

# **Low B Series II Systems from Acme Sound Owner's Guide**

**Low B-1**



**Low B-2**



**Low B-4**



Rev 10/02  
Acme Sound Ltd USA

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**Owner's Notes**  
**Acme Low B Systems**  
**Series II**  
**Acme Sound Ltd USA**  
Rev July 28, 1999

**Introducing the Series II Models**

Since the introduction of the original Acme Low B-2 in December 1993, and the Low B-4 in September 1994, the speakers have remained unchanged until now, with the exception of a rust-proof powder coating on the front grilles. The original period of development of these two models was long and painstaking, and I believed at the time of their introduction that nothing could be done to improve them.

In the ensuing years, with the distribution of the speakers all over the United States and six continents (no customers in Antarctica yet), we have had the opportunity to receive comments and feedback from a very diverse group of individuals. Most of the suggestions had been anticipated during the design process, and weren't particularly helpful. Some advice has been valuable, however, and was filed away until such a time as a number of small improvements could be incorporated into a different enough speaker to justify a new designation: "Series II."

The incorporation of these changes has been concurrent with the development of our new Low B-1 1x10" model, which is being introduced as part of the "Series II" line, even though no previous 1x10" model existed.

One other reason these several small changes have been "saved up" for their simultaneous introduction into a design which I believed to be essentially perfect years ago is that the manufacturer of our little tweeter, Audax, actually discontinued this marvel of high output and cost effectiveness in mid 1996, shortly before Scott Malandrone, of "Bass Player" magazine discovered our products and introduced them to the bass playing world in the November 1996 issue.

After the review in BP was published, we scrambled for tweeters, and bought every one we could find in the United States and Canada. A sizable pile of tweeters it was. But not any more. We've used them up.



Interestingly, after examining a great many tweeters from a great many manufacturers since then, we were reaching a point of total frustration when, viola, in mid 1998 we were able to examine samples of the latest high-sensitivity models from, you guessed it, Audax.

They say the fruit doesn't fall far from the tree, and in this case they are right- our new tweeter of choice is the model from Audax which superseded our beloved shallow horn. The new model is a slightly deeper horn. It has a larger voice coil, a rare-earth neodymium magnet, handles more power, and in fact, exhibits slightly less coloration, and better projection than our original tweeter, which was quite good.

Like it's predecessor, it is a marvel of high output in a tiny package. Unfortunately, it's a little more expensive, but it sounds better too, so that's OK.

(The incorporation of this new tweeter into an existing design is what made development of the 1x10" model take so long. It required an enormous computer model to "exactly" duplicate the response of the

original system through passive equalization. Extensive passive EQ is difficult, because it has a way of making the impedance drop too low for most amplifiers to handle. The job was devilishly difficult, but in the end was quite successful.)

What are the other changes which distinguish the Low B Series II from the original? Several things.

The distinctive metal edges which gave our speakers such a conspicuous appearance were considered important in the early days of the company because, frankly, we were trying to be noticed. This isn't a concern any more. In fact, we have heard of TV producers who actually balk at the idea of having such a glaring piece on their soundstage.

After we upgraded the bare metal screens to a powder-coated finished version, in 1997, as a rust preventative, it became clear that eventually the metal edges would benefit from a similar treatment. The Series II models have a new charcoal black powder-coated steel edge protector. Better.

The original Low B crossovers had a design drawback which has been corrected in the new models. The attenuators, which control the output of the midrange and tweeter were unprotected. In cases of stupidity or accident (about 3%-4%) it was possible to burn one or both attenuators out. It had never occurred to me that this would be a problem, and even though it has been an unusual occurrence, it has been annoying and frustrating for manufacturer and customer alike.

Not any more, however. We found a way to add a component to the crossover which actually introduces itself gradually into the circuit as the attenuation is increased, and it is now all but impossible to damage the attenuators. The trade-off is that the midrange and tweeter output can only be reduced by 20 dB, which is equal to 99% power reduction, instead of being totally shut-off.

Another change which has been made to the crossover is that instead of being supplied with twin 1/4" input jacks, as before, the Low B now comes equipped with a single 1/4" jack, banana jacks, and a Speakon connector. Both banana and Speakon provide greater electrical integrity than the more common 1/4" phone-type connector, and the industry seems to be aware of this, so I've decided to jump on this bandwagon.

Handles. I've been internationally condemned and universally chastised for my choice of small, recessed handles for the Low B systems, particularly in the case of the large B-4 unit. (See section on Handles later in this publication.) I know when I'm licked. I admit that the handles I've used on the B-4 are essentially useless, other than providing internal support for the ports, and I've caved in to popular demand- the Low B-4 Series II now has larger, heavier, and more useful handles. It's the best example of this type of handle I've been able to find, and they aren't cheap. The B-2 still has the small recessed handle, because it hasn't been such a problem with this smaller speaker.

