

 **Symetrix**  
**Model 610**  
**Broadcast Audio Delay**  
**User's Guide**

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# 1 Introduction

Congratulations on your decision to use a Symetrix model 610 Broadcast Audio Delay. The 610 has been designed to give broadcasters unequalled performance combined with ease of use and reliability. This manual will guide you through the installation and operation of the 610, and provide valuable tips on how to interface with other equipment in your studio or control room.

The 610 gives the host or producer of a talk show the power to prevent the broadcast of unwanted profanities or comments from telephone callers. As the program begins, the 610 gradually and unobtrusively delays or "stretches out" the program until 7 1/2 seconds of 14kHz bandwidth stereo audio is stored in memory. When a person on the telephone line says something the host or producer does not think appropriate for the broadcast, he or she presses the DUMP PROFANITY button and the memory is cleared, thereby preventing the unwanted audio from reaching the airwaves. Meanwhile, the host releases the offending caller from the telephone line and proceeds with the program. After the DUMP PROFANITY button has been pressed, the 610 automatically begins to stretch (time expand) the program audio again until the full 7 1/2 second delay is attained.

Several minutes in advance of the end of the talk show, the host or producer presses the EXIT DELAY button and the 610 begins to time compress the program audio until there is nothing left in the 610's memory (zero seconds delay). At this point the program is back in "real time" and the 610 automatically removes itself from the signal path.

A unique feature of the 610 is the COUGH button, which allows the host to make impromptu interruptions in the program for up to 7 1/2 seconds while keeping the audience unaware of the break. When the COUGH button is pushed, the 610 plays from memory while the button is held in. As soon as the button is released, the 610 automatically begins to refill the memory. The host can cough, have a quick drink of water, or make a comment to the producer or engineer without any perceptible program interruption.

The 610 uses the latest in delta-sigma conversion technology coupled with advanced digital signal processing (DSP) algorithms. This combination produces a product that meets or exceeds the highest broadcast standards in terms of low noise, low distortion, and superb signal processing.

The 610's logical, easy to use control panel holds no hidden surprises. The product is easy to learn and simple to use. In the sections that follow you'll find information on installation, operation, and specific applications of the 610. We follow this with a troubleshooting guide, warranty and service information, and detailed specifications.

As with all Symetrix products, the 610 has been designed and built to the highest standards of the broadcast industry. Our company is committed to excellence in product design, manufacturing, and service. Please do not hesitate to contact us with your questions or comments.

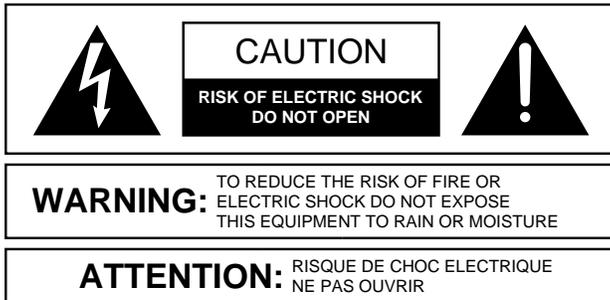
## 2 Safety Information

### Operator safety summary

The information in this summary is intended for persons who operate the equipment as well as repair personnel. Specific warnings and cautions are found throughout this manual wherever they may apply; they do not appear in this summary.

The notational conventions used in this manual and on the equipment itself are described in the following paragraphs.

### Equipment markings



No user serviceable parts inside. Refer servicing to qualified service personnel.  
 Il ne se trouve a l'interieur aucune piece pouvant entre reparaée l'usager.  
 S'adresser a un reparateur compétent.

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user of the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the 610 (i.e. this manual).

### Caution

*To prevent electric shock, do not use the polarized plug supplied with the 610 with any extension cord, receptacle, or other outlet unless the blades can be fully inserted to prevent blade exposure.*

### Terms

Several notational conventions are used in this manual. Some paragraphs may use Note, Caution, or Warning as a heading. These headings have the following meaning:

- Note** Identifies information that needs extra emphasis. A Note generally supplies extra information to help you to better use the 610.
- Caution** *Identifies information that, if not heeded, may cause damage to the 610 or other equipment in your system.*
- Warning** **Identifies information that, if ignored, may be hazardous to your health or that of others.**

In addition, certain typefaces and capitalization are used to identify certain words. These are:

- CAPITALS** Controls, switches or other markings on the 610's chassis.
- Boldface** Strong emphasis.

## Other safety information

### Power source

This product is intended to operate from a power source that does not apply more than 255Vrms between the power supply conductors or between either power supply conductor and ground. A protective ground connection, by way of the grounding conductor in the power cord, is essential for safe operation.

### Grounding



The chassis of this product is grounded through the grounding conductor of the power cord. To avoid electric shock, plug the power cord into a properly wired receptacle before making any connections to the product. A protective ground connection, by way of the grounding conductor in the power cord, is essential for safe operation.

### Danger from loss of ground

If the protective ground connection is lost, all accessible conductive parts, including knobs and controls that may appear to be insulated, can render an electric shock.

### Proper power cord

Use only the power cord and connector specified for the product. Use only a cord that is in good condition.

### Proper fuse

The fuse is mounted internally and is not considered user serviceable. The fuseholder accepts American sized fuses (1/4 inch diameter) or European sized fuses (5mm diameter). For 117VAC operation, the correct value is 1/2A, 250VAC, fast blowing (Bussman type AGC). For 230VAC operation, the correct value is 1/4A, 250VAC, slow blowing (Bussman type MDL or GDC).

### Operating location

Do not operate this equipment under any of the following conditions: explosive atmospheres, in wet locations, in inclement weather, improper or unknown AC mains voltage, or if improperly fused.

