

RM12

Routing Matrix Module

OPERATING INSTRUCTIONS

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Rio Rancho, NM

INTRODUCTION

The RM12 Routing Matrix provides a programmable interface between logic inputs and relay contact outputs. The RM12 provides 12 logic inputs and 8 sets of relay contact outputs. The association of logic inputs and relay outputs is fully programmable. The programmed setups are stored in non-volatile EEPROM. The status of the logic inputs and relay outputs is indicated by LEDs on the front panel.

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GENERAL TECHNICAL DESCRIPTION

Please refer to Figure 1, RM12 Block Diagram, for this discussion.

The logic inputs of the RM12 are active low, and pulled up to +5V through 100K Ohm resistors. Either a mechanical switch closure, or an electronic closure (e.g. the output transistor of an opto-isolator) will suffice to activate the logic input. The relay outputs provide both the normally open (NO) and normally closed (NC) terminals of the 8 output relays, as well as the common (COM) terminal.

The MC68HC705 microcontroller continuously polls the logic inputs to determine their current state. If any logic inputs are active, the RM12 will activate the relay outputs which are associated with the active logic inputs. The RM12 can operate in either of two modes, Hold or Momentary. Mode selection is made via an internal jumper on the RM12 module. In the Hold mode, the last active logic input (and associated relay output) will be held until another logic input becomes active. In the Momentary mode, the relay outputs will only be active for as long as the associated logic inputs are active.

If multiple logic inputs are asserted simultaneously, all relay outputs associated with the active logic inputs will be activated.

