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# **M-1 Digital Mic Processor**

## **TECHNICAL MANUAL**

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 *Wheatstone Corporation*

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600 Industrial Drive, New Bern, North Carolina, USA 28562

**VORSIS** ULTRA-HIGH RESOLUTION PROCESSING

**M-1 Digital Mic Processor Technical Manual - 1st Edition**

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# Attention!

## **Federal Communications Commission (FCC) Compliance Notice: Radio Frequency Notice**

**NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



**This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.**

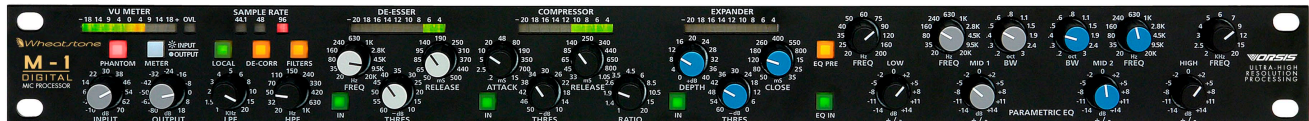
This equipment must be installed and wired properly in order to assure compliance with FCC regulations.

**Caution! Any modifications not expressly approved in writing by Wheatstone could void the user's authority to operate this equipment.**



# M-1 Digital Mic Processor

## Quick Start Guide



Please inspect the contents of the package to ensure that the following items are present:

- Wheatstone M-1 Unit - Qty 1
- M-1 Technical Manual and Software CD - Qty 1
- AC Power Cord - Qty 1
- Quick Start Guide - Qty 1

## Install and Connect the M-1

1. Install the M-1 in the equipment rack using at least two rack screws. If only two screws are used they *must* be installed in the bottom holes of the rack ears to prevent undue stress on the front panel and possible bending.
2. Connect the microphone to the XLR female microphone input on the rear panel.
3. Connect either line level analog out or AES digital out XLR connector to your desired signal path.
4. If using the M-1 GUI software connect rear panel Ethernet RJ-45 jack as appropriate for your intended use:
  - a) for direct connection to PC use crossover CAT5 cable;
  - b) for connecting into your LAN use a straight through CAT5 cable from Ethernet switch or HUB.
5. Connect the AC power cord to the M-1 rear panel connector and then plug it into AC power. The M-1 unit will power up.

The M-1 microphone processor may be controlled via three different methods:

1. Full access to all controls using the front panel of the unit.
2. Full access to all controls using the standard GUI interface.
3. Selection of presets only using the Talent Control Interface.

Options 2 and 3 share the same methods for configuring hardware devices, therefore the method for configuring one is the same as the other. Please refer to the instruction for configuring the “full control” GUI (see Chapter 2) in order to configure the Talent Control Interface.

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## Operating the M-1 Locally

You may use the front panel knobs and buttons to set operating modes and make adjustments as long as the front panel “Local” indicator is illuminated. If local operation is desired and the “Local” indicator is not illuminated, please, press and hold the “Local” button for several seconds until Local Mode has been selected as indicated by the “Local” button being illuminated. “Local” mode is released in the same fashion.

## Operating the M-1 Remotely – Installing GUI Software

For remote operation via the GUI software supplied with the unit, insert the M-1 software CD into a Windows XP/2000 computer and follow the steps below to install the software. If the software installation does not automatically start when the CD is inserted into the drive, you can start the installation manually by:

- Clicking Start
- Then click Run
- Then click Browse
- Browse the “My Computer” device tree to locate the CDROM device and then double click it.
- When the contents of the CDROM drive appear in the window, locate the auto-run.inf file on the CDROM and double click it.
- Follow the on screen instructions to complete the GUI installation.

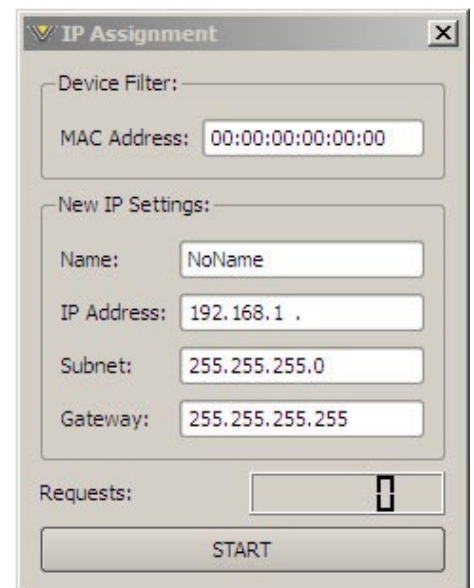
## Configuring the M-1 IP Address\*

Once the GUI has been installed you must configure it and the M-1 so that they can communicate with each other. This requires configuration for both the M-1 and the remote GUI so that they agree on the networking parameters.

Before starting the configuration procedure, please locate and carefully make a note of the M-1’s 12-digit MAC Address which is located on a label either on the top cover or the rear panel. This address will be in the format 00:50:C2:23:xx:xx where xx:xx are the digits unique to your M-1.

**Note that if the MAC address is not entered carefully and correctly in the following steps, the M-1’s IP address will not be changed!**

Start the M-1 GUI software. Then right click on the control area of the GUI and select Hardware/Assign IP Address. The window on the right will appear:



**Figure 1**

*\*The M-1 does not support DHCP (Dynamic Host Configuration Protocol) and therefore requires a static TCP/IP address on the network. Its presence on the network will not interfere with DHCP addressing of other network connected devices as long as the IP address that is configured for the M-1 does not conflict with the address of any other device on the network. Please consult your friendly IT manager if necessary.*

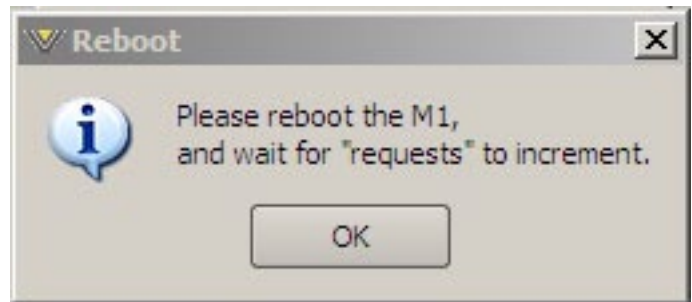
Next, carefully enter your M-1's MAC address in the MAC Address field. The MAC address must be carefully entered because the GUI will "send" the IP address information to the device that owns the MAC address that was entered in this step. If the MAC address is incorrect, the M-1 will never "hear" it.

Next, enter a pet name for your M-1, like AirStudio1, etc.

Then, enter the IP address that you wish the M-1 to have, noting that this address must be unique if the M-1 will be communicating over your network.

Next enter the desired Subnet Mask and Gateway IP addresses. In some cases (but not all) it is sufficient to use 255.255.255.0 for the Subnet Mask and 255.255.255.255 for the Gateway IP address.

Once this is done, click the "Start" button at the bottom of the IP address configuration box. A message similar to the one on the right should appear:



Click OK. Remove power to the M-1 for a few seconds and then reapply it. As the M-1 is booting up, the "Requests" number in the IP Assignment window should increment to something other than zero (please see the bottom of the image in Figure 1).

When this occurs the M-1 has been programmed with its new IP address and is ready for use. Click the X in the upper right corner of the IP Assignment window to close the window.

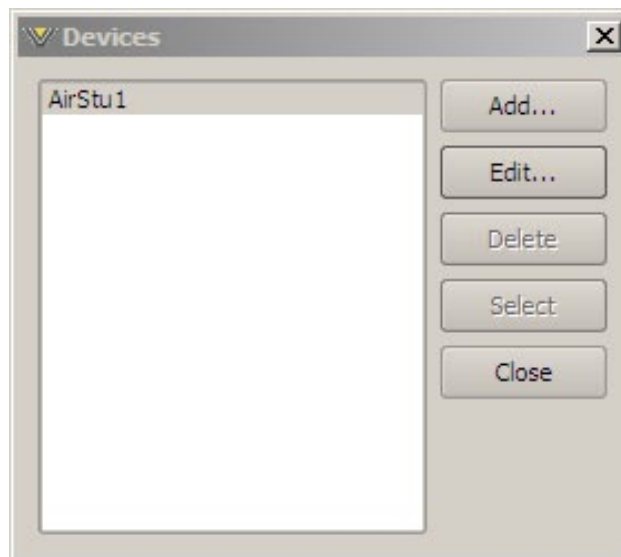
Now that the M-1 has its own TCP/IP identity, we must configure the GUI so that it can talk to the M-1. This is done by adding "devices" to the list of M-1's that the GUI knows about. To do this, locate and click on the "Devices" button that is located along the right side of the GUI.



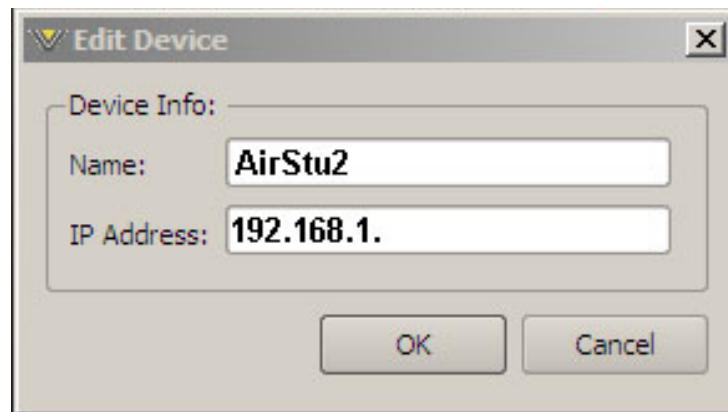
Location of "Devices" button

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When this is done, the following window will pop up:



Next, click the “Add” button and a new dialog box will appear. This is how new devices are added or the configuration of existing devices modified.



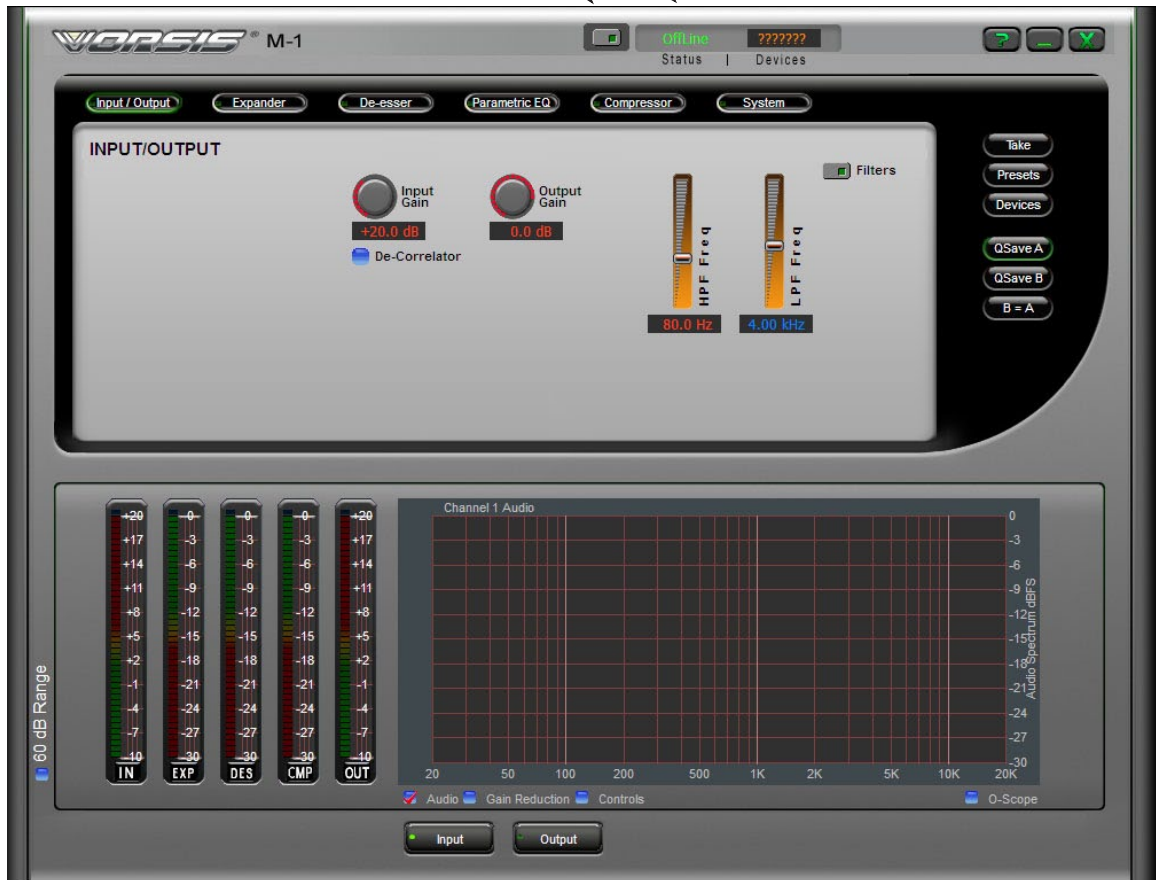
First, enter the same pet name that you used when you assigned the IP address to the M-1. The above dialog shows us adding a new device called “AirStu2,” noting that there is already a configured device showing in the Devices dialog box called AirStu1.

Then enter the IP address that you configured the M-1 for in the previous steps. Note that it is always best to completely delete any existing data in the IP Address box and enter the complete address from scratch. We apologize for this inconvenience.

After this is done you may click “OK” on the Edit Device box. Then, in the Devices dialog box highlight (single left click) the M-1 device that you just added and click on “Select.” This step tells the GUI specifically which M-1 you want to connect to.

Next, click on the Online/Offline button just to the left of the *Status* indicator, unless the button’s green indicator is already lit.

Online Status Indicator  
Online/Offline Button



In the Status window you may see the message “Trying” as the GUI is handshaking with the M-1. Once the handshake is complete and communication protocols are locked in the Status message should revert to “Online.” The device’s name will show up in the Devices display.

If for some reason the GUI cannot connect with the M-1, the “Trying” status message will remain and will occasionally blink as the GUI retries the establishment of a connection. Under these circumstances the configuration of the GUI and M-1 should be carefully examined to ensure that the destination TCP/IP address is consistent between the two.



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Here are the operating modes when the states of the front panel Local mode, the remote GUI, and the rear panel Lock mode switch are considered:

- If Lock mode is off and Local mode is selected when the remote GUI establishes a connection to the M-1, only the front panel controls will have control, but the GUI can still display changes made from the front panel.
- If Lock mode is off, the state of the front panel can be changed from Local to not Local.
- If Lock mode is off and Local mode is not selected when the remote GUI establishes a connection to the M-1, only the GUI has control.
- If Lock mode is on when the front panel is not in Local mode, the ability to go to Local mode is locked out.
- If Lock mode is enabled and the front panel is not in Local mode when the remote GUI establishes a connection to the M-1, then only the GUI has control.
- If the front panel is in Local mode *before* Lock mode is enabled, both the remote GUI and the front panel are locked out!

