Acme Sound
Low B Series III
2x12″ Impulse-Compensated System
Owner's Guide

Acme Sound LLCUSA
www.acmebass.com

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Paper Owner's Manual vs. Website:

Believe it or not, much of the content in the earlier owner's manuals was written in the early nineties, before the internet made information so easy to get. In updating the manuals for the Series III models, it has become clear that they could be more useful if focused squarely on practical suggestions, and less on history, philosophy, background and theoretical considerations. All of that fluff can easily be made available on the web, and has. Therefore, this manual will attempt to focus on taking the cabinet to the gig, and sounding good when you get there.

Quickstart-Guidelines for Use:

IMPORTANT TO READ BEFORE YOUR FIRST USE!

On Amplifier Level Controls:

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 amplifer 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 its full power! If a 1000 watt amplifier is only turned halfway up, it does not become a 500 watt amplifer! It is still able to produce it's full 1000 watts if it gets a "hot" enough input signal.

Read it again.

Thank you.

Impedance and Amplification:

These speakers have a reputation for being power hungry, handling large amounts of power, and being very loud for their size. All of these things are true.

The Low B-212 models are rated at 1500 watts RMS continuous. We recommend 1200-2000 watts.

Grown-ups can be trusted to use more power than that, and those who choose to do so will be rewarded with a very loud and very clean sound. Just be careful, and listen for distortion, which will be an indicator that your reaching some limits somewhere. More on this later.

Placement Low B-212:

The 112 System has rubber feet on the bottom, which implies a way to place it. The handles are on the sides.

Because of the back-to-back orientation of the woofers, the cabinet is inherently stable, and needn't be anchored to the floor by a massive object on top, as with conventional loudspeakers.

The system is minimally affected by a wall in close proximity. Tests have shown that a driver in the back isn't as prone to the effects of a close wall as ports are. The ports on the Low B-212 system are in the front. It's still a good idea to leave 4-6" of space behind the unit anyway, if you'd like to keep it pure.

Also, keep in mind the needs of your drummer, who will likely be able to hear you much better than he/she could when you were using a conventional speaker.

Experience has shown that musicians "in the field" will often adjust their positioning and placement to their circumstances. There is every reason to expect this to be true with this unconventional 212 model as well, if not more so.

Don't be afraid to experiment, and don't be afraid to be flexible. Please feel free to tell us about your placement impressions and experiences with us, such that we can share your knowledge with your fellow bass players.

END QUICKSTART GUIDE

Notes Specific to the 212 Impulse-Compensated Systems

The Concept:

Conventional loudspeakers, with the woofer or woofers facing the same way, have an inherent cause of distortion addressed for the first time in the bass guitar world in the Acme Low B-212 Impulse-Compensated system.

Newton taught us that for each reaction, there is an equal but opposite reaction. For this reason, when a speaker cone moves in one direction, it is simultaneously pushing the enclosure assembly in the opposite direction. When the cones are fairly massive, as in bass-guitar woofers, the tendency becomes more pronounced.

It's easy to test for the audibility of this effect, particularly if you have access to a sine wave generator. Simply play low frequencies through your conventional speaker while your friend elevates it off the floor. You friend will be able to feel the vibrations with his hands as he holds the speaker.

Then, simply have your friend put the conventional speaker on the floor, and sit on it. The vibration, as the enclosure responds to the moving mass of the cones, will diminish, and you will hear a less distorted sound.

One simple solution: Just make the enclosure weigh a ton. Problem solved! Unless you're the one lifting the thing, that is. The more massive your speaker, including the mass of the magnets, the less pronounced the effect will be. This is one reason for building super-heavy speaker enclosures.

For people who want the purer sound, but don't care to sit on their speaker, or carry around a heavy speaker, there is a more practical solution. Simply mount two woofers back-to-back, and the system instantly becomes stable. As the moving masses of the opposing cones apply a net zero force to the enclosure assembly, the spurious vibration is eliminated.

When the motions of the two masses of the speaker cones cancel each other out in this fashion, there are other benefits. The first is that the enclosure can be made as light as possible, without the effect being exacerbated.

