

# T3S Compact 2-way Bookshelf Speaker Kit

Thank you for purchasing the T3S compact bookshelf speaker kit. This speaker kit was precision cut using CNC machinery for the best possible fit and finish. With a little time and patience, your finished product will provide years of enjoyment. Please follow the following instructions for the best possible results.

## **Suggested tools and consumables:**

Drill	Rag or paper towels
Wood clamps (you can never have too many of these)	Cyanoacrylate Adhesive (super glue)
Wood glue	Solder
Polyurethane glue (Gorilla Glue)	Soldering iron
Sanding block and/or electric finishing sander	Hot glue gun

## **Package contents:**

First, empty the contents of the package and review parts to ensure everything has been included and is in good condition. If any parts are missing or damaged please contact our customer service department at 1-800-338-0531.

Note: Crossover components may be substituted with parts of equal or higher quality depending on stock.

## **Main Components:**



**A**

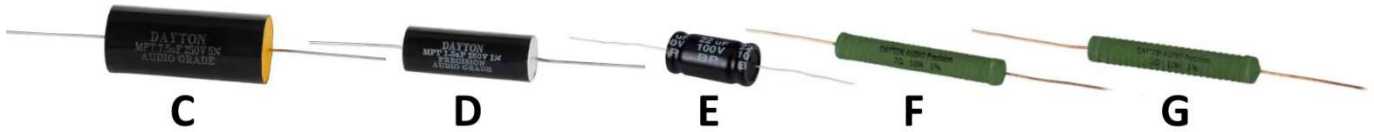


**B**

**A) 1 x Dayton Audio RS150-4 6" Reference Woofer 4 Ohm**

**B) 1 x Peerless XT25TG30-04 1" Dual Ring Radiator Tweeter**

## Crossover and Other Components:



- C) 1 x Dayton Audio DMPC-7.5 7.5uF 250V Polypropylene Capacitor**  
**D) 1 x Dayton Audio PMPC-1.5 1.5uF 250V Precision Audio Capacitor**  
**E) 1 x 22uF 100V Non-Polarized Capacitor**  
**F) 1 x Dayton Audio DPR10-7.0 7 Ohm 10 Watt Precision 1% Audio Grade Resistor**  
**G) 1 x Dayton Audio DPR10-2.0 2 Ohm 10 Watt Precision 1% Audio Grade Resistor**

