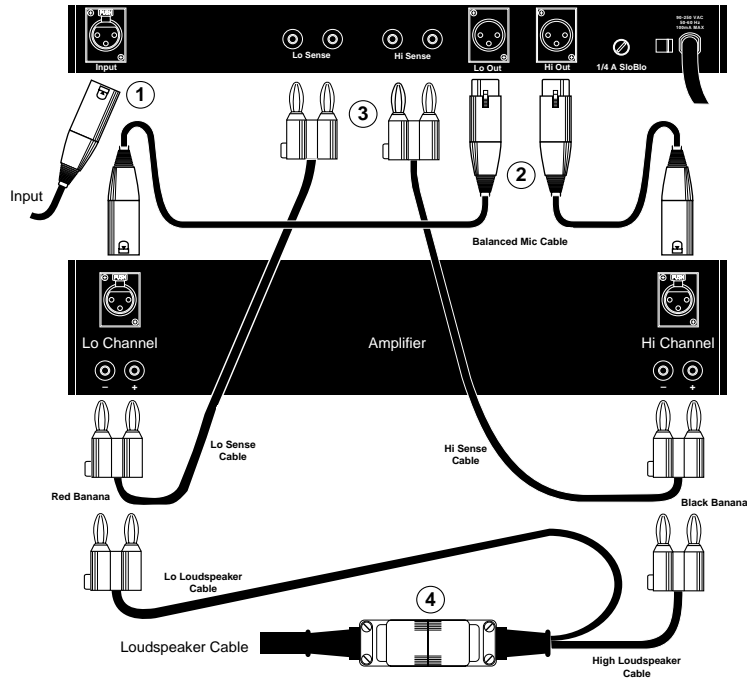


The Meyer Sound M-3A is a single channel active signal processor designed for use with the MSL-3A loudspeaker. It occupies a single 1 3/4" rack space.

The functions of the M-3A are:

- ISO Input™ to prevent ground loops
- Active crossover for bi-amplification
- SpeakerSense™ driver protection
- Loudspeaker frequency and phase response alignment
- Muting relays to prevent turn on/off transients



The M-3A operates at line level and is intended to be the final component in the signal chain before the power amplifier. Connections between the M-3A and the power amplifier should be made according to the diagram above.

**3. SpeakerSense™** connections are made from the output of the power amplifier back to the M-3A Sense inputs. The **Hi** output of the power amplifier **must** be connected to the **Hi** Sense input, and the **Lo** output of the power amplifier to the **Lo** Sense input, in order for the **SpeakerSense** driver protection circuitry to operate properly. **Note:** polarity of these connections does not matter.

**Connections**

**1. Signal inputs** to the M-3A may be either balanced or unbalanced. For best signal-to-noise ratio, the average input level should be at least 1 volt RMS. The M-3A will accept peak input levels up to +23 dBu balanced or unbalanced (see figure 1).

**2. Signal outputs** from the M-3A may be balanced or unbalanced. The maximum output levels before clipping are +26 dBu balanced, +20 dBu unbalanced (see figure 1). Because of the isolated and floating topology of the ISO Input™, it is virtually impossible for ground loops to develop as long as no pin of the input is linked to the connector shell. (The connector shell is connected to earth through the chassis.)

**4.** Connections between the power amplifier outputs and the MSL-3A loudspeaker should be made in accordance with the **MSL-3A Operating Instructions**. These connections **must be verified for correct polarity and correct channel assignment (Hi to Hi, Lo to Lo)**. Color codes for the pigtail adapter and the loudspeaker cable are as follows:

- Lo + (Red) P-Connector pin #1
- Lo - (Black) P-Connector pin #2
- Hi + (Green) P-Connector pin #3
- Hi - (White) P-Connector pin #4

Signal Source Output Configuration	Wiring of ISO Input™			Output Connector Polarity			Comments
	Pin 1	Pin 2	Pin 3	Pin 1	Pin 2	Pin 3	
Balanced	n/c	-	+	GND	-	+	Best CMRR and lowest hum
	n/c	+	-	GND	+	-	
Unbalanced	n/c	GND	+	GND	-	+	Best performance unbalanced
	n/c	+	GND	GND	+	-	

**Figure 1. Polarity Table**

**Note:** GND = Signal Ground  
(Do not connect the shield to any pin. The shield may be connected to the shell.)



## Operation

Once all the connections have been made and verified, switch on the M-3A, then the power amplifier.

- Set the power amplifier level controls (if any) to 23 dB voltage gain (14 VRMS out for 1 VRMS in). It is preferable to check the amplifier gain with a sine wave generator and RMS-reading voltmeter.

- Advance the M-3A **Attn dB** level control to set the system sensitivity. You may wish to use a pre-recorded source such as a Compact Disc™ to verify system operation. If the system is not operating properly, recheck all connections.

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## Preset Panel Controls

The setup controls on the M-3A Preset Panel are designed to be used to tailor the system response for different applications. Remove the Preset Panel cover plate to adjust the controls.

**Safe Switch.** The M-3A incorporates three limiters in the SpeakerSense driver protection circuitry (see detailed description, below). When the **Safe** switch is engaged the RMS limiters come on at lower power levels, affording added protection when heavy continuous power demands are placed on the system (the VHF peak limiter threshold is unaffected). For operator convenience, a green LED indicator is provided on the M-3A front panel and when the **Safe** switch is engaged, this indicator will light. **Note:** It is recommended that the **Safe** switch be engaged until the operator is familiar with the system's capabilities.

**VHF Switch and Control.** The **VHF** Switch affects the very high frequency response of the system. It selects either a preset (**CAL**) high frequency response or variable response (**VAR**). In the **VAR** position, system response around 16 kHz is adjustable ( $\frac{3}{4}$  turn screwdriver adjustment) from +5 dB to -2 dB around the preset point (CCW for increased level at 16 kHz). This feature may be used to emphasize or de-emphasize sibilants, compensate for room acoustics, and so on.

