

M170

Belt Pack Transmitter

OPERATING INSTRUCTIONS and trouble-shooting guide

LECTROSONICS, INC.
Rio Rancho, NM

INTRODUCTION

Thank you for selecting the M170 Series transmitter. The M170 Series transmitters operate on high band frequencies from 150 MHz to 216 MHz. It is offered in five different versions to meet your specific needs. This manual covers all five versions.

Only the M170 series transmitters are covered in this manual. Receivers are covered in separate manuals. All versions of the M170 Series transmitters will operate with any Lectrosonics high band VHF receiver. A frequency matched transmitter/receiver combination makes up a "wireless system".

If you are new to wireless microphones, you will discover a new freedom of movement and level of convenience. If you are an experienced wireless user, you will be pleased with the versatility and superior performance of the M170 design.

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M170 Series transmitters are FCC type accepted under the following Parts:
Part 90 (150-172 MHz)
Part 74 (174-216 MHz)

GENERAL DESCRIPTION

The M170 Series transmitter is offered in five versions. The standard model is the M170. The M170-LS, M170-XLR, M170-BGO, and the M170-CTM are modifications of the standard M170.

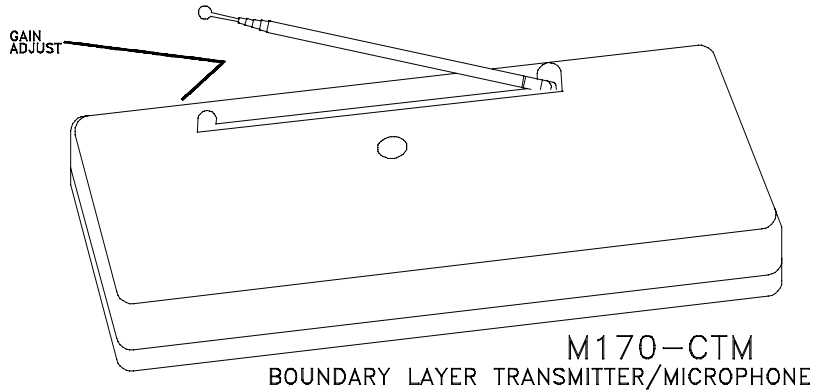
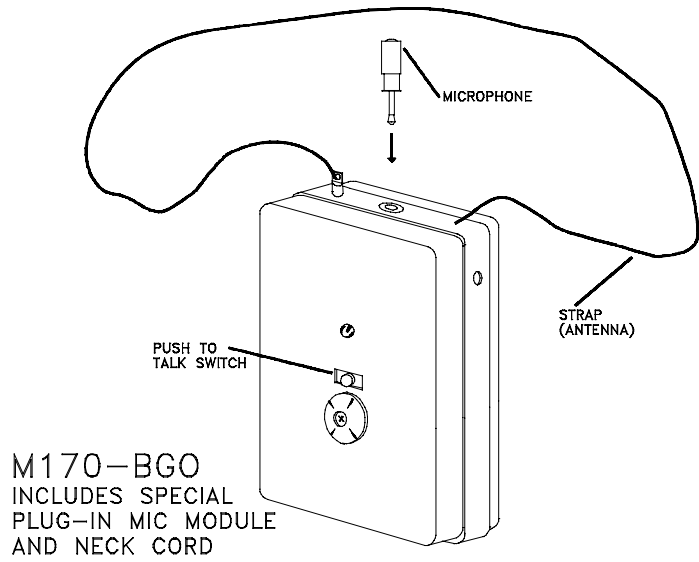
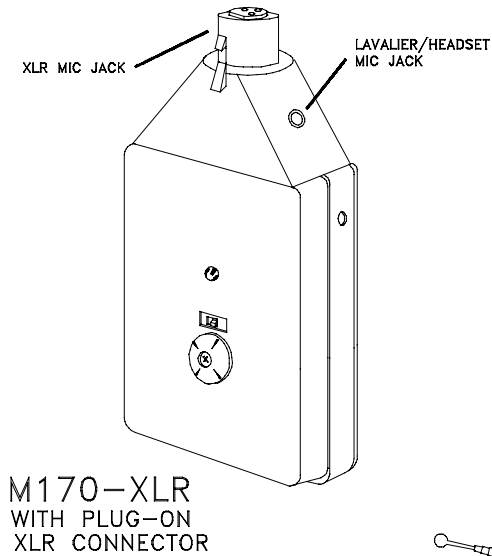
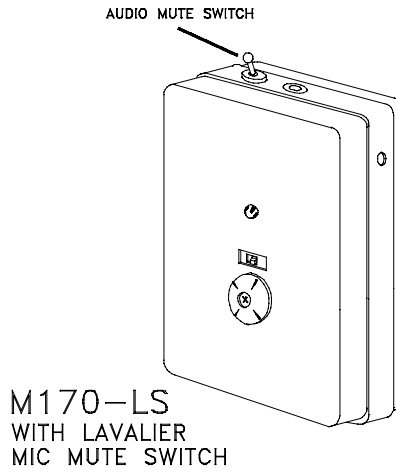
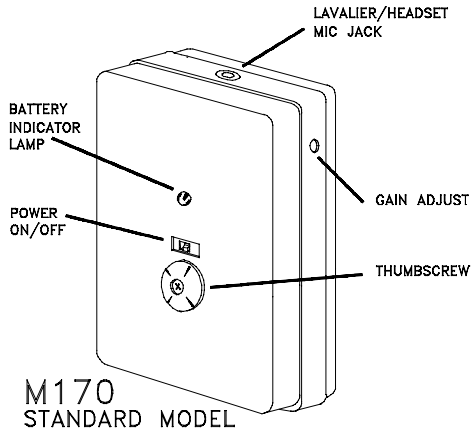
The M170 and M170-LS transmitters use the microphone cord for the antenna. The M170-XLR uses the hand-held microphone for the antenna. This feature eliminates the need for the "dangling wire" antenna found on many transmitters. The walnut body of the M170-CTM is securely attached to a machined aluminum plate which serves as the antenna ground plane and as mass to absorb vibration. The M170 Series transmitters use a crystal controlled oscillator and temperature compensation circuitry to ensure that the transmitter does not drift over time or with age.

