

EQ1 and EQ2

27 BAND AUTOMATIC EQUALIZER

**OPERATING INSTRUCTIONS
and trouble-shooting guide**

LECTROSONICS, INC.

Rio Rancho, NM

INTRODUCTION

The EQ1 and EQ2 are 27 band, constant-Q, automatic equalizers. The EQ1 has a 2 line LCD screen for user interface, while the EQ2 is a blank faced unit. Both of the units have the capability to inject pink noise into a sound system, and to measure and adjust the system equalization to a user specified target curve. In addition, a dynamic pop suppressor minimizes breath pops. The EQ1/EQ2 has an RS-232 port for remote set-up or control by a computer or other RS-232 compatible controller.

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FCC PART 15 NOTICE

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

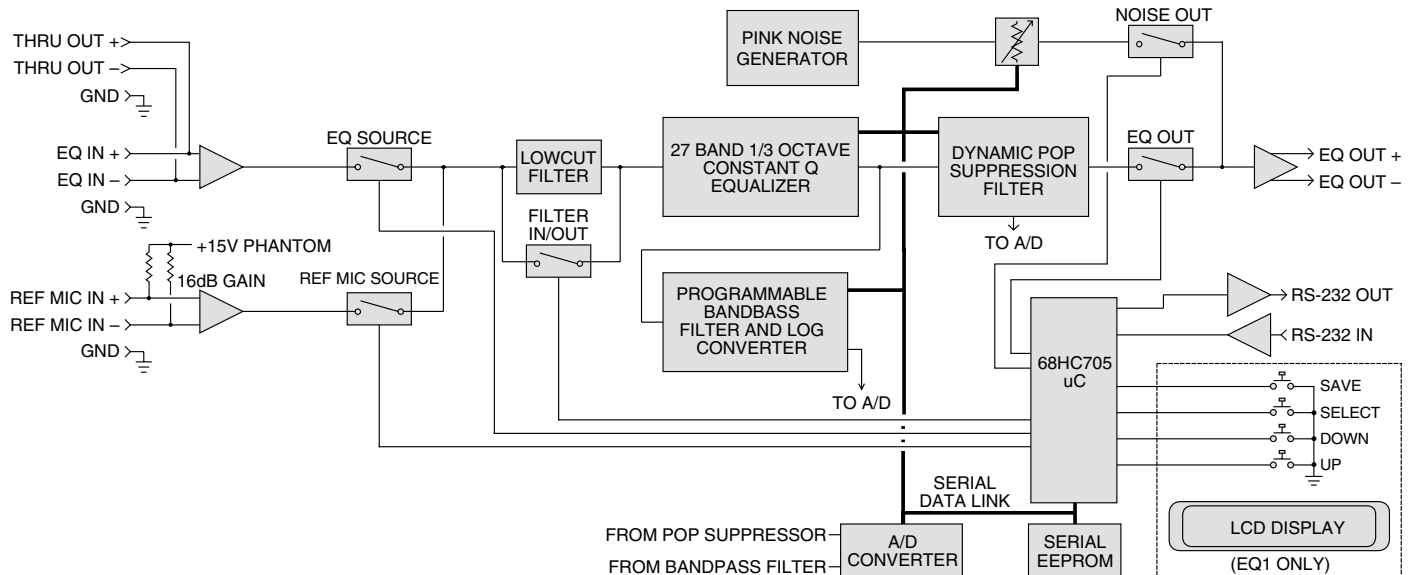
GENERAL TECHNICAL DESCRIPTION

The EQ1/EQ2 uses a straightforward analog signal path to provide excellent audio performance. 27 bands of constant-Q equalization allows systems to be accurately equalized. The constant-Q topology means less interaction between adjacent EQ bands, which in turn means less “tweaking” of the EQ settings to achieve the desired EQ curve. The EQ1 and EQ2 have a programmable pink noise generator and a programmable 1/3 octave measurement filter. These provide the capability to stimulate a room with pink noise, and measure its response. A sophisticated automatic equalization algorithm is used to equalize the room, typically to within +/-2dB of a user selected target curve. This process takes just over one minute.

A fixed frequency, switchable low cut filter combines with Dynamic Pop Suppression (DPS) circuitry to give precise control over system low frequency performance. The DPS system is a dynamic high-pass filter, which reacts only to low frequency transients. Breath pops or bass boost from speaking too close to a directional microphone are both significantly reduced. Since the filter is dynamic, it has no effect on the normal frequency response of the system.