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# General Information

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# General Information

## Introduction

The Wheatstone M-1 is a flexible and easy-to-use digital Microphone Processor offering user presets, security, networkability, an all digital DSP-based framework, and easy to set up parameters. This unit occupies one 19" wide rack space (height 1 3/4"), and is 10" deep.

All individual adjustments of the M-1 can be controlled from the front panel, and most can also be controlled from the remote GUI, enabling voice talent to have their own sound at the press of a button. In fact, from one GUI it is possible to control an entire facility equipped with M-1's, making multiple Microphone Processor management easy and straightforward.

The salient features of the M-1 include a very high quality microphone preamplifier, a two band parametric EQ, two bands of shelving EQ, and Vorsis-designed dynamics controllers such as de-esser, compressor, and expander. The unit comes loaded with factory designed presets, although designing your own sound is easy thanks to features such as "Quick save" and quick compare, which allow you to toggle back and forth and compare different presets as you adjust them.

The electrical specifications of the M-1's microphone preamplifier approach the theoretically perfect. Noise within the audio band nudges the theoretical minimum, limited only by the thermal (Johnson) noise of the precision resistors\* used. Frequency response is ruler flat beyond the extremes of human hearing, and unwanted signal distortions such as THD, IMD, and TIM are vanishingly low.

Static waveform fidelity is virtually perfect, affected only by the input high pass and low pass filters, the de-correlator when it is in circuit, and any equalization being used. Dynamic waveform fidelity is virtually perfect (except when the de-esser is dynamically modifying the signal spectrum in the presence of voice sibilance).

The XLR and CAT5 connectors, located on the rear of chassis, make installation very simple.

*\* Thermal noise is intrinsic to all resistors and is not a sign of poor design or manufacture, although certain types of resistors may have excess noise.*

## Pre-Installation Notes

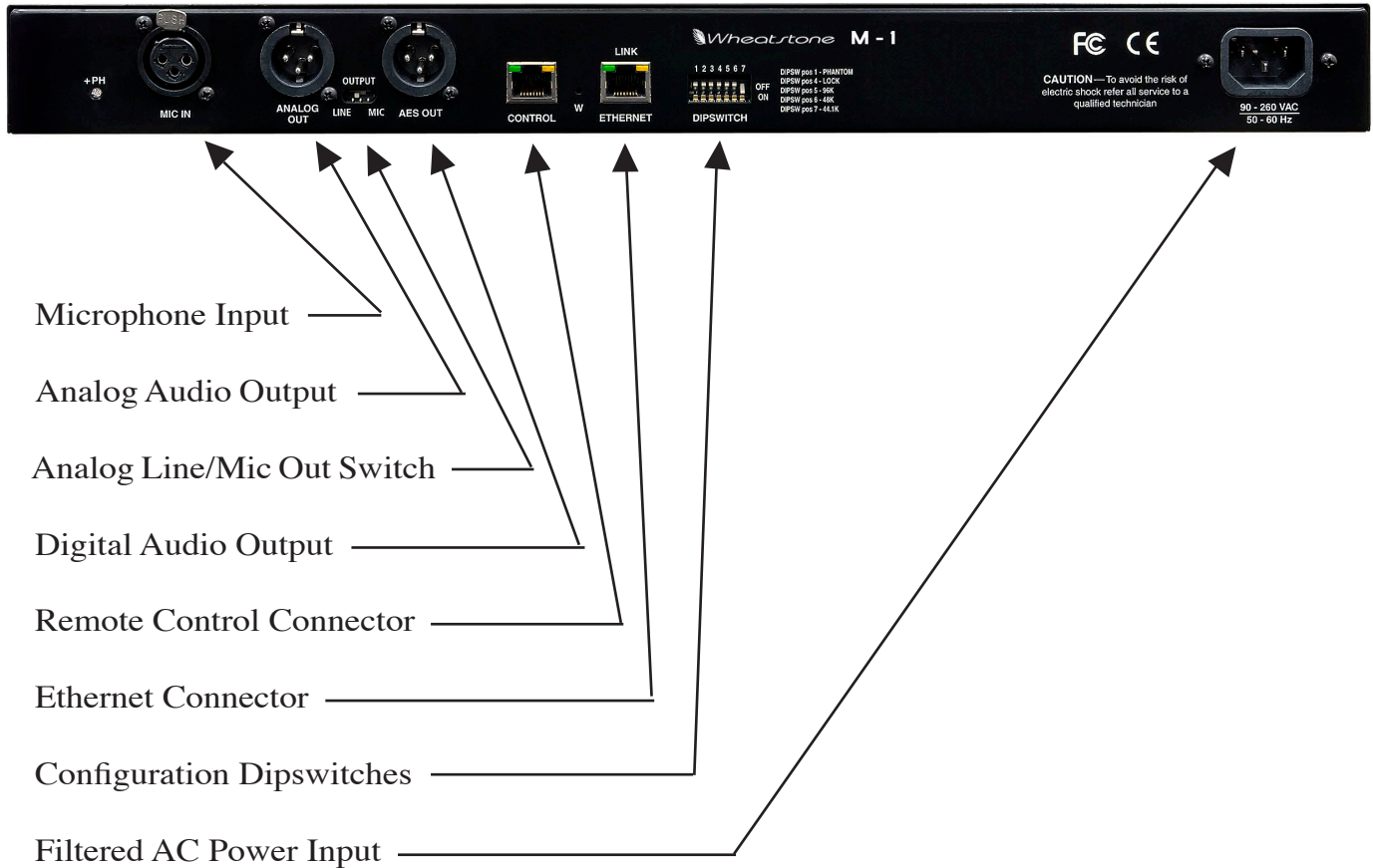
- The M-1 Microphone Processor should be mounted in a well grounded equipment rack using at least two, and preferably four, rack screws. When only two screws are utilized they must be installed in the two bottom holes in the M-1 front panel rack ears in order to prevent undue twisting and distortion of the front panel.
- If the M-1 is installed in a rack containing heat generating equipment, particularly when it is installed above such equipment, one rack unit (1 3/4") blank rack panels should be installed above and below the M-1 in order to aid natural convection cooling.
- The M-1 should be connected to a source of clean AC power. If local power has a history of being unstable, it is wise to incorporate an Uninterruptible Power Source (UPS) in the AC power feed to the M-1\*.
- In facilities with a history of damage or surges from lightning or other sources, it is wise to incorporate a good quality AC line surge suppressor in the M-1 power feed\*.
- Audio connections to the microphone input should be made with a high quality shielded microphone grade cable. The cable shield should be terminated at both ends of the cable to the XLR connector's Pin #1. We do not recommend the use of unbalanced connections at the M-1 input.
- As far as signal input polarity is concerned, the XLR Pin #2 is "hot" and the M-1 does not invert the phase of the audio.

(The exception to the above statement is when the "De-correlator" is used, which *will* result in frequency dependent phase shift which causes the output signal's phase to be inverted relative to the input signal at certain audio frequencies.)

*\* As with all computer or microcomputer based equipment such as the M-1, clean and surge-free AC power is a must. Otherwise unpredictable and hard to identify issues may arise with the operation of that equipment, including but not limited to equipment damage or the corruption of important data.*

## Rear Panel Connections

All audio input and output, control, Ethernet, and power supply connections are made via various connectors mounted on the M-1's rear panel. Three XLR connectors are provided for mic input and analog and digital outputs. Two RJ-45 connectors are provided for control and Ethernet connections. The pinout drawings on page 1-9 summarize all wiring connections.





## Mic Input

The M-1 analog mono mic level input (-50dBu nominal) is fed from the female XLR connector to the internal microphone preamplifier. The mic preamp has digitally controlled gain, up to a maximum of 70 dB, and displays remarkably high performance and accuracy. Phantom power is available.

- Pin 1 XLR SH – MIC IN SH
- Pin 2 XLR HI – MIC IN HI
- Pin 3 XLR LO – MIC IN LO

## Outputs

The M-1's two output signals are available as individual analog line level (+4dBu, balanced) or mono mic level (-50dBu) on the male XLR ANALOG OUT connector, and in digital AES formatted on the male XLR AES OUT connector.

### ANALOG OUT—XLR-M

- Pin 1 XLR SH – LINE / MIC OUT SH
- Pin 2 XLR HI – LINE / MIC OUT HI
- Pin 3 XLR LO – LINE / MIC OUT LO

Switching between high level analog line output and low level mic output can be made via slide switch SW1, labeled “OUTPUT” and located on the rear of the M-1 unit next to the “ANALOG OUT” XLR connector.

### AES OUT—XLR-M

- Pin 1 XLR SH – AES OUT SH
- Pin 2 XLR HI – AES OUT HI
- Pin 3 XLR LO – AES OUT LO

## Remote Control Ports

The RJ-45 “CONTROL” connector may be used with the (optional) Wheatstone ANP-RJ remote Announcer Panel, or may be wired to a custom interface if desired. Functions include remote on and off, cough, and tally.

- Pin 1 – DIGITAL GROUND
- Pin 2 – COUGH ENABLED (momentary)
- Pin 3 – N/C
- Pin 4 – OFF TALLY (open collector)
- Pin 5 – ON TALLY (open collector)
- Pin 6 – REMOTE OFF (momentary)
- Pin 7 – REMOTE ON (momentary)
- Pin 8 – +5V DIGITAL POWER

### Optional ANP-RJ Announcer Panel

The optional ANP-RJ panel connects to the M-1 using a standard straight CAT5 Ethernet cable of any reasonable length. This panel has “ON,” “OFF,” and “COUGH” switches for remote control of the microphone inputs. The “TB” (talkback) button has no function in the M-1. The “ON” and “OFF” buttons are LED illuminated. These panels can be mounted directly into a furniture surface or a turret.



## To Turn the Microphone ON & OFF from a Remote Location

**REMOTE ON** — When taken low (connected to Digital Ground) activates the ON TALLY and simultaneously unmutes the M-1 audio outputs. You must provide a momentary closure between Remote On (Pin 7) and Digital Ground (Pin 1) to latch the microphone audio ON. A user-supplied momentary contact switch or the optional ANP-RJ panel is required.

**REMOTE OFF** — When taken low (connected to Digital Ground) activates the OFF TALLY and simultaneously mutes the M-1 audio outputs. You must provide a momentary closure between Remote Off (Pin 6) and Digital Ground (Pin 1) to latch the microphone audio OFF. A user-supplied momentary contact switch or the optional ANP-RJ panel is required.

**COUGH** — When taken low (connected to Digital Ground) temporarily mutes the microphone. You must provide a momentary closure between Cough (Pin 2) and Digital Ground (Pin 1) to temporarily mute the microphone. This is a non-latching mode so the microphone will unmute as soon as the switch is released. A user-supplied momentary contact switch or the optional ANP-RJ panel is required.

### On and Off Tallies

**ON TALLY** — There is a continuous closure (via open collector) between On Tally (Pin 5) and Digital Ground (Pin 1) whenever the microphone audio is unmuted. This allows the microphone ON function to also control an on-air light or other “microphone on” indicator at a remote location.

**OFF TALLY** — There is a continuous closure (via open collector) between Off Tally (Pin 4) and Digital Ground (Pin 1) whenever the microphone audio is muted. This allows the microphone OFF function to also control a “microphone off” indicator at a remote location.

The ON and OFF tallies can be used to control externally powered tally lights or other functions that require a continuous closure to function. External tally lights (such as LEDs) can be powered from the tally output by connecting the external LED anode to +5V Digital (Pin 8)\* and the external LED cathode to the On Tally port (Pin 5) or Off Tally port (Pin 4).

\* An appropriate current limiting resistor must be used so that current drawn from Pin 8 does not exceed 30 milliamps.

## Ethernet Interface

The rear panel RJ-45 connector assigned to the Ethernet communication function uses a standard 10/100BaseT interface. It employs TCP/IP to communicate with the remote GUI software running on a host PC and utilizes common ports to communicate with the M-1.

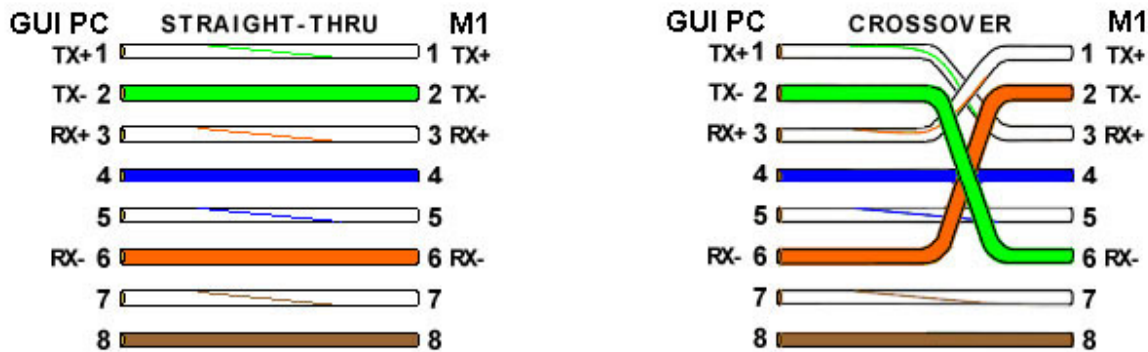
### ETHERNET—RJ-45

Pin 1 – TXD +  
 Pin 2 – TXD -  
 Pin 3 – RXD +  
 Pin 4 – N/C  
 Pin 5 – N/C  
 Pin 6 – RXD -  
 Pin 7 – N/C  
 Pin 8 – N/C

When using the M-1 with a nearby computer and when no local area network is available, you must use a standard Ethernet crossover cable to interconnect the computer and the M-1.

When using the M-1 with a remotely connected computer or when it is interconnected to the remote computer via a LAN you must use a standard straight through Ethernet cable.

Please see the drawing below for the wiring for both straight through and cross-over cables.



In each case the color code for the GUI PC end of the cable is as follows:

- 1 – White w/Orange tracer
- 2 – Solid Orange
- 3 – White w/Green tracer
- 4 – Solid Blue
- 5 – White w/Blue tracer
- 6 – Solid Green
- 7 – White w/Brown tracer
- 8 – Solid Brown

## Dipswitch Configuration

The seven position dipswitch SW2, located on the rear of the M-1 unit, allows the M-1's Digital Output Sample Rate and Microphone Phantom Power to be set according to installation requirements. A security lockout feature is also enabled by one dipswitch position.

Dipswitch SW2 is **OFF** when in the **UP** position and **ON** when in the **DOWN** position!