To suppress audible noise, a "compandor" noise reduction circuit is used which is compatible with all Lectrosonics 170 series or 185 series receivers. In addition, the input limiting circuit will absorb 12 dB of overload without distortion. The audio circuitry is extremely quiet, with low distortion for natural reproduction of either voice or music. The wide input adjustment range of M170 Series transmitters allows the use of virtually any microphone on the market and with line level inputs such as tape recorders or musical instruments.

The M170 Series transmitters operate from a replaceable standard 9 Volt alkaline battery. A precision battery test circuit continuously monitors the battery voltage. A highly visible LED glows as long as the battery voltage is high enough to operate the transmitter. A 9 Volt alkaline battery will provide up to 15 hours of operation.

The electret microphone input jack provides 5 Volts DC positive bias for all Lectrosonics electret microphones. Many other electret microphones may be adapted to the M170 Series by making simple wiring changes in the microphone connector.

M170 VARIATIONS



CONTROLS AND FUNCTIONS

The **MIC JACK** is a locking micro jack that supplies "phantom power" for electret microphones such as the Lectrosonics M130, M140 and the HM142V and HM152V headset models. Insert the microphone cord plug into the jack and rotate it clockwise to lock it. It is important that the plug be securely locked, since the microphone cord serves as the antenna for the transmitter.

