Subject: Boomtoobz
Posted by lon on Fri, 12 Mar 2004 23:28:20 GMT
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On Fri, 12 Mar 2004, Lon Ponschock wrote:> > Looks pretty goofy still, but I now have the tubes coupled> differently to keep the length of the line but not standing 7 ft high.> > > a.> |-(> | -(b.> | |> | |> | | > |++ |> _____> > So the tall part has the speak in an elbow at a. The sound goes> down through the pipe, makes an upturn and comes out through another> elbow at the port end b.> > > The interesting thing here is that the whole assemblage is> demountable to reconfigure without new construction.> > Once you get past the sewer pipe idea it sounds pretty good.> A question I have for the experts is: should the port more properly> be placed on the short end and closer to the listener with the 1197> driver at the higher pipe a farther from the listener? Also, since> I'm just messing arround with lengths, is there some ideal to> shoot for?> > > Since these things are on rotateable elbows, the base can be put out> of the way next to a wall and the elbows turned to focus toward the> listener.> > > > The only modification internally is a small piece of pillow> stuffing directly behind the driver sort of wadded in there.> > My leads are soldered onto the driver and the speajer wire> length is runs from the driver all the way out through the> port tube. Connection to the speaker leadsis with wire nuts.> > > So far I've only assembled one of these things. There is no stereo> image but the clarity seems pretty good.> > > > The organ concert is on tonight... that's the big test. [Note on stick figure drawing above: The editor does not show the same image you see, so you'll have to use your imagination.]> > >

Subject: Re: Boomtoobz
Posted by Wayne Parham on Fri, 12 Mar 2004 23:48:09 GMT
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It will be good to get Martin's take on your project. My thoughts are that you'll have three primary pipe resonances. The first being set by the entire pipe length, the second by the longer section between the speaker and the floor bend and the third set by the length of the shorter section between the floor bend and the opening termination. Then there will be harmonics for each of those.

Subject: Re: Boomtoobz
Posted by lon on Sat, 13 Mar 2004 03:14:28 GMT
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Friday night is organ recital night and this is going pretty good. www.pipedreams.org O410 - March Again. My goal, aside from not having beaucoup dinero to spend oneither tools or audio goods was to use inexpensive materialsat high efficiencies so as to be able yo get large sound

outof, say, one of those mini units they sell at the Best Buy. I know this goes contrary to all the theories and conspicuousconsumption that goes on in the audiophile world, but hell, itkeeps this board going, right Wayne? :-) Thanks for your reply. And yes, I'd like to get the professional lowdown on this (no pun intended). I don't knowof experiments with PVC that have gone in this direction, or withas little ado about calculations or internal treatment. I mentioned those shelf systems to test out high efficiencyspeakers but I don't have one. My playback is from a YamahaRP U100. The Yam is an integrated peripheral for PC use whichhas a USB connection to control the stand alone receiver/ampfrom the computer. It works either as stand alone or in conjunctionwith the PC. These were on deal with rebates at giveaway pricesat buy.com a few months ago: after rebate $89.00 including shipping.I should have got more than one and possibly an RP U200 5:1 system as well. 'Been watching Ebay for these to turn up from bulkpurchases. So explain a bit more about the harmonics. I am not hearingany strange disonances from this arrangement. And I haven't done any of the numerous tweaks to the Radio Shack 1197. Because the RS 1197 is discontinued, I'm anxious to test something in current production from Tangband (to maintain the budget approach) or one of the smaller Fostex'. Please send other suggestions for inexpensive full range drivers I might have missed. Next listening test is with a VHS video of the Civil War called Gods and Generals. There should be some boomers in that one. by the time this project gets finalized, I may have a digital camera to show some pix. Stay tuned.lon@athenet.net

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Subject: Re: Boomtoobz
Posted by lon on Wed, 17 Mar 2004 04:58:49 GMT
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Wayne, did you mean Martin King? I've only seen MK inthe Full Range Driver forum.

Subject: Re: Boomtoobz
Posted by Wayne Parham on Wed, 17 Mar 2004 05:44:57 GMT
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Martin King posts here as "Martin". I think he may be busy with other things and hasn't seen your posts yet.