- SW2 pos. 1 - When UP, phantom power is switched OFF.  
When DOWN, phantom power is enabled, if the front panel PHANTOM switch is lit.
- SW2 pos. 2 - Unused.
- SW2 pos. 3 - Unused.
- SW2 pos. 4 - When UP, the M-1 is unlocked and may be controlled by either its front panel or through the remote GUI. When DOWN, the M-1 is **LOCKED**; this prevents inadvertent adjustments from being made.
- SW2 pos. 5 - When DOWN, sets the M-1 for a digital audio output sample rate of 96 kHz.
- SW2 pos. 6 - When DOWN, sets the M-1 for a digital audio output sample rate of 48 kHz.
- SW2 pos. 7 - When DOWN, sets the M-1 for a digital audio output sample rate of 44.1 kHz.

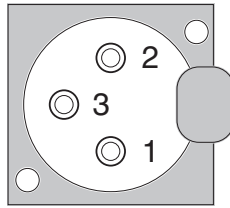
### **IMPORTANT NOTES!**

If more than one sample rate switch is DOWN the sample rate corresponding to the highest rate is selected.

If no switches are DOWN, the sample rate is 48 kHz.

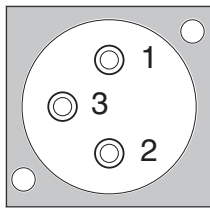


**Mic In  
XLR-F**



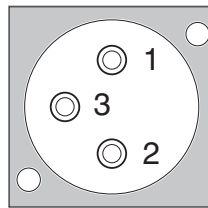
- PIN 1 XLR SH - MIC IN SH
- PIN 2 XLR HI - MIC IN HI
- PIN 3 XLR LO - MIC IN LO

**AES Out  
XLR-M**



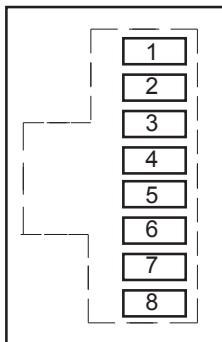
- PIN 1 XLR SH - AES OUT SH
- PIN 2 XLR HI - AES OUT HI
- PIN 3 XLR LO - AES OUT LO

**Analog Out  
XLR-M**



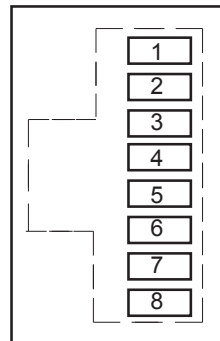
- PIN 1 XLR SH - LINE / MIC OUT SH
- PIN 2 XLR HI - LINE / MIC OUT HI
- PIN 3 XLR LO - LINE / MIC OUT LO

**Control  
RJ-45**



- 1 DIGITAL GROUND
- 2 COUGH
- 3 N/C
- 4 OFF TALLY
- 5 ON TALLY
- 6 REMOTE OFF
- 7 REMOTE ON
- 8 +5V DIGITAL

**Ethernet  
RJ-45**



- 1 TXD+
- 2 TXD-
- 3 RXD+
- 4 N/C
- 5 N/C
- 6 RXD-
- 7 N/C
- 8 N/C

# M-1 Operating Guide

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# M-1 Operating Guide



## Front Panel Operator Interface

The Wheatstone M-1 front panel is shaded to indicate how controls are grouped together by function. The first section at the left contains controls related to gain and input-related functions. The area in the middle is used to controls dynamics, and the area to the right contains controls for equalization.

For some functions there are illuminated indicators located on the front panel that are related to controls appearing on the rear of the chassis. Two examples are the settings for phantom power and those related to setting the AES3 digital output sample rate.

## Remote Interface With The M-1 GUI

A PC application program to control one or many M-1 processors is included with the product. It is a Windows® Graphical User Interface (GUI) program, intended to be straightforward in use, controlling and displaying the features of the M-1 over a LAN or WAN and from any PC. There is also a simpler, more restrictive version of the GUI available, called the Talent Control Interface. The Talent Control Interface installs over the top of the standard GUI and allows control to be restricted to the selection of existing presets and the configuration of devices (see pages 2-38 to 2-41 for details).

Since many of the GUI functions act to duplicate front panel functions it seems efficient to describe such GUI functions in line with the front panel functions, rather than in a separate section of the manual. This reduces the risk of having large blocks of text in the later sections of the manual that simply mimic earlier portions. Such repetition can easily add confusion to an already complicated description, and the repetition often lulls the reader into a feeling of *deja vu*, causing important topics dropped into the midst of otherwise repetitive material to be missed. Hopefully this results in a cleaner, more concise, manual.

The GUI software is supplied as a self-installing program which will install under “Program Files\Vorsis\M1”. A M-1 icon will appear on the desktop at the completion of installation and double-clicking it will start the GUI program.

The software is compatible with all recent releases of Microsoft Windows® including Windows 2000, Windows XP Home and Professional, and the recently released Windows Vista operating system.

The GUI is designed to operate up to 253 M-1 microphone processors. Since each M-1 unit is associated with its own static TCP/IP address, as is the controlling PC, they collectively would consume all 254 of the usable addresses on a subnet. Remember that address xxx.xxx.xxx.255 is a reserved broadcast address and should never be used for configuring network devices.



Since all the M-1's to be operated by a single GUI must be configured with TCP/IP addresses within the same subnet, the number of devices "reachable" by the GUI is limited by the subnet used.

It is possible to remotely operate *any* number of M-1 processors if the network, the M-1's, and the GUI PC's are all configured appropriately according to accepted networking standards.

It is also possible to operate the M-1 via a variety of available wireless protocols and hardware. Given the current state of flux of wireless technology we will leave it up to the end user to design and implement the best way to operate the M-1 wirelessly in their particular environment.

To configure the M-1 network connection a basic familiarity with Windows navigation techniques is assumed. If terms such as "left-click," "right-click," "double-click," and "drag-and-drop" seem alien, operating the M-1 GUI could be problematic.

## Architecture of the GUI

The M-1 GUI allows you to control and view how the M-1 is reacting to the audio passing through it, and in real time. It also allows you to make changes to the processing while viewing the significance any change is having on the audio.

## Connecting the M-1 and the GUI

### With LAN (Local Area Network)

The M-1 and a Windows® PC running the M-1's GUI program can be connected over a standard Ethernet Local Area Network (LAN).

Once the M-1 is installed, powered-up, and verified to be operating normally, a CAT5 cable connected to a 100baseT LAN should be inserted into the appropriate socket on the rear panel. Likewise, the GUI should be installed on the desired PC that has been verified to be working correctly with the LAN.

### Without LAN (Local Area Network)

It is also possible to work without a LAN by connecting the M-1 and the PC Ethernet ports together using a standard Ethernet crossover cable.

## Host PC Requirements

Constraints for the host PC are not extraordinary – it should preferably be at least 1GHz in speed and the screen resolution at least 1024 x 768 pixels. The LAN should be 100baseT (100MHz) capable. Any recent Windows operating system is quite sufficient.

## Using the GUI

The GUI screen may be maneuvered around the computer's screen by left-clicking-and-dragging the GUI near the "Vorsis" logo at the upper left of the application screen. In true "Windows" fashion, the GUI may be minimized (taken off the screen) and closed by way of the familiar controls at the extreme top right.

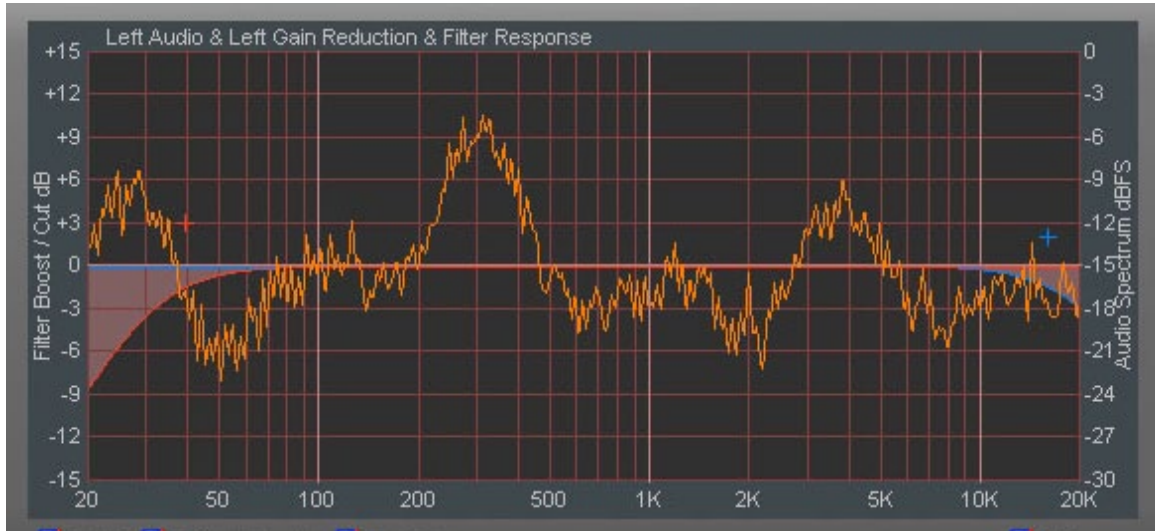
Description of the features and functions of the GUI will follow different discrete regions of the screen. It will begin with the most eye-catching region containing the Dynamic Displays. The Control Area is the section of the GUI that closely correlates with the front panel controls, so it will be covered along with those controls. Once that is complete we will deal with the functions of the Control Area that still remain, followed by the Side Bar buttons, and winding up with the Title Bar and Menus.



## Dynamic Display Region

### Frequency-Domain Graph

Visually, the most interesting and useful element on the main screen, and dominating the lower half of the GUI, is a large graphical display logarithmically depicting the standard audio frequency range of 20Hz – 20 kHz. The vertical axis scale may be altered by clicking and dragging the scale up or down. The overall displayed vertical range remains at 30dB, with gradations every 3dB.



Under the large graphical window is a row of four small checkboxes. When selected or deselected a red checkmark appears and disappears respectively.



**Audio** — When selected (and O-Scope is unchecked), an FFT (Fast Fourier Transform) of the audio is displayed in real time showing audio frequency spectra versus time.

**Gain Reduction** — When selected, displays the amount of gain control in dB occurring in the compressor, expander, or de-esser.

**Controls** — When selected, displays any controls which may be associated with the selected screen.

**O-Scope (oscilloscope)** — When it and “Audio” are simultaneously selected, the display substitutes a real time amplitude versus time display instead of the FFT which shows frequency versus time.

**Displayed Signal Selection** — Directly underneath the small checkboxes are two large buttons labeled **INPUT** and **OUTPUT**.

When **INPUT** is selected, the graphical display shows audio presented at the input to the M-1. When **OUTPUT** is selected the graphical display shows the audio after the M-1 has processed it. The mode that has been selected is indicated by a small green “on” light in the selected button.

## Bargraph Metering

To the left of the graphical display area are five vertical bargraphs, each having a 30dB vertical display range. From left to right, they are:

**IN** — Displays the input level occurring after the microphone preamplifier.

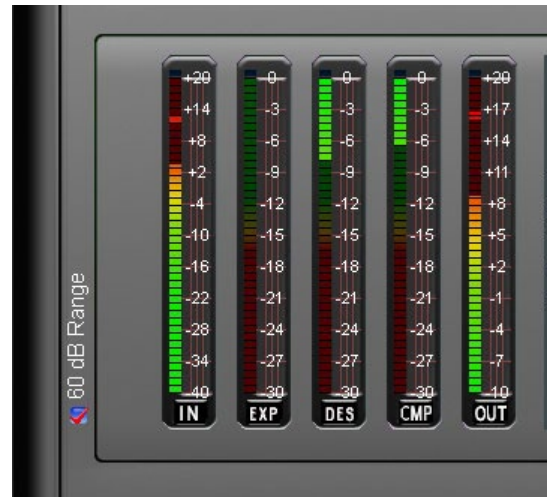
**EXP** — Displays the amount of gain control occurring within the Expander algorithm.

**DES** — Displays the amount of de-essing when it is occurring.

**CMP** — Displays the amount of gain control occurring within the compressor section.

**OUT** — The right-most meter simply displays the audio output amplitude in dBu.

**60 dB Range** — To the left of the meters is a small button labeled “60 dB Range.” When this box is checked the input meter has a 60dB range instead of the normal 30dB. The 60dB range is useful during initial set-up.



## Control Area Region

This is the large area above the graph and meters - all controls are found within this area. To operate them either place the cursor above the desired control and use the mouse's scroll wheel to "increase" or "decrease" the control's position; or left click on the control, and slide the mouse to move the control - up or right increases the control's indicated position, down or left decreases it. The behavior of the controls can be made finer by holding down the keyboard's control key ("Ctrl") while adjusting.



Left-to-right across the upper portion of the GUI are buttons corresponding to the various processing elements and in the signal flow order. A small indicator at the left end of each button indicates if signal processing within that block is active. Left-clicking a button opens a panel of controls for that portion of the signal-processing.



**Input/Output** — Displays the controls for the input and output functions.

**Expander** — Gains access to the controls for the Expander.

**De-esser** — Gains access to the controls for the de-esser stage.

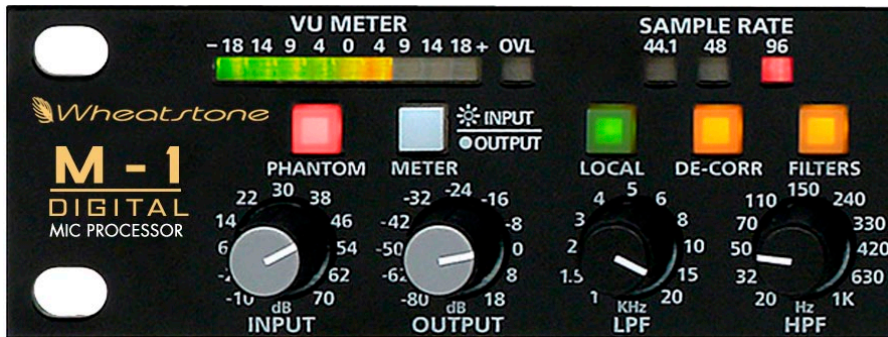
**Parametric EQ** — Displays the controls for the two band parametric equalizer and two band shelf equalizers.