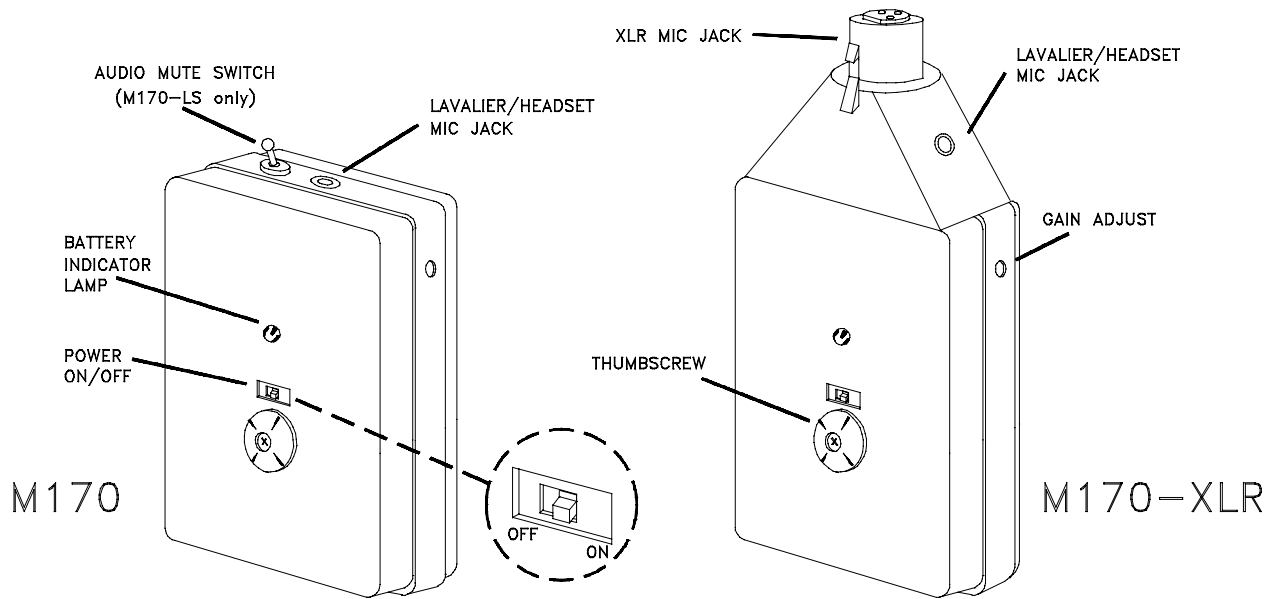
The **POWER ON/OFF** switch turns the power on and off. The switch should be left in the off position when the transmitter is not in use. When the switch is in the on position, the battery will be drained even though the transmitter is not being used. The ON/OFF switch on the M170-CTM is located on the bottom of the unit.

The **BATTERY INDICATOR LAMP** will light when the transmitter is turned on and will stay lit as long as the battery is good. As the battery voltage drops, the lamp will grow dim and finally go out. Turn the M170-CTM upside down to check the battery lamp.

The **THUMBSCREW** is turned counter-clockwise to remove the side cover to allow battery replacement.

The **GAIN ADJUST** is a recessed screwdriver adjustment used to match the gain of the transmitter to different microphones, individual voices or other audio inputs such as tape deck outputs. The gain adjust hole on the M170-CTM is located in the walnut body along the back side of the unit.

The **AUDIO MUTE SWITCH** (M170-LS only) is a toggle type on-off switch used to shut off the audio signal without shutting off the RF carrier of the transmitter. To turn the sound on, push the switch handle toward the microphone jack. This feature is useful for users who may want to converse with someone close at hand without the main audience hearing the remarks.



CONTROLS AND FUNCTIONS (cont'd.)

The **XLR MIC JACK** (M170-XLR only) is a standard 3-pin audio connector (Switchcraft A3F) that will accept standard hand-held microphones with balanced or unbalanced outputs. The transmitter may be plugged directly onto hand-held microphones or worn on the belt when used with lavalier or headset microphones. The M170-XLR input is designed for best performance with balanced, low impedance (50 to 600 Ohms) dynamic microphones, but will work with high impedance mics. If your microphone has selectable impedance, set or wire it for 150 to 200 Ohms, or set it to the "low impedance" position.

