

**440 Foreground
Audio Controller**

440



User's Guide

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Rev A.01, 8 Junw, 1999

Symetrix part number 53440-0A01

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Congratulations on your purchase of the Symetrix 440 Foreground Audio Controller. The 440 is designed to provide a high degree of flexibility and control in your music/paging system. It may be used as the signal router and controller in a new music/paging sound system installation, or it may be used to add paging to an existing background music system.

Three stereo program inputs are provided, allowing selection between three different program sources, such as satellite feed, CD player, and AM/FM tuner. Each program input has separate gain control, for optimal level-matching.

The 440 provides both a mic-level page input and a line-level page input. You may use either type of page input, or a mix of both inputs. When a page occurs, the selected program material will be ducked (decreased) by a user-selected amount, to provide intelligibility for the page.

Bass and treble tone controls and a master volume control allow the user to tailor the overall sound, and the stereo program material may be summed to mono at the output stage, if desired.

A separate output is provided to feed the music-on-hold input of a telephone system. This is a direct music-only output (no paging), and the music at this output will not be ducked when a page occurs.

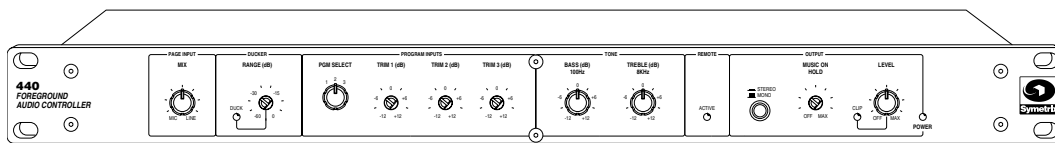
The 440 offers an excellent range of routing and control options, making it the perfect choice for a wide variety of installations. Its flexibility and simplicity can save you time and money in the design and installation of your next project.

We recommend that you read this manual cover-to-cover. You will find the answers to most of your questions inside. If you have technical questions beyond the scope of this manual, please contact our Customer Service Department at:

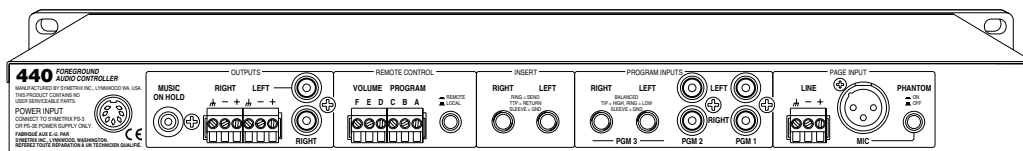
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Front panel

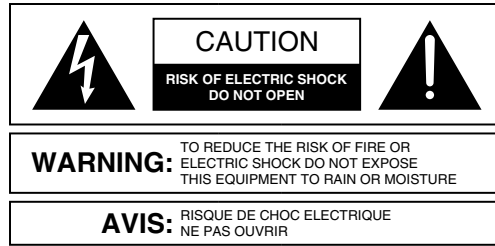


Rear panel

440

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Equipment Markings



SEE OWNERS MANUAL. VOIR CAHIER D'INSTRUCTIONS.
 No user serviceable parts inside. Refer servicing to qualified service personnel.
 Il ne se trouve à l'intérieur aucune pièce pouvant être réparée l'utilisateur.
 S'adresser à un réparateur 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 product (i.e. this manual).

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

Terms

Several notational conventions are used in this manual. Some paragraphs may use **Note**, **Caution**, or **Warning** as a heading. Certain typefaces and capitalization are used to identify certain words. These are:

- Note** Identifies information that needs extra emphasis. A **Note** generally supplies extra information to help you to better use the 440.
- Caution** *Identifies information that, if not heeded, may cause damage to the 440 or other equipment in your system.*
- Warning** **Identifies information that, if ignored, may be hazardous to your health or that of others.**
- CAPITALS** Controls, switches or other markings on the 440’s chassis.
- Boldface** Strong emphasis.

Important Safety Instructions

Please read and keep these instructions. Heed and follow all warnings and instructions. Install in accordance with the manufacturer’s instructions.

Grounding The chassis of this product is grounded through the grounding conductor of the PS-3/PS-3E 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. **Do not defeat the safety purpose of the grounding plug.** The grounding plug has two blades and a third grounding prong. The third prong is provided for your safety. When the provided plug does not fit your outlet, consult an electrician for replacement of the obsolete outlet.

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 and your operating locale. Use only a cord that is in good condition. **Protect the power cord** from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

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. Do not install near any heat source such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat. Unplug this apparatus during lightning storms or when unused for long periods of time.

Stay Out of the Box To avoid personal injury (or worse), do not remove the product covers or panels. Do not operate the product without the covers and panels properly installed. Only use accessories specified by the manufacturer. Clean only with a damp cloth.

User-serviceable parts There are no user serviceable parts inside the 440. In case of failure, refer all servicing to the factory. Servicing is required when the 440 has been damaged in any way, such as when a power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



Fast First-Time Setup

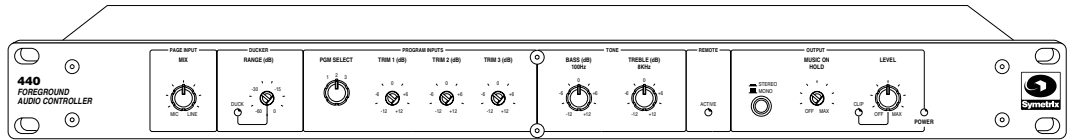
This section provides simple instructions to begin using the 440. Please refer to later chapters for detailed descriptions of product features and applications.