The Low B-1 is equipped with a Fender-type strap handle. It is a great handle in terms of preserving cabinet integrity, and serves the second function of helping avoid obstruction of the speaker's side-mounted port. More on this below.

## **Acme Low B Systems for Bass Guitar: Introduction**

Congratulations on your purchase of what I believe is a unique product in a crowded field. The Acme Low B systems were introduced because I felt the existing products in their class were inadequate in performance and rather expensive. And as a free-lance drummer educated in physics, I've had a unique opportunity to be exposed to a wide variety of bass guitar equipment, and to understand the causes of the coloration and distortion present in most.

How often have you heard a bassist say, "The best sound I get is when I'm in the studio?" Why is this? When in the studio, running directly into the board, the biggest difference isn't in the electronics. Any quality bass amplifier is capable of producing a low distortion, wide-range signal to drive a speaker.

The difference is in the speaker itself. When "running direct," a bassist hears his instrument reproduced not through a typical limited-bandwidth "bass guitar speaker," but through a low-distortion, wide range studio monitor. It stands to reason then, that this "perfect" sound could be duplicated onstage only through the use of a speaker of similar characteristics. This is the concept behind the Acme Low B systems.

My basic approach to this business is, "If it ain't broke, don't fix it." The high cost and ho-hum performance of many popular bass speakers though, offered an excellent opportunity for a small business to fill a niche. Frankly, if I had sensed a similar need for a better PA, or a better hi-fi, or you-name-it speaker, the first products bearing the Acme Sound name would have been of another type, not bass guitar equipment.

But for now, this is what Acme Sound has to offer. The Low B systems for bass guitar.

Happily, the same laws of physics govern the performance of all different types of loudspeakers. And I hope to find other needs to fill which are as obvious as was the need for better compact bass guitar speakers. I've had my eye on ultra-compact PA speakers to compete with the Elite Microns and similar, which sound good, but are somewhat lacking in bass and are quite expensive. The new Low B-1 model competes in this area quite nicely.

### **"Owner's Notes"**

Early on, it was anticipated that a definitive owners manual would emerge as questions were raised by musicians using the speakers. It has become apparent with the passage of time, however, that creating an owner's manual is more of an ongoing process than a one-time job; it'll never be done as long as people can think of other questions to ask, or I think of other things to say (That could take a while!). So this is the latest version of "Owners Notes," subject to change without notice! The purpose of this guide is to anticipate some questions and provide basic information on use of your system to help you use it to its full potential. I will further amend this guide to answer questions as they come in, and ask for your help in knowing what to add.

## **IMPORTANT TO READ BEFORE YOUR FIRST USE!**

Two very important points of information which will optimize your woofers for maximum power handling, and increase your speaker's chances for a long, trouble-free life.

1. The woofers in our Acme Low B Series II models have a break-in period. The surrounds on these woofers have a higher stiffness new-out-of-the-box than they do after some hours of use. This has two real-world consequences.

The first is that the ability of the systems to reproduce the lowest notes doesn't reach it's full capability until the surrounds have been loosened up by being used.

The second, and perhaps more important consequence, is that when driven to their maximum excursion, the woofers are much easier to damage when they are new, than after they've been broken in. It is more likely that the cones will be overstressed the when the speakers are brand new, than at any time after they've been used.

How much break-in time is necessary? I have broken them in using a sine-wave generator in less than three hours. I believe that whan playing bass, it is very difficult to predict how long it would take for a specific person to do it. It depends on your style, and how loudly you play. My best advice is to start slowly, and work you way into it. Within reason, of course, the longer, and the more gradual the better. But please do your best to loosen up the woofers before you get into any serious slammin.'

The reason I have chosen to point out these concerns about breaking the speakers in, is because just lately, I have had two customers damage their woofers within the two-week trial period. This was unheard of just several years ago. The woofers are the same. But I believe that the availability of incredibly powerful amplifiers, even more than just a few years ago, has sort of changed the landscape.

Which brings me to the second IMPORTANT warning...

2. A little bit of information about the level controls on power amps:

I've had unfortunate conversations with an alarming number of people who have made the same mistake:

A great many people, I've learned, believe that a 1000 watt amplifier becomes a 500 watt amplifier once the level controls are set to "halfway up," "12 o'clock," or "only at 5," if you catch my meaning.

I would prefer not to have this conversation any more, because it usually is with some well-intentioned kid whose woofers are in tatters, and who can't understand what he did wrong.