**Compressor** — Displays the controls for the voice compressor.

**System** — Gains access to settings for security, preset management, and M-1 device configuration.

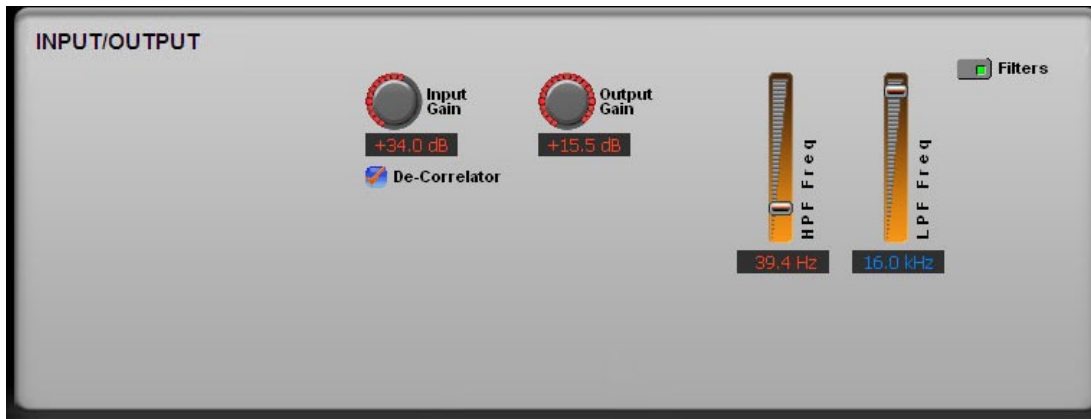
## Gain And Input Related Functions

The figure below shows the controls at the left end of the M-1. Individual controls and indicators are described in the paragraphs that follow, along with the comparable GUI functions.



**Gain And Input Functions**

The GUI Input/Output screen hosts the controls for input gain, output gain, the vocal de-correlator, and the high and low pass filters.



**M-1 Input/Output Screen**

## Local / Remote

The M-1 may be operated in one of two modes: local or remote. Simply put, when the LOCAL button is lit the unit is in local mode and can be operated by the front panel controls, but *not* by the remote Windows® GUI; the GUI, if connected, will still reflect any changes made from the front panel. On the other hand, if the LOCAL button is *not* lit the unit is in remote mode and the front panel controls, other than the METER and PHANTOM switches, will not function.

To switch between local and remote modes press and hold the LOCAL switch for about four seconds, until you see the button illumination change state. Note that if the M-1 has been locked by using the rear panel dipswitch you can not switch between modes from the front panel.

The GUI has no control over selecting local mode or remote mode.

## Sample Rate

These are indicators of and not selectors for the sample rate for the AES3 digital output of the M-1, as the sample rate is selected using rear panel dipswitch SW1:

SW1 pos.5, when activated, set the sample rate to 96kHz,

SW1 pos.6, when activated, set the sample rate to 48kHz,

SW1 pos.7, when activated, set the sample rate to 44.1kHz.

The available sample rates are 44.1 kHz, 48 kHz, and 96 kHz. All three sample rates are tightly locked to a very accurate internal clock having vanishingly low jitter.

The AES digital output of the M-1 meets all the requirements of AES3-1992 (r1997), as well as the American National Standard, ANSI S4.40-1992, and international standard, IEC 60958-4. As such it has a balanced interface and may not interface with equipment using the SP/DIF (Sony Phillips Digital Interface) standard. Attempts at interfacing the M-1 output to a device equipped with an SP/DIF input should be accomplished by using one of the commonly found transformer devices.

**Note:** Not all bits in the AES3 data stream are compatible with equipment using the SP/DIF interface. Therefore there is no guarantee that the M-1 will correctly interface to a SP/DIF device even though the appropriate hardware matching device has been used!

The GUI has no control over selecting the M-1 sample rate.



## Phantom Power

The M-1 supplies phantom power in the form of a strictly regulated and heavily filtered DC voltage and will easily power all known microphones requiring phantom power.

Phantom voltage is applied in common mode to the balanced input connections of the M-1.

Phantom power is enabled via position 1 of the seven-position rear panel dipswitch, SW 1. When the switch is down, phantom power is enabled; when the switch is up phantom power is disabled. Once phantom power is enabled via the dipswitch, the front panel PHANTOM button will indicate whether phantom power is being supplied to the microphone input connector. At this point phantom power is turned on and off by pressing the PHANTOM switch and holding it for about four seconds, until you see the button illumination change state. A rear panel +PH indicator also shows the status of phantom power on the mic input.

The GUI has no control over phantom power.



## Input/Output Metering

When the METER button is illuminated, the VU meter shows the M-1 input signal. When it is extinguished, the output signal of the M-1 is displayed. Each time the METER button is pressed, the VU meter source will toggle to the one not currently selected.

In other words, if Input is selected and the METER switch is pressed once, the VU meter source will change to indicate Output level instead. If the METER switch is then pressed again, the VU meter source will toggle back to display the Input level\*. The range of this front panel meter is -18dB to +18dB.

\* The Input Level as read by the front panel VU meter is after the microphone preamplifier.

The GUI has no control over this meter and what it displays. The GUI does, however, have its own input and output metering, as discussed previously in the section on Bargraph Metering in the Dynamic Display region of the GUI. The GUI input meter range is +20dB to -10dB (or +20dB to -40dB when switched to the 60dB range) and the output meter range is +20dB to -10dB.



## Input Gain

The front panel INPUT control adjusts the overall gain of the precision microphone preamplifier between -10dB and +70dB in 1dB steps. The fine resolution of the input gain control is more than sufficient to meet the most demanding professional installation. The input gain is high enough and the preamplifier architecture quiet enough to be used with microphones having the most infinitesimal output level.

The GUI Input Gain control on the INPUT/OUTPUT screen duplicates the function of this control.

## Output Gain

The front panel OUTPUT control sets the output level of the M-1 processor's analog and digital AES3 outputs simultaneously. The range of the control is -80dB to +18.0dB in half dB steps above -60 and one dB steps below -60.

The GUI Output Gain control on the INPUT/OUTPUT screen duplicates the function of this control.



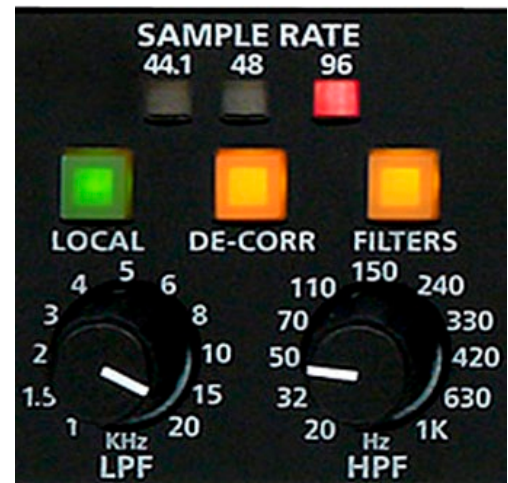
## LPF (Low Pass) Frequency

Some intentional rolloff of the upper extremes of the audio spectrum is usually desirable in voice applications in order to reduce out of band noise. Since reduced bandwidth results in reduced noise levels, the microphone source can sound “cleaner” than it otherwise would if low pass filtering were not employed. Depending on the setting of other controls, low pass filtering may also be effective at reducing or avoiding high frequency feedback when microphones are operated near speakers carrying the microphone’s signal.

Typical applications will see the LPF set somewhere below 20kHz, sometimes as low as 10kHz or perhaps even lower depending on the application, the microphone being used, or the artistic desires of the talent or engineer. The minimum frequency setting is 1kHz and the upper limit is 20kHz.

The Low Pass Filter is an 18dB/octave linear phase design.

The GUI LPF Freq control on the INPUT/OUTPUT screen duplicates the function of this control.



## HPF (High Pass) Frequency

In most applications it is usually desirable to limit the low frequency response of the microphone to minimize signals which are not related to the desired signal. The M-1 provides a sweepable high pass filter to enable rolloff the low frequency response as desired by the user. The lowest frequency of the control is 20Hz, while the highest possible setting is 1kHz.

Many typical voice applications will have the HPF set somewhere around 100Hz or perhaps slightly lower. Special applications or special effects will have the control at other settings.

The High Pass Filter is an 18dB/octave linear phase design.

The GUI HPF Freq control on the INPUT/OUTPUT screen duplicates the function of this control.

## Filters

Above the high pass filter frequency HPF knob is the FILTERS button. This can be thought of as the Master On/Off switch for the high and low pass filters and is convenient when there is a need to quickly switch the LP/HP filters in and out for comparison.

The GUI Filters button on the INPUT/OUTPUT screen duplicates the function of this button.

## De-Correlator

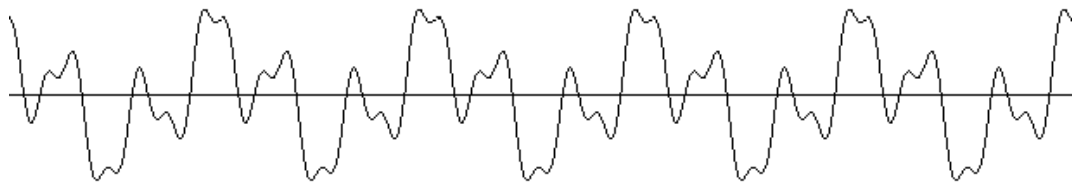
Located above and between the low and high pass filter frequency adjustments, DE-CORR button is used to enable or disable the de-correlator function. The de-correlator is a special linear circuit that rearranges the phase-verses-time alignment of the voice signal's harmonics relative to its fundamentals. This results in positive and negative signal peaks being more equal. The de-correlator is also known as a phase scrambler or phase rotator.

The positive to negative energy distribution having been corrected, voice signals are easier to process by the stages following the de-correlator. The end result is that voices will be louder and subjectively cleaner after exiting a compressor than if the voice had not been de-correlated beforehand.

The waveform below is typical of many human voices. Notice how the amount of signal inside the peaks both above and below the center line is unequal? This means that the voice is asymmetrical and can benefit from de-correlation.

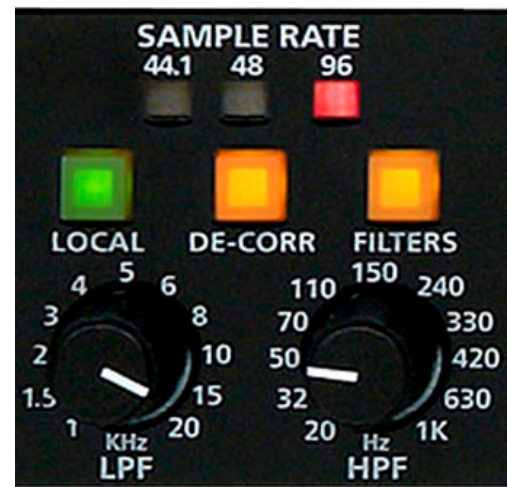


Below is the waveform of the same voice after processing by the de-correlator. Notice how the amount of energy inside the peaks above and below the center line is more equal? This is what the de-correlator does.



It is important to know that neither the frequency content nor RMS energy of the voice waveform are altered by the de-correlator, nor are any forms of nonlinear distortion added or created by the process. It is strictly a rearrangement of the phase relationships of the signal's harmonics to its fundamental frequencies. This makes the voice far easier to process by the following stages. For instance, it may be possible to make the voices louder after exciting a compressor than if the voice had not been de-correlated beforehand.

The GUI De-Correlator check box under Input Gain on the INPUT/OUTPUT screen duplicates the function of this button.



## Dynamics Functions

We now move on to the Center section of the M-1 front panel. This section, which groups the dynamics controls, is divided into three subsections: De-esser, Compressor, and Expander.

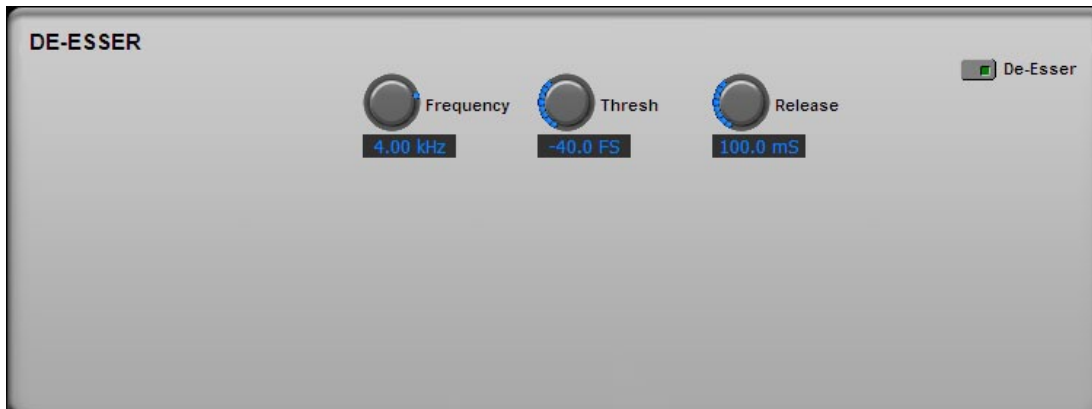


Dynamics Functions

### De-Esser

The de-esser is a dynamic equalization section designed to automatically restrict the output level within a chosen frequency range depending on the signal level. The basic idea is to dynamically restrict the sometimes prominent and objectionable sibilant “hissy” noises in speech, particularly if poorly recorded or subject to poor microphone technique. There are three operating controls involved.

These controls are also found on the GUI DE-ESSER screen:



M-1 De-Esser Screen

## Frequency

Adjusts the frequency where the de-esser is most sensitive. With few exceptions, most human speech sibilant artifacts fall between 4kHz and 6kHz, although we've allowed the control to be adjustable over the entire 20Hz to 20kHz audio bandwidth so that it may also be used for special effects.

The GUI Frequency control on the DE-ESSER screen duplicates the function of this control. This setting is reflected in the Dynamic Display screen as shown below at the default frequency of 4kHz:



De-Esser Sensitivity Curve

## Threshold

Threshold is the signal level within the de-esser's selected bandwidth (as set by the FREQ control) at which the de-esser constrains the output level within the de-esser's bandwidth. In other words, a signal within the de-esser's frequency band will not be allowed to exceed this threshold level. The threshold is adjustable over the range of -60dB to -10dB, and controls the amplitude where the de-esser begins to take effect.

The GUI Thresh control on the DE-ESSER screen duplicates the function of this control.

## Release

RELEASE, or "release time," is the control that determines how fast the de-esser returns the gain to normal after chasing a sibilant sound in voice. Faster release times are less audible than slower ones, which may under certain circumstances "punch holes" in the audio – an obvious reduction in output level for a time longer than was necessary to actually process the event that was controlled. Release can be varied from 50mS to 500mS.

The GUI Release control on the DE-ESSER screen duplicates the function of this control.

## Metering

The bargraph meter above the controls shows the instantaneous gain reduction occurring in the de-esser and can display a maximum gain reduction of 20dB.

The “DES” meter in the Dynamic Display region of the GUI displays the same information, but can display an additional 10dB of gain reduction, to 30dB.

## IN

When the front panel IN button of the DE-ESSER section is illuminated, the de-esser is in the signal path. Use this button to toggle the de-esser in and out of the signal flow.

The GUIDe-Esser button on the DE-ESSER screen duplicates the function of this button.



## Compressor

The compressor is an envelope dynamics modifier that controls the overall voice energy from the M-1 (not to be confused with the Output control!).