1. Set the PAGE INPUT MIX and DUCKER RANGE controls to the 12:00 position.
2. Use the PROGRAM SELECT control to select the desired program input.
3. Set the PROGRAM INPUTS trimpots (TRIM 1, TRIM 2 and TRIM 3) to the 12:00 position (0).
4. Set the TONE controls, BASS and TREBLE, to the 12:00 Position.
5. Set the OUTPUT STEREO/MONO switch appropriately for your output configuration.
6. Set the OUTPUT MUSIC ON HOLD trimpot to the 12:00 position.
7. Set the OUTPUT LEVEL control completely counterclockwise.
8. Connect the 440 to an appropriate source of AC power, using the Symetrix PS-3 or PS-3E power supply provided with your 440.
9. Set the REMOTE CONTROL LOCAL/REMOTE switch (located on the back panel) to the Local (out) position.
10. Set the PAGE INPUT PHANTOM POWER switch to the Off (out) position, *unless* you will be connecting to the PAGE INPUT a condenser page mic that requires external phantom power.
11. Connect your audio inputs and outputs.
12. Turn up the GAIN control until the desired volume level is reached.

Now read the rest of this manual.

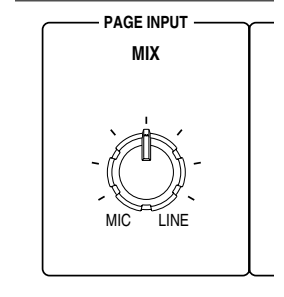
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Page Input Section

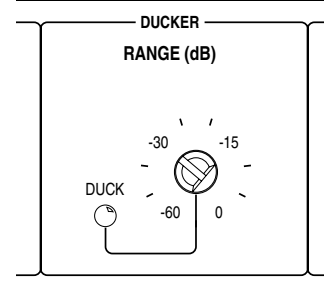
MIX control – Sets the ratio of mic input signal to line input signal. When this control is set completely counterclockwise, the signal present at the mic-level PAGE INPUT will pass, but the signal present at the line-level PAGE INPUT will not. When this control is set completely clockwise, the signal present at the line-level PAGE INPUT will pass, but the signal present at the mic-level PAGE INPUT will not. When the MIX control is set anywhere between clockwise and counterclockwise, both signals will pass, and the balance between their levels will be determined by the position of this control.



Ducker Section

DUCK LED – Lights to indicate that the program material is being ducked.

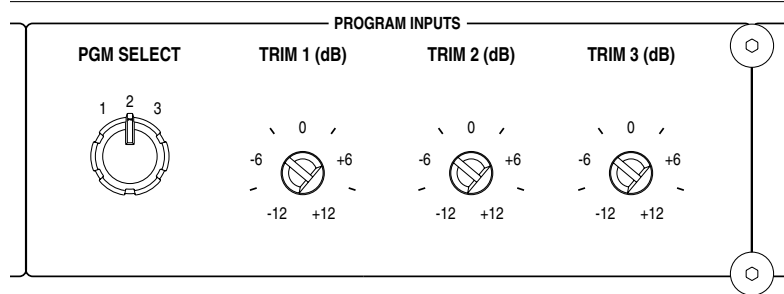
RANGE control – Determines the amount of ducking that will occur. If this control is set completely counterclockwise (-60), the program material will be ducked by 60dB (virtually muted) when a page occurs. If this control is set clockwise (0), then the program material will not be ducked at all, even when a page occurs.



THRESHOLD and RELEASE TIME controls – Internal controls are provided to change the Ducker threshold setting and release time from the factory presets. Please see Appendix B for instructions.

Program Inputs Section

PGM SELECT control – Selects which of the three program inputs will be present at the output of the 440. Only one input may be selected at a time.



TRIM 1 control – Sets the gain that will be applied to the program material which is connected to PROGRAM INPUT 1.

TRIM 2 control – Sets the gain that will be applied to the program material which is connected to PROGRAM INPUT 2.

TRIM 3 control – Sets the gain that will be applied to the program material which is connected to PROGRAM INPUT 3.

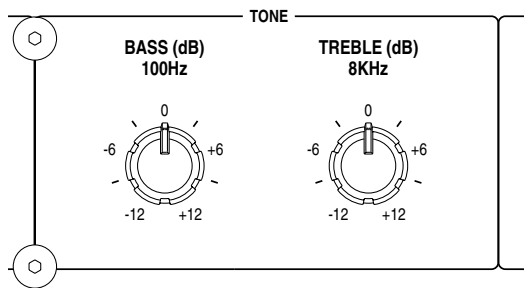
Tone Section

BASS control – Provides up to 12dB of boost or cut at 100 Hz to all signals, program and paging, which pass through the 440.

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TREBLE control – Provides up to 12dB of boost or cut at 8000 Hz to all signals, program and paging, which pass through the 440.

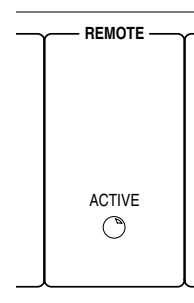
Note The 440 may be modified to cause the Bass and Treble Controls, as well as the Output Level Control, to affect only the program material, and not the page signal. Please see Appendix B for modification instructions.



Remote Section

ACTIVE LED – Lights to indicate that the user has activated the remote control mode by setting the rear panel LOCAL/REMOTE switch to the REMOTE position. When the remote control mode is activated, the front panel PROGRAM SELECT control is rendered inactive, and the PROGRAM SELECT functions are solely controlled by a remote unit connected to the Remote Control terminals on the rear panel of the 440.

In REMOTE mode the OUTPUT LEVEL control on the 440 determines the maximum output level obtainable. The REMOTE LEVEL control can be used to reduce the output level from this maximum setting.

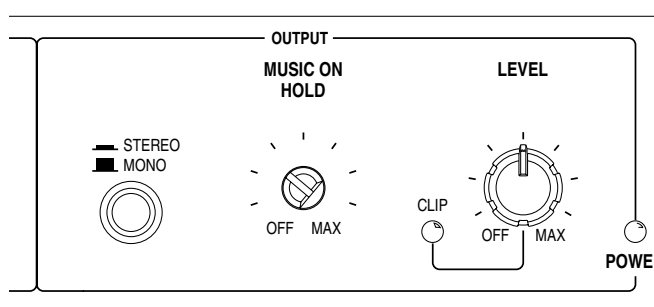


Output Section

STEREO/MONO switch – Selects whether the output of the 440 will be stereo or mono. If “STEREO” is selected, the stereo program material will be preserved, with the mono paging signal appearing equally on the left and right outputs. If “MONO” is selected, the stereo program material will be summed to mono and combined with the mono paging signal.