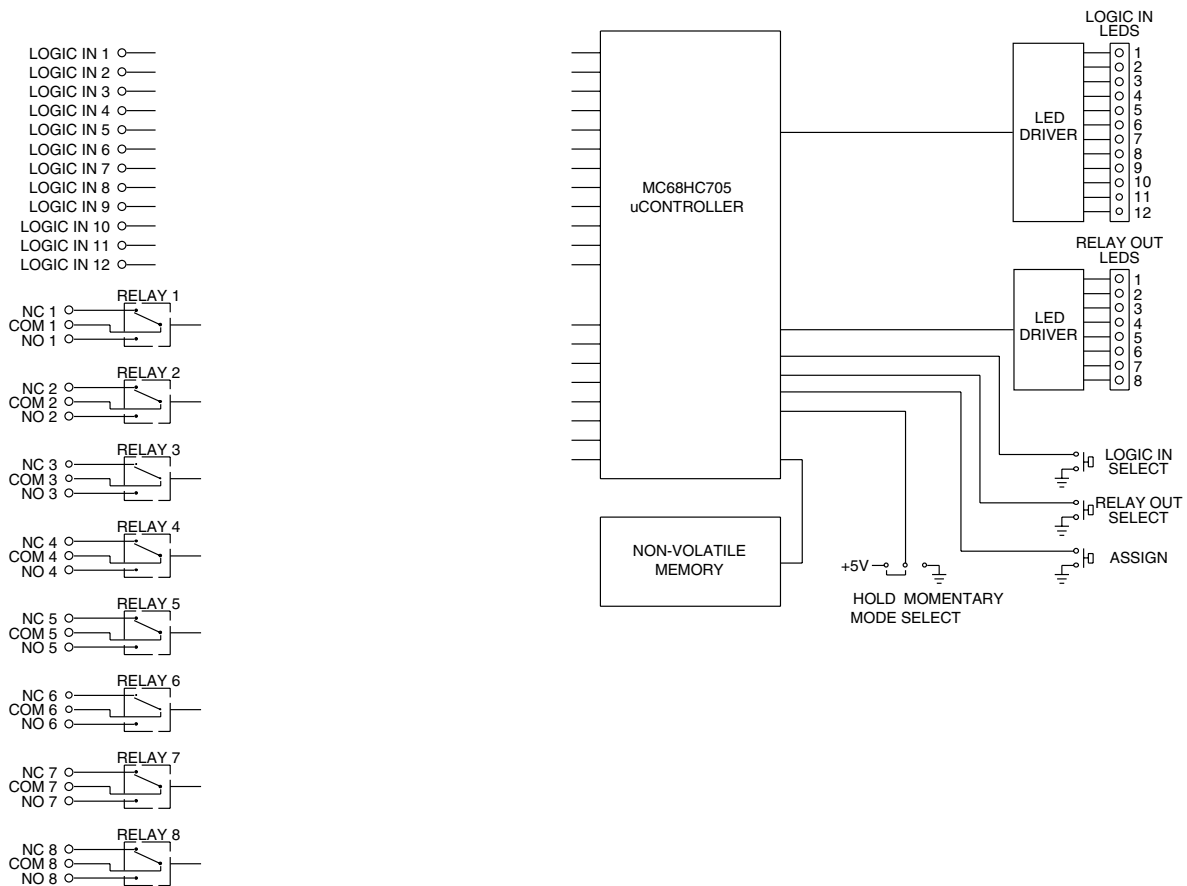


Figure 1 - RM12 Block Diagram

INSTALLATION

Before installing the module, see the Operating Instructions section for guidance as to how to select the operational Mode jumper.

The RM12 is installed from the rear of the Modular Audio Processor mainframe. Care should be taken when aligning the circuit board with the card guides. Once the module is aligned, slide the card forward in the mainframe until the female edge connector on the module seats firmly onto the male pins of the main bus board. Again, care should be taken to insure proper mating of the connectors.

Four #4 machine screws are provided with the RM12 module. The two screws with captive washers are used to secure the rear panel to the top and bottom rails of the mainframe. After this is accomplished, fit the front panel (also supplied) over the front of the module and secure it, using the two flat-head #4 machine screws, to the front panel of the Modular Audio Processor mainframe. Once these four screws are in place, the installation is complete.

FRONT PANEL DESCRIPTION

Logic In LEDs - Indicate which logic inputs are currently active.

Logic In Select Button - Advances the active logic input. Note that the Logic In Select button is only operative when **no** rear panel logic inputs are asserted. When a new logic input is selected, the relay output LEDs associated with that logic input light as well.

Relay Out LEDs - Indicate which relays are currently active.

Relay Out Select Button - Advances the active relay. The newly selected active relay will blink once if the relay out LED was previously off, and twice if it was previously on.

Assign Button - Changes the state of the active relay and saves the result to non-volatile memory.

REAR PANEL DESCRIPTION

Logic Input - Accept mechanical or electrical contact closures. Logic input is activated when the Logic In + and Logic In - terminals are connected together.

Relay Output - Allows connection to the eight separate relay outputs.