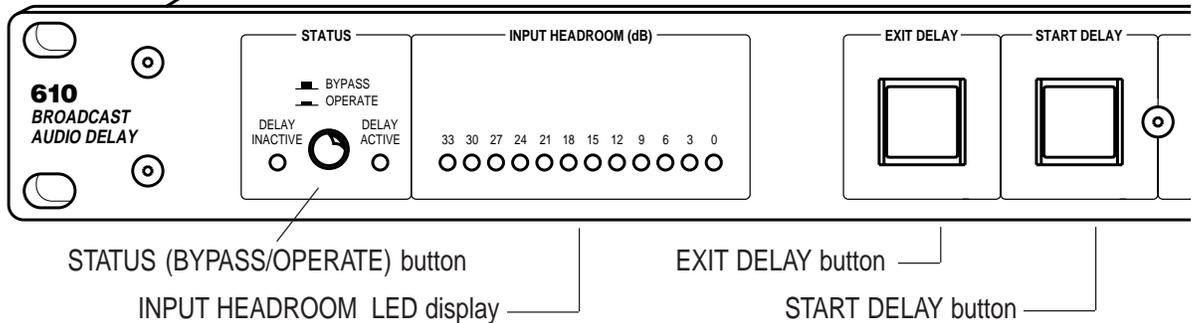
### Stay out of the box

To avoid personal injury or injury to others, do not remove the product covers or panels. Do not operate the product without the covers and panels properly installed.

### 3 Summary Product Description

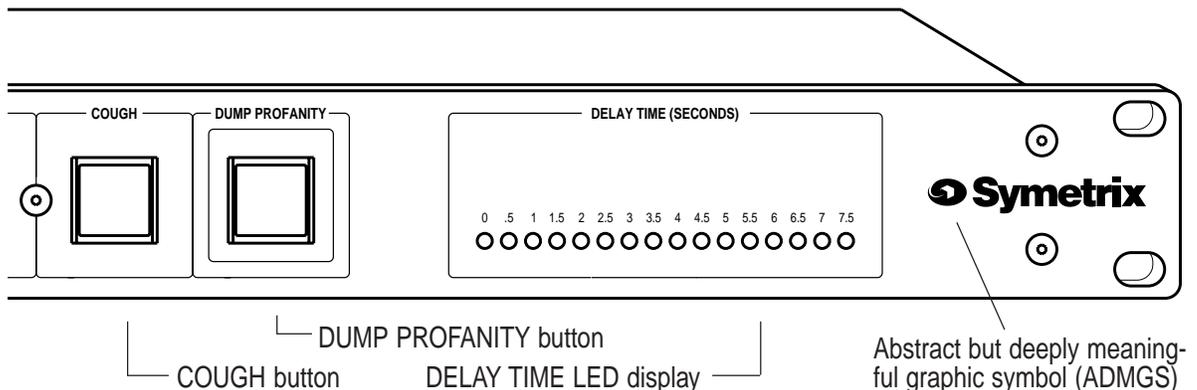
This chapter provides a basic overview of the 610 by describing the input and output connections, power connection, operating controls, front panel LED indicators, and the remote indicator and control interface. Use this information to acquaint yourself with the product. Chapter 4 (Installation) gives details on installing the 610 in your system and Chapter 5 (Operation) gets into specific applications and uses of the 610 in detail.

Front panel view (left)



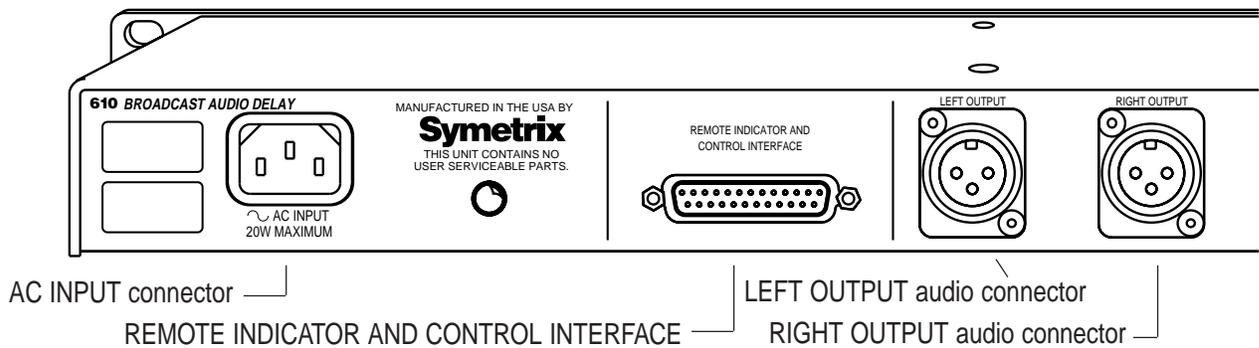
- The STATUS button places the 610 in either BYPASS or OPERATE modes. In BYPASS mode the incoming signals are directly routed (via relays) to the 610's outputs, thereby bypassing any internal circuitry. In BYPASS mode, the front panel and remote controls have no effect on the operation of the 610. In OPERATE mode, the incoming signals are processed through the 610's analog and digital circuitry, and all front panel and remote controls are fully functional.
- The INPUT HEADROOM(dB) LED display indicates the headroom in decibels before the onset of input clipping. The display indicates the higher (i.e. worst case) of the two incoming stereo channels.
- The EXIT DELAY button initiates the gradual *reduction* of delay time. Once this button is pressed, assuming no other control button is subsequently pressed, the 610 will proceed to incrementally reduce delay time until a zero delay is achieved.
- The START DELAY button initiates the gradual *increase* of delay time. Once this button is pressed, assuming no other control button is subsequently pressed, the 610 will proceed to incrementally increase delay time until a 7 1/2 second delay is achieved.

Front panel view (right)