MUSIC ON HOLD control – Sets the volume level of program material present at the 440’s Music on Hold Output.

CLIP LED – Lights to warn that the output signal is too high, and distortion may occur. It is acceptable for this LED to flash occasionally, on peaks in the program material or paging signal, but this LED should never stay lit. If this LED stays on, turn the OUTPUT LEVEL control towards the counter-clockwise position until the CLIP LED only flashes occasionally, or not at all.



LEVEL – Sets the overall gain (volume) of the combined program material/paging signal which appears at the 440’s LEFT AND RIGHT OUTPUTS, when the LOCAL/REMOTE switch on the rear of the 440 is set to the “Local” position.

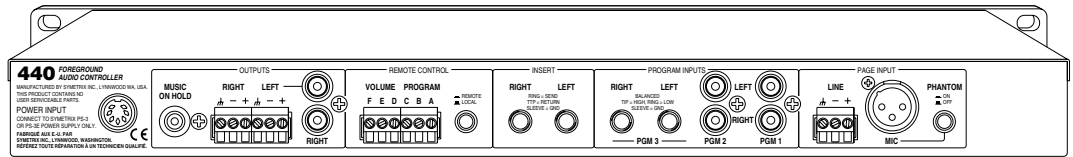
When the LOCAL/REMOTE switch on the rear of the 440 is set to the “Remote” position, the LEVEL control sets a master gain limit, above which the output gain will not be allowed to rise. In other words, when the 440 is in “Remote” mode, the remote control’s output level adjustment may be used to increase the 440’s output level up to, but not exceeding, the level determined by the setting of the front-panel LEVEL control.

Note The Symetrix 440 may be modified so that the LEVEL control only affects program material, and not the paging signal. See Appendix B for modification instructions.

POWER LED – Lights to indicate that the 440 is receiving power.

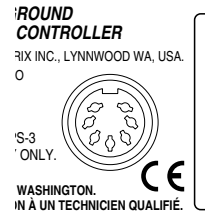
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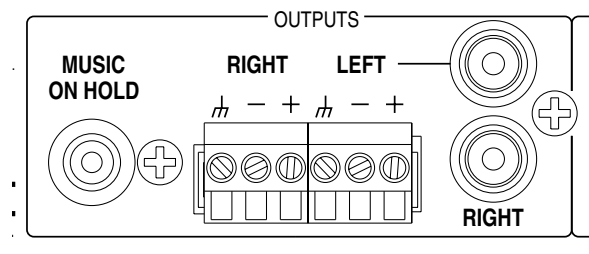
Power Input

POWER INPUT – This is a 7-pin DIN power receptacle. Connect only the Symetrix PS-3 (117V power supply) or Symetrix PS-3E (230V power supply) to the Power Input receptacle. Connect the AC power connector of the PS-3 or PS-3E to an AC power source that is of the correct voltage and frequency, as marked on the PS-3 or PS-3E.



Outputs

MUSIC ON HOLD OUTPUT – This RCA jack provides a direct, line-level, mono output of **only** the program material currently selected. The level of this output is determined by the MUSIC ON HOLD LEVEL control. No paging signal is present at this output, and the program material at this output is not ducked when a page occurs. This output is designed to feed the “music on hold” input of a telephone system. The MUSIC ON HOLD OUTPUT is transformer-isolated to prevent ground loop noise.

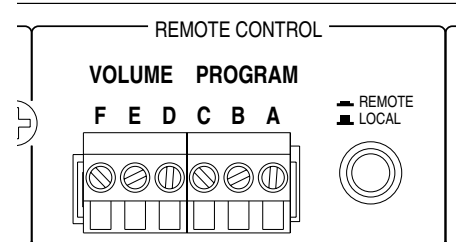


LEFT OUTPUT – If the STEREO/MONO switch on the front panel is in the STEREO position (in), this final output of the 440 will include paging signal and the left channel of the selected program material, as modified by all of the 440’s front panel controls and/or remote control. If the STEREO/MONO switch on the front panel is in the MONO position (out), this final output of the 440 will include paging signal and both channels of the selected program material, as modified by all of the 440’s front panel controls and/or remote control. This line-level output is available at the LEFT OUTPUT Euroblock terminal connector (balanced) and at the LEFT OUTPUT RCA connector (unbalanced).

RIGHT OUTPUT – If the STEREO/MONO switch on the front panel is in the Stereo position (in), this final output of the 440 will include paging signal and the right channel of the selected program material, as modified by all of the 440’s front panel controls and/or remote control. If the STEREO/MONO switch on the front panel is in the MONO position (out), this final output of the 440 will include paging signal and both channels of the selected program material, as modified by all of the 440’s front panel controls and/or remote control. This line-level output is available at the RIGHT OUTPUT Euroblock terminal connector (balanced) and at the RIGHT OUTPUT RCA connector (unbalanced).

Remote Control

REMOTE CONTROL VOLUME – When connected to the Symetrix RC-2 remote controller, this Euroblock terminal connector allows remote control of the 440’s output gain. The REMOTE/LOCAL switch must also be in the REMOTE (in) position to enable remote volume control. **If the switch is set to REMOTE but there is no remote control connected, the 440 will produce no signal at any of its outputs.**



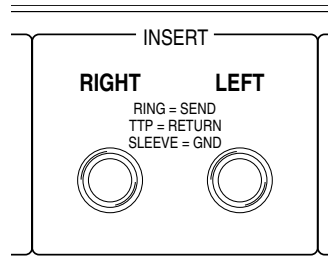
Note See Appendix A for more information on the Symetrix RC-2 remote controller.