Subject: Re: Boomtoobz
Posted by Martin on Thu, 18 Mar 2004 01:12:17 GMT
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Hi Lon,Wayne woke me back up, I drifted off for a while and was busy working on other things

(horns!). I am struggling to understand your "sketch", I tried cutting and pasting it into notepad, and changing the font, but I could not get it to line up so I could get a clear picture of you layout. Is there a particular font or application that it will line up all of the typing to form a clear picture for me to see?Martin

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Subject: Re: Boomtoobz
Posted by lon on Thu, 18 Mar 2004 02:31:15 GMT
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Hello Martin, Thanks for your gracious reply to a newbie.The link below you might well be familiar with from James Melhuish'Full Range Driver site.I started out with that design. So I had one ten foot length that I was going to cut down to the proper length for 2 speaks with RS 1197 drivers. I didn't know what I was doing so I made some baffles from closet fittings because the cutout was the right size. To get the fittings attached to the 90d elbow I used a short length of the 4" diameter PVC glued onto a closet flange. Before cutting down the rest to make 2 speakers I assembledone complete speak with the entire reamining length. This wasa little over 7 feet. Unlike the PVC Periscope, my port at thebase was a 4" tee fitting. So port is the same diameter asthe pipe and faces front. Listening to this configuration was a gas during the weekly organrecital on Wisconsin Public Radio. I loved the depth of the soundrigth away. After all, I had been reading about speaker designs for years but had no listening opportunities. I then tried out some electronic music from Steve Roach and Tangerine Dream too. Theselistening tests were also good. But I still had this Wilt The Stilt speaker nowhere nearear or listening height. It took me a few days to realize that a second tee fitting at the bottom coupled to the port on the base would allow me to cut the pipe down while retaining the overall line length. To get the idea of what the assembly looks like, imagine you are on the deck of a cruise ship near some stacks that protrude through the deck: one is 5 ft high and there's another 3 ft length in front of it coupled at the base. There's some other flanges and stuff holding the thing upright on some MDF squares with through bolts and t-nuts. Wayne was wondering how the harmonics would work and I was wondering which is the best way to tweak them. The only interior treatment is a couple 12" squares of pillow stuffing directly behind each driver. If I had to put a number on it, the length of the boomtoobfrom driver to port is about 8.5 ft. Not much sound pressureat the port end but it is definately noticeable. A fellow over at the t-line discussion has also done some assemblage of PVC. Those interested can look for thepiece called "Laying Pipe with Audio Leggo" at the t-linesite. But I have not seen anything like what I put together.It may be goofy and impractical to duplicate, but I was looking for something to build with a minimum of tools. I have no shop and live in an apartment. So a hack saw and some other hand tools are all I've used. I have one of the boomtoobz completed and there is anotherof 5 ft. length from the original design so some comparison listening can be done. Perhaps 2 boomtoobz would be too many? Many questions remain. :-)lon@athenet.net
PVC Periscope from Full Range Driver site

Subject: Re: Boomtoobz

Posted by Martin on Fri, 19 Mar 2004 00:08:58 GMT
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Hi Lon,About two years ago I bought 10 of the RS 1197 drivers when Radio Shack started dumping them at about $5 each. All of my drivers are the older purple and blue box models. I measured the T/S parameters for all 10 and got the following average values.fd (Hz) = 84.2Qed = 0.419Qmd = 3.578Qtd = 0.375Re (ohms) = 7.59Vad (liters) = 4.87Sd = 49.5 cm^2BL (T-m) = 4.95SPL (dB) = 90.2I came up with a whole directory full of interesting MathCad designs for the drivers but never got around to building anything. I still have all ten drivers stored in my workshop for a time when I want to experiment.So if we assume your drivers are similar to mine, then I don't see any reason why a sewer pipe speaker would not be a nice design. Since this is a constant area line I would tune the length to the driver fd.L = 344 / (4 x 84.2 Hz) = 3 ft 4 inchesFor a 3/4 wavelength pipe tuned to the driver fdL = 3 x (3 ft 4 inches) = 10 ftand the fundamental tuning frequency would be 28 Hz. Your pipe is very long! I have never tried a longer pipe like this so I am not sure what to expect. Interesting experiment. What is the inside diameter of the pipe?I don't see any problem bending it like you did and I also don't see any issue with have the driver in front of the open end or the other way around. At low frequencies these types of separation distances are not important.Martin