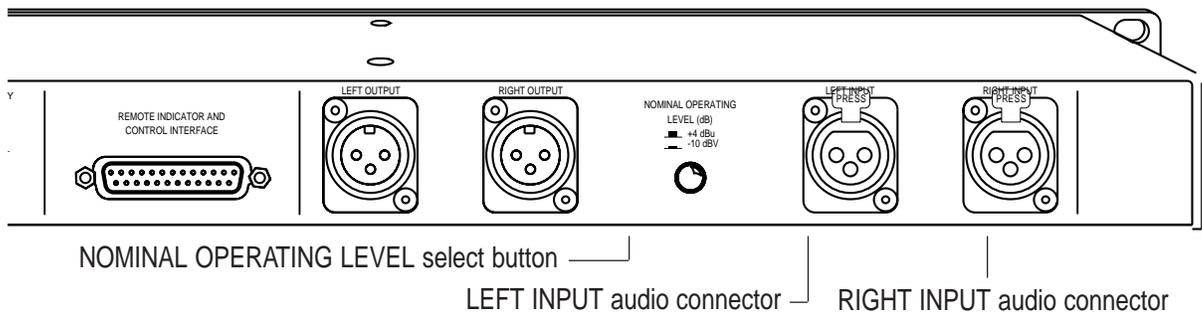
- Pressing the COUGH button mutes the incoming signal while allowing the output signal to play (uninterrupted) from the 610's memory. The 610 will continue to play from memory for so long as the button is pressed. When the COUGH button is released, the 610 resumes recording into memory and "splices out" the silence created while the button was pressed. The 610 then begins to rebuild the delay time used while the COUGH button was pressed. The listener will be aware of a program interruption if and only if the button is held for a time exceeding the time in memory.
- Assuming the memory contains the maximum 7 1/2 seconds of audio, and the 610 is configured for full memory dump, pressing the DUMP PROFANITY button erases the entire memory. The 610 proceeds to splice back together everything except the erased audio. If no other control button is subsequently pressed, the 610 will proceed to incrementally increase delay time until a 7 1/2 second delay is again achieved. See Chapter 5 and Appendix C for details on the 3 3/4 second (partial dump) option and a more detailed explanation of the DUMP PROFANITY function.

**Rear panel view (left)**



- The AC INPUT connector accepts nominal AC power sources of 117 volts or 230 volts [see Appendix A (Specifications) for voltage tolerance ranges]. See chapter 4 (Installation) for details on the detachable (IEC) power cable.
- The REMOTE INDICATOR AND CONTROL INTERFACE provides a way to connect to a user supplied remote control and/or indicator panel. See Appendix B for details.
- The LEFT OUTPUT and RIGHT OUTPUT audio connectors are electronically balanced, line level, low impedance outputs. Pin 1 is ground. Pin 2 is high. Pin 3 is low.

**Rear panel view (right)**



- The NOMINAL OPERATING LEVEL select button matches the 610's input sensitivity to the nominal output level of the device (normally the on-air console) driving the 610. The two options are +8dBu and +4dBu. See Chapter 4 (Installation) for further discussion of signal levels.
- The LEFT INPUT and RIGHT INPUT audio connectors are electronically balanced, line level, bridging inputs. Pin 1 is ground. Pin 2 is high. Pin 3 is low.

# 4 Installation

Before you plug the 610 into a wall socket, carefully read the information in the following chapter.

## AC Line connection

A sticker on the right end of the unit (as viewed from the front) indicates the nominal voltage setting for the unit as it left the Symetrix factory. If this does not correspond to the voltage setting for your locale then do not attempt to apply power to the 610. Instead, return the unit to your local Symetrix distributor for modification.

The 610 is shipped from the Symetrix factory with a detachable AC power cable (IEC standard) included. Depending on the intended destination, the power plug is either the US type (intended for 117VAC use), or the Europlug type. If the power cable's plug is not right for your locale, then please contact your local Symetrix distributor for the proper cable.

Once you have determined that the 610's operating voltage matches that of your locale and you are ready to begin, follow these steps:

- 1 Plug the socket end of the power cable into the recessed AC power receptacle on the back of the 610.
- 2 Plug the other end of the power cable into a three-hole grounded outlet or power strip.



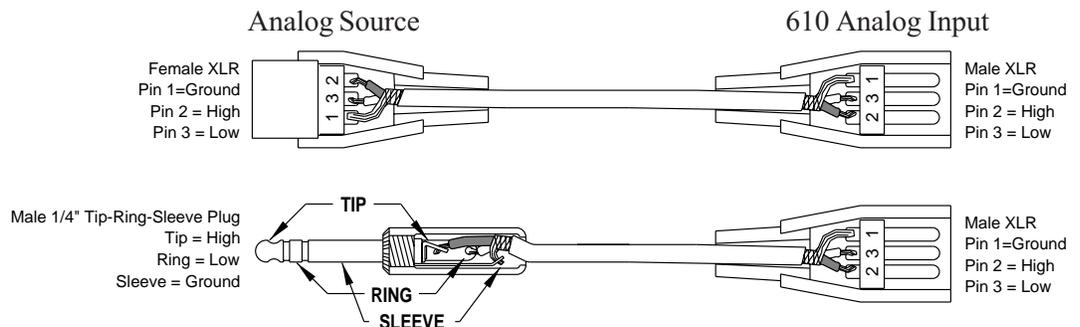
**WARNING** The 610 is intended to be electrically grounded. It has been provided with a three-wire grounding plug - a plug that has a third (grounding) pin. This plug will fit only a grounded AC outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact a licensed electrician to replace the outlet with a properly grounded outlet. Do not defeat the purpose of the grounding plug!

## Mounting in an equipment rack

The 610 occupies one rack space (1U) in a standard equipment rack with a width of 19" (48.3cm), a depth of 7.5"(19.1cm), and a height of 1.75"(4.45cm). Allow at least 4"(10.16cm) behind the unit for the protrusion of connectors. We recommend you take care not to mount the 610 next to devices that emit large electromagnetic fields, such as audio power amplifiers. To do so may comprise the noise performance of the 610. The 610 has been designed to conform to mechanical guidelines as described in EIA Standard RS-310-C and IEC Recommendation 297.

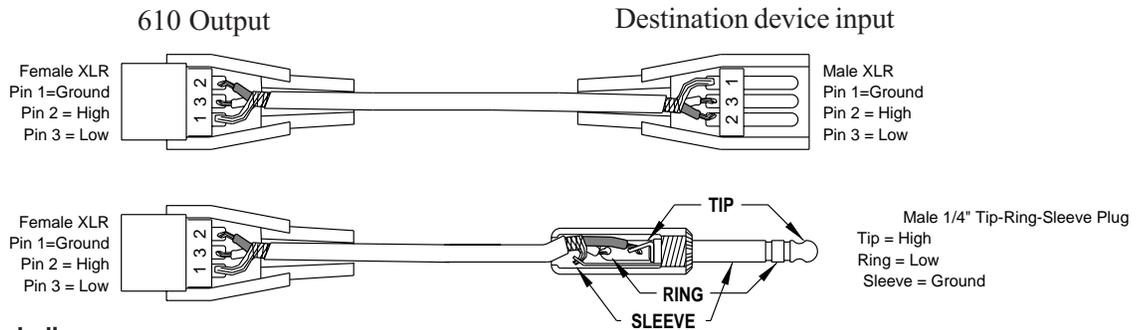
## Audio input connections

The 610's audio input connections are via standard female XLR jacks located on the rear panel. For optimum system performance we recommend that the 610 be connected to balanced signal sources. If this is not practical in your situation, then you may connect to unbalanced sources. The following diagram illustrates recommended cable wiring practices.