This stage compresses the dynamic range of voice signals, making soft sounds louder and loud sounds softer. With proper adjustment it can create a consistent output level from a talent's voice and can do it subtly - or - it can do it with a lot of "energy" if that is the sound desired. Basically the compressor allows the overall volume of the sound to be tailored to taste when the input level naturally varies as the talent speaks.



The M-1 compressor is a broadband feed forward architecture utilizing special program-related dynamics control algorithms specially designed by Vorsis. There are only four operating controls plus an IN/OUT switch, making compressor operation easy and intuitive.

The COMPRESSOR screen of the GUI contains the matching controls:



**M-1 Compressor Screen**

## Attack

This control determines how quickly the compressor responds to a signal exceeding the threshold. The control is adjustable between 0.2 milliseconds and 1 second and is adjusted to personal preference. Faster attack times catch signal peaks more quickly but may make the sound "mushy" and without detail. Operation at faster attack, below approximately 10 milliseconds, causes the compressor to operate more like a peak limiter than an average responding compressor. Conversely, slower attack times allow more peaks to escape uncontrolled, making the sound more relaxed. The caveat is that slower attack times allow peaks to escape that might cause problems further downstream.

The GUI Attack control on the COMPRESSOR screen duplicates the function of this control.

## Threshold

Threshold is the signal level at which the compressor begins to constrain the output level. A signal exceeding this level will have its gain reduced in a manner determined by the Ratio control (see below). The threshold is adjustable over the range of -50dBFS to -10dBFS (decibels Full Scale). More negative settings cause gain reduction to begin at lower audio levels, while higher (less negative) settings cause gain reduction to begin at higher audio levels.

The GUI Thresh control on the COMPRESSOR screen duplicates the function of this control.



## Release

Release determines how fast the compressor returns the gain back to normal after chasing an audio peak. Faster release times increase the average audio energy but might sound “busy” if too fast. Slower release times make the sound more natural and relaxed, but lower the average sound level. Release time is adjustable between 33.0 milliseconds and 1 second.

The GUI Release control on the COMPRESSOR screen duplicates the function of this control.

## Ratio

Ratio controls the steepness of gain reduction once the audio has reached the Threshold. A ratio of 1 (or 1:1) results in no compression at all, and at the other extreme a ratio of 20 (or 20:1) makes it operate more like a limiter. In the latter case, once the threshold is reached the output level of the compressor will only increase 1dB when the input level increases 20dB. The ratio control, while adjusted to taste, will typically be set somewhere between 3:1 and 6:1 for most voices. Special effects of course may call for radically different settings.

The GUI Ratio control on the COMPRESSOR screen duplicates the function of this control.

## Metering

This ladder indicates gain-reduction being applied to the signal by compressor, from -4dB to -20dB.

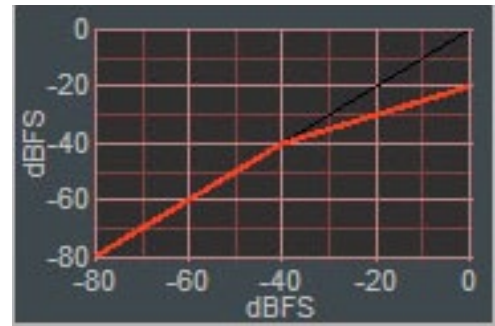
The CMP meter in the Dynamics Display region of the GUI displays the same information, but with an expanded range of 0dB to -30dB.

## IN

When the front panel IN button of the COMPRESSOR section is illuminated the compressor is in the audio path. When this button is not illuminated, the compressor is not in the signal path. The button toggles this function.

The GUI Comp button on the COMPRESSOR screen duplicates the function of this button.

The GUI also displays an input/output transfer function plot, to visually represent the settings of Ratio and Threshold, on the COMPRESSOR screen.



### Compressor Release Time Operating Hint

While the compressor's attack time and ratio are typically adjusted to provide peak protection for equipment following the M-1, the setting of the release time control is largely an artistic decision. Please allow us to offer three of the most common caveats of operating a compressor with extremely fast release times.

- A very fast release time increases the amount of intermodulation distortion, or IM. This is because when the compressor release time is set fast enough to “follow” every cycle of a low frequency signal, the lower amplitude higher frequency signals “go along for the ride.” This results in modulation of the high frequencies by the low frequencies, or intermodulation.\*
- A very fast release time exaggerates reverb, whether artificially created by electronic or electromechanical means, or due to the natural early sound reflections from the hard surfaces of the room where the microphone and voice talent are located.
- A very fast release time accentuates of the speaker's breath sounds or other unwanted background sounds that would otherwise be inaudible.

*\*The sound of intermodulation distortion ranges from a subtle “thickening” of the sound, to downright muddy or even “gurgling” at the extreme.*



## Expander

Sometimes called “downward expansion,” or “noise gate”, its purpose is to reduce the output signal once the input signal has fallen below a chosen threshold. It is commonly used to “gently” turn down an input signal when there is no input present or when it is too low to be useful.

Typical expander uses include suppression of room noises from open microphones, reducing prominent breath noises in speech, and muting of phone line noise on a TELCO circuit.

The EXPANDER screen of the GUI contains the matching controls:



**M-1 Expander Screen**

### Depth

The maximum amount that the expander is permitted to reduce the output signal level when the input signal level falls below the Expander Threshold. Typical uses will have this control set between 10dB and 16dB. The full range of the control is from 0dB (no expansion) to 40dB.

The GUI Depth control on the EXPANDER screen duplicates the function of this control.

### Threshold

Controls the input level below which the automatic attenuation will start to take effect. This control is adjusted to taste, and ranges from -60dB up to 0.

The GUI Thresh control on the EXPANDER screen duplicates the function of this control.

### Close

Close is the rate at which the expander circuit attenuates the output signal once the input signal has fallen below the threshold. This control is adjusted to taste, and ranges from 50 milliseconds to 3 seconds.

The GUI Close control on the EXPANDER screen duplicates the function of this control.

## Metering

This ladder indicates gain-reduction being applied to the signal by the expander, from -4dB to -20dB,

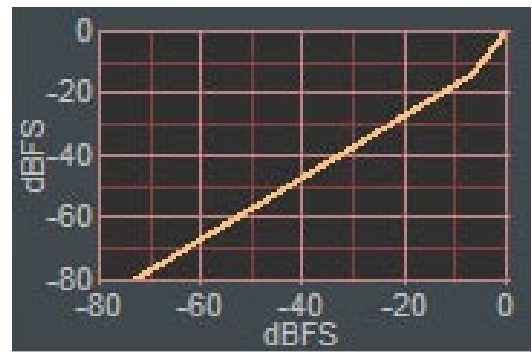
The EXP meter in the Dynamic Display region of the GUI displays the same information, but with an expanded range of 0dB to -30dB.

## IN

When the front panel IN button of the EXPANDER section is illuminated the expander is in the audio path. When this button is not illuminated, the expander is not in the signal path. The button toggles this function.

The GUI Expander button on the EXPANDER screen duplicates the function of this button.

An input/output transfer function plot is displayed as a graphical representation of the relationship between the threshold and depth controls as they have been set by the user.



## Expander Operating Hint

Almost always, the trick is to carefully set the threshold of the expander below where it starts to attenuate the input signal – basically high enough to capture the noise, but not too high as to snatch at the lower levels of the voice as this can make the operation of the expander “obvious,” a generally undesired result.

## Equalization Functions

### Parametric Equalizer

The M-1 equalizer section has two identical fully parametric equalizers. It also has two shelving filters at the audio band frequency extremes that may be used as desired to shape the overall frequency response.

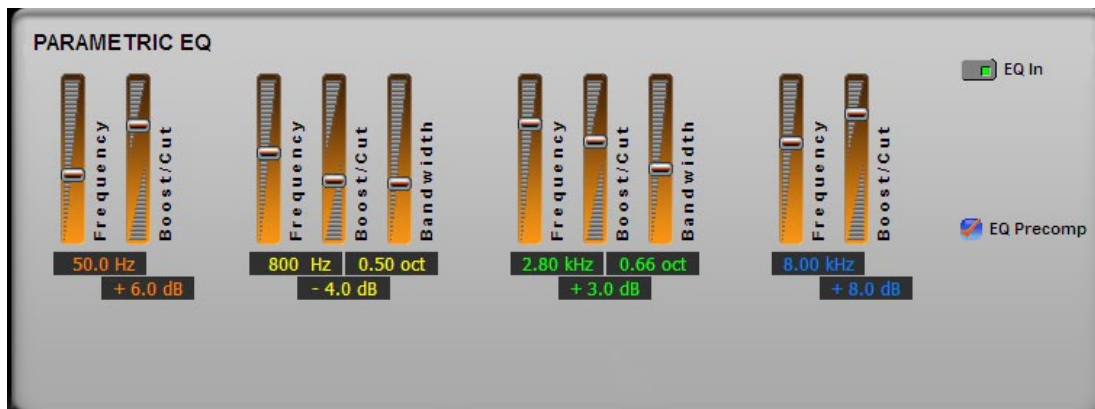
The two parametric sections are fully adjustable in three ways – center frequency (20Hz-20kHz), bandwidth (0.2 to 3 octaves), and boost/cut (plus or minus 14dB).

The high and low shelving filters can be adjusted from 2kHz to 20kHz and 20Hz to 200Hz respectively, with +/- 14dB of boost or cut. These filters are further described on the following pages.



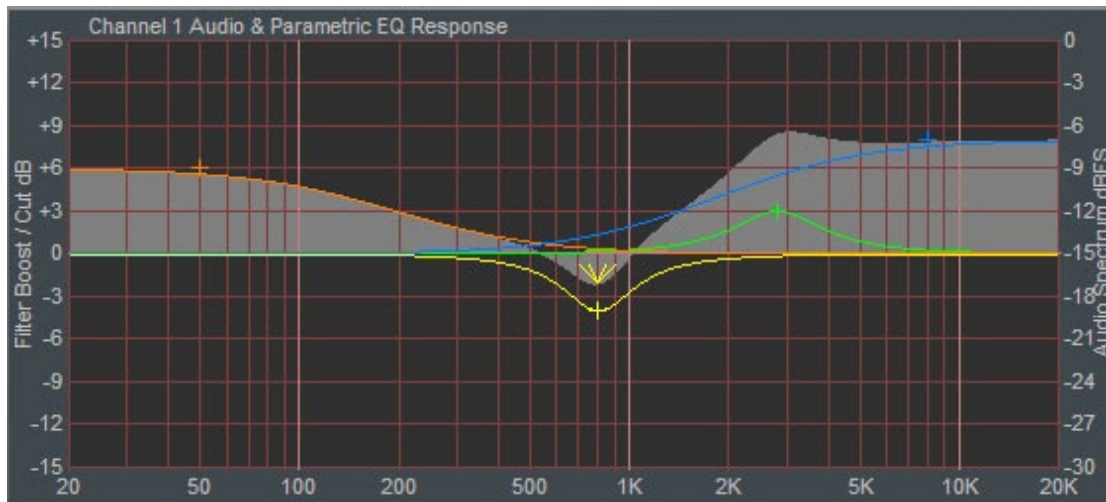
Equalization Functions

The GUI PARAMETRIC EQ screen has a full set of controls to duplicate the front panel controls:



M-1 Parametric Equalizer Screen

The graphic below shows how equalizer settings are depicted in the Dynamic Display region of the GUI.



## EQ PRE

At the left side of the equalizer controls are two buttons. The top one is labeled “EQ PRE.” When this button is illuminated the parametric equalizer is inserted into the signal path prior to the compressor stage. When the button is not illuminated the equalizer is inserted into the signal path after the compressor.

Why? Completely different processing textures may be designed by the user by placing the parametric equalizer stage where it creates the intended artistic effect.

The GUI EQ Precomp button on the PARAMETRIC EQ screen duplicates the function of this button.

## EQ IN

When this button is illuminated the equalizer section is switched in. When it is not illuminated the equalizer section is not in the signal path. The button has a toggle action behavior – pressing it changes the state of the EQ IN function.

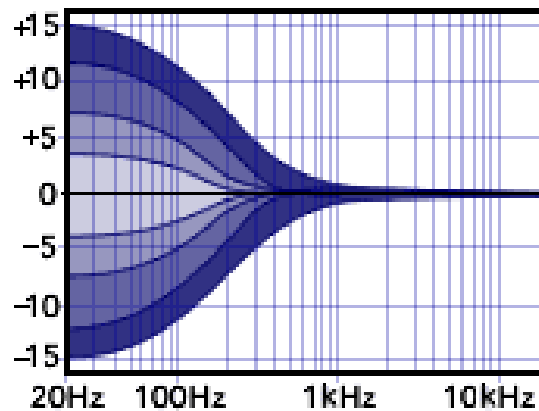
The GUI EQ In button on the PARAMETRIC EQ screen duplicates the function of this button.

## Low Shelf Equalizer

The Low Shelf Equalizer is a second order type with adjustable Frequency and Gain adjustments, and behaves similarly to the “Baxandall” tone controls found on many types of common audio equipment.



The Low Shelf FREQ control is adjustable between 20Hz and 200Hz, allowing the turnover point to be placed precisely where it will do the most good. The Boost/Cut control is simply labeled “LOW” and allows the shelf gain to be set anywhere between 14dB of cut to 14dB of boost.

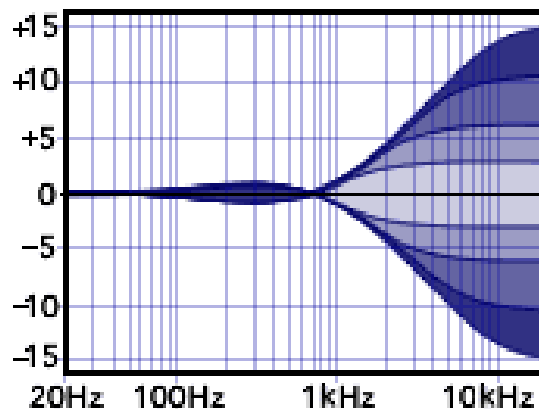


## High Shelf Equalizer

Like the Low Shelf Equalizer, the High Shelf Equalizer is a second order type with adjustable Frequency and Gain adjustments, and behaves similarly to the “Baxandall” tone controls found on many types of common audio equipment.