REMOTE CONTROL PROGRAM - When connected to the Symetrix RC-2 remote controller, this Euroblock terminal connector allows remote selection of the active PROGRAM INPUT, overriding the front panel PGM SELECT control. The LOCAL/REMOTE switch must also be in the REMOTE (in) position to enable remote program selection.

Sidechain Inserts

LEFT INSERT – This ¼" TRS jack (Tip = Return, Ring = Send, Sleeve = Ground) allows line-level outboard processing of the signal which will appear at the left program output (page signal mixed with the left channel of the selected program material).

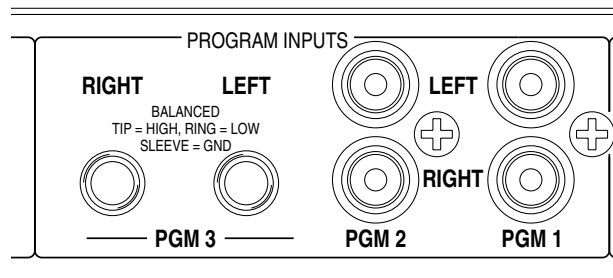
RIGHT INSERT – This ¼" TRS jack (Tip = Return, Ring = Send, Sleeve = Ground) allows line-level outboard processing of the signal which will appear at the right program output (page signal mixed with the right channel of the selected program material).



Note If you wish to process just the selected program material (before it is mixed with the page signal), please see Appendix B for modification instructions.

Program Inputs

PROGRAM INPUTS 1 (Left & Right) – RCA unbalanced left and right input jacks for program material. These line-level inputs will be active when the PGM SELECT control is in the “1” position. Gain of this input pair is controlled by the TRIM 1 front-panel control.



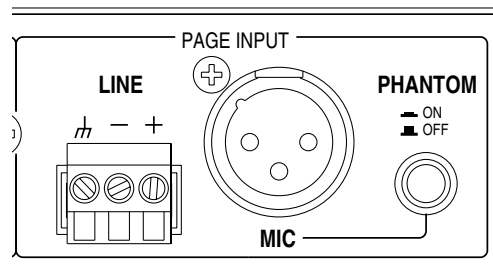
PROGRAM INPUTS 2 (Left & Right) – RCA unbalanced left and right input jacks for program material. These line-level inputs will be active when the PGM SELECT control is in the “2” position. Gain of this input pair is controlled by the TRIM 2 front-panel control.

PROGRAM INPUTS 3 (Left & Right) – Balanced TRS ¼" left and right input jacks for program material. These line-level inputs will be active when the PGM SELECT control is in the “3” position. Gain of this input pair is controlled by the TRIM 3 front-panel control.

Page Inputs

LINE PAGE INPUT – This balanced Euroblock terminal input connector accepts line-level paging signals.

MIC PAGE INPUT – This balanced XLR input jack accepts mic-level paging signals. If you need phantom power for a condenser microphone connected to this input, set the PHANTOM switch to the “in” (on) position.



PHANTOM SWITCH – This on/off switch allows +15 V phantom power to be applied to pins 2 and 3 of the MIC PAGE INPUT XLR connector. If you need phantom power for a condenser microphone directly connected to this input, set the PHANTOM switch to the “in” (on) position. If you do not require phantom power at this input, set the PHANTOM switch to the “out” (off) position.

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Please refer to Figure 6-1 on the next page for an illustration of the appropriate connections.

Foreground Music with Paging

This type of paging system is typically used in a restaurant or shopping mall. It is desirable for the paging to be clearly heard, but the transition between paging and music should not be too obtrusive. We recommend that you duck the background music by 10 – 20dB.

Foreground Music/Paging with Emergency Override

If you have a foreground music/paging system that you wish to override in the case of an emergency, you will want the ducking action to be thorough. Connect the emergency paging source to the PAGE INPUT of the 440. Use the MIC PAGE INPUT if your emergency paging source is mic-level, and use the LINE PAGE INPUT if the emergency paging source is line-level.

Because this is an emergency-paging situation, use the PAGE INPUTS only for emergency page sources. Set the RANGE control completely counterclockwise for maximum ducking. Connect your foreground music/paging source to one of the PROGRAM INPUTS of the 440. Set the PGM SELECT control to activate the desired PROGRAM INPUT.

Using Multiple Program Sources

The 440 provides program inputs for up to three stereo program sources, such as satellite feed, cassette tape deck, CD player, radio, etc. PROGRAM INPUTS 1 and 2 use unbalanced RCA connectors for left and right channels. PROGRAM INPUT 3 uses balanced ¼" TRS connectors for left and right channels. The setting of the PGM Select control determines which program source will be active, and only one program source may be used at any given time.

Connect your program sources to the PROGRAM INPUTS of the 440, then adjust the front-panel PROGRAM INPUT trimpots to match program levels. For example, if you are connecting the outputs of a CD player to PROGRAM INPUT 1, and the outputs of a cassette deck to PROGRAM INPUT 2, the trimpot for PROGRAM INPUT 1 would probably be set for a lower volume level than the trimpot for PROGRAM INPUT 2. This is because the output levels of CD players tend to be higher than the output levels of cassette decks.

Providing Background Music for a Telephone System

When a PROGRAM INPUT is activated by the PGM SELECT control, its signal is split and routed to two destinations. The first destination is the ducker circuitry. The second destination is the MUSIC ON HOLD output. The signal present at the MUSIC ON HOLD output is active program material only (no paging), and because this signal was split off before reaching the ducker circuitry, it will not be ducked when paging occurs. The MUSIC ON HOLD output of the 440 is designed to be a music-only output, which may be connected to the music-on-hold input of a telephone system. Active program material used by the music/paging system will also be the music-on-hold signal used by the telephone system. To prevent the possibility of ground loop noise, this output is transformer-isolated.

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The power LED does not light:

Are you using the correct Symetrix power supply for your location? For areas with 117V AC power, the Symetrix PS-3 is correct. For locales with 230V AC power, the Symetrix PS-3E is the correct power supply.

Check the power supply connections at the 440 and at the AC power source.

Is the AC power source actually providing power?