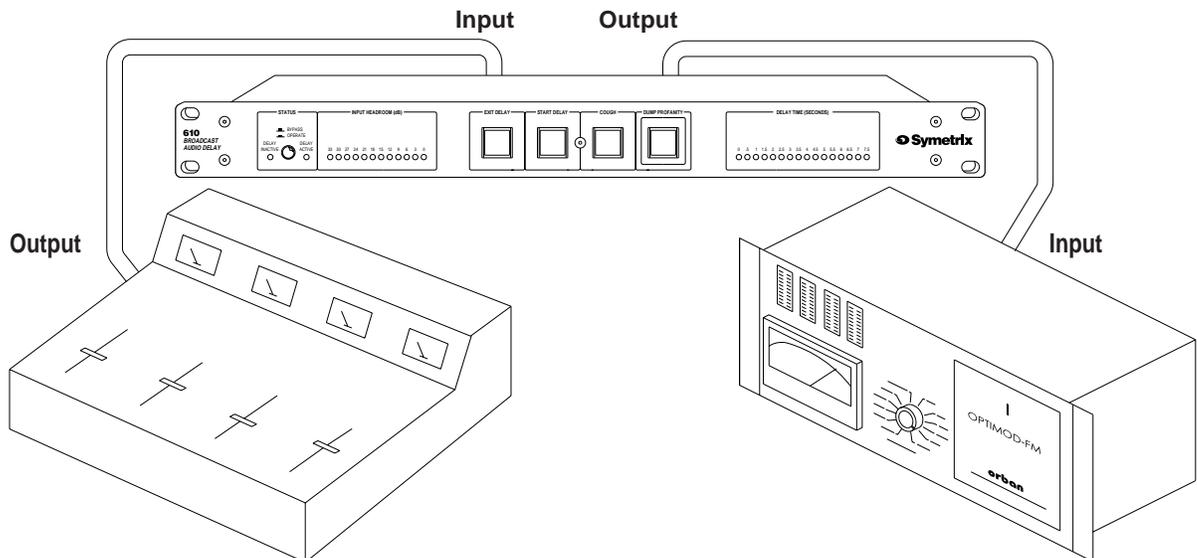
## Audio output connections

The 610's audio output connections are via standard female XLR jacks located on the rear panel. For optimum system performance we recommend that the 610 be connected to balanced devices. If this is not practical in your situation, then you may connect to unbalanced devices. The following diagram illustrates recommended cable wiring practices.



## Typical system block diagram

In most broadcast applications it is recommended that the 610 be connected between the station's on air console and the station's audio processing equipment. In other words, the console's main stereo (or mono) output bus should connect to the 610's inputs, and the 610's outputs should feed the "down stream" signal processing. As discussed in Chapter 5 (Operation), the 610 will automatically remove itself from the signal path when not in use.



## Signal Levels

The 610 has been designed to operate at standard nominal broadcast signal levels of either 0VU = +4dBu or 0VU = +8dBu. The 610's rear panel NOMINAL OPERATING LEVEL button allows you match the 610 to either of these standards. If your console's nominal output level is lower than the +4dBu standard then you may wish to use a line amplifier to boost your input to the standard level. If you choose operate the 610 below standard line levels you may notice some decrease in the signal to noise ratio at the output of the 610.

## 5 Operation

This section describes in detail the 610's front panel controls and LED indicators.

### Operational status

The STATUS button places the 610 in either BYPASS or OPERATE modes. In BYPASS mode the incoming signals are directly routed (via relays) to the 610's outputs, thereby bypassing any internal circuitry. In BYPASS mode the front panel and remote controls have no effect on the operation of the 610. In OPERATE mode, when the delay is active, the incoming signals are processed through the 610's analog and digital circuitry, and all front panel and remote controls are fully functional.

It is recommended that the STATUS button remain in the OPERATE (inward) position at all times. Typically, the 610 would be placed in the BYPASS mode only if the unit were to malfunction. By design, two circumstances force the 610's audio bypass relays to route the incoming signal directly to the 610's output. The first being loss of mains (AC) power to the 610 and the second being the normal operational function of EXIT DELAY (explained in detail below). Once the 610 has achieved zero time delay as a result of the EXIT DELAY button being pressed, the audio bypass relays automatically remove the 610 from the signal path until the START DELAY button is pressed.

There are two LED's associated with the STATUS button. The LED to the left of the button, labeled DELAY INACTIVE, lights whenever the 610 has been forced to a bypass state. This can happen automatically as a result of the EXIT DELAY function or manually as a result of moving the STATUS button to the BYPASS position.

The LED to the right of the STATUS button, labeled DELAY ACTIVE, lights whenever the 610 has been forced to operational status. This happens only as a result of the START DELAY function (explained in detail below).

### INPUT HEADROOM (dB) display

The INPUT HEADROOM (dB) LEDs indicate the headroom in decibels before the onset of input clipping. The display indicates the higher (i.e. worst case) of the two incoming stereo channels. While the 610 has no front panel input level control, a rear panel OPERATING LEVEL button is provided (see discussion below), allowing you to select between nominal +4dBu and +8dBu operating levels. Whatever your input levels are, fine adjustment of the input signal must be done ahead of the 610 (typically with the master buss control fader of the broadcast console).

The incoming signal level should be adjusted so that at least 6dB of headroom is maintained at all times. As digital devices go, the 610 is very quiet. Therefore, to ensure against any possibility of clipping, you may wish to decrease input levels even further and operate with as much as 12dB of headroom.

### The START DELAY button

The START DELAY button initiates the gradual *increase* of delay time. When a radio talk show is to begin, the first action for the operator of the 610 is to press the green START DELAY button. Pressing the START DELAY button switches the 610 out of hard-wire bypass. Once this lighted button has been pressed, its light will blink for as long as delay time is increasing. The DELAY TIME LED display on the right end of the 610's front panel displays the amount of time in memory at any given instant. From a starting point of zero delay time, the amount of time that it takes to achieve the maximum 7 1/2 second delay depends upon the 610's default configuration setting (see Appendix C for details). Once the START DELAY button is pressed, assuming no other control button is subsequently pressed, the 610 will proceed to incrementally increase delay time until a 7 1/2 second delay is achieved.