So, read this twice if you have to: Lowering the setting of the Level, or Volume control on your power amplifier does not limit it's ability to produce it's full power! If a 1000 watt amplifier is only turned halfway up, it does not become a 500 watt amplifier! It is still able to produce it's full 1000 watts if it gets a "hot" enough input signal.

Read it again.

Thank you.

## Guidelines for Use

### Impedance and Amplification:

These speakers have a reputation for being power hungry, handling large amounts of power, and being very loud for their size. Although all of these things are basically true, it's interesting how some users will focus on one of these qualities and others will concentrate on others. For example, I've had people ask if their 1800 watt amp will be enough for the 700 watt-rated B-4! The answer is yes.

After reading the admonitions about power in the magazine review (Bass Player magazine, 11/96), some people think they need incredibly huge amplifiers to hear the speaker at all! Implicit in that assumption is that the speakers will handle infinite power. Both of these ideas are exaggerations of the truth.

The Low B-2 is rated at 350 watts RMS continuous. It has been used with success with 100-500 watt amps. One customer here in Denver has managed with only 100 watts, although it seems impossible to me. It is

recommended that you use at least 300 watts for comfortable operation. In some situations, with certain players, power requirements can be surprising. You have doubtless already been warned.

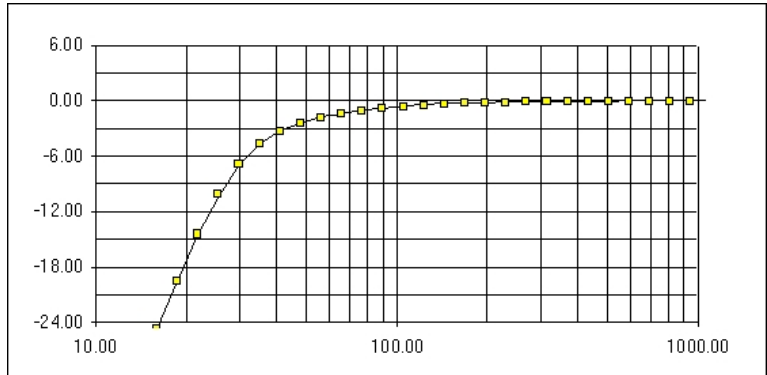
Cut these numbers in half for the Low B-1 1x10" model.

We rate the Acme Low B-4 at 700 watts RMS continuous. It has been used with success with 200-1000 watt amps. At lower levels you may find amplifiers of as little as 200 watts acceptable, but again, it is recommended you use at least 300-500 for comfortable operation.

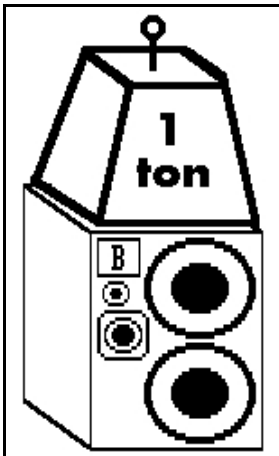
These systems are aligned using Thiele-Small technology to minimize distortion in the lowest half-octave (down to the "Low B") but this alignment increases amplifier current requirements at these frequencies. As a general rule, when distortion is heard from these speakers, it will be eliminated by increasing amplifier power. This is the unfortunate price we pay for low distortion, extended bass from a compact enclosure. High damping factor solid state amps are recommended for greatest cone control, but if you have a tube amp, results will generally be acceptable. Several users report excellent results with the Ampeg SVT head and large Mesa-Boogie tube amps, with no negative consequences resulting from the high internal amplifier resistance associated with all tube amps.

### Placement: Low B-2

Because of the position of the midrange and tweeter, a vertical placement is suggested for the Low B-2, with those units up off the floor. For people who want to use a single speaker in a horizontal configuration, it is recommended that you elevate the system on a chair or similar object, with the midrange and tweeter toward the top.



When using two Low-B-2 boxes together, I have recommended placing them side by side in the vertical orientation. Several customers have tried stacking them end-wise, column style, and have really liked the raised midrange speaker, and the way it disperses very evenly around the room.



In either case, place your amp or other heavy object on top to help anchor your system to the floor. As the speaker cones move in and out, they will have a tendency to cause the enclosure to vibrate in opposition to the movement of the cones. (Newton's second law of motion.) This effect is present in competing designs as well, and this is good advice when using any speaker, not just these Acme models. It is to your advantage to minimize this effect by using as much weight as is available on top of the speaker, Walter Woods notwithstanding.

Also, as the ports are located on the back of the box, you should leave at least 6" between the speaker and any wall. Restricting the ports will increase distortion and decrease power handling.

### Placement: Low B-4

The Low B-4 has rubber feet on what is designated the "bottom" of the speaker. The idea, again, is to raise the midrange and tweeter off the floor, and allow these higher frequencies to disperse into the room. In fact, to locate the midrange in the center of the front panel would provide a more perfect and coherent source, but in the real world, it was judged to be more important to cover the room.

