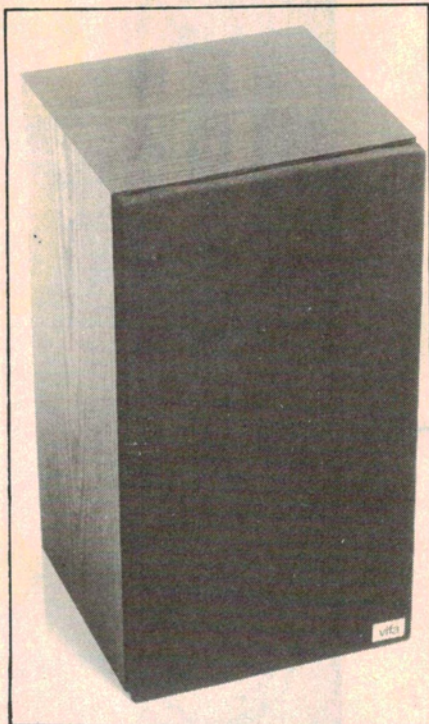


Save money with this easy-to-assemble kit

Build these 2-way hifi loudspeakers

Build this compact two-way loudspeaker system and save yourself a bundle by comparison with equivalent fully imported units. These speakers are an ideal match for our new Playmaster Sixty-Sixty amplifier without being too big or expensive. You can buy the complete kit or just the speakers and build the enclosures yourself, to save more money.

by COLIN DAWSON & LEO SIMPSON



The loudspeakers are finished in a good-looking synthetic black veneer.

While the cost of imported loudspeaker systems has gone through the roof, you can still save a considerable amount of money by building your own. And while there are presently a number of build-it-yourself loudspeakers on the market, this compact two-way system must be one of the best value-for-money buys available.

This loudspeaker system has been quite a while coming. When we were in the process of developing the Playmaster Sixty-Sixty amplifier we knew that readers would want a matching speaker system to follow. In meeting this demand, there were several approaches we could have taken which would have involved large and expensive systems, complex cabinetry and crossover networks and so on.

Instead, the system duplicates what is presently the most popular segment of the hifi market. Accordingly, it is a two-way unit with 20cm woofer and 19mm dome tweeter in a compact sealed enclosure, with a relatively simple crossover network. The design was commissioned by Scan-Audio Pty Ltd and uses loudspeakers from Vifa, one of Denmark's largest speaker manufacturers.

Just as a point of interest, Vifa drivers are used in many expensive fully imported loudspeaker brands, such as Mission, Jamo, Bang & Olufsen, Heybrook, Rogers, DCM Timewindow and Monitor Audio.

Vifa drivers

The designated woofer is the Vifa C20WG-19-08. This is a conventional woofer with a nominal diameter of 200mm. It has a foam roll surround and a doped paper cone with an effective (piston) diameter of about 155mm. The chassis is a steel pressing fitted with a ceramic magnet. In other words, it is a straightforward woofer with no frills. It



has a nominal free-air cone resonance of 39Hz and is claimed to be suitable for sealed enclosures up to 60 litres. Its Thiele-Small parameters are: Vas 82 litres; Qt 0.78.

By comparison with the no-nonsense woofer, the tweeter is an exotic little beastie. It is a 19mm soft dome unit with a ferro-fluid damped voice coil for high power handling and a very smooth frequency response. Its resonant frequency is around 1.7kHz.

The crossover is a relatively simple network dividing the audio spectrum at 3kHz with attenuation slopes for both tweeter and woofer of 12 decibels per

octave above (for the woofer) and below (for the tweeter) 3kHz.

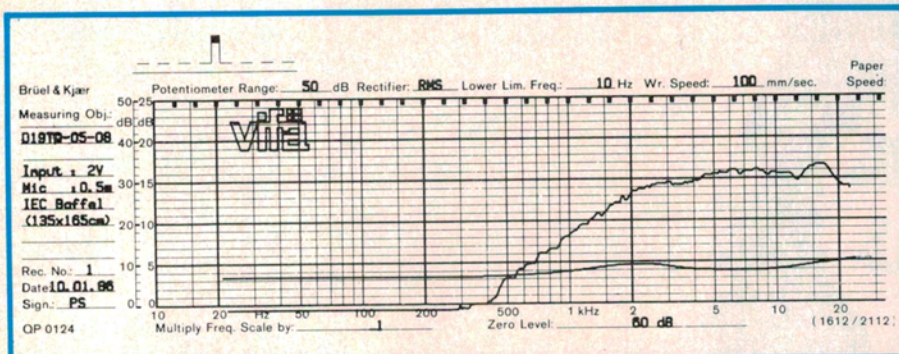
Let's discuss the crossover network in a little more detail. It uses two air-cored inductors, two bipolar electrolytic capacitors, one metallised polyester capacitor and several wirewound resistors. Associated with the woofer is an impedance equalisation network consisting of a 6.8 Ω resistor and 10 μ F capacitor.

