

Hammer Dynamics

Super 12 Loudspeaker

Construction Manual

Hammer Dynamics
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To the reader:

If you find any mistakes or have corrections or comments, please direct them to Colleen Wyckoff at the addresses above. Thank you.

Manual written by:

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Introduction

Read this entire manual all the way through *before* starting construction. There are several places in which you have a choice on which method to use. If you follow in order without reading first, you could make mistakes.

All dimensions that are in inches are marked with double quotes (").

You can choose to follow these directions, or have a cabinet-maker build the boxes for you, or design your own cabinet for the drivers. The final outer dimensions (using 3/4" MDF) are 14.5" width, 14.5" depth, 48" height. Internal volume is 7858 cubic inches. Port size is 4" diameter, 3/4" length.

The manual describes the procedure to create *one* loudspeaker box, with the exception of the Table Saw section which describes how to cut the wood for two boxes. You can either double the instructions as you go along, or follow through for one box then repeat for the other box.

Materials Required

Hammer Dynamics Super 12 loudspeaker kit
Mounting bolts and nuts or T-nuts for Super 12 drivers
Two mounting bolts and nuts for tweeters.
Tiny screws for mounting crossover terminal strips
Loudspeaker wire (and optionally speaker binding posts)
Two sheets of 8 x 4 foot 3/4" MDF
Two small strips of hardwood or masonite (each 0.5" x 3/16" x 3.5")
2" length of 3/4" wood dowel
Wood glue (polyurethane such as Gorilla Glue, or PVA such as Elmers)
Caulking material (latex or silicone, latex is fine)
Glue for holding inductors in place (epoxy, silicone rubber cement, etc.)
Philips head 1 inch decking screws (approx 200)
Double sided carpet tape
1/4" x 1/8" wide closed cell vinyl foam insulating weather strip — usually light gray (22 feet)
12" wide bubble wrap with little bubbles (approx 30 feet)
Carpet felt underlay (or Deflex[®]) 12" x 12" (two)
Styrofoam peanuts
Optionally, speaker basket damping material for Super 12 drivers
30 Sheets Asphalt Bismuth Sheeting (Parts Express #268-010)
Buy two 8 x 4 foot sheets of 3/4" MDF. In order to get these home in smaller pieces, you can ask for each sheet to be cut as below:
(1) Cut two strips of 48" long by 29 1/4" per sheet of MDF. This leaves a strip of 37".
(2) If you want, ask for another 48" strip of 15" wide (for the ends), which will leave you with 23" by 48" strip.

The MDF will eventually be cut into the sizes shown below. All quantities below are *per speaker*:

- 2 (front baffle and rear) 13" x 46.5"
- 2 (sides) 14.5" x 48"
- 2 (ends) 13" x 14.5"
- 4 (supports) 46.5" x 1.5"
- 4 (supports) 11.5" x 1.5"
- (Optional another 4 supports 10" x 1.5")

You will end up with these pieces before starting to construct each speaker (here the long strips are shown already glued and screwed on the side pieces):



(Left to right): one side piece (with strips attached), the other side piece, front baffle, rear baffle, two end pieces, and end strips (on the floor).

Required Tools

Circular saw or Table saw

Electric Drill

Twist drill bits: 11/32 (or size to fit head size of the decking screws), 1/8 (just clearance for decking screws), and 3/32 (pilot hole for shank of decking screws, do a test drilling to see if the screws bite and hold well in this size hole).

Screwdrivers

Sanding block or power sander (belt sander, orbital sander)

Clamps:

- at least two 24" bar clamps (preferably four)
- at least two 3" C clamps
- one (or two) band clamps (not strictly necessary but very helpful).
- optionally, four corner clamps (for clamping corners of work together)

Note: if you do not have the bar clamps, band clamps, or corner clamps, you can use the screws alone to provide the clamping force. However you will get a stronger joint if you clamp the work together (because gaps and voids are minimized with clamping).

Table Saw Method

1. If you have not had the MDF cut as in the Materials section above, you can either cut it as above using a circular saw (Skilsaw) or the table saw to 29 1/4", or you can try to push the whole sheet through the table saw to make the final cuts below (this is not recommended).
2. Set the table saw to 14.5". With one of the 29 1/4 strips from (1) above, cut the 14.5" panel. Do the same for the other 29 1/4 strip. Do this for both speakers (i.e. 4 cuts at 14.5).
3. If you had the 15" cut for the end pieces (in Materials, above) then take the 15" end piece and make a 14.5" cut. Do this for both speakers (2 cuts).
4. Otherwise take the 37" piece and make two 14.5" cuts.
5. Set the table saw to 13". Taking the leftover offcuts from Step 2, cut the 13" front and rear baffles. Do this for both speakers (4 cuts). You should be left with four 1.5" strips 48" long.
6. Take the end pieces from Step 3 (or Step 4), make 4 cuts at 13", leaving you with four 14.5" x 13" ends (enough for both speakers).
7. Set the table saw to 1.5". Take the remaining large piece and make six cuts of 1.5" x 48" (enough for both speakers).

Circular Saw (Skilsaw) Method

This method describes the cuts required for *one* speaker box. You will need to follow the instructions through twice to get two speakers.

1. You will cut both of the sides at the same time which will make them exactly the same in width. (You will also cut the front and rear baffle together, and the end pieces together).
2. **Side Pieces** With your finger feeling for a ridge, line up two 29 1/4 pieces together so that one long 48" side is perfectly flush. Clamp the two 29 1/4 pieces together. Clamp the pieces to a workbench with the flush side facing out (towards you). Support the piece overhanging the workbench with a stool or something similar (and use your hand to support the other end when you are finishing the cut). Screw a guide allowing for a 14.5" cut. Allow the exact width of the powersaw (check the width from the edge of the saw that runs against the guide to the *outer* edge of the blade. Do a test cut where you just nick the edge of the MDF before cutting it, then check the distance with a tape measure. The guide must be very straight. A piece of U-channel shelving support works nicely. Clamp the guide in position first to check the distance with the saw, then when it is correct, screw it in place (use at least 3 screws, two in the ends and one in the middle). If you drill pilot holes before screwing, make sure you do not drill all the way through the work. (If you do it is not a disaster, you will simply need to fill the holes with wood filler). Run the saw down the guide. Use a carbide-tipped saw blade (Black and Decker only costs \$8). Cut slowly: a fast cut will result in an uneven surface with ridges and score marks. (Photo 1).

Photo 1.



