Subject: Midrange Horn
Posted by Wayne Parham on Mon, 12 Apr 2004 06:00:52 GMT
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Horn Basics
Cabinets
Implementation

Subject: Horn Basics
Posted by Wayne Parham on Mon, 12 Apr 2004 06:01:43 GMT
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It's been a long time coming, but now I've got a pretty good design nailed down. It is inexpensive and extremely simple to build. And we will be offering them complete or in flat-pack kit form which makes them even easier to build.

Horn Basics

The horn covers the 200Hz to 2kHz band and has 105dB/W/M sensitivity. Maximum power is 300 WRMS, so maximum SPL is over 125dB. Actual response depends on placement, but it is

corner placement is normal. In this application, the horn is smooth down to below 200Hz, almost to 150Hz.

Response is good to 2kHz, and then drops about 5dB and remains at this reduced shelf for almost an octave, to 3.5kHz. This is due largely to breakup modes in the driver. Both the Eminence Delta 10 and the JBL 2012 have rising response that peaks in the region above 2kHz. What occurs here is that the cone begins to flex making ripples in the surface of the cone. These cone surface movements are decoupled from the heavier moving assemblies so it's like having another much lighter cone driving the horn. This makes a second area of response that increases output from the horn above 1kHz.

In some applications, this output can be used making the horn capable of output to 3500Hz. Other applications will want to rolloff the region above 2kHz, and I've found that this can be done

with a simple 1mH series coil.  This is the same "Pseudo Butterworth" arrangement I've used in the past, and the addition of a 1mH coil does very little to affect horn response below 2kHz.  It just shaves the peak between 2kHz and 4kHz, attenuating that region and preventing it from increasing horn output in this range.

Here are the plans:

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Subject: Cabinets
Posted by Wayne Parham on Mon, 12 Apr 2004 06:02:36 GMT
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Cabinets

Klipschorn clones and other speaker systems where a high-quality full-vocal-range horn is required.  Some of the intended cabinet designs are shown below, and of course, many others are possible.

A simplified midhorn cabinet is shown above.  The horn is enclosed in a cabinet, and the rear chamber is lined with R13 or other suitable absorbent stuffing material.  The size and shape is arbitrary, as long as the rear chamber exceeds 0.35ft3;  It just needs to be big enough to surround the driver and that's all.  Since the horn is often used on cornerhorns, it makes sense to have a shape that is suitable, so trapezoids and shapes like shown above might be better than rectangular cabinets.  But it is really a matter of aesthetics.

One thing that I think is important is that the driver mount panel also be used as a physical support.  It should be extended to meet the top and/or bottom of the cabinet.

A version of the cabinet can be made to fit Klipschorns and Klipschorn clones.  The dimensions are shown below.

As I mentioned earlier, we plan to offer this horn as a completed assembly and as a flat-pack kit.  Prices aren't set yet, but we'll do that pretty soon and add them to the shopping cart.  I think they'll be something like $100.00 each for basic MDF and $150-$200 for various fine woods.  Flat pack kits make assembly easy, since they are already cut-out and ready to assemble.  We also have the drivers in stock and our prices are competitive, cheaper than Parts Express and places like that.

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Subject: Implementation
Posted by Wayne Parham on Mon, 12 Apr 2004 06:03:31 GMT
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Implementation

The simplest implementation of the horn is as a full vocal range driver. When used in this way, it will provide output from 250Hz to 3.5kHz in free space, or 150Hz to 3.5kHz quarter-space or eighth-space, such as when used indoors. For public address or speech amplification, this is really all you need.

Response in Freespace

Response is down -3dB at 300Hz and 1.2kHz, -6dB at 250Hz and 1.6kHz and -10dB at 200Hz and 3.5kHz. In room boundaries extend low frequency performance and make the overall response curve smoother. You can expect lower rolloff points to shift an octave lower in room corners.

such, output above 2kHz is not wanted. So adding a 1mH coil in series shaves the 3kHz peak without doing much of anything else.