The purpose of this network is to cancel out the 0.8 millihenry inductance of the woofer voice coil which would otherwise reduce the attenuation slope of the woofer feed components, com-

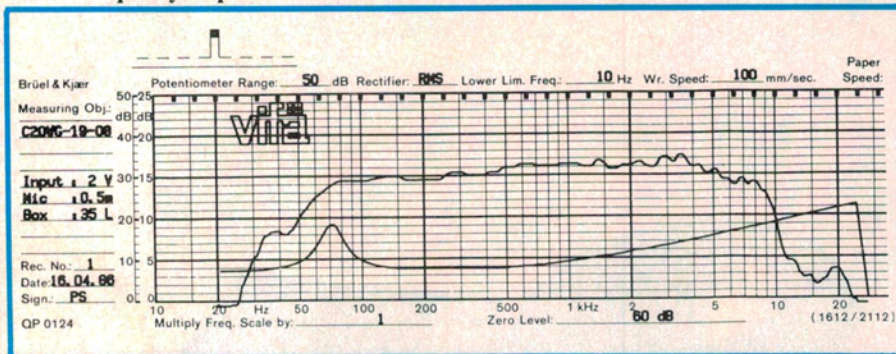
prising the 0.42 millihenry inductor and 6.8 μ F capacitor. The tweeter feed components are the 3.3 μ F metallised polyester capacitor and 0.26 millihenry inductor.

In addition to these components, we found it necessary to attenuate the tweeter slightly, by about 2dB, by the addition of a resistive attenuator. This consists of a 2.2 Ω series resistor together with an 18 Ω resistor to shunt (ie, in parallel with) the tweeter. This just takes the "edge" off the tweeter response so that the overall balance is more pleasant and less likely to emphasise tape hiss and surface noise on vinyl

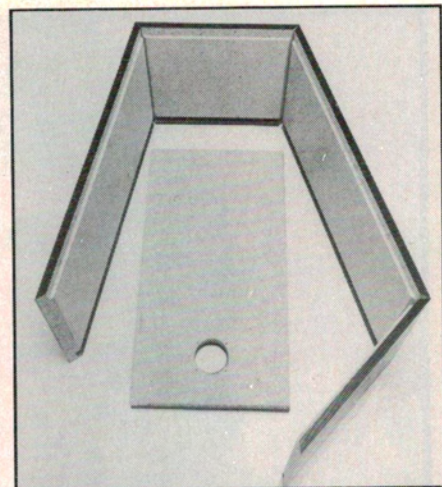
Two-way loudspeakers



Above: frequency response curves for the C20WG woofer and the D19TD tweeter.



This graph shows the frequency response and impedance curves of the Vifa 60-60 system.



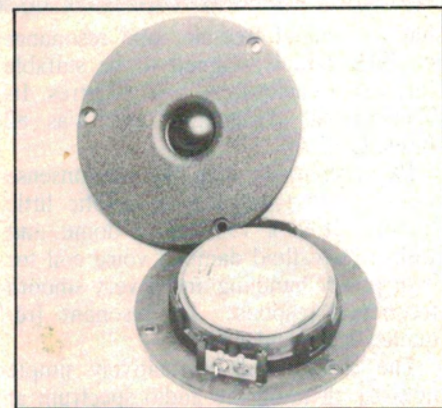
The cabinet comes as a wraparound assembly. records.

The cabinet is a compact 35-litre sealed enclosure made of 16mm chip-board. This size has been settled upon as ideal for a bookshelf loudspeaker which can also be hung on the wall. As well as being compact, this enclosure volume also allows the woofer to handle plenty of power without running into overload.

Specifically, it makes a very good match to the recently described Playmaster Sixty-Sixty stereo amplifier. Hence, these compact loudspeakers have been designated the Vifa Sixty-Sixties.

