

ARGOS Tapered Pipes

About the Tapered Pipe design:

The tapered pipe was designed to fulfil 4 major requirements;

- a) A loudspeaker that does not look like a rectangular box.
- b) As an exercise in getting the best possible mid and low response from a smallish speaker. .
- c) The cost structure of the components should be reasonably low
- d) NO parallel sides and allowing the speaker to move freely (no closed or tight ports)

Disclaimers:

These plans are given in good faith, but subject to the following disclaimer.

Since they are given as a “Do-It-Yourself” plans, I have no control over the outcome.

Therefore I cannot be liable of any problems or non-performance issues. I do, however make the following statement, “If you build these speakers as per the plans, using the prescribed speakers you will have a reasonably cheap pair of speakers that stand out from the crowd visually and sonically.”

Speaker Selection:

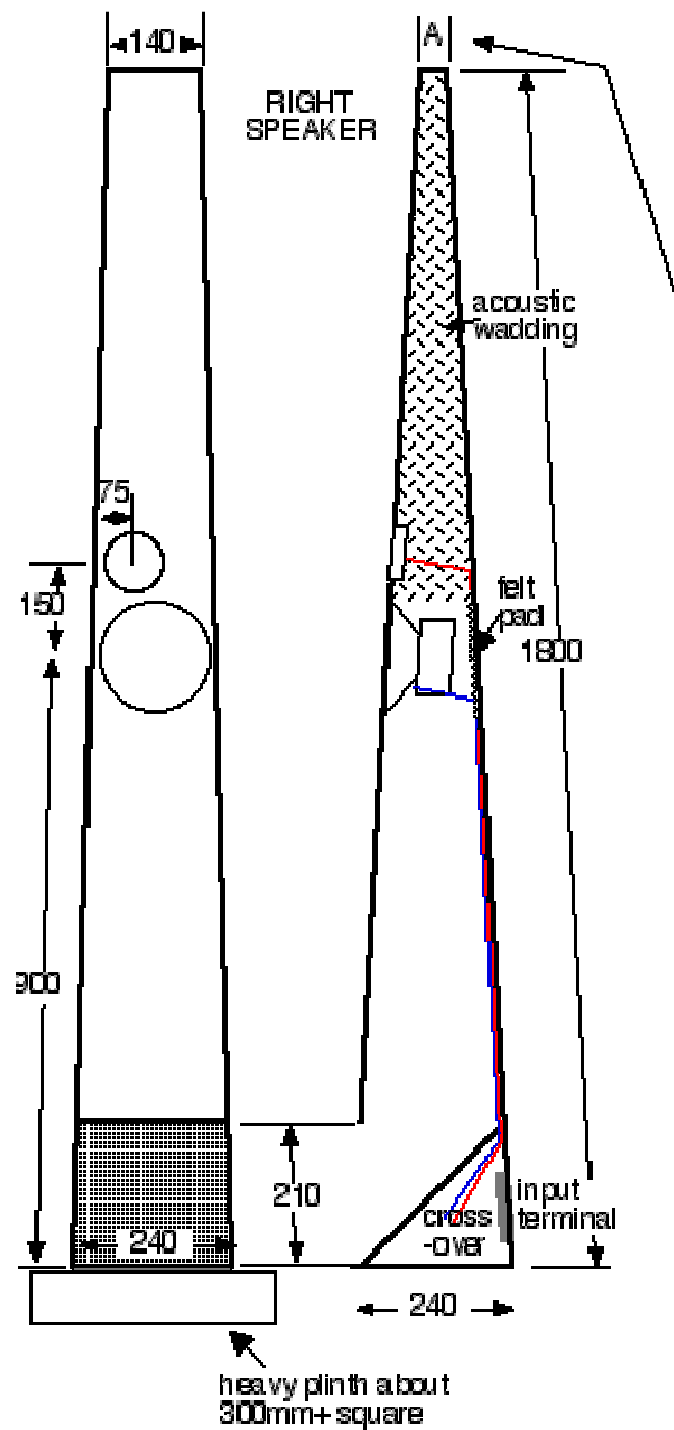
The speaker I have used is the Vifa P17WJ 6.5” woofer. It has a frequency response 45- 5000 Hz, Qts of .35, Vas of 34.7L , and will handle 70w rms. Other drivers should work just as well if they have similar specs, eg the Peerless 850122, Seas P17RE, but no guarantee can be given in this respect. You can match it with any number of tweeters. There is also the option of using a full range driver, but again the specs must be fairly similar to those of the Vifa P17WJ..

