Subject: Damping 511B ringing: Whats your experience?
Posted by AstroSonic on Mon, 05 May 2003 15:34:57 GMT
View Forum Message <> Reply to Message

The stock cast aluminum/welded Altec 511B horn rings quite audibly on playback in comparison to more recent non-metal horns such as the JBL 2380 which I also have. On some selections the sound even becomes 'shouty'. The excited range of frequencies is like those emitted when the horn is tapped or gently brushed. At this point I have reviewed the archives here (horn damping and 511b damping) and several suggested fixes were turned up.1) De-stress the horn by separating/cutting the dividers.2) Apply a few layers of paint and sand until the ringing is inaubible,3) Apply a thick layer of window puty,4) Apply a thick layer of duct sealant,5) Apply a 'layer' of constrained layer' damping material (like Dynamat), and6) Build a box around the horn and fill with sand.My guess is that all of these methods provide some audible/beneficial improvement. I would like to do the most effective reasonable modification. The sand-filled box is out because it is just too heavy. I was favoring doing #1, but decided to investigate a bit further. I got a 50 # bag of 'playsand' and filled a total of 18 zip-lock sandwich bags. These were placed, first on the lips (above and below). I noticed an obvious but minor improvement. Interestingly, my wife commented favorably right away. I then added sand bags above and below the body of the horn, and this made a huge improvement (to me). This does suggest that the sound benefits from damping the body of the horn, as well as (more than?) the lips. The sand bags on the body of the horn can stay, but the bags on the lips have a very low WAF and must be replaced with an alternative. Anybody had experience with one or more of the above approaches? I am especially curious about the 'constrained layer' technology. TIA,AstroSonic

Subject: Re: Just say no to dope
Posted by bmar on Mon, 05 May 2003 23:00:04 GMT
View Forum Message <> Reply to Message

Cutting the fins will help but not damp the entire horn. do this in addition.I used a box filled with sand. This makes a nice presentation of your horn when its installed into a cabinet so to speak. Fill the box with sand from the back and close it up.The painting layers thing will eventually work (i presume) but when to you think its properly damped vrs you got used to the ringing sound.The putty, caulk, foam, dope and sealant approach is just too gross to even think about. If you want that shit all over your horns, then by all means! I am to understand the "bed Bath and Beyond pillows are the nuts!lastly, wood horns. Enjoy the Altecs. Nice stuff arn't they. just dont goop em upBill

Subject: 7)sell on ebay
Posted by Sam P. on Tue, 06 May 2003 09:32:42 GMT

View Forum Message <> Reply to Message

...you are not worthy :) Buy wood horns. Sam

Subject: Re: Just say no to dope
Posted by AstroSonic on Wed, 07 May 2003 12:49:10 GMT
View Forum Message <> Reply to Message

Bill, Thanks for replying. I want to do as little 'damage' as possible to these awesome horns. Based on my sand-bag experiment, I think they can be effectively damped and provide superb sound quality. I too would prefer a solution with minimal aesthetic damage. The box that you built around the back of the horn - was it built up to the flange or did it go up to/over the lips. If not the latter, do you hear any remnant ringing possibly coming from them? Did you cut the fins?Also, are you using your 511B's with a VOTT style cabinet or other type. What type of crossover are you using? Any HF compensation?Regards,AstroSonic

Subject: Love'm or leave'm!
Posted by AstroSonic on Wed, 07 May 2003 13:19:17 GMT
View Forum Message <> Reply to Message

Sam, Thanks for replying. You tried cutting the fins on your 511B's. Did that adequately damp the ringing (by itself)? Did you try any damping on the lips or body of the horn? At this point I don't think that the ringing I currently have with the sand bags is unlivable. Fact is, the sound quality is incredible, and in most respects, better than I have ever had in my home. However, I want to get the best sound quality that I can from my equipment. I enjoy building and tweaking, and the improved sound quality that results (eventually...most of the time). I may at some point try wooden horns but I am enjoying the 511B's too much to make the change now.Thanks for emailing the details of the fin cutting. Seems like that can be done with minimal aesthetic impact. After receiving your emails I picked up a sawzall. Have not done the deed yet, but did cut down some overgrown bushes!Regards,AstroSonic

