

302 Dual Microphone
Preamplifier

302



Users Guide

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Congratulations on your purchase of the Symetrix 302 Dual Microphone Preamplifier. The 302 is an ultra-clean two channel dual mono preamp for use in critical digital and analog recording situations. The 302 delivers exceptional sonic performance even at extremely high input levels, making it the ideal mate to the newest transformerless condenser microphone designs.

When compared with older mic preamps, the 302 offers substantial sonic advances, such as:

- 1) Its solid stereo imaging (less than 10 degree phase shift at 20kHz);
- 2) Excellent transient handling (its positive and negative slew rates are symmetrical);
- 3) Very low noise (approaching the theoretical limit); and
- 4) Almost undetectable distortion (.007%).

Variable gain inputs with 15dB pads allow the 302 to handle any input level up to +14dBV. Phantom power is available at both inputs. In addition, both channels include a polarity switch to correct for improperly wired cables or unresolvable mic placement problems.

Balanced low-Z line drivers are on 3-conductor 1/4" TRS connectors and Euroblock connectors. These drivers are capable of +24dBm maximum output. The output stage can also drive unbalanced lines of up to a maximum of +18dBm.

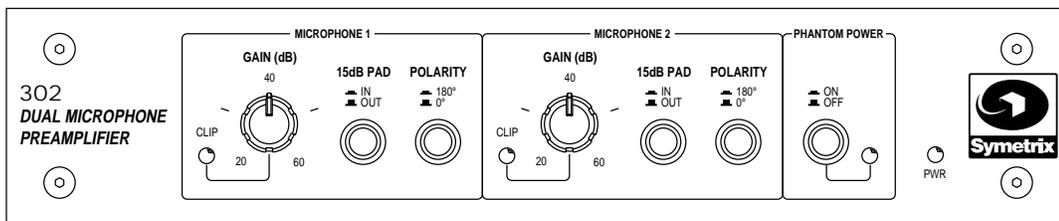
We recommend that you read this manual cover-to-cover. You will find the answers to most of your questions inside. However, if you are in a hurry, go directly to Chapter 3 (Fast Setup). It will get you started quickly. Please feel free to contact us if you have questions, comments or suggestions.

Phone: (425)778-7728

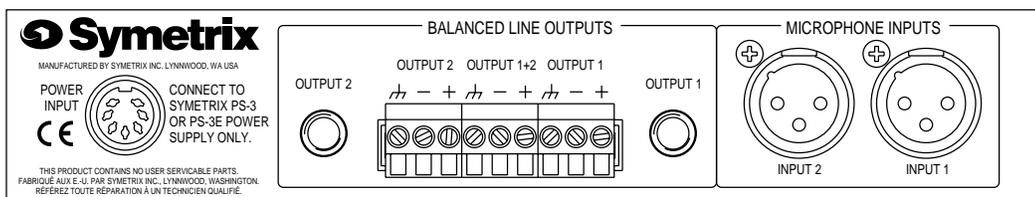
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Front panel



Rear panel



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.

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

Equipment Markings



WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE

AVIS: RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR

SEE OWNERS MANUAL. VOIR CAHIER D'INSTRUCTIONS.
No user serviceable parts inside. Refer servicing to qualified service personnel.
Il ne se trouve a l'interieur aucune piece pouvant entre reparaee l'usager.
S'adresser a un reparateur competent.

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 302 (i.e. this manual).

Caution *To prevent electric shock, do not use the polarized plug supplied with the 302 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 302.

Caution Identifies information that, if not heeded, may cause damage to the 302 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 302's chassis.

Boldface Strong emphasis.

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.

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.

In-line power supply - This product receives its operating power from the Symetrix PS-3 or PS-3E power supply. These are the only power supplies approved for use with the product. Do not connect the product to any other in-line, or plug-in, transformer. The use of other power sources may cause damage to the equipment or present a shock hazard to the operator.

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.

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Fast First-Time Setup

Follow these instructions to get your 302 up-and-running as quickly as possible. The intent of this section is fast setup only. Please refer to later chapters for explanation of the 302's controls and functions.

1. Set the Microphone 1 and Microphone 2 GAIN controls completely counter-clockwise.
2. Set the Microphone 1 and Microphone 2 PAD switches to the OUT position.
3. Set the Microphone 1 and Microphone 2 POLARITY switches to the OUT position.
4. Set the PHANTOM POWER switch to the OUT position, unless you will be using a condenser microphone which requires phantom power.
5. Connect your first microphone to the Microphone 1 XLR Input. If you are using two mics, connect your second microphone to the Microphone 2 XLR Input.