This is known as an "impulse-compensated" design, and reduces noisy cabinet vibration dramatically. I became aware of this concept for the first time in the mid '70's, when the it was described in an issue of "Audio" magazine. It has been a rarity in commercially-produced speakers, but the desire for lightweight loudspeakers in the bass-guitar industry has made the impulse-compensated loudspeaker an idea whose time has come, in terms of the needs of bassists for equipment which is both lightweight and capable of low-distortion output at low frequencies.

There is also a dearth of information on the idea on the internet. I did locate one European magazine with a version of the impulse-compensated loudspeaker on its cover. (See picture.)

In fact, it was the desire to create the lightest, most formidable system possible that prompted Acme Sound to resurrect this old technique in the first place. The original idea was to use some of the high-stiffness, lightweight materials now available to build these loudspeakers, but mass-producing these composite enclosures has been quite a challenge, and is taking a long time. The composite model listed on the Acme website at this time is not available, and won't be for a while longer.

The second benefit of this design is that the two woofers internal voice-coil vents bathe each other with forced air, which cools each other's heat sinks. This allows them to dissipate heat more effectively than would otherwise be the case. This is a lucky, unanticipated side effect of the configuration, although it's not the primary reason for it. As a result, the 212 can handle more power than a pair of 112 units.

Performance and Frequency Response:

Our traditional Acme models are designed to have a flat, wide-range frequency response. In a way, this new model is no different, but there is a real-world difference. This loudspeaker is, in a way, a combination of the Low B-112 "Flatwound" and "Full-Range" systems. It's sort of like a "Full-Range" in front and a "Flatwound" in back (with 212-specific crossover considerations).

Therefore, ignoring the back woofer, it sounds like a regular wide-range, low coloration Acme loudspeaker. The "nominal" frequency response is the same, as is the basic character, but the essential differences have to do with the bizarre configuration, with the 2nd woofer in the back.

We would expect the speaker to sound a lot different with a hard wooden surface behind it than with a carpeted wall, for example, just as a the sound of a conventional speaker will be affected by placement in a corner.

The bottom line is that even as a conventional loudspeaker is affected by the room and the unit's placement, this back-to-back model is even more susceptible to room effects.

So, while the back-to-back configuration might be great for your drummer, it also makes meaningful frequency response measurements almost impossible. This configuration makes room interactions all but impossible to anticipate. In a way, it's more about creating a lightweight, brute-force reproduction of high-level, low distortion bass than it is about finesse, as is famously the thrust of our conventional low-coloration models.

That said, we had an interesting experience with the cab in a real nightclub, in which Protools recorded both a direct line and a microphone in front of the cab, and upon playback, we discovered that the two were essentially indistinguishable from each other, other than ambient noise, such as cymbal-wash, that the microphone inadvertently captured.

The drummer sought me out that night, to tell my how much he loved hearing the bass so well.

The Low B-212 Impulse-Compensated system basically sounds like the Low B-212 "Full-Range" model, only with a significant testosterone infusion, a greater appetite for power, and a lot more sound than you'd expect from a package its size and weight.

Acme Low B Series III 12" Systems Owner's Guide

Introducing the Series III 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 essentially unchanged. The Series II models were not much different from the original so-called "Series I" units, and the new Series III models are also only nominally different. Our website, at www.acmebass.com has a description of the specific changes made Series I to II, and needn't be repeated here.

What's New: The Series III Template:

The Series III models, including these 12" models, share some new features, as compared to the earlier Series II units. These include:

Enclosures:

Duratex finish standard. Most people hated the carpet covering on the earlier models. (See notes on the Duratex finish later in this document.)

The Low B-112 Series III enclosure is constructed using a new bracing configuration. It is quite lightweight, uses the port as part of the bracing mechanism, and uses a single front-located port. The tuning is optimized.

Crossovers:

The Series III models no longer use variable attenuators, but use fixed-attenuation crossovers, optimized for superior accuracy, consistency, and just good-old quality. All midranges, tweeters, and heat-dissipating crossover components are protected by self-resetting solid-state Polyswitches.