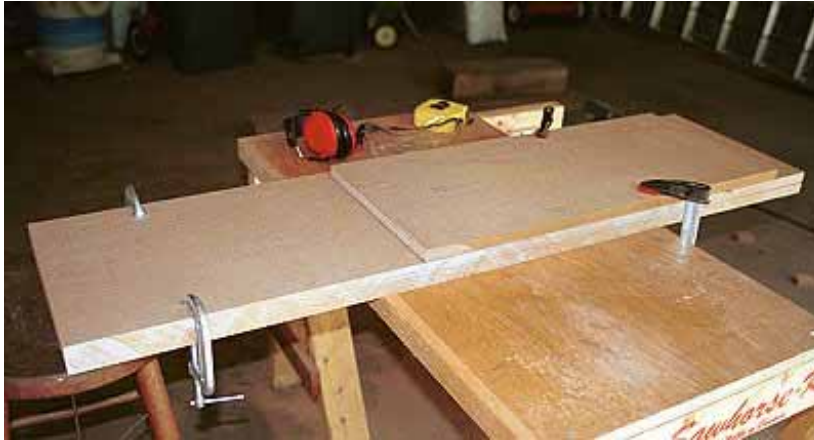
- 3. Front and Rear Baffle** Take the remaining clamped pieces from Step 2 and set it up for a 13" cut. Follow the same procedure as Step 2 (Photo 2). You will be left with two strips of 48" long by 1.5" wide.

Photo 2.



- 4. End Pieces** Clamp the two remaining pieces of either 37" or 15" (depending on whether you had the 15" cut made in the Materials section above) to allow a 13" cut. Make the front edge flush (just as in Step 2 above). Set the guide to allow a cut of exactly 13". The setup will look something like Photo 1 (for the 37" pieces) or Photo 2 (for the 15" pieces). Cut the 13" strip for the end pieces.
- 5.** Set up the guide on the end piece to allow a cut of exactly 14.5" (Photo 3). Cut one set of end pieces. Instead of screwing a shelf rail, you can simply clamp a straight piece of MDF (see the short piece clamped on top).

Photo 3.



6. Set up the remaining 48" long leftovers as in Photo 2 and cut three more 1.5" x 48" strips (five 1.5" strips total).
7. Repeat Steps 1 to 6 for the other speaker.

Assembly of Strips

1. Measure the 48" length of the 14.5" sides. Make sure they are 48" (mine were 49.5"!) If they are too long, accurately mark and cut them to 48" (using the same clamp system as in Photo 3 with circular saw, or using your table saw).
2. Take the front and rear baffles (13" x 48") and cut the length down to exactly 46.5" using the same clamp setup as in Photo 3.
3. Take four of the 1.5" x 48" strips and cut the lengths to exactly 46.5". One at a time, put the strips against the side pieces (14.5" x 48") and using a small scrap of 3/4" MDF check that the strips are short enough so that the strips plus two MDF pieces are not longer than the 48" side pieces. (Feel the distance with your fingers.) If the strips are too long, use a belt sander (or sand by hand) and carefully shorten the 46.5" strips until they fit. (See Photo 4 for an example of using the MDF blocks temporarily to adjust the position (or find the length) of the strips).

Photo 4.



4. Using two MDF blocks temporarily on either end, clamp the 46.5" strips in position on the side piece leaving 3/4" gaps to the edge of the side piece (Photo 4). Drill recesses for the

screws that are 1/4" deep using a 11/32 drill, starting at 2.5" from the strip end, then spacing holes at 7" centers after that. Note: it is important to start the drilling using the large 11/32 drill first, then follow with the small drill. If done the other way, the large drill rips into the work too fast and you cannot control the depth of the hole. You might even go right through the work.

5. Using a 3/32 drill, drill a hole through the strip and into the side piece. Drill 1/2" into the side piece (not all the way through!). (The amount required from the top of the strip will be 1.25", and you can use masking tape to mark that amount on the drill itself, then you simply drill down until the masking tape is just flush with the top of the strip). Do this for all holes.
6. Remove the strip from the side piece. Take a 1/8 drill and drill out the holes in the strip (but *not in the side pieces*). This allows a little clearance for the screws so the screws bite into the side pieces but don't hang up on the strips.
7. Sand the mating surfaces smooth. Wipe off the dust and apply glue. If using Gorilla Glue (polyurethane), you need to lightly dampen one side of the work with water (use a sponge) and apply glue to the other side (see the instructions). If using Elmers white glue (PVA) or similar, you simply apply the glue to one side of the work.
8. Line up the strip using the blocks as in Photo 4. Clamp the strip on the ends then using a screwdriver, screw in the 1 inch decking screws. Use clamps between the screws (as many clamps as you have) (Photo 5).

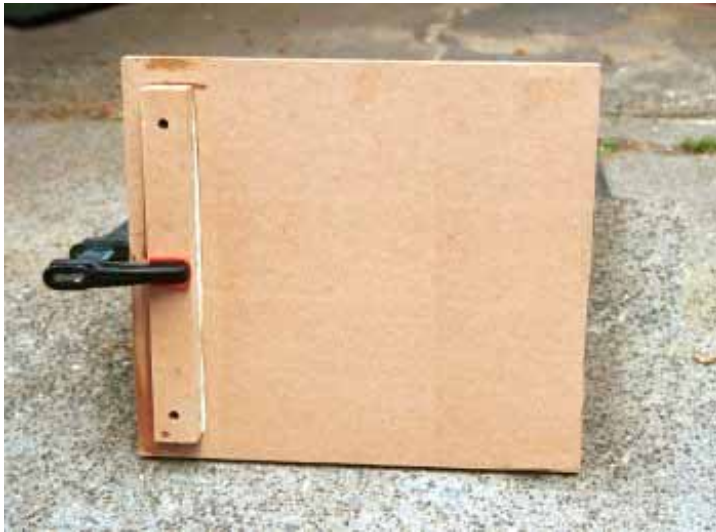
Photo 5.



9. Repeat this for the other edge of the side piece (as above) and repeat again for the second side piece.
10. Take one of the 1.5" x 48" remaining strips and cut it into four 11.5" long strips.

11. One at a time, place each 11.5" strip on an end piece on the 13" side. Using two MDF blocks, check the length of the 11.5" strip (similar method to Step 3 and Photo 4). If necessary, sand the strips until they are short enough to give a *tiny* amount of clearance (approximately 1/64 total clearance). We want this clearance because if the strips are too long, they will prevent the edges of the end pieces from mating securely with the side pieces and there will be a gap.
12. Follow the procedure in Step 4 above to drill, glue, screw and clamp the short strip onto one 13" edge of the end piece (Photo 6). *Do not glue the second strip on yet.* You will glue this of after assembling the box.

