Subject: 511B Update (#2)
Posted by AstroSonic on Sat, 14 Jun 2003 14:39:13 GMT
View Forum Message <> Reply to Message

With help from Wayne, Sam, Troy (from Iconic) and others, I have done some investigating and am moving forward with improvements to my Altec based 2-way speakers. Here is a summary of items that may be of interest.The peak in response between 4 and 7 kHz (mentioned in a previous post) was largely 'solved' by adding another layer of damping material (Dynamat Xtreme) on the 511B's, between the driver and where the horn rapidly expands horizontally. Damping this part of the horn was suggested by Troy Swan of Iconic Manufacturing, (makers of the Iconic Model 102-16 drivers I am using). Things like cymbals, sibilance and applause no longer jump out at you. Interestingly, a change to zip cord for the tweeter wiring also 'solved' this problem. It also took away much of the resolution and extended HF this combination is capable of.Some (Sam!?) had suggested that 500 Hz was a lower than optimal crossover frequency, because its too close to the horns cutoff. I made an impedance run on the 511B/102 and found a strong impedance peak centered on 400 Hz. I also measured the response (Stereophile test CD with warble tone sequence, and tripod mounted Radio Shack SLM) and found that the response was pretty level from 1.2 to 6.5 kHz. At the low end there was a gradual drop to -2.5 db at 800 Hz (Looks like Sam was right!), then a trough centered on 600 Hz, followed by a 400 Hz peak. So...I am redesigning the crossover for 800 Hz. Above 6.5 kHz there was a drop of a few db, then a shelf with a gentle downward slope of about 3 db/octave. EQ in the crossover nearly levels this out. Note that the SLM is only accurate out to 10 - 12 kHz. A few posters have suggested that the 515B did not have a very extended response, even suggesting that it took a nose-dive above 800 to 1 kHz. That would be good to know if one were designing an 800 Hz crossover! I made a response run in one of my 515B's: other than a few boundary (?) related dips, it had a very even response up to around 1.6 kHz, followed by a rapid rise to a broad peak of about 6 db between 1.8 and 2.2 kHz, then by a rapid drop off. This is very similar to a response graph from the Altec 515B spec sheet.I have found these response measurements useful in identifying some fairly audible problems. For example the 400 hz peak in the tweeter is rather obvious on music having sustained notes in that area, (male singers, piano and string quartets for example). Moving the crossover from 500 to 800 Hz should help, but may not be enough. Any suggestions on dealing with this would be appreciated. The peak in woofer response has shown up consistently through numerous crossover alterations, as a suckout in system response. Any ideas on how to deal with this? Please note, before any flame wars begin, that I do not think that these response measurements are anything other than a useful, semi-quantitative tool. They have been useful for identifying some fairly obvious audible colorations to the sound. Regards,AstroSonic

Subject: Re: 511B Update (#2)
Posted by GrantMarshall on Sat, 14 Jun 2003 15:36:44 GMT
View Forum Message <> Reply to Message

Hi Astrosonic.If it isn't designed into the drivers/horns you can adjust other ways. An equalizer could take care of a 6 db spike quite nicely. They've got nice little 30 band models now that should let you play with "spots" to your hearts content. Just make sure the bands you want to

adjust are covered by the equalizer before buying. It sounds like you're not completely sold on the "zip cord" (whatever that is). High resolution and extended HF is a good thing.It sounds like you've put a lot of work into your speakers. I hope they're great other than the little bit of tweaking they need.Grant.

Subject: Re: Zip cord
Posted by AstroSonic on Sun, 15 Jun 2003 10:44:42 GMT
View Forum Message <> Reply to Message

Grant,I may get an equalizer, if only to use as a design tool. I have listened to a few in the past, but found them to bring other problems with them - like veiling, grain or harshness. I certainly haven't listened to all of them though. Perhaps someone could recommend a good one.Zip cord is another name for lamp cord, commonly used on appliances. By making a small cut between the two insulated wires and pulling the ends apart, the cord can be unzipped (the two wires can be separated). For a relatively low power, in-home system, zip cord would have adequate power handling. Some people feel that it works very well for speaker cable.A lot of work has gone into them, but it is a hobby that I really enjoy. At this point, most visitors (including a few 'philes') find the sound to be amongst the best they have heard. I enjoy listening to music through them, but can hear a few defects. So the quest will continue...Regards,AstroSonic