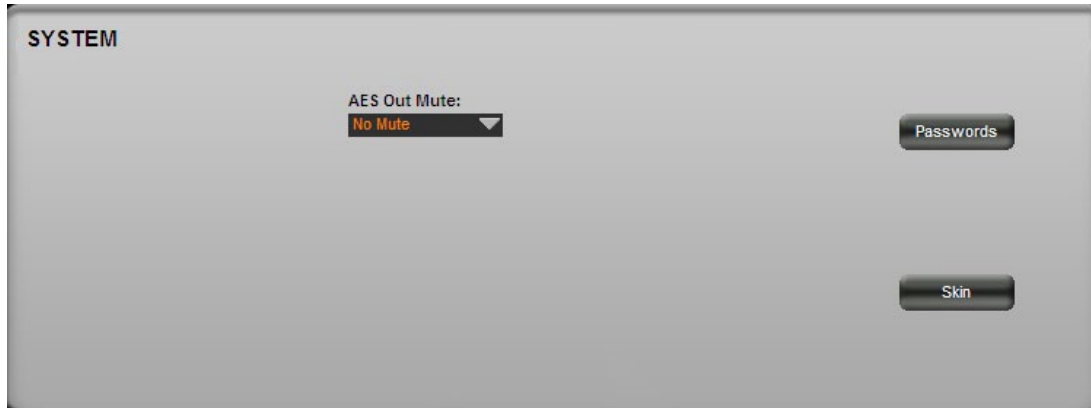


The High Shelf FREQ control is adjustable between 2kHz and 20kHz, allowing the turnover point to be placed precisely where it will do the most good. The Boost/Cut control is simply labeled “HIGH” and allows the shelf gain to be set anywhere between 14dB of cut to 14dB of boost.



## Additional GUI Functions

### System



**M-1 System Screen**

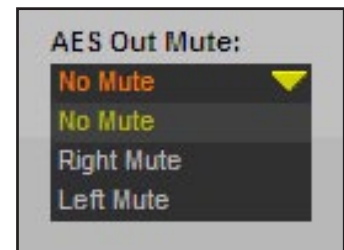
The M-1 System screen contains a list box for selecting the channel assignments for the AES3 output and two buttons which are utilized to access the unit's Security and Interface Options.

### AES Out Mute

There are three options:

- No Mute – Both left and right channels of the AES3 digital output carry the monophonic audio output of the M-1.
- Right Mute – Only the left channel of the AES3 digital output carries the monophonic audio output of the M-1.
- Left Mute – Only the right channel of the AES3 digital output carries the monophonic audio output of the M-1.

These modes are useful when it is desired to route and then mix two M-1 signals into one digital stream.



### Passwords

Functional only when the GUI is online with the M-1, this button is used to access the Passwords security menu for the setting of passwords to restrict the level of user access to certain functions and controls of the M-1. Clicking "Password" brings up the Login Password dialog box. To change the password you must enter the old password, then enter the new password, then enter the new password a second time to verify. If you don't want the M-1 to be password protected, leave both the New Password and Verify Password boxes blank. Check the "Remember This Password" box only if are sure no unauthorized person will use your computer.

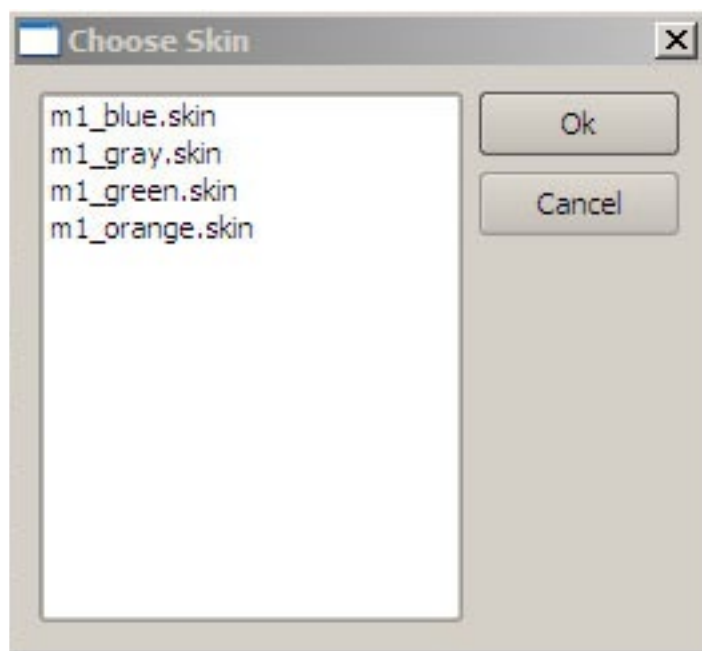


If a password has been set for an M-1, then when the GUI connects to that device the GUI user has to type in the correct password to finish connecting.



## Skin

Several alternate “skins” are provided that the end user can choose from for customizing the look of his or her M-1 GUI. More skins for the M-1 may become available from Wheatstone at a later time.





## Side Bar Region

To the right of the control area is a vertical row of six buttons arranged in two groups of three. We will begin by discussing presets and their management, which involves five of the six buttons. We defer discussion of the “Devices” button to the very end of this manual section, after presets have been thoroughly dealt with.

## Managing Presets

Let’s begin with a simple definition: a *preset* is a snapshot of all the settings of the M-1. It is desirable in many situations to have a library, or collection, of presets so that we can accommodate different audio processing needs at different times. As your library of presets grows, preset management (*i.e.*, having presets arranged so that you can find the one you need as quickly as possible) is a major concern.

Several tools are implemented within the GUI to make your preset managing life easier. We will intermix discussion of the sidebar buttons, dialog boxes, and management philosophy in a way that will, hopefully, help you to get the most out of your M-1 presets.

The M-1 comes with a variety of Factory Presets which are good starting points for a wide variety of applications. They are quite useful for demonstrating the extreme flexibility of the M-1 Microphone Processor’s features.

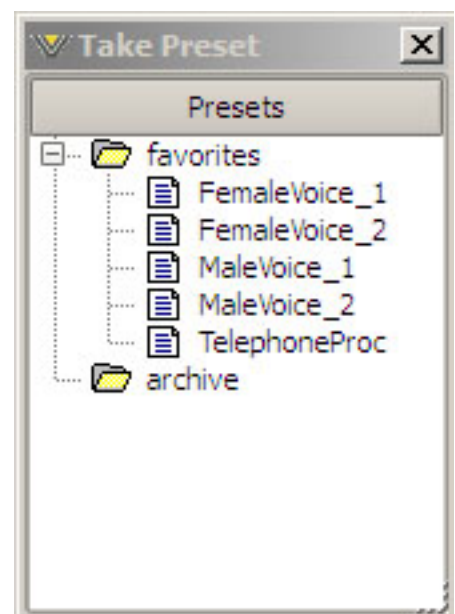
One thing can’t be said often enough: if you dial up some settings that you like, SAVE the settings as a preset before you ever load in another preset or twiddle more dials.

## Take

The most basic operation you can do with a preset is to *Take* it, *i.e.*, load it so that the M-1 will operate according to the settings of that preset. Left-click the “Take” button to start. The “Take Preset” box appears, showing the folders that the GUI knows to contain presets. Opening and browsing a folder displays the presets and/or sub-folders, sorted by name. Double-clicking on a preset brings it immediately into use on the M-1.

For your convenience the “Take Preset” box stays open until deliberately closed, allowing different presets to be selected in quick succession. This is a very direct and convenient means of quickly comparing the sound of various presets. To close the form, click the “X” in the upper right corner of the form.

**IMPORTANT!** As stated above, always remember to save your present settings as a preset name *before* invoking other presets from the list or your settings will be lost forever!



## More On Presets

At this point it is worthwhile to go into a little more detail about what a preset is. As stated earlier, a preset is a snapshot of all the settings on the M-1. Presets are saved in a format that computer gurus call *plain text*. This simply means that the information can be read not only by a computer, but by a real human being as well. Presets are saved in a specific format in a text file having the extension `.ml`. If you were to read one of these files in a text editor such as Notepad, you would basically see a list of the controls and how they are set for that particular preset. You could even use a printout of the text and enter the settings by hand into the GUI to recreate a particular setting.

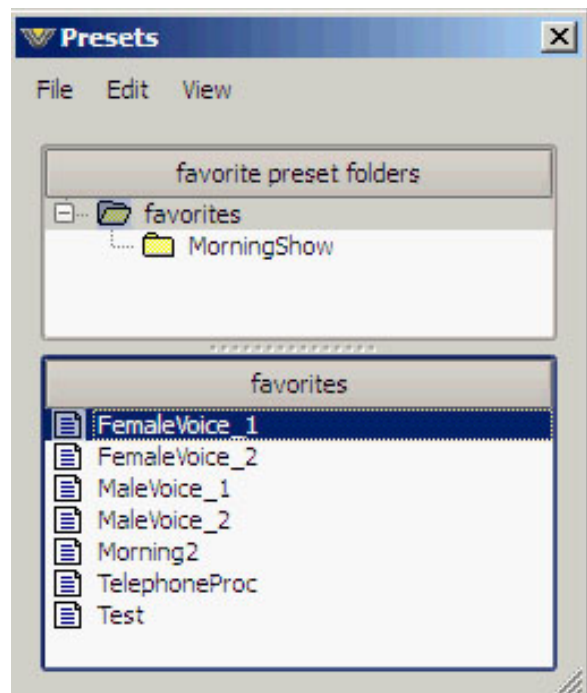
Thankfully you don't have to do that. The M-1 GUI is capable of saving your settings as presets with a few mouse clicks and keystrokes, and, as you've already seen, loading those presets into the GUI with a minimum number of mouse clicks. For the remainder of this document we will usually refer to both presets and preset files by the common name *preset*, with the context indicating whether we are referring to the presets themselves or the files that describe them.

There is another level of preset management that we will discuss in more detail later, and that is the preset *package*. A preset package is simply a collection of presets. When the GUI is used to create, or build, a package, what happens is that the data from a number of individual files is thrown together into a single preset package file, having an extension of `.pkg`. This allows you to transfer a group of presets from one M-1 to another as a single file, rather than as a set of files. The preset package file is *not* saved in plain text, so if you load one of them into Notepad you will not be able to read the settings of the individual presets. This file format is meant to be used only by the M-1 GUI to transfer file preset collections between M-1 units.

## The Presets Button

The brunt of the preset management tasks are performed from the Presets form that comes up when you press the "Presets" button in the Side Bar. The form shows preset folders in the upper pane and individual preset files in the lower pane. A menu has various items depending on what you have highlighted in the upper or lower pane. From this dialog box you can take, save, rename, move, or delete presets, and you can also export and import preset packages. When you are done with this form, click the "X" in the upper right corner to close it. You will need to close this form before you can adjust any GUI controls.

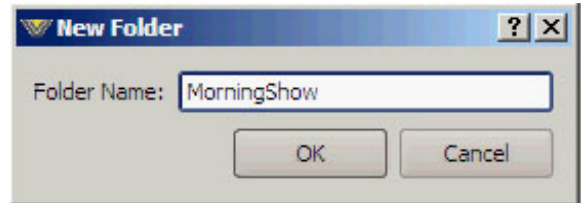
The following menus and sub-menus appear when the dialog box is used as described.



## File Menu

The File menu contents depend on whether you have a folder or preset highlighted. The following choices are possible if a folder is highlighted:

**New Folder...** - This selection brings up the “New Folder” dialog box, allowing you to create a new sub-folder within the folder you have highlighted. Enter the name for the new folder, then click the **OK** button. Click **Cancel** if you change your mind before you’re done.



**Install Preset Package...** — This selection brings up the “Install Preset Package” dialog, which is a standard Windows *Open* dialog box. The dialog looks for files of type “Preset Packages (\*.pkg)” and starts its search within the M-1 install directory. A package thus imported appears in the Presets dialog box as a new package folder under favorites, having the same name as the .pkg file but without the extension. The package folder appears as a folder but has a light red coloring within the icon to distinguish it from a standard folder icon. It is possible, but not necessarily recommended, to install the same package twice (or a second package with the same name as the first). The second import will have the same name as the first with the addition of the text “ (2).”

**Build Preset Package...** — This selection brings up the “Build Preset Package” dialog, a standard Windows *Save* dialog box, allowing you to save all of the presets in the highlighted folder, as well as any sub-folders and their enclosed presets, as a file of type “Preset Packages (\*.pkg)”. The default file name, which you can change, is the name of the highlighted folder with the extension .pkg added to it, and the default location to save the file to, which you can also change, is the M-1 install directory.

The following choices are possible if a preset is highlighted:

**Take** — This selection takes the preset, just like double-clicking a file name in the “Take Preset” window.

**Print...** — This selection brings up a standard Windows *Print* dialog box, allowing you to print out the settings for that preset.

## Edit Menu

The Edit menu contents also depend on whether you have a folder or preset highlighted. The following choices are possible if a folder is highlighted:

**Save** — This selection brings up the “Save as Preset in Favorites” dialog box, allowing you to save a new preset within the folder you have highlighted. Enter the name for the new preset, then click the **OK** button. Click **Cancel** if you change your mind before you’re done.

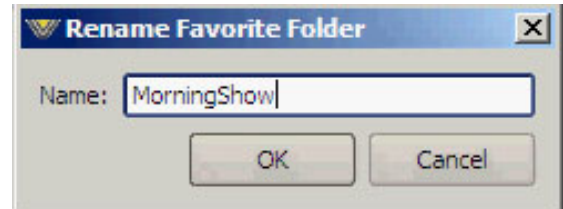


**Copy** — This selection copies all presets in the highlighted folder, but not in any sub-folders, to the clipboard.

**Paste** — This selection pastes the clipboard contents (one or more presets) into the highlighted folder. ***Important: there is no overwrite warning! If the highlighted folder already contains a preset of the same name as one being copied, the one from the clipboard will overwrite the one currently in the target folder.***

**Delete** — This selection deletes the highlighted folder after first asking if you are sure this is what you want to do. This menu item is grayed out if you have the top level **favorites** folder highlighted; you can't delete this folder.

**Rename...** — This selection brings up the “Rename Favorite Folder” dialog box, allowing you to rename the folder. Enter the new name for the folder, then click the **OK** button. Click **Cancel** if you change your mind before you're done. This menu item is grayed out if the highlighted folder is really a preset package. It is also grayed out if you have the top level **favorites** folder highlighted; you can't rename this folder.



The following choices are possible if a preset is highlighted (please note that use of the **Shift** or **Ctrl** keys allows you to select multiple preset files for the following operations):

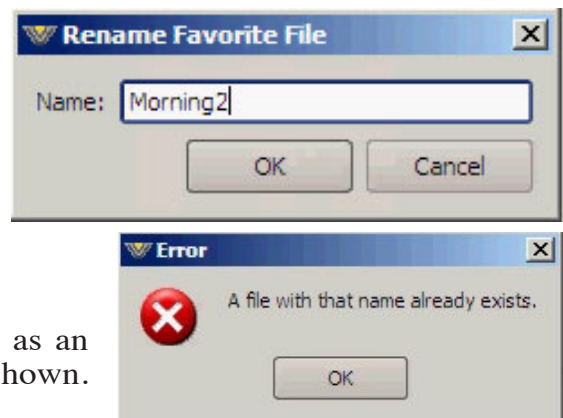
**Copy** — This selection copies the highlighted preset(s) to the clipboard.