Response in Freespace, with 1mH series coil added

As you can see, the coil reduces the peak about 3dB, just enough to drop the overtone region a bit. It has absolutely no effect on horn output below 2kHz. The tweeter will cover the range above 1.6kHz so midrange output above 2kHz is unwanted.

Midrange horn output is as high as the compression driver, so this leaves us with a couple of configuration options. The tweeter crossover's compensation cable assembly can be removed and a shunt damper installed on the tweeter instead. A damping resistor is required to prevent the voice coil from peaking with crossover capacitance. But level matching attenuation could be removed, allowing the tweeter horn and the midrange horn to generate 105dB/W/M.

But that would leave us with a couple of problems to solve by other means. Without top-octave compensation, the tweeter will begin to rolloff at 4kHz and EQ will be required. Also, the midrange horn will rolloff around 200Hz or 300Hz, depending on its placement. So unless the woofer is capable of 105dB/W/M, it will need some EQ as well.

Leaving the tweeter compensation in place gives the following response curve:

Midhorn with 1mH series coil, tweeter with 1K6a010dB crossover

As you would expect, tweeter response is extended but it is also shelved at a reduced level. It actually sounds pretty good this way, and some audiophiles might prefer it. But my solution is to pad the midrange to match, using a 4 ohm series resistor followed by 8 ohms in shunt.

Midhorn with 1mH series coil and attenuator, tweeter with 1K6a010dB crossover

This brings sensitivity down to 98dB/W/M, but it does offer some advantages. Obviously, the response curve is made flatter. Also, the system is well-damped by the padding resistors, and the amplifier sees a more resistive load. The amplifier is presented a load that is gradually rising through the midrange and overtone region but that is mostly resistive. It sounds very, very nice.

Now for the crossover to the woofer. The common-sense thing would be to replace the woofer crossover components, dropping the lower crossover point down to 200Hz for a cornerhorn or 300Hz for bass-reflex or freestanding horn. That's a good approach. The wavelength of 200Hz is over 5 feet, so unless the woofer and midrange are very far apart, you'll want the woofer and midrange in phase electrically. That ensures that the midrange and woofer are phased properly at the crossover point.

everything up as is described here, with the midrange padded down to match the tweeter, and the tweeter connected in reverse polarity. I am very pleased with this system; It sounds very good and well balanced. You gain all the benefits of reduced midrange distortion and flatter response from the front midhorn, and you maintain the room filling richness, the sort of homogenous uniformity of the reverberent field that only the cornerhorn configuration and it's uniform 90° dispersion can provide.

For any of you that might want to get started now, it's relatively easy for you to connect everything up as I did. If you want, you can swap the woofer crossover components to shift the lower

made this way and ready to go.

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Posted by Wayne Parham on Mon, 12 Apr 2004 06:04:38 GMT
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An interesting application of this midrange horn is to make a mini-VOTT, which I'm calling the

could be ported, made 5.5ft3 or so and house an Alpha 10.

It's intended to be used in corners, but can just as well be put against a single wall. Placement isn't quite as critical as a cornerhorn because it isn't a cornerhorn. The tweeter would be a

PSD2002 on a 1kHz horn, and it would be mounted with the mouth edge flush with the midhorn. If you have the means, the wood horn is nice but on a budget, the H290 would work perfectly and could be housed in a nice small subenclosure that would look really nice. There's lots of ways to make this work well and look good too.

speakers. It was really impressive. The bass is incredible, and the midrange is nice too.

do.

I'm really excited about this new little speaker. It isn't intended to outperform the higher-priced cornerhorns or anything like that, but it does have a place in the lineup somewhere near the Thermionic and Theater Series cornerhorns. It should be a good performer with classic looks. The cabinetmakers can have a field day with two-tone and forties style finishes.