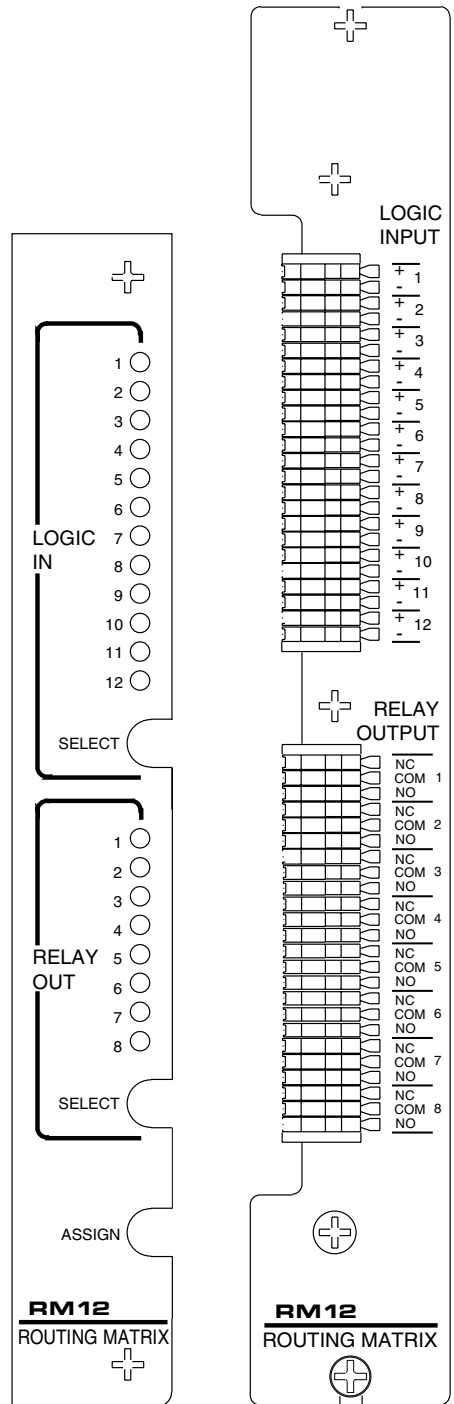


Figure 2 - RM12 Front & Rear Panels

OPERATING INSTRUCTIONS

Before programming the RM12, the Mode jumper should be set to the desired position. Figure 3 shows the position of the Mode jumper on the RM12 printed circuit board. If the left and center pins of the Mode jumper are shunted, the RM12 will operate in the Hold mode. The Hold mode will continue to keep the relay outputs associated with the last active logic input asserted, even if that logic input is no longer active. The Hold mode is useful if the RM12 is used with momentary switches, but system operation dictates that the last active logic input be held until a new one is asserted. If the center and right pins of the Mode jumper are shunted, the RM12 will operate in the Momentary mode. In this mode, the relay outputs are asserted only as long as the associated logic inputs are active.

Note that the factory preset associations between logic inputs and relay outputs may be restored by pressing both the Relay Out Select and Assign buttons while turning on the power to the mainframe. The RM12 will then light the Logic In LEDs from 1 to 12 and their associated factory preset relay outputs. *Restoring the factory presets will erase and overwrite any existing user setup.*

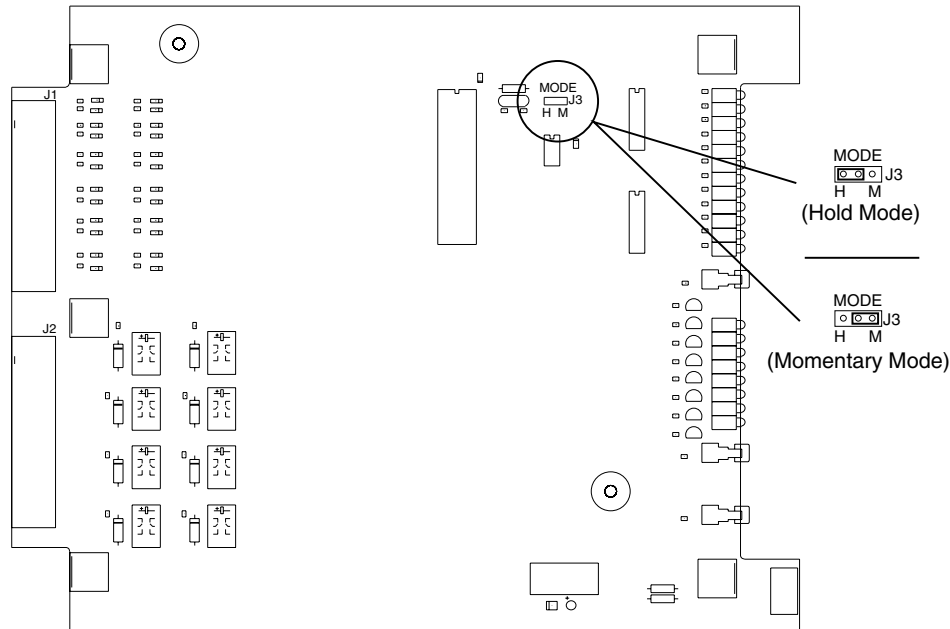


Figure 3 - RM12 Mode Jumper Location and Settings

Programming the RM12

After power is applied to the mainframe, the RM12 may be programmed for associations between the logic inputs and relay outputs. The logic inputs may be activated in either of two ways. If there are no logic inputs asserted through the rear panel connection, the Logic In select button is active. Under this circumstance, simply press the Logic In Select button until the desired logic input is reached. The currently stored relay output setup will be shown on the Relay Out LEDs.

If the logic inputs to the RM12 are connected at the time of programming, and can be asserted one at a time, this method may be used to activate the desired logic input.