Some older types of hand-held dynamic microphones did not have a balanced output. These microphones will not work properly with the M170-XLR transmitter unless the microphone output is on pin 2 and pin 3 is connected to pin 1 (audio ground).

The **M170-BGO** was designed specifically for use by bingo halls. A carrying strap acts as the antenna and allows the user to wear the unit around their neck. The microphone plugs directly into the top of the unit. The transmitter is activated by pushing the button on the side panel and holding the button in while you speak. A standard lavalier microphone can be substituted for the plug-in microphone if you wish to wear the transmitter on your belt rather than around your neck. When the transmitter is worn on your belt, the neck strap (the antenna) must not be wrapped around the transmitter.

The **M170-CTM** is a conference table microphone/transmitter ideally suited for board room applications. A high quality, very sensitive, omni-directional electret microphone is flush-mounted in the top of the walnut body and wired internally to an M170 transmitter.

BATTERY INSTRUCTIONS

The battery you use in the M170 Series transmitter should be a 9 Volt alkaline, available almost everywhere. An alkaline battery will provide 12 to 15 hours of operation. Carbon zinc batteries, even if marked "heavy duty" will only provide about 4 hours of operation. Make sure your batteries are marked "alkaline."

The **BATTERY LAMP** will light when the transmitter is turned on and will stay lit as long as the battery is good. As the battery voltage drops, the lamp will grow dim and finally go out. Even after the lamp goes out, there may still be up to an hour or more of operating time remaining. When the battery voltage is too low for proper transmitter operation, the sound from the wireless system may be intermittent or totally absent. When the transmitter is first turned on, the lamp may light for a short while even with a bad battery. It is good practice to check the brightness of the lamp after the transmitter has been on for several minutes and to note the brightness frequently during use.

To replace the battery, turn the thumbscrew counter-clockwise 2 or 3 turns until you can lift off the side cover. To remove the battery, hook your fingernail under the base of the battery, press toward the contacts and lift the base of the battery out of the compartment. It is difficult to install the battery backwards. Observe the large and small holes in the battery contact pad before inserting a new battery. Insert the contact end of the battery first, making sure the contacts are aligned with the holes in the contact pad, and then press the other end of the battery into the compartment.

OPERATING INSTRUCTIONS

This section covers adjustments to the transmitter that must be made before the wireless microphone system is placed into operation. The step-by-step procedures are listed in the order in which they should be performed:

- 1) Turn the wireless receiver power on and make any required preliminary adjustments in accordance with instructions in the receiver operating instructions.
- 2) Plug the microphone into the transmitter. If you are using a lavalier or headset microphone, rotate the plug clockwise to make sure the connection is locked.
- 3) Turn the transmitter power on and verify that the red lamp on it lights. If the lamp is very dim or does not light, replace the battery.
- 4) Observe that the RF lamp on the receiver control panel is lit. This verifies that the receiver is receiving a useable radio signal from the transmitter.
- 5) Position the microphone on your person in the location it will be used during actual operation. If a headset microphone is being used, adjust the headband for a comfortable fit with the "gooseneck" to the left side of your head. Position the microphone element at the corner of the mouth and rotate the white volume control fully clockwise. The headset is designed to be worn over the head, but can also be worn around the neck. Do not position the microphone pickup directly in front of your mouth as this may cause unwanted noise from breath pops as you speak.

OPERATING INSTRUCTIONS (cont'd.)