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Subject: Re: Implementation
Posted by Adrian Mack on Mon, 12 Apr 2004 08:08:16 GMT
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Looks cool. I think the 1.6KHz crossover is the best choice. Off-axis response above that probably drops like a rock especially once the drivers in breakup modes, good idea having the compression driver take over instead. Have you taken the 2nd, 3rd and 4th graphs indoors or something? They all seem to have a lot more response below 300Hz than the 1st one does. Is the rear facing midrange you talk about just the woofer in the cornerhorn's? Did you run into problems with the edge of the cone in the midrange horn slamming into the mounting plate? This was a problem I found in my horn at high levels. It was clear as daylight to hear it when excursion was high at high SPLs, awful sound it makes. I had to add a ring between driver and mounting plate, and add another piece between cone and front chamber to bring the volume back down again that the ring displaced in the front chamber. Or you could just route a circle groove in the mounting plate where the edge of the cone meets instead. Good job!

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Subject: Re: Implementation
Posted by Wayne Parham on Mon, 12 Apr 2004 08:39:44 GMT
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All graphs were done outdoors, and they all varied a little bit from sample to sample. I always take at least three measurements and look for consistency. But I've also always considered tests

like this to be a bit ambiguous because it is really sort of a budget test.  Please don't consider these datasets to be anything but tools to help explore the design.The rear-facing midrange used

midrange drivers.  They were a 5" cone midrange, and there were sets for the front and rear installed in that model.  Two-way versions develop all midrange from the driver in back, so the addition of a forward-facing midhorn will cause the speaker to have front and rear midrange output unless the driver in back is crossed over lower.A 1/4" or 3/8" mounting spacer ring is an excellent idea.  The additional front chamber volume won't hurt and it will ensure that the cone can't strike the mounting plate.  For those that have routers, it might be just as good to route out that much area around the driver on the plate, maybe even just at the edge and back towards the center for an inch or so.  The only part that might strike at high excursions is the surround and maybe the edge of the cone.

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Subject: Re: Implementation
Posted by Adrian Mack on Mon, 12 Apr 2004 10:00:06 GMT
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Yeah, I know, they're still useful though. I like that measurements page you've linked, I can finally see what the difference is between the PSD2002 and 2426 now. Seems the PSD2002 goes the highest and is smoothest on H290, and pretty good on JBL 2370, dont know why I'm even mentioning it, just been something I've wondered about for awhile.

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Subject: Re: Implementation
Posted by Wayne Parham on Mon, 12 Apr 2004 11:17:30 GMT
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Hey, by the way, are your speakers finished?  Last time I remember you were pretty much done, listening to them and just waiting to do the final touches of wood finish and what-not.  You're running 2235's, a midhorn with an Alpha 6 and a compression horn tweeter, aren't you?We're starting to really warm up here, so I suspect it must be cooling off there.  Last I heard, you were getting record heat and cooking the electric company.  Has that passed?

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Subject: Re: Implementation
Posted by Adrian Mack on Mon, 12 Apr 2004 11:51:18 GMT
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Actually I got the 2225's in mine. I was working on the speakers today actually, because I had slacked off for a bit :P I've had other stuff on though which has taken up some of my time so its

not all just being lazy! Going to the hardware store tomorow to see what sort of finishing they have. I hope its not too much, I want to get Tung Oil, the name sounds expensive. I gotta get some casters too, the boxes really ARE heavy and difficult to shuffle around. I need to do the correct crossovers still, it's just half done make-shift stuff at the moment. It's well into Autumn now, temperatures are a lot cooler. But we had zero rainfall all last month, something which hasn't happened since a decade or two, show's the effects of global warming I guess. Not good for our water supplies, we have water restrictions in the summer each year and for the first time we now have them through winter as well. I was rummaging through the storeroom today and found a pair of old 8" Rola vintage drivers I had forgetten about. Just for fun I threw them on the tractrix horns I'm not using. They sounded OK actually, but definitly no where near as clean as the Alpha 6 conical horn. I might take do some frequency response measurements for fun on it, cuz I got a pair of them doing nothing. If its anything interesting I'll post some pics of the drivers and FR curves, see what I can do with a driver with no TS parameters and about 25-30 years old :P