**Paste** — This selection pastes the preset(s) in the clipboard to the same folder as the highlighted preset file is in. ***Important: there is no overwrite warning! If the target folder already contains a preset of the same name as one being copied, the one from the clipboard will overwrite the one currently in the target folder.***

**Delete** — This selection deletes the highlighted preset(s) after first asking if you are sure this is what you want to do.

**Rename...** — This selection brings up the “Rename Favorite File” dialog box, allowing you to rename the preset file. Enter the new name for the folder, then click the **OK** button. Click **Cancel** if you change your mind before you're done. If you have multiple preset files selected, the “Rename Favorite File” dialog box appears multiple times in sequence, allowing you to rename each file you have selected.

If you try to rename a file to the same name as an already existing file you get an error message as shown.



## View Menu

The View menu is only available when you have a preset file highlighted. The following choices are possible:

**Settings...** — This selection brings up the “Preset View” form, which displays a list of all the settings and their values for that particular preset in two re-sizable columns: **Setting** presents the name of the control, such as “Input Mic Gain,” while **Value** indicates the value that control is set to in the preset, such as “-4.0 dB.” Click the “X” in the upper right corner of the form to close it.

If you have multiple preset files selected the “Preset View” form appears multiple times in succession, allowing you to view the settings of each preset in turn. Upon clicking the “X” to close the form for one preset, the form reappears for the next preset, and so on until all presets have been viewed.

**Current Difference...** — This selection brings up the “Preset Difference” form, which displays three re-sizable columns: **Setting** presents the name of the control, **Current** indicates the value that control is set to currently in the GUI (please note this value will follow the “QSaveA” / “QSaveB” button selection as described later), and **Favorite** indicates the value that control is set to in the saved preset.

Setting	Value
Name	FemaleVoice_1
Num IDs	30
CRC	DE06F31C
Input Mic Gain	- 4.0 dB
Input Symmetry	In
Filter In	IN
Filter HPF Freq	42.9 Hz
Filter LPF Freq	13.5 kHz
Expander In	IN
Expander Depth	+12.0 dB
Expander Thresh	-37.5 FS
Expander Close	270.0 mS
De-Esser In	IN
De-Esser Thresh	-56.0 FS
De-Esser Release	72.0 mS
De-Esser Freq	5.34 kHz
EQ Pre DYN	DYN-->EQ
EQ In	IN
Lo Shelf Freq	28.7 Hz
Lo Shelf Lift	0.0 dB
PEQ 1 Freq	177 Hz
PEQ 1 Lift	+ 4.0 dB
PEQ 1 BW	0.73 oct
PEQ 2 Freq	3.00 kHz
PEQ 2 BW	2.10 oct
PEQ 2 Lift	+ 3.5 dB
Hi Shelf Freq	16.0 kHz
Hi Shelf Lift	0.0 dB
Comp In	IN
Comp Thresh	-42.0 FS
Comp Ratio	1 : 3.00
Comp Attack	3.1 mS
Comp Release	270.0 mS
Output Gain	+ 4.5 dB

Setting	Current	Favorite
Name		MaleVoice_1
Num Parameters	30	30
CRC	3A331903	4D87C681
Input Mic Gain	+20.0 dB	- 4.0 dB
Input Symmetry	Out	In
Filter In	OUT	IN
Filter HPF Freq	80.0 Hz	42.9 Hz
Filter LPF Freq	4.00 kHz	13.5 kHz
Expander In	OUT	IN
Expander Depth	+14.0 dB	+12.0 dB
Expander Thresh	0.0 FS	-37.5 FS
Expander Close	300.0 mS	270.0 mS
De-Esser In	OUT	IN
De-Esser Thresh	-40.0 FS	-56.0 FS
De-Esser Release	100.0 mS	72.0 mS
De-Esser Freq	4.00 kHz	5.34 kHz
EQ Pre DYN	EQ-->DYN	DYN-->EQ
EQ In	OUT	IN
Lo Shelf Freq	50.0 Hz	29.5 Hz
Lo Shelf Lift	+ 6.0 dB	0.0 dB
PEQ 1 Freq	800 Hz	96.4 Hz
PEQ 1 Lift	- 4.0 dB	+ 4.0 dB
PEQ 1 BW	0.50 oct	0.56 oct
PEQ 2 Freq	2.80 kHz	3.67 kHz
PEQ 2 BW	0.66 oct	1.05 oct
PEQ 2 Lift	+ 3.0 dB	+ 2.0 dB
Hi Shelf Freq	8.00 kHz	16.0 kHz
Hi Shelf Lift	+ 8.0 dB	+ 2.5 dB
Comp In	OUT	IN
Comp Thresh	-40.0 FS	-42.0 FS
Comp Ratio	1 : 2.00	1 : 3.00
Comp Attack	1.0 mS	3.1 mS
Comp Release	150.0 mS	270.0 mS
Output Gain	0.0 dB	+ 4.5 dB

Print...

A “**Print**” button at the bottom of the form allows you to produce a print-out of the differences as displayed. Lines that indicate differences start with a double asterisk (“\*\*”). On a color printer these lines will also show up in red.

Click the “**X**” in the upper right corner of the form to close it.

If you have multiple preset files selected the “Preset Difference” form appears multiple times in succession, allowing you to view the difference information for each preset in turn. Upon clicking the “**X**” to close the form for one preset, the form reappears for the next preset, and so on until differences have been viewed for all presets.

## QSaveA, QSaveB, and the “Equals” Button

The GUI utilizes two temporary storage areas (referred to as Buffer A and Buffer B in the following discussion) for keeping track of the current GUI settings. Whenever you load a preset or change a control setting that action is being recorded into one of these two buffers. Look at the “QSaveA” and “QSaveB” buttons in the Side Bar area. If you have not clicked these buttons since starting up the GUI you will see that “QSaveA” is highlighted. What this means is that any GUI setting changes loaded or modified are currently residing in Buffer A. If you now click “QSaveB” any changes you make will be recorded to Buffer B instead.

To see this for yourself, start by making sure “QSaveA” is highlighted and look at your current settings. Now click “QSaveB” and make a couple of changes, and then click “QSaveA” again. You’ll notice that the settings revert to what they were before you clicked “QSaveB.”

This is a very useful scenario if you want to make an A/B comparison between two different sounds. Let’s say you have two different presets and you want to compare how they sound. Make sure “QSaveA” is highlighted and load in the first preset. Now click “QSaveB” and load in the second preset. If you now click “QSaveA” you will be hearing the results of the processing from the first preset, and if you click “QSaveB” you will be hearing the results of the processing from the second preset.

Changes made will be reflected in the buffer contents. For example, switch to Buffer A and make a change, then switch to Buffer B and make a different change. Now as you switch between the two buffers you will be listening to the presets as modified by the changes you made. Please note, none of this will affect the actual preset files, only the contents of the temporary buffers.

Now lets say you want to do something completely different. Click “QSaveA” and load in a preset. Then hit the bottom button, which will be currently labeled “B=A.” What this does is to make the contents of Buffer B be the same as Buffer A (it makes **B equal to A**). This gives you two identical working copies of the preset. Now you can switch to Buffer B and make changes, then switch between A and B to hear the differences between the saved preset and the modifications you are previewing. This is a good way to take an existing preset and modify it for a new situation.

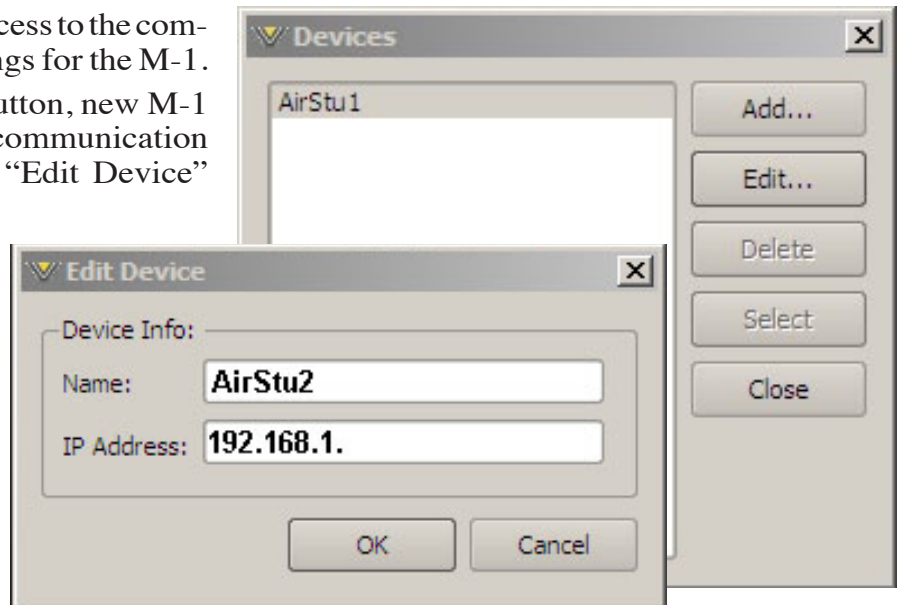
You will notice that, if “QSaveB” is highlighted, the bottom button is labeled “A=B.” If you click the button at this time it will make the contents of Buffer A be the same as the contents of Buffer B (it makes **A equal to B**). Thus you can start by using either Buffer A or Buffer B and make your changes to just one of the buffers. Just be sure to remember which buffer you’re using as the reference and which one you are using to preview a new preset.

## Devices

The devices menu allows access to the communication configuration settings for the M-1.

By clicking the “Add...” button, new M-1 devices can be configured for communication with the GUI. The following “Edit Device” dialog will appear:

Under “Device Info” you can enter the pet name of the M-1 that you are configuring. Then, in the IP Address box, enter the IP address that the M-1 should be using.



## Title Bar Region



Along the top edge of the M-1 GUI screen (in line with the M-1 product label to the left, and the Windows About, Minimize, and Exit icons to the right) are “Status” and “Devices” indicators. The M-1 GUI is capable of controlling multiple M-1s (“Devices”). Whether a connection is made (“Status”) or not, the device presently under command is indicated in the “Devices” box. Double-clicking “Devices” will gain access to device management screens.

### Status

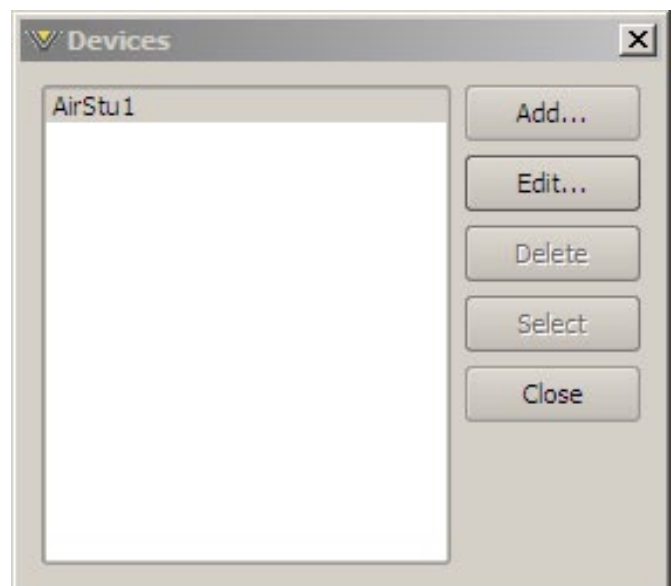
This indicates: “Online,” meaning the GUI is in communication with and directly reflects an M-1; “Offline,” meaning the GUI and M-1 are disconnected; or “Trying,” meaning the GUI is attempting to find the M-1 on the LAN and connect to it. An adjacent button toggles between “Online” and “Offline.”

### Devices

The name of the M-1 to which the GUI is connected (or with which it is attempting to connect) shows here in amber.

Double-clicking on the name area brings up the “Devices” dialog box. A list of M-1 devices with which the GUI has had cause to become familiar is shown here. Highlighting the desired M-1’s name and hitting “Select” causes the GUI to attempt to connect to it.

In the event no M-1’s are listed or one is adding an additional device, “Add” brings up a small dialog box which asks for the new prospect’s name and IP address.



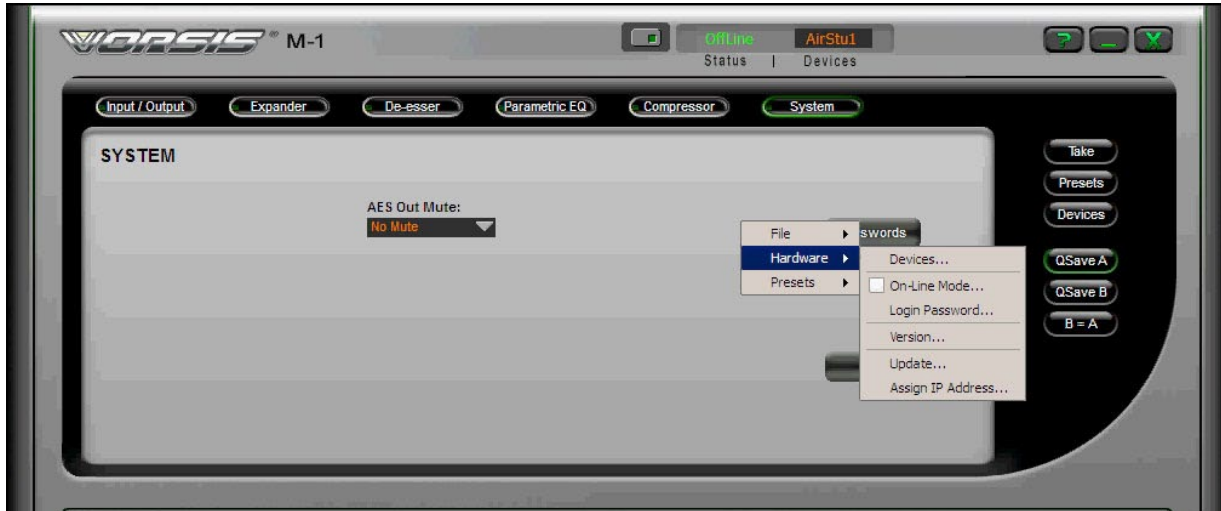
### Network Notes

- The M-1 utilizes static TCP/IP addressing and does not use DHCP (Dynamic Host Configuration Protocol); therefore it must be assigned its own IP address. Please consult your local network administrator if the M-1 network configuration poses any difficulties.
- The M-1 utilizes both TCP and UDP protocols while communicating with the remote GUI, and the interconnecting network and its hardware (routers, switches, etc.) need to be able to pass both protocols as well as traffic to/from the M-1 on port 55891.



## Accessing Menu Options

Right clicking anywhere on the main M-1 GUI will open a pop up menu tree with access to *File*, *Hardware*, and *Presets* choices. These choices lead to sub-menus and dialog boxes that may also be accessed by clicking on other dedicated buttons on the main M-1 control panel. As with many Windows programs, there are multiple ways to access menu trees - go ahead and explore!