When the desired logic input is activated, the Relay Out Select button should be pressed until the desired Relay Out LED blinks. The blink indicates that the relay output is the active relay output and can be assigned, using the Assign button. Note that Relay Out LEDs which are not lit will blink once, while those that are already lit will blink twice.

The Assign button will reverse the current state of the active relay output. In addition, the new setting will automatically be saved to non-volatile memory.

Once all the associations between logic inputs and relay outputs have been programmed, the RM12 is ready for use.

SAMPLE APPLICATIONS

APPLICATION 1

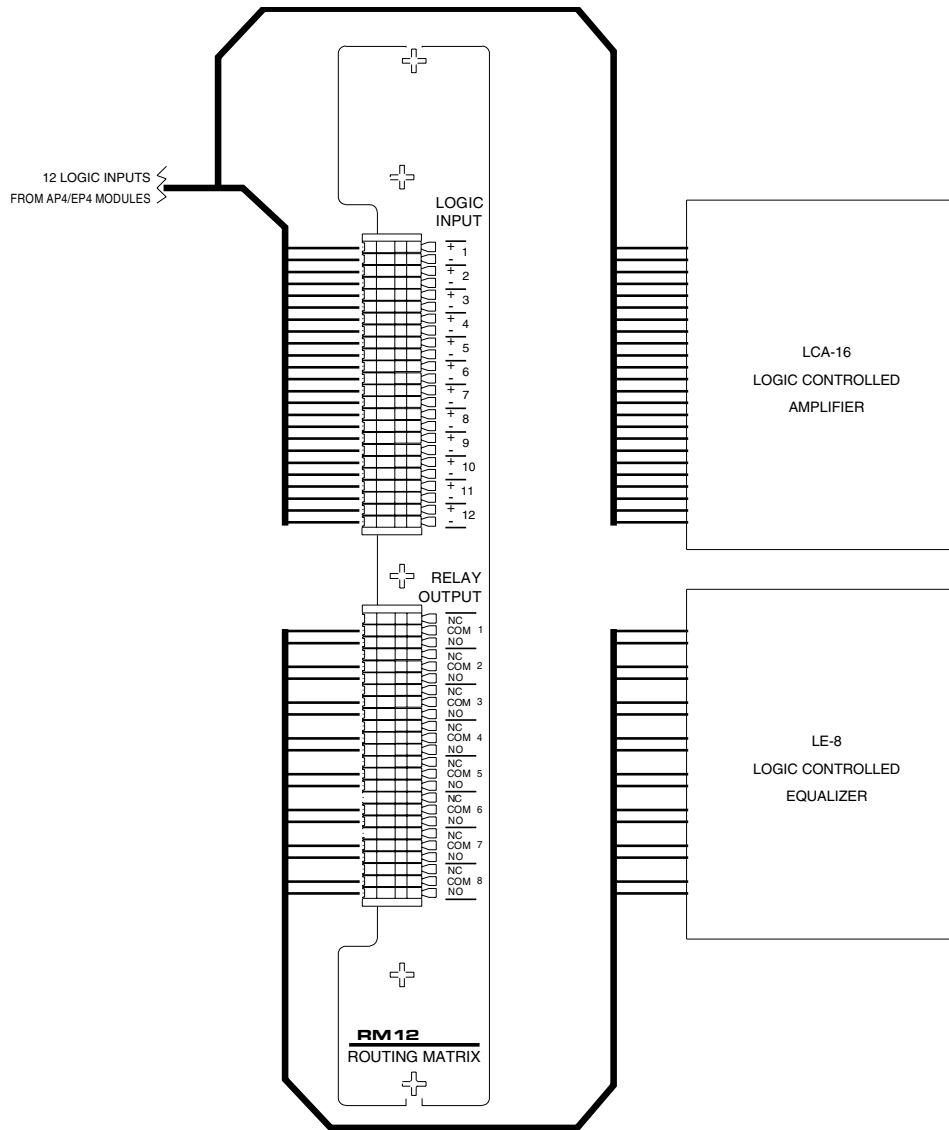


Figure 4

In this application, the RM12 is used to interconnect 12 logic inputs from the mic preamps to the 8 logic inputs of the LE8. This situation is common where one LE8 will be used with more than 8 microphones. The RM12 allows multiple microphones to trigger the same LE8 logic input, while allowing each separate microphone to be connected to the logic inputs of the LCA-16.