Photo 6.



13. Repeat Step 11 for the other end piece.
14. Using a file or other tool, scrape and sand any excess glue that has squeezed out of the strips on the *outside* edge of all the pieces. Do not worry about the glue on the inside. With polyurethane glue, you often get a large hard foam crust. You need to get back to a square inside corner because you need to have the surfaces mate exactly when you glue the box together.

Optional Step

15. If you wish, you can create a stronger box with some additional strips. The speaker boxes have been made both ways and have turned out fine in either case. Using a remaining 48" long leftover, set up a guide as in Photo 2 and cut one more 1.5" x 48" strip. Cut it into four 10" pieces. Screw and glue these pieces so they are flush with the top of the long strips, as in Photo 7. Do this for both ends of each side piece.

Photo 7.



Front Baffle

You need to cut two holes in the front baffle. The larger hole for the speaker will be cut with a Saber saw (also known as a jig saw). The smaller 4" hole for the port can be cut either with a hole saw, a fly cutter in a drill press, or with the Saber saw. If you use the Saber saw, try and cut very evenly and use a sanding "flapper" on a drill to smooth the port out.

1. Measure the height from the floor to your ear level as you sit to listen to music. This will be the height of the center of the driver.
2. Measure the distance on the front baffle to the center of the driver. If you want a generic position (not measured for you), you can place the center 8" down from the top of the baffle (and centered side to side, that is 6.5" in from the edge).
3. Mark a 11.1" diameter circle for the driver. If you do not have a large compass, you can make one by taking a 8" strip of cardboard, pressing a small nail through one end and hammering that into the driver center, then measuring out exactly 5.55" from the nail and pressing a nail through to make another small hole. Now take a very sharp pencil and place it in the hole and swing the cardboard arm around the circle while drawing with the pencil.
4. Mark the center of the port 14" from the bottom of the baffle (and centered side to side). Use a compass or cardboard compass and make a 4" circle.
5. Drill a starter hole larger than your Saber saw blade for the driver cutout and use the Saber saw to cut the 11.1" hole.
6. Using either the Saber saw or hole saw or fly cutter, cut the 4" hole for the port (Photo 8).
7. Sand the holes (if necessary) with rotary sanding device on a drill.

Photo 8.



8. Mark hole centers along the edge of the baffle, starting at 1" down from the top, then the next hole is 6" from the last (7" from the top) and every hole after is at 7" centers. The holes need to be 3/8 in from the edge. You can draw lines 3/4" from the edge using a small MDF block as template, then simply eyeball half the distance (centered between the edge and the line).
9. Mark one hole at the center of the top of the baffle, repeat for the bottom of the baffle.
10. Using the 11/32 drill, drill 1/4" deep holes (recesses for the screws).
11. Using the 1/8 drill, drill all the way through in each recessed hole. Sand the other side smooth (the mating surface).
12. Dust off the baffle and take it inside to meet your Super 12 drivers. Supporting the baffle at top and bottom, carefully lower one driver in. Note if it is tight and will not sit flush, mark this with a pencil then take it outside and sand the hole slightly larger.
13. Once the driver sits flush, mark the mounting holes. Try for a symmetrical pattern, with holes on top/bottom and side to side. Remove the driver.
14. Drill the holes to fit the mounting bolts. If using T-nuts (recommended), the holes need to be large enough to accommodate the T-nut (larger than the bolt size).
15. Hammer in the T-nuts.

End Pieces

1. Mark holes on the outside edges of the end pieces 1.5" in on the long (14.5") side and 3/8" in from the edge. Using the 11/32 drill, drill 1/4" deep hole recesses for the screws (Photo 9).

Photo 9.



2. Using the 1/8 drill, drill all the way through in each recessed hole. Sand the other side smooth (the mating surface).

Prepare for Assembly

1. Mark the side pieces as having a top, and mark where the front of the speaker (the front baffle) will be with a big arrow. Each side piece is of course a mirror image of the other.
2. Check the length of the front baffle against the two side pieces by laying it up against them (one at a time and observing your markings in Step 1 above) and feeling for the amount of clearance. The baffle should be “slightly” shorter than the side piece strips (about 1/32 or 1/64). At the same time, mark where the speaker mounting hole “hits” the side piece strip.
3. If necessary, sand down the edge of the front baffle using a belt sander or similar. At this time, you should check that the front baffle is square (use a carpenter’s square) and if not, correct it by sanding.
4. Take a scrap piece of wood and clamp it flush with the side piece strip where the speaker mounting hole is. Drill a 3/8" hole to provide clearance for the speaker mounting bolts. (PHOTO FORTHCOMING).

Box Assembly

Note: you need to **work fast** if using Gorilla Glue (or similar) as the glue will start to set before you get the box completely together. It might be more forgiving to use Elmers PVA or similar.

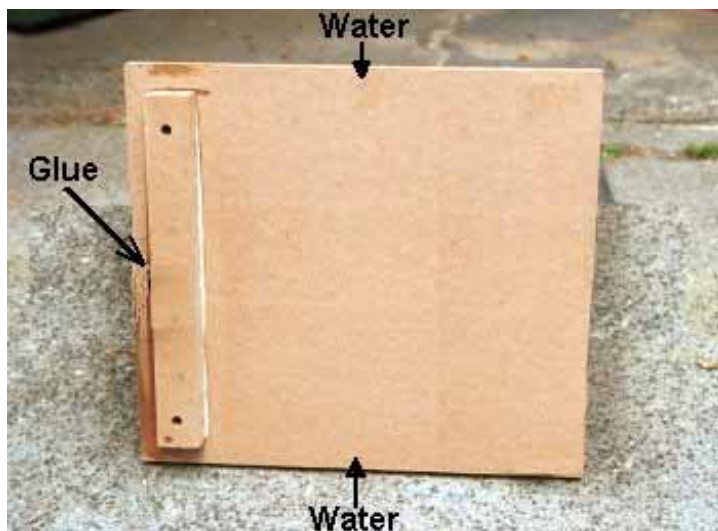
Note: if you want, you can do a test run to see how the baffle and side/end pieces fit together before gluing. Simply follow Steps 1 to 14 *without using any glue*. If things don't fit well, you can adjust them at this stage. See Photo 11.

Note: you can do the assembly using corner clamps to clamp the corners so that you can glue the sides and the ends together without gluing the baffle on. This might be an easier job. In this case, you clamp the corner clamps on once you have coated the edges with glue. Make sure that you have the front baffle mounting strips flush with each other. The front baffle must lie flat on the mounting strips. Once the glue has dried, you can fit the front baffle and glue it in place. While this method will take longer and requires corner clamps, it could be easier (though I have not tried each method so I don't actually know).

