

# **QUADUHFD**

**MULTI-CHANNEL WIRELESS SYSTEM  
WITH RF/POWER DISTRIBUTION**

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**OPERATING INSTRUCTIONS  
and trouble-shooting guide**

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# INTRODUCTION

The design of Lectrosonics Quad Pak systems has evolved over the years as a result of suggestions garnered during many conversations with industry sound mixers and production engineers. These suggestions, together with meticulous attention to design and construction details, have resulted in a system that offers portability, versatility, and "bullet-proof" reliability of operation.

The QUADUHFD system is a high performance, 4-channel wireless microphone receiver system designed primarily for motion picture and television production in the studio and in the field. The QUADUHFD is a dual-antenna, diversity design for up to four UCR195, UCR195D, UCR200D, UCR205D or UCR210D diversity receivers. The European specification UCR300 receivers can also be installed.

Complete QUADUHFD systems consist of a rugged mechanical assembly with built-in rechargeable batteries for up to four receivers, one or two RF/power multi-couplers (depending upon the receivers installed) and various options for antennas and chargers to meet a wide variety of applications. The mechanical assemblies are covered with a padded, naugahyde carrying case with reinforced, zippered and hinged front and rear panels for easy access to controls and connectors.

Problems such as interaction of receivers, intermodulation and desensitization have been eliminated with the use of proven design principles in the active antenna multi-couplers.

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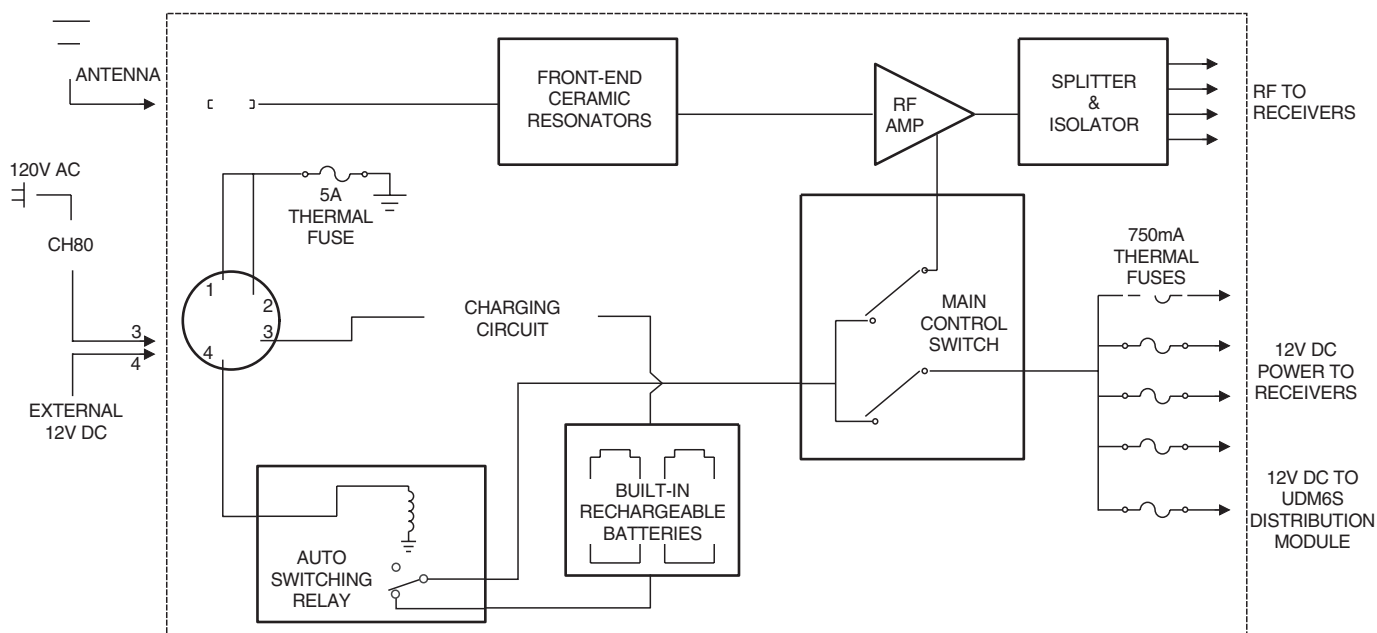
## GENERAL TECHNICAL DESCRIPTION

The QUADUHFDF consists of three sub-systems; the housing which contains the gel-cell power supply, the UDM6 RF/power distribution module and the UDM6S RF distribution module.