---

Subject: Re: 511B Update (#2)
Posted by Russellc on Sun, 15 Jun 2003 11:03:38 GMT
View Forum Message <> Reply to Message

Hello,I have followed with interest, the various mods to these horns, but am reluctant to stick stuff on my horns. I have now aquired a beat up set of 511bs to experiment with. Are these day and night improvments or more of slight improvement catagory? This sounds like a very positive approach to this problem. I don't quite follow your description of "between the driver and where the horn rapidly expands horizontally." Exactly where and how many layers (noted you said you added another layer...)did you apply this stuff? Would it be removable? I have never used dynamat products before. Did you attempt any deadening on the horns "lips" ? Haave heard this is also a worthwhile area to deaden as well. Thanks, Russellc

---

Subject: Deadening the 511B

Posted by wunhuanglo on Sun, 15 Jun 2003 14:08:19 GMT
View Forum Message <> Reply to Message

I've had a few pairs of 511B and 811B horns. I can tell you with a couple of things with certainty based on empirical evidence:*the all-welded 511B has significantly more ring than the all-welded 811B*Either all-welded horn is damped considerably when baffle mounted or mounted on the Altec "right-angle" wood mount that was typically used atop the A7*the late-production 511B with silastic bonded sectoral webs vs. the earlier welded webs is quite dead enough for me, especially when screwed down to a baffle or A7 mount.All my experience with these horns confirms Wayne's contention that the best way to damp these horns is to de-stress them by parting the sectoral webs (cut the welds). I really don't know how to do that neatly with hand tools, but if I couldn't buy a pair of late production horns, I'd take welded horns to a local machine shop and pay them a few dollars to part the webs for me.

Subject: Re:Use a sawzall
Posted by Tom Brennan on Sun, 15 Jun 2003 16:02:01 GMT
View Forum Message <> Reply to Message

Takes about 3 minutes to cut the welds in the vanes with a sawzall, piece of cake.

Subject: Re:Use a sawzall
Posted by wunhuanglo on Sun, 15 Jun 2003 16:23:36 GMT
View Forum Message <> Reply to Message

You and my brother (plumber) would be great buddies - You're a fitter or boiler maker, right? My brother does everything with a sawzall except carve the Thanksgiving turkey. He's always saying "It says SAWS ALL don't it?"While you and he may be artists with a sawzall, I certainly am not. I know I could part the webs with a hacksaw blade in one of those "jab saw" holders too, but neat it wouldn't be.OTOH, A couple of years ago I needed to trim down a brass kickplate to fit the narrow bottom rail of my front door. I didn't think I could cut it very well, so I took it to a local shop asking them to take a couple inches off of it. I figured they'd put it in a shear and lop it off. They cut it freehand in a band saw - I could have done as well with a chainsaw. I spent an hour squaring the ragged edge with a flat mill file, the plate clamped bewteen pieces of angle iron as a reference.Upon reflection, maybe a sawzall is the way to go....

Subject: Re:Use a sawzall
Posted by AstroSonic on Sun, 15 Jun 2003 21:05:39 GMT
View Forum Message <> Reply to Message

Tom is right! It's easy and the cut is clean. If you have not used one before, practice a few cuts, even on wood. Once you get the feel of the tool it will go just fine. You will need ear protection! If you are uncomfortable with a tools, maybe find a friend to help.AstroSonic

Subject: Re:Use a sawzall
Posted by BillEpstein on Sun, 15 Jun 2003 22:00:15 GMT
View Forum Message <> Reply to Message

Anybody try one of those Rotozip/Dremel/DeWalt rotary cutters? Pretty easy to control and I've cut 20 gauge aluminum and even stainless steel with little effort. Also cuts circles in MDF speaker baffles pretty well. Did a head to head with the three: the Dewalt was more powerful, the Rotozip had the weakest motor but best circle jig and the Dremel was the tweener. Chose the Dremel. Gonna have at my 811B's AFTER I hear what they sound like in the baffles I'm building.Sometime in 2008.