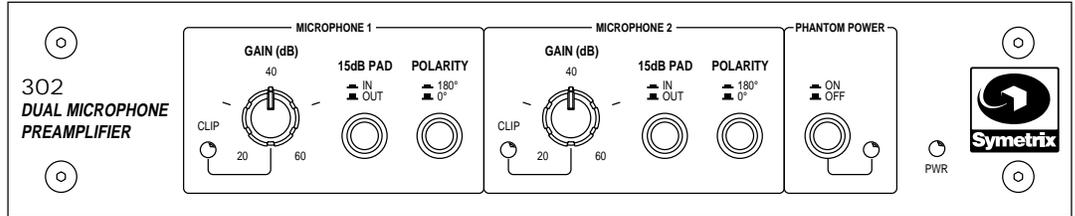
Caution: *Use only balanced microphones and cables!*

6. Connect Output 1 and Output 2 of the Symetrix 302 to the inputs of the destination device.
7. Plug the 302 into an AC outlet using the external power supply (the Symetrix PS-3 or PS-3E).

Caution: *Failure to connect the 302 to the proper AC mains voltage may cause fire and/or internal damage.*

8. Turn the Microphone 1 and Microphone 2 GAIN controls slowly clockwise until you achieve the desired output level from the 302.
9. Fast setup is now complete. Please refer to later chapters of this user's guide or the Symetrix Customer Service Department if you have additional questions.

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Front Panel

CLIP LED - The CLIP LED lights when the signal reaches 3dB below clipping. This LED should never be on solidly. It is usually all right if the CLIP LED flashes occasionally, on peaks in the program material. If you see the CLIP LED light, monitor your final signal destination to be sure that you are not creating distortion by running audio levels that are too hot.

GAIN control - Sets the gain of the preamplifier from a minimum of 20dB to a maximum of 60dB.

15dB PAD - Reduces the input signal by 15dB when the switch is set to the IN position.

POLARITY push-button - Inverts the phase of the signal being amplified when the switch is set to the IN position.

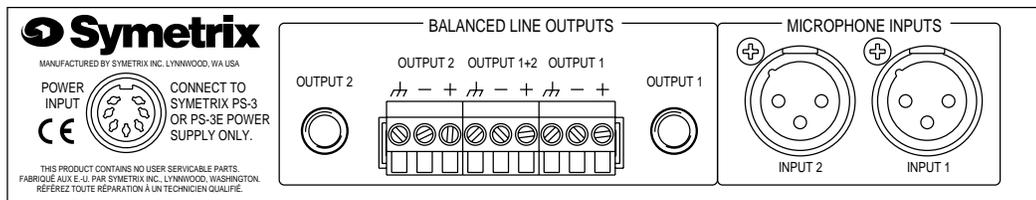
PHANTOM POWER - Applies a positive DC voltage to pins 2 and 3 of the XLR input jacks when the switch is set to the IN position. This provides the ability to power condenser microphones which require phantom power.

Caution: *When Phantom Power is engaged, always turn your monitoring speakers and headphones completely off before connecting or disconnecting any microphones to the 302. This is to avoid a loud pop which occurs due to the sudden change in voltage on XLR pins 2 & 3 when they are connected to, or disconnected from, Phantom Power. Such a loud pop can result in speaker and/or hearing damage.*

Caution: *Never connect an unbalanced microphone or mic cable to the input of the 302 when the Phantom Power is engaged. This will short out the Phantom Power.*

See page 8 for more Do's and Don'ts of Phantom Powering.

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Rear Panel

POWER INPUT - 7-pin DIN receptacle. Connect this to the 7-pin DIN plug of a Symetrix PS-3 or PS-3E **only**. 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.

Note The PS-3 is a 117V AC power supply, used to power a single unit. The PS-3E is a 230V AC power supply, used to power a single unit. The PS-3 and PS-3E are Symetrix accessories, available from your Symetrix dealer.

