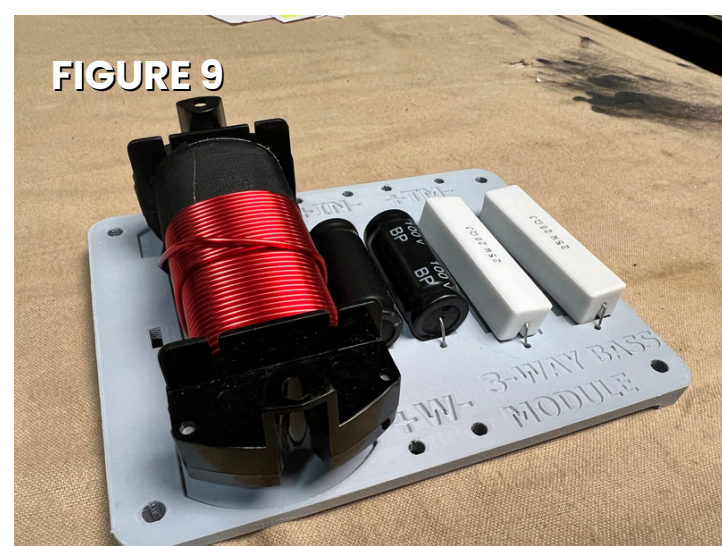


FIGURE 9

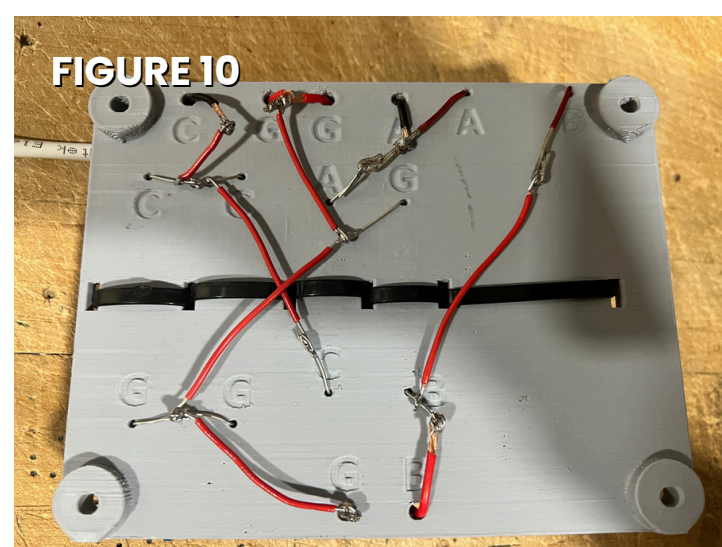
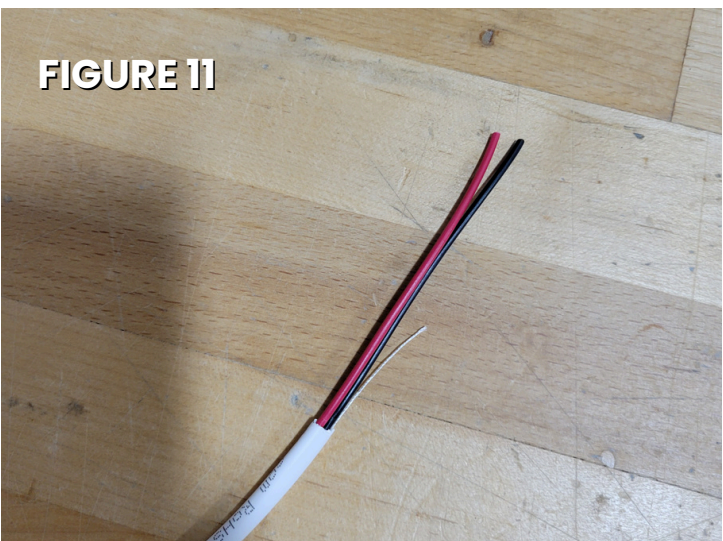


FIGURE 10

NOTE: Crossing bare wires from non-matching letters can degrade sound quality and damage the drivers or your amplifier. If you need to run across another wire, ensure you use the insulated hookup wire supplied in your kit.