The assembly below is *without* corner clamps.

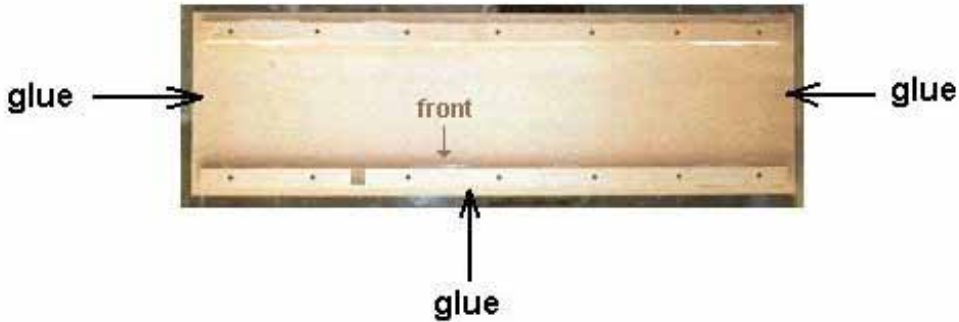
1. Clean all joints with a dry cotton cloth, and by blowing dust off to make the surfaces clean.
2. Lay the front baffle front side down on a supporting piece (or pieces) of wood which raises the baffle off the working surface.
3. If using Gorilla Glue (polyurethane), you need to lightly dampen one side of the work with water (use a sponge) and apply glue to the other side (see the instructions). If using Elmers white glue (PVA) or similar, you simply apply the glue to one side of the work.
4. Tear off four strips of duct tape, each 6" long and stick them temporarily to the workbench.
5. Use a little square of duct tape to tape over the hole of the two T-nuts that will sit against the baffle.
6. (Gorilla Glue) Using a wet sponge, wipe down all the edges of the front baffle, and one inch in toward the center all around the baffle.
7. (Gorilla Glue) Wet two edges of each end piece (Photo 10)
8. Apply glue to the two surfaces on one edge of the end piece (onto the strip and the end piece itself, Photo 10). Set the end piece aside.

Photo 10.



9. Apply glue to the two surfaces on three edges of the side piece (Photo 11). Make sure that you apply glue to the long side that has the clearance hole (also marked the front by the arrow you drew in 4. in Pre-assembly above).

Photo 11.



10. Lower the side piece onto the front baffle *on the correct side of the baffle*, and while holding it upright take the end piece and place it also on the baffle pulling it firmly together against the side piece so the glued edges mate. Take one strip of duct tape and tape together the upper corner of the box (side piece and end piece).
11. Apply glue to one edge and strip of one end piece and water to the other two edges (Photo 10) and place it on the baffle pulling it firmly together against the side piece. Take one strip of duct tape and tape together the upper corner of the box (side piece and end piece).
12. Apply glue to the two surfaces on three edges of the side piece. Make sure that you apply glue to the long side that has the clearance hole (also marked the front by the arrow you drew in Step 1. in Prepare for Assembly above).
13. Lower the side piece onto the front baffle and pull it firmly against the end pieces. Take the last strips of duct tape and tape together the two upper corners of the box (Photo 12).

Photo 12.



14. Take the band clamp and loop it around the box. Pull it tight by hand. Insert the two spacers on the end pieces. Tighten the clamp by turning the nut. Every few turns, tap or smack the box end pieces with your hand to snug things up, and also tap the spacers so that the friction is reduced and the band pressure is distributed evenly (Photo 13).

Photo 13.



15. Using a 24" bar clamp, clamp the lower sides of the box together low over the end pieces. Using a 3/32 drill, drill pilot holes. Screw in two screws. Leave the clamp in place (if you have enough clamps).
16. Repeat Step 15 for the other end piece.
17. You might need or want to wipe up dripping glue at this point (**but keep hurrying**).
18. Drill one or two holes in the top of the front baffle (working upside down) and screw in the screws. Repeat for the bottom of the baffle. (**Work quickly!**)
19. Rotate the box over so the baffle is facing up or to the side (shown in Photo 14). Take two or three 24" bar clamps and clamp the sides together, one in the middle and one either side of the middle. Remove the duct tape from the outer corners.

Photo 14.



20. Move the clamps from the front baffle end of each end piece to the rear baffle end (move from front to rear of speaker) and clamp the outer corners together.
21. Drill out all the top baffle pilot holes using 3/32 drill. Screw in all the screws.
22. Drill out the outer corner pilot holes and screw in the screws.

23. Leave to dry with the clamps in place.
24. Once dry, sand or scrape off any excess glue, especially in the mounting edges for the rear baffle.
25. Take the remaining short 11.5" x 1.5" strips and screw and glue them on the rear end of the end pieces so that the strips are flush with the long strips of the side pieces. (This way you will get a flat and flush surface for the rear baffle to mount onto. If you have mistakenly already added these short strips, don't worry, just try and make sure that they are approximately flush with the long strips by sanding if necessary).

Rear Baffle

1. Try fitting the rear baffle to the box (when the glue has dried!). If the fit is tight, mark where the constriction is with a pencil and use a belt sander to gradually remove material. Check often to see how the fit is. Stop when the baffle slides in easily.
2. Mark the same mounting hole pattern as on the front panel. Follow the same instructions as in Step 8 to Step 11 of Front Baffle to drill recess holes for the screws.
3. Fit the rear baffle and using a 3/32 drill, make pilot holes at all screw holes. Screw in the decking screws. Then remove the rear baffle again.

Installing Caulking and Damping Material

1. Squeeze caulking into the newly glued edges inside the box. If you have significant residue glue (such as polyurethane foam from Gorilla Glue) you might want to scrape it out first. Or you can simply skip the caulking if you decide the glue residue provides enough caulking and is not porous.
2. Let the caulking dry.
3. Take the double sided carpet tape and stick three strips down the length of each side inside the box, and on the inside of the rear baffle and front baffle. Firmly press on the 12" wide bubble wrap with the bubbles facing inwards (smooth surface out).
4. Again using carpet tape or using contact cement, fix the felt or Deflex[®] to the top of the rear baffle.
5. Install the foam weatherstrip on the rear mounting strips *inside* of the holes, or on the rear baffle *inside* of the holes. Make sure it is snug fitting with no air gaps in the corners.