Figure 1. shows the block diagram of the EQ1/EQ2. Balanced inputs are available for both the line level input to the EQ and the reference microphone. Note that either input may be used as the source for the AutoEQ™ process. The signal path includes the switchable low cut filter, the 27 band equalizer, the DPS system, and a balanced output driver. The output source may be switched between the normal signal path and the pink noise generator (used for the AutoEQ™ process). The programmable 1/3 octave bandpass filter and log converter allows post-EQ system response to be measured as part of the AutoEQ™ process.

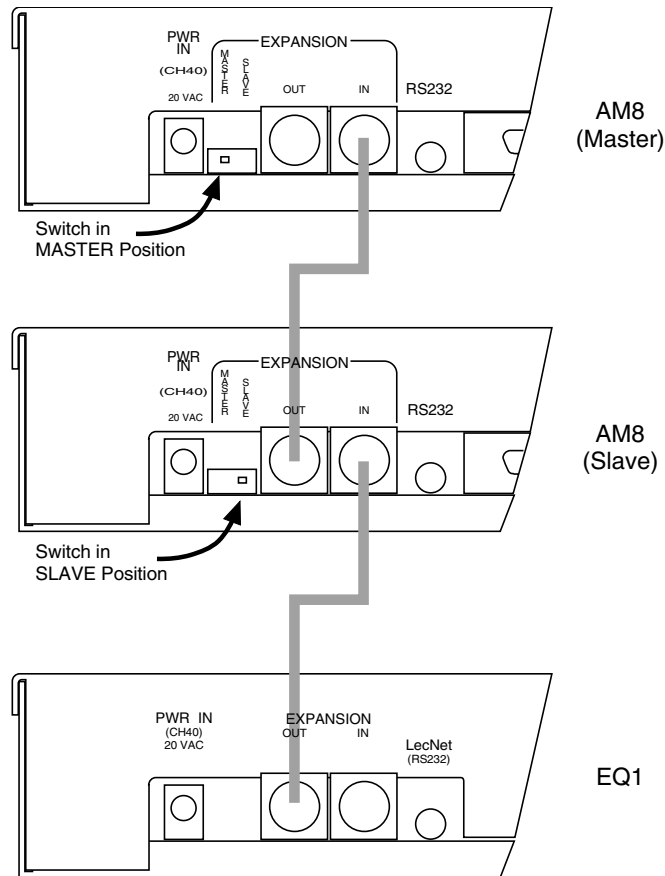
An RS-232 port is available to allow many of the functions of the EQ1/EQ2 to be controlled either by a computer or a dedicated control system (such as the AMX or Crestron systems).



EQ1/EQ2 Block Diagram

INSTALLATION

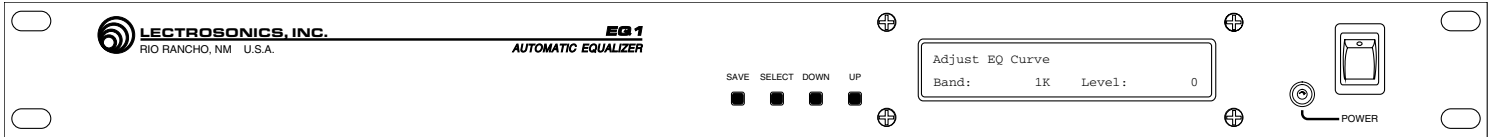
Installing the EQ1/EQ2 properly is simple, and only requires attention to a few issues. The EQ1/EQ2 should be used in a grounded metal rack. The Expansion Out port of the EQ1/EQ2 should be connected to the Expansion In port of the next device. Note that if multiple AM8s are being used with the EQ1/EQ2, the EQ1/EQ2 should be connected to the last AM8 in the chain. Figure 2 shows the correct interconnection for EQ1/EQ2s.



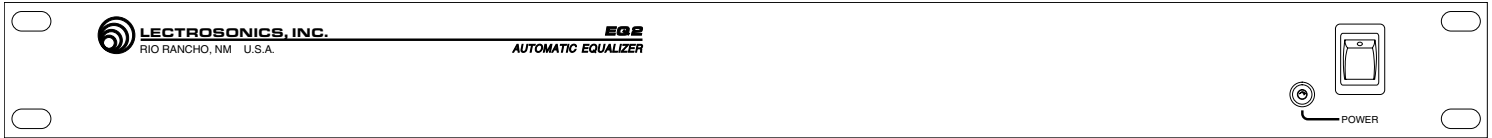
EQ In and Ref Mic In connections should be made with good quality braid or foil shielded twisted pair. The shield should be used for the ground (Pin 1) connection. If an unbalanced signal is used, the unbalanced signal lead should be connected to the “+” input terminal, while the unbalanced ground lead should be connected to both the “-” and ground terminals of the input connector. The reference microphone input has +15V phantom power supplied at all times.