The housing is constructed of machined aluminum. A strap handle is bolted directly to the top panel of the housing for ease of carrying. The lead-acid gel-cell batteries are connected in series to provide 12 VDC (nominal) power to all the modules installed into the system. These batteries were selected for their recharge characteristics and reliability under extreme conditions. The batteries are also highly resistant to damage caused by prolonged deep discharge.

The front end design places RF filtering before gain to minimize intermodulation (IM) products and prevent overload. Two transmission line ceramic resonators at the input provide filtering with a 50 MHz bandwidth. Following the resonators is a low noise, low gain RF amplifier designed to evenly compensate for splitter losses in the stage that follows. A precision splitter/isolator divides the RF signal into four isolated signals, which prevents spurious RF coupling between receivers. The splitter/isolator is also termination independent, which prevents mismatched or disconnected RF outputs from affecting the other receivers.

Power can be supplied to the distribution module from four possible sources. The primary source is the gel-cell battery pack built into the bottom of the housing. Secondly, power may also be provided through an external DC power source of 12 to 16 VDC of either polarity. When an external source is connected, an internal relay automatically disconnects the internal battery pack. If that DC source fails or is disconnected, the system automatically reverts to the internal batteries. AC power can be provided through the charger included with the unit. While operating in the AC mode, the internal batteries are also recharged. All power circuits in the distribution module are independently protected by internal auto-reset fuses. If the power to one receiver fails, the other receivers will continue to operate.



UDM6 Block Diagram

# FRONT PANEL DESCRIPTION

**ANTENNA LEADS** - These BNC terminated leads provide isolated RF signals for each receiver installed in the system.

**ANTENNA** - The antenna provided with the unit attaches to this BNC connector directly with a twist lock motion. Other 50 Ohm antennas may also be used.

**POWER SWITCH** - The switch on the front panel of the UDM6 module controls the powering options:

In the EXT (upper) position, the unit will operate only from external power supplied to pins 1 and 4 of the rear panel 4-pin XLR connector.

In the OFF position, all power to the receivers and distribution modules is disconnected, however, the internal batteries in the Quad Pak can still be charged with the CH80 charger connected to the rear panel 4-pin XLR connector.

In the EXT OR BATT (lowest) position, the system is activated and power will be drawn from either the gel-cell batteries located in the bottom of the Quad Pak, or from an external 12 VDC power source if one is connected to the rear panel 4-pin XLR jack. In this mode, the internal batteries act as a backup of the external power source. If the voltage from the external power source drops to a level too low for operation, a built-in automatic relay will switch the external power off and the internal gel-cell batteries on.