**Lo Cut Switch.** This switch introduces a 6 dB/octave high pass filter at 160 Hz. It is designed to provide an alternative crossover slope when using Meyer Sound subwoofers, and can also be used to compensate for the proximity effect of cardioid microphones.

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## SpeakerSense™ Driver Protection

Through the **Sense** connections back to the M-3A from the power amplifier, the **SpeakerSense** circuitry of the M-3A continuously monitors the voltage across both the high and low frequency drivers. If the amplifier output exceeds the safe operating limits of the drivers, independent high- and low-frequency limiters are automatically activated, holding down the power level of the M-3A outputs.

The operation of the SpeakerSense circuitry is indicated by a set of five LEDs located on the front panel.

**Sense indicators.** These function as signal presence indicators, and verify that the **Sense** connections to the M-3A are made. These indicators will be green whenever a signal is present, or will flicker at low signal levels. **If the Sense connections are not made or are swapped, or if the voltage gain of the power amplifier is greater than 32 dB or less than unity, the indicators will turn red and the outputs will be muted.**

**Limit Indicators.** These indicators will come on whenever the corresponding limiter is activated, and a moderate amount of flashing of these indicators is acceptable.

## Limiters Operation

To verify limiter operation in the field:

- Disconnect loudspeakers, leaving the amplifier and the M-3A in their standard connection configuration.
- If your amplifier requires a load, use resistive loads sufficient to dissipate the full power of the amplifier.
- Turn on both the M-3A and the amplifier.
- Set the VHF switch to VAR, the Lo Cut out and the Safe switch in.
- Supply an input to the M-3A, preferably a sine

wave oscillator. If you do not have an oscillator, use a Compact Disc™ with dense program material and a mixer to produce a line level signal.

If you are using an oscillator, set the frequency according to this table:

LF limiter	HF limiter	VHF limiter
200 Hz	5,000 Hz	16,000 Hz

Bring up the input level until you see the corresponding limit indicator come on. Since in each case the indicator will light only if the limiter actually operates, it provides a positive indication that the limiter is functioning.

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## Balancing Amplifier Gain

The standard connection configuration for the M-3A Control Electronics Unit uses a single two-channel amplifier as a biampifier, one channel for the lows and one for the highs. In large systems where a number of M-3A's are used, some may prefer to assign one or more amplifiers only to the lows, and other amplifiers only to the highs. In either case, the Lo and Hi amplifiers must have equal voltage gain. If they do not, you may balance your system using an oscillator and an RMS-reading voltmeter.

- Connect the M-3A and amplifiers as you wish to use them, **leaving speakers disconnected**.
- If an amplifier requires a load, use an 8-ohm resistor sufficient to dissipate the full power of the amplifier.

- Input the oscillator to the M-3A and set its frequency to 800 Hz  $\pm$ 5 Hz (use a frequency counter if possible).
- Set the M-3A **Lo Cut** switch out, the **VHF** switch to CAL, and the **Safe** switch out.
- Measuring with the voltmeter at the **Hi** amplifier output, advance the M-3A **Attn dB** control to a convenient reading (a few volts).
- Now measure at the **Lo** amplifier output. If the level is different, adjust the input level control of the amplifier channel whose output voltage is higher until the Hi and Lo outputs are equal.

**Specifications**

Input Type <sup>1</sup>	Balanced ISO-Input™, 10k ohms, 5k ohms per leg
Output Type	Active push-pull, 200 ohms output impedance
Maximum Input Level	
Balanced	+23 dBu
Unbalanced	+23 dBu
Maximum Output Level	
Balanced	+26 dBu
Unbalanced	+20 dBu
Hum and Noise <sup>2</sup>	<-90 dBV
Dynamic Range <sup>3</sup>	>110 dB
Sense Inputs	10k ohms true differential, opto-isolated
Electronic Crossover Frequency	800 Hz
High Frequency Delay Type	Active all-pass
Driver Protection Circuitry	
Low Frequency	RMS limiter, 100 msec integration time
High Frequency	RMS limiter, 100 msec integration time VHF peak limiter, 2 msec on-time, 35 msec release time
Indicators	
Sense/Amplifier Gain Detection; Hi and Lo	Green/Red LEDs
Limit; Hi, Lo and VHF	Red LEDs
Safe	Green LED
Power	Green/Red LEDs
Controls	
Front Panel	Input attenuator, AC power switch
Preset Panel	Lo Cut switch, Safe switch, VHF var/cal switch VHF control (3/4-turn screwdriver adjust)
Rear Panel	Ground lift switch, AC range switches
Connectors	
Balanced Input/Output	3-pin XLR (A-3) female/male
Sense Inputs	Banana jacks (2 dual)
Power	120/240 VAC, 50/60 Hz (internally switchable)
Physical Dimensions	19" W x 1 3/4" H x 7 3/4" D, standard rack mount
Weight	8 lbs (3.6 kg)

**Note 1:**

**ISO™ Input: Pins 1, 2 and 3 are transformer-isolated, and shell is connected to chassis/AC earth ground.**

**Note 2:**

**"A"-weighted, unbalanced.**

**Note 3:**

**"A"-weighted noise floor to maximum output.**

Note: The M-3A utilizes Meyer Sound's exclusive ISO™ Input. Pins 1, 2 and 3 are transformer-isolated, and the connector shell is connected to earth ground. The Input GND/Lift switch controls the connection between pin 1 and circuit common, which is tied to AC/chassis ground through a 500 ohm resistance. If hum problems occur, this switch may be used to control ground loops in the system.