Subject: Re: Damping 511B ringing: Whats your experience?
Posted by djn on Wed, 07 May 2003 18:27:04 GMT
View Forum Message <> Reply to Message

Do like I'm doing. Take your horns, with the driver attatched, to a local university engineering department and talk to the NVH prof (noise, vibration, and harshness) and have do an "experimental modal analysis" on the horn and driver. That with tell you the resonent frequency of the horn/driver and from there they can tell you what freq your dampening stuff should be and were to get it. With this method you can make a horn/driver combo as dead as concrete (which by the way has a resonent freq but is to low to notice)

Subject: Re: Damping 511B ringing: Whats your experience?
Posted by tdc on Wed, 07 May 2003 20:04:31 GMT
View Forum Message <> Reply to Message

Just to share what I did with 811b which does not ring quite like a 511. I cut the fins and filled the gaps with hard rubber cut from a tire. Poly cord and steel belts sound the same. Be sure to use radial tires with all radial horns. Then I sprayed the outside of the horn with automoble sound damping material. This comes in a spray can and is like undercoating. That looks bad but the next step takes care of that. Then I built a box to hold the horn with a heavy wood face plate. Use all the mounting holes to screw the horn face to the wood (use t nuts) and clamp it tight. You can also a a washer made from an inner tube.That is the most help. A bell rings from the edge. Bolt it to a wooden plank and you get a dull thud.The box also serves a small baffle which allows you to cross over closer to the horns bottom line. I use 850 hz 12db with the 811b but will try both 1000 and 1200 later. Problem is the woofer starts to break up a little above 500 but is not bad a 800. At full range about 1600hz it is a bit rough. I also use JBL 2345 and 2370 horns. They need none of the above treatments. tdc

---

Subject: more on fin cutting
Posted by tdc on Wed, 07 May 2003 21:35:30 GMT
View Forum Message <> Reply to Message

You only cut the weld between the vertical fins. Its about 4mm thick. You don't remove or cut out the entire fin. When you do you release a lot of pressure that was applied to bring the fins together for welding in the first place. I got the trick over the phone from altec engineers before the company went out of business. I believe altec sold the last runs of 811 and 511 horns with the fin welds removed so they really believed in it. tdc

---

Subject: 'Nother question on fin cutting
Posted by JLapaire on Thu, 08 May 2003 10:59:54 GMT
View Forum Message <> Reply to Message

Bill, is there a downside to cutting the fins off and grinding them flush? Do they serve a purpose if the flange is bolted to a cab?Thanks,John

Subject: Anyone tried Dynamat?
Posted by AstroSonic on Thu, 08 May 2003 14:11:07 GMT
View Forum Message <> Reply to Message

Has anyone tried constrained layer damping like Dynamat Xtreme (from Dynamic Control) or 3M 2552? This stuff comes in sheets with adhesive backing and is used to damp metal panels in machinery, aircraft and automobiles. Both appear to be effective between about 100 Hz and 10,000 Hz at room temperature. They can be cut to shape with scissors. If you have tried either of them what results did you get? Both companies have pdf data sheets: www.dynamat.com and www.3M.com/industrialtape.AstroSonic

Subject: Re: more on fin cutting
Posted by AstroSonic on Thu, 08 May 2003 15:09:16 GMT
View Forum Message <> Reply to Message

TDC,I am pretty much convinced that fin cutting will be a part of my 511B ringing control plan. Sam P. (below) also did this and reported good results. He used a sawzall and needed to make several cuts per fin to remove enough material. How did you cut them and what tool(s) did you use? Any hind-site observations greatly appreciated.Good idea using the radial tire matrerial (to damp radial horns!). In as much as I do play some blues and rock on my system, perhaps I should use material from off-road radials.Regards,AstroSonic

Subject: Re: more on fin cutting
Posted by tdc on Thu, 08 May 2003 15:27:04 GMT
View Forum Message <> Reply to Message

Since I only cut the welds I used a cuttng wheel on a drill. If you want to remove the whole fin you would need something more. I don't know what you would gain by removing the fins. The idea is

to release the pressure on the bell part of the horn which contibutes to the ringing. At least thats what Altec told me. tdc

Subject: Fin cutting - Just the welds!
Posted by AstroSonic on Thu, 08 May 2003 16:12:58 GMT
View Forum Message <> Reply to Message