Subject: Re: Boomtoobz
Posted by lon on Fri, 19 Mar 2004 05:24:44 GMT
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My pipe diameter is tandard 4" with the fittings.I do not have golden ears for listening to what's here..more like cabbage ears. Most of my listening is done with the Yamaha RP U100receiver. I originally began experimenting with the 1197'sacross the room on a bench system. The bench system consists ofa Radio Shack SA155... the smallest and lowest power unitthere is on a commercial basis. I got that used because it hasa built-in phono preamp. On the bench set-up I managedto transfer a couple phonograph tracks. That was my primaryintention for the bench machine. Somebody donated an oldPioneer turntable to me and I bought a fresh Grado cartridgefor it. I figured I could upgrade parts as a I went. My 1197s are blue box and cost about the same. I read aboutthem in the forums and so word of mouth sent me to the storeto go see if there were any left. As part of this dialog I began reading your introductory pages the t-lines but am not very far with that yet so I don't have anysensible sort of questions. I'm moving the 1197's from one project to another. They started out in cardboard boxes. I had wondered how SPL effects pushing the sound through such a long length... or which of the parameters addresses the issue ofpushing the sound through a long length. Send me a mail with your address. I will take some snapsand send them to you. The footprint of these things isn't reallythat large. Both toobz sit on a piece of chipboard shelvingI get for $.69/ea. The shelving is 10 1/2 inches by 23 1/2. I'm reminded of some recent postings in the Full Range Driver forum which related to building with sonotube. More dimensionis available with that and the upshot of the article was thatsonotube sound (which I figure is similar to what I have) soundedbetter to the listeners than more expensive rigs in the same room. I have not found any fault with the boomtoobz except insofaras announcers on their various mic setups can sound from ok

topeculiar. But those shortcomings are tranparent when listingto concert performances like Pipe Dreams and other classicalreproductions. To conclude, you said up there that a 3/4 wavelength pipe would be a total of 10 ft. What could I expect by adding onanother short length to go the full 10 ft. distance?Would anything be gained? Since the 3 ft. 4" length for a TL is pretty close tomy shorter tube, I'm thinking that the driver shouldbe on the shorter length which would be closer to listener'ssitting height and the back tube would be open and maynot even need an elbow for "directionality" if I'mreading what you're saying correctly. In that configurationit'd prob'ly look more like a calliope. Which way to go for a driver upgrade or leave well-enoughalone? lon@athenet.net