In an average-sized lounge room and driven by the Playmaster Sixty-Sixty or an equivalently rated amplifier, these speakers will deliver enough sound volume to satisfy the most power crazed enthusiast. However, if you have a larger-sized lounge room and a bigger amplifier, such as the Playmaster Series 200, you should consider a larger speaker system with more power-handling capacity.

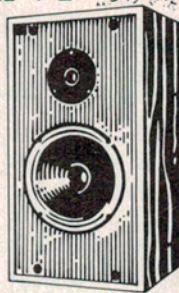
Suffice it to say that, as far as value for money is concerned, these Vifa



The D19TD tweeter is a 19mm soft dome unit with a ferro-fluid damped voice coil.

ANOTHER BRILLIANT RELEASE FROM VIFA!

VIFA EA 60/60 KIT SPEAKERS.



The value and the sound get better and better!

As you probably know, the value of kit speakers has never been greater than it is today. Our falling dollar, together with the rate of import duty, freight costs and other handling charges make fully imported loudspeakers almost a super luxury item. On the other hand, kit speakers can offer the same – and in most cases better – drivers and cross-overs and cost far, far less and sound far, far superior.

A perfect example of the sound of excellence.

The new Vifa loudspeaker kit has been designed to completely outperform any similarly priced speakers. This is a 2-way design incorporating drivers which give a deeper, more natural bass response and 19mm soft-dome ferro fluid cooled tweeters which provide clear, uncoloured sound reproduction.

These VIFA drivers are identical to the ones used in such fine speakers as MISSION, ROGERS, BANG & OLUFSEN,

MONITOR AUDIO, HAYBROOK just to mention a few. Some of these speakers cost well over \$1000 a pair.

The dividing network is of the highest quality and produce no inherent sound characteristics of their own; they simply act as passive devices which accurately distribute the frequency range between both drivers in each speaker.

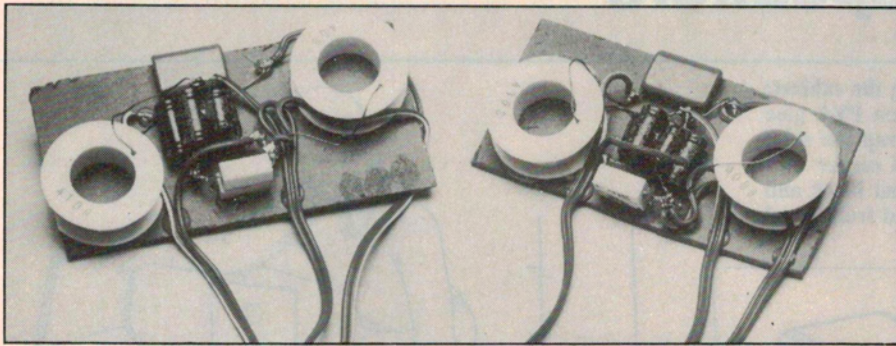
The ideal Bookshelf Speakers.

The fully enclosed acoustic suspension cabinets are easily assembled and are perfect for bookshelf use or on speaker stands. All you need are normal household tools and a couple of hours enjoyable application and you've built yourself the finest pair of speakers in their class.

For further information and the name of your nearest Vifa stockist, please contact the Sole Australian Distributor:

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52 Crown St.,
Richmond 3122.
Phone (03) 429 2199.

vifa



The crossover networks are relatively simple and are supplied preassembled.

Sixty-Sixty loudspeakers must be one of the best buys presently available. If your budget won't run to the \$600 to \$800 needed for a fully imported pair of equivalent speakers, these are the ones to go for.

Construction

Only the most basic of tools are required to assemble these loudspeakers. Even if you are a rank amateur at carpentry you will have no problems putting them together. You don't need special clamps or jigs and all timberwork has been precisely machined. You do have to be able to use a soldering iron though, to connect the loudspeakers to the crossover network.

On the other hand, if you are experienced in carpentry, you could make your own enclosures and just purchase the loudspeakers and crossover networks. By doing it this way you stand to save quite a bit of money. However, this should be balanced against the very good finish that these precut enclosures will give. They are finished in a very good-looking synthetic black veneer which is a good match for the Playmaster Sixty-Sixty, or indeed, almost any modern amplifier.