When using two B-4 units together, some users have achieved good results by stacking the two speakers

on their sides, with the midranges and tweeters oriented on a common vertical axis. Acoustically, this orientation offers a better "line source" than stacking the two boxes upright or side-by-side. Experiment.

### Placement: Low B-1

At first glance, the Low B-1 looks a little strange. As was mentioned above, the speaker uses a Fender-type strap handle. The port is apparently located on the top, next to the handle. Unusual.

In fact, however, the port and the handle are located on the side of the speaker. They are placed on a common surface to discourage the user from stacking another speaker (or anything else) over the port, thereby ruining the operation of the port, and placing the woofer at great risk. As was mentioned in the section on placement of the B-2, blocking the port(s) greatly reduces system power-handling, and is to be avoided at all costs.

As a consequence, the disadvantage of this type of handle for use on the Low B-2, limiting stacking options, is a necessity on this smaller speaker, and allows the use of this excellent handle on the B-1.

Place the speaker with the midrange and the tweeter toward the top.

The port and handle will be on the side, correctly, and the top of the box will provide an open surface for placement of your amplifier, or for stacking a second Low B-1.

### Cables

As a design goal, internal system resistance has been kept to a minimum. To maintain the same level of electrical integrity, short, heavy gauge cables are best. Don't run out and spend a fortune however, unless you're certain that what you have is inadequate. I recommend a cable of under .3 Ohms, and the larger the cable the better.

### Stands

Some customers have successfully used the Low B-2 systems as PA speakers. This has led to the idea of using the units elevated on speaker stands. Be warned: There are only two small places on the cabinet where a recessed receptacle can be mounted, and you don't know where they are. To cut holes anywhere else in the box will do irreparable harm to the enclosure. This is because of the orientation of the special bracing that is used to stress the enclosure. **DO NOT CUT HOLES IN THE ENCLOSURES FOR THE PURPOSE OF INSERTING SPEAKER STANDS WITHOUT CONSULTING WITH US FIRST!** If you need to do this, please call before you destroy

### Port Placement: Front, Rear, or Side?

Bass players seem to enjoy discussing the merits of front or rear placement of ports. Based on their experiences, many players and manufacturers alike are convinced that front placement has distinct advantages over rear placement, or vice-versa. When asked to justify their opinions, these partisans will invariably refer to vague impressions and gut feelings. They will never talk about wave propagation or Helmholtz resonance. In fact, a bass-reflex enclosure, at the frequencies where the port contributes to the system's output, is a pressure device, as opposed to a wave device. So the interaction of the enclosure and the port, and the port's position with respect to the woofer, itself, are unaffected by any directional activity. Direction is utterly unimportant. By way of illustration, examine another pressure-related model, a balloon. As you inflate a balloon, does it expand on one direction only, or in all directions at once?

Only after a port's output leaves the cabinet, and enters the environment, does it assume the characteristics of a wave, one of which is direction of propagation. Direction does assume importance when speaking of waves. Only, however, at frequencies where the size of the source is large compared to the wavelength under consideration. The highest frequencies at which the port in our Low-B systems contribute to system output have wavelengths of 14 feet or so. The speakers are obviously quite small compared to these wavelengths, and the port output is omnidirectional. Again, port placement is irrelevant to system performance.

Why does the B-2 have ports in the back? Because that's where they fit. Why does the B-4 have its third port in the front? Same reason.

The B-1 system could have been correctly tuned with a shorter, smaller diameter port located in either the front or the back, if location mattered. But it doesn't. The drawback would have been that at higher power levels, excessive port friction would have resulted in diminished power handling capability. This larger diameter, longer port fits when installed on the side of the box. Plain and simple.

Tell your friends that the reason your B-1 system sounds so good is that the tremendous innovation of a side-mounted port results in some type of magical quantum-leap in performance. In fact, the truth is much less exciting: a high-quality woofer in a solid and correctly-tuned enclosure. Feel free to let other people lose sleep over where their ports are located. Now you know the truth.



anything.

Or send your speaker back to us, to insure that the job will be done right.

Either the Low B-2 or B-1 systems are available with receptacles installed for use with common "Ultimate" style tripod stands. The charge for this option is \$30 per cabinet.

### **Equalization**

Thiele-Small modeling predicts a -6dB point of 31 Hz, below which response rolls off rapidly. In many real-world situations, with walls and floor nearby, perceived response will seem very flat to this point, and no low-end boost will be desirable. In situations where equalization may be necessary (such as when elevating the speaker on a stand with very wide range program material, or playing outdoors), 6 dB of boost at 31 Hz will result in a theoretical near-perfect flat response. (Speaker-geeks will recognize this as a classic "sixth-order alignment," a concept pioneered by A. N. Thiele, and put into production by Electro-Voice. But I digress.)