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Subject: Re: Boomtoobz
Posted by Martin on Fri, 19 Mar 2004 14:27:14 GMT
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Hi Lon,"My pipe diameter is tandard 4" with the fittings.I do not have golden ears for listening to what's here..more like cabbage ears."So you probably have an S0/Sd of about 1.6 which is a littrle low but not too bad. As a TL's area gets bigger the bass resposne gets better. I have found that this effect starts to reach a diminishing return at about S0/Sd = 3. The classic ruls of thumb recommended S0/Sd = 1.25 which in my opion is too small and chokes the bass response."My 1197s are blue box and cost about the same. I read aboutthem in the forums and so word of mouth sent me to the storeto go see if there were any left."I did the exact same thing, I hit every Radio Shack I came across in my daily travels. I think my wife even hit the mall stores and scored a couple of the 1197 drivers. I think we have the same versions of the 1197 drivers."As part of this dialog I began reading your introductory pages the t-lines but am not very far with that yet so I don't have anysensible sort of questions.I'm moving the 1197's from one project to another. They started out in cardboard boxes."I bet you are learning a lot and having a great time in the process. If I were to recommend a classic TL per my understanding of the topic, I would recommend the length I preciously posted and a pipe diameter of at least 5 inches. If you could find a way of mounting the driver 20% to 33% along the length you would get additional improvement. Maybe a "T" could be used."I had wondered how SPL effects pushing the sound through such a long length... or which of the parameters addresses the issue ofpushing the sound through a long length."The sound does not really get pushed through the length. The pipe responds at discrete frequencies that are related to the length. At these frequencies the air in the pipe resonates, attenuates the driver's motion, and almost all of the sound comes form the pipes open end. This is similar to a BR but at more frequency values."Send me a mail with your address. I will take some snapsand send them to you. The footprint of these things isn't reallythat large. Both toobz sit on a piece of chipboard shelvingI get for $.69/ea. The shelving is 10 1/2 inches by 23 1/2.I'm reminded of some recent postings in the Full Range Driver forum which related to building with sonotube. More dimensionis available with that and the upshot of the article was thatsonotube sound (which I figure is similar to what I have) soundedbetter to the listeners than more expensive rigs in the same room."I used a sonotube for my test TL and it worked great. I seen many TL designs using sonotube both tall straight ones and folded ones using nested tubes of different diameters. If you can cut cardboard easily and glue joints that are air tight then sonotube would probably be as flexible to use as the sewer pipes. Nothing wrong with cheap and easy. "I have not found any fault with the boomtoobz except insofaras announcers on their various mic setups

can sound from ok topeculiar. But those shortcomings are tranparent when listingto concert performances like Pipe Dreams and other classicalreproductions. To conclude, you said up there that a 3/4 wavelength pipe would be a total of 10 ft. What could I expect by adding onanother short length to go the full 10 ft. distance?Would anything be gained?"I have no idea how a 3/4 wave pipe would work and if there is an advantage or disadvantage to using one. I always try to keep things small. TL's tend to be big enclosures and I struggle building big boxes and getting up two flights of stairs form the basement to my listening room."Since the 3 ft. 4" length for a TL is pretty close tomy shorter tube, I'm thinking that the driver shouldbe on the shorter length which would be closer to listener'ssitting height and the back tube would be open and maynot even need an elbow for "directionality" if I'mreading what you're saying correctly. In that configurationit'd prob'ly look more like a calliope."I think that this experiment would answer the question above. Try the two different lenght and see what you hear. Maybe one will be far superior to the other. The proof is in the listening."Which way to go for a driver upgrade or leave well-enoughalone?"The two manufacturers that come to mind are Fostex and Tangband (spelling?) for an upgrade that would not cost an arm and a leg. I don't know anything about Tangband and have seen mixed reports on different models. Some appear to be very good and others are reported to be not so good. In my gallery is a back loaded horn using one of these drivers and it is reported to be excellent. I think any of the smaller Fostex drivers would be a step up but at a little more money.Hope that helps,Martin

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Subject: Re: Boomtoobz
Posted by lon on Sat, 20 Mar 2004 08:58:19 GMT
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Re: BoomtoobzHi Lon,"My pipe diameter is standard 4" with the fittings.So you probably have an S0/Sd of about 1.6 which is a littrle low but not too bad. As a TL's area gets bigger the bass resposne gets better. I have found that this effect starts to reach a diminishing return at about S0/Sd = 3. The classic rules of thumb recommended S0/Sd = 1.25 which in my opinion is too small and chokes the bass response.I bet you are learning a lot and having a great time in the process.>> Yes, lack of tools meant that I had to find a design without much cutting thatcould be done with a hand saw. But I am still mathmematically challenged. If I were to recommend a classic TL per my understanding of the topic, I would recommend the length I previously posted and a pipe diameter of at least 5 inches. If you could find a way of mounting the driver 20% to 33% along the length you would get additional improvement. Maybe a "T" could be used.>> Ok. So a speak made this way could use the 6" diameter PVC at 40" of length usingthe information from the previous post as a guide(?) The issue that I had when making my initial length was: How does downfiring intocarpet affect what is heard? I could understand downfiring onto a wood floorbut carpet would have to absorb the energy of the sound would it not? So then Igot onto the idea of getting the pipe pointing forward like the driver. That was on the single length tube. Then I used the longer length, cut it down and bent the tubeup with a fitting at the open end identical to the elbow for the driver. 6" pipe at 40" is going to look like a narrow trashcan sitting in the living room...or maybe two of them. Sonotube is no decorator's dream either, but someday Iam going to fool with that depending on how the current work goes.So you probably have an S0/Sd of about 1.6 which is a littrle low but not too bad. As a TL's area gets bigger the bass resposne gets better. I have found that this effect starts to reach a diminishing return at about S0/Sd = 3. The classic