TDC,Just to clarify: I am considering cutting out only the welds and/or enough material to leave an open (damped) gap in each fin. That is what Sam P. did as well. In searching the archives here I did run into a post by someone who had cut out the fins entirely and reported no improvement beyond that obtained from just cutting out the welds and leaving a (damped) gap.I had not considered a cutting wheel for cutting out the welds. I imagine that the working room was pretty tight? The hand drill I have would probably not allow a square cut with a cutting wheel - it would have to be angled in. Were you able to get reasonably straight, clean cuts? How would you describe the resulting improvements in sound quality?Regards,AstroSonic

Subject: Re: Just say no to dope
Posted by bmar on Thu, 08 May 2003 17:14:46 GMT
View Forum Message <> Reply to Message

First I had the little brother 811B horns. I did not cut the fins because I was happy after damping them. I don't think cutting the fins on a 811 or 511 is an issue. The horns are not so rare that it will decrease the value. If they cut with a good saw, water, laser, plasma arc. You wont even hardly see the kerf.I build boxes that went up to the rear flange. I wanted the ability to change the driver conveniently. If your going to use the same driver you could box the whole rear portion. On the front side the sides of the box came up to the flange but the top and bottom extended past the flange. I would consider this a matter of taste in decorating only. You could damp the lips if the cabinet covered them too.I pretty much always multi amp this stuff. Almost all compression drivers need compensation when used in a 2way or 3way, and I wouldn't cross a 511 any lower than 750 - 1000 hz IMOBill

Subject: Re: Just slice them
Posted by bmar on Thu, 08 May 2003 17:18:35 GMT
View Forum Message <> Reply to Message

I dont know anyone who has ever cut the fins out. You just slice the fin right in the middle at the welded joint. If you want to get tricky you can fill the kerf with an elastomer like SikaFlex and repaint the horn. The metal will still be seperated and stress relieved yet invisable as a cut.Bill

---

Subject: Re: Fin cutting - Just the welds!
Posted by tdc on Thu, 08 May 2003 17:38:29 GMT
View Forum Message <> Reply to Message

I did all the steps more or less at once. I did not conduct extensive listing test with each step progress. There is some improvement but its not like going from a bad crossover to a perfect one. When you strike the horn after all the above is done there is a dull lower thud and you know its dampened. You could also use the horn to make a cast and then pour the cast with depleated uranium from surplus operation Iraqi Freedom shells. Now that would be dead. tdc

---

Subject: Breakup modes and crossover points
Posted by Wayne Parham on Thu, 08 May 2003 17:59:05 GMT
View Forum Message <> Reply to Message

About crossover points, I want to point out that all speakers using cones or domes (including compression drivers) are operated through much of their range in a mode that introduces cone flex. This has been called breakup mode operation, and no speakers are immune. While most designers attempt to suppress this mode of operation, many have designed features that take this behavior into consideration, some taking advantage of it to extend response. An example is whizzer cones, which are designed to move independently of the rest of the cone at high frequencies. The fact is that it is difficult - bordering on the impossible - to create a speaker using current technologies that doesn't enter this mode of operation.Over the years, I've crossed large-format midwoofers a variety of crossover points from 100Hz to 3kHz. Usually in a three-way system, I'm using the LF driver as a woofer and crossing between 200Hz and 500Hz. That tends to keep the woofer in its pistonic range, or within an octave of it. I tend to expect 250Hz is pistonic range and 500Hz is the first breakup mode.In a two-way system, I'm usually crossing over much higher, in the octave where midwoofer DI and compression horn DI match - between 800Hz and 1.6kHz. In this regard, my designs are much like JBL's two-way monitor speakers that are almost always crossed over above 1kHz. The JBL 68881 is a 1.5kHz passive two-way crossover and it is a good example, being used with a 15" midwoofer and a 1" exit compression horn tweeter on a radial horn flare.But whether a person uses two-way or three-way configurations, the drivers are going to be used in their breakup modes over a large part of the audio band. I think its important to consider all things, and drivers that are designed to be used at high frequencies usually have well-behaved cone flex patterns and don't become excessively anomalous. Lots of high-efficiency drivers are made this way, especially compression drivers and high-efficiency large format cone

midrange and midwoofer drivers. I find that a well-designed midwoofer operates pretty well in the vocal range, provided its breakup modes are well damped, which is something that is easy to determine from its response graph.