---

Subject: How about the Beta 10CX
Posted by JLapaire on Mon, 12 Apr 2004 15:44:17 GMT
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Hi Wayne,I KNOW you've thought of this, thot I'd ask.The motor is kind of in between the Alpha and the Delta, might make usable thumpity and pretty decent single-point-source. The HF wouldn't be as sweet as with Bill's horns, but soundstage improvements might make up for it. A poor man's Unity type?John

---

Subject: Re: How about the Beta 10CX
Posted by Wayne Parham on Mon, 12 Apr 2004 21:53:28 GMT
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I loved the coaxials you made with your piezo's. Really clever idea. As for the Beta 10CX, you could sure mount one to this midhorn and see how it worked. For a coaxial driver, it would probably be best to use a symmetrical crossover instead of the cross-connected pseudo 1st/3rd I've used.

---

Subject: Re: Implementation
Posted by Adrian Mack on Mon, 12 Apr 2004 23:03:08 GMT
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HAHA. Its raining today. About time too, its over a month into Autumn and its the first rainfall we've had.

---

Subject: funny old woofers
Posted by Mike.e on Tue, 13 Apr 2004 01:53:09 GMT
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post the response of them! the best thing when u find old woofers and plug them onto generic boxes and they go ok -so funny :P

Subject: Re: Implementation
Posted by Wayne Parham on Tue, 13 Apr 2004 02:11:10 GMT
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Subject: Dimensions
Posted by JLapaire on Tue, 13 Apr 2004 11:31:13 GMT
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Are the dimensions given as INSIDE?  So the throat is 4.5 x 4.5 for a compression ratio of about 3:1 with the Delta 10?A question about HF mating - would the use of H290 instead of H295 allow less padding of the Delta due to less CD pull-up required?Discontinuity in the horn flare will probably rule out the 10CX in this application now that I think about it.  If I had one I'd try it anyway though.Once again, thanks for sharing your designs.  Simple = Elegant, especially when the engineering is sound (no pun intended).John

Subject: Re: funny old woofers
Posted by Bill Wassilak on Tue, 13 Apr 2004 15:13:15 GMT
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Nothing wrong with that, old drivers that I had no T/S parameters for I just measured the Fs and went with a box and experimented with different tunings from there. That's part of the fun. :)Bill W.

Subject: Re: Implementation
Posted by GarMan on Tue, 13 Apr 2004 16:22:34 GMT
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Wayne,Since Eminence stopped production of the PDS3003, this midrange presents an awesome way to move the 18" PI's into a three-way.  PDS2002, the midrange horn, with the 18" drivers in 4PI or 7PI configuration sound like a winner to me.Gar.

---

Subject: Re: Dimensions
Posted by Wayne Parham on Tue, 13 Apr 2004 21:21:30 GMT
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Yes, those are inside dimensions.  The H295 horn needs EQ, so many of the padding issues would still remain.  You could use passive components as I have, or remove them and go with active instead.  But either way, there is going to need to be some HF compensation or a super-tweeter and the woofer system must be considered too.  There's lots of good options and ways to implement this.

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Subject: Re: Implementation
Posted by Wayne Parham on Wed, 14 Apr 2004 13:38:44 GMT
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Me too.  I'll be rolling them out like this as time permits.  Most of the design work is done, and now I just need to put things on paper and draw up plans.  This will happen over the course of the next few months.  You can already see the outline of what is coming, and there is enough information to assemble each of the new products already.  I'm planning a lot of incremental changes.  Many models will be different, but will retain much that is the same too.  One of the priorities for me was a transition that allowed a smooth and smart upgrade path, so that anyone who bought a speaker

speakers were made in 1980, 1990 or just last month.What I mean is that upgrades won't require throwing away a bunch of stuff and starting over.  You might toss a capacitor, or you might swap out something for an improved part.  But in general, the improvements I'm working on are incremental.In many cases, existing crossovers won't even need to be replaced;  They will be reused almost entirely and with fairly little modification.  That was an important design criteria for me.  I like being able to at least allow for the possibility of using off-the-shelf assemblies, and re-use of existing components and assemblies where possible.  So I think these upgrades are