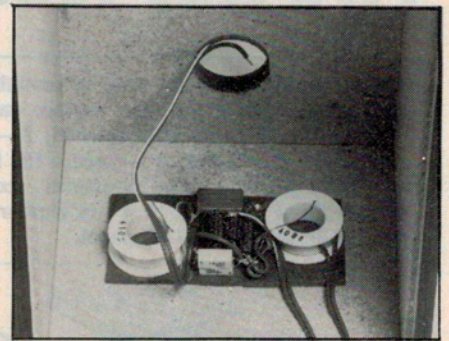
The baffleboard (on which the speakers are mounted) is also finished in a subdued grey vinyl.

The complete kit for a pair of loudspeakers is supplied in two boxes. One box is long and flat and contains all of the timberwork for the two enclosures. The other box contains the drivers, crossovers, terminal blocks, Dacron filling material, screws, etc. Although they do not look at all like a couple of hifi speakers at this stage, there is surprisingly little work involved in putting them together.

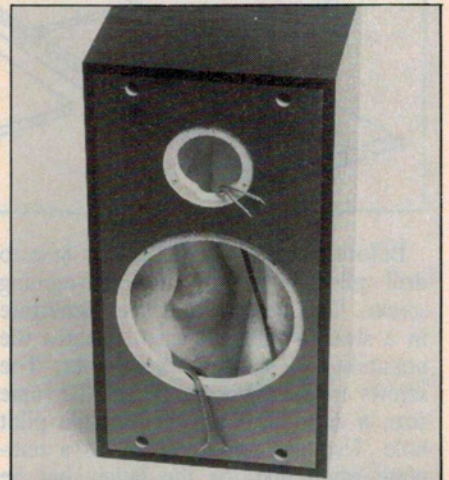
Not supplied in the kit, but nevertheless essential to construction are: (1) a tube of PVC woodworking glue; and (2) a roll of adhesive foam tape (eg, Engels No. 5 draught exclusion tape). The tape is needed to make airtight gaskets for mounting the drivers on the baffleboard.

Begin by carefully emptying the contents of the long flat box. This must be done very carefully because the top, sides and bottom of each enclosure are in a wraparound piece and held together only by the decorative veneer "hinges" which allow them to be folded. If you are not careful in handling the enclosure in this form you could tear the veneer and spoil the finished result.

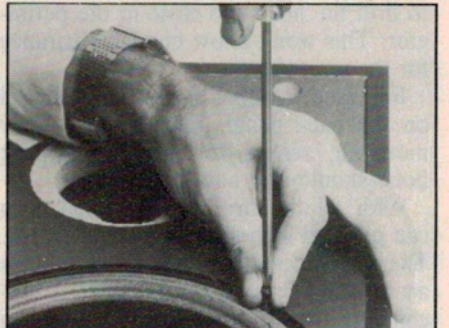
You should also empty the box containing the individual loudspeakers, the crossover networks and the other components, to check that all have been supplied and are in good condition.



The crossover is glued to the bottom of the cabinet.



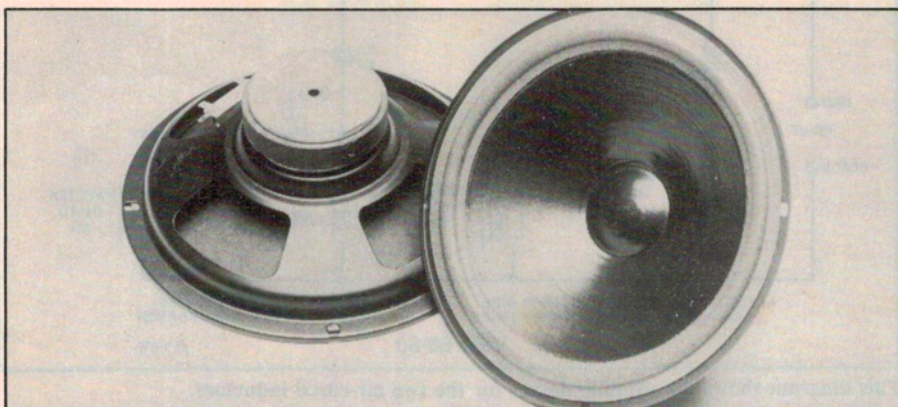
This view shows the assembled cabinet, prior to mounting the loudspeakers.