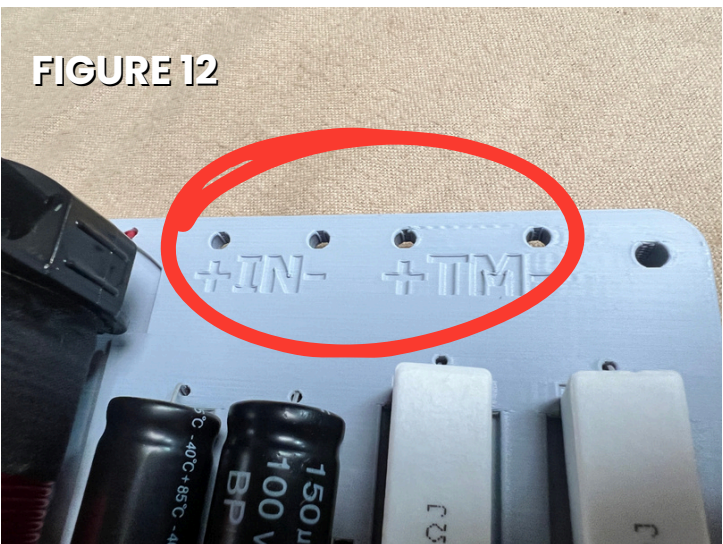
NOTE: Inductors have an insulating coating. You cannot connect directly to the red colored portions of the inductor wire, or you will cause an open circuit. You should connect to the pre-tinned leads (silver portion) to ensure proper connection.

6. Strip 3" of white outer insulation from each wire pair and ¼" of red or black inner insulation from each wire end (*figure 11*). It may be better to strip more than ¼" on the ends that will be connected to the SmartNode boards.



7. Insert the red wire through the TM+ hole on the front of the SmartNode board and solder to the appropriate letter on the rear (*figure 12*).

Insert the black wire through the TM- hole on the front of the SmartNode board, then solder it to the appropriate letter on the rear.



8. Insert the red wire through the W+ hole on the front of the SmartNode board and solder to the appropriate letter on the rear (*figure 13*).

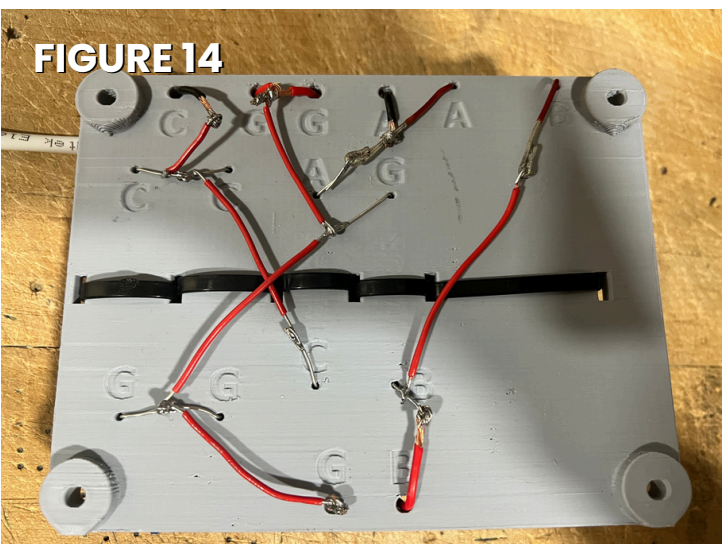
Insert the black wire through the W- hole on the front of the SmartNode board, then solder it to the appropriate letter on the rear.



9. Insert the red wire through the IN+ hole on the front of the Smart Node board and solder to the appropriate letter on the rear. Insert the black wire through the IN- hole on the front of the Smart Node board, then solder it to the appropriate letter on the rear (*figure 12*).

10. Connect the inserted wire ends to the appropriate lettered nodes using the supplied jumper wire if necessary.

11. Solder all twisted connections (*figures 14*).



Final Assembly

CAUTION: It is recommended to test your speaker after final assembly by starting at a very low volume and listening to each driver by placing your ear close to it. You should hear highs coming from the tweeter and lows from the woofer. You should hear no crackling or static. If everything sounds normal, proceed to turn up the volume and enjoy.

1. Mount the SmartNode crossover board to the bottom panel of the cabinet.

2. Route the wire pair from the +TM– holes on the SmartNode board up along the sides of the cabinet. Feed the wires through the center brace and continue routing them toward the top of the cabinet and the upper binding posts (*figure 15*).