cornerhorn family based on the Eminence Magnum Series woofers;  These will use the midhorn and will probably adopt the Audiophile Series name.  Both Audiophile and Professional Series lines use drivers with flux stabilization, and that was always key in my mind for these

like the performance of current models, the extra cost and complexity is not all that great. It will increase the cost of each cornerhorn about $200.00, but I think the improvement is worth the

some two-way variants were made a long time ago that proved quite popular. Then and now, they are really interesting, with that "where is the sound coming from" all-around-the-room magic. Wives love them because they sound great and they blend into the room. So I'll still offer plans to anyone who requests them (just like the Peavey CH-3 versions from a few years ago). But this

woofer becomes essentially a subwoofer, and the midhorn takes most of the load. The mid/high crossover is already worked out, and it can be implemented with existing off-the-shelf components

incorporated, and the combination makes an excellent system. My plans here are to leave

modular approach. It's a wide-bandwidth midbass horn, and is useful for a variety of

that desire. I think it's a pretty cool "little" speaker. It just sort of happened. You and others were

anyway. So kind of like the chocolate and peanut butter Reese's commercials, the two just sort of fell together in what I think is a really groovy retro-meets-modern design.

---

Subject: Re: Midrange Horn
Posted by dwkurfma on Wed, 14 Apr 2004 16:46:03 GMT
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Just a flat mounting surface, right? Any special surface treatments appropriate? (felt, foam, etc.) Round over the throat entrance with a router help any? Without the inductor could the same basic unit be used with JBL 2123 or 2118 do you think?Dan

---

Subject: Re: Midrange Horn
Posted by Adrian Mack on Wed, 14 Apr 2004 23:00:23 GMT
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Routing the throat entrance so that its rounded wont do anything. Flares which terminate sharply at the mouth typically suffer mouth diffraction more than ones which dont. Just like a speaker box, really. On a tractrix flare, the added flare at the end of the mouth serves to limit diffraction. On other flares which dont have this extra rounded bit, some people put felt or some other damping material around the edges of the mouth to reduce diffraction. Dont put any absorbing materials

inside the throat or near the throat entrance or higher frequencies will be attenuated severly. I'd add a mounting ring or route out a groove where the edge of the cone/surround meets up with the mounting plate to prevent it from slapping against it at high levels.

---

Subject: Re: Midrange Horn - Thanks! n/t
Posted by dwkurfma on Thu, 15 Apr 2004 01:59:18 GMT
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Subject: Re: Implementation
Posted by Wayne Parham on Fri, 16 Apr 2004 16:00:36 GMT
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I just wrote a letter to Eminence, asking that they make the Alpha 10 front gaskets available as a separate item. This would make the perfect spacer, and it can be easily attached to the existing gasket with white glue or just put in place when the driver is bolted to the mounting plate. If they'll sell them, I'll include the spacer gasket with every horn.

---

Subject: Re: Implementation
Posted by Adrian Mack on Fri, 16 Apr 2004 23:30:42 GMT
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Good idea. So its the same gasket thats on the driver, having essentially two of them? How thick are the gaskets/spacer on the Alpha 10 by the way?

---

Subject: Re: Implementation
Posted by Wayne Parham on Fri, 16 Apr 2004 23:39:39 GMT
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Gonna have to do it on the Alpha 10 too. I'm assuming it's the same gasket, which is about 1/4" thick.

---

Posted by wasteh202 on Thu, 03 Jun 2004 03:11:24 GMT
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WayneAre you sending out the plans for this model 8 speaker yet ? ...and are you packaging kits for this model ? Thanks, Rodney

Posted by Wayne Parham on Fri, 11 Jun 2004 14:42:03 GMT
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We have everything for kits in stock except one of the coils.  I ordered a bunch of them and expected them middle of last month, so we're a couple weeks later than I had hoped.  But we're

Subject: 7PI midrange horn angle
Posted by hornT on Tue, 09 Mar 2010 21:01:31 GMT
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Just wandering about the angles of the flare on the 7PI mid horn. Theoretically they are supposed to be 90x40 but mine are only ~83x29
And according to the drawings 29x83 is correct. Is there a catch. Its my first homebrewed midhorn so maybe I messed things up?