BALANCED LINE OUTPUTS

TRS jacks - 1/4-inch tip-ring-sleeve (TRS) phone jack, wired:

Tip= high(+), Ring=low(-) and Sleeve=ground

Use these jacks when you need 1/4-inch balanced or unbalanced outputs (Output 1 or Output 2). The nominal signal level here is +4 dBu. If you need an unbalanced output use a tip-ring-sleeve phone plug for best results and connect only to the tip and sleeve.

Note Connecting an unbalanced cable here will result in an output level that is 6dB lower than the output level achieved using a balanced cable.

Euroblock connectors - Low-profile balanced (+, - and ground) connectors, typically used in contractor sound installations. Use these jacks when you need Euroblock balanced outputs (Output 1, Output 2 or Output 1+2).

Note The signal at Output 1+2 is a combination of Output 1 and Output 2 signal, with the level balance between Output 1 and Output 2 determined by the front-panel GAIN and PAD settings.

MICROPHONE INPUTS

XLR inputs - Balanced XLR input jacks for Microphone 1 and Microphone 2.

(Pin 1 = ground, Pin 2 = +, Pin 3 = -)

These are *mic-level* inputs, designed to accept the balanced output from one microphone.

Caution: When Phantom Power is engaged, do not use unbalanced microphones or mic cables.

Caution: When Phantom Power is engaged, do not use switched mics which short Pin 2 and /or Pin 3 to ground.

Caution: When Phantom Power is engaged, always turn down monitors/headphones before connecting or disconnecting microphones.

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The Preamplifiers

The 302's ultra-low noise, low distortion mic preamps provide direct-coupled balanced low-Z inputs for optimum transient response and phase coherency. The positive and negative slew rates are symmetrical, ensuring sonic integrity.

Gain Controls, Clip LEDs, Pads

The 302's gain controls set the gain of the preamp circuitry. They operate like the trim controls found on most mixers. On a mixer the trim controls set the initial amount of amplification for each mic input. The faders govern how much of the amplified signal is allowed to pass into the rest of the system. Using a separate mic preamp such as the 302 assumes that somewhere downstream there will be a volume control that functions like the fader on a mixing console.

The 302 offers 40dB overall gain range, from 20 dB to 60dB, when used without the pad. Including the 15dB pad, the total range is 75dB, with a minimum overall gain of 5dB.

Any mic output level is easy to match with the 302's stepless gain control, regardless if it is the -60dBV to -80dBV levels common with ribbon mics or the near line level often delivered by transformerless condenser mics. Input signals as high as +14dBV can be handled by the 302. (The front panel clip LEDs fire at 3dB below clipping.)

Both source level and preamp gain are directly related to the noise floor, as well as to headroom at the output. The key to using the 302 at its optimum performance level is to:

1. Use the maximum allowable source level.
2. Use only as much gain as necessary.

The combination of the highest possible input levels with the lowest possible gain always results in minimum noise and maximum headroom.

The PAD push-buttons on the 302 reduce the input level at each channel by 15dB. Use these pads when a very high output mic is used or when the incoming signal is so hot that the clip indicator is lighted with the gain control at minimum. As previously mentioned, the 302 uses gain controls, not volume controls or faders. It is not necessary to use the pads to reduce input levels in order to get the gain controls to operate in some theoretical best position. The only best operating position for a gain control is the minimum gain that delivers the required output level.

In addition to their more common use in reducing input signal strength, the pads can also give the user a wider gain control-adjustment range for more accurate channel-to-channel level matching. For very close level matching, the resolution of the gain controls at the very lowest end of their range may be too coarse if the pads are not engaged. There is a trade-off here, however: When using the pads the apparent noise floor is higher.

Polarity Push-buttons

Both channels include a polarity push-button. In the normal out position, signal source polarity is maintained to the outputs. In the in position, the wiring from the XLR connector pins 2 and 3 is reversed. This allows for correction of miswired cables, and for polarity matching of various manufacturers' microphones.

Powering for Condenser Microphones

All condenser microphones require some kind of electrical power. This power may be supplied by internal batteries, an external power supply that is connected to the microphone by a special multiwire cable, or through a standard microphone cable by phantom or T system powering. Phantom powering and T system powering are incompatible systems.

Phantom power derives its name from its invisibility to audio signals, even though the microphone cable carries both phantom power (as direct current) and audio signals (as alternating current). Specifically, the term phantom power means a positive DC voltage sent to the microphone on both audio leads, through current-limiting resistors which also serve to isolate the audio leads



from one another. The front panel phantom power button applies phantom power via pins 2 and 3 of the mic input XLR connectors.