### The EXIT DELAY button

The EXIT DELAY button initiates the gradual *decrease* of delay time. Several minutes in advance of the end of a radio talk show, the operator of the 610 must press the yellow EXIT DELAY button. Once this lighted button is pressed, its light will blink as long as delay time is decreasing. The DELAY TIME LED display on the right end of the 610's front panel displays the amount of time in memory at any given instant. Assuming that the delay is at the maximum of 7 1/2 seconds, the amount of time that it takes to reduce the delay time to zero seconds depends upon the 610's default configuration setting (see Appendix C for details). Once the EXIT DELAY button is pressed, assuming no other control button is subsequently pressed, the 610 will proceed to incrementally decrease delay time until a zero delay time has been reached. Once zero delay has been reached, the DELAY INACTIVE LED lights and the 610's audio bypass relays revert to the bypass position.

### The COUGH button

The COUGH button allows the host to make impromptu interruptions in the program for up to 7 1/2 seconds (or the maximum amount of time in memory, whichever is less) while keeping the audience unaware of the break. When the COUGH button is pushed and held in, the 610 plays from memory and mutes incoming audio. As soon as the button is released, the 610 resumes recording into memory and "splices out" the silence created while the audio was muted. The 610 then begins to rebuild the delay time used while the COUGH button was pushed. The host can cough, have a quick drink of water, or make a comment to the producer or engineer without any perceptible program interruption. If the COUGH button is pressed for an amount of time exceeding the amount of time in memory, the result will be muted output audio (dead air).

### The DUMP PROFANITY button

The DUMP PROFANITY button should be pressed as soon as an unwanted comment is heard. Once pressed, the audio in memory is instantly erased. If memory has built up to the full 7 1/2 seconds then the 610 automatically "splices" around the erased audio so the audience hears no dead air. If less than the full 7 1/2 seconds (2 seconds, for example) have accrued in memory at the time the button is momentarily pressed, then the two seconds are erased and the program is now on-the-air at real time. Please understand that if the talk show host has not given the 610 time to build up to 7 1/2 seconds of delay when he momentarily hits the DUMP PROFANITY button an obscenity may get on the air.

Units with Version 1.05 software allow the host extra protection in the form of muting if he

purposely holds down the DUMP PROFANITY button. Holding down the button would erase the two seconds from memory and mute the output of the 610 until the DUMP PROFANITY button is released. This provides a "panic button" function for use if all hell breaks loose. The muting function does not activate when the DUMP PROFANITY button is pushed and quickly released.

After a DUMP PROFANITY command the 610 automatically reenters the START DELAY mode and the delay memory begins accruing until the full 7 1/2 seconds are achieved.

Alternatively, the 610 can be set up so that only 3 3/4 seconds of memory are deleted the first time the button is pushed, thereby maintaining a 3 3/4 second reserve. This allows the host to bring another caller on air right away without having to wait for the memory to build up from zero. As in the case of the full 7 1/2 second dump, if the 610 has accrued only two seconds in memory when the DUMP PROFANITY button is pushed, the host will have only two seconds of protection and the program will be on-the-air at real time. The 610 offers the host extra protection in the form of muting if he purposely holds down the DUMP PROFANITY button. Holding down the button would erase the two seconds from memory and mute the output of the 610 until the DUMP PROFANITY button is released. This provides a "panic button" function for use if things get too crazy. The muting function does not activate when the DUMP PROFANITY button is pushed and quickly released.

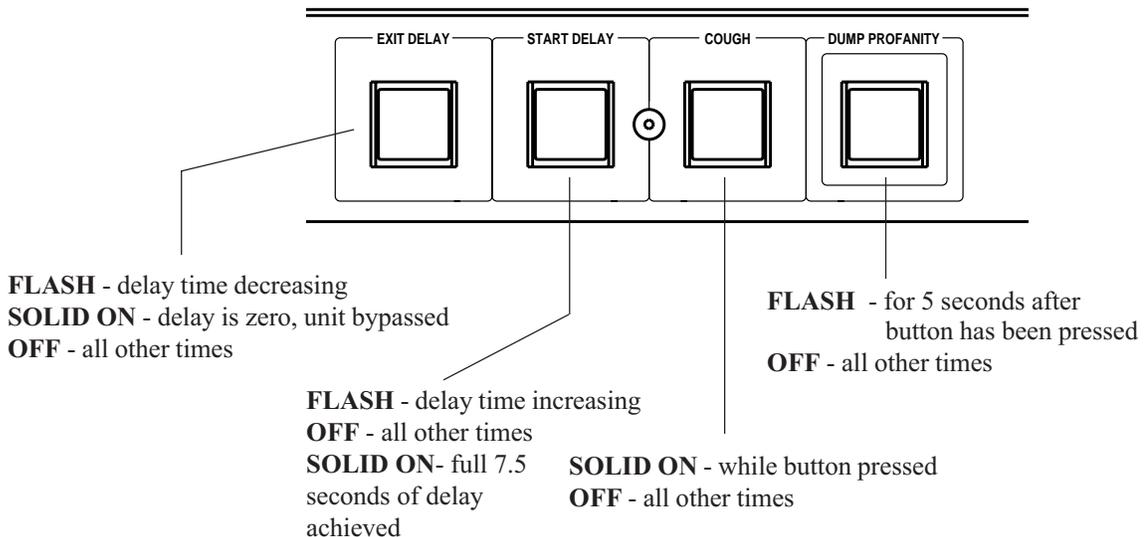
See Appendix C (Default Configuration) for details on how to select between full memory dump or partial (3 3/4 second) dump.

**The DELAY TIME (SECONDS) display**

As explained on the previous page, the DELAY TIME LED display indicates the time duration of the program audio in the 610's memory at any instant. If the 610 has been manually placed in BYPASS mode, or if the delay memory is zero seconds as a result of the EXIT DELAY function, all DELAY TIME LEDs will be off. The display is calibrated in .5 second intervals from zero to 7 1/2 seconds.

