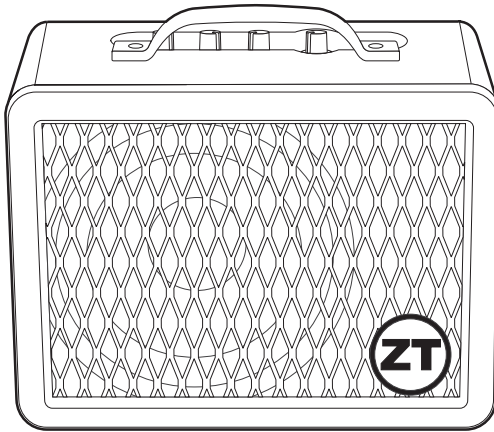


Owner's Manual

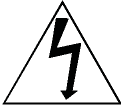


ZT Amplifiers



Lunchbox

IMPORTANT SAFETY INSTRUCTIONS



CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION: TO REDUCE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with the arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. THE APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND THAT NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.

1. **READ INSTRUCTIONS** - All safety and operating instructions should be read before the appliance is operated.
2. **RETAIN INSTRUCTIONS** - Safety and operating instructions should be retained for future reference.
3. **HEED WARNINGS** - All warnings on the appliance and in operating instructions should be adhered to.
4. **FOLLOW INSTRUCTIONS** - All operating and use instructions should be followed.
5. **WATER AND MOISTURE** - The appliance should not be used near water - near bathtub, washbowl, kitchen sink, laundry tub; in a wet basement near a swimming pool, etc.
6. **CARTS AND STANDS** - Do not place this product on an unstable cart, stand, tripod, bracket, or table. The appliance should be used only with a cart or stand that is recommended by the manufacturer.
7. **VENTILATION** - The appliance should be situated so that its location and position do not interfere with proper ventilation. The appliance should not be situated on a bed, sofa, rug, or any surface that may obstruct cabinet openings.
8. **HEAT** - The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other devices (including amplifiers) that produce heat.
9. **POWER SOURCES** - This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type power supply in your home, consult your product dealer or local power company. For products intended to operate from battery power or other sources, refer to the operating instructions.
10. **POWER CORD PROTECTION** - Power supply cords should be routed so that they are not likely to be walked upon or pinched by items placed upon or against them, paying attention to cords and plugs, convenience receptacles, and the point where they exit from the appliance.
11. **POLARIZED PLUG** - This appliance is equipped with a polarized line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit, contact your electrician to replace your obsolete outlet. Do not attempt to defeat this safety feature.

