Subject: 511B update #3 Major Improvement!
Posted by AstroSonic on Sun, 29 Jun 2003 19:22:17 GMT
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For a couple of months now I have been working to get the most out of the Altec 511B horn. Modifications to the horn addressed the resonance of the aluminum horn body. Modifications included gapping and damping the vanes, removal of the midhorn stud, covering the exterior of the horn with constrained layer damping material and attaching a wood frame to the flange. Every step resulted in a (to me) obvious improvement in sound quality. After all of these change/improvements, I gradually picked up on a residual roughness. The longer I listened the more it became evident. The last element of the horn/driver assembly, the driver, was the only one still vibrating during use. The back cover on the driver could be felt (by lightly touching it) to be vibrating. Removal was easy - it is a nicely cast piece, surprisingly thick. By the way it vibrated, I had expected a thinner, stamped piece. On removal of the back cover, the aluminum diaphram was exposed - there was no loading cap. Some posts have suggested removal of the loading cap to improve the sound, but at some loss of power handling at the lower end of the frequency range. No hay to be made here. Others had suggested adding a felt pad to the back cover as a way to improve resolution and minimize a mid-treble prominence. There was already a thick felt pad with adhesive backing inside the cover. Again, already done. Disappointed that there was little else to do I began to replace the covers. Then it ocurred to me that there WAS obvious vibration of the back cover during use. I cut round patches of Dynamat Xtreme (the constrained damping material I had used so successfully on the horns) and adherred them to the inside of each cover, then added the felt pads. I could hardly believe my ears at the improvement. The amount of improvement was of about the same magnitude as that from all of the horn mods combined! Surprisingly, there were a number of improvements to the sound including a substantial gain in resolution, a loss of grain, a loss of 'technicolor highlighting', a gain in dynamics and an overall gain in 'naturalness'. There was also an appraent increase in HF extension, enough so that it sounded nearly the same as with crossover HF EQ (before back cover damping) or the addition of a 'tweeter'. My wife even commented favorably, then sat down and listened as I played some choice pieces that we both enjoy. I am using the Model 102-16 driver made by Iconic Manufacturing. This driver is very similar to the Altec 902 series. See their website (iconicspkrs.com) for details. My experience suggests that if you can feel vibration of the driver back cover (regardless of the driver being used), there is probably substantial improvement to be gained by damping the surface of the cover that is directly behind the diaphram (which could be both the back cover and the loading cap, if present). It only makes sense that the acoustic space and the bounding structure directly behind the diaphram would have a substantial influence on the sound, much like the enclosure of a full range driver.This is a quick, easy, inexpensive and non-destructive modification that has resulted in a very substantial improvement in sound quality. Let me know if you try it and what the results are. I think that you will be very pleased.Regards,AstroSonic

Subject: Re: 511B update #3 Major Improvement!
Posted by wunhuanglo on Sun, 29 Jun 2003 20:35:06 GMT

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Good post. Thanks. But I do have a question and an observation:The question is: is there enough room inside the rear cover to keep the Dynamat and felt combo from touching the diaphragm? Seems awful crowded in there.The observation is: Steve Schell suggests removing the rear cover entirely. Haven't tried it myself: I figure with three teenagers and A7's a crushed diaphragm would be the almost immediate result, but you might think about it.

Subject: Re: 511B update #3 Major Improvement!
Posted by AstroSonic on Sun, 29 Jun 2003 22:08:40 GMT
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When you see those aluminum domes, you know you have got to be very careful! In fact, I worried that the wire leads might dent the diaphrams on closure. No need for worry, as they were pre-bent to move to the sides, away from the 'top' of the dome. The Dynamat is about 0.075 inches thick (just over 1/16") so there was 'plenty' of room. With respect to removing the back cover entirely, I considered that the enclosed volume loads the diaphram much as an enclosure loads a cone driver. Running it open back might result in a lower Fs for the driver, but also lower power handling. Apart from the ambience added by the rear radiation, it might also result in a more open (improved) sound due to the lack of reflections and resonances. An open back baffle might not supply the optimum acoustic load to the diaphram. I decided to not significantly alter the enclosed volume. Some of the better dome tweeters have a shaped cavity and damping materail behind the dome. Perhaps this would be appropriate for compression drivers.Perhaps the forum compression driver experts could comment on the importance of the rear cavity volume with respect to diaphram loading. If the open back configuration is Ok, then the diaphram could be protected with a stiff, wire mesh cover (shaped over a baseball or similar object of appropriate size) with ears screwed to the back.Regards,AstroSonic