If, after checking all of the above, the 440 is not powering up correctly, consult a qualified service technician or the Symetrix factory.

There is no output signal:

Is the power LED on? If not, see above.

Is the Output Level control turned up? If you are using the remote controller, is the Output Level control on the remote controller turned up?

Check position of the Remote/Local switch on the 440's rear panel. If the switch is set to Remote but there is no remote control connected, the 440 will produce no signal at any of its outputs.

Check input, output and remote controller cables and connections.

Determine that there really is signal coming from the paging source and the program material source, and that these signals are reaching the 440.

Is your paging source connected to the correct input? If your paging source is a mic, it should be connected to the Mic Page Input, *not* the Line Page Input.

If you are connecting a condenser paging mic that does not have its own power supply to the Page Input of the 440, is the Phantom switch set to the "in" position?

Try setting the Mix control to the 12 o'clock position.

Is the PGM Select control set to the correct position for the desired program source? If you are using the remote controller, is the correct program source selected?

Is the Trim control for the desired program source turned up?

Distortion in the output signal:

Is the Clip LED on? If it is, turn the Output Gain down.

Check your signal sources to make sure that the incoming signals are not already distorted before they reach the 440.

Check your input signals. Are they overdriving any of the 440's inputs? If so, reduce the incoming signal level.

Is the distortion occurring in both the paging signal and in the program material signal?

If the distortion is occurring only in the paging signal, check your paging source. If your paging source is line-level, make sure that you connected it to the 440's Line Page Input, *not* the Mic Page Input.

If the distortion is occurring only in the program material signal, then you may be feeding the 440 a program signal that is too hot.

Are you using the correct Symetrix power supply for your locale (PS-3 for 117V AC power, PS-3E for 230V AC power)?

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No ducking is occurring:

Is the Range control turned clockwise (0)? Try turning this control counterclockwise.

Is page signal reaching the 440? Do you hear the page?

Did you use the Music On Hold output by mistake?

The 440 is not responding to the front-panel PGM Select and Output Level Controls:

Is the Remote Active LED on? It should not be, if you wish to use these front panel controls.

Check the setting of the Remote/Local switch on the 440's rear panel. For the front-panel PGM Select and Output Level controls to be enabled, the switch should be in the "Local" position.

The 440 is not responding to the Remote Controller:

Is the Remote Active LED on? It should be, if you wish to use the remote controller.

Check the setting of the Remote/Local switch on the 440's rear panel. For the remote controller to be enabled, the switch should be in the "Remote" position.

Is the remote controller correctly connected to the 440?

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. The input may be too low in level. If so, boost the incoming signal.

If the incoming page signal to the 440 is Mic level, make sure that the page source is connected to the Mic Page Input, *not* the Line Page Input.

Are one or both of the input signals already noisy? Listen "up stream" from the 440 to determine that you are feeding it clean signals.

The 440 doesn't respond properly:

Consult a qualified service technician or the Symetrix factory.

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Architects and Engineers Specifications

The foreground audio controller shall provide page-over-music capability and shall allow the user to select between three music inputs. The unit shall occupy a single rack space (1U).

The 440 shall provide separate mic-level and line-level page inputs. The mic-level page input shall be balanced and low-impedance, and shall use one XLR connector. The mic-level page input shall also have a rear-panel pushbutton which shall apply +15V phantom power to the mic-level page input. The line-level page input shall be balanced and high-impedance, and shall use one Euroblock detachable terminal connector. A front-panel mix control shall be continuously adjustable from mic-level page input signal only, to a mix of mic-level and line-level page input signals, to line-level page input signal only.

Three stereo line-level program inputs shall be provided. Program inputs 1 and 2 shall use unbalanced left and right RCA input connectors. Program input 3 shall use balanced left and right ¼" tip-ring-sleeve connectors. Each program input shall be individually buffered, and shall have an associated front-panel trimpot, which provides a continuous adjustment range from +12dB signal boost to -12dB signal cut. Any one of the three program inputs may be selected by a front-panel program select control.

Remote control shall be available for control of program selection and output level. Remote control shall be enabled/disabled by a rear-panel pushbutton switch. When remote control is enabled, a front-panel indicator LED shall light, the front-panel program select control shall be disabled, and the front-panel output level control shall become a master gain limit control.

Bass and treble tone controls shall be provided. These controls shall act on the combined page signal and selected program signal or optionally only on the program signal. The bass tone control shall have a center frequency of 100 Hz, and shall have a continuous adjustment range of -12dB to +12dB. The treble control shall have a center frequency of 8kHz, and shall have a continuous adjustment range of -12dB to +12dB.

Rear-panel ¼-inch, tip-ring-sleeve left and right insert jacks shall be provided to allow external processing of the combined paging and selected program signals, or optionally on the program signal only.

The unit shall incorporate a priority ducking system. When audio is present at either page input, the selected program signal shall be attenuated (ducked). There shall be a duck LED to indicate that ducking is occurring. A continuously adjustable range control shall set the amount of attenuation from -60dB to 0dB.

The stereo main outputs of the unit shall be available at left and right unbalanced RCA connectors, and also at balanced left and right Euroblock detachable terminal connectors. A front-panel switch shall allow stereo or mono main output capability. A front-panel gain control with a clip LED shall simultaneously and continuously adjust the level of the left and right main outputs.

A music-on-hold output, available at a single unbalanced RCA connector, shall also be provided. The music-on-hold output shall provide a mono sum of the selected program input, prior to any processing. A front-panel trimpot shall provide gain control for this signal.

The foreground audio controller shall be a Symetrix., Inc. model 440 Foreground Audio Controller.

