Subject: Wayne, my bass horn design...
Posted by Adam on Tue, 23 Jul 2002 15:46:04 GMT
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Hey dude,Do you remember that huge design I was planning? the like 300 cubic foot bass horn, 40 Hz flare in half space, 4,500 sq inches of mouth and around 12 feet of horn length?I've been contemplating for a very long time about how to build this thing and still keep it mobile. My first idea was to just build it all out of plywood, which I can do, but the weight woudl be huge. I am guesstimating about 700 pounds of plywood per horn. My second design was to use a sandwich of 1/2" plywood and expanding foam. The idea is to use a 1/2" inner horn wall, use perhaps 2x6's as "studs" every 16" (almost creating a wall like building a house) and then another 1/2" layer of plywood. After that, I could fill all the cavities with mass amounts of expanding foam.My third idea was to pretty much engineer the whole thing out of solid styrofoam, maybe giving the actual horn walls a couple of layers of fibreglass. Only trouble is, that much fibreglass woudl be very expensive and I don't even know where to get styrofoam chunks that huge.If you recall the design, it's rediculously huge. The mouth is slated to be 8 feet wide and 4 feet tall, with the largest unit being 4 feet deep as well, with a smaller bolt on section making up the rest. So pretty much, the longest length that needs to be braced is roughly eight feet. Also figuring I can only use cross bracing inside the horn mouth no more then every two feet.Also, I'm wondering what happens when you load a single horn with multiple woofers. If I were to load this thing with four JBL 15's as opposed to my original single 15" plan, woudl I also have to make the mouth area and everything four times a large? Or can I just quadruple the rear and front compression chambers?Thanks man... With some help, I'm hoping to get a revised design up soon.Adam

Subject: addition
Posted by Adam on Tue, 23 Jul 2002 15:48:03 GMT
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P.S. yeah I forgot to ask the first question, hehe... I'm just asking if you have any advice on how to brace this puppy, in addition to my second question.Adam

Subject: Big Horns!
Posted by Wayne Parham on Tue, 23 Jul 2002 18:19:29 GMT
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Being mobile is the problem. I'm assuming you have a requirement that the horn be used singly, rather than using them in groups, that's why you need it to be so big. But that does give you the problem that your structure will be huge.That limits your choices, doesn't it? Of course, if you didn't need to be movable, you could make a structure from concrete - Something like an

ampitheater. But if you must be movable, I have another good suggestion.I would make two large panels, perhaps having wheels on the bottom. The two panels would make sides of the horn and the ground makes the bottom - Something like what I use the walls of a corner for in the cornerhorn. If you want a curved flare, then you can make protrusions that narrowed the area closest to the motor chamber, in order to constrain the throat.Something like this:For the panels, I would probably build a framed structure like the walls in your home, using sandwiched expansion foam surrounded by reasonably thick wood panels. For installation, bring the two panels together at their apex and have them firmly clamped together. They should be tied together along their length with braces put along the top and bottm, or perhaps with guy wires or rods holding them taut.I'd avoid building an entire horn structure, because it will be hard to keep it from being "flimsy" at this scale. But the panels probably wouldn't be too hard to work with, and your motor chamber would simply sit in the corner. It can be a box that is shaped like monitor speakers having a diagonal face, and you can load several drivers in the motor chamber cabinet. Even MF/HF subsystems can be placed within the horn if it had a conical flare or a curved throat shape that wasn't constrained too much.

Subject: LARGE, portable patio speakers, YEAH!
Posted by Sam P. on Tue, 23 Jul 2002 19:36:56 GMT
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Wayne, You are brilliant. A two sided horn that sits on the ground. Driven at the apex by a woofer(s), and why not screw a couple of piezo to the walls a la "unity"(ha). A veritable "wall of sound" for entertaining while barbecueing. And they can be hinged, for folding up and putting away like my saw horses:) Sam

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Subject: Re: LARGE, portable patio speakers, YEAH!
Posted by Wayne Parham on Tue, 23 Jul 2002 20:08:00 GMT
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That's sort of what I pictured for an "outdoor version," yes. Much like a cornerhorn, but with portable panels.

Subject: Re: LARGE, portable patio speakers, YEAH!
Posted by Adam on Tue, 23 Jul 2002 20:32:02 GMT
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Wayne, that is an excellent idea, I have seen another design like that, but I actually woudl prefer to keep it one solid piece.Like the design I am considering uses multiple sections that can be

detached, moved seperately and bolted together. It woudl be a huge task to move them around, but that's life. I moved a 1,500 pound trebuchet that's 35 feet tall, four feet wide and sixteen feet long from my house to a grassy field with only a trailer, myself and my dad, I think this thing will be a synch in comparison. :)So, what kind of increases will I see if I use multiple woofers? Will I see the usualy +6 db gain from doubling the number of subs?If I use four subs in one horn, that is four times the cone area and four times the power input (just assume that second point for a second) so I should be getting +12 db max output over a single driver design, and +6db sensitivity over a single driver, right? That woudl put the sensitivity of this bass horn at around 112 db/1w/1m... pretty sweet! :PAlso, is it possible for me to split the horn into two sections partially down the line? I know it's possibe actaully, I'm just not sure how to do it.I mean like an "M" shape, with the center being the mouth, and then the horn splitting into two like a mcdonalds crest, and having two of the woofers at each end. Obviously each individual horn woudl still have to have the same area as the bigger single one, but when they combine, I'd have to immedietly cut it in half... I know that sounds really confusing, I'll draw a diagram if you don't really follow me.Thanks for the help, Wayne.Adam