The speaker is designed to withstand high power in this region, and should easily handle most demands. **CAUTION: Cone excursion increases rapidly below 30.87 Hz (Low B), and any low end boost below this frequency decreases power handling, and could damage the woofers.** See "Forms of Abuse Not Covered."

### **Biamping**

Speakers capable of producing only a limited bandwidth (frequency response) need to be used with a second speaker, and can benefit from biamping. Full range systems, such as the Acme Low B systems do not.

Other two-by-ten and four-by-ten systems are designed with limited bass extension, and can benefit greatly from the addition of a larger woofer. (You are probably aware of our B-2W and B-4W units which can work nicely in this application.) The Low B systems are full-range systems, however, and biamping would only serve to restrict them. **BIAMPING NOT RECOMMENDED.**

### **Attenuators**

The attenuators which control the output levels of the midrange and tweeter on the Low-B systems are calibrated on the back panels in dB of attenuation. Some customers have called in confusion, commenting that they seem to be backwards.

A typical amplifier will have level controls marked "1 through 10." The higher the number, the louder the sound. A level control calibrated in dB of attenuation seems different- zero attenuation can be considered "full-blast."

Physically, both schemes result in highest output when turned to maximum clockwise position. The operation of the two differently calibrated level controls is, in practice, the same. It is only the markings on the dial which are different. The attenuators on your Low B speaker operate just as any level controls. They are simply marked, or calibrated, in the opposite fashion. Zero dB of attenuation is synonymous with maximum output.

## **Care and Maintenance**

### **Lint**

Depending on your circumstances, lint can collect on the carpet covering your Acme speaker. It is easy to remove it though, and to restore the unit to it's original good looks. The easiest way is with simple cellophane tape. Just put the tape over the dirty area. When you remove the tape, the dirt/lint will come with it. If your speaker is covered with a large amount of lint, you can use wide cellophane packaging tape to clean it up quickly!

## Covers

Vinyl covers for the Low B systems are now available. We've contracted with a leading manufacturer of same, Tuki, to make them for us, and you can buy them directly from Acme. Standard covers are \$50 for the B-2, and \$54 for the B-4. Padded covers are \$75 for the B-2 and \$81 for the B-4.

## Flight Cases

I am at a loss to make a recommendation. Most of the companies I have talked to who manufacture flight cases charge about as much for them as we charge for the speakers themselves. If at some time we can locate a manufacturer who is able to offer a quality product at a fair price, we will arrange to stock them for our customers. Until then, you're on your own. If you, as a customer, are able to share with us the name of such a manufacturer, please do so. I and others will be grateful.

For B-2 owners, it may be helpful to know that your speaker will fit perfectly into a case made for the older SWR Goliath system. (I've always admired SWR's ability to think of catchy names for their products.)

## Cats

One user has reported damage from an over-aggressive tabby. Until you're sure your kitty isn't inclined to use your speaker as a scratching post, you'd best keep the two separated.

## Duct Tape

Duct tape will leave a residue on virtually any surface. The popular carpet covering often found on professional sound equipment, and on these Acme systems, is a particularly nasty material from which to remove duct tape. It is recommended that you not apply duct tape to your speaker. If someone puts duct tape on your speaker, common lighter fluid (Ronsonol) can be used to remove the gooey stuff.

## General Information/Overview

### A Full-Range System?

When I began this project, I had no idea how important the upper octaves were to the sound of the bass guitar. I was surprised at how bassists responded to the addition of a low-coloration midrange and a tweeter capable of brilliant reproduction of high harmonics. Modern active pickups have a very wide-range signal. Surprisingly, even older basses, with passive pickup systems, have enough output in the higher audio frequencies to make our little tweeter worth having. But this fact wasn't discovered by divine revelation, or a flash of insight on my part, it was rather a result of trying enough different approaches to figure out what sounded best, with a lot of help and feedback from some very patient local bassists.

### Midrange

One of the reasons the Acme Low B speakers are three way systems is the wide variety of preferences of bass players. Through extensive on-stage testing it was found that even among top players, some prefer the midrange all the way up, and some like it to be virtually off. Suit yourself. This is an extra adjustment parameter with which you can experiment as you perfect your sound, and it might take some time for you to get used to it.

For keyboards or PA, a position of -5dB has worked well. This is, of course, subject to your personal taste and the acoustic properties of your room. It is reasonable to expect to make changes frequently if you perform in very different environments. As with any new tool, you will become more skilled in its use as you gain experience.