What you get with these plans:

1. The right to make 2 pairs of speakers for non-commercial purposes.
2. Full plans and cutting diagrams.
3. Methods and order of construction, with comments and hints and Email support during construction ;-))

The one extra thing I ask, is that you send me photos of the finished speakers, either by e-mail or post

THE PLANS All units in mm



measurement 'A' will depend on the thickness of timber used for front and back

METHOD AND CUTTING DIAGRAM

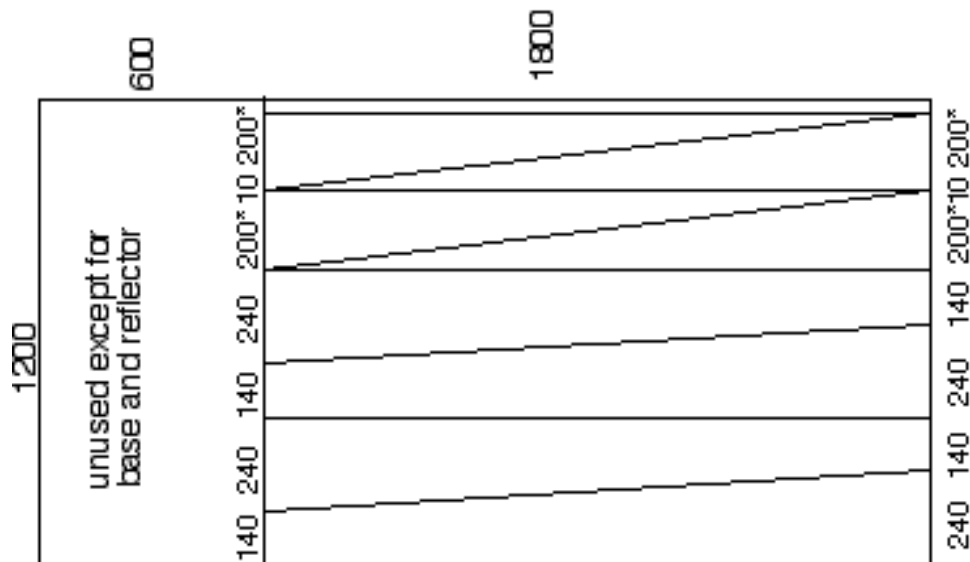
1. Buy an 8' x 4' sheet of 18mm mdf (2400x1200) measure and cut the pieces one at a time.

I set the board on some slats and clamp a straight piece of 4x1 in place as a guide and use a rotary saw. The design should fit neatly (or was that tightly) on the sheet. Do not cut the base and reflector yet. Once all pieces are cut, you then need to work out

the angle at the bottom and top of each piece to form an isosceles trapezium (front and back) or isosceles triangle for the sides. I use a bevel square from each edge, adjusting until they align.

Shorten the fronts by 23cm to allow for the port.

MAKE SURE ALL PIECES MATCH. Don't cut the base and reflector yet.



Now mark out and cut and sand the holes for the speakers. I use a router with a hand made base plate to cut the woofer hole, and hole saws drills for the smaller ones (tweeter and input terminals).

Flush mounting is preferable !!

A jigsaw could just as easily be used. Remember that one is a mirror-image of the other on the front if you are using faced material.

The BACK is attached to the sides first.

Lie 2 sides on the bench and check for fit of the back. The bottoms should align. If the top of the sides is too high, trim the bottom of the sides slightly. Slightly short is not a real problem. Glue and screw or nail (pre-drill if using MDF) one of the sides. (I use spiral nails). Near the top, use small nails to avoid splitting, and nail from the inside. You may need to push and shove a bit to get a smooth joint, (my belt sander works overtime later). Now attach the other side.

The next step is to pin the wires in, to go from the speakers to the crossover. I use a thick wire for the woofer and a thinner wire for the tweeter, mainly so I know which is which. ALLOW PLENTY OF EXTRA WIRE out of the input terminal hole and at the speaker end. Firmly pin one wire along each side in the back of the cabinet , the tweeter wire on the tweeter side. MAKE SURE they will not vibrate by using some goop of some sort along the pinned length.

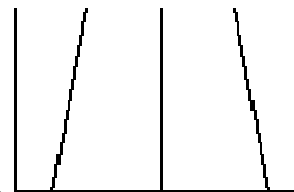
The top part need to be filled with wadding, use white acoustic stuff or quilt wadding NOT FIBREGLASS BATTS. Put the speaker on its back and cut layers of wadding in decreasing lengths to fill the top of the speaker. For neatness make the bottom one extra long and fold it up over the others as the last piece. Small dobs of wood glue will hold it in place.

Now the fun part. Attaching the front. Unless you are a wizard at cutting out this is the difficult part, because you can bet things won't fit as nicely as you want. I always have several 1 foot clamps available to pull the sides in and a piece of wood to lever the sides out (through the speaker holes) if they are too far inwards. (Sides slightly in from the edge can be fixed with the belt sander, but it is awkward if the sides are out past the edge of the front)

If the line of the sides and back at the top is wrong, sand down to get a level for the front to sit on. Now glue and fix the front. Remember to apply glue to all places where front will sit.. Make sure the front and back are fixed and glued together firmly at the top.