Take care when mounting the drivers — it's all too easy to punch a hole through a cone.



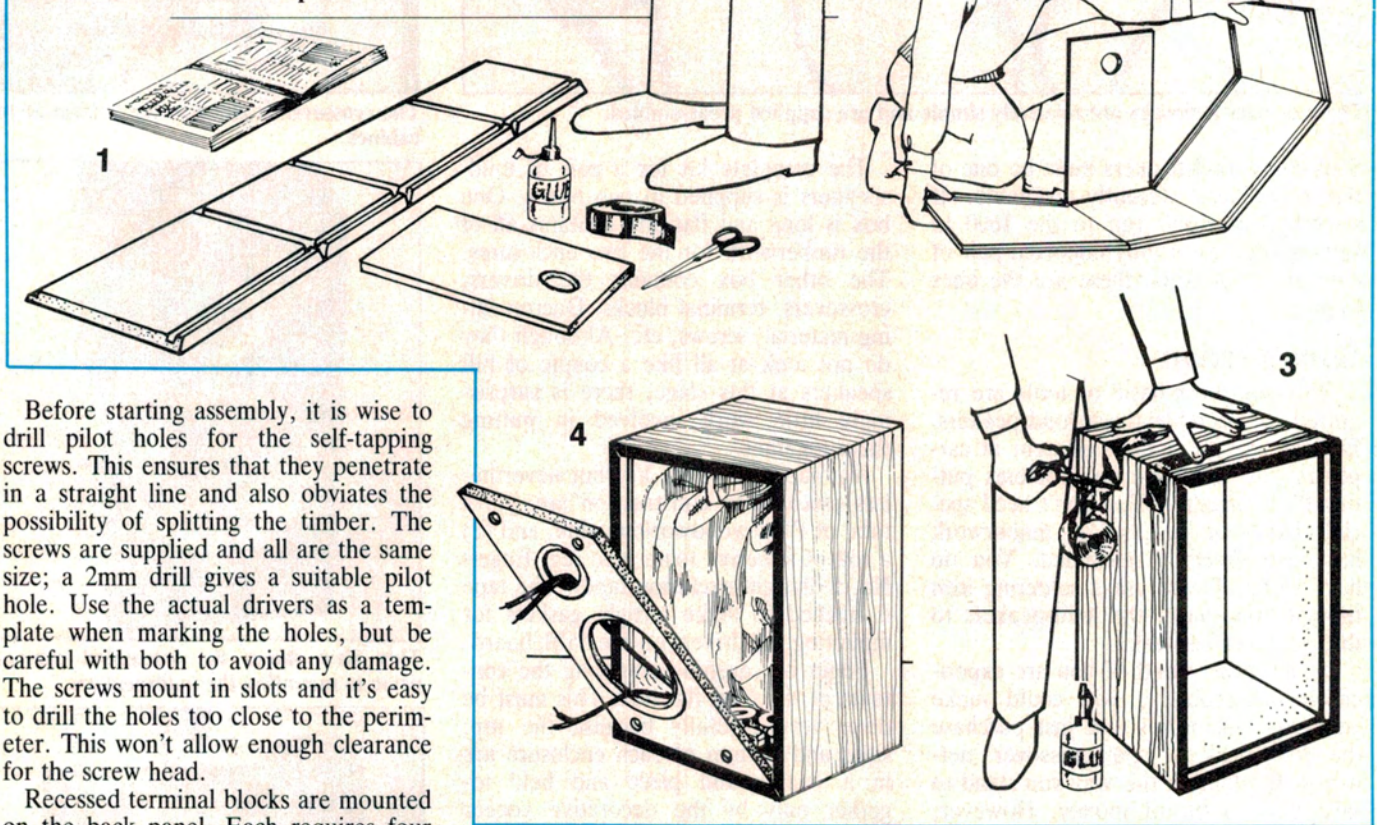
The grille cloth is stretched over the framework supplied and retained with tacks.



The C20WG-19-08 is a straightforward 200mm woofer with a free-air resonance of 39Hz.

Two-way loudspeakers

These drawings show the steps in assembling the cabinet: 1 — lay the pieces on a flat surface and run PVA glue into the V-cuts and rebate channel; 2 — wrap the sides around the rear panel; 3 — secure the final corner with masking tape; 4 — install crossover, terminal block and Dacron filling material, then run glue around front-panel rebate and install the front panel.