## File Menu Items

The *File* menu tree may be accessed by right clicking anywhere on the main M-1 GUI. Sub-menu choices include:

*About...* - brings up the GUI program's About splash screen. Click anywhere on the splash screen to dismiss this screen.

*Center Window* - centers the GUI window on your display.

*Choose Skin...* - brings up the "Choose Skin" form discussed earlier.

*Exit* - closes the GUI program. Any connected device will continue to operate.

## Hardware Menu Items

The *Hardware* menu tree may be accessed by right clicking anywhere on the main M-1 GUI. Please note that many of these functions require you to be connected (Online) to an M-1. Sub-menu choices include:

*Devices...* - opens the "Devices" dialog box. Allows the creation, editing, selection, and deleting of Wheatstone processors connected to your system.

*On-Line Mode...* - toggles between ONLINE and OFFLINE modes.

*Login Password...* - opens the Passwords dialog box for editing login passwords.

*Version...* - displays the current software versions running on your M-1.

*Update* - opens the "Choose a file to download" dialog box. Only files of type \*.vbn are visible. See the later section on software updates.

*Assign IP Address...* - opens a dialog box that allows the user to change the IP address parameters of the M-1. Please see the **Read Me!** at the beginning of this manual for complete details on changing the network settings.

## Presets Menu Items

The *Presets* menu tree may be accessed by right clicking anywhere on the main M-1. Sub-menu choices include:

*Take...* - opens the “Take Preset” form to allow quick loading of presets to the M-1. This form was discussed in detail earlier.

*Presets...* - opens the “Presets” form for preset management. This form was discussed in detail earlier.

## Software Updates

Future versions of the M-1 software may be released to implement new features or correct known problems. The Software Update menu choice opens a dialog box and prompts the user to select a file to be uploaded to the M-1. Upon completion, you will be asked to restart the M-1 (cycle power).

Only verified updates provided by Wheatstone will work!

## The M-1 “Talent Control Interface” - Restricting Access to Processing Controls

There have been many requests from end users for a method to allow air talent to change presets in the M-1 without giving them the full control that the standard GUI provides. To satisfy that need we’ve created a special GUI for the M-1 Microphone Processor that does just that.

All Wheatstone audio processors ship with a standard GUI interface that allows access to all processing and input/output controls. For each product there are several different standard “skins” available that permit the cosmetic appearance of the GUI to be changed by the user if desired.

For the M-1 product there are new “skin” files available that convert the standard GUI into a “Talent Control Interface.” This new interface displays all metering and processing activity but disallows viewing and changing the processing and input/output settings. The new interface also retains the ability to configure and select multiple M-1’s for control of preset recall operations if desired.

Please follow the instructions below to install and enable the new M-1 Talent Control Interface.

1. Install the standard M-1 GUI on the desired PC (such as an air studio PC).
2. Configure the GUI to connect to the desired M-1 device(s).
3. Download the “M1\_TalentControlInterface.zip” file from the M-1 product page’s “Recources” tab on the wheatstone-processing.com web site.
4. Copy the “M1\_TalentControlInterface.zip” file into the “Skins” folder where the M-1 GUI has been installed on the host PC.
5. Unzip the contents of “M1\_TalentControlInterface.zip” into the M-1’s Skins folder. Three new files should be unpacked during the unzipping process:

*M1\_TalentControl\_1.skin*

*M1\_TalentControl\_2.skin*

*M1\_TalentControl\_3.skin*

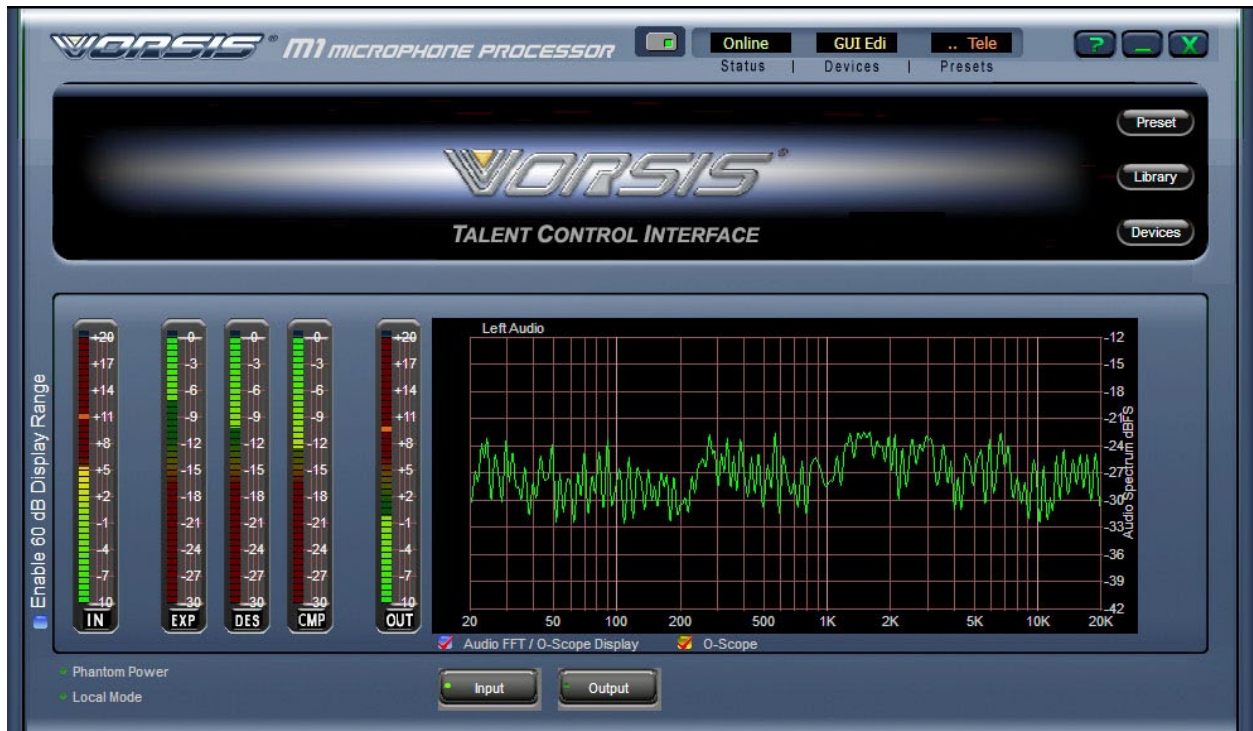
The three files are identical in function and differ only in their cosmetic appearance. This allows the end user some flexibility in choosing the particular Talent Control Interface color scheme that is most pleasing in their environment.

### Selecting a Talent Control Interface

The following steps can be used to change the appearance and functionality of the M-1 user interface once the new Talent Control Skins are installed.

1. With the GUI running (you do not need to be online to the M-1) a new skin file can be selected by right clicking in the controls area of the GUI and selecting the “File/Choose Skin” dialog. The three new M1\_Talent Control skins files should be among those listed.

- Highlight one of the M1\_TalentControl skins in the list and click OK. The appearance of the M-1 GUI should change completely. All processing controls should disappear and the upper window of the GUI should contain a Vorsis logo and the words “Talent Control Interface.” The M-1 Talent Control Interface should appear as below:



**M-1 Talent Control Interface permits preset changes only!**

## Restricting Access to Controls

Usually when one of the Talent Control skins is being utilized it means that it is desired to restrict access to the M-1’s controls. In order to accomplish this, besides selecting a Talent Control skin it is also necessary to ensure that those skins are the only ones available should a curious user navigate to the Choose Skin function of the GUI and begin to explore.

To accomplish this level of security simply navigate to the installation folder of the M-1 using Windows Explorer or other suitable file utility and locate the “Skins” folder. Inside this folder should be one or more of the following files:

*Default.skin*  
*M1\_Blue.skin*  
*M1\_Gray.skin*  
*M1\_Green.skin*  
*M1\_Orange.skin*

(plus the three M-1\_TalentControl skins that were already copied there)

In order to restrict access to the M-1's processing controls (which could be reached again if talent simply changed back to a standard M-1 GUI skin) it will be necessary to make the non-Talent Control Interface files inaccessible. One way to accomplish this is by deleting all of the files in the Skins folder except for the M1\_TalentControl skins. Once this is done only the M1\_Talent Control skins will be available to end users.

Or, rather than deleting the original M-1 skin files they may also be *renamed* with a different file name *extension* which will make them invisible to the GUI's Choose Skin dialog. For instance, simply appending another character such as a "1" to the file extension will render the skin files invisible to the GUI.

Example: "M1\_Blue.skin" is renamed to "M1\_Blue.skin1"

## Changing the M-1's Processing Settings Later

If it is desired to change the sound of the M-1 after the M-1\_Talent Control Interface skins have been installed and the other "full-control" skins are inaccessible, there are three options:

1. New presets can be created on another M-1 processor and then copied into the Presets folders of the M-1's with restricted GUI access. That makes those presets available for selection through the Preset and Library dialogs of those restricted GUI's.
2. A "protected" M-1 can always be controlled remotely over the network from a standard M-1 GUI that has not been restricted. Up to four remote GUI's can be connected to a single M-1 at the same time.
3. A standard M-1 skin file (such as the M1\_Blue.skin) can be temporarily copied into the protected M-1 GUI's skins folder and then selected as the current skin (or a renamed skin put back to its original file name). This will allow the M-1's controls to be viewed and adjusted.

Once adjustments are completed the new settings can be saved as a preset, the GUI's skin changed back to one of the M1\_TalentControl skins, and the M1\_Blue.skin made inaccessible again.

## Security Tips

1. For protecting against inadvertent "upgrade" we recommend that any existing .vbn files be removed from the M-1's installation folder to prevent inadvertent "updating" of the product when it is not necessary.
2. For preventing unauthorized access to the M-1's controls by someone replacing or renaming the original skin files, we recommend that if a secure GUI is desired the M-1's factory default installation path of "c:\program files\vorsis\m1" *not* be used. Instead install the M-1 GUI into a non-descriptive folder. Example: When the M-1 GUI installer requests the installation path and displays the default location C:\Program Files\Vorsis\M1, change the path to something like C:\Temp1\Old\M1. Most idle and curious talent won't bother to navigate to what they perceive is a potentially "boring" path.

3. Protecting your device configurations. Device configurations are stored in the M-1 installation folder in a subfolder call "MAPS." This folder stores individual device configuration files which may be protected from corruption and deletion by utilizing Windows file attributes. Highlight the .cfg file to be protected, right click it, and select properties. Check the Read Only option and click Apply. Now that configuration is protected even if someone uses the M-1 Device dialog to "delete" a configuration. Simply exit the M-1 GUI and restart it and the original configuration will be restored and available once again to the Devices dialog.

We'll leave other suggestions for enforcing security on the M-1 GUI installation to the imagination of the reader. Just remember that the better hidden the original skin files are, the less chance there is that someone will figure out how to access and adjust the M-1's controls when they shouldn't.

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# Appendix 1

## Contents

Parameters, Units and Ranges.....A-3



## Parameters, Units and Ranges.

Approximately following the M-1's signal path, these are the values and ranges appropriate to each type of processing.

### System Level

Headroom:	20dB
Nominal Operating Level:	-20dBFS
LED Input/Output Level Meter	

### Input

Type:	Electronic Differential
Input Impedance:	> 2kohms at 1kHz
Optimum Source Impedance:	200 ohm
Phantom Power	
Maximum Gain:	70dB
Minimum Gain:	-10dB
Gain Increments:	1dB
EIN:	-128dBu
FR:	+ / - 0.2dB
THD+N:	<0.03%20Hz - 20kHz@-50dBu in
SMPTE DIM:	0.00007%

### Filters

#### a. High-Pass Filter

Filter class:	24dB/oct. Butterworth
Frequency:	20Hz – 1kHz (default 80Hz)
Defaults:	Off

#### b. Low-Pass Filter

Filter class:	24dB/oct. Butterworth
Frequency:	1kHz – 20kHz (default 4kHz)
Defaults:	Off

## Equalization

Four independent bands of equalization:

Low Frequency:	Shelving 20Hz – 200Hz
Mid Frequency (two identical bands):	Parametric 20Hz – 20kHz, 0.2-3.0 octave BW
High Frequency:	Shelving 2kHz – 20kHz
Lift / Cut:	+ / - 14dB
Defaults:	All off
	Defaults When Activated
	LOW: 50 Hz, +6dB
	MID1: 800Hz, 0.5 oct., -4dB
	MID2: 2.8kHz, 0.66 oct., +3dB
	HIGH: 16kHz, +8dB

## De-Esser

Type:	Recursive-style true (not broadband) De-Esser
Threshold:	-10 to -60dBfs (default -20dBfs)
Release:	50mS – 500mS (default 100mS)
De-Ess Frequency:	20Hz – 20kHz (default 4kHz)
Defaults:	Off
LED Gain Reduction Meter	

## Expander

Type:	Downward Expander
Threshold:	-60 – 0dBfs (default -40dBfs)
Close:	50mS – 3Sec. (default 300mS)
Depth:	0 – 40dB (default 14dB)
Defaults:	Off
LED Gain Reduction Meter	

## Compressor

Threshold:	-10 to -50dBfs (default -40dBfs)
Attack:	0.2mS – 1S (default 1mS)
Release:	33mS - 1Sec. (default 150mS)
Ratio (soft-knee):	1:1 – 1:20
LED Gain Reduction Meter	

## Control

Local:

Front Panel

All parameters accessible via a rationalized set of front-panel controls and displays.

Remote:

Software

Windows® GUI software affords control of all parameters, via Ethernet.

## Appendix 2

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For the most part there are no user-replaceable parts in the M-1. A complete list of available components is shown on the next page. Contact Wheatstone technical support for further information.

Wheatstone Corporation (600 Industrial Drive, New Bern, North Carolina, USA 28562) may be reached by phone at 252-638-7000, fax 252-637-1285, electronic mail "techsupport@wheatstone.com".

## REPLACEMENT PARTS —M-1 MIC PROCESSOR

COMPONENT	DESCRIPTION	WS P/N
M-1 LOADED CARD	PROCESSOR LOADED CARD ASSEMBLY	"008844"
MSW-1 LOADED CARD	SWITCH LOADED CARD ASSEMBLY	"008842"
CABLE	50 COND FLAT RIBBON CABLE	"150007"
POWER CORD	7 1/2' BLACK POWER CORD	"150017"
POT CAP	11MM BLACK CAP W/WHITE LINE	"530036"
POT CAP	11MM MID GREY CAP W/WHITE LINE	"530081"
POT CAP	11MM GREY CAP W/WHITE LINE	"530082"
POT CAP	11MM BLUE CAP W/WHITE LINE	"530317"
POT CAP	11MM CREAM CAP W/BLACK LINE	"530352"
POT CAP	11MM PALE BLUE CAP W/BLACK LINE	"530353"
MANUAL	OWNER'S MANUAL	"008884"