Output connections to the EQ Out connector can be made balanced or unbalanced. If an unbalanced connection is desired, simply connect the unbalanced signal lead to the “+” output terminal, and the unbalanced ground lead to the output ground terminal. Leave the “-” output terminal unconnected. The EQ Thru connector is electrically in parallel with the EQ input. If the EQ input is connected unbalanced, the EQ Thru will also be unbalanced.

FRONT PANEL DESCRIPTION



EQ1 Front Panel



EQ2 Front Panel

EQ1 and EQ2

POWER SWITCH and LED - Indicates that the EQ1/EQ2 has AC power and is on.

EQ1 Only

LCD DISPLAY - Shows the available menu items for configuring the EQ1.

SAVE Button - Saves the current value of all EQ1 parameters to nonvolatile memory. Used if changes are made from the front panel which should become permanent. If the SAVE button is not pressed after any changes, the changes will be lost when the power is removed from the EQ1.

SELECT Button - Moves the active cursor between menu categories.

UP and DOWN Buttons - Increments or decrements the values in the active menu category. If the Up and Down buttons are both pushed while the power is turned on, the EQ1 will be returned to factory default condition. Factory defaults are as follows:

- 1) Stored EQ curve is reset to flat.
- 2) User Target curves 1-3 are reset to Factory curves 1-3.
- 3) Pop Suppress system is set to off.
- 4) LCD display contrast is set to the factory default.
- 5) Operational mode is set to Local.

EQ1 Menu Options:

EQ1 Address - Allows the LecNet address of the EQ1 to be changed. The factory default address is 131.

Adjust EQ Curve - Allows the cut or boost value of each of the 27 1/3 octave bands to be adjusted. Adjustment range is +/-15dB.

Adjust Target Curve - Allows any of the three user programmable target curves (U1, U2, or U3) to be adjusted. Adjustment range for any band is +/-15dB. Note that while no adjustment of the three factory curves (F1, F2, and F3) is allowed, the factory values may be reviewed using this menu option.

Adjust Target Curve Input Source - Allows the input source associated with each of the user programmable target curves (U1, U2, or U3) to be chosen. Note that while no change may be made to the input source of the three factory curves (F1, F2, and F3), the factory values may be reviewed using this menu option.

EQ Status (EQ In/Out) - Bypasses the equalizer and low cut filter of the EQ1. This is useful for A/B comparisons between the equalized and unequalized systems.

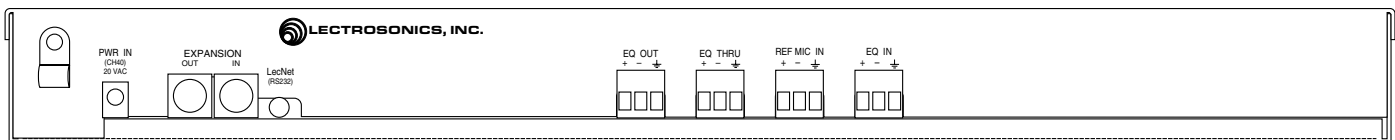
Low Cut Filter (In/Out) - Bypasses the low cut filter of the EQ1.

Pop Suppress Threshold - Allows adjustment of the amount of DPS action. Threshold range is -40dB to 0dB. A dynamic display of the amount of DPS activity is included in this screen to help in the adjustment process.

Display Contrast - Allows the contrast ratio of the LCD display to be adjusted to accommodate different viewing angles.

Auto Equalize... - Initiates the AutoEQ™ process. Note that the Target Curve/Target Input Source used for the AutoEQ™ process is the one that has been selected by the Adjust Target Curve menu item. If the SELECT button is pressed, the AutoEQ™ process will begin. First, the Pink Noise Level menu item will be displayed. Use the UP and DOWN buttons to adjust the noise level to an appropriate measurement range. Prompts on the display will indicate when the noise level is adequate. The SELECT button is pressed again to start the actual AutoEQ™. The Checking Band screen will then be shown, and will indicate how far along the AutoEQ™ process is. At the end of the process, the display will revert to the Auto Equalize... menu. Remember that the SAVE button must be pressed after the AutoEQ™ process to store the new EQ curve to permanent memory.