Before starting assembly, it is wise to drill pilot holes for the self-tapping screws. This ensures that they penetrate in a straight line and also obviates the possibility of splitting the timber. The screws are supplied and all are the same size; a 2mm drill gives a suitable pilot hole. Use the actual drivers as a template when marking the holes, but be careful with both to avoid any damage. The screws mount in slots and it's easy to drill the holes too close to the perimeter. This won't allow enough clearance for the screw head.

Recessed terminal blocks are mounted on the back panel. Each requires four mounting screws for which the pilot holes should also now be drilled.

With all the drilling completed, you can proceed with gluing the enclosures. The wraparound member actually folds around the back panel and has a machined rebate to hold the back panel in place. This gives a rigid structure, even before the glue sets.

The procedure is quite simple. Lay out the continuous side piece on a flat surface such as the floor or a large table. The three fold joints should be flexed as little as possible, as noted above. Then run a fillet of PVA glue into each of the V-cuts for the three-fold joints and into the rebate channel.

The back panel can now be fitted in to the channel of what will become the base panel. Make sure that the terminal block hole is at the bottom; ie, it corresponds to the join in the veneer which should also be at the bottom. Then it's a matter of carefully wrapping the sides around the back panel, making sure

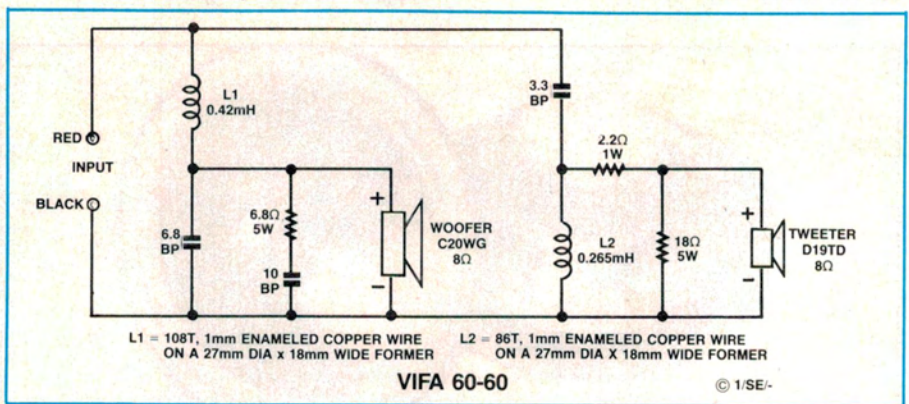
that no stress is placed on any of the three corner joints.

That done, the final corner is held together with strips of masking tape or packaging tape. Don't worry too much if a little glue oozes out onto the veneer. It peels away from the plastic quite easily once it's dry.