ruls of thumb recommended S0/Sd = 1.25 which in my opion is too small and chokes the bass response.I bet you are learning a lot and having a great time in the process. If I were to recommend a classic TL per my understanding of the topic, I would recommend the length I preciously posted and a pipe diameter of at least 5 inches. If you could find a way of mounting the driver 20% to 33% along the length you would get additional improvement. Maybe a "T" could be used."I had wondered how SPL effects pushing the sound through such a long length... or which of the parameters addresses the issue ofpushing the sound through a long length."The sound does not really get pushed through the length. The pipe responds at discrete frequencies that are related to the length. At these frequencies the air in the pipe resonates, attenuates the driver's motion, and almost all of the sound comes form the pipes open end. This is similar to a BR but at more frequency values.I used a sonotube for my test TL and it worked great. I('ve) seen many TL designs using sonotube both tall straight ones and folded ones using nested tubes of different diameters.>> Where are examples of the nested tube approach? These would be new to me. If you can cut cardboard easily and glue joints that are air tight then sonotube would probably be as flexible to use as the sewer pipes. Nothing wrong with cheap and easy.>> The next tool I will get is a spin saw. RotoZip is the commercial name and there'sexamples of their use here in AudioRoundtable. I've made a homebrew spin saw usingan electric handrill, a drill guide (type found at Sears) and RotoZip(c) bit. I'vefound that using this rig makes little dust and what waste is created goes downmore than up into the air. There's some holes in the drill guide which I've usedas centers to cut circles. But I am limited to using this rig for the 3 circle diametersavailable. The spin saw comes with an adjustable circle guide. To conclude, you said up there that a 3/4 wavelength pipewould be a total of 10 ft. What could I expect by adding onanother short length to go the full 10 ft. distance?Would anything be gained?"I have no idea how a 3/4 wave pipe would work and if there is an advantage or disadvantage to using one. I always try to keep things small. TL's tend to be big enclosures and I struggle building big boxes and getting up two flights of stairs form the basement to my listening room.>> I am asthmatic. I live on one level. So the things you are saying appliesto me as well. Small tools, low dust levels, and minimal lifting. At age 56I have no work and would like to learn something I can do at my own pace. "Since the 3 ft. 4" length for a TL is pretty close tomy shorter tube, I'm thinking that the driver shouldbe on the shorter length which would be closer to listener'ssitting height and the back tube would be open and maynot even need an elbow for "directionality" if I'mreading what you're saying correctly. In that configurationit'd prob'ly look more like a calliope."I think that this experiment would answer the question above. Try the two different length and see what you hear. Maybe one will be far superior to the other. The proof is in the listening.>> That will be my next step: reverse the construction keeping the same lengthsand test individually. Then after that, add some additional length out to 10 ftof length total.Hope that helps,>> It certainly does, though I don't know if I will ever be able to apply theoryover intuition and listening experience. Bill Schultz' followup article in_audioXpress_ on Alpha t-lines should provide some additional clarification.>> I have scouted the Tangbands and Fostex extensively and I use the FE87e inmy computer setup. I use the FE87e's in some doctored mini enclosers from anold Nakamichi shelf system. Being in Wisconsin, Madisound is within drivingdistance or fairly inexpensive shipping. lon