All Series III models use twin Neutrik "Dual Connectors," which accept both Speakon connectors and standard 1/4" phone plugs.

Handles:

The Low B-212 system is equipped with a recessed handles on each side.

Internal Connections:

The new Series III systems use solderless "Fast-On" type connectors for the woofers and crossovers. This allows easy replacement and/or service. See "Service and Component Replacement."

Fasteners:

The woofers in the new Series III systems are installed using actual bolts and machined, threaded "inserts," instead of the self-tapping screws in previous models. This is sort of expensive, but it allows the woofers to be removed and re-installed without any wear and tear to the front panel.

What are the Acme Series III Neo Systems?

The Acme 12" systems are compact, lightweight, high performance loudspeakers which, like the classic Acme Low B systems using 10" drivers, achieve superior low-end output, extension, and transient response by manipulating the Thiele-Small parameters in order to optimize for these qualities at the expense of efficiency.

The Acme 12" systems use a special, proprietary twelve inch woofer. They represent a synergistic marriage of classic design principles, and cutting edge materials and techniques, executed with great precision, attention to detail, and craftsmanship.

The Acme Low B-112 "Flat Wound" System is a one-way system, with no tweeter, and no crossover. Its surprisingly extended top end, for a twelve inch bass driver, makes it an excellent solution for a great many bass players, particularly those who don't need an extended studio-monitor type of high end.

It is simplicity itself. No whistles, no bells. It is a nearly perfect distillation of the essence of what a classic Helmholtz Resonator can do. And it weighs 37 lbs.

It is a stand-alone witness to the ability of a modern neodymium woofer to fill a big room with a big sound, in a small, lightweight loudspeaker.

The Acme Low B-112 Full Range System is similar to the "Flat Wound" System, but with a smoothed midrange, and an added high-output, high-accuracy shallow horn tweeter. It is similar to the "Flat Wound" unit, but with high end which extends to the limits of audibility. The Full Range System is a relatively low-coloration, high accuracy speaker, much in the tradition of the classic Acme models, but with lighter weight made possible by the availability of lighter high-performance neodymium magnets.

The Full Range System comes in a little heavier, at 38 lbs.

The Low B-212 Impulse-Compensated System is sort of a combination of a 112 "Flatwound" plus a 112 "Full-Range" system in one, with a unique, back-to-back woofer configuration, resulting ina loudspeaker which is greater than the sum of its parts.

The Low B-112 wooden model weight 61 lbs. The composite model weights 50 lbs.

Why were they created?

We rephrase that question: What, if anything, is lacking in the traditional Acme Low B systems, which might be addressed in these new models?

In a word, weight. The Acme Low B-2 system, based on the ten-inch woofers, is the same size as the 112 models. It is loud, clear, uncolored, has a massive bottom end, and is as relevant today as it was when it was introduced in 1993. It is probably the second most imitated loudspeaker in the industry, after the ubiquitous Ampeg SVT. It was named one of the "Ten Most Important Products of the Decade" by Bass Player Magazine, has a fanatical following around the world, and is not in need of substantive improvement. So why bother?

Neodymium magnets were not available in 1993. They are now. My back is older. So is yours. How much heavy stuff do you need to carry around in order to make music? As little as possible, that's how much.

The first choice would have been to introduce the traditional models using a ten-inch neo woofer which would be a direct replacement for my classic woofer. But no such woofer is available yet. It may be later. I haven't given up. The traditional Acme systems will continue to be available, more-or-less unchanged, and when and if such a woofer is available, we'll let you know.

In the meantime, Eminence has a template for a truly great twelve-inch neo woofer, and the willingness to modify it to Acme's specifications. The resulting bass driver is unique in the world, and for people who are willing to use more power to drive a less efficient loudspeaker, provides an opportunity to fill a room with loud, extended bass using a system of unprecedented compactness and light weight.