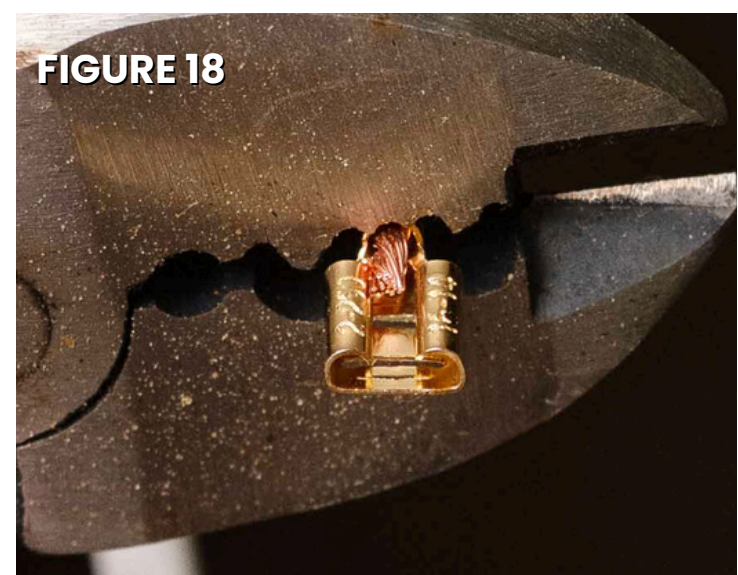
3. Route the wire pair from the +W– holes on the SmartNode board to the upper driver opening. These wires will connect to the woofer installed in the top opening (*figure 16*).



4. Route the wire pair from the +IN– holes on the SmartNode board to the lower binding posts (*figure 17*).

5. Crimp the quick-connect terminals onto the ends of the wires. Verify the polarity and ensure each connector is securely crimped before installation.

- Red - Positive woofer terminal and binding post
- Black - Negative woofer terminal and binding post



6. Install the upper and lower binding posts into the corresponding openings in the rear panel. Feed the wires through the appropriate opening before securing each binding post. Orient the binding posts so the wire connections are accessible from inside the cabinet. Secure the binding posts to the cabinet using the supplied hardware (*figure 18*).

6. Binding Posts

Unscrew the nuts, remove the washers, and remove the terminal rings. Unscrew the thumbscrew with colored stripes on the opposite end of the binding post and remove it.

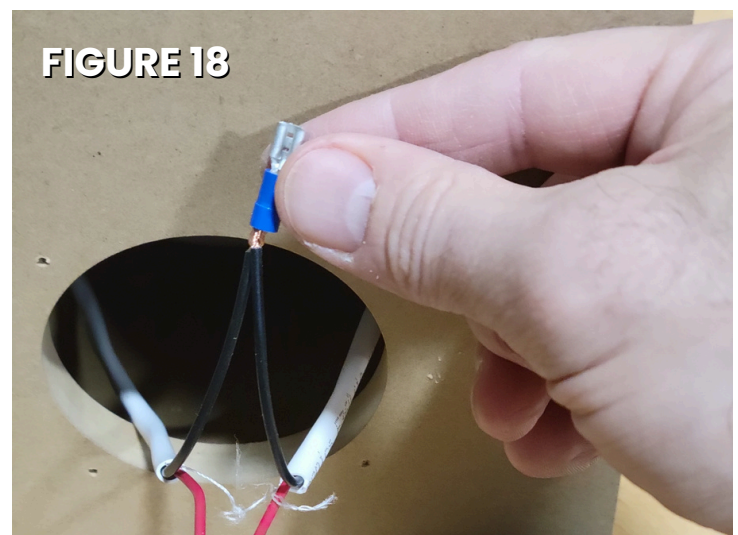
Insert the long-threaded end of the binding posts into the holes on the rear panel and tap them in with a hammer (*figure 20*), making sure to orient the through-wire openings up and down for easy accessibility.

Reinstall the nuts, lock-washers, and terminal ring in the following order: nut, lock-washer, terminal ring, lock-washer, nut. Tighten with a small socket or wrench to ensure they do not rattle loose.

Reinstall the thumbscrews on the outside of the box.

NOTE: It is recommended to install binding posts after you have applied the finish to your cabinet. They are difficult to remove once installed and might not fit snugly if reinstalled. If you want to test your speakers before the final finish is applied, it is recommended to run jumper wires from the positive and negative input wires on the crossover out of the port, and to place painter's tape over the binding post holes

7. Connect the TM wires to the upper binding posts and the IN wires to the lower binding posts. Red wires connect to the positive terminals and black wires connect to the negative terminals. Ensure all connections are secure (*figure 21*).