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Specifications

Program Inputs

Gain	0dB +/- 12dB
Maximum Input Level	+20dBu, 0dB gain
Program Input Impedance	20k Ohms Balanced, 20k Ohms Unbalanced
CMMR	>40dB, Input 3 only

Paging Inputs

Microphone Input Gain	40dB
Line Input Gain	unity gain (0dB)
Microphone Input Impedance	>1500 Ohms
Line Input Impedance	20k Ohms
Mic Input Max Input Level	-20dBu
Line Input Max Input Level	+20dBu
CMMR	>40dB
Phantom Power (Mic input only)	+15VDC switchable

Ducker Sidechain

Threshold	Factory preset at equivalent of -20dBu at page preamp output
Hold Delay	Fixed at 1 second
Release Time	Factory Preset at 1/2 second
Attack Time	10mS – 16mS program dependent
Range	-60dB to 0dB

Insert Patching

Signal Level	0dBu nominal
Output Impedance	200 Ohms
Input Impedance	20k Ohms
Maximum I/O Level	+20dBu

Tone Controls

Bass	+/-12dB maximum at 100Hz
Treble	+/-12dB maximum at 8kHz

Outputs

Maximum Output, Unbalanced	+20dBu into 10k Ohm load
Maximum Output, Balanced	+20dBm into 600 Ohm load
Output Impedance	200 Ohms Unbalanced, 400 Ohms Balanced

Performance Data

Frequency Response	20Hz – 20kHz, +/-1dB with tone controls centered (any input to any output)
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Frequency Response, MOH output	100Hz to 15kHz, +/-1dB (at 0dBm into 600 Ohm load)
Channel Balance	1dB maximum offset with controls at unity (typical < 0.5dB)
	1.5dB maximum offset with controls in any position (typical < 0.75dB)
Noise Floor with Page Level CCW	-89dBu typical (20kHz NBW)
Page Mic Preamp EIN	-125dBu typical (20kHz NBW)
THD+Noise	<0.08 at +4dBu output level (any input to any output, all controls at unity gain)

Connections

Mic Page Input	XLR
Line Page Input	Euroblock
Program Inputs 1 and 2	RCAjacks
Program Inputs Left, Right, 3	1/4" TRS
Left and Right Inserts	1/4" TRS
Remote Control	Euroblock
Left and Right Outputs	Euroblock
Music on Hold Output	RCAjack
Power In	7 pin DIN

Physical

Size (hwd)	1U rack unit 1.72" x 19" x 6"
Shipping Weight	8 lbs

Electrical

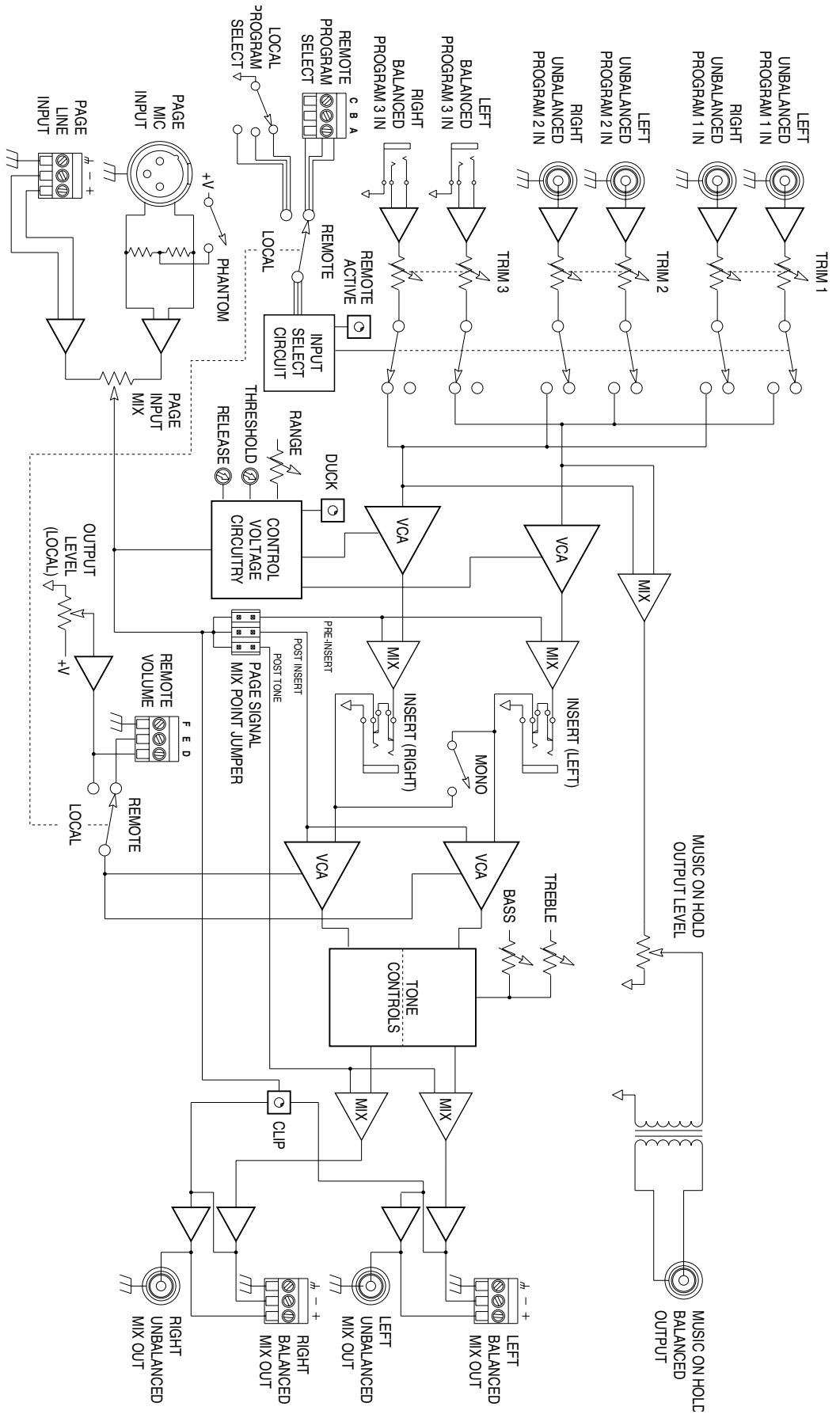
Power Requirements	115V nominal, 60 Hz, 15 watts maximum 230V nominal, 50 – 60Hz, 15 watts maximum
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In the interest of continuous product improvement, Symetrix, Inc. reserves the right to alter, change, or modify these specifications without prior notice.