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Subject: Here
Posted by Adam on Tue, 23 Jul 2002 20:45:56 GMT
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Here's what I mean... If I understand the whole thing right, each individual horn section has to have the same dimensions as the one big one would have int hat area, so when they connect, you would theoretically need to cut the horn area in half (going from two of them combining to one) without using any actual horn length, so how would you do that?

Subject: Re: LARGE, portable patio speakers, YEAH!
Posted by Wayne Parham on Tue, 23 Jul 2002 21:07:47 GMT
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When using multiple drivers, you'll gain 3dB with each doubling of the number of motors, assuming power is constant. If connected parallel and voltage is constant, you'll gain 6dB, an additional 3dB from halving impedance (which doubles power).Keep us posted on your progress!

Subject: Sweet!
Posted by Wayne Parham on Tue, 23 Jul 2002 21:13:41 GMT

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Instead of having two throat sections as you've shown above, you might combine the throats into one, having a common motor chamber. Otherwise, you'll just need to limit the discontinuity where they join as much as possible. If you'll keep it small in relation to wavelength, it won't be a problem.I gotta see this thing when you're done!

Subject: Re: Sweet!
Posted by Adam on Tue, 23 Jul 2002 21:32:12 GMT
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Hehehe... Progress will definitely be reported my man.I'm aiming for a fall construction date, I'm not sure when I'll get the woofers, though.Trying to catch another tent sale. After seeing the prices of the tent sale, I simply refuse to pay the retail on the JBL 15's. I couldn't live with myself.I'll keep updating.Adam

Subject: Re: Wayne, my bass horn design...
Posted by Anonymous on Wed, 24 Jul 2002 18:41:50 GMT
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and which car is this going in ?j/k

Subject: Re: Here
Posted by Anonymous on Wed, 24 Jul 2002 18:44:29 GMT
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Last week I did a patent search, there was a unity horn patent, check it out.

Subject: Ha!
Posted by Wayne Parham on Wed, 24 Jul 2002 19:00:15 GMT

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Midrange drivers facing horn walls, reflections a-plenty.

Subject: Re: Wayne, my bass horn design...
Posted by bmar on Wed, 24 Jul 2002 22:08:43 GMT
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I would be inclined to pick up a few inexpensive utility trailer frames. Most I've seen can carry 1000 lb loads. If you went with something like this you could build the whole thing on a trailer chasis and it would be instantly protable. If the mouth of the horn is 2.5 meter x 2.5 meter you would be in legal limit of interstate width laws. if more than that you could have 4 panels that could fold out and become the last few feet of the mouth. Space would also be available near the front where the horn is smaller so you could store other gear for transportation. Just my thoughts. Good luck, it's a big project for sure.Bill

Subject: Re: Wayne, my bass horn design...
Posted by Adam on Thu, 25 Jul 2002 16:35:18 GMT
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That's a great idea.... !Adam

Subject: Re: Wayne, my bass horn design...
Posted by freddyi on Thu, 25 Jul 2002 22:54:27 GMT
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Adam (apologies for breaking into the thread) - might consider this type of modular unit? - is it too short for your application?freddy

http://www.modernsolutions.com/artichoke/bman99_p4.html

Subject: Re: Wayne, my bass horn design...
Posted by Wayne Parham on Fri, 26 Jul 2002 01:17:23 GMT
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Super idea!

Subject: Re: Wayne, my bass horn design...
Posted by D Kurfman on Fri, 26 Jul 2002 12:53:51 GMT
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Adam,I would spend some time studying stress skin panels used for home construction. You are probably over-estimating the amount of plywood you need. Admittedly, they need most of their strength in compression mode, but the panels can be used as roofs and have trucks put on them. A typical panel is OSB with 4-12 inches of expanded polysterene, extruded polystyrene (much better, ie blueboard)or polyisocyanurate, the high R stuff like the expanding foam. I would bet that for what you are doing, 2" blueboard with 1/4' luan style surface would work. You need very strong adhesion between the wood and the foam using an adhesive that won't attack the foam. Typically, the edges (top and bottom) have a continuous strip of wood. In your case you would probably want to cut inter-locking strips that join at the correct angle. Splines are often driven from top to bottom as part of joining the assembly. The excess foam that has to be removed to do this can be removed via router or hot wire. Such a build up, if you can compress each panel sufficiently, will be much simpler than maniplating expansion foam, in my opinion, though you can fill voids with the foam. Examples are available from panel manufacturers of how the techniques are used for homes. Probably something on the net with some hunting under structural foam panels.