### Tweeter

In average rooms, flattest response will be found in about the -2 dB position, but most people like it all the way up. Its effect can be subtle for bass guitar, but some round-wound players insist the tweeter makes all the difference in the world. Again, experiment.

Interestingly, the extended high end of our midrange driver made it possible to add an excellent tweeter at a low enough cost to make the Low B an outstanding full-range system, comparable in performance to studio monitors. The Low B-2 has been proven to be excellent for use as a PA speaker in smaller rooms and when very clean reproduction is important, as when amplifying acoustic instruments.

The addition of this quality European tweeter is one of the unique things about the Low B-2 and Low B-4 systems. What was a very good bass guitar speaker has become an outstanding all purpose/bass/keyboard/PA. It is a better hi-fi speaker than many commercial stereo rigs, and nearly as true as some popular studio monitors.

Connect a pair to your keyboard rig, stereo, or studio system, and see if you agree about the versatility of this unique product. One gentleman in South Carolina has even used the Low B-2 as a subwoofer in a biamped system with Magnepan planar loudspeakers! He said it was the only system he'd found with enough speed to keep up with the "Maggies," and low end extension worthy of this audiophile class system.

### **Handles**

Acme Low B-2 systems use miniature, recessed handles because they require a very small hole in the enclosure. Consequently, the superior structural properties of the Acme enclosure are minimally affected. The handles are located directly over the center of gravity, so the system can be carried without tilting. For aging baby-boomer musicians, minimum back strain will be accomplished with the screen facing the person carrying the system. Unless you can get somebody else to carry it, which is the ideal solution!

As was mentioned before, I have succumbed to popular demand, and made a larger, more useful handle standard equipment on the new Low B-4 Series II. This very high-quality handle will, I hope, meet with your approval, and it's thick, strong construction only minimally affects the sound.

The strap handle is used on the Low B-1. What is a disadvantage on the B-2, limiting stacking options, as mentioned above, is a necessity on this speaker. The location of the port, on the side of the unit, makes it important to discourage stacking or laying anything on this surface, and the strap handle helps to ensure that this will not happen.

## **Troubleshooting**

As questions have come in about potential trouble, I have attempted to compile some answers to possible concerns in this section.

### **General**

Many people, when they hear their instrument reproduced through these lower-distortion speakers, are alarmed at the difference compared to what they are used to. There are several reasons for this.

One reason is the wide range, low-coloration sound. You might be surprised at the wide range of frequencies produced in the harmonics of your bass.

Another reason is the power requirements of the Acme units. A 200 watt amplifier, which is more than adequate to power a JBL, can seem gutless when used with these speakers, the 8 ohm models in particular. Low power can obviously be a source of trouble. Even with higher-power amps, a slightly different approach to using your equipment can be helpful. See the section on "Distortion."

In addition, the increased clarity of reproduction can reveal things about your bass and amplifier that you haven't heard before. An example could be a high-frequency "hiss" in your amplifier that wasn't

noticeable before. Or, your pickups might exhibit a “peakiness” that hadn’t been noticeable when used with a peakier speaker.

## **Distortion**

Distortion, when introduced by any part of a sound system, will be heard from the speaker. If, for example, an amplifier has a weak tube, the effects of that weakness will be heard as distortion from the speaker. Sometimes, then, to say “the speaker is distorting,” can present a false picture.

A couple of gents had their Low B speaker disassembled before they realized that their effects processor had a low battery. Another fellow sent frantic email asking help in diagnosing his faulty speaker, before realizing the battery in his bass was nearly spent, and he hadn’t noticed with his old speaker. A new battery fixed his speaker!

The point, then, is that when you hear distortion, you must isolate the cause of it. If your instrument is at one end of a chain, and your speaker is the other end, distortion occurs when any link in the chain is overdriven. To overdrive any component is to expose it to an input signal of sufficient strength to exceed it’s capabilities.

Sometimes, when faced with a speaker of lower efficiency, such as the Low B systems, a player will, without thinking, boost the volume control on his/her instrument to compensate. To do this though, is to risk overdriving the preamplifier, by exceeding it’s input capability. Similarly, to turn the volume control to levels that would try to squeeze 200 watts from a 100 watt amplifier is to (over)drive the amplifier into distortion. To push 1000 watts into a 500 watt speaker will obviously overdrive the speaker.

So, having explained that, if you hear distortion, proceed as follows:

- (1) Increase the volume setting on your power amp, if you have one. Compensate by decreasing the volume on your preamp.
- (2) If distortion persists, increase the setting on your preamp’s volume control, and compensate by decreasing the setting on your instrument’s volume control.
- (3) If distortion persists, check all of your batteries, and make sure any ancillary equipment is operating properly.
- (4) If distortion persists, and you’re not playing very loud, you might not have enough power. If you’re playing quite loud, you might have too much power, and could be overdriving the speaker (Yes, it is possible.) Try with another amp.
- (5) If distortion persists, call Acme, and we’ll talk about it.