Subject: Depleted uranium and radial tire rubber
Posted by Wayne Parham on Thu, 08 May 2003 18:02:57 GMT
View Forum Message <> Reply to Message

Depleted uranium and radial tire rubber! Only dampen radial horns with rubber from radial tires! [grin]

Subject: Re: Depleted uranium and radial tire rubber
Posted by tdc on Thu, 08 May 2003 18:36:36 GMT
View Forum Message <> Reply to Message

Hi Wayne. On cone break up. The comment pertains to the over 50 year old Altec 416a which I use with the 811b in the A-7 set up. It seems to work well up to about 800-1200 but not at 1600hz. I have 4x 4648a boxes with 2226 woofers. One pair is used with the Pi crossover at 1600 hz (pseudo Butterworth) to the JBL 2426-2370. I hear no break up or any problem with this woofer in your design. I love it. The old Altec system is used with triodes and vinyl. Its warm and wonderful but maybe a bit fat. Goes well with Merlot, Cabs and Zinfandel. I use your system with s.s. amps (Crown and Apt) for everything else. tdc

---

Subject: Re: Depleted uranium and radial tire rubber
Posted by Wayne Parham on Thu, 08 May 2003 18:50:04 GMT
View Forum Message <> Reply to Message

Gotcha on the 416. I suspected that you might be talking about a part that didn't like going up so high. There's lots of 'em that are great parts but that get a little edgy up top. I just wanted to mention the breakup thing 'cause there lots of midwoofers that get way up there smoothly.

Subject: As usual, we have the answers.....
Posted by BillEpstein on Thu, 08 May 2003 21:38:49 GMT
View Forum Message <> Reply to Message

.....See the bottom of the page "third party sources"; the 3 articles by Jim Dickinson.I knew I had them somewhere but been busy selling stuff and preparing to scarf a new DVD/SACD player

http://www.southernelectricaudio.com/altec.html

Subject: Answers found! Thanks
Posted by AstroSonic on Thu, 08 May 2003 22:35:20 GMT
View Forum Message <> Reply to Message

Bill, In the article on the small VOTT's, in the section on improving the horns, the first solution done by Altec was to place foam between the webs...that would be the 'fins' of the current discussion, and the foam was placed where the weld on the earlier models was right? The latex paint and sand idea also sounds like it would be very effective. Would you say that either method by itself would be sufficient? I had run into that article a few years ago and had forgotten how informative and useful it was.Thanks again.AstroSonic

Subject: Re: Answers found! Thanks
Posted by AskBill on Thu, 08 May 2003 22:54:16 GMT
View Forum Message <> Reply to Message

As I just wrote to the other Bill, these damned Towers are like a bad houseguest and I don't have time for the Altecs. But I do recall mixing sand and latex paint to coat sandboxes for VPI turntables years ago. It would take a lot of sand to get dampening and you'd have to put it on with a trowel. Speaking of which, what about using Thin Set for ceramic flooring? heavy as hell, trowels on thick, flexible and you can add dye.There ya' go.Oh yeah, the fins are indeed the webs. Just use an angle grinder and as already posted, remove only the welds, fill the gaps with any silicone caulk and paint. With thin-set!

Subject: Thanks (nt)
Posted by JLapaire on Fri, 09 May 2003 07:58:50 GMT
View Forum Message <> Reply to Message

.

Subject: Re: Yes, Dynamat Xtreme
Posted by Matts on Sun, 11 May 2003 15:07:54 GMT
View Forum Message <> Reply to Message

and it's great. I've put it in my CDP and damped speakers with it- noticeable improvement every place I've used it and it's very clean and easy to work with. Also works in higher temps than many other damping products. Assume the 3M product is similar. Recommend it highly.

Subject: Re: Yes, Dynamat Xtreme
Posted by AstroSonic on Mon, 12 May 2003 19:29:45 GMT
View Forum Message <> Reply to Message

Hey, good to hear about your positive experience with these types of products (constrained-layer damping material). I wonder if you would give some detail on your use of dynamat in digital players. It's off topic here so respond via email me or post in the digital forum on the Asylum) See my 511B Ringing Update, above for my very positive experience with Dynamat xtreme.Regards,AstroSonic