

# **MM12**

## **MATRIX MIXER MODULE**

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(For serial numbers 214 and up)

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### **OPERATING INSTRUCTIONS**

#### **and trouble-shooting guide**

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**LECTROSONICS, INC.**

Rio Rancho, NM

# INTRODUCTION

The MM12 is a 12 in (unbalanced) by 8 out (balanced) matrix audio mixer. It is designed for selective mix minus output from AP4 modules on the Lectrosonics Modular Audio Processor.

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## GENERAL TECHNICAL DESCRIPTION

Each input channel is unbalanced. As such it is important to maintain correct polarity on the inputs. The input channels are mixed via a DIP switch matrix located on the board which directs the output to each of eight output channels. The mixed outputs have a jumper selectable mute function. When the mute function is engaged via a contact closure, the outputs are muted approximately 43dB. The output channels are balanced and offer a maximum gain of 6dB.

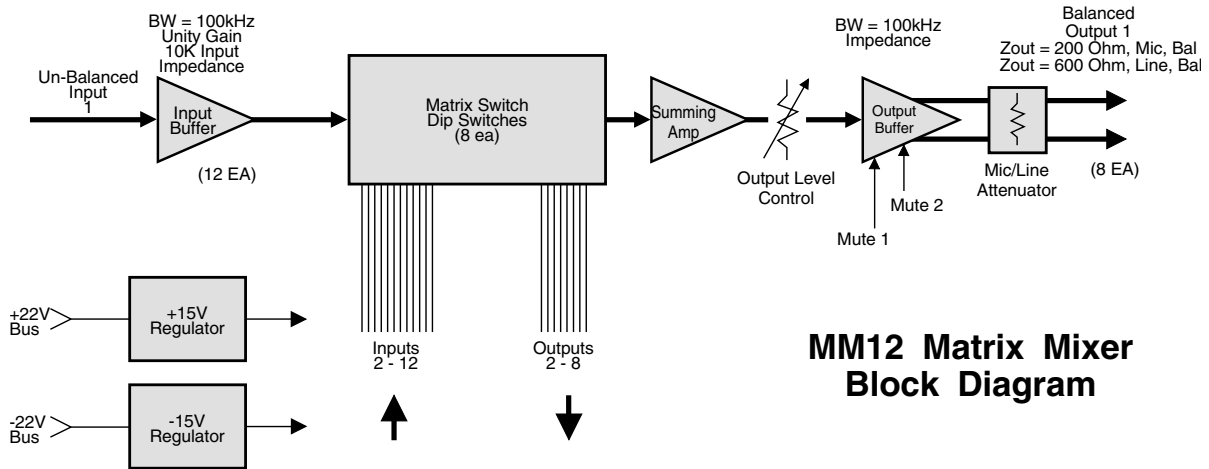


Figure 1 - MM12 Block Diagram

## REAR PANEL DESCRIPTION

**INPUTS (1-12)** - Accepts an unbalanced input to the module. Each channel is labeled with the channel number for (+) signal (hot) and (-) for ground.

**OUTPUT (1-8)** - Provides low impedance balanced outputs. Gain is unity when balanced, -6db when unbalanced. The ground is common to all outgoing channels and so each pair (1&2, 3&4, etc) have a common ground connector.

**MUTE** - The four bottom connectors provide for the muting function. The mute function affects the output buffer. Connect a dry contact for muting. Two mute inputs are provided, so a channel may respond to either Mute 1 or Mute 2. Whether a channel responds to either mute is determined by the setting of the Mute jumper for each channel. See page 5 for jumper instructions.

## INSTALLATION

The MM12 module is installed from the rear of the Modular Audio Processor mainframe. The printed circuit board can fit into any of the ten slots provided for Modular Audio Processor modules. Once the module is fit into the card guides for the slot, it may be slid forward in the mainframe until the female edge connector seats firmly onto the male pins of the main bus board.

Care should be taken when inserting the edge connector onto the pins to be sure there is correct alignment.

Two #4-40 machine screws with captive washers are provided to secure the rear panel of the MM12 to the top and bottom rear rails of the Modular Audio Processor mainframe. Two #4-40 flat head screws are provided to secure the front panel of the MM12 to the front panel of the Modular Audio Processor mainframe. Once these eight screws are in place, the installation of this module is complete.

## OPERATING INSTRUCTIONS

Operation of the MM12 is quite straightforward. An unbalanced signal is supplied to the input connector. When connected to the LP4 module, the signal is taken from one of the two send outputs located on the back of the LP4. The signal is returned via the ground to the GND connection on the back of the LP4.

The output channels are connected via the terminals located on the lower end of the card. The connections are in groups of 5. Each five connectors permits connection of two balanced output channels. The first terminal is the first channel (+) positive, the second is the first channel (-) negative, the third is ground for both channels (shield), the fourth is the second channel (+) positive and the fifth connector is the second channel (-) negative. This pattern is repeated for each of the 4 pairs of output channels.

On all connections it is recommended that all leads be tinned prior to insertion into the clamp jaws.

The muting function is achieved by connecting the "+" and "-" terminals on either pair of the last four terminals on the MM12 at the bottom. Output channels 1-8 can be individually selected for muting via a jumper located on the board. See Figure 3. The factory default is mute off. By moving the jumper, the mute function may be activated.