REAR PANEL DESCRIPTION



EQ1/EQ2 Rear Panel

EQ IN - Provides the balanced, RF protected line level input into the EQ1/EQ2.

EQ THRU - Provides an output directly in parallel with EQ IN. Note that if EQ IN is used unbalanced, EQ THRU will also be unbalanced.

REF MIC IN - Provides the balanced, RF protected reference mic input into the EQ1/EQ2. +15V phantom power is provided to this input.

EQ OUT - Provides the balanced line level output of the equalizer.

LecNet™ (RS-232) SERIAL PORT - Provides access to and control of some of the operational features of the EQ1/EQ2. The port is compatible with the serial port of a PC, or other controllers with RS-232 type serial ports. For hardware interconnection and software details, see Appendix 1, "Serial Port Hardware and Software".

EXPANSION IN/OUT - Connects the EQ1/EQ2 to other LecNet™ compatible devices. The Expansion connection to the EQ1/EQ2 is only necessary if the device is used with a computer. The EQ1/EQ2 Expansion Out port should be connected to the last LecNet™ in the chain (see Figure 2 above).

PWR IN - Connects to the CH40 power supply to provide power for the EQ1/EQ2.

OPERATING INSTRUCTIONS

Setup of the EQ1/EQ2 consists of adjusting the EQ curve (either manually or using AutoEQ™), selecting the low cut filter status, and adjusting the DPS system.

- 1) The desired EQ curve should be set first. With the EQ1, and EQ curve may be set manually either from the front panel display and controls, or using a PC or compatible. The EQ2 may only be set up using a PC. When set up from the front panel display and controls, the Adjust EQ Curve menu option is used. Cut or boost may be set for each frequency band, and then the SAVE button should be pushed to store the new EQ curve in nonvolatile memory. If a PC is used to adjust the EQ curve, simply adjust the EQ band sliders to the desired cut or boost level. Use the File/Download option to store the resulting EQ curve in nonvolatile memory.

If the AutoEQ™ process is used, a few preliminary items should be taken care of. If the equalization will be done using the reference microphone, the reference microphone should be placed centrally in the listening environment. If the equalization is to be performed with system microphones (i.e. microphones connected to the AM8 or other mixer feeding the EQ1/EQ2), the microphone(s) should be moved into the listening environment. Choose the Auto Equalize... menu option and press SELECT. The Pink Noise Level sub-menu prompts for an appropriate pink noise level to be set. The EQ1 will indicate when the pink noise level is adequate. Press the SELECT button again, and the Checking Band sub-menu appears. The actual AutoEQ™ is now started, and progress will be indicated on this menu. At the conclusion of the process, the menu will revert to the Auto Equalize... option. The AutoEQ™ process using the PC is similar, and initiated using the AutoEQ/Start menu option. After the AutoEQ™ process is complete, use the SAVE button (or File/Download menu option on the PC) to store the new EQ curve to nonvolatile memory.

- 2) If the Low Cut filter is desired, use the Low Cut Filter menu option.
- 3) Set up the DPS system using the Pop Suppress Threshold menu option. Adjust the threshold value until breath pops are minimized.

The system is now ready for use.

Resetting the EQ1 to Factory Defaults

If the Up and Down buttons are both pushed while the power is turned on, the EQ1 will be returned to factory default condition. Factory defaults are as follows:

- 1) Stored EQ curve is reset to flat.
- 2) User Target curves 1-3 are reset to Factory curves 1-3.
- 3) Pop Suppress system is set to off.
- 4) LCD display contrast is set to the factory default.
- 5) Operational mode is set to Local.

TROUBLESHOOTING

SYMPTOM

EQ1/EQ2 doesn't remember new settings

POSSIBLE CAUSE

- 1) The SAVE button must always be selected after power up to make changes permanent

SERVICE AND REPAIR

If your system malfunctions, you should attempt to correct or isolate the trouble before concluding that the equipment needs repair. Make sure you have followed the setup procedure and operating instructions. Check out the interconnecting cords and then go through the TROUBLE SHOOTING section in the manual

We strongly recommend that you **do not** try to repair the equipment yourself and **do not** have the local repair shop attempt anything other than the simplest repair. If the repair is more complicated than a broken wire or loose connection, send the unit to the factory for repair and service. Don't attempt to adjust any controls inside the units. Once set at the factory, the various controls and trimmers do not drift with age or vibration and never require readjustment. **There are no adjustments inside that will make a malfunctioning unit start working.**

LECTROSONICS service department is equipped and staffed to quickly repair your equipment. In-warranty repairs are made at no charge in accordance with the terms of the warranty. Out of warranty repairs are charged at a modest flat rate plus parts and shipping. Since it takes almost as much time and effort to determine what is wrong as it does to make the repair, there is a charge for an exact quotation. We will be happy to quote approximate charges by phone for out of warranty repairs.