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 Symetrix



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440 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 by Symetrix via United Parcel Service (surface), to any location within the Continental United States. At Buyer's request the shipment may be returned via airfreight at Buyer's expense. 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 allocable 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 or substitute facilities or supply houses.

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Servicing the 440

If you have determined that your 440 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:

Before sending anything to Symetrix, contact our Customer Service Department for a return authorization (RA) number. The telephone number is (425) 787-3222, Monday through Friday, 8AM (0800 hours) though 4:30 PM (1630 hours) Pacific Time.

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.

In-warranty Repairs

To get your 440 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.

Repairs made in-warranty will cost you only one-way freight charges. We'll prepay the return (surface) freight.

If you send us your product in substandard packaging, we will charge you for factory shipping materials. If you don't have the factory packaging materials, please use an oversized carton, wrap the unit in a plastic bag, and surround it with bubble-wrap. Pack the box full of Styrofoam peanuts. Be sure there is enough clearance in the carton to protect the rack ears (you wouldn't believe how many units are returned with bent ears). We will return the unit in Symetrix packaging. Of course, if the repair is due to operator error, parts and labor will be charged. In any event, if there are charges for the repair costs, 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.

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The Symetrix 440 Foreground Audio Controller is designed for use with the Symetrix RC-2 Remote Controller in situations that require remote control. The RC-2 provides remote PGM SELECT control and remote OUTPUT LEVEL control.

Note The Symetrix 440’s rear-panel REMOTE/LOCAL switch must be set to the “Remote” (in) position to enable remote control of the 440.

RC-2 Controls

PGM SELECT control – Selects which of the three program inputs will be present at the output of the 440. Only one input may be selected at a time.

OUTPUT LEVEL control - Sets the overall gain (volume) of the combined program material/paging signal which appears at the 440’s LEFT and RIGHT OUTPUTS, when the REMOTE/LOCAL switch on the rear of the 440 is set to the “Remote” position. Optionally, the 440 may be modified so that the OUTPUT LEVEL control sets the overall gain of the program material only (not the paging signal). Please see Appendix B for modification instructions.

Note When the REMOTE/LOCAL switch on the rear of the 440 is set to the “Remote” position, the 440’s front-panel LEVEL control sets a master gain limit, above which the output gain will not be allowed to rise. In other words, when the 440 is in “Remote” mode, the RC-2 remote control’s output level adjustment may be used to increase the 440’s output level up to, but not exceeding, the level determined by the setting of the 440’s front-panel OUTPUT LEVEL control. This switch setting disables the front-panel PGM SELECT control.

RC-2 Connectors

REMOTE CONTROL VOLUME and PROGRAM – When connected to the Symetrix 440, these Euroblock terminal connectors allow remote control of the 440’s output gain, and selection of the active PROGRAM INPUT. The 440’s rear-panel REMOTE/LOCAL switch must be in the REMOTE (in) position to enable remote control.

Installing the RC-2

When installing the RC-2 remote control, be sure that you connect the RC-2’s VOLUME connector to the 440’s VOLUME terminals, and that you connect the RC-2’s PROGRAM connector to the 440’s PROGRAM terminals. When connecting to the 440, be sure to connect with the correct polarity, so that the “A” pin of the RC-2’s REMOTE CONTROL connector matches up with the “A” pin of the 440’s REMOTE CONTROL Euroblock terminal connector, etc. Set the LOCAL/REMOTE switch to the “REMOTE” (in) position, and keep your cable runs under 200 feet. Use a standard single-gang Decora plate for ground fault circuit interrupters (#80401).

Note Decora plate not supplied with Symetrix RC-2 or 440.

Note Symetrix recommends using a six-conductor cable, 22 AWG or better. Examples of suitable cable types include Belden 9745 (stranded), Belden 8742 or 9576 (solid), and Belden 82742 (Plenum rated).

Caution When installing the RC-2, always follow applicable building codes.

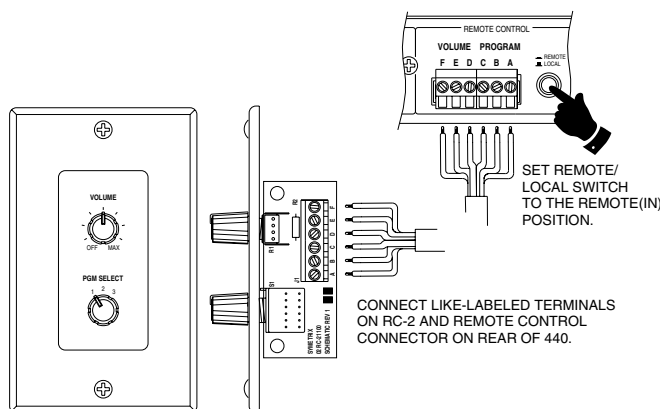


Figure A-1. RC-2 Front panel and connections.

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Caution *These servicing instructions are for use by qualified personnel only. To avoid electric shock do not perform any servicing other than that contained in the operating instructions portion of this manual unless you are qualified to do so. Refer all servicing to qualified service personnel.*

Warning **Lethal voltages are present inside the chassis. Perform all service work with the unit disconnected from all AC power.**

Changing the Insert Point Signal to Program Material Only

The 440 ships from Symetrix configured so that the page signal and selected program material combine before the insert point. This means that the signal present at the LEFT and RIGHT INSERT jacks is a combination of page signal and program material. If you wish to have only the selected program material present at the LEFT and RIGHT INSERT jacks, then the 440 must be modified so that the page signal and selected program material do not combine until *after* the insert point. To perform this modification, please follow the following instructions.