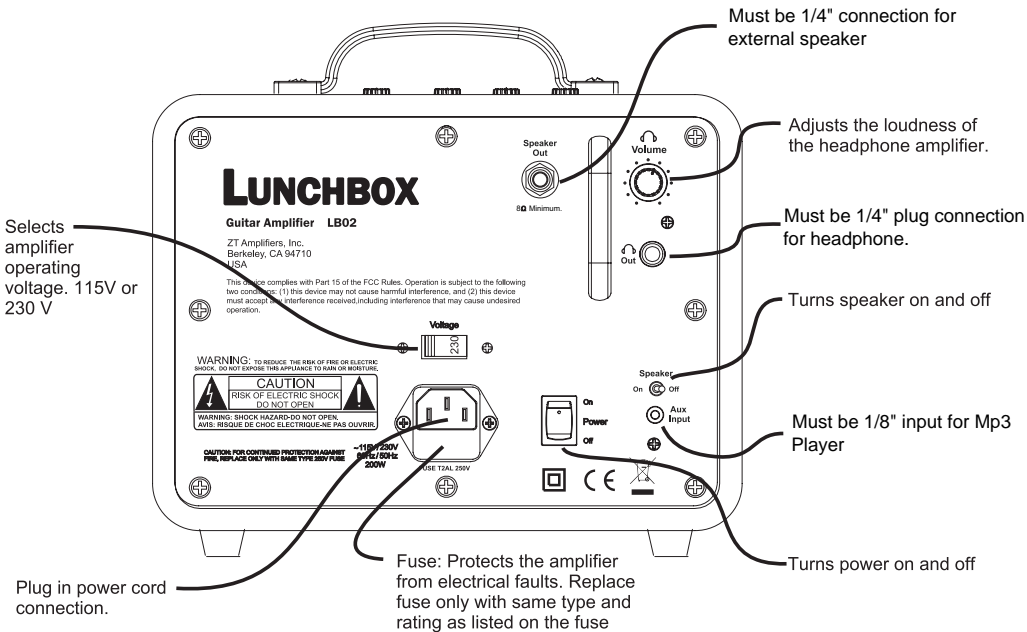
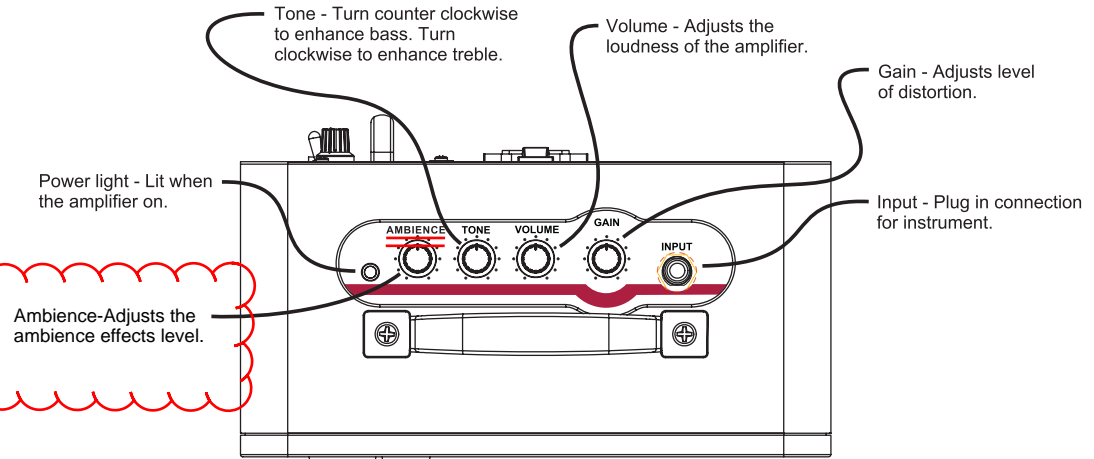


12. **LIGHTNING** - For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power line surges.
13. **OVERLOADING** - Do not overload wall outlets, extension cords, or integral convenience receptacles, as this can result in a risk of fire or electric shock.
14. **CLEANING** - Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
15. **NON-USE PERIODS** - This amplifier should be unplugged from the outlet when the appliance is left unused for a long period of time.
16. **OBJECT AND LIQUID ENTRY** - Never push objects of any kind into this product through openings, as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on this product.
17. **DAMAGE REQUIRING SERVICE** - The appliance should be serviced by qualified personnel when:
 - a. The power supply cord or plug has been damaged; or
 - b. Objects have fallen on or liquid has been spilled into the appliance; or
 - c. The appliance has been exposed to rain; or
 - d. The appliance does not appear to operate normally or exhibits a marked change in performance; or
 - e. The appliance has been dropped or the enclosure is damaged.
18. **SERVICING** - Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel. For service warranty information call the ZT Amplifiers service number: 1-510-704-1868.
19. **REPLACEMENT PARTS** - When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or that have the same characteristics as the original part. Unauthorized substitution may result in fire, electric shock, or other hazards.
20. **SAFETY CHECK** - Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

CAUTION

TO PREVENT ELECTRICAL SHOCK, DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE

Operation



LUNCHBOX

Guitar Amplifier LB02

ZT Amplifiers, Inc.
Berkeley, CA 94710
USA

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
WARNING: SHOCK HAZARD-DO NOT OPEN.
AVIS: RISQUE DE CHOC ELECTRIQUE-NE PAS OUVRIIR.