RETURNING UNITS FOR REPAIR

You will save yourself time and trouble if you will follow the steps below:

- A.** DO NOT return equipment to the factory for repair without first contacting us by letter or by phone. We need to know the nature of the problem, the model number and the serial number of the equipment. We also need a phone number where you can be reached 8 am to 4 pm (Mountain Standard Time).
- B.** After receiving your request, we will issue you a return authorization number (R.A.). This number will help speed your repair through our receiving and repair departments. The return authorization number must be clearly shown on the outside of the shipping container.
- C.** Pack the equipment carefully and ship to us, shipping costs prepaid. If necessary, we can provide you with the proper packing materials. UPS is usually the best way to ship the units. Heavy units should be "double-boxed" for safe transport.
- D.** We also strongly recommend that you insure the equipment, since we cannot be responsible for loss of or damage to equipment that you ship. Of course, we insure the equipment when we ship it back to you.

Mailing address:

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Rio Rancho, NM 87174
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Telephones:

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Toll Free (800) 821-1121
FAX: (505) 892-6243

World Wide Web: <http://www.lectrosonics.com>

Email: sales@lectrosonics.com

SPECIFICATIONS

EQ In:	Balanced, RF protected, 40k Ohm impedance
Ref Mic In:	Balanced, RF protected, 1.5k Ohm impedance +15V phantom power (always present)
Thru Out:	Parallel to EQ In, provides a pre-EQ output
Main Out:	Balanced, 200 Ohm output impedance
EQ Type:	27 band, 1/3 octave, on ISO centers from 40Hz to 16kHz
Filter Type:	Constant-Q, $\pm 3\%$ center frequency accuracy
Cut/Boost Range:	$\pm 15\text{dB}$
Low Cut Filter:	200Hz, 6dB/octave
Pop Suppression Filter (DPS):	Dynamic high-pass, maximum filter corner frequency is 1kHz, 6dB/octave. Threshold range at 100Hz is -40dBu to 0dBu.
Noise (20Hz to 20kHz)	
All controls flat:	-95dBu
All controls +12dB:	-68dBu
All controls -12dB:	-82dBu
THD:	Less than 0.08% (20Hz to 20kHz, +4dBu in)
Frequency Response:	+0/-3dB, controls flat, 20Hz to 70kHz
Maximum Levels	
Input:	+22dBu, controls flat
Output:	+22dBu, controls flat

Specifications subject to change without notice.

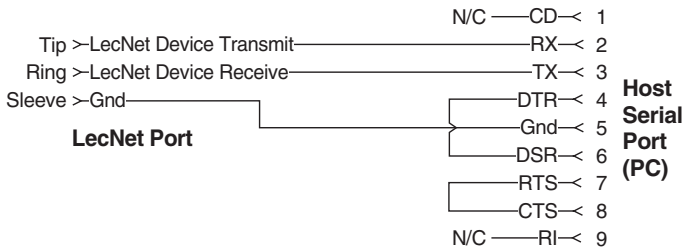
SERIAL CABLE WIRING DIAGRAMS

The serial port on the LecNet device is a minimal RS-232 implementation. The figure shows the wiring diagram to accommodate interconnection with either a 9 or a 25 pin serial port on a PC or other serial device.