1. Disconnect power from the 440.
2. Remove the top cover.
3. Locate the PAGE MIX jumper terminals on the circuit board. These are labeled “PRE-INSERT”, “POST-INSERT” and “POST-TONE”. (See next page for circuit board illustration.)
4. The 440 is shipped from the factory with a jumper in the Pre-insert position. Remove this jumper by grasping its sides and pulling straight up (needle-nosed pliers may be helpful).
5. Move this jumper over to the Post-insert position, and press the jumper straight down, so that it connects the two Post-insert terminal pins.
6. Replace the top cover.
7. Reinstall the 440 and connect the input and output connectors.

To Make the Tone and Output Level Controls Act Only on the Program Material

The 440 ships from Symetrix configured so that the page signal and selected program material combine before reaching the TONE and OUTPUT LEVEL controls. This means that the TONE and OUTPUT LEVEL controls act on the combination of page signal and program material. If you wish to have the Tone and OUTPUT LEVEL controls affect only the selected program material, then the 440 must be modified so that only the selected program material passes through the tone control and output level circuitry. The page signal and selected program material are combined *after* the program material has passed through these stages. To perform this modification, please follow the following instructions.

1. Disconnect power from the 440.
2. Remove the top cover.
3. Locate the PAGE MIX jumper terminals on the circuit board. These are labeled “PRE-INSERT”, “POST-INSERT” and “POST-TONE”. (See next page for circuit board illustration.)
4. The 440 is shipped from the factory with a jumper in the Pre-insert position. Remove this jumper by grasping its sides and pulling straight up (needle-nosed pliers may be helpful).
5. Move this jumper over to the Post-tone position, and press the jumper straight down, so that it connects the two Post-tone terminal pins.
6. Replace the top cover.
7. Reinstall the 440 and connect the input and output connectors.

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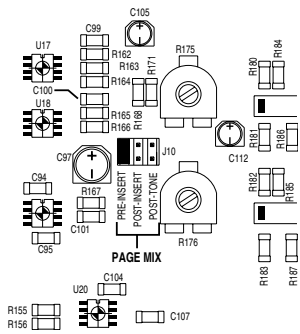


Figure B-1. Pre-insert position.

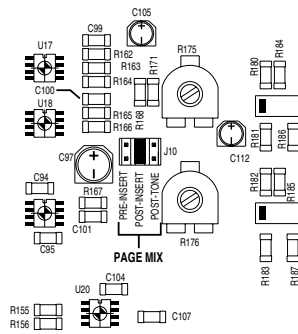


Figure B-2. Post-insert position.

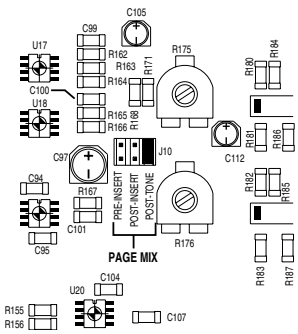


Figure B-3. Post-tone position.

Changing the Ducker Threshold and Release Time Settings

The 440 ships from Symetrix with factory-adjusted THRESHOLD and RELEASE TIME settings which should be adequate for most applications. If you wish to change either of the settings, please follow these instructions:

1. Disconnect power from the 440.
2. Remove the top cover.
3. Locate the trimpots labeled “THRESH” and “RELEASE” on the circuit board.
4. The range of the THRESHOLD control is -40 to 0 dBu. It is factory set to activate ducking when a paging signal of -20 dBu is detected at the page preamp output. Rotating this control clockwise will increase the threshold setting (and vice-versa).
5. The range of the RELEASE control is $\frac{1}{2}$ second to 4 seconds. It is factory set to release at $\frac{1}{2}$ second. Rotating this control clockwise will increase the release time (and vice-versa).
6. Replace the top cover.
7. Reinstall the 440 and connect the input and output connectors.

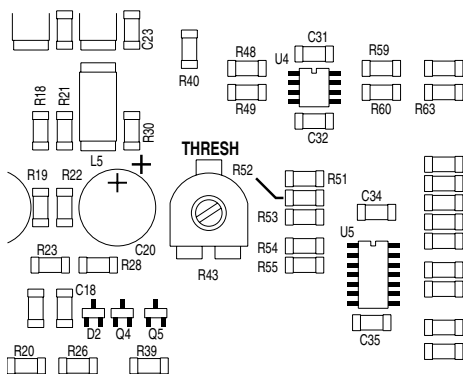
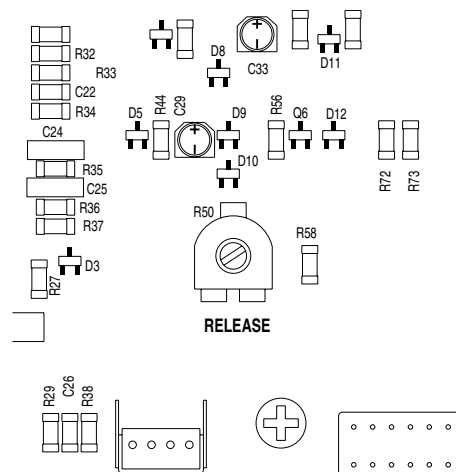


Figure B-4. Threshold trimpot.



Declaration of Conformity

We, **Symetrix Incorporated**,
14926 35th Ave. West, Lynnwood, Washington, USA,
declare under our sole responsibility that the product:

440 Foreground Audio Controller

to which this declaration relates,
is in conformity with the following standards:

EN 60065

Safety requirements for mains operated electronic and related apparatus for household and similar general use.

EN 55103-1

**Electromagnetic compatibility - Generic emission standard
Part 1: Residential, commercial, and light industry.**

EN 55103-2

**Electromagnetic compatibility - Generic immunity standard
Part 1: Residential, commercial, and light industry.**

The technical construction file is maintained at:

Symetrix, Inc.

14926 35th Ave. West
Lynnwood, WA, 98037-2303
USA

The authorized representative located within the European Community is:


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P.O. Box 100
St. Austell, Cornwall, PL26 6YU, U.K.

Date of issue: May 28, 1999

Place of issue: Lynnwood, Washington, USA

Authorized signature:



Dane Butcher, President, **Symetrix Incorporated**.

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