## **Midrange Attenuator**

The midrange attenuator, while rugged and generally quite nice, can have a “scratchiness” if you listen to it while you turn the control. Don’t be alarmed. This isn’t a sign of a defect. That’s just the way they are. I believe it’s as a result of a manufacturing residue of some kind, as it tends to go away as the attenuators are adjusted repeatedly.

## **Tweeter**

The tweeter in these speakers is crossed over at a very high frequency. In some circumstances, there will very little output from the tweeter, because there will be no substantial signal from the instrument in the very-high harmonics. This has led to the conclusion by some that their tweeter is either blown or malfunctioning.

Before you jump to this conclusion, listen to a wide-range program source through your speaker, such as a CD. With this source, the output from the tweeter will be much more obvious than with some bass guitars, particularly older, passive models.

The very high crossover point makes it nearly impossible to damage this tweeter. It is very unlikely that you will destroy it no matter what you do. If you suspect damage, please perform the test described above before making up your mind.

### **Fuse/Bulb**

The midrange and tweeter are protected by an automotive light bulb which acts as a fuse. A bulb has a distinct advantage over a simple fuse, in that rather than simply failing, as a fuse does, a bulb will intrude into the circuit gradually, and limit input current without failure. As input current decreases to safe levels, the bulb will cool, and effectively remove itself from the circuit.

This is another concept pioneered by Electrovoice, to the best of my knowledge. In all honestly, the finer points of the process of a bulb's intrusion into the circuit, and the resultant changes in impedance and frequency response were researched for these Low B models to a point far beyond the work done in the past by anyone else. The crossover was designed with the variable-resistance bulb considered an integral part of the circuit, and has been compensated for in the choice of crossover components to a degree never before approached in other designs.

You will know when the bulb/fuse in your Low B system has failed: both the midrange and the tweeter will stop functioning. This is a rare occurrence. Even more unusual is the failure of the midrange, the tweeter, or either attenuator. The degree of protection afforded the drivers and attenuators in the Low B SeriesII is nearly absolute. The crossover circuit ensures that only the bulb/fuse will fail.

In the event of bulb failure, you can find a replacement at any grocery store or service station in the United States, or any automotive parts store in the world. The bulb is a #1156 12 volt bulb, the most common single-filament automotive bulb in the world.

## **For the Technically Curious**

What is the difference between the Acme Low B and countless other two-by-ten inch clones? Why a three-way system? I'll try to explain the concept without getting mathematical.

The most important design goal of the Acme Low B systems was to reproduce the extreme bottom end of a five-string bass with a compact enclosure. Consequently, superior low-end extension with low distortion was the main criteria of woofer design.

Unfortunately, the characteristics that give a woofer good bass also decrease its midrange output (specifically, rigid cone, low resonance). Consider, for example, the venerable JBL E110. This is an example of a 10" speaker capable of exceptional clarity, efficiency, and power handling in the midrange. A thing of beauty to be sure, and a great guitar speaker! But as a tool for reproduction of low bass it's worthless. It's built to do a different job!

The Acme woofer (a custom Eminence) in the Low B systems is designed to be a BASS driver. It has a heavy, stiff cone, with a long voice coil, and very compliant suspension. Great for bass, but necessarily limited at the top end. Therefore, ironically, a midrange speaker is necessary to make superior bass possible!

If one were to consider the JBL E110 at one end of the "bass-scale," and this Acme woofer at the other end, then the woofers in the average two or four-by-ten system would be about in the middle. This assertion is parameter-related. The difference can be expressed in numbers, and is not a matter of subjective judgment.

So, the obvious difference between the Acme Low B and similar looking systems is the midrange speaker, instead of the ubiquitous horn tweeter. This is just, however, one characteristic of a fundamentally different approach to the one, two, or four-by-ten inch bass speaker. This speaker was designed "from the ground up" around a different type of woofer. It's designed first to do the things the others don't do, and that's the important difference.

I encourage you to compare this system head-to-head with any type of bass guitar system. Listen in particular to the crop of systems which use ten inch speakers, and play your five-string. See how a three-way system can free a little woofer to reproduce the low notes on your instrument. Play a four string or keyboard. Experiment with the attenuators and fine-tune your sound with a new degree of control. (And tell your friends!)

Compare the quality of low bass to the enormous biamped system with an eighteen-inch woofer being used by your muscular young friend. Does your Acme box give up anything on the low end other than power requirements or maximum volume? Is an eighteen or fifteen inch woofer as "fast" and responsive to your instrument as this puny little Acme box?

