
Subject: Piezo chirping

Posted by [dbeardsl](#) on Tue, 02 Jul 2002 01:45:39 GMT

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My father just built a stereo guitar cabinet with 2 Alpha 8A's and two KSN1005A's per side, all in parallel. We is running it with a (30W/ch at 8 ohms) guitar head. The piezo's chirp at moderate to loud volumes. I've isolated it to the back emf problem... it doesn't happen with the woofers out of the circuit. Is there anyway to fix this besides having two amps? I tried a few quick things with resistors and caps I had laying around... but nothing worked. I do have some of the cheap CTS knockoff piezo and they distort horribly at moderate to loud volumes and also chirp just as much. Would a zobel help?

Subject: Re: Piezo chirping

Posted by [Wayne Parham](#) on Tue, 02 Jul 2002 03:33:30 GMT

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I've run into this before. If the amplifier can't damp the system well enough, back EMF causes the tweeters to oscillate - making that chirping sound. I've found it to be the case with woofers having high inductance voice coils, even on amplifiers with good damping ability.

Try connecting the woofers in series, so that load resistance is raised. This will also raise inductance, but since these woofers are known to work well with piezos in most cases, you may find a solution in this. You could also use a single compression driver to replace the piezo's, if no other solutions are found.

Discussions about back-EMF and piezoelectric tweeters

Subject: continued....

Posted by [dbeardsl](#) on Tue, 02 Jul 2002 06:43:44 GMT

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>I've run into this before. If the amplifier can't damp the system>well enough, back EMF causes the tweeters to oscillate - making that >chirping sound. I've found it to be the case with woofers having >high inductance voice coils, even on amplifiers with good damping >ability.yeah, I just didn't think it'd happen with the Alpha's.>Try connecting the woofers in series, so that load resistance is >raised. This will also raise inductance, but since these woofers are >known to work well with piezos in most cases, you may find a >solution in this.He is really going for max output, so parallel to series is a 6db hit.. final resort, if it even helps.>You could also use a single compression driver to replace the >piezo's, if no other solutions are found.The cabinet is already built, no room for a compression driver, really.Hmm... how about a second order low pass right when the piezos come in around 4k?I read all of the previous posts about it... good info. I hope I

find a solution.

Subject: Try a proper x-o on the piezos
Posted by [Andy.G](#) on Wed, 03 Jul 2002 10:03:40 GMT
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Go to my web site, bottom of right column run the 2 piezos in series, not parallel, and reduce the resistor in series with the tweeters in the diagram to about 10 ohms (wag)

Andy G's web site

Subject: arg..
Posted by [dbeardsl](#) on Thu, 04 Jul 2002 05:11:43 GMT
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The piezo's don't need to be crossed over, I need a method of limiting back-EMF from the woofer. I tried your suggestion anyway, but it didn't change anything.. except make the tweeter output 6db quieter and rolling of the highs just a bit as expected. I tried several different resistor values. Wayne, think it might help if I used a low pass xover on the woofers? One more question, With the Alpha 8's.. would running 2 in series cut the highs a bit since the amp obviously doesn't have high damping?

Subject: Re: arg..
Posted by [Wayne Parham](#) on Thu, 04 Jul 2002 06:18:49 GMT
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I've run into this myself, and described the symptoms, what I did about them and my final conclusions on the post called "More piezo stuff - high order networks, etc." Sadly, in some situations, there is no passive solution that will damp the system and/or isolate the tweeter enough to prevent oscillation and maintain acceptable frequency response and system sensitivity. I'm afraid you may be out of luck with that amp. Try a few things more before we make this conclusion: 1. Run one woofer and one tweeter. 2. Run the pair of woofers in series. 3. Try a different amplifier. 4. Use a different tweeter, but still use a piezo. Try KSN-1038's instead of KSN-1005's. 5. If the guitar amp uses tubes, you might try a different output transformer.