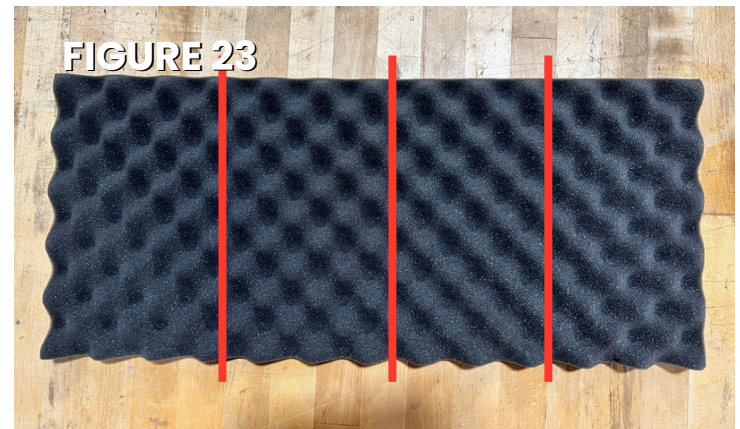
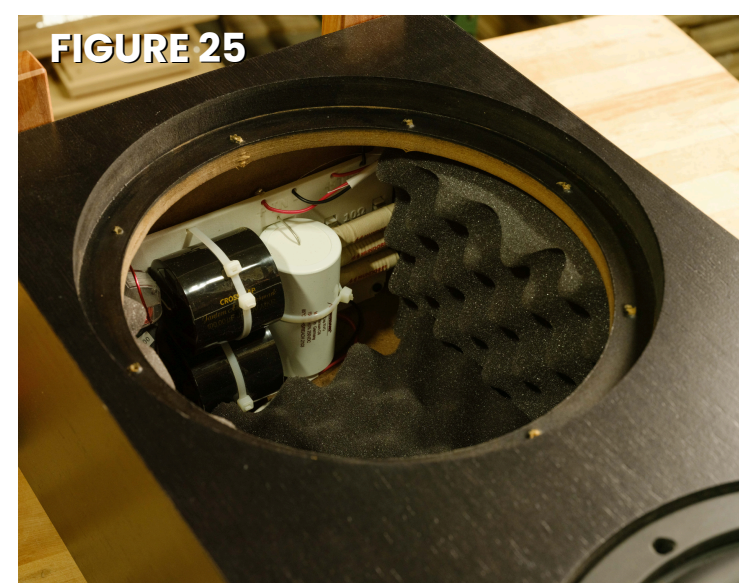
7. Cut the eggcrate foam panels as follows:

- Cut one 10.5" x 24" panel in half to create two 10.5" x 12" pieces. Install one piece on the back panel of each cabinet behind the passive radiator (figure 22).
- Cut one 10.5" x 24" panel into four 10.5" x 6" pieces. Install one piece on the top and bottom panels of each cabinet (figure 23).
- Cut the remaining two 10.5" x 24" panels into four 5.25" x 12" pieces each. Install the pieces on the side panels of the upper and lower driver sections of each cabinet (figure 24).

6. Connect the +W- wires to the woofer terminals.

Ensure the red wire is connected to the positive terminal and the black wire is connected to the negative terminal (figure 25).

8. Install the woofer in the upper driver opening and the passive radiator in the lower opening. Secure both drivers using the supplied screws (figures 26 & 27).



Troubleshooting

1. **No Sound From the Whole Speaker** – No sound from one or both speakers typically means you have a problem on the amp input side of the crossover. Check that your input wires are properly connected to the crossover (including the ground wires returning to the negative connection) and to the binding post side. Ensure the input wires and binding posts are not shorted by stray wires or other metal, which could create a conductive path between the negative and positive.
2. **No Sound From One Driver** – No sound from a single driver most typically results from a bad connection in the crossover. Review all connections to make sure only similar letters are on the same connection points. Ensure inductors are properly connected to tinned/bare wire, not over the insulation. Ensure there are no loose connections anywhere.
3. **Crackling Sound** – Crackling sounds are usually the result of a loose connection. Check to make sure you have secure connections on all driver and binding post wiring. Ensure crossover wiring has a solid connection, and solder welds are tight. You should see no movement in the joint itself. Check crossover wiring for any bare wires that are inadvertently touching where they shouldn't. If the source cannot be identified, contact us.
4. **Amp Shuts Down** – An amp shutting down is likely caused by a straight short to ground, meaning your amp is seeing minimal or no resistive load. The most likely cause is wiring touching where it shouldn't be. Check crossover wiring for any bare wires that are inadvertently touching where they shouldn't. Ensure binding post terminals are not inadvertently touching. An amp shutting down is likely a straight short to ground, meaning it's seeing no resistive load. If the source cannot be identified, contact us.
5. **Lack of Bass** – There are a few things that can cause a lack of bass. Check to make sure all your connections have the same polarity on both the inside and the outside of the binding post. Inverting the polarity of one speaker will cause bass cancellation. Ensure there is free airflow around the port openings and that they are not blocked by stuffing material. Ensure the woofer is connected to the woofer W +/- section of the SmartNode board and not the tweeter T +/- section. Ensure the port is adjusted to the correct length. If the source cannot be identified, contact us.