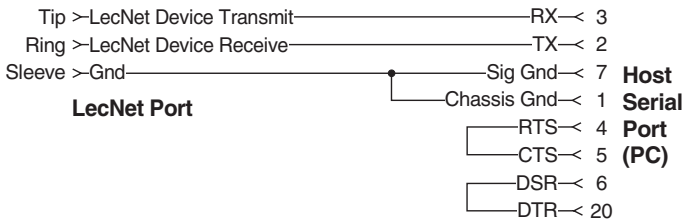
LecNet Device to PC



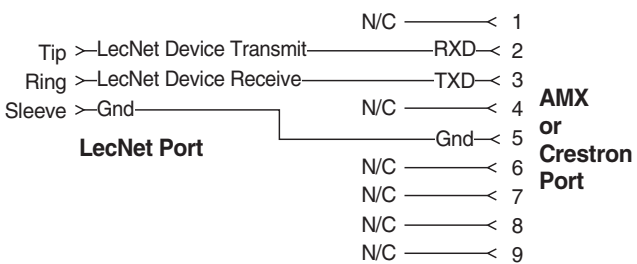
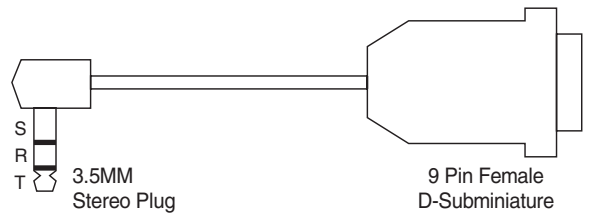
Wiring Diagram, 9 Pin D-Sub



Wiring Diagram, 25 Pin D-Sub



LecNet Device to AMX or Crestron



AMX Programming Notes

If you are using an AMX system to control your LecNet equipment, you'll want to purchase the Lectrosonics PT3 Protocol Translator. The PT3 connects between the AMX bus and any LecNet equipment. With the PT3, the LecNet equipment looks just like native AMX equipment. The PT3 is the fastest and most productive way to control LecNet devices with an AMX system.

SERIAL PORT COMMANDS AVAILABLE

The EQ1/EQ2 uses a modification of the typical one-to-one connection between two RS-232 compatible devices. The EQ1/EQ2 has both an RS-232 transmitter and receiver section. The transmitter section is “tri-stated”, or placed in a high impedance mode, until the particular device is addressed. To facilitate the simple parallel connection of multiple devices on a single RS-232 port, an addressing scheme is employed to route commands from the host to the proper device. When a device receives its address from the host computer, it temporarily turns on its RS-232 transmitter long enough to send whatever data is requested by the host. In this way, multiple devices may drive a single transmit signal back to the host, because only the addressed EQ1/EQ2 will turn on its transmitter.

Valid address values are 128-254 (80h-FEh). 255 (FFh) is an invalid address and must not be used. Because the EQ1/EQ2 will interpret any single data byte whose value is greater than 127 as an address, single byte data (as opposed to addresses) sent from the host must be in the range of 0-127. If a data value needs to be output that exceeds 127, two bytes are output such that the first byte is the lower 7 bits of the 8 bit value, and the second byte is 1 if the MSB of the data byte is 1, or 0 if the MSB of the data byte is 0.

Each EQ1/EQ2 command must be preceded by the address of the device to be controlled. If a device with the requested address exists on the system, it will respond by sending a “0” back to the host. The following code fragment, in BASIC, would be used to get an “Acknowledge” name string back from an EQ1/EQ2:

OPEN “COM1:9600,N,8,1” FOR RANDOM AS #1 LEN = 256	‘Open com port, 1 for 9600 baud, no parity, 8 ‘data bits, 1 stop bit.
...	
...	
...	
PRINT #1, CHR\$(131);	‘Output the device address.
DataByte% = ASC(INPUT\$(1, #1))	‘Receive “0” byte. The ASC function is used to ‘convert the received string data to numeric ‘data.
PRINT #1, CHR\$(1);	‘Output the “Acknowledge” command.
DataByte% = ASC(INPUT\$(1, #1))	‘Receive the length of the acknowledge string ‘(3 for the EQ1/EQ2).
Name\$ = INPUT\$(DataByte%, #1)	‘Receive the name string (“EQ1/EQ2”)

The first PRINT and INPUT\$ sequence must precede every command sent, even if the command is sent to the same EQ1/EQ2 as the previous command. The following is a listing of available commands grouped based on the EQ1/EQ2 function to which the commands are related. The word “Host” in the command descriptions means the IBM PC or compatible to which the EQ1/EQ2 is connected.

There are several “status” flags that may be set by the host computer. Those flag commands that store the new value in EEPROM will continue to have the new value even if the power to the EQ1/EQ2 is turned off.

General Device Commands

Acknowledge - Causes the EQ1/EQ2 to send its "name" string back. The first data byte is the length of the name string, and the rest of the data bytes are the device name.

Host sends command - 1

Host receives data bytes: Byte 1 is the length of the name string (3 for the EQ1 and EQ2), bytes 2, 3, and 4 are the ASCII values for "EQ1" (69,81,49).

Change Device Address - Changes the EQ1/EQ2 device address and stores the new address in EEPROM.

Host sends command - 2

Host sends 1 byte: device address, valid range 128 to 254.