APPLICATION 2

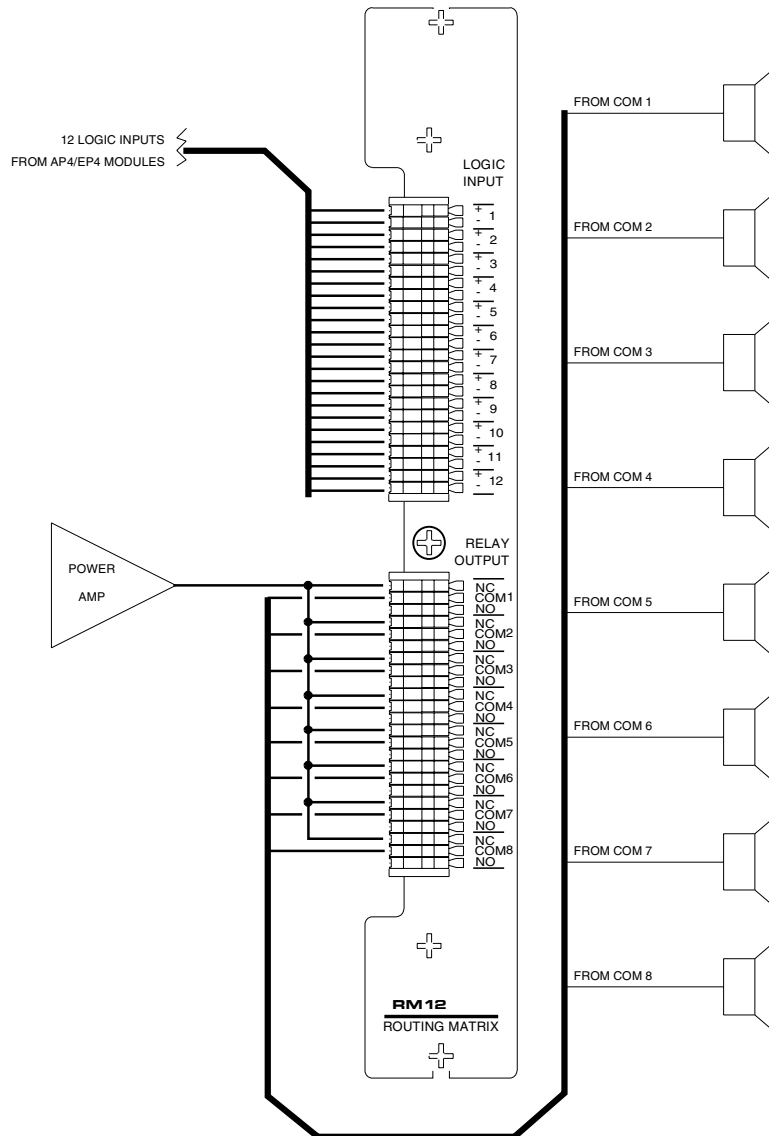


Figure 5

In this application, the RM12 serves a simple relay muting system to help eliminate feedback. Each of the 12 microphones can be programmed to mute one or more of the 8 system loudspeakers when it is active. Note that the speakers are connected through the common and normally closed connections, such that when a relay output is made active by an active microphone, the relay interrupts the amplifier to speaker connection, thereby muting the speaker. The only caution here is to observe the maximum switching power rating of 62.5VA for each relay output.

