

Enclosure Bracing

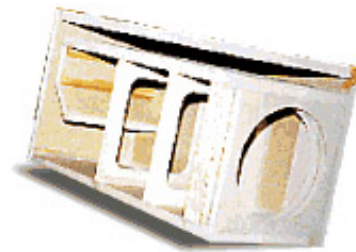
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Tips and tricks regarding enclosure bracing.

A well braced enclosure

This is what a properly braced ported enclosure for a single driver would look like. Note the liberal use of wood in the construction of the baffle itself (where the subwoofer actually mounts—here on the right side of the box just below the slot-port). This provides an extremely solid, vibration free anchor for the subwoofer to mount.



For enclosures that house multiple drivers, just follow the same general procedure, which is to basically just go nuts with the bracing. You can never have too much bracing (unless, of course, you were to brace your box to the point that it would be reduced to a solid block of wood, in which case it wouldn't be a box—it would be ballast).

It doesn't have to be pretty, just effective. Just make sure that you compensate for the braces' displacement by over-voluming the enclosure by just the amount necessary to make up for what the braces displace. Do not simply add a fixed percentage of fudge factor, particularly when dealing with ported or bandpass enclosures—this practice can result in serious mis-tunings (read: it'll make your sub sound like crap). Sealed systems are a bit less finicky and a percentage-based or rough guestimate over-volume will be less of an issue, but we still don't recommend the practice. Don't be lazy...better to do a little math now than to regret the hours you spent designing and building the box later!

While there are other methods of bracing involving extremely complex shapes, the following is probably the easiest to implement as it requires no pesky angle cuts and is also quite effective.

Brace Placement

Well positioned bracing

When deciding where to place your braces inside the enclosure, it is a good idea to make sure you use asymmetrical placement so that the span between any brace and the nearest wall (or the next brace brace) is unequal to subsequent spans between braces and walls (and you thought this was going to be easy). This placement technique will minimize the possibility of standing waves forming in the wood panels that make the walls of the enclosure, which would cause nasty losses and potentially bothersome colorations.



If you are using actual partitions as bracing in your particular design (when using multiple drivers, this is advisable), this rule does not apply; it is only for braces used within the individual chambers.

Basic Brace Types

Using this scheme, there are two types of braces that are commonly used. To keep things really interesting, we'll call these two types of braces types A, B, and C.

Type "A"

Type "A" Bracing

A type "A" brace is simply a solid piece of wood that does not span the entire width of the box (it contacts the enclosure walls on three of its four edges). It gets a little more fun as we go along, so hang in there.



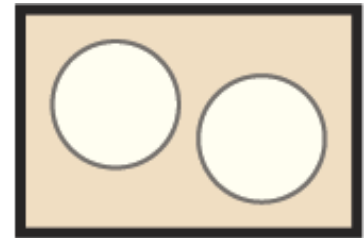
Type "B"

Type "B" Bracing

Type "B" Bracing

Type "B" braces involve a little more work, but they are a bit more effective since all four edges of a **Type "B"** brace are in contact with the enclosure walls. A **Type "B"** brace is made by simply cutting holes into a piece of wood that would otherwise be considered a partition; it touches all four walls. To maintain the brace's rigidity while keeping displacement to a minimum (allowing air to flow freely through the brace), cut circular or rectangular holes, and make sure that the distance between each hole's edge and the edge of the brace is no thinner than one inch.

The bracing used in the photograph at the top of this page are **Type "B"** braces with rectangular openings. The shape of the opening in the wood is of little consequence, for the most part, but it should be noted that using circular holes does offer a slight strength advantage.



Type "C"

Type "C" Bracing

A **Type "C"** brace takes a little more skill and/or patience to make (due to the angled cut), but are very much a worthwhile investment of your time. The braces are nothing more than triangular corner braces that help assure you of a very solid connection between adjacent walls of your enclosure. This not only reduces cabinet losses but also makes your enclosure much less susceptible to being turned into a rhombus when subjected to the "Jumbo Test".

Make them as big or small as you like, but always keep in mind that the more braces you use, the more air they'll displace!

To keep life simple (or relatively simple), use the same wood you are using to make the enclosure for your braces.