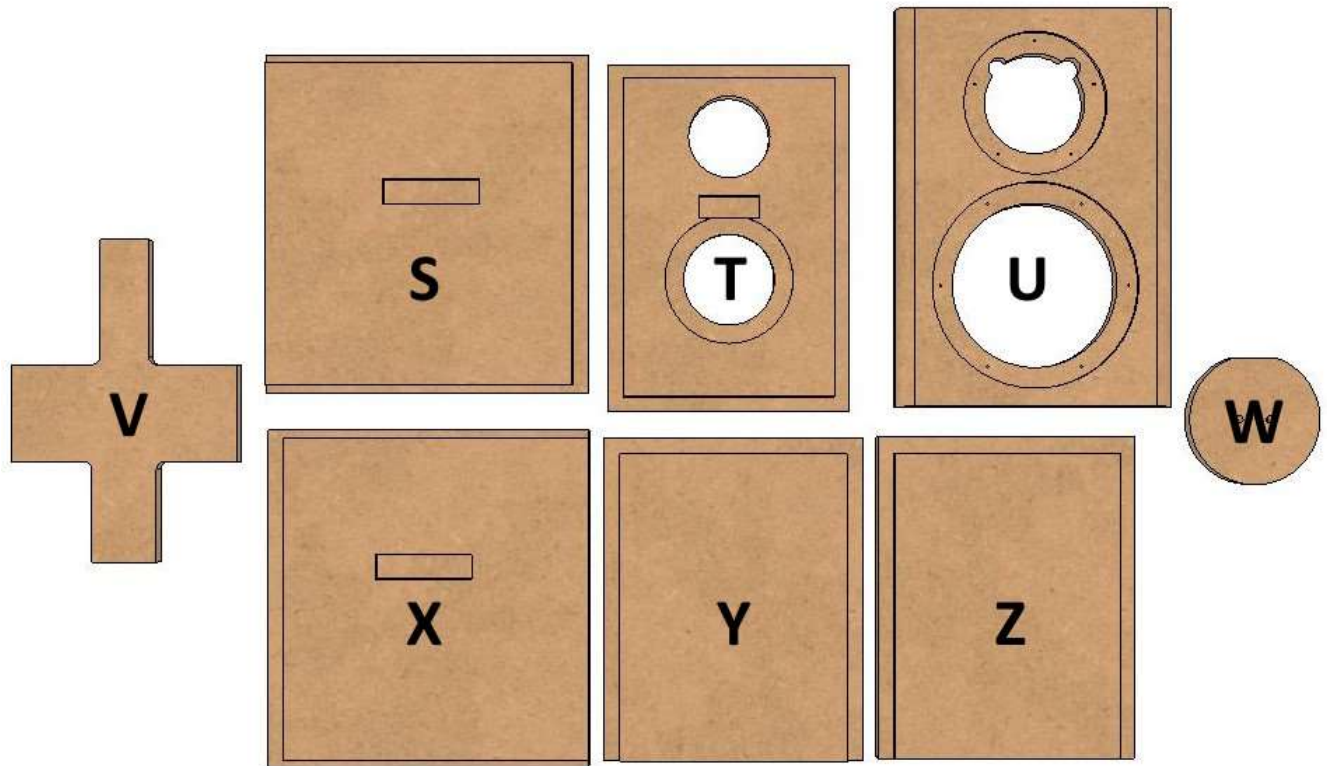


- H) 1 x Dayton Audio AC201-4 1.4mH 20 AWG Air Core Inductor Coil**  
**I) 1 x Dayton Audio AC20-40 0.40mH 20 AWG Air Core Inductor Coil**  
**J) 1 x Shadzi T3S Reference Speaker Kit Crossover Printed Circuit Board**  
**K) 1 x Dayton Audio BPA-38G HD Binding Post Pair Gold**  
**L) 1 x Port Tube 1-7/8" ID x 5-5/8" L Flared**



- M) 1 x Sonic Barrier 1/2" Acoustic Foam w/PSA 18" x 24"**  
**N) 6 ft. Audtek 16 AWG Stranded OFC Twisted Pair Hookup Wire Red/Black**  
**O) 5 x 0.205" (16-14) Female Disconnect**  
**P) 5 x 0.110" (16-14) Female Disconnect**  
**Q) 25 x #8 x 3/4" Pan Head Deep Thread Black Screws**  
**R) 10 x 12" Black Cable Ties**

### **Enclosure Components:**

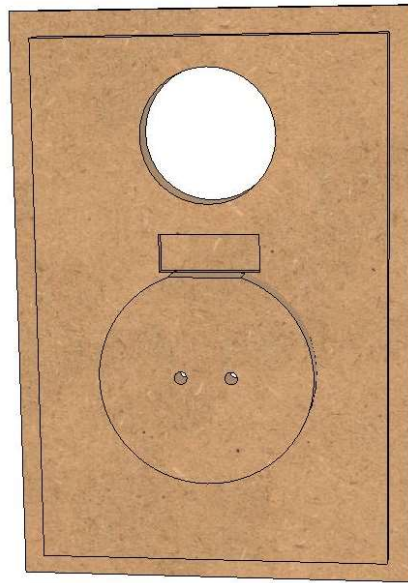


- S) 1 x Side 1**
- T) 1 x Back**
- U) 1 x Front Baffle**
- V) 1 x Brace**
- W) 1 x Terminal Plate**
- X) 1 x Side 2**
- Y) 1 x Top**
- Z) 1 x Bottom**

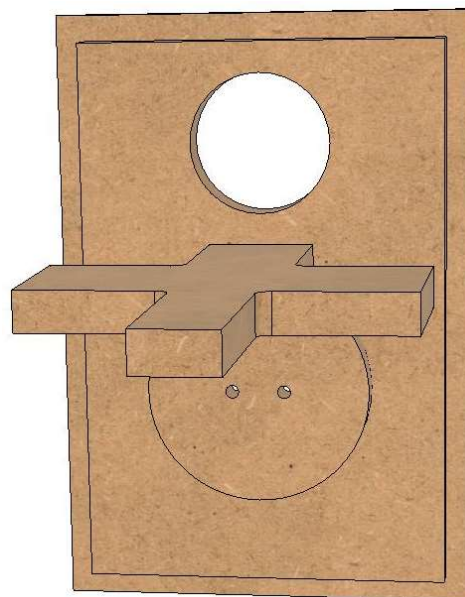
### **Enclosure Assembly:**

- 1)** Before gluing anything, we recommend that you do a dry fit of the enclosure to familiarize yourself with the parts and assembly. This will also give you a chance to ensure that all pieces have been cut properly.
- 2)** Begin by setting the enclosure parts out on a flat level surface and ensure that all pieces are free of dust and debris.