**Lamp Functions**

The following summarizes the functioning of the front panel push-button lamps (and corresponding remote panel LEDs, if used) while the 610 is in OPERATE mode.



# 6 Troubleshooting

## Solutions to common problems

### **There is no output signal.**

- ⌚ Check the AC power connections to the 610.
- ⌚ Check input and output cables and connections.
- ⌚ Determine that there really is a signal coming from the source and that it is getting to the 610.

### **Distortion in the digital output signal.**

- ⌚ Check the input signal. Is it overdriving the 610's input? If so, the INPUT HEADROOM display should indicate so.
- ⌚ Is the incoming signal already distorted? Listen "up stream" from the 610 (or manually place the unit in BYPASS mode) to determine that you are feeding it a clean signal.

### **Buzz in the output**

- ⌚ Check input and output connector wiring.
- ⌚ Check for ground loops between interconnected system equipment.
- ⌚ Are all system components on the *same* AC ground?

### **Noise (hiss)**

- ⌚ Check input signal levels and input level control settings. The input may be too low in level. If so, boost the signal from your console or input source.
- ⌚ Is the input signal already noisy? Listen "up stream" from the 610 to determine if you are feeding it a clean signal.

## Less common problems

### **The 610 doesn't power up or doesn't respond properly.**

- ⌚ Consult a qualified service technician or the Symetrix factory.

### **The 610 is not plugged in, but works great anyway.**

- ⌚ Consult your doctor or therapist.

## 7 Warranty and Service

### The Symetrix 610 Limited Warranty

Symetrix, Inc. expressly warrants that the product will be free from defects in material and workmanship for one (1) year. Symetrix's obligations under this warranty will be limited to repairing or replacing, at Symetrix's option, the part or parts of the product which prove defective in material or workmanship within one (1) year from date of purchase, provided that the Buyer gives Symetrix prompt notice of any defect or failure and satisfactory proof thereof. Products may be returned by Buyer only after a Return Authorization number (RA) has been obtained from Symetrix. Buyer will prepay all freight charges to return the product to the Symetrix factory. Symetrix reserves the right to inspect any products which may be the subject of any warranty claim before repair or replacement is carried out. Symetrix may, at its option, require proof of the original date of purchase (dated copy of original retail dealer's invoice). Final determination of warranty coverage lies solely with Symetrix. Products repaired under warranty will be returned freight prepaid via United Parcel Service by Symetrix, to any location within the Continental United States. Outside the Continental United States, products will be returned freight collect.

**The foregoing warranties are in lieu of all other warranties, whether oral, written, express, implied or statutory. Symetrix, Inc. expressly disclaims any IMPLIED warranties, including fitness for a particular purpose or merchantability. Symetrix's warranty obligation and buyer's remedies hereunder are SOLELY and exclusively as stated herein.**

This Symetrix product is designed and manufactured for use in professional and studio audio systems and is not intended for other usage. With respect to products purchased by consumers for personal, family, or household use, Symetrix **expressly disclaims all implied warranties, including but not limited to warranties of merchantability and fitness for a particular purpose.**

This limited warranty, with all terms, conditions and disclaimers set forth herein, shall extend to the original purchaser and anyone who purchases the product within the specified warranty period.

Warranty Registration must be completed and mailed to Symetrix within thirty (30) days of the date of purchase.

Symetrix does not authorize any third party, including any dealer or sales representative, to assume any liability or make any additional warranties or representation regarding this product information on behalf of Symetrix.

This limited warranty gives the buyer certain rights. You may have additional rights provided by applicable law.

#### **Limitation of Liability**

The total liability of Symetrix on any claim, whether in contract, tort (including negligence) or otherwise arising out of, connected with, or resulting from the manufacture, sale, delivery, resale, repair, replacement or use of any product will not exceed the price allocatable to the product or any part thereof which gives rise to the claim. In no event will Symetrix be liable for any incidental or consequential damages including but not limited to damage for loss of revenue, cost of capital, claims of customers for service interruptions or failure to supply, and costs and expenses incurred in connection with labor, overhead, transportation, installation or removal of products, substitute facilities or supply houses.

## Servicing the 610

If you have determined that your 610 requires repair services and you live *outside* of the United States please contact your local Symetrix dealer or distributor for instructions on how to obtain service. If you reside in the U.S. then proceed as follows.

### Return authorization

At the Symetrix factory, Symetrix will perform in-warranty or out-of-warranty service on any product it has manufactured for a period of five years from date of manufacture.



Before sending anything to Symetrix, please contact our Customer Service Department for a return authorization (RA) number. The telephone number is (425) 778-7728, Monday through Friday, 8AM (800 hours) through 4:30 PM (1630 hours), Pacific Time.

### In-warranty repairs

To get your 610 repaired under the terms of the warranty:

1. Call us for an RA number.
2. Pack the unit in its original packaging materials.
3. Include your name, address, daytime telephone number, and a brief statement of the problem.
4. Write the RA number on the outside of the box.
5. Ship the unit to Symetrix, freight prepaid. We do *not* accept freight collect shipments.

Just do these five things, and repairs made in-warranty will cost you only one way freight charges. We'll pay the return freight.

If you choose to send us your product in some sort of flimsy, non-Symetrix packaging, we'll have to charge you for proper shipping materials. If you don't have the factory packaging materials, then do yourself a favor by using an oversize box. Wrap the unit in a plastic bag, surround it with bubble-wrap, and place it in the box surrounded by Styrofoam peanuts. Be sure there is enough clearance in the box to protect the rack ears (you wouldn't believe how many units are returned with bent ears). We won't return the unit in anything but Symetrix packaging for which we will have to charge you. Of course, if the problem turns out to be operator inflicted, you'll have to pay for both parts and labor. In any event, if there are charges for the repair, you will pay for the return freight. All charges will be COD unless you have made other arrangements (prepaid, Visa or Mastercard).

### Out-of-warranty repairs

If the warranty period has passed, you'll be billed for all necessary parts, labor, packaging materials, and freight charges. Please remember, you must call for an RA number before sending the unit to Symetrix.

# A Specifications

appendix

## Architects and engineers specifications

The Broadcast Audio Delay shall be a stereo model whose output is delayed by as much as 7 1/2 seconds, thereby allowing the operator to delete or "dump" unwanted audio. The Broadcast Audio Delay shall occupy one rack space (1U).