Leave the assembly for at least 30

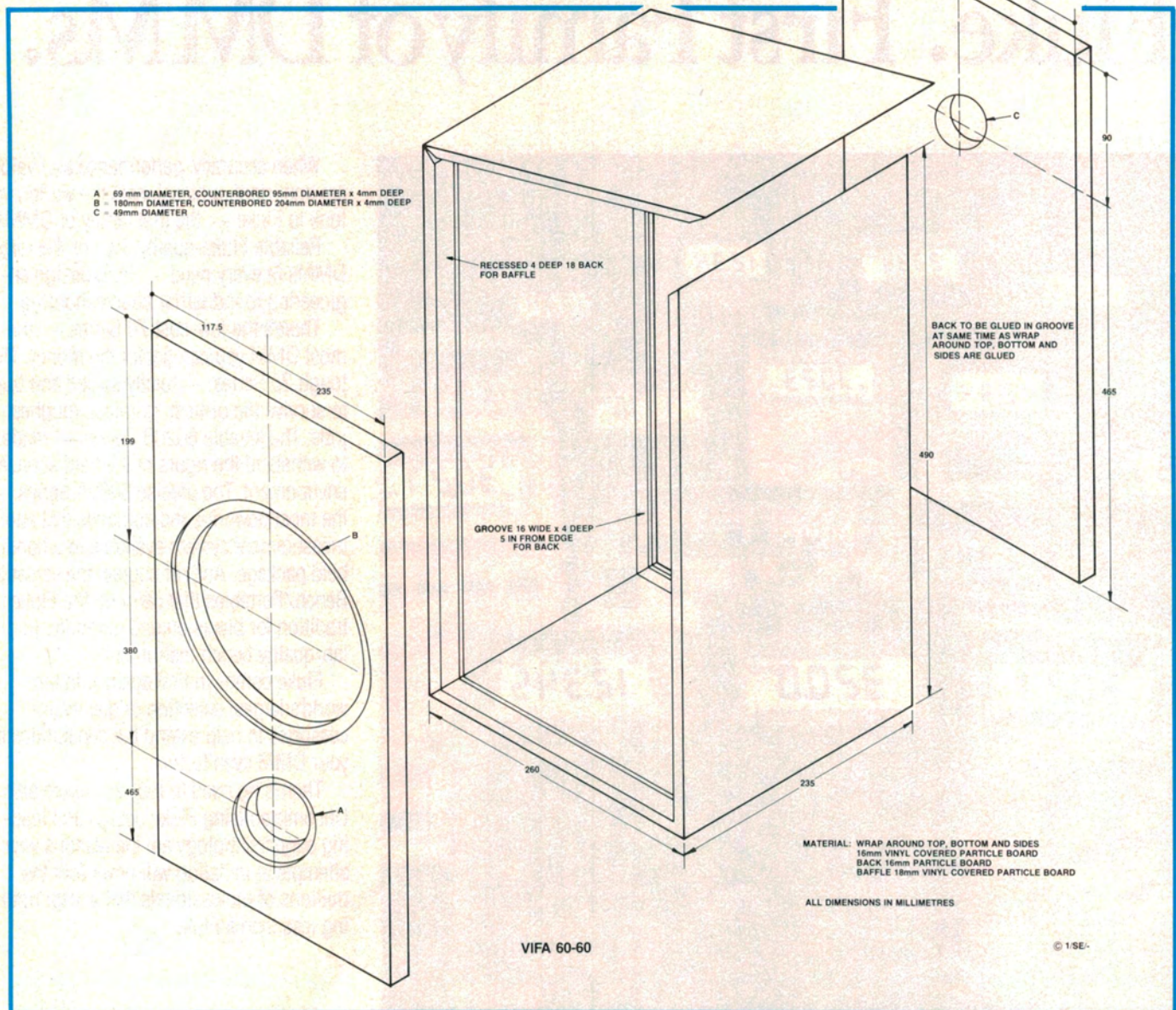
minutes to allow the glue to set and cure.

Each crossover is preassembled on a piece of masonite. This means that they can be glued in position on the bottom of the enclosures. This may as well be done now so that the glue can be drying at the same time as the back panel. Take a note of the connections for the



This diagram shows the winding details for the two air-cored inductors.

Two-way loudspeakers



You can save even more money by building your own enclosures. All dimensions are in millimetres.

respective terminals on the crossover; ie, input, bass and treble.

Meanwhile, the grilles can be prepared. A framework is supplied, over which the screen cloth must be stretched. As each side of the cloth is stretched and folded into position, it can be retained with tacks. We used a rather slower process of first glueing one side, waiting for this to dry then stretching and sticky taping, glueing the opposing side, and so on. Only the corners were tacked.

The grille cloths are supplied rather oversize. When they are fixed in place, you should trim off the excess. Be sure to uncover the grille mounting holes. There is one in each corner — they are

about 12mm diameter. A special plastic clip is inserted into each. The mating half of each clip is mounted in the front panel of the enclosure. They can be inserted now. A gentle tap with a hammer may be needed.

Assuming that the cabinet has been sitting for half an hour or so, fit the terminal blocks and solder them to the crossovers. Dacron filling material has been supplied, enough to half-fill each cabinet. This can be put in now.

The front panel can now be fitted. This is rather simpler than the back panel — it just slides into the rebated front of the box. Run a bead of glue around the perimeter of the box first. Use a generous squirt of glue because it

has to give the front panel an airtight seal. Leave the whole enclosure for another half hour or so, to again let the glue dry.

After the requisite drying time has passed, the drivers can be mounted. Solder their terminals first, paying particular attention to polarity and making sure that you don't transpose the woofer and tweeter connections. If you make a mistake here the speakers will sound odd indeed.

Then it is a matter of fitting the grilles onto the enclosures — just push them on — and you are finished. Connect them up to your amplifier, select your program and settle back to enjoy the sound. EA