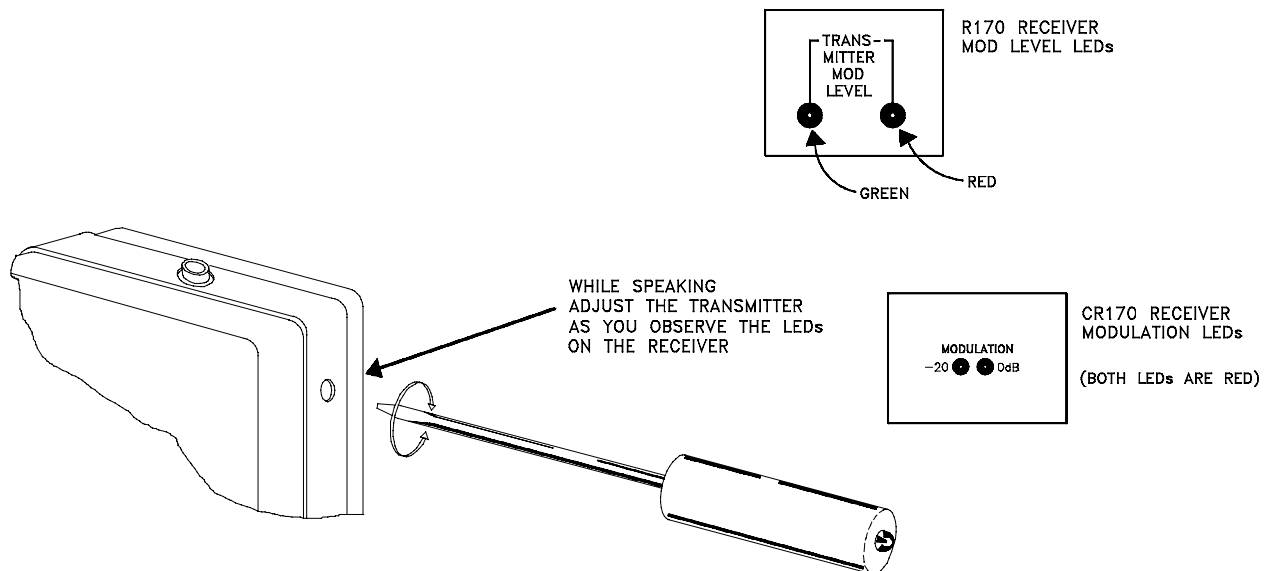
- 6) A small screwdriver is supplied with the transmitter. The screwdriver is used to adjust the audio gain of the transmitter to match your microphone and your voice. The **GAIN ADJUST** is located on the side of the transmitter as shown on page 3. The adjustment is made while observing the modulation level lamps on the receiver control panel:
- Speak at the voice level you will be using during actual operation.
 - While speaking, adjust the transmitter gain until the green modulation lamp on the receiver (may be marked "-20") is lit or flickers and the red modulation lamp blinks only on the loudest words. Raise and lower your voice while observing the lamps. The red lamp should blink only occasionally.

NOTE

The modulation lamps on some receivers are marked or colored differently than just described. Consult the operating manual for the receiver in use.

- 7) You may now adjust the receiver output level (wireless microphone or mic volume, level, or volume attenuator) to the desired audio output level. Consult your receiver manual if you are not sure of the location of these controls.

The **GAIN ADJUST** is used only to adjust for proper modulation level lamp indications. **DO NOT** use it to adjust the audio output level of the receiver. Different voices and different microphones will usually require readjustment of the transmitter gain control, so check the adjustment frequently. If several different people will be using the transmitter, and there is not time to make the adjustment for each individual, adjust it for the loudest voice.



TROUBLESHOOTING

Before going through the following chart, be sure that you have a good battery in the transmitter. It is important that you follow these steps in the sequence listed.

