

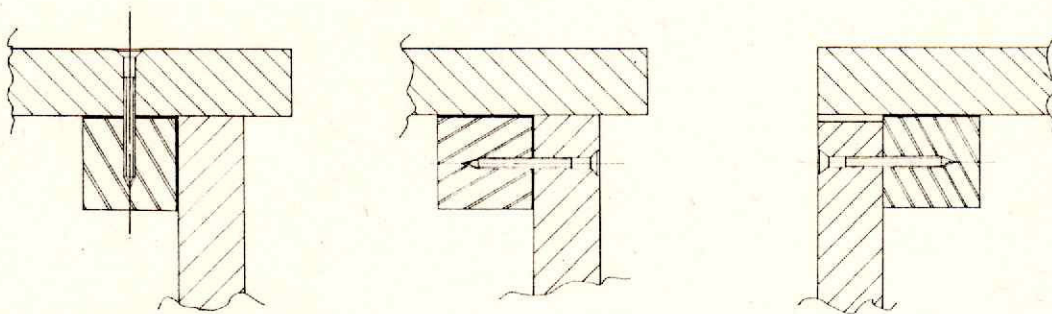
TIMBER

The best material for the construction of loudspeaker enclosures is Birch plywood. Chipboard, or particle board, is a cheaper and widely-used alternative. Whilst chipboard has the merit of being relatively dense, and has an apparently quite hard surface texture, its tensile properties are very poor. It is therefore susceptible to damage due to misuse or a hard 'life on the road'. Chipboard also has a relatively coarse surface texture, rendering it difficult to finish neatly and precisely, and making it less suitable for enclosures which are not to be fabric-covered. Chipboard can be made more hard-wearing by the addition of metal "flight-case" type trimming, especially along the edges. Alternatively, a combination of both plywood and chipboard can be employed. For example, an enclosure which is basically built from chipboard may be fitted with a plywood baffle, since the baffle, which carries the drive units and mounting hardware, is the area of the enclosure which bears the greatest work-load. A Bass Bin may be built with plywood outer panels and chipboard inner panels.

As a general rule, it is recommended that small enclosures of 2 cu.ft. (55 litres) or less are constructed from $\frac{3}{4}$ " (15mm) chipboard or $\frac{1}{2}$ " (12mm) plywood; 2 cu.ft. and over from $\frac{3}{4}$ " (18mm) chipboard or $\frac{3}{4}$ " (12mm) plywood.

JOINTS

There is a wide variety of methods for jointing timber, some of which necessitate expensive machinery. Because this is not available to many home constructors, and because the major requirements for speaker enclosure joints are that they be both strong and airtight, only the most straightforward method, the reinforced butt joint, will be described. Although it is omitted from the plans for clarity, it is shown in detail here and may be used for all the designs included in this book:



Versions of the reinforced butt joints shown above may be employed. The reinforcing battens should be 1" x 1" (25 mm x 25 mm) planed softwood. It is important that all surfaces of the joint are liberally coated with a suitable woodworking adhesive, to ensure that joints are both strong and airtight. Screws should be No. 8 or No. 10 countersunk and should be spaced no more than 6" (15 cm) apart. Screw lengths will be determined by the exact thickness of timber employed.

BRACING

Unbraced cabinets, particularly those with large panel areas, can suffer from panel resonance caused internally by forces generated by the loudspeaker drive unit. Panel resonance is heard as vibration and undesirable colouration of the sound. Internal bracing is therefore recommended. Any suitable stout timber can be used for bracing, including off-cuts from the main panels, in 4" widths placed on edge and braced between 3 panels e.g. across back, top and bottom. Opening panels should be strengthened with short battens.

In 4 x 12" enclosure designs, a piece of 3" x 3" (75 mm x 75 mm) bracing is additionally recommended from centre front to centre rear. This method of bracing should be used in any enclosure the baffle of which carries heavy drive units or which has been significantly weakened by extensive baffle hole cutting.

The structural rigidity of cabinets will be further increased by the fitting of flight-case type aluminium edging.

SEALING

As has already been mentioned, all joints in cone driven loudspeaker enclosures should be airtight. This applies both to sealed and vented designs. Permanent joints will have been sealed with adhesives. A seal for removable panels can be provided by fitting window sealing foam strip. Chassis loudspeakers are always fitted with a sealing gasket for internal mounting, but such a gasket is not always fitted for front mounting the loudspeaker from the outside. If there is no front mounting gasket on the rear of the speaker flange, it is simple to provide one, again using foam strip.

Attention should also be paid to sealing the edges of apertures cut for cabinet handles and electrical connectors. There are many suitable adhesives or sealants available to the home constructor for this purpose.

LOUDSPEAKER FIXING

The loudspeaker mounting hole should be cut in the baffle and drilled in accordance with the loudspeaker fixing dimensions or requirements. This should be performed after the baffle has been cut to size but before the cabinet is assembled.

Most loudspeaker units may be mounted either from the front or the rear. Mounting from the rear is usually accomplished by the use of T-nuts and bolts. Mounting from the front is, however, preferable, since this allows speedy fitting or removal of the loudspeaker, and access to the inside of the enclosure, thus eliminating the need for a removable rear panel. Cabinet construction is therefore stronger. Front mounting is achieved by T-nuts and bolts, either directly through the loudspeaker mounting holes, or fitted on a larger diameter, slightly outside the overall diameter of the loudspeaker chassis, so that the T-nuts can be used to secure special clamps to hold the speaker in place. Holes for T-nuts and bolts should be of small enough gauge for the shank to be a hammer drive fit into the baffle.

T-Nut assembly:—