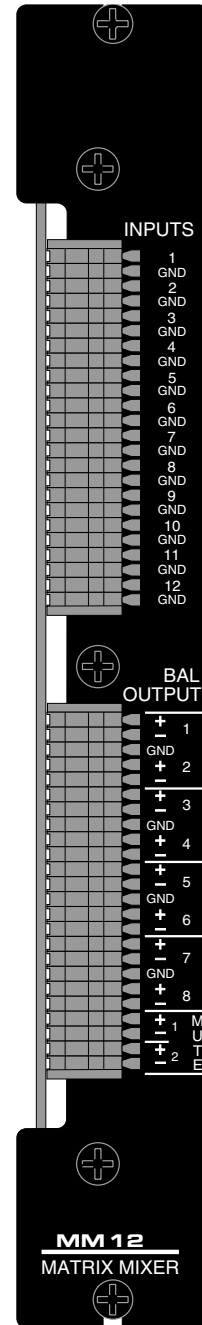


Figure 2 - MM12 Rear Panel

# INTERNAL SWITCHES & JUMPERS

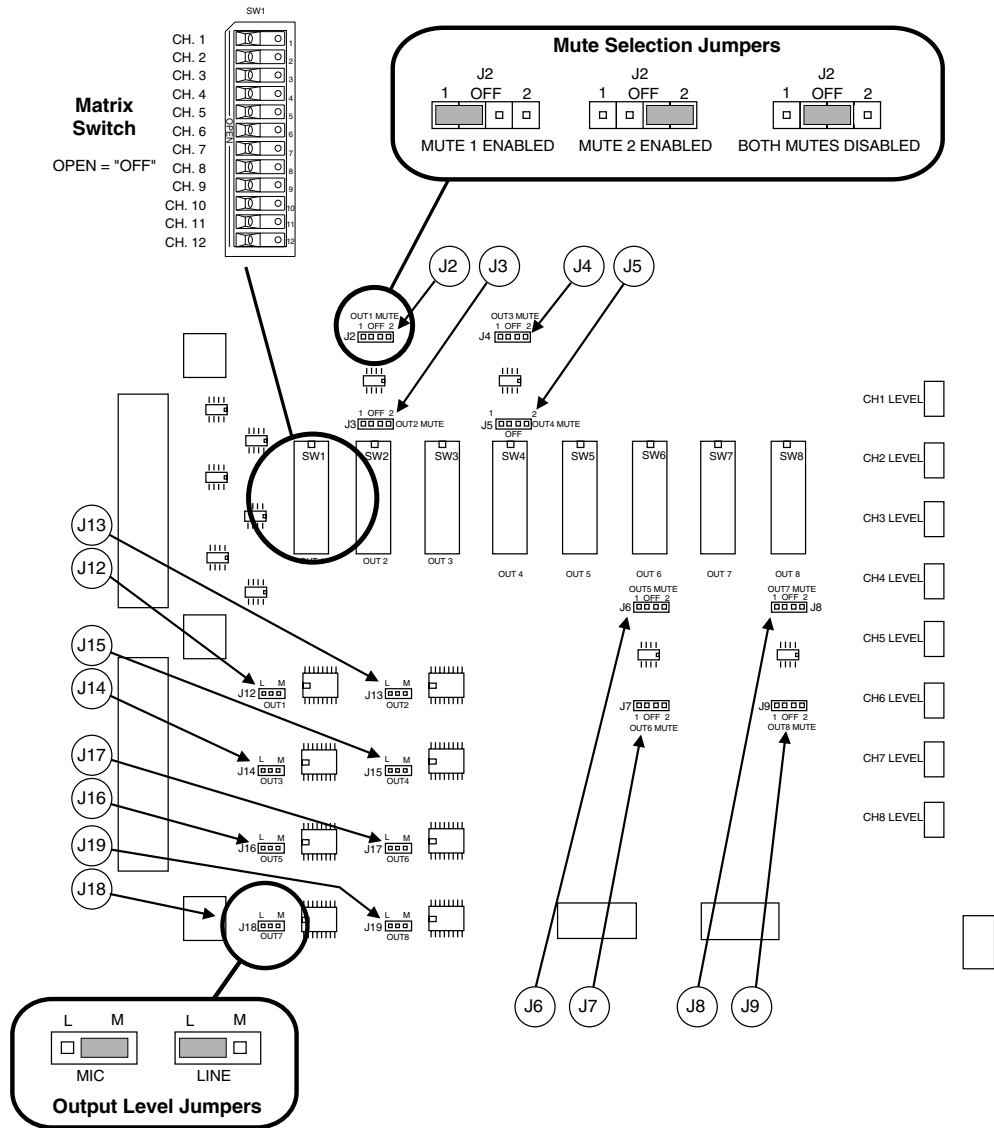


Figure 3 - MM12 Internal Switches and Jumpers

	Output 1	Output 2	Output 3	Output 4	Output 5	Output 6	Output 7	Output 8
Mute	J2	J3	J4	J5	J6	J7	J8	J9
Mic/Line Output Level	J12	J13	J14	J15	J16	J17	J18	J19
Matrix Switch	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8

# SPECIFICATIONS

<b>Maximum Gain:</b>	+6dB
<b>THD @ +4dBv, 20-20KHz:</b>	Less than 0.01%
<b>IMD @ +4dBv, 60/7KHz:</b>	Less than 0.01%
<b>Noise at Unity Gain: 20-20KHz</b>	-90dBv, one input assigned -80 dBv, all inputs assigned
<b>Maximum Input Level:</b>	+20dBv
<b>Input Impedance:</b>	10K Ohms
<b>Input Type:</b>	Unbalanced
<b>Crosstalk:</b>	70dB, +4dBv at 2kHz reference
<b>Mute Attenuation:</b>	40dB
<b>Output Impedance:</b>	600Ω line, 200Ω mic
<b>Maximum Output Level:</b>	+20dBv into 600 Ohms in the line position -20dBv in the mic position

## 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.

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**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, 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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