CAUTION FOR CONTINUED PROTECTION AGAINST FIRE, REPLACE ONLY WITH SAME TYPE 250V FUSE

115V 250V
2000mA 200W

USE T2AL 250V

Voltage

On

Off

Power

Off

Speaker

On

Off

Aux

Input

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Lunchbox Advanced Users Guide

The ZT Amplifiers Lunchbox is a product unlike any other musical instrument amplifier currently available. This Application Guide was developed to help the advanced user understand its unique features and characteristics. The Guide is not intended to replace the Owner's Manual. It is assumed that the reader is already familiar with the basic features and operations of the Lunchbox. Our purpose here is to explain more detailed technical concepts to help the serious user get the most from their sound.

Topics Include:

- Lunchbox design philosophy.
- Initial setup.
- Signal path.
- Gain and volume controls.
- Minimizing noise in real-use situations.
- Ambience.
- External speaker output.
- Additional inputs and outputs.
- Using the Lunchbox with other instruments and sound sources.
- Mic'ing the Lunchbox.
- Understanding amplifier power.
- About "modding."

Design Philosophy:

The ZT Lunchbox is the result of many years of study into the sound, feel and science of the world's best musical instrument amplifiers. Our goal was not to clone or "model" any particular product. Rather, we have tried to understand, in a methodical way, what technical factors give an amp great tone, flexibility and playability. As a group of experienced audio scientists and passionate musicians, we set out to learn what makes a classic amp survive for generations, giving artists of many styles and genres a consistently great playing experience over the years. ZT's research investigation was "clean slate." We didn't assume we knew any secret, magic formula; we set our own techno-biases aside. Likewise, we did not assume that conventional wisdom is always all that wise.

What we found is that guitar amps are fantastically complex systems. Many aspects of the overall product design interact with one another under real-world playing conditions. Sections of the electrical circuit influence each other, the electrical system interacts with the acoustical system, etc. Some of these interactions are well known to amp aficionados and designers. Others have been underrated, or overlooked entirely. Thus, we soon came to realize that guitar amps have plenty of mysteries to reveal, and plenty of room for improvement in areas that musicians would appreciate.

Eventually, ZT started collecting real, practical insight into what makes great amps tick. In our view, optimization between electrical, acoustical and mechanical subsystems is the key to bringing more tone, power, smaller size, and lower costs into the picture. By applying sophisticated technical understanding to overcome limitations that have previously been considered facts of life, ZT is able to re-write some of the rules while working in complete harmony with more traditional approaches. We believe it is time to re-think the fundamental design of the guitar amp, bringing in advanced audio technology without losing the wonderful benefits of proven classics.

We offer the Lunchbox amp as proof that ZT has "cracked the code." It's an amp that is small, simple and affordable, bringing a whole new level of sound and tone to portable applications. And, it's an amp with a personality all its own; a flexible and adaptable problem-solver in the hands of a musician. The Lunchbox is layered with responsive tone, but powerful and seriously fun to play at the same time. Isn't that what "classic" is all about, anyway?

Initial Setup:

When first connecting your Lunchbox, before power is applied, please be sure to set the controls as follows:

- ✓ AMBIENCE set to off. (Fully counter-clockwise.)
- ✓ TONE set to mid-point. (12 o'clock position.)
- ✓ VOLUME set to off. (Fully counter-clockwise.)
- ✓ GAIN set to mid-point. (12 o'clock position.)
- ✓ SPEAKER switch on rear panel set to "On" position. (Towards left side.)
- ✓ Now you can apply power, and turn up your instrument to the desired level using the VOLUME knob.

The Signal Path:

The main input to the Lunchbox is via a standard ¼" input on the top panel. This input has an impedance of $1M\Omega$, ($2M\Omega$ @ DC), and can accept working signals up to 6Vpp. It is protected against RF interference and ground-error overloads. After the input stage preamp, the signal is sent to an analog GAIN pot on the front panel, and then into a diode overdrive network. Thus, the GAIN knob controls the input sensitivity, and allows an analog overdrive to be applied to the signal, if desired.