I've heard no conventional bass speaker regardless of size, that can approach the overall quality of sound of the three-way Acme Low B, particularly in the lowest region of the five-string. Search for another system which can envelope you with this big, warm, low frequency sound, while maintaining the quickness and precision we associate with a ten-inch woofer. After listening to the Low B systems from Acme Sound, I believe you'll be as disappointed with what's available elsewhere as I was.

### **Marketing**

I've tried to sell these speakers through music stores, and the response is always the same: "Great speaker, but we want something cheaper." While I understand their need to preserve their exorbitant profit margins, the fact is that they generally have a store full of cheap stuff already, and really don't need more.

These speakers, however, were designed with one thing in mind- optimum performance. A small business, obviously, could never compete, for example, with Peavey or SWR in terms of price, simply because of the numbers involved in high volume manufacturing. The only thing then, that a smaller operation, such as Acme can offer, is superior performance. In fact, these Acme bass systems are more expensive to produce than competing systems, and are competitive in price only because of direct sales and low profit margin.

Because of the lack of exposure that would be gained by widespread placement in retail outlets, this has been a largely word-of-mouth enterprise. Considering this fact, the increase in sales over time has been satisfying.

If you experience any problems, it is in the best interest of Acme to have your unit working correctly and back onstage as quickly as possible. It is not in Acme's interest to find a way to "beat you" out of a few bucks in your time of crisis.

Although we do the best we can to identify and remove any potential problem before shipment, nobody's perfect, and occasionally someone will get a weak woofer. Eminence does a great job for us, but they're not perfect either.

When warranty issues have arisen, my policy has generally been to give the customer the benefit of the doubt. More specifically, if we sold you a bad part, obviously it should be replaced for free. Several customers have sent back woofers that didn't fail for any evident reason. My policy has been to replace them for free as well.

## Warranty

**Acme Sound Ltd warrants this speaker to be free from defects in materials and workmanship for a period of two years from date of purchase. This warranty includes cost of any covered repairs and shipping one way. Warranty not to cover repairs necessary as a result of abuse. Warranty voided by any attempt to modify, improve, or reverse engineer the speaker.**

With units which have been obviously damaged through some type of catastrophic event or long term abuse, the policy has been to replace the speakers for a nominal charge based on the customers attitude, and more importantly, to try to identify the cause of the damage, so it can be avoided in the future.

It's most important to me to get the speaker operating properly, so all the world will know how great it sounds! But we're unable to subsidize destructive behavior by replacing for free anything you can find a way to damage. If, for example, your amplifier fails, and sends something hideous through the speaker, or you like to pound on your strings at full volume to massage your back, please, I beg of you, don't send me back woofers whose cones are in tatters with the expectation that they will be replaced for free, because this type of horrible damage cannot be construed as a "defect" in the product you were sold.

### Forms of abuse not covered:

- (1) **Blown Speakers.** A woofer which was shipped to you with a defect of some kind will not show signs of physical destruction when it fails. If, for example, you can see a "creasing" around the circumference of the cone, your speaker has been overdriven, exposed to a DC component, or been fed a distorted signal by an overdriven amplifier. This is not a defective woofer. If your voice coil has been burned to carbon, please don't bother to make your case that it was received with a defect.
- (2) **Pounding on your strings with your palm.** I know it sounds cool, but that's not the point. Power handling decreases drastically below 31 Hz (B), and string pounding can send near-DC through the poor thing. If pounding is an integral part of your playing style, you shouldn't be using a vented cabinet, but would be better off with a sealed-box system, such as an SVT. I believe Bag-End has one or two sealed models as well.
- (3) **Amplifier DC offset.** Because of the long woofer excursions necessary to produce this quality of bass from such a small enclosure, these Acme speakers are sensitive to poorly adjusted amplifiers. Any speaker is likely to be damaged by a DC component, and the Low B is not an exception to this rule. If you have any doubts about the integrity of your amp, test for a DC voltage at the speaker terminals when no signal is being amplified. A reading of more than several hundredths of a volt can be a sign of trouble, and you'd best have the amp looked at.
- (4) **Burnt voice coil.** The best way to destroy a voice coil is to continue to play at a higher volume than either the amplifier or speaker will handle. If either is pushed beyond its limits, damage to the speaker could occur. Listen to your system carefully. Inordinate distortion, regardless of the source, is a sign that you're pushing the envelope, and could damage your amp, speakers, or both.
- (4) **Drop/smash.** No explanation necessary.

Please remember if you have any trouble, that I'm mostly interested in solving your problem as quickly as possible, and saving whatever money can be saved by either or both of us!

I hope this information makes it possible for you to get the most from your speaker. Again, if you have ideas to make this guide more useful, please let me know. Thanks for listening.