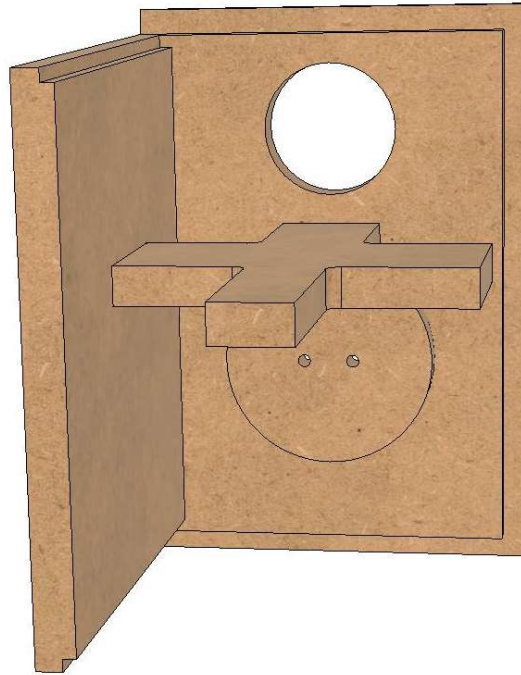
- 3) With the **Back Panel (T)** laying flat, apply a thin bead of glue inside the circular recessed area for the Terminal Plate. Set the **Terminal Plate (W)** inside the recessed area and ensure that the flat section on the terminal plate is aligned with the dado for the brace. Apply enough pressure to ensure that the glue is spread evenly throughout the mating area. Due to limited access, you may want to use a damp rag to wipe away any excess glue from the inside of the terminal recess on the back panel (excess glue on the inside of the enclosure is fine). To make assembly easier, we recommend you let this glue joint dry or temporarily secure the terminal plate before beginning the next step.



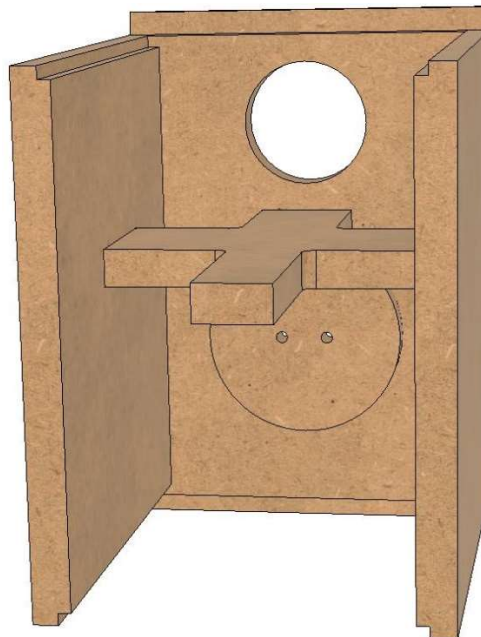
- 4) With the **Back Panel (T)** lying flat, apply a generous amount of glue inside the dado for the brace. Then set the **Brace (V)** in place applying enough pressure to fully seat the brace in the dado and ensure glue is spread through the joint (some glue squeeze-out can be expected).



- 5) Next, glue all mating surfaces of the Back Panel, Brace, and **Side 1 Panel (S)**. Be sure to apply a generous amount of glue inside the dado for the brace. Then set in place applying enough pressure to ensure glue is spread through each joint and the brace is fully seated in the dado (some glue squeeze-out can be expected).



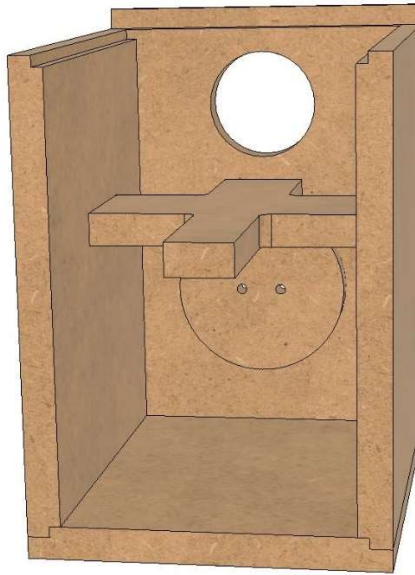
- 6) Glue all mating surfaces of the Back panel, Brace, and **Side 2 Panel (X)**. Be sure to apply a generous amount of glue inside the dado for the brace. Then set in place applying enough pressure to ensure glue is spread through each joint and the brace is fully seated in the dado (some glue squeeze-out can be expected).