The inputs shall be active balanced bridging designs terminated with 3-pin XLR (AES/IEC standard wiring) female jacks.

The outputs shall be active balanced designs terminated with 3-pin XLR (AES/IEC standard wiring) male jacks.

Overall frequency response shall be 20Hz to 14kHz, +1,-1dB, measured at +4dBu output. There shall be no more than 0.1% harmonic distortion measured under the following conditions: +4dBu input, +4dBm output, 7 1/2 second delay, 1000Hz test frequency.

When the unit is inoperative (either by loss of power, or via the BYPASS switch), the inputs and outputs shall be wired together.

The Broadcast Audio Delay shall be capable of operating by means of its own built-in power supply connected to 117V nominal AC (105 to 130V), 50/60 Hz and 230V nominal AC (207 to 253V), 50 Hz.

The Broadcast Audio Delay shall be a Symetrix, Incorporated model 610 BROADCAST AUDIO DELAY.

## Architects and engineers specifications

### Technical specifications

Audio		Physical	
Inputs	Stereo, balanced bridging	Input connectors	XLR
Outputs	Stereo, electronically balanced	Output connectors	XLR
Maximum input level	+22dBu	Polarity	Pin 2 high
Maximum output level	+22dbu into 600 ohms	Chassis size	1.75" H x 19" W x 7.5" D
Frequency Response	±1dB, 20Hz-14kHz(in full delay)		4.45cm H x 48.3cm W x 19.1cm D
	-3.5dB@10kHz (building and exiting delay)	Shipping weight	8 lbs, 3.64kg
Dynamic Range	>80dB		
Crosstalk	-55dB, +4dBu in, 20Hz-14kHz	Electrical	
Input common mode rejection	>60dB @ 1kHz	Power	117VAC, nominal, 105-130VAC, 50-60Hz 230VAC, nominal, 207-255VAC, 50Hz
		Power Consumption	15 watts, maximum

*In the interest of continuous product improvement, Symetrix, Inc. reserves the right to alter, change, or modify these specifications without prior notice.*

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# B appendix

## Remote Indicator and Control Interface Wiring

Many of the 610's most important control buttons and LED indicators may be wired to a user supplied panel via the DB-25 multi-pin male connector on the 610's rear panel. In addition, a control current loop is provided for triggering optically isolated control input ports such as those found on cart machines. The current flows for 100 milliseconds every time the DUMP PROFANITY button is pressed. The following tables detail the pin functions. The remote switches and LED indicators are electrically isolated from the switches and LEDs on the 610's front panel, but effectively operate in parallel (i.e. simultaneously) with them.

### Remote panel switch pinouts

Function	Pin #	Note
START DELAY	1	The remote switches used should be high quality, momentary, single pole, push button type. All switches should return to pin #13, the switch common point.
EXIT DELAY	4	
DUMP PROFANITY	7	
COUGH	10	Note If the 610's STATUS has been forced to BYPASS mode by the front panel button, the only way to return the 610 to OPERATE mode is to depress the front panel button. It cannot be done remotely.
Emergency BYPASS	14	
Switch Common	13	

### Remote panel LED indicator pinouts

Function	LED Cathode	LED Anode
3.5 Seconds	pin 3	pin 2
7 1/2 Seconds	pin 6	pin 5
START DELAY	pin 9	pin 8
EXIT DELAY	pin 12	pin 11
DUMP PROFANITY	pin 16	pin 15
COUGH	pin 18	pin 17
BYPASS	pin 20	pin 19
OPERATE	pin 22	pin 21

#### Note

Internally within the 610, all LED anodes connect to +10V and all LED cathodes to +.6V through 330 ohm resistors.

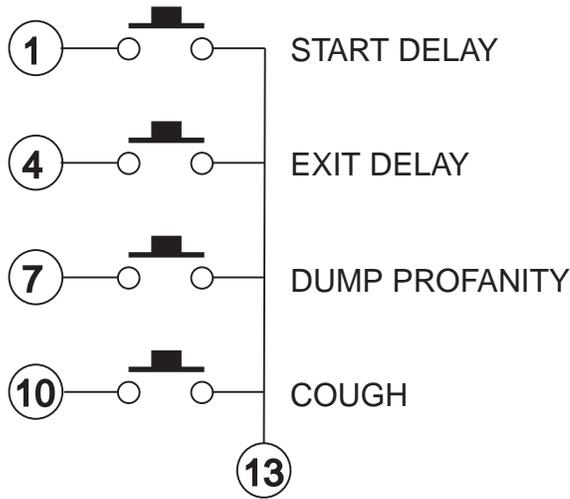
### Cart machine start opto isolator pinouts

Cathode	Anode	Ground
24	23	25

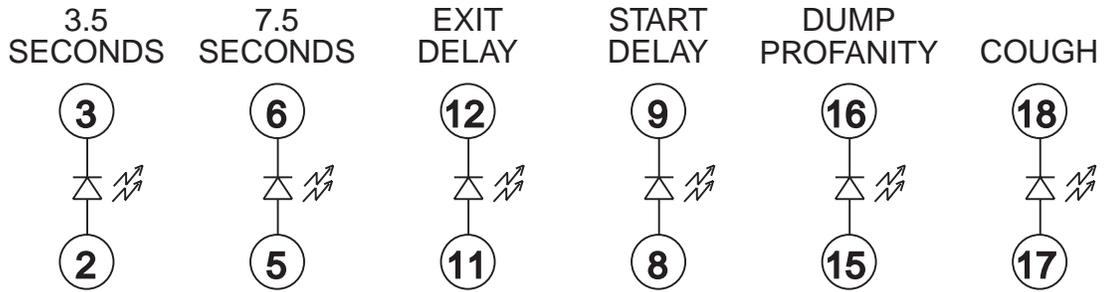
#### Note

Pin 23 is internally connected to +10V through a 330 ohm resistor. An internal open collector (pin 24) returns current to ground. Current flows for 500 milliseconds whenever the DUMP button is pressed.

**Typical remote panel switch wiring**



**Typical remote panel LED wiring**



Note

The numbers within the circles refer to pins on the 610's rear panel DB-25 connector which is labelled REMOTE INDICATOR AND CONTROL INTERFACE.