Output Firmware Version - Causes the EQ1/EQ2 to outputs the version number of the current firmware. For example, Version 1.0 software would be returned as 10 (decimal).

Host sends command - 25

Host receives data byte: firmware version.

Output Local/Remote Status - Outputs the current status of the EQ1/EQ2, Local or Remote. 0 indicates Local mode, 1 indicates Remote.

Host sends command - 21

Host receives 1 byte: EQ1 Mode

Set Local/Remote Mode - Allows the Local/Remote status of the EQ1/EQ2 to be set. 0 is Local mode, 1 is Remote. New value is stored in EEPROM.

Host sends command - 22

Host sends 1 byte: 0 or 1, Local or Remote

Host receives 1 byte: 100 to indicate successful completion.

Equalizer Commands

Output EQ Band Level - Outputs band levels, either singly or all 27. Range is from 0-30, where 0 corresponds to -15dB, and 30 to +15dB. The first byte is the curve to use for output. The second byte is the particular band of interest.

Host sends command - 3

Host sends 2 bytes: Byte 1: 0 - Current EQ setting
1 - Stored EQ curve
2 - User Target curve 1
3 - User Target curve 2
4 - User Target curve 3
5 - Factory Target curve 1
6 - Factory Target curve 2
7 - Factory Target curve 3

Byte 2: 0-26 gives single band level 1-27 (corresponding to 40Hz - 16KHz, ISO centers) 27 or greater outputs all 27

Host receives 1 or 27 bytes (see above): EQ band levels

Set EQ Band Level - Allows the value of one or all EQ bands to be changed. The first byte sent is the EQ curve to change. The second byte sent is the EQ band number, from 0-27. 0-26 correspond to 1/3 octave spaced frequencies from 40Hz to 16KHz, and implies that one EQ band level byte will follow. If the second byte is 27, this implies that 27 EQ band level bytes will follow to set up the entire EQ. EQ band level byte range is 0-30, which corresponds to -15dB to +15dB. Note that changes to any of the stored curves (1-4) will be written into nonvolatile memory.

Host sends command - 4

Host sends 3 or 29 bytes:

Byte 1: 0 - Current EQ setting
 1 - Stored EQ curve
 2 - Stored Target curve 1
 3 - Stored Target curve 2
 4 - Stored Target curve 3

Byte 2: 0-27, single or all band levels

Byte 3-29: New EQ band levels (see above)

Host receives 1 byte: 100 to confirm.

Set EQ Mode (Active/Bypass) - Sets the EQ to Active or Bypass Mode. In Active mode, the EQ functions normally. In Bypass, all EQ bands are set to flat, and the Low Cut Filter is also defeated. The current EQ curve is restored when the EQ1 is switched from Bypass to Active.

Host sends command - 5

Host sends 1 byte: 0 - Bypass, 1 - Active

Pink Noise Generator Commands

Output Pink Noise Level - Outputs the current pink noise level attenuation setting. Range is from 0-127. 0-96 corresponds to 0-48dB attenuation in .5dB steps, 97-126 corresponds to 49-78dB in 1dB steps, and 127 is 100dB mute.

Host sends command - 6

Host receives 1 byte: Attenuation level (see above)

Set Pink Noise Level - Allows the value of the pink noise attenuator to be set. Range is from 0-127. 0-96 corresponds to 0-48dB attenuation in .5dB steps, 97-126 corresponds to 49-78dB in 1dB steps, and 127 is 100dB mute.

Host sends command - 7

Host sends 1 byte: Attenuation level (see above)

Pop Suppress (DPS™) Commands

Output Pop Suppress Setting - Outputs pop suppress attenuation setting. Range is from 0-80. This corresponds to -40dBu to 0dBu threshold values in .5dB steps, and 127 is 100dB mute (Pop suppress off).

Host sends command - 8

Host sends 1 byte: Attenuation level (see above)

Output Pop Suppress Level - Outputs the instantaneous pop suppress level. The range is from 0-255, and corresponds (non-linearly) to the instantaneous corner frequency of the high pass filter.

Host sends command - 9

Host receives 1 byte: Pop suppress level

Set Pop Suppress Setting - Allows the pop suppress setting to be adjusted. Range is from 0-80 plus 127. 0-80 corresponds to -40dBu to 0dBu threshold values in .5dB steps, and 127 is 100dB mute (Pop suppress off). Byte 1 is the new setting. Byte 2 is 0 or 1, and indicates whether or not to save the new value to EEPROM.