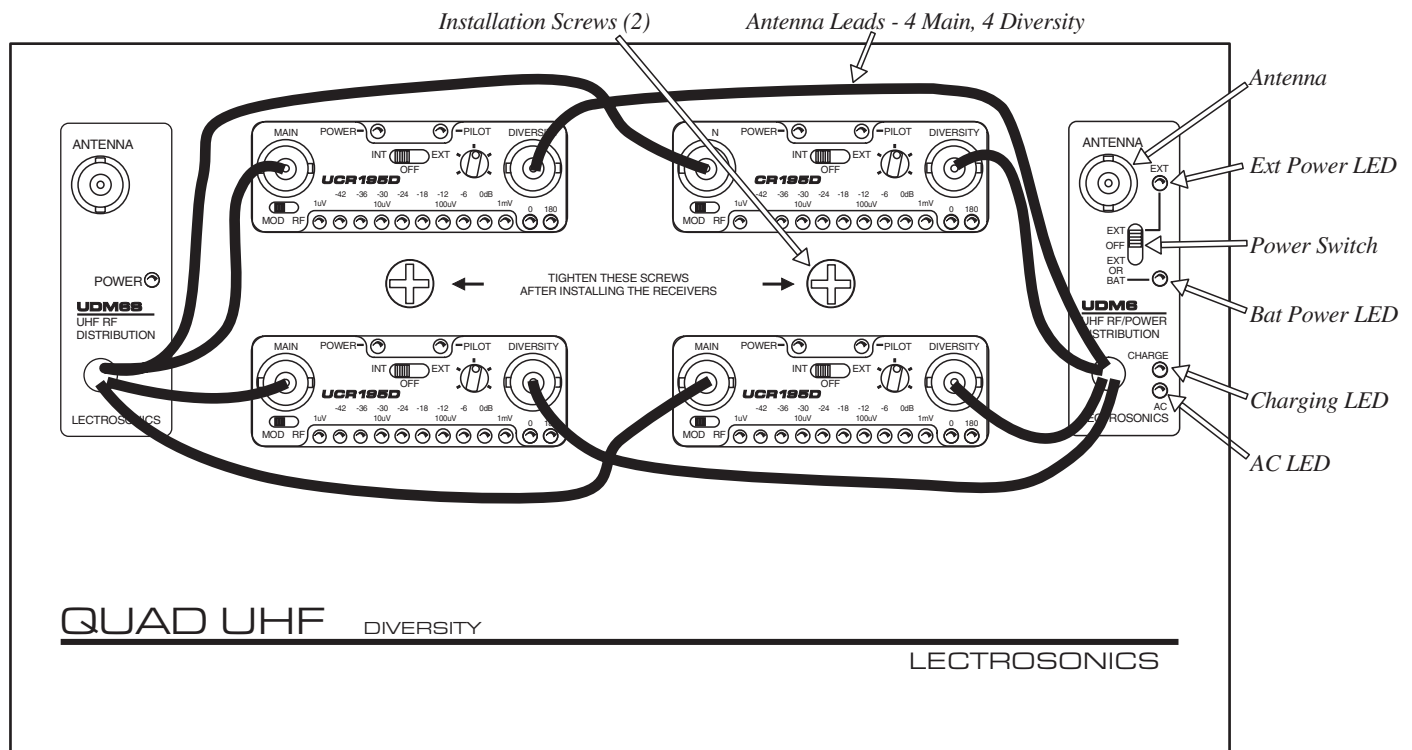
**EXT LED** - This LED will light when power is provided from an external 12 VDC power supply at the rear panel 4-pin XLR connector.

**BATT LED** - This LED indicates operation from the internal gel-cell batteries.

**CHARGE LED** - This LED lights when the gel-cell batteries are being charged with the CH80 charger. It will extinguish when the batteries achieve full charge.

**AC LED** - This LED indicates the unit is plugged into AC with the CH80 charger. It remains on as long as the charger is connected, regardless of the battery charge state.

**INSTALLATION SCREWS** - These screws are used for receiver installation and removable. See RECEIVER INSTALLATION for further instructions.



## REAR PANEL DESCRIPTION

**SERIAL/FREQUENCY LABEL** - This label, located on the rear of the housing on each distribution module, indicates the serial number and the RF passband of the distribution module. **IMPORTANT** - The receivers installed in the unit must fall between the passband indicated on the label. Serious signal loss results if the receiver frequencies are outside the RF passband.

**POWER XLR CONNECTOR** - This 4 pin Switchcraft D4M connector is the power input jack for both the AC charger and for external 12VDC power. Pins 1 and 4 are used for external 12 VDC input. Pins 2 and 3 are utilized for 15VDC charging with the CH80 charger.