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Subject: Re: Boomtoobz
Posted by Martin on Sat, 20 Mar 2004 20:05:54 GMT
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Hi lon,I think a 40 inch long piece of 6 inch diameter PVC would work well. Having the open end near the floor should not be a big problem, you might try using a 12 inch square wood base and mounting the pipe 3 or 4 inches above the base on attached legs. I have seen similar things done many times without any hints of poor performance resulting.I remember seeing a sub done this way on the DIY Forum, I think. Basically it was something like a 12 inch diameter tube with the driver at one end near the floor. The sond came up this tube and then wnet back down a 15 inch tube mounted concentric ans paced about 3 or 4 inches above the end of the inner tube. The sound then exited the outer annulus near the floor. This arrangement was a different way of folding the line in half.I am also waiting to see the next alpha TL article from Schultz. I have communicated with him a few times and we have swaped ideas. He approaches TL design and alignment a little different so it is always interesting hearing about his results.Martin

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Subject: Re: Boomtoobz
Posted by lon on Mon, 22 Mar 2004 03:43:13 GMT
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So the outer 15 in tube was capped on the top? I'm trying to visualize this thing: 12in. driver facing up at the floor attached to a tube (what length I wonder?) Then a 15 in. tube inserted over itwith little legs or something keeping it off the floor. The top would have to be capped then ennit? Ceramic tiles would work well on a base too I think. I've made the switch on these tubes putting the driver on the shorter lower front tube and the open end with an elbow at the rear. On the other one I put an extra length of pipe onthe rear portion with no elbow like a smoke stack. Too early tosay if this is practical plus it is not cut to a specific length.Overall the length of that one from throat of the terminus to driver is... omigod 9 ft 9 in... just shy of the 10 ft 3/4 wave length.If I put the elbow back on I'd have it all. Soundwise, I have no test equipment so not sure about that last one up there. I spoze I should figure out what I have here by calculation but the 8.5 length is the closest thing to 'fitting a room' that I've come up with and sounding good to boot. I'm starting to get curious about how a different driver would sound.

Subject: Re: Boomtoobz
Posted by Martin on Tue, 23 Mar 2004 00:31:26 GMT
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Hi lon,Your description of the nested sonso-tube sub is correct. I don't remember the details but the builder was very happy. I think that you could find details in the DIYAudio forum Loudspeakers subforum if you go back far enough. I think it was at least a year ago.As for your PVC pipes. You are on uncharted ground as far as I am concerned so I am looking to hear about your impressions. Does a 3/4 wavelength pipe offer any advantages over a 1/4 wavelength pipe. I have no idea.Martin

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Subject: Re: Boomtoobz
Posted by lon on Tue, 23 Mar 2004 04:06:11 GMT
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Thanks for sticking around on this one. I made some progress inreading your theory pages... got distracted once... it's not likebook reading. Anyway, being pretty isolated socially from any other hobbyists I have no effective gauge of what I'm hearing. The first impression Ihave of making the toobz length nearly 10 ft overall is thateffective listening is put too far out. In other words, just likemy 8.5 ft straight pipe open at the front bottom, you have to getway back in order to appreciate the lower frequency reproduction...with considerable volume. The folded U-shape has given the most satisfying listeningexperience. other thing to try is going in the other direction: shorter.I will follow up with the link (when I find it) of another approach.It'd be good if all the tubes were archived in the same place butI guess not many are doing this kind of building.

Subject: Re: Subwoofer Horn
Posted by Mike.e on Sun, 04 Apr 2004 05:37:57 GMT
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Hi ionif u have a picture you need to show on a forumdraw it in MSPAINT,save as say a 16colour bmp,then resave as a GIF or PNG file(png is less distorted)email it to me, and i can save it on my webspace then ppl can see the pic to get the idea :-)basshornguy(at)yahoo.co.nzCheers!

Subject: Re: Subwoofer Horn
Posted by lon on Sun, 04 Apr 2004 06:53:23 GMT
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That's "Lon" and hello. :-) My drawing talents wouldn't be up to the job. Butover time I'd like to show how the design progressed. That's easyto do since all that needs to be done is reassemble the partsa few times. There's a small amount of webspace that's available atmy ISP account. It's just getting a proper image into it. lon@athenet.net

Subject: re pics
Posted by Mike.e on Sun, 04 Apr 2004 10:32:48 GMT
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No problemIve always had that problem, Is and ls :P