BASE can now be measured from the cabinet and cut, remembering to allow for slight beveling on all edges to fit the slope of the sides. Bevel and fix the base.

REFLECTOR can now be cut. It is 27cm long with a 45° mitre at each end. Measure the width at the bottom front and level with the top of the port at the back. Cut the reflector wider than needed and mitre the ends. Lay-out a 90° centre line and mark half the measurements either side of the centre line. (diagram exaggerated).



Check fit then fix in cabinet, fill any gaps.....

PORT FINISHING: There are 2 basic options.

1. leave the port open (best unless you own ferrets) and complete the front edge with square timber (same thickness as your main timber) before finishing and painting. OR
2. make a frame using timber about 3mm thinner and cover with speaker cloth. Attach with velcro pads. There is a lot of air movement, so this should only be used if really necessary.

GO TO TOWN WITH THE BELT SANDER .

Round or square the top, fill any minor gaps etc, Sand the sides smooth. Vacuum inside to remove dust, etc etc.....

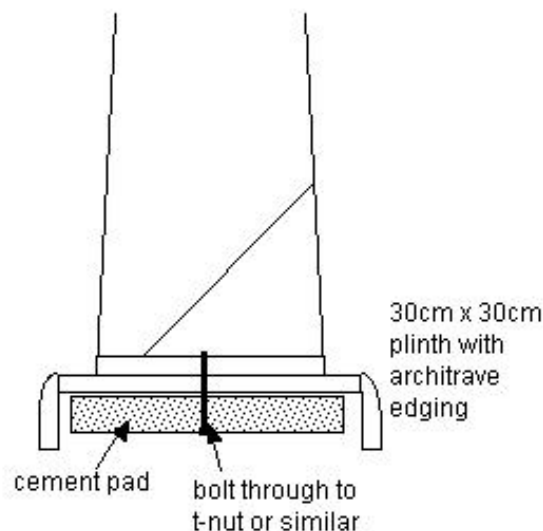
FINISH: normal finishing procedures, BUT PLEASE.....BE ORIGINAL AND INVENTIVE

I've used metal paint finishes, cracked paint finishes, oiled cedar veneer (lots of hard work).

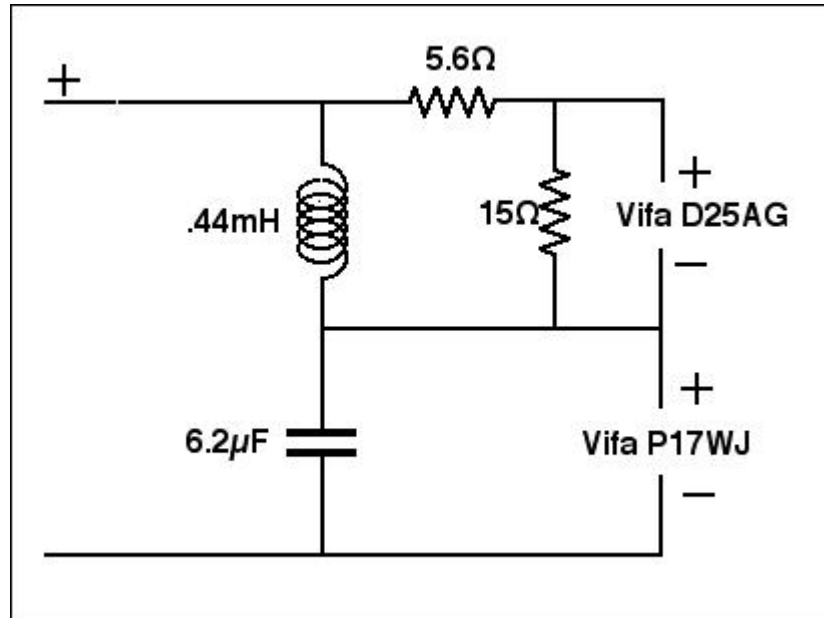
I block the speaker holes with cardboard or a ply circle before doing any spraying..

ATTACHING SPEAKERS: Speakers should be flush mounted !. I always use a rubber or foam gaskets between the cabinet and the speakers. Once the finish has absolutely dried, the speakers and cross-over can be put in. Don't rush after painting. Although it may seem dry, applying pressure when screwing in the speakers can cause the finish to stick to the gasket and you can never remove the gasket later.

PLINTH: It is very important for stability and also for better controlled bass response that a heavy plinth is added to the base of the speaker. This diagram shows how I carry this out, there are actually 2 bolts about 15cm apart, bolted right through the cement pad, plinth and base of speaker, masonry drill required !!



CROSS-OVER: I use a series crossover, tuned by ear only. You may want to use another sort of x-o or optimise the one below using software, but PLEASE listen to this one first !!! Cap should be of high quality, coil should be 12 to 18g wire wound air core. Resistors 10w at least, preferably non-inductive. Top end can be adjusted by altering the resistors a bit.



BEST OF LUCK AND HAVE FUN,
from ARGOS Audio