Subject: Re: 7PI midrange directivity
Posted by Wayne Parham on Tue, 09 Mar 2010 21:20:36 GMT
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The wall angles aren't exactly 90°x40°, more like 85°x30°.  Those angles are what set the pattern up high, and the (corner) room boundaries are what set it down low.

To give a little more description of of the pattern, the flare wall angle sets the radiating angle at

angle.

To put this into perspective where the midhorn is concerned, it does a pretty good job of setting the pattern in the horizontal, having control down to just a few hundred Hertz.  Below that, the corner placement provides assist, with the room walls setting the pattern all the way down to the

Schroeder frequency, where room modes take over. Where the pattern width would double in freespace at 400Hz or so, the room's walls confine the beamwidth and limit the radiating angle. In a sense, the corner itself acts as an extension to the horn.

The vertical is a different situation, and the wall angle doesn't really set the pattern. The vertical pattern is taller than the flare wall angle, more or less collapsing through the entire band up to the crossover region, where it narrows to approximate the flare. This then limits the amount of energy at large vertical angles in the crossover band, which helps reduce null-forming interactions. But the point is that the horn doesn't really set the vertical pattern until nearly the crossover frequency. It isn't large enough.

It is important to understand that vertical directivity of the individual sound sources is modified when stacking other sound sources to form a loudspeaker system. In a sense, vertical position is more important than the source's vertical pattern because when sources are stacked, the interactions form lobes and nulls. See my reply in your other thread:
Vertical directivity

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Subject: Re: 7PI midrange directivity
Posted by hornT on Wed, 10 Mar 2010 07:36:05 GMT
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Thanks Wayne. I was just curious. If you calculate the the angles on the midhorn it gives exactly 83.1x29

---

Subject: Re: Midrange Horn
Posted by danielm on Sat, 03 Apr 2010 13:56:21 GMT
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Has anyone tried the Beta 10 in the mid horn?

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Subject: Re: Midrange Horn
Posted by Wayne Parham on Sat, 03 Apr 2010 14:19:32 GMT
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I didn't try that driver, no. I expect it would probably work pretty well, but it's hard to say - sometimes they surprise you. If you don't already have the drivers, it might be better to go with one of the drivers it has been tested with.

The midhorns are supposed to be ready this week, by the way. Finally!

One thing, the new shop prefers to build completed horns as opposed to flat packs. We kicked

around the options, looked at the pros and cons, weighed the fact that flat pack kits are smaller but pre-assembled horns don't depend on user alignment of pieces during assembly.

In the end, we decided to provide midhorns assembled instead of as flat packs.  You'll still need to build the cabinet to house it, but the precut and assembled horn will keep you from having to do the angled cuts and build a clamp/jig for assembly.

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Subject: Re: Midrange Horn
Posted by danielm on Sat, 03 Apr 2010 15:16:49 GMT
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Thanks Wayne.  I have a stack of Beta 10s that I used in a vertical array of vented boxes.  I need to get a little more out of 'em as I am AC power limited to the outdoor stage where they are used.
I was thinking of using this mid horn and tuning the box for a small bump around 80-90hz might just get me by.
Four Lab subs for <90hz.

---

Subject: Re: Midrange Horn
Posted by Wayne Parham on Sat, 03 Apr 2010 21:21:46 GMT
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be used with a midbass subsystem below them.  The midhorns just won't reach the subs and would leave about an octave wide hole without midbass drivers in between.  I'd suggest adding something like this:

models

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Subject: Re: Midrange Horn
Posted by danielm on Sat, 03 Apr 2010 23:23:51 GMT
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I didn't expect the mid horn to offer much below 250hz.
I was thinking/hoping if I tuned the rear chamber to 80-90hz...
But, since I have a few of the beta 10s here's my ideas so far:

1) One mid horn centered in a 32" wide box with another 10" mounted on each end BPs 80-250hz( flanked left and right). With the spacing between the two ends I might get a little forward direction control down to 100hz or so as a doublet. One driver flipped to cancel the non-linear suspension stuff.