## C

## appendix

## Default Configuration

### START DELAY and EXIT DELAY speed

As discussed in Chapter 5, the START DELAY button initiates the gradual *increase* of delay time and the EXIT DELAY button initiates the gradual *decrease* of delay time. You may select between six different default configuration settings, the parameters of which are explained in detail below. Selecting the right algorithm will optimize the match between the 610 and your particular station's programming needs.

The amount of time required to increase delay from zero to 7 1/2 seconds (and to decrease delay from 7 1/2 seconds to zero) may be partially program dependent (option 1 and 2), or non program dependent fixed times (option 3,4,5, and 6). The program dependent options have the advantage of potentially faster START and EXIT times. The fixed time options are advantageous in that the operator knows exactly how long it will take to get to full delay and back to real time so that broadcast programming decisions can be made based upon known quantities.

The default configuration (as shipped from the factory), which is referred to as option #1 in the table on page 19, is partially program dependent. It takes no longer than 5 minutes to increase from zero to 7 1/2 seconds delay (it can be much faster) and no longer than 5 minutes to go from 7 1/2 seconds delay back to zero. We recommend you try this option first. It represents the best trade-off in terms of audio quality versus speed.

### Full memory dump or half memory (3 3/4 second) dump

As discussed in Chapter 5, the DUMP PROFANITY function may be configured in either of two ways: 1) when the DUMP PROFANITY button is pressed the entire content of the delay memory is erased, or 2) when the DUMP PROFANITY button is pressed only 3 3/4 seconds of memory is erased. With the second option, assuming there is a full 7 1/2 seconds in delay memory, the host can dump one caller and put a second caller on air immediately, while the 610 automatically continues to rebuild memory up to the 7 1/2 second maximum.

The default configuration (as shipped from the factory), which is referred to as option #1 in the table on page 19, dumps only half of the memory each time the DUMP button is pressed. As mentioned above, we recommend you try this option first. The two stage dump feature allows you to bring a new caller on air immediately after dumping a previous caller without having to wait for the delay to build from zero.

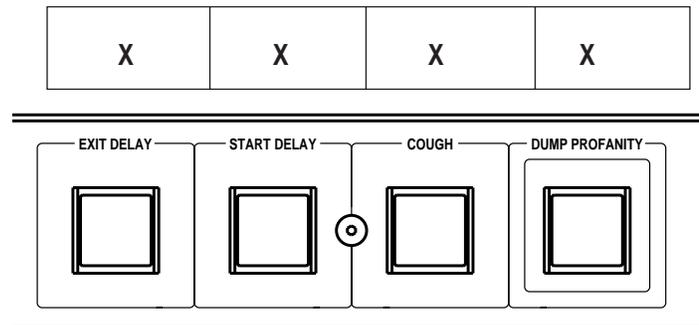
## Default configuration programming procedure

The 610 default configuration is set from the front panel. The process involves placing the 610 in programming mode and selecting one of six possible configurations. It is not necessary to remove the unit from the equipment rack, or to remove the top cover to configure or re-configure. The unit must be powered up and not in use. *Please note - the 610 cannot be configured while operational!*

The configuration settings are nonvolatile. Should power go down, the last configuration setting is maintained. To program the 610 default configuration, proceed as follows:

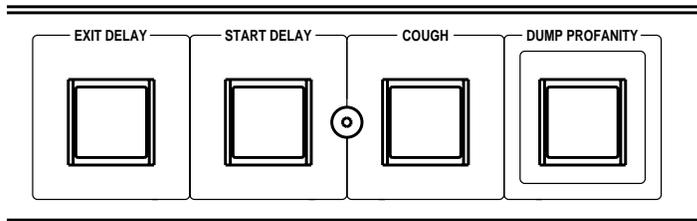
**Step #1 - Place 610 in BYPASS mode** - Use the STATUS button at the left end of the 610 front panel to place the 610 in BYPASS mode.

**Step #2 - Initiate Programming Mode** - Press all four front panel lighted push buttons (EXIT DELAY, START DELAY, COUGH, DUMP PROFANITY) and hold until all four lights come on (approximately five seconds). When you release the buttons all four will flash, indicating that the 610 is in programming mode.



**Step #3 - Select Desired Option** - While all four lights continue to flash, select your option by pressing a button or combination of buttons as indicated in the table on the following page. The associated light(s) flash to confirm your selection. After several seconds the light(s) will stop flashing, indicating that the 610 has left the programming mode.

**Step #4 - Return 610 to OPERATE mode** - Use the STATUS button at the left end of the 610 front panel to place the 610 in OPERATE mode. The unit is now ready to operate.



**Option #**

1	X				<b>Partially program dependent</b> increase/decrease time, 1/2 memory (3 3/4 seconds) dump.
2		X			<b>Partially program dependent</b> increase/decrease time, full memory dump.
3			X		<b>4 minute</b> increase/decrease time, 1/2 memory (3 3/4 seconds) dump.
4				X	<b>4 minute</b> increase/decrease time, full memory dump.
5	X	X			<b>5 minute</b> increase/decrease time, 1/2 memory (3 3/4 seconds) dump.
6	X		X		<b>5 minutes</b> increase/decrease time, full memory dump.
7	X			X	<b>Partially Program Dependant</b> , 3.5 second maximum delay
8		X		X	<b>3.0 minute increase/decrease</b> , 3.5 second maximum delay

Notes:

**Option 1 - *Try this one first!*** This is the factory default option. It gives you the fastest increase/decrease time, and the ability to dump only half the memory each time the profanity button is pushed. This algorithm has minimal artifacts, i.e. it works well with music so you can play commercials during the increase/decrease cycle.

**Option 2** - Same as option 1 but with full memory dump.

**Option 3** - Fixed 4 minute increase/decrease time with 1/2 memory dump. The 4 minute increase/decrease time gives you predictable build up/build down times but you may notice some pitch shifting of the audio with this option.

**Option 4** - Just like option 3 but with full memory dump.

**Option 5** - Fixed 5 minute increase/decrease time with 1/2 memory dump. The 5 minute increase/decrease results in minimal pitch shifting as compared to options 3 and 4.

**Option 6** - Just like option 5 but with full memory dump.

**Option 7** - Partially program dependent delay build and exit. A 3.5 second delay and full delay dump.

**Option 8** - Fixed 3 minute delay build and exit. Has a 3.5 second delay time with full delay dump.



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