Finishing the Boxes

You can finish the boxes by painting with your favorite furniture paint. First you will need to fill the screw holes and any surface imperfections with a wood filler. I would recommend using a two-component filler such as MinWax. I used two layers of black semi-gloss acrylic over an undercoat. Use a roller with a very fine surface to roll the paint on (and very lightly sand the undercoat and first coat with 220 grit sandpaper).

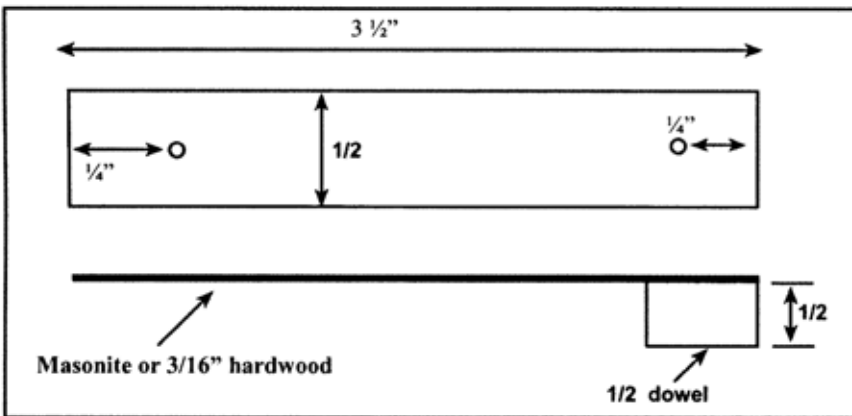
You can also laminate the boxes with formica or similar laminating plastic from a hardware store.

Another option is laminating with wood veneer such as cherry or oak.

If you have any finishes that you discover and like, please let us know.

Build the Tweeter Mount

1. Make the masonite or hardwood strip as the dimensions show below:

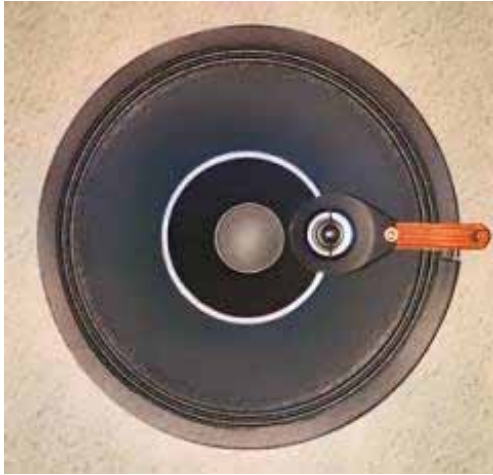


2. Glue the dowel to the wood strip. Using a 11/32 drill, drill a very shallow recess in the center of the wood at 0.375" from the end (just enough for the screw head to mount flush). Drill a 1/8 clearance hole the rest of the way through.
3. Drill a hole appropriately sized for the tweeter mounting bolt.

Install the Drivers

1. Mount the Super 12 driver using the attached gasket (but see Step 7 below first). Snug the bolts up, not too tight.
2. Mount the tweeter onto the tweeter support. Place the tweeter so that the center of the tweeter is right on top of the edge of the large free (whizzer) cone. Have the tweeter support horizontal and mark the hole position on the box. Drill a 3/32 pilot hole for the screw.
3. Drill a small (1/8 ?) hole for the tweeter wires just below the dowel. It might need to be quite deep to go through the strip inside the speaker box.
4. Feed the tweeter wires through from the rear of the box and solder them to the tweeter.
5. Place a small 3/4" circle of double sided carpet tape onto the dowel and puncture a hole for the screw. Place the screw through the tweeter mount and screw the mount to the speaker box while carefully aligning the mount so it is horizontal and the tweeter appears at the correct place on the large free cone (Photo 15).
6. Pull the tweeter wires gently tight from inside the box.
7. Solder the speaker wires to the Super 12 driver. (Or you can do this before mounting the driver).

Photo 15.



Build the Crossover

You can either build an external crossover box (which is recommended) or you can build separate crossovers for each speaker and mount them on the inside of the rear baffle.

Separate Crossover Box

1. Using 1/2" MDF, build a box that is 24" x 12" and either 4" or 6" deep (Photos 16 and 17). Use duct tape to hold the corners while the glue is wet until you can get the clamps fixed.

Photo 16.