2) Mid horn wrapped with a longer path folded horn driven with another beta 10. The mouth would be far too small but these are to be used in a stack of four to eight boxes tall.

3) Forget the whole vertical stacking idea and make several "point and shoot" boxes with narrow patterns that will array horizontally.

I've been using a vertical stack of twelve Beta 10s per side in vented boxes tuned to 70hz. Nice sounding but, the system really lacked low mid output needed on my limited power budget. Plus, it is a nightmare to rig. Top end is P-Audio 1.4" drivers in a much shorter array.

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Subject: Re: Midrange Horn
Posted by Wayne Parham on Sun, 04 Apr 2010 00:47:39 GMT
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There are probably a lot of things you can make "work" but I think you'll be happier in the end with more midbass capacity, and that's gonna require different drivers, in my opinion. I'm not saying you should do away with the Beta 10's necessarily, just that they are midrange drivers and can't do midbass no matter how you load them. If you were doing a home hifi setup, you could definitely use them but when pressed for max SPL, they're just not going to cut it down low.

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Subject: Re: Midrange Horn
Posted by tom-m on Mon, 05 Apr 2010 01:04:27 GMT
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So, midhorns ready soon. What kind of wood will be used? I hope for an option other than mdf.

Thanks.

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Subject: Re: Midrange Horn
Posted by Wayne Parham on Mon, 05 Apr 2010 01:43:01 GMT
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We're going to start with MDF, but any veneer can be applied.

Subject: Re: Midrange Horn
Posted by tom-m on Wed, 12 May 2010 03:26:29 GMT
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Are the mid-range horns ready for sale? Might you bring a few to the Dallas diy show?

Thanks.
Tom

Subject: Re: Midrange Horn
Posted by Wayne Parham on Tue, 20 Jul 2010 01:13:46 GMT
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Subject: MID HORN FLAT PACK
Posted by biglaz on Thu, 02 Sep 2010 17:23:54 GMT
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Wayne,

I received the (2) Mid Horn flat packs from UPS yesterday. Opened them this AM. Extremely well packed with your expanding foam on the corners. (You must like the expanding foam because I remember you used it to fill the cavity of I believe the 10Pi.) Anyway, no damage.

For any forum member thinking about this flat pack do not hesitate. It took only about 30 minutes to assemble both horns, no drivers yet. All the dowels lined up and if you follow the number code you can not mess up. Can't wait to mount the drivers and give them a listen.
FYI. I attempted to build this horn twice. Even though I ended up with reasonable facsimiles they were just not right.

Thanks,

Robert

PS. Need Pi emblems to stick on the horns.

Subject: Re: MID HORN FLAT PACK
Posted by Wayne Parham on Thu, 02 Sep 2010 18:28:55 GMT
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Glad they arrived OK.  And you're right, you have a good memory, I've used that same kind of foam to fill dead air spaces on speaker cabinets.  Works very well as a foam-in-place packaging material too, protecting those sharp corners.  The tips of the midhorn's top and bottom panels will punch right through most other kinds of fill.

Subject: Midhorn Flat Pack Tips
Posted by Bane2871 on Wed, 24 Aug 2011 18:29:09 GMT
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Just received the midhorn flatpack. Does anyone who has done these have any construction tips? They look like one of those projects that appear fairly straight forward but end up being pretty tricky. Any thoughts?

Also, what size wooden dowel pins should I use?

Subject: Re: Midhorn Flat Pack Tips
Posted by Wayne Parham on Wed, 24 Aug 2011 18:37:55 GMT
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The Miller dowel pins are included.  They're just sitting in throat hole cutout, sandwiched in between side panels.  If you use them to pin the horn together you won't need to cradle the horn while the glue sets.  Just put white glue on every surface, assemble the horn and tap the pins in.