Host sends command - 10

Host sends 2 bytes: Byte 1: Pop suppress setting (see above) Byte 2: 1 - Save to EEPROM, 0 - don't

Host receives 1 byte: 100 to confirm save.

Bandpass Filter/Log Converter Commands

Output BP Filter Center Frequency - Outputs the current center frequency of the 1/3 octave bandpass filter. The first byte sent is the frequency, and the second byte is the range multiplier. The range of the frequency byte is from 1-255. The values for the range multiplier are 1, 2, or 3. These values correspond to x1, x10, and x100.

Host sends command - 11

Host receives 2 bytes: Byte 1: Center frequency (1-255)

Byte 2: Range multiplier (1-x1, 2-x10, 3-x100)

Set BP Filter to 1/3 Octave Center Frequency - Allows the center frequency of the 1/3 octave bandpass filter to be set to one of the 27 ISO center frequencies between 40Hz and 16KHz. Byte 1 is the 1/3 octave frequency (0-26, 0 - 40Hz, 26 - 16KHz).

Host sends command - 13

Host sends 1 byte: Byte 1: Center frequency (0-26)

Output BP Filter Log Converter Level - Outputs to dB level of the signal being measured by the 1/3 octave bandpass filter. Note the only values from 20 to 120 (-60 to -10) are valid. If a 0 is returned, the level is below -60, and if a 255 is returned, the level exceeds -10.

Host sends command - 14

Host receives 1 byte: 20-120, 0, or 255; BP filter level

Input/Output Switching Commands

Output Input Source - Outputs the current input source, EQ In or Ref Mic In for either the current setup or one of the stored Target EQ curves.

Host sends command - 15

Host sends 1 byte: Byte 1: 0 - Current input source

1 - User 1 source

2 - User 2 source

3 - User 3 source

4 - Factory 1 source

5 - Factory 2 source

6 - Factory 3 source

Host receives 1 byte: 0 - EQ In is source, 1 - Ref Mic In is source

Set Input Source - Allows the EQ1 input source to be set.

Host sends command - 16

Host sends 2 bytes: Byte 1: 0 - Change current setting
1 - User Target Curve 1
2 - User Target Curve 2
3 - User Target Curve 3

Byte 2: 0 - EQ In, 1 - Ref Mic In

Host receives 1 byte: 100 to confirm

Output Output Source - Outputs the current output source, EQ Out or Noise Out.

Host sends command - 17

Host receives 1 byte: 0 - EQ Out is source, 1 - Noise Out is source

Set Output Source - Allows the EQ1 output source to be set.

Host sends command - 18

Host sends 1 byte: 0 - EQ Out is source, 1 - Noise Out is source

Low Cut Filter Commands

Output Lowcut Filter - Outputs the current state of the Lowcut filter.

Host sends command - 19

Host receives 1 byte: 0 - Lowcut out, 1 - Lowcut in

Set Lowcut Filter - Allows the state of the Lowcut filter to be set. Byte 1 is the Lowcut Filter setting (0-Out, 1-In). Byte 2 is 0 or 1, and indicates whether or not to save the new value to EEPROM.

Host sends command - 20

Host sends 2 bytes: Byte 1: 0 - Lowcut Out, 1 - Lowcut In; Byte 2: 1 - Save to EEPROM, 0 - don't

Host receives 1 byte: 100 to confirm.

LIMITED ONE YEAR WARRANTY

The equipment is warranted for one year from date of purchase against defects in materials or workmanship provided it was purchased from an authorized dealer. This warranty does not cover equipment which has been abused or damaged by careless handling or shipping. This warranty does not apply to used or demonstrator equipment.

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

This warranty applies only to items returned to Lectrosonics, Inc. or an authorized dealer, shipping costs prepaid, within one year from the date of purchase.

This Limited Warranty is governed by the laws of the State of New Mexico. It states the entire liability of Lectrosonics Inc. and the entire remedy of the purchaser for any breach of warranty as outlined above. NEITHER LECTROSONICS, INC. NOR ANYONE INVOLVED IN THE PRODUCTION OR DELIVERY OF THE EQUIPMENT SHALL BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL, OR INCIDENTAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THIS EQUIPMENT EVEN IF LECTROSONICS, INC. HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL THE LIABILITY OF LECTROSONICS, INC. EXCEED THE PURCHASE PRICE OF ANY DEFECTIVE EQUIPMENT.

This warranty gives you specific legal rights. You may have additional legal rights which vary from state to state.

LECTROSONICS, INC.

581 LASER ROAD
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October 9, 2001