Following this analog input preamp, the signal is converted to 24bit PCM digital at a 44.1 KHz sampling rate. In the digital domain, ZT's proprietary dynamics and EQ signal processing are implemented. Also, a TONE control with characteristics closely following a vintage stack is applied. Finally, adjustable "Ambience" processing is done, allowing the user to obtain the sound of an open back cabinet, a closed back cabinet, or anything in between. At this point, the signal is converted back to analog and routed to the power amplifier.

The output amp section is carefully designed to constantly adapt to the signal characteristics and the instantaneous power supply behavior. The amp itself is a pair of Class A/B output stages, running fully bridged across the speaker load. The result is very high RMS power, with extraordinary additional peak dynamics on top of that, together with a natural, progressive overdrive characteristic.

Gain and Volume Controls:

Normal adjustments to the sound level should be made using the VOLUME control only. This knob affects the signal levels at all inputs and outputs.

The GAIN control is used to set the amount of signal drive and natural distortion that is achieved. In almost all cases, this control should be set high up, well above the 50% point on its range. This will assure a good tone, and low operating noise. The only time the gain should be turned down is when a very clean tone is needed for an excessively high signal input, such as when certain external effects units are used with the Lunchbox.

Minimizing Noise:

The ZT Lunchbox can deliver peak sound pressure levels in excess of 120 dB to a listener sitting 1 ft., (0.3 m) in front of it. Thus, even boasting an excellent Signal-to-Noise Ratio of 85 dB, with certain control settings there can still be a residual peak noise level of almost 50 dB in the near field! This can be quite audible, and is simply a function of how loud the amp is capable of playing, and the high gain (>4,000) that is potentially available. (We could have put an aggressive noise "gate" in the circuit, like many modern amps do, but the tone, touch and sustain of the amp would have been negatively impacted.)

The key to low noise is to, Keep The GAIN Knob High,

and,

Use the VOLUME Knob To Adjust your sound level!

Ambience:

This control adds the type of natural short-term reflections that emanate from the rear of an open-back cabinet. These reflections are a big part of why open-back amps have such a rich and dimensional sound.

You can use this knob on your Lunchbox to dial-in some nice dimensionality and fullness to your sound. But, it's a subtle effect, and you won't get a Surf sound out of it, even if you turn it up farther than you probably should. We did it this way because we could; the effect was a natural outgrowth of the proprietary technology we use in our signal chain. If you want a more conventional reverb sound, you will need to plug in an external unit.

The External Speaker Output:

There is a ¼" external speaker output connector on the rear of the Lunchbox, which can be used to power an external cabinet. The Lunchbox makes a really good sounding, very powerful head. With the right cabinet, we think you will be stunned by the results. If you decide to try this, please note the following IMPORTANT rules:

- ✓ This output is high power. Connect it only to a speaker cab.
- ✓ Do not use this output for recording or connect it to other amps.
- ✓ Use a speaker cabinet rated at 8Ω, or higher.
- ✓ Be sure your external cabinet can handle at least 100W.

It's usually a good idea to turn off the Lunchbox's internal speaker when using an external cabinet, to make 100% of the amp's power available to the output. This is done by setting the rear panel SPEAKER switch to "Off."

Additional Inputs and Outputs:

The Lunchbox can accept a line input from an audio source such as an MP3 player, via a standard 1/8" Stereo jack on the rear panel, labeled AUX INPUT. This input is not affected by the GAIN control, but does run through all the other Lunchbox controls. The input impedance is 22K Ω , and the expected signal level is 50mVrms. If you need to tweak the relative balance between your guitar and your MP3 player, you can use the GAIN control to do it, or adjust the output level on your player. It is recommended that you disconnect any cables from the AUX INPUT when it is not in use.

There is also a line-level OUT on the rear panel. This 1/4" Stereo connector can be used to run most stereo headphones. (However, the signal itself is always mono.) The line output is also useful for running into house sound, or a recording rig. It has its own level adjustment, so that you can adjust the level of your phones once the Lunchbox controls are set where you want them.

Unlike most headphone outputs, this one doesn't mute the internal speaker. If you want to do that, just use the SPEAKER switch. This approach give you total control of what is on or off at any given time. For example, you can use the Lunchbox to monitor the sound on stage, even when routing into the board via the line out.