Further Owner's Notes:

Concept: Deep Bass, Low Efficiency, Low Coloration:

If you've come this far, you probably know the concept: There are two main characteristics which distinguish the Acme Sound Acme Low B loudspeakers for bass guitar from every other product in the bass guitar loudspeaker industry:

First, these are compact loudspeakers capable of delivering low-distortion, extended low bass. This is made possible by sacrificing efficiency in favor of such bass performance, which makes it necessary to use higher-power amplifiers than is normally the case with loudspeakers of this size.

Second, they are designed to reproduce a signal with low coloration, such that they are useful for not only bass guitar, but for both other instruments, including keyboards and acoustic stringed instruments, and even for reproduction of vocals. Most "bass guitar" speakers don't go there, or even try to.

As with earlier Acme models, greater than average power is required.

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."

Amplifiers:

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.

In fact, please let us know if a particular amp really pleases you, or not...

More on Power Amplifiers and Their Level Controls:

We recommend that you use your power amplifier with the level control set to their highest setting, or "full blast," if you will. There are common sense reasons for this, that are even more important when using a lower-efficiency loudspeaker.

In short, when you "max" the levels on your power amp, you are less likely to overload any of the earlier stages in your signal chain, which would cause distortion.

Please see the "Quickstart Guide" earlier in this document.,

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.

I'm very conservative in the area of cables, and I believe the benefits of expensive cables are sometimes exaggerated by those who offer them. See "James Clerk Maxwell."

Troubleshooting:

As questions have come in about potential trouble, we have attempted to compile some answers to possible concerns in this section. Please visit the website a www.acmebass.com and other internet resources for more information.

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 a 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 its 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.

Duratex Finish, Maintenance:

The Duratex finish on the Series III models solves most of the problems associated with the "rat fur" carpet on the previous models. It it not without its disadvantages, however, the most obvious of which is it's tendency to chip or scratch, when exposed to the rigors of the road.

We supply a simple "touch-up" kit with each unit, to facilitate easy repair of light damage. The material is easy to apply, using Q-tips, or even your finger, and cleans up with water.

Service and Component Replacement:

The Series III models use faston, or "Quick-Connect" connectors to make electrical connections to crossovers and drive units.

Long a devotee of soldered connections, for obvious reasons, I finally caved. I saw connectors of this type when I was snooping around inside my favorite studio monitor speakers. If it's good enough for them, it's good enough for me.

I love the easy serviceability and upgrade. You will too. That's it in a nutshell.

When and if, for whatever reason, a driver has to be replaced, it will no longer be necessary to have soldering equipment, just a Phillips head screwdriver.

Warranty:

Acme Sound LLC warrants this speaker to be free from defects in materials and workmanship for a period of ten 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.

A speaker which is blown or worn out is not replaceable under warranty. Exceptions would be when a crossover fails, resulting in a damaged driver.

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.

When warranty issues have arisen, the 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. Our policy has been to replace them for free as well.

Forms of abuse not covered:

Bown 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.

Pounding on your strings with your palm. Yes, 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.

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.

Drop/smash. No explanation necessary.

Please remember if you have any trouble, that we're mostly interested in solving your problem as quickly as possible, and saving whatever money can be saved by either or both of us!
Drop/smash. No explanation necessary.

Please remember if you have any trouble, that we're 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 us know.

Warranty and Service Notes:

What's most important is 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, don't send 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 to be a "defect" in the product you were sold.

Acme Low B-212 Impulse-Compensated System

Specifications:

Frequency Response:	**31 Hz to 20 kHz**
Sensitivity:	**94.1 dB 1 watt/1 meter**
Loading Method:	**Helmholtz Resonator**
Dimensions:	**26.5H x 23W x 16.5D inches**
Power handling:	**1500 watts RMS**
Recommended amplifier power:	**1200-2000 watts**
Impedance:	**4 or 8 ohms**
Weight:	**60 lbs plywood model** **27.3 kg** **51 lbs composite model** **23.2 kg**
Connection:	**Neutrik NLJ2MD-V dual connectors (2 parallel)** **accepts Neutrik Speakon and/or standard USA 1/4" phone plug**
Rohs compliance:	**Compliant**

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