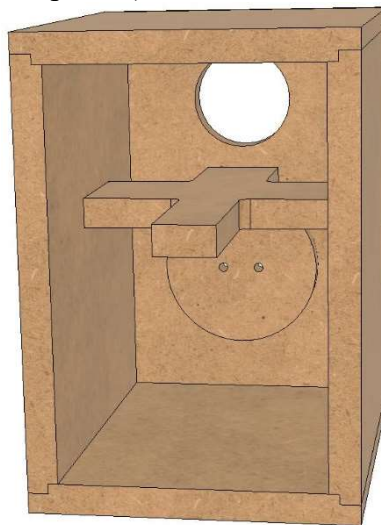


- 7) Glue all mating surfaces of the Back panel, Side panels, and **Bottom Panel (Z)**. Then set the Bottom panel in place applying enough pressure to ensure glue is spread through each joint (some glue squeeze-out can be expected).

**Note:** You might want to mount the crossover on the bottom panel before installing the panel. If so, please assemble the crossover first, starting at step #12, and see step #22 for mounting details.

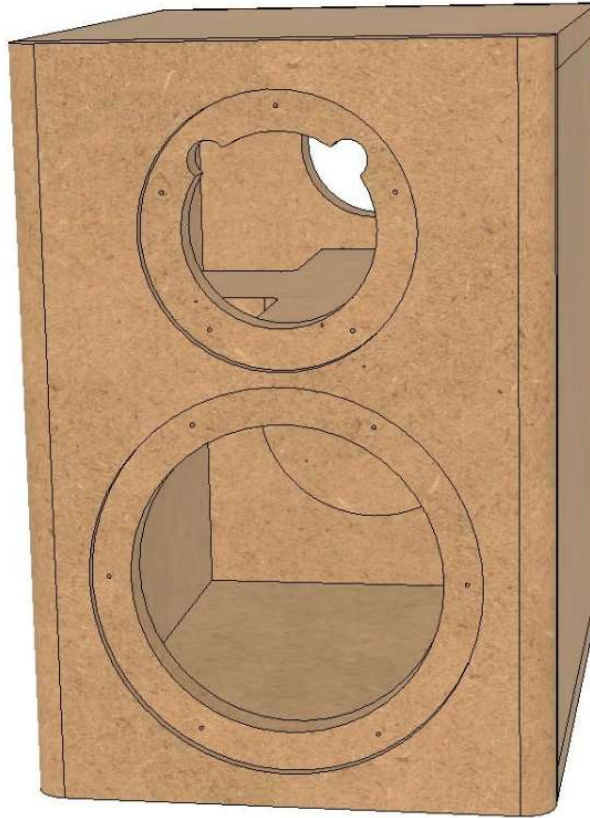


- 8) Glue all mating surfaces of the Back panel, Side panels, and **Top Panel (Y)**. Then set the Top panel in place applying enough pressure to ensure glue is spread through each joint (some glue squeeze-out can be expected)



- 9) At this point we recommend clamping this portion of the enclosure and allowing it to dry before continuing. Apply ample pressure to ensure glue is spread evenly through each joint (some glue squeeze-out can be expected). Visually inspect all seams to make sure they are all flush and closed tightly, you may need to relocate clamps (or add more clamps) to get a perfect fit. Wipe away any glue squeeze-out on the outside of the enclosure with a damp rag or paper towel (excess glue on the inside is fine). Allow to dry according to the glue manufacturer's recommendations and remove clamps.

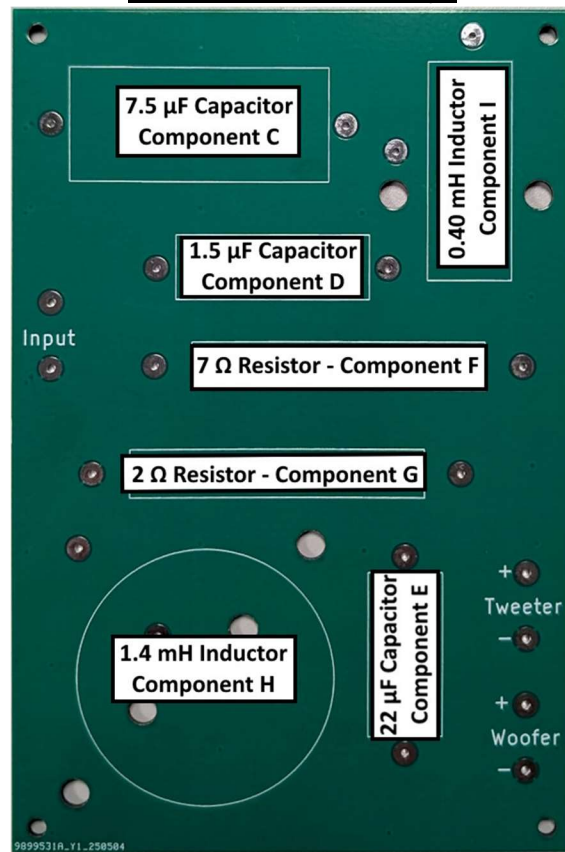
- 10) Finally, glue all mating surfaces of the Top, Bottom, Sides, Brace, and **Front Baffle (U)**. Be sure to add a generous bead of glue to the front portion of the Brace. Then set the Front Baffle in place applying enough pressure to ensure glue is spread through each joint (some glue squeeze-out can be expected). Apply clamps to secure the baffle into place and inspect all seams to make sure they are flush and closed tightly. Wipe away any glue squeeze-out on the outside of the enclosure with a damp rag or paper towel.