Using The Lunchbox With Other Instruments:

The Lunchbox is not just for guitars. In fact, the Lunchbox loves a very wide variety of instruments and sound sources. Excellent results have been achieved with acoustic guitar pickups, harmonica, electric piano, sax, accordion, electronic organ, traditional string instruments, and synths. We've even seen people successfully run an electric bass through the Lunchbox in a small venue.

Start with the GAIN, TONE and AMBIENCE controls all set at midpoint, and the VOLUME all the way down. Then inch up the VOLUME, step by step. Season to taste. Because of the high available gain, some acoustic instruments may tend to feedback if the GAIN control is accidentally set too far up.

Mic'ing The Lunchbox.

When making a recording, or running through a house PA, a great sounding amp really deserves to be mic'd. Direct feeds are convenient, sometimes necessary, but they rarely capture the full tone the player is hearing. Because the Lunchbox uses a very unique speaker, which is also smaller than most, adjustments to your usual approach might be worth trying. Getting really good recordings always involves experimentation, but here are some general tips:

- ✓ Start with the microphone directly in front of the driver's dustcap, about 6" back from the grille.
- ✓ Cardioid LD condensers are the first choice, if available.
- ✓ Cardioid SD's are good, too.
- ✓ An Omni SD can capture a very accurate sound, but you might have move it in closer to the grille, and play with side-to-side positioning. A spot about halfway between the center ("dustcap") and the outer edge ("surround") of the speaker will often work well.
- ✓ The classic dynamic guitar amp mics can work, of course, but be prepared to try a variety of setup positions to get the tonal balance you want.
- ✓ Remember, the Lunchbox can be Loud, and it concentrates a great deal of sound energy into a small area. Unless you are an unusually soft player, you will probably have to engage the pad on your mic.
- ✓ Using a foam windscreen is also a good idea, since the driver can create bursts of air when driven very hard.

Understanding Amplifier Power.

Nobody has come up with one number that can fully represent the power capability of a guitar amp. RMS is a very conservative approach, but it misses the issue of dynamic power and real world musical signals. At the other extreme, Peak Power can readily be inflated to the point where it is not a reliable indicator of anything. In fact, the actual power of any given amplifier varies widely at different frequencies. Every amplifier company has their own procedure for stating the power capability of their products, which ideally should be done within the boundaries of accepted technical standards and legal requirements. Here is our thinking on the matter, which we believe results in specifications that are both conservative and useful.

Maximum Instantaneous Peak Power: 221W.

Musical Peak Power: 220W.

RMS Power: 120W.

Sustained Average Music Power: 180W.

Finally, Two Words About Modding: Please Don't.

Sooner or later, most of us get the urge to modify or improve our amps by replacing various parts. But, remember, the Lunchbox is not like other guitar amps. It is a highly integrated and optimized system, combining electrical, acoustical and mechanical subsystems. Replacing any element of this combination is sure to upset the balance and operation of the whole. For example, our speaker driver is fully custom, and built using special high-power components. You won't find anything else quite like it.

So enjoy your Lunchbox, and please do send us any and all suggestions you have. We take our customers' input very seriously. (Oh, and we like compliments, too!)

Thanks!

Specs

Dimensions: (h) 185mm (7.3")
(w) 249mm (9.8")
(d) 112mm (4.4")

Weight: 4.7kg / 9.5 lbs.

Output: 200 watts, greater than 120 dB @ 1 meter

Voltage: Switchable - 115V / 230V

Controls: Top Panel: Volume, Gain, Tone, Ambience
Rear Panel: Headphone Volume, Speaker Switch

Speaker: 6.5" / 165mm

Cabinet: MDF (High Density Fiber Board)
high gloss finsh.

Technical Support

Technical questions:

Email: techsupport@ztamplifiers.com

Telephone: 1-510-704-1821

To obtain service for your ZT product:

Your dealer should be your first contact if you experience technical problems with your ZT product. Contact your dealer with a specific description of the problem, and have your purchase receipt available for purchase date proof (this will determine if your product is within ZT's warranty coverage period). Your dealer will contact ZT and make arrangements for repair or replacement of your product.