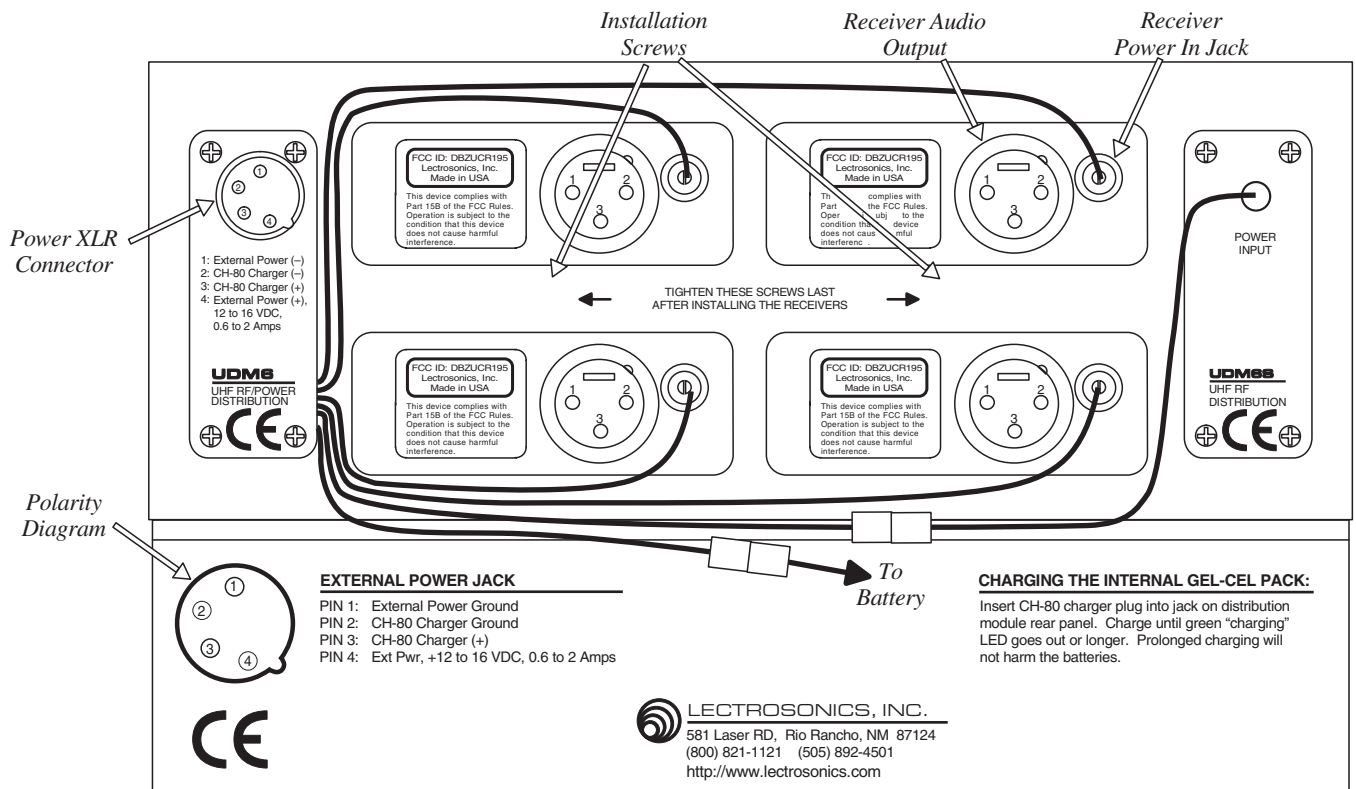
**POLARITY DIAGRAM** - The polarity diagram on the lower panel indicates the wiring connections for the 4 pin XLR power connector. Use this diagram when connecting your own external power source to the system.

**POWER LEADS** - These connectors provide power for the individual receivers. Insert the connectors into the jack provided on each receiver.