- 11) Allow everything to dry according to the glue manufacturer's recommendations and remove clamps. Finish enclosure to your liking. See our web page for ideas and examples.

The T3S enclosure is now complete!

### Crossover assembly:

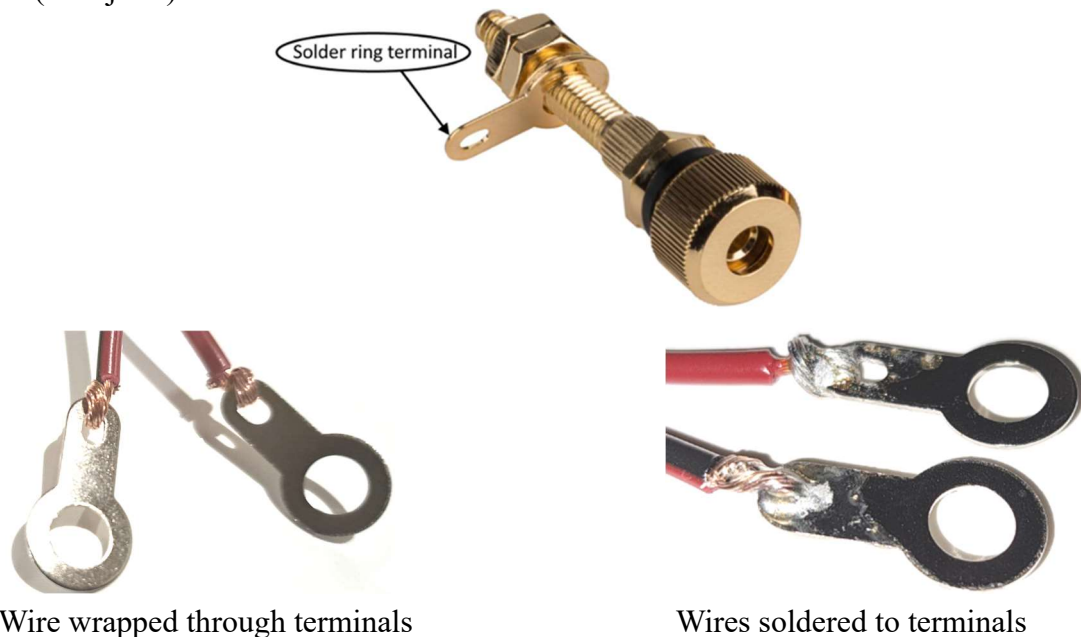


- 12) Begin by preparing the input, woofer, midrange, and tweeter wires. Cut one 8" piece of **16 AWG 2-conductor Wire Red/Black (N)** and label this wire "input". Then cut two more 12" pieces of **16 AWG 2-conductor Wire Red/Black (N)** and label these "woofer" and "tweeter".
- 13) Strip approximately 1/2" of insulation from only one end of each of the wires you cut in **step #12** and make sure the strands are tightly twisted together. Using a soldering iron apply heat to the stripped ends and tin the bare copper as shown below.
- Note:** When tinning the ends only apply gentle pressure to the wire to prevent flattening the twisted strands. You want the twisted strands to remain round. Also, use just enough solder to flow into the strands holding them together, try to avoid big "blobs" of solder.





- 14) Prepare the "woofer" and "tweeter" wires by stripping approximately 3/8" of insulation from the other (non-tinned) ends of the wires. For the "tweeter" wire, crimp one **0.110" (16-14) Female Disconnect (P)** onto each wire. For the "woofer" wire crimp one **0.110" (16-14) Female Disconnect (P)** onto the black wire, and one **0.205" (16-14) Female Disconnect (O)** onto the red wire.
- 15) Remove the solder ring terminals from each of the **Dayton Audio BPA-38G HD Binding Posts (K)**. Strip approximately 3/4" of insulation from the other end of the 8" "input" wire and make sure the strands are tightly twisted together. Insert the stripped ends through the small hole in the solder ring terminals and fold the wire tightly to secure it to the terminal. Using a soldering iron, apply heat to the terminals and solder the wire and terminal together. See images below.
- Note:** Make sure the solder flows onto both the wire and the terminal to avoid forming a "blob" on the surface (cold joint).