If you purchased your product directly from ZT, you may call 1-510-704-1821 or complete the [Return Authorization](#) form available on ZT's website. You will receive a Return Authorization (R.A.) number that must be written clearly on the shipping carton in which product is returned. A copy of the Return Authorization form must be included inside the carton.

If your product is not within warranty period, you will be advised repair charges.

Limited Warranty

ZT Amplifiers, Inc., warrants that the ZT product you have purchased shall be free of defects in parts and workmanship if used under normal operating conditions for a period of one (1) year from the date of purchase. This limited warranty shall run to the original purchaser when purchased from an Authorized ZT Amplifiers Dealer and any transferee of a retail purchaser. This limited warranty covers normal use of the ZT product only, and does not cover damages caused by misuse, abuse, accidents, or unauthorized service or parts.

IMPORTANT: PLEASE RETAIN YOUR SALES RECEIPT, AS IT IS YOUR PROOF OF PURCHASE COVERING YOUR LIMITED WARRANTY. TO TRANSFER THE WARRANTY TO A SUBSEQUENT PURCHASER, YOU MUST ENDORSE THE SALE OF THE PRODUCT TO THE SUBSEQUENT PURCHASER ON THE FRONT OF THE SALES RECEIPT. THIS LIMITED WARRANTY IS VOID WITHOUT SUCH ENDORSED SALES RECEIPT.

Defective products that qualify for coverage under this limited warranty will be repaired or replaced, at ZT's discretion, with a like or comparable product, without charge. The ZT Amplifiers Dealer from whom you purchased your product may be authorized for warranty service and should be your first point of contact when service is required. To receive warranty service from ZT Amplifiers, you must contact ZT Amplifiers by e-mail during the warranty period at [e-mail address] to explain the defect and to obtain an RMA number (return materials authorization number), and then return the complete product (in original packaging, if available) to an Authorized ZT Amplifiers Electronics Service Center, with proof of purchase, during the applicable warranty period. You are responsible for shipping the defective product to the Service Center. Return shipment will be provided at no cost to you; provided, however, that if you are located in a country other than the United States of America, then you will be responsible for all customs duties, VAT and other associated taxes and charges applicable to the shipment of the product. Any repair or service performed by any person or entity other than an Authorized ZT Amplifiers Electronics Service Center is not covered by this limited warranty. This limited warranty becomes void if the serial number on any product is defaced or removed, or the product has been damaged by alteration, misuse, accident, or neglect; or the product has been repaired or serviced by persons not authorized by ZT Amplifiers.

THE FOREGOING CONSTITUTES THE ONLY WARRANTY MADE BY ZT AMPLIFIERS WITH RESPECT TO THE PRODUCTS AND IS MADE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. Any implied warranties, including without limitation, any implied warranties of merchantability or fitness for any particular purpose, imposed under the law of any applicable jurisdiction are limited to the duration of this limited warranty. This limited warranty also applies to ZT products shipped to

ZT AMPLIFIERS ASSUMES NO LIABILITY FOR PROPERTY DAMAGE RESULTING FROM ANY DEFECT OF THIS PRODUCT NOR ANY LOSS OF BUSINESS, INCOME, PROFIT, SATISFACTION, OR DAMAGES ARISING FROM THE LOSS OF USE OF SAME DUE TO DEFECTS OR AVAILABILITY OF SAME DURING SERVICE. NOTWITHSTANDING ANY DAMAGES YOU MIGHT INCUR FOR ANY REASON WHATSOEVER, THE ENTIRE LIABILITY OF ZT AMPLIFIERS SHALL BE LIMITED TO THE AMOUNT ACTUALLY PAID BY YOU FOR THE DEFECTIVE PRODUCT.

Some jurisdictions do not allow the exclusion or limitation of damages or limitations on how long an implied warranty lasts, so the above limitations may not be applicable to you.

EFFECTIVE DATE: December 1, 2008
ZT AMPLIFIERS, INC.
2329 FOURTH STREET
BERKELEY, CALIFORNIA 94710 USA