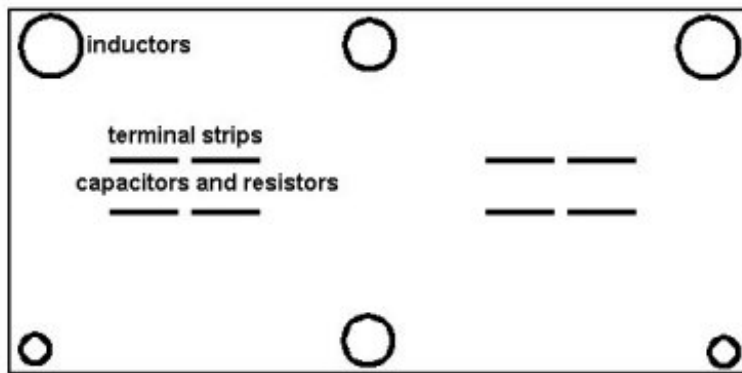


2. Cut a bottom and top to fit, glue the top on to form a lid (Photo 16).

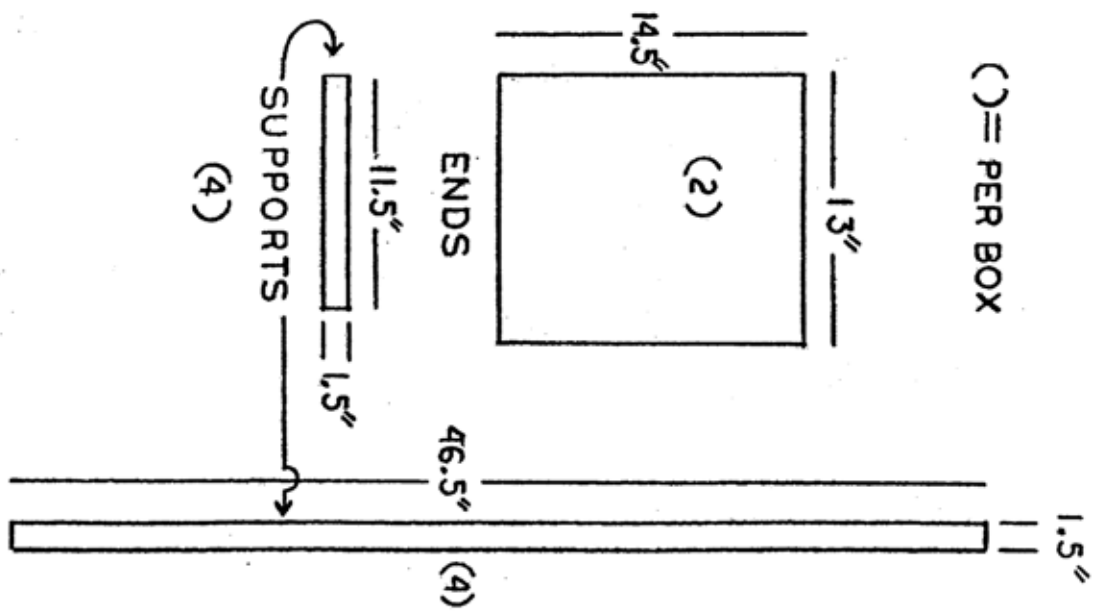
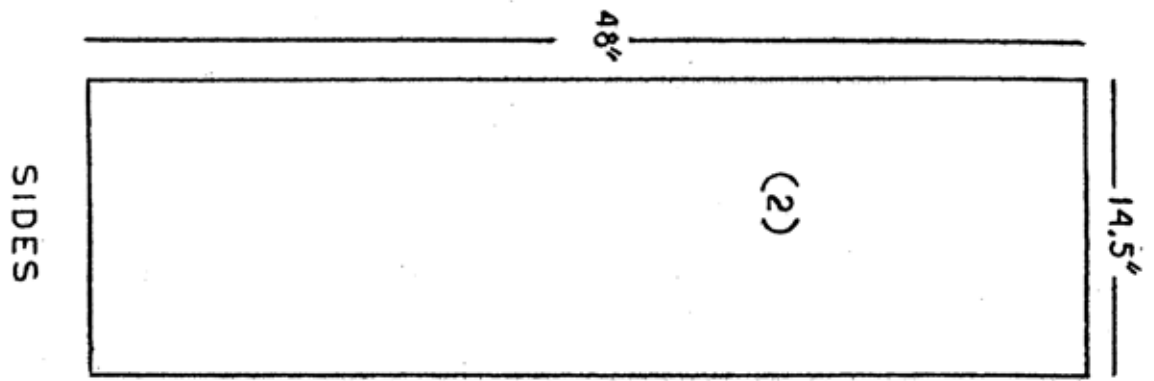
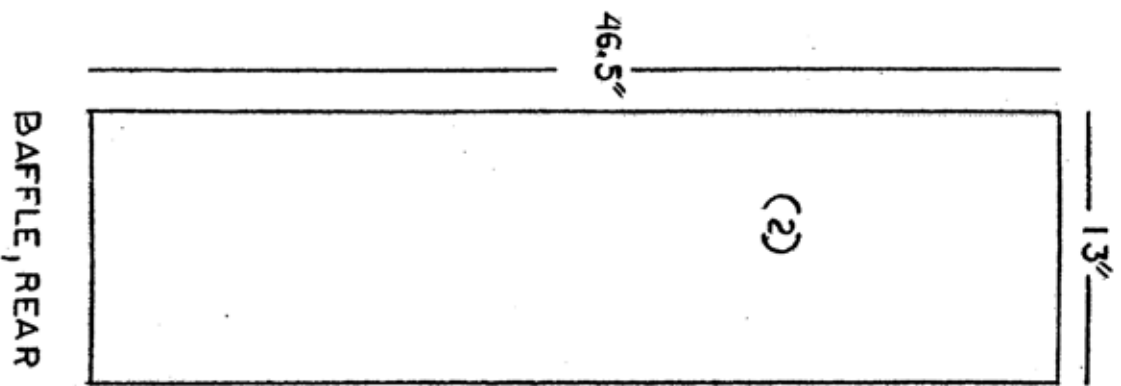
Photo 17.



3. Using the bottom sheet of 12 x 24 MDF, set up your two crossover networks as below. Make sure that the inductors are at least 1/2" in from the edge so the top box can sit on it properly. Attach the inductors with glue (epoxy, silicone rubber cement, etc.) and screw down the terminal strips with tiny screws.



4. Solder up the crossover network according to the diagram later in this manual.
5. **Direct wiring:** Run the wires from the drivers down the inside of the box (fix with one sided carpet tape) and out a hole near the bottom in either one side, or the bottom end piece itself (this will only work if you are going to put feet on the boxes). You can also put the wires through a hole in the rear baffle but you need to leave some slack in the box. Pull the wire through tight then apply silicone rubber cement to the wires and around the hole. Pull the wires back into the box slightly to suck the rubber cement back into the hole.
6. **Speaker Terminals:** Run the wires from the drivers down the box to speaker terminals (located on the rear baffle). Choose the lightest weight terminals you can, the less metal the better. You can either solder the wires to the terminals inside the box, or you can run the wires out a hole (seal with silicone rubber cement as in Step 5) and simply put the wires through the speaker terminal hole. Now you can clamp the speaker wires directly to the speaker cables without the terminal being part of the conducting path.