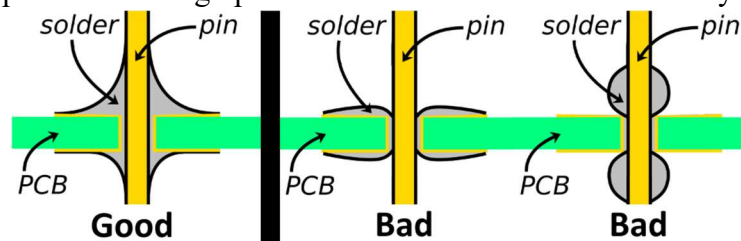
Wire wrapped through terminals

Wires soldered to terminals

- 16) Prepare the crossover components as follows for easy installation onto the **T3S Crossover Printed Circuit Board (J)**:
- Capacitors:** Straighten out the leads and then bend at a 90° angle about 1/8" from the capacitor.
- Inductors:** Straighten the leads and be sure that all enamel/insulation is removed where the leads penetrate the crossover board. Enamel can be removed by scraping with a razor or fine grit sandpaper.
- Resistors:** Straighten leads and then bend at a 90° angle about 1/8" from the resistor.
- 17) The **T3S Crossover Printed Circuit Board (J)** is labeled to make it easy to locate and install the corresponding components and cables. Working from one side of the board to the other, insert the leads (or wires) through the corresponding holes in the crossover board and solder into place.
- Tips:** 1) Elevate the board a couple inches so you will not have to deal with trimming the leads until the crossover is complete.
- 2) Apply a bed of glue beneath each component before placing them on the board to eliminate the possibility of rattles or buzzing from the crossover.

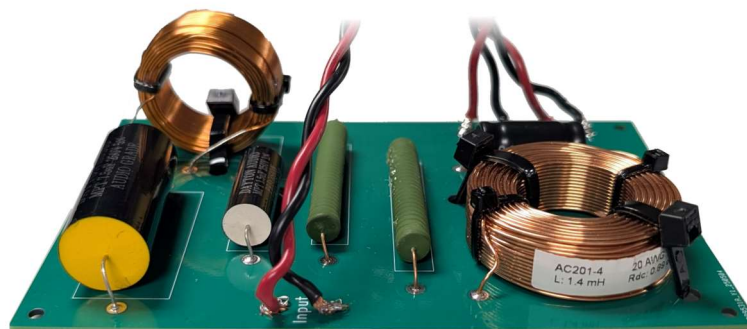
- 3) Notches are cut beside each inductor so you can zip tie them into place to help support their weight and secure them to the crossover board.
- 4) Tin the tip of your soldering iron with a bit of solder before each connection to prep the joint and optimize heat transfer.
- 5) When soldering components to the board, use the side of the soldering iron tip to apply heat to both the solder pad and lead/wire at the same time. This will help ensure that the solder adheres properly to both surfaces.
- 6) If you have difficulty inserting the tinned speaker wires into their corresponding holes, apply heat to the wire while inserting it into the board.
- 7) Clean the tip of your soldering iron often with a wet sponge or brass sponge to remove oxidation. A clean and shiny tip ensures optimal heat transfer for easy soldering.

- 18) Carefully inspect each solder point to ensure that the solder has flowed onto the lead/wires and the solder pads. Each solder pad is plated through-hole (PTH) type, so make sure that you inspect the front and back sides of the board. Each connection on the front and back of the board should have solder covering each pad and flowing up the lead/wire. Reheat and correct any bad solder joints.



Trim all excess leads and wire from the back side of the crossover board using flush cutters (preferred) or wire cutters.

- 19) Secure the inductors in place by looping the included black 11" cable ties through the holes provided near each inductor. Tighten cable ties securely and trim off excess.