Subject: Proper Guitar Spkr Design

Posted by [Paul C.](#) on Sat, 06 Jul 2002 12:45:20 GMT

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I just received this from my brother, and lifelong sideman, a guitarist himself. He asked me to post this: Perhaps there is an easier way to avoid the chirping, by avoiding or turning off the tweeters! Is the purpose of the stereo guitar amp and cabs is to amplify guitar, especially electric guitar? If so, the basic audiophile rules of speaker design need to be ignored. For guitar cabs, the cabs themselves are part of the sound--they need to be live, not dead, as with audio and PA cabs--so you don't want to stuff the boxes at all. I have some decent, but rather old Epicure stereo speakers and have run my Les Paul through them--Yuck! It is the driest, deadest sound imaginable. You want the sound to be colored by the cabinet because the straight sound is uninteresting. Craig Anderton. John Simonton along with PAiA have a tube pre-amp for guitar called stack-in-a-box (<http://www.paia.com/tubestuf.htm#siab>) with "two switchable filters simulate the timbre of speaker cabinet resonances." You want to minimize bracing, until you get up to 4x12 cabs and then a single front to rear brace is fine. You want limited low end response and so forget porting and you want nothing over about 7.5 k, so forget piezos (or any kind of tweeter) altogether. Anything over 7.5 k you get an unpleasant harshness that even a heavy metal guitarist would want to avoid. There is a good discussion of this at the Celestion site. Go to <http://www.celestion.com/pro/pro.htm> and since this site is in frames, you need then to go to "guitar", and then "system upgrading and technical information" and then "guidelines for cabinet design." You want neither ports nor tweeters nor damping material in a guitar amp. Bass guitar, keyboard, other instruments, PA, etc. will have different designs, but these will usually follow the guidelines of standard hi-fi speaker design more closely than guitar cabs. Electric-acoustic guitar speaker design is different still, using more of the upper mid range and less of the lows. It is noted elsewhere in the Forum that DJ PAs will often be a bit heavier in the bass guitar range to pound out the beat for dancing. Just as with other things, "Form follows function." The guitar amp probably does no damping of highs as Wayne mentioned. The reason for this is that guitar amps are designed to run with guitar speaker cabs, which do not reproduce frequencies above about 5 or 6 k. No need to worry about those highs if the speakers are not going to reproduce above 5 or 6 k. If you want the amp/speaker setup to do several things, it might be a good idea to put an L-pad in the crossover and turn the tweeters way down. An on-off toggle to the tweeters would probably work just as well. But this still doesn't get to the chirping problem at all. (A different amp might fix it.) It is just that if the speakers are for guitar amplification, you do not want tweeters at all in the sound, and so with tweeters gone, the chirp goes away. Morris

Subject: Re: Proper Guitar Spkr Design

Posted by [Paul C.](#) on Sat, 06 Jul 2002 13:15:45 GMT

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A further note from my brother: You might want to add that should dbeardsl remove the tweeters (for use elsewhere), he should find some way to cover the holes or just leave them in place. He doesn't want to port his box. Morris

Subject: Re: Proper Guitar Spkr Design
Posted by [Paul C.](#) on Sat, 06 Jul 2002 15:50:51 GMT
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Morris suggests you remove the Piezos, and use the cheap knockoffs as hole fillers, so you don't port your cab. Just screw them in the tweeter holes, don't hook them up.

Subject: Thanks...
Posted by [dbeardsl](#) on Sat, 06 Jul 2002 16:19:41 GMT
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Thanks for responding. My father is actually the one designing the cabinet(yeah, it is for electric). He has been playing guitar for 35 years or so and likes the added highs. While I'll probably try turning them down with a cap. Yeah, thats definately an option, but in the end it's up to him.Thank you for posting! I'm sure we'll figure something out.

Subject: Re: Thanks...
Posted by [Paul C.](#) on Sat, 06 Jul 2002 16:39:24 GMT
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And one more from Morris:Paul,Here is an excellent article on the guitar, bass and keyboard amps and speaker design.<http://sound.westhost.com/instamps.htm>Also, if you click on <http://sound.westhost.com/readymade.htm>Elliot has an interesting 100W RMS Power amp sans box, power supply and heatsinks for \$90 US (Paypal) and shipping from AU can't be that much for thissmall item. Very interesting. Would be nice with that stack in a box fromPAiA.Morris