Subject: Re:Grinders
Posted by Tom Brennan on Mon, 16 Jun 2003 00:54:26 GMT
View Forum Message <> Reply to Message

Bill----Yeah, a small side grinder with a wafer-wheel would cut the welds if you could fit it in there. I'm talking a real pro grinder like a Metabo, not a Dremel tool which is a toy. But wafer-wheels are dangerous tools, they're prone to binding in the kerf and then jumping back and biting you. I've seen some Boilermakers get cut REAL BAD with wafer wheels; down to the BONE baby, ligements sprung back like broken rubber bands, time to call Horowitz and Horowitz or Arnie Rubin; that kind of cut. I'd stick to the sawzall, MUCH safer tool.

Subject: Re: Deadening the 511B
Posted by Russellc on Mon, 16 Jun 2003 10:25:40 GMT
View Forum Message <> Reply to Message

Hello,By silastic bonded, do you mean that instead of just a metal weld, there is some rubbery

stuff between the vanes? if so, my current set of 511bs have this feature. My spare "experimenting" set I wil have to look at, I didn't realize there was a difference. If they are hard welded I think I will mount them up and see what problems they have compared to my "rubberized" (hopefully silastic) set. Thank you for the info. I assume that since there is rubbery stuff inthere, this version has already been cut as others suggest? Thanks again,
Russellc

Subject: RE: silastic
Posted by wunhuanglo on Mon, 16 Jun 2003 21:42:17 GMT
View Forum Message <> Reply to Message

Hi:"By silastic bonded, do you mean that instead of just a metal weld, there is some rubbery stuff between the vanes?" EXACTLY!Sorry if I was confusing - a habit formed may years ago, referring to room-temperature-vulcanizing, silicone based, compounds as "silastic" - I guess I never knew if that was an "official" term or not, but where I worked at the time, that was the common term.If a black rubbery compound is present in the center of the webs then they are not welded in that area - the RTV is joining them and damping the "halves" of the horns. Altec incorporated the RTV in the late production of the 511B to damp the vibration everyone had recognized and complained about for years.

Subject: Re: 511B Upgrade Worthwhile?
Posted by AstroSonic on Mon, 16 Jun 2003 21:58:18 GMT
View Forum Message <> Reply to Message

The Altec 511B horn is like a good vintage tube amplifier. If run stock, it sounds quite good and in some ways, better than most current gear. But, given a fundamentally good design, it can be upgraded relatively easily, to a very high level of performance. The 511B sounds very good if run stock, and many horn enthusiest like it that way. But with a little effort, it can be made to perform at a very high level. The worth of these modifications is really up to you, and depends on how much you value the improvement. If you enjoy tweeking your system and appreciate the improvements to the sound, or you picked your components after considerable auditioning, then you will probably appreciate the improvements that modification of the 511B's will yield.I suggest you listen to them stock for a while, then if you find room for improvement, start down the (slippery!) upgrade path. Beware that the upgrade path often spreads to the rest of your sound system. To get a start, run a search for '511B' at this site. This site is rich in 511B lore. You will basically find that the 511B's principal faults are related to its metal construction. It rings due to excitation by the sound it is reproducing. The ringing saps energy from the sound signal, and releases it as a resonant decay. The delayed release of energy fills in the silence between the notes causing a loss of resolution and microdynamics. The energy is released at new resonant

frequencies that interact with the sound the horn is reproducing and imparts a grainy, opaque quality to the sound. The horn has a structurally complex shape. Different sections vibrate/resonate at different frequencies and with different magnitudes (Q's). There are many upgrades that can be made and many ways to order them. Some just take a leap and place the horn in a box that is then filled with sand and sealed. I suspect this works very well. Others paint the entire outer surface of the horn with a sand/paint mixture, which I have been told works very well also. These I think of as relatively complete, one step solutions. Others, like myself have taken a stepped approach. The sequence goes something like this:1) Destress the horn structure by cutting and damping the vanes. Most feel that this step yields a LARGE return in sound quality, and many stop here, quite satisfied.2) Attach a wood frame to the mounting flange.3) Damp the horn exterior surface with some kind of damping material. I used Dynamax Xtreme, constrained layer damping material. I did #3 in steps, the latest of which was to add a second layer of Dynamat to the small part of the horn between the flange where the driver is mounted and where the horn begins its rapid horizontal expansion. I suggest that you start #3 by playing music through the horn and checking it (by touch) for vibration/resonant ringing. You will find different areas respond to different frequency ranges and vibrate at different frequency ranges. I ended up covering all the external surfaces (including the 'lips' - very worthwhile!))except the large mounting flanges. I screwed a wood frame to them (improved midrange resolution and dynamics). Apply the damping material a section at a time. Listen for the change/improvement with each step. Or...you may just want to cover the whole thing at once and enjoy. To my ears, damping, after cutting the vanes, made considerable improvements in resolution, dynamics, sound staging and overall naturalness. Night and day difference...no. Obvious major improvement...yes. I also know that some of these improvements are not as audible through systems with average grade amplification, cabling and sources. Also, people value different aspects of the sound differently. Only you can decide if the improvements are worthwhile. If you are unsure, take a step and see. If you like what you hear, try another. None of these steps caused a degradation to the sound (to my ears). The Dynamat sticks very well to the metal of the horn. I have not tried to take a large piece off, but small pieces come off fairly easily with patience. Some spots of damping material will be left. They can be removed with acetone. The Dynamat is easy to use although not as easy as the advertisements say.I say go for it! Try a step and see if you like what you hear.Regards,AstroSonic