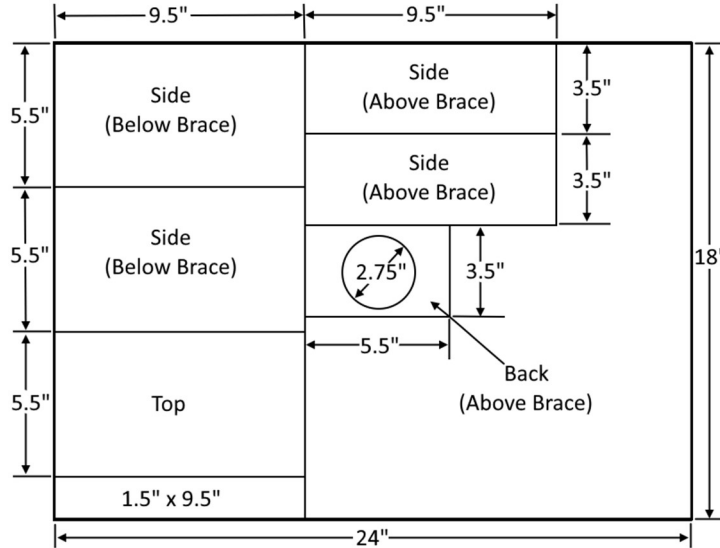
The T3S crossover is now complete!

### Final Assembly:

**Note:** We recommend that you temporarily wire everything up at this point to ensure all parts (crossovers and drivers) are performing properly.

- 20) Start by laying the **Sonic Barrier 1/2" Acoustic Foam w/PSA 18" x 24" (M)** on a flat, level surface. Layout the sheet as shown below. Cut the sheet with a sharp knife or scissors.

**Note:** Reserve the 1.5" x 9.5" strip cut from the edge of sheet, this will be used later.



- 21) Line the top, back (only the port area for now) and sides of the enclosure with the pieces cut on step # 19. Remove the backing from each panel and carefully insert through the driver cutouts. Carefully set the panel into place and press firmly to adhere to the enclosure.

**Note:** Use care while inserting the panels through the driver cutouts. Roll the panels so the adhesive is on the outside of the curve in order to get them to fit. The adhesive is very aggressive, **do not** allow it to stick to itself.

- 22) Cut the 1.5" x 9.5" piece (reserved from step #20) approximately in half. Peel off the backing and apply the two strips to the bottom panel as shown below. These strips will act as stand offs for the crossover board to ensure it does not buzz or rattle once the speaker is complete.



- 23) Insert the crossover board through the woofer cutout and place it on the bottom of the enclosure towards the back. Place four **#8 x 3/4" Pan Head Deep Thread Black Screws (Q)** through the four screw holes in the corners of the crossover board. Tighten screws just until the foam standoffs are compressed to about 1/4" – 1/8". Use care when tightening the screws to avoid cracking the crossover board.

**Note:** A stubby or right angle screwdriver will make installing the screws much easier. Alternatively, you can install the crossover before assembling the enclosure (Step #7)



- 24) Port installation is simple. Place the port through the back panel of the enclosure. Cover the flared opening of the port with a flat piece of wood. Then tap the port into place with a hammer or mallet until it is fully seated in the enclosure.

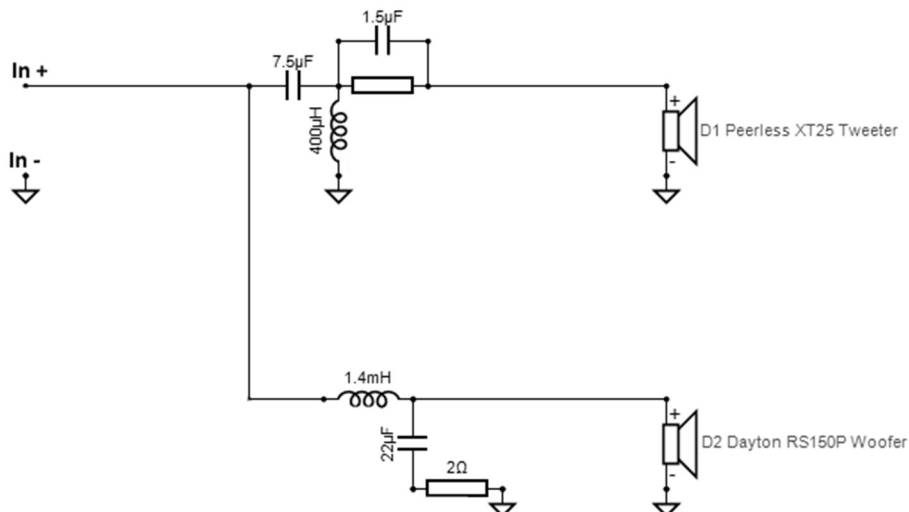
**Note:** The port is a barbed press fit design. Once installed the barbs can cause significant damage to the MDF back panel if you try to remove the port. We recommend finishing the back panel before installation.