**INSTALLATION SCREWS** - The two large counter-sunk phillips head screws in the central area between the receivers are used for receiver installation and removal. See the following page for further instructions.

**RECEIVER AUDIO OUTPUT** - Supplies a balanced, low impedance output at microphone or line level. The audio signal is output on pins 2 and 3, while pin 1 is ground. The output level of this jack is controlled by the OUTPUT control on the front panel of the receiver and by the range switches in the battery compartments of the receivers (see receiver instruction manuals). The connector is a standard XLR type.

**RECEIVER POWER IN JACK** - Connects to the POWER LEAD for powering the receiver from the QUADUHFD source.



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## RECEIVER INSTALLATION

The QUADUHFD is designed to contain up to four receivers. Installation of these receivers is quite simple. First, loosen but do not remove, the two large counter-sunk phillips head screws in the front panel and the two in the rear panel of the housing. (See drawings on previous pages) Insert the receivers, front end first (the end with the antenna connection), in through the rear panel. Seat the front end of the receiver into the recessed lip of the front panel. Repeat this for each receiver to be installed. After all receivers are in place, hold them in position and tighten the front panel screws first. These screws should be fairly snug but excessive force should be avoided and is unnecessary. You are compressing a natural rubber tension tube. Tighten the rear panel screws last. Press firmly on the front of each receiver to be certain that the receivers are secure.

At the front panel, attach the antenna leads to each receiver, making sure the BNC connector is securely locked into place. Set the power switch on the receivers to the EXT position. Antenna leads serving empty slots do not need to be terminated.

At the rear panel, insert the power connectors into the power jack of each receiver. If using battery powered receivers it is recommended that each receiver have a fresh battery in place to serve as backup power in the event that the internal battery pack or external power source fails for any reason.

## OPERATING INSTRUCTIONS

After all the receivers have been installed, check to be sure that the receivers have their power switch set to EXT. Audio leads should be balanced audio cables leading to the mixer or recorder.

Turn the system on by switching the power switch on the distribution module to EXT or EXT OR BAT. The EXT position will allow the QUADUHFD to operate ONLY on external power no matter what the external voltage is. If the voltage of the external power source (not the charger) drops below operational levels, then the system may not operate. The EXT OR BAT position allows use of an external power source until that source drops below 9V. The system then switches automatically to the internal batteries of the QUADUHFD. The Charger is not an external power source in this sense because the charger and the battery are the same buss as far as the UDM6 is concerned. The power indicator LEDs should light on all the receivers and the distribution modules. If the charger is connected and plugged into an AC source, the AC and perhaps the CHARGE LEDs will be on as well. If the power source is an external 12 VDC power supply, the EXT LED will be on.

Operate the wireless microphone according to the instructions included with the wireless systems.

After use, recharge the batteries immediately to prolong their life. The system incorporates industrial quality gel-cells which can be left on charge 10 days at a time without damage. The charging circuitry will automatically limit the current flow to the batteries. There are no "memory" problems with these batteries. **Charge after every use for maximum battery life.** The CHARGE LED will activate to indicate the batteries are charging and will extinguish when the batteries are at full charge. The charge rate is 3.5Amps for about 3 hours falling to a rate of 1 Amp. When the charge rate drops to 1 Amp, the green LED will reduce brightness to 1/2 and the battery voltage will be 13.8V. At approximately 16 hours, the unit will achieve full charge. It may be left on charge for a few days without damage although we do not recommend leaving the system on charge continuously. **Important - this unit will achieve an operational level of charge after 3 hours from a totally dead battery.**

The red BAT led will go out when voltage drops to 11.5 volts - approximately 10% battery capacity remains at that point.

The external 12 VDC power supply may be connected to the system through the 4 pin XLR connector on the rear panel. The connection is made by supplying the voltage through pins 1 and 4. Pin 1 is negative or ground, pin 4 is +12V DC.. Polarity is noted on the housing.

## TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE
<b>NO POWER LEDs OR AUDIO</b>	1) Power switch in the OFF position. Switch to EXT or EXT OR BAT.
<b>POWER LED LIGHTS ON UDM6 BUT NO LIGHTS ON RECEIVERS</b>	1) Power leads in back not connected to receivers. Check power connections. 2) Check power switch on receivers.
<b>NO POWER LEDs, ALL CONNECTIONS CHECK OK</b>	1) Gel-cell battery charge too low. Either use an external 12 VDC power supply, or operate on 110 to 240 VAC with the CH-80 charger.
<b>POWER AND MODULATION LEDs ON, BUT NO AUDIO</b>	1) No audio connection to recorder or mixer. Check connections.
<b>POWER LEDs ON, NO MODULATION LEDs</b>	1) Transmitters not on or in mute position. Check transmitters. 2) Transmitters have dead batteries, check batteries.
<b>POOR SIGNAL/NOISE OR DROPOUTS</b>	1) Antenna leads not connected, Check antennas. 2) Main antenna improperly connected. Check antenna. 3) Antenna "blocked" or in poor RF location. Try moving the system or the antenna. 4) Transmitter modulation improperly set. Check mod levels.
<b>INTERNAL GEL-CELLS NOT CHARGING</b>	1) Check CH 80 charger - Output voltage should be 15 VDC on pin 3, with pin 2 as ground.

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# SPECIFICATIONS

## RF/POWER DISTRIBUTION MODULE

<b>RF Gain:</b>	0 to +1 dB
<b>RF Output:</b>	Four outputs, 50 Ohm, BNC
<b>Filtering:</b>	Ceramic resonators - 50MHz bandwidth
<b>Third Order Intercept:</b>	+27 dBm
<b>Power Input:</b>	<ul style="list-style-type: none"><li>• 9 to 16 V DC<ul style="list-style-type: none"><li>• Pins 1 (gnd) and 4 (+) on XLR power jack</li></ul></li><li>• CH-80 adapter for AC operation, 15V @ 2.8 A<ul style="list-style-type: none"><li>• Pins 2 (gnd) and 3 (+) on XLR power jack</li></ul></li></ul>
<b>Power Consumption:</b>	200 mA at 14V (distribution modules only) Total draw is dependent on the receiver types involved and can be as high as two amps total.
<b>Connectors:</b>	<ul style="list-style-type: none"><li>• RF: BNC</li><li>• POWER INPUT: 4 pin XLR (Switchcraft D4M)</li><li>• POWER OUTPUT: 2.1mm power jack</li></ul>
<b>Short Circuit Protection:</b>	Auto-reset thermal fuses (6), 750mA to receivers, 5A to/from battery and external DC supply.

## MECHANICAL ASSEMBLY

<b>Construction:</b>	Machined aluminum panels, housings, and mechanical parts.
<b>Dimensions:</b>	6.75H x 10.75W x 8.5D inches (in carrying case)
<b>Weight:</b>	22.25lbs. with 4 UCR205D receivers loaded
<b>Batteries:</b>	Two 6V, 12 Ah rechargeable gel-cells
<b>Operating Time per Charge:</b>	Dependent on receivers installed, 8-9 hours with UDR205D's or UCR300's 5-6 hours with UCR200's 14-16 hours with UCR210's 12-14 hours with UCR195D/UCR195

*Specifications subject to change without notice.*

<p>This product meets the CE Compliance Standards - EN55022 and EN50082-1:1998. A copy of the Declaration of Conformity may be requested from your dealer or by contacting the factory directly: Lectrosonics, Inc. Marketing Department 581 Laser Rd. NE, Rio Rancho, NM 87124 USA tel: 505-892-4501 fax: 505-892-6243 e-mail: <a href="mailto:marketing@lectrosonics.com">marketing@lectrosonics.com</a></p>
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## SERVICE AND REPAIR