APPLICATION 3

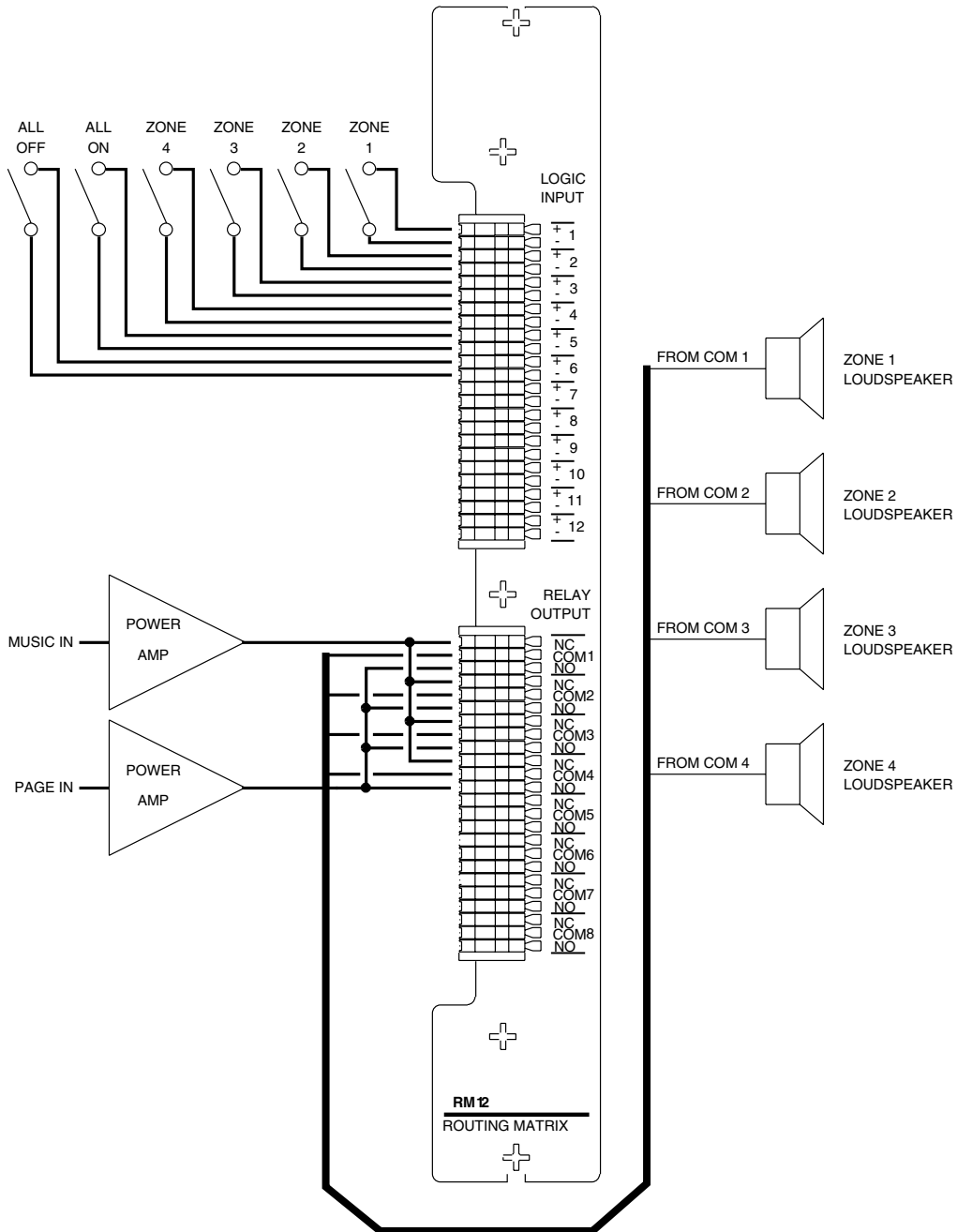


Figure 6

In this application, the RM12 serves as the controller of a 4 zone paging system with background music. The 6 switches control which zones are addressed by the page. In addition, an All On and All Off switch allows all zones to be paged or set to background music, respectively. This system can easily be expanded to more zones.

SPECIFICATIONS

Logic Inputs:

Number of Inputs:	12
Active Level:	Active Low
Input Network:	100K Ohms, pulled up to +5V

Relay Outputs:

Number of Outputs:	8
Terminals:	Normally Open (NO), Normally Closed (NC) Common (COM) for each relay
Max. Switching Power:	30W, 62.5VA (Unity power factor)
Max. Switching Voltage:	30V DC
Max. Switching Current:	1A

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:
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PO Box 15900
Rio Rancho, NM 87174
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World Wide Web: <http://www.lectrosonics.com>

email: 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, 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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