---

Subject: Re: 511B Upgrade Worthwhile?
Posted by Russellc on Wed, 18 Jun 2003 10:43:18 GMT
View Forum Message <> Reply to Message

Thank you for your informed response! Yes, I know what you mean about upgrade paths and tweeking! This is what lead me to tubes and altec in the first place, the simplicity of vintage listening. With time, the tweek bug has resurfaced again. I am definately going to try your methods to improvr these great horns. I noticed differences in my two sets of 511bs... My "nice" set is made such that it appears the vanes are split, but have some rubbery feeling stuff inthere. on my other set, they are more solid metal through and through. Do you think I need to cut the ones with the rubbery stuff in the gap, or only cut the all metal ones? I hope this makes sense, I just reread and I probably could have put it better, hope you followed this. Russellc

Subject: Re: RE: silastic
Posted by Russellc on Wed, 18 Jun 2003 10:45:38 GMT
View Forum Message <> Reply to Message

Thanks, this is good news, looks like possibly I only need to put on the deadening material as per astrosonics findings. Russellc

Subject: Re: 511B Upgrade Worthwhile?
Posted by AstroSonic on Wed, 18 Jun 2003 15:24:38 GMT
View Forum Message <> Reply to Message

Sounds like we are treading the same path! The good 511B's with the rubber and precut vanes are already destressed. You might find it interesting to compare the cut and uncut versions to hear the improvement destressing makes. After that, the entire exterior of the horn needs to be damped. I have been pleased with the results from using Dynamat Xtreme, but other competitive products would probably work. Its currently the one to beat and has a lot of lower cost immitators. I applied one layer over the entire exterior, and a second layer over the area between where the driver attaches and where the horn starts to rapidly widen. mounting the horns on a wood panel or frame also results in a clearly audible improvement. I think that you will be very pleased with what you hear. I look forward to reading your progress reports!Good luck,AstroSonic

Subject: Re: 511B Upgrade Worthwhile?
Posted by Russellc on Thu, 19 Jun 2003 10:41:20 GMT
View Forum Message <> Reply to Message

Well, in that case I need to aquire this dynamat extreme stuff. Where did you find it, it seems I remember seeing it on parts express's page, but I have looked at so many I may be wrong. Do you have a favorite source for this stuff? (I am going to compare and contrast the two different styles of the 511 tonite!) Thanks, Russellc

Subject: Re: Dynamat source
Posted by AstroSonic on Thu, 19 Jun 2003 11:26:36 GMT
View Forum Message <> Reply to Message

You can order Dynamat Xtreme form the Dynamat website (dynamat.com), but I found it locally. Their largest market is car stereo. I found it at several car stereo installation shops as well as at Circuit City and Best Buy. It is also available from a number of websites. You may also want to check out the 'Be Quiet' products (be-quiet.com). Their 'Brown Bread' product is probably a good alternative at about 60% of the cost of the Dynamat product.AstroSonic

Subject: Re: Dynamat source
Posted by Russellc on Fri, 20 Jun 2003 10:26:55 GMT
View Forum Message <> Reply to Message

Thanks, I will obtain some of this stuff and begin experimenting! Thanks again,
Russellc