() = PER BOX

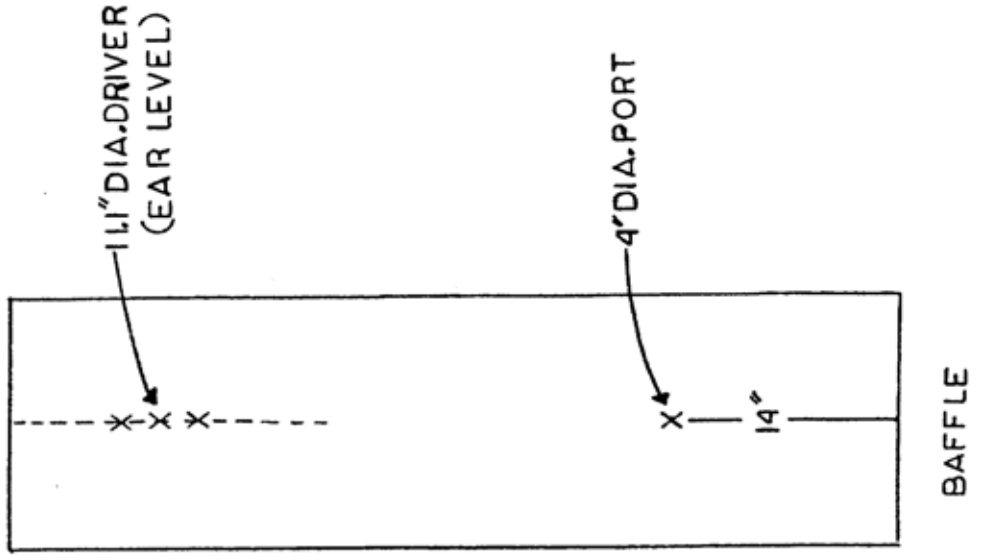
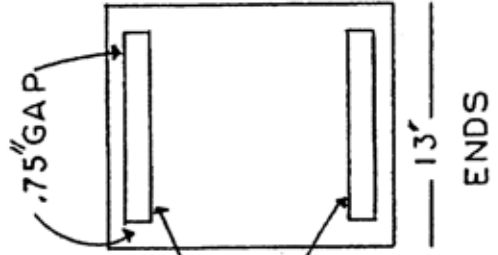
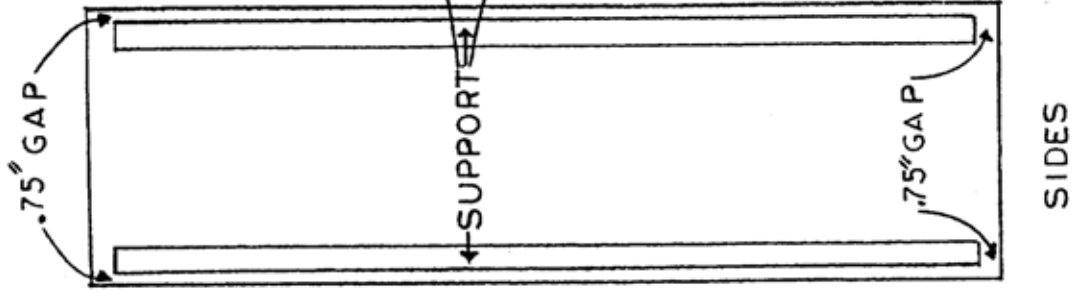
BAFFLE, REAR