- 25) Remove all solder lugs, nuts, and washers from the **BPA-38G HD Binding Post Pair (K)**. Place the binding posts into the holes in the terminal plate making sure the bare wire holes in the binding posts are pointing in the direction you desire. Tap the binding posts into position with a mallet or hammer until fully seated (use a scrap wood block to protect the finish if using a hammer). Secure the binding posts with one nut each and tighten with a 10 mm nut driver or socket.
- 26) For each binding post add a lock washer, red or black input wire from crossover (with solder lug attached), lock washer, and then nut. Be sure to observe polarity when making these connections (positive = red, negative = black). Tighten each nut with a 10 mm socket. If necessary, use some of the left over Sonic Barrier to secure and/or cushion any excess wire to prevent rattles or buzzing.

- 27) Rout the tweeter wire to the tweeter opening. If necessary, use some of the left over Sonic Barrier to secure and/or cushion any excess wires to prevent rattles or buzzing.
- 28) Connect tweeter wires to the terminals on the **Peerless XT25TG30-04 1" Dual Ring Radiator Tweeter (B)** while observing polarity (positive + and negative – is marked on the underside of the tweeter's mounting flange) and set tweeter in place. Using a screwdriver, secure tweeter with 5 x #8 x 3/4" **Pan Head Screws (Q)** just until tight, being careful not to strip out the holes (a power drill is not recommended).
- 29) Connect woofer wires to the terminals on the **Dayton Audio RS150-4 6" Reference Woofer (A)** while observing polarity and set woofer in place. Using a screwdriver, secure woofer with 6 x #8 x 3/4" **Pan Head Screws (Q)** just until tight, being careful not to strip out the holes (a power drill is not recommended).
- 30) You are now ready to enjoy your finished T3S speakers.



### T3S Crossover Schematic:

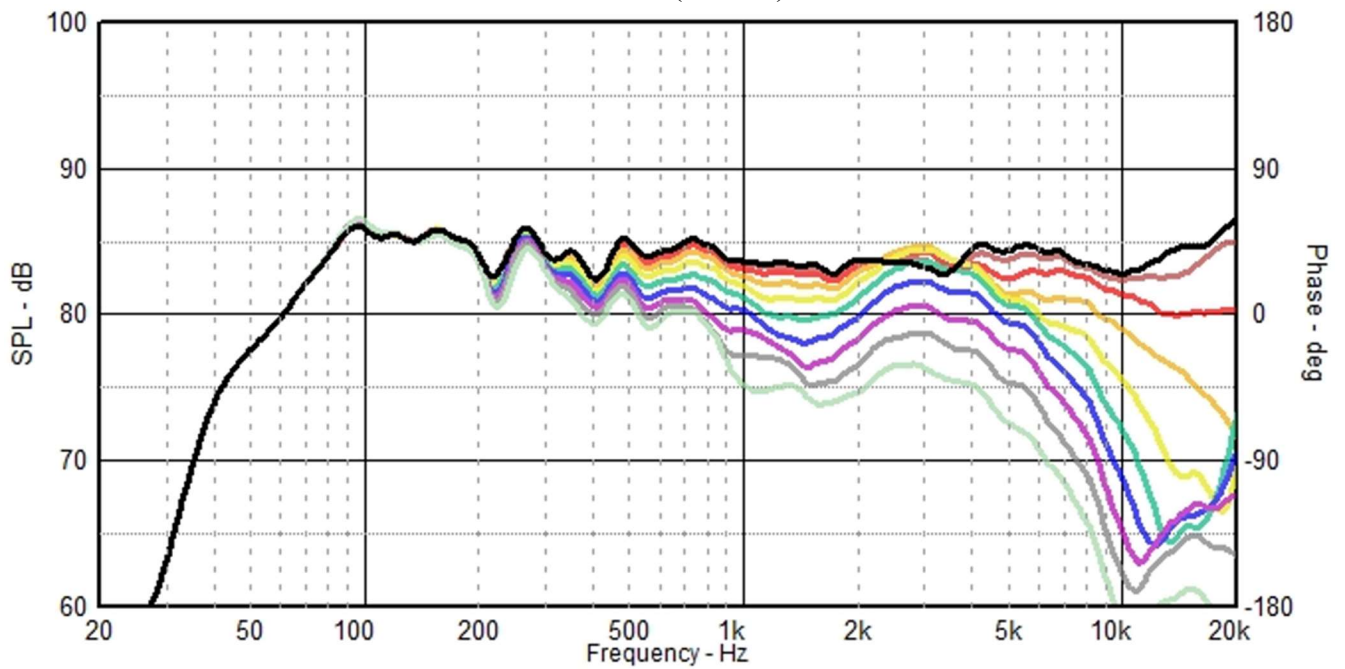




## Measured Frequency Response and Impedance:

T3S 0 – 90° frequency response

Black = 0° (on-axis)



OmniMic

T3S final measured impedance

Nominal 4 ohm load