Subject: Re: Midhorn Flat Pack Tips
Posted by Bane2871 on Wed, 24 Aug 2011 21:56:22 GMT
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Thanks. I hadn't pulled the pack apart yet.

Is there a way to make this thread sticky? It's a great reference thread.

Subject: Re: Midhorn Flat Pack Tips
Posted by Wayne Parham on Wed, 24 Aug 2011 22:02:18 GMT
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It's a pretty heavily visited thread, one that gets referenced often.  I suppose we could make it a sticky, but I think it gets enough attention anyway.  We just keep bringing it back up, as needed.

Subject: Re: Midrange Horn
Posted by Bane2871 on Fri, 26 Aug 2011 22:28:35 GMT
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I assume that if I am going to veneer the inside of the horn, I will need to do so prior to assembly? The issue I see is accounting for interference.

How do Pi's best and brightest usually do this?

Subject: Re: Midrange Horn
Posted by Wayne Parham on Fri, 26 Aug 2011 23:09:09 GMT
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It depends on the thickness of the veneer.  If you're using thin veneer, you can cover the entire side before assembly.  But thick veneers will create enough offset the pieces won't fit together well so you have to trim to fit.  On those, it's best to cut the veneer to size before assembly, but don't actually attach it until after assembly.  Honestly, the thinner veneers are easier to use for the flare pieces.  Save the thicker stuff for the cabinet sides.

Subject: Re: Midrange Horn
Posted by djnagle on Fri, 24 Feb 2012 17:58:50 GMT
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Hi Wayne, any thoughts about offering a 100hz front loaded horn???  I have 350hz edgarhorns and 4 good subs that will easily go up to 100hz.....just need to fill that gap.  Dennis.

Subject: Re: Midrange Horn
Posted by Wayne Parham on Fri, 24 Feb 2012 18:47:01 GMT
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I designed one, but it's really too large for home hifi use. Especially since corner placement allows for a much smaller horn to be used. That's the direction I went with the midhorn - It is used on my constant directivity cornerhorns, and its output blends with the woofer in the 100Hz to 200Hz range, smoothing room modes in that band.

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Subject: Re: Midrange Horn
Posted by cookiemonster on Fri, 06 Sep 2013 21:16:31 GMT
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How thick should the mounting plate be? Is there any minimum/maximum thickness? (Trying to convert to the MDF thicknesses I have available here).

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Subject: Re: Midrange Horn
Posted by Wayne Parham on Sat, 07 Sep 2013 01:35:02 GMT
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Any thickness adds to the front chamber volume, but the amount is slight unless the panel is really thick. Still, you don't need much. So limit it to 3/4". Sizes from 1/2" to 3/4" are fine.

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Subject: Re: Midrange Horn
Posted by cookiemonster on Mon, 09 Sep 2013 12:49:19 GMT
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Thanks Wayne,

Did you ever try to run the horn with a simple sealed box behind the horn itself rather than enclosing the entire horn?

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Subject: Re: Midrange Horn
Posted by Wayne Parham on Mon, 09 Sep 2013 13:29:23 GMT
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Yes, and that's fine. Almost doesn't matter what shape the rear chamber is as long as it's large enough. So just make sure it's larger than 0.5ft3.

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Subject: Re: Midrange Horn
Posted by petew on Mon, 09 Sep 2013 20:04:07 GMT
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Do your flatpacks include all the parts or just the hard-to-cut flare?

Subject: Re: Midrange Horn
Posted by Wayne Parham on Mon, 09 Sep 2013 23:00:40 GMT
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Just the flare.  The rest is kind of easy and probably wouldn't meric the cost.  But the flare angles make it attractive for some to buy the flatpack kit.  As horns go, it's as easy as it gets, but still, there are some angles to cut.  I recommend starting off doing a mockup in cardboard for people that want to cut their own.