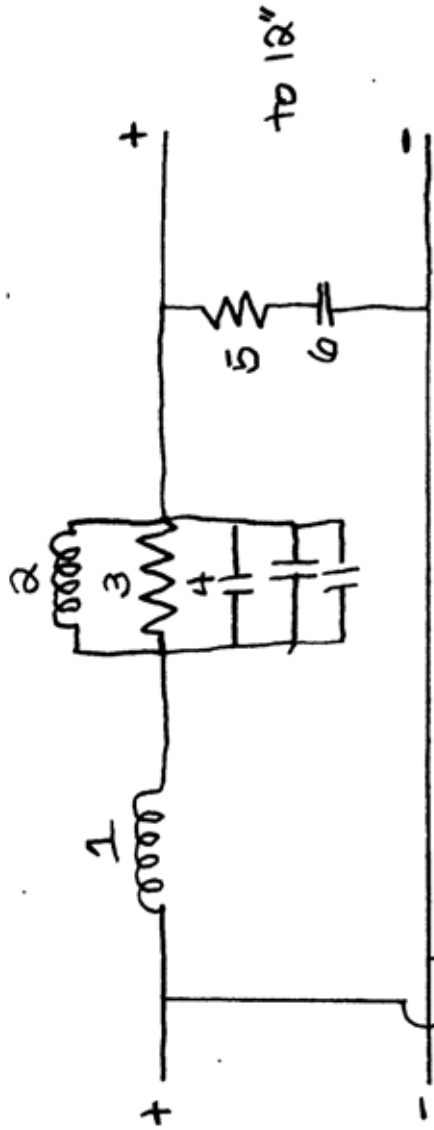
SIDES

ENDS

SUPPORTS

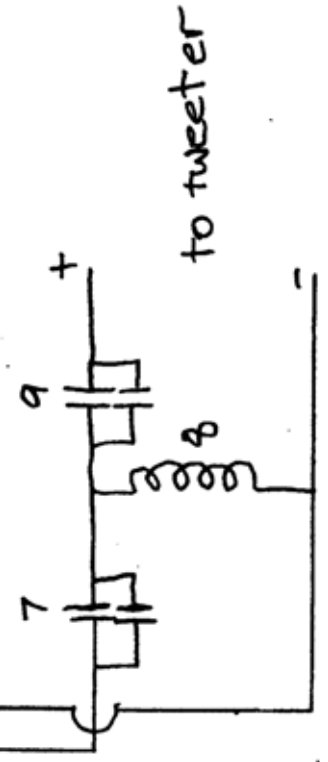
ALL STOCK .75" MDF

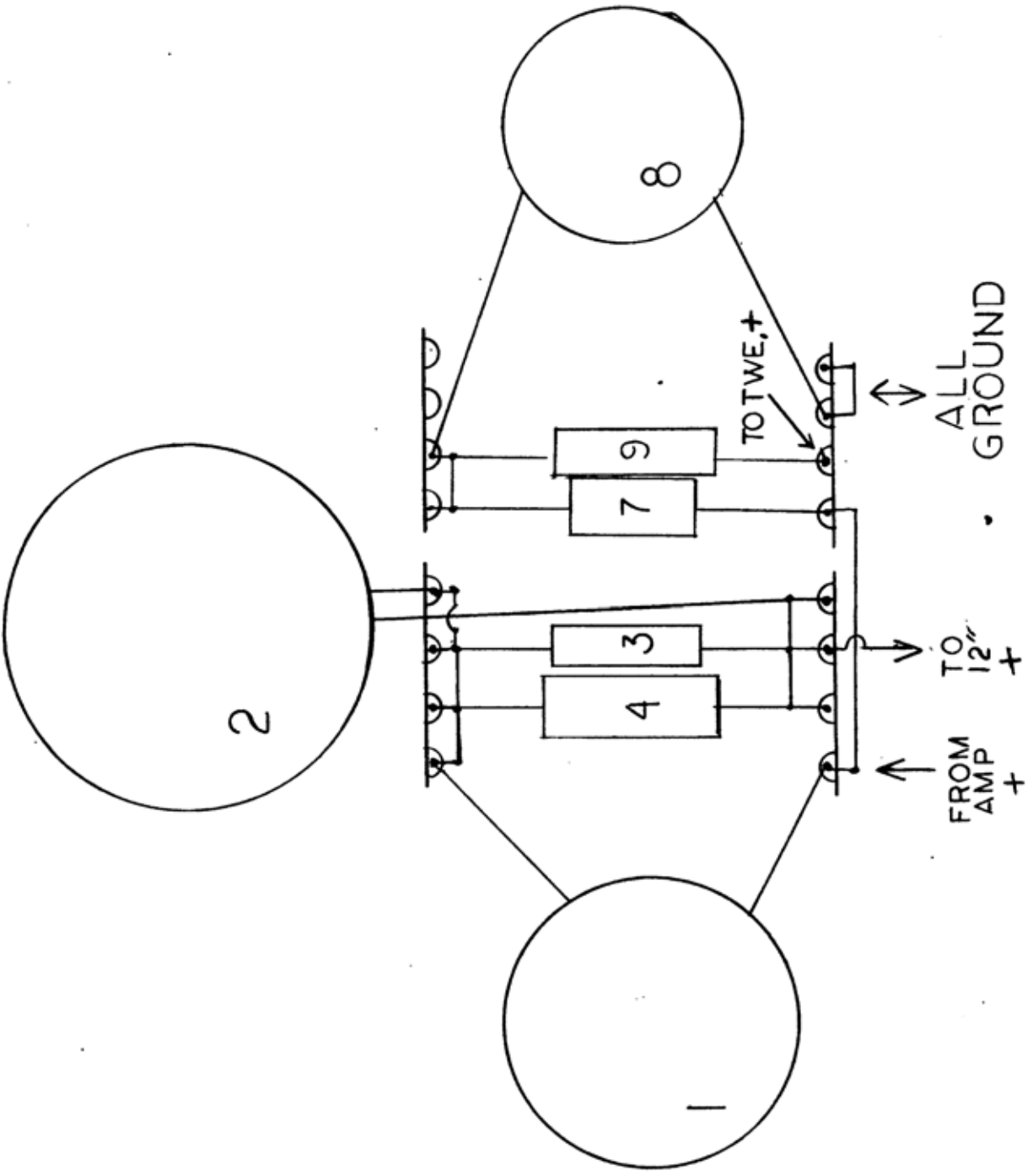




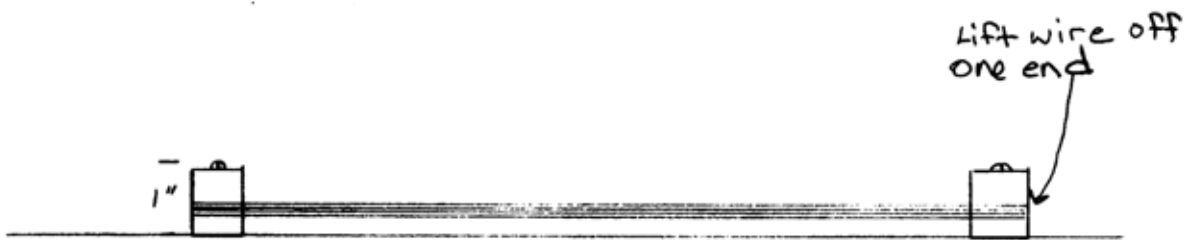
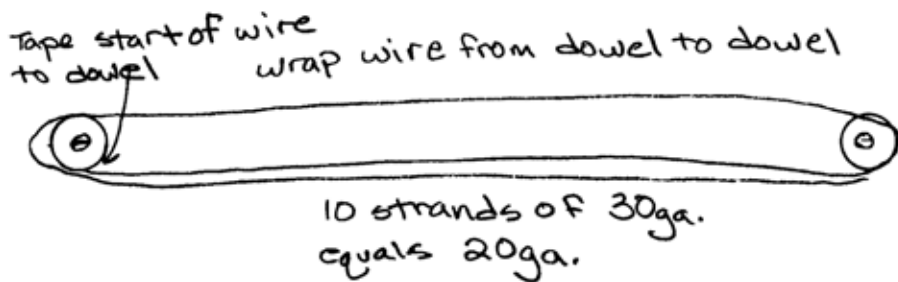
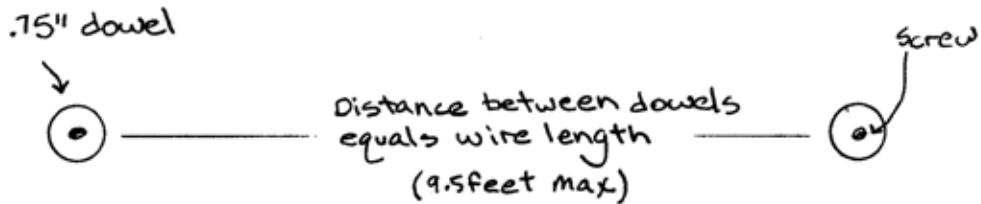
5&6 are soldered
Directly across
12" driver

1. 24mH
2. .65mH
3. Parallel 4x47Ω, 30Ω
4. Parallel 7.5μF, 1μF, .1μF
5. 6.8 Ω
6. 10.μF
7. Parallel 1.8μF, .1μF
8. .3mH
9. Parallel 4.7μF, .1μF





Making Litz Speaker Wire



once twisted, snip, strip and solder ends.

chuck lifted wire in a drill and twist.

Digi-Key 1 800 344 4539

200 feet white V-1090 - \$22.03
 200 feet blue V-1091 21 39

A simple
Brace

Don't over
tighten!



5/16" threaded Rod 16.5" Long

Nuts and washers front and back

ADDITIONAL NOTES ON CONSTRUCTION

1. For one unfamiliar with woodworking, the cabinets can easily be built according to the manual with little possibility of error. A professional cabinetmaker would probably eliminate the strips & use “lap” or “butt” joints to assemble the cabinets as they would be more proficient with keeping things square & could build the cabinets more quickly that way. As long as the internal volume is according to specs & the seams are tight the performance will not be affected regardless of what method you choose.
2. Bracing the cabinet is recommended. The few cabinets we built utilized a “shelf” or “window” brace which can be constructed as follows:

Dimensions apply to a cabinet constructed out of $\frac{3}{4}$ ” MDF

Cut a 13” square piece of MDF

Cut a 10 $\frac{1}{2}$ ” diameter hole out of the center

Place the cut brace approximately in the middle of the cabinet. Not the exact middle, but 1” above or below center (at 23” or 25”)

Screw the brace on from the outside (we always laminated the cabinets)

3. The manual describes building one external box for the crossover network. If you are planning on mounting your crossover networks externally, I would recommend building two small boxes. Mine are 11 $\frac{3}{4}$ ” x 11 $\frac{3}{4}$ ” x 3 $\frac{1}{2}$ ”D. Size isn’t critical as long as everything fits.
4. Unless you plan on doing a lot of “tweaking” on the crossover networks, I would recommend you mount them internally. The few we built all had internal crossovers. We took a piece of MDF 9” x 12” & attached it to the back baffle board resting on top of the window brace behind the main driver.

GOOD LUCK & HAPPY LISTENING!