SYMPTOM	POSSIBLE CAUSE
TRANSMITTER BATTERY LED OFF	<ol style="list-style-type: none">1) Unit turned off. Check front panel on/off slide switch.2) Battery is inserted backwards.3) Battery is dead.
NO TRANSMITTER MOD LEVEL LEDs	<ol style="list-style-type: none">1) Gain control turned all the way down.2) Battery is in backwards. Check power LED.3) Mic capsule is damaged or malfunctioning.
RECEIVER RF LAMP OFF	<ol style="list-style-type: none">1) Transmitter not turned on.2) Transmitter battery is dead.3) Receiver antenna missing or improperly positioned.4) Transmitter and receiver not on same frequency. Check labels on transmitter and receiver.5) Operating range is too great.
NO SOUND AND RECEIVER MOD LEVEL LEDs ARE OFF	<ol style="list-style-type: none">1) Transmitter audio muted (M170-LS only)
NO SOUND BUT RECEIVER MOD LEVEL LEDs ARE ON	<ol style="list-style-type: none">1) Receiver audio is muted. Refer to receiver manual.2) Receiver audio output is disconnected or cable is defective or mis-wired.3) Sound system or recorder input is turned down.
DISTORTED SOUND	<ol style="list-style-type: none">1) Transmitter gain (audio level) is too high. Speak or sing into the transmitter and check mod level lamps on the receiver (see page 7).2) Receiver output may be mis-matched with the sound system or recorder input.3) Excessive wind noise or breath "pops."
HISS AND NOISE -- AUDIBLE DROPOUTS	<ol style="list-style-type: none">1) Transmitter gain (audio level) too low.2) Receiver antenna missing or obstructed.3) Operating range too great.
EXCESSIVE FEEDBACK	<ol style="list-style-type: none">1) Transmitter gain (audio level) too high. Check gain adjustment and/or reduce receiver output level (see page 7).2) Transmitter too close to speaker system.3) Move transmitter closer to the user's mouth.

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 inter-connecting 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
WATS: (800) 821-1121
FAX: (505) 892-6243

M170-BGO

SUPPLEMENTAL SHEET

The M170-BGO was designed specifically for bingo halls. This transmitter is a lower cost alternative to a traditional system that uses multiple receivers. Since all the transmitters are on the same frequency, only one receiver is necessary. The special design of the transmitter solves the problem of multiple transmitters. Normally, if you have two transmitters operating at the same time, they must be on different frequencies. The M170-BGO automatically shuts off when the switch is released.

The M170-BGO transmitter is activated by pushing the button on the side panel. Since you are only "on the air" as long as you hold the button in, several transmitters on the same frequency will not interfere with each other.

The transmitter must be held up to your mouth as you speak. A standard lavalier microphone can be substituted for the plug-in microphone if you wish to wear the transmitter on your belt rather than around your neck. When worn on the belt, the neck strap (the antenna) must not be wrapped around the transmitter.

SPECIFICATIONS AND FEATURES

Operating frequencies:	150 to 216 MHz
RF Power Output:	50 mW
Deviation:	±15kHz
Spurious Radiation:	60dB below carrier
Frequency Stability:	±0.005%
Equivalent Input Noise:	-126dB
Input Sensitivity:	8mV to 1.6V for full modulation
Input Compressor:	Soft Compressor; 12dB range
Electret Bias:	+5 Volt DC (positive bias)
Antenna:	Input cord or microphone body
Input Jacks:	
M170, M170-BGO and M170-LS:	Twist-lock micro for electret microphones
M170-XLR:	XLR for dynamic microphones; Twist-lock micro for electret microphones
M170-CTM:	Integral microphone/transmitter unit
Battery Indicator:	LED indicates battery condition
Battery:	9 Volt Alkaline
Controls:	Power on/off slide switch Recessed audio gain control Mute on/off toggle switch (M170-LS only)
Size:	1.1 x 2.3 x 3.3 inches
Weight:	M170:4 ozs. including battery M170-BGO:4.5 ozs. including battery M170-XLR:6 ozs. including battery M170-CTM:1.625 lbs. including battery
FCC ID:	DBZM170 (150-172 MHz) DBZM170A (174-216 MHz)
Emission designator:	54KOF3E

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

This warranty applies only to items returned to us, shipping costs prepaid, within one year from the date of purchase.

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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RIO RANCHO, NM 87124 USA

May 2, 1994