If your system malfunctions, you should attempt to correct or isolate the trouble before concluding that the equipment needs repair. Make sure you have followed the setup procedure and operating instructions. Check out the interconnecting cords and then go through the TROUBLE SHOOTING section in the manual

We strongly recommend that you **do not** try to repair the equipment yourself and **do not** have the local repair shop attempt anything other than the simplest repair. If the repair is more complicated than a broken wire or loose connection, send the unit to the factory for repair and service. Don't attempt to adjust any controls inside the units. Once set at the factory, the various controls and trimmers do not drift with age or vibration and never require readjustment. **There are no adjustments inside that will make a malfunctioning unit start working.**

LECTROSONICS service department is equipped and staffed to quickly repair your equipment. In-warranty repairs are made at no charge in accordance with the terms of the warranty. Out of warranty repairs are charged at a modest flat rate plus parts and shipping. Since it takes almost as much time and effort to determine what is wrong as it does to make the repair, there is a charge for an exact quotation. We will be happy to quote approximate charges by phone for out of warranty repairs.

## RETURNING UNITS FOR REPAIR

You will save yourself time and trouble if you will follow the steps below:

**A.** DO NOT return equipment to the factory for repair without first contacting us by letter or by phone. We need to know the nature of the problem, the model number and the serial number of the equipment. We also need a phone number where you can be reached 8 am to 4 pm (Mountain Standard Time).

**B.** After receiving your request, we will issue you a return authorization number (R.A.). This number will help speed your repair through our receiving and repair departments. The return authorization number must be clearly shown on the outside of the shipping container.

**C.** Pack the equipment carefully and ship to us, shipping costs prepaid. If necessary, we can provide you with the proper packing materials. UPS is usually the best way to ship the units. Heavy units should be "double-boxed" for safe transport.

**D.** We also strongly recommend that you insure the equipment, since we cannot be responsible for loss of or damage to equipment that you ship. Of course, we insure the equipment when we ship it back to you.

**Mailing address:**  
Lectrosonics, Inc.  
PO Box 15900  
Rio Rancho, NM 87174  
USA

**Shipping address:**  
Lectrosonics, Inc.  
581 Laser Rd.  
Rio Rancho, NM 87124  
USA

**Telephones:**  
Regular: (505) 892-4501  
Toll Free (800) 821-1121  
FAX: (505) 892-6243

**World Wide Web:** <http://www.lectrosonics.com>

**Email:** [sales@lectrosonics.com](mailto:sales@lectrosonics.com)

## LIMITED ONE YEAR WARRANTY

The equipment is warranted for one year from date of purchase against defects in materials or workmanship provided it was purchased from an authorized dealer. This warranty does not cover equipment which has been abused or damaged by careless handling or shipping. This warranty does not apply to used or demonstrator equipment.

Should any defect develop, Lectrosonics, Inc. will, at our option, repair or replace any defective parts without charge for either parts or labor. If Lectrosonics, Inc. cannot correct the defect in your equipment, it will be replaced at no charge with a similar new item. Lectrosonics, Inc. will pay for the cost of returning your equipment to you.

This warranty applies only to items returned to Lectrosonics, Inc. or an authorized dealer, shipping costs prepaid, within one year from the date of purchase.

This Limited Warranty is governed by the laws of the State of New Mexico. It states the entire liability of Lectrosonics Inc. and the entire remedy of the purchaser for any breach of warranty as outlined above. NEITHER LECTROSONICS, INC. NOR ANYONE INVOLVED IN THE PRODUCTION OR DELIVERY OF THE EQUIPMENT SHALL BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL, OR INCIDENTAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THIS EQUIPMENT EVEN IF LECTROSONICS, INC. HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL THE LIABILITY OF LECTROSONICS, INC. EXCEED THE PURCHASE PRICE OF ANY DEFECTIVE EQUIPMENT.

This warranty gives you specific legal rights. You may have additional legal rights which vary from state to state.

## LECTROSONICS, INC.

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