The phantom power technique uses the two signal conductors in a standard balanced mic cable to deliver the power required by the microphone, eliminating the need for internal batteries or an external power supply. Because the voltage is applied equally to both sides of a floating balanced circuit, no current flows through the microphone's transformer, or through the microphone element itself.

It is often said that the sound of some dynamic microphones is affected by phantom power and that ribbon mics cannot be plugged into an input that is phantom powered. For the most part, these are myths that grew out of difficulties created by other problems in the mic circuit:

1. When XLR connectors are mated there is no guarantee that both pins 2 and 3 will make contact at exactly the same time. It is possible that a damaging current could flow through the mic for a brief moment under these conditions. However, this is a connector problem, not a problem with the mic itself or phantom power in general.
2. In the past, it was a common practice to ground the center tap of the mic's output transformer. However, this practice should be avoided in phantom powered systems. The solution: Locate the center tap and cut the connection between it and pin 1 of the XLR connector.
3. If the mic's output transformer has developed leakage, the microphone may become noisy when phantom power is turned on. Crackling, sputtering or even humming noises may occur. The leakage, not the power, is the problem. The solutions are:
 - A. Turn off the phantom power.
 - B. Put a 1:1 low-impedance transformer between the mic and the input.
 - C. Get the mic repaired.

The dominant remote powering system in use today is the phantom power system, which is compatible with both condenser and non-condenser microphones (dynamics, ribbons, etc.). If your microphone's specifications sheet claims that it requires phantom power, the Symetrix 302 can power it.

The technical requirements for operation and/or compatibility are:

1. The microphone must have a balanced, low-impedance output.
2. The balanced output must be floating with respect to ground. If there is a center tap, it must not be grounded.

In a nutshell, here are the do's and don'ts of phantom powering:

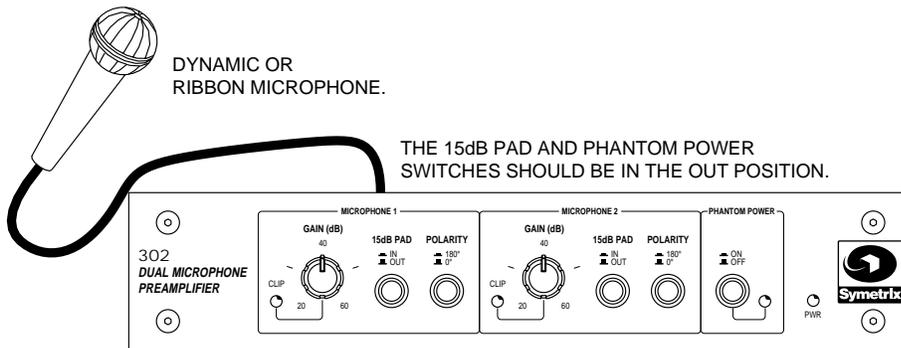
<p>DO: Verify that your microphone can be phantom powered (if it is a condenser mic).</p> <p>Ensure that your microphone's output is low impedance, balanced and floating. This is especially important for ribbon mics.</p> <p>Turn the phantom power off when connecting vintage ribbon microphones.</p> <p>Mute your monitor speakers or headphones when turning the phantom power on or off. If you don't, there will be a loud, nasty pop.</p> <p>Mute your monitor speakers or headphones whenever you plug in or unplug a phantom powered microphone. If you don't, there will be a loud, nasty pop.</p>
<p>DON'T: Plug in an A-B powered microphone without a suitable adapter.</p> <p>Worry about your dynamic or ribbon microphones, as long as they are wired so that the output is balanced and floating.</p> <p>Use the microphone input for line-level sources, especially those that are transformerless.</p> <p>Use the microphone input with unbalanced sources. Use a direct box to feed an unbalanced source into the microphone input.</p> <p>Worry about your tube condenser mics. They are compatible (although they cannot be phantom powered).</p>

Dynamic or Ribbon Microphone

When using a dynamic or ribbon microphone with the Symetrix 302, use the following control and switch settings:

GAIN:	Completely counter-clockwise
PAD:	Out
POLARITY:	Out
PHANTOMPOWER:	Out

Slowly turn the GAIN control clockwise until the desired output level from the 302 is achieved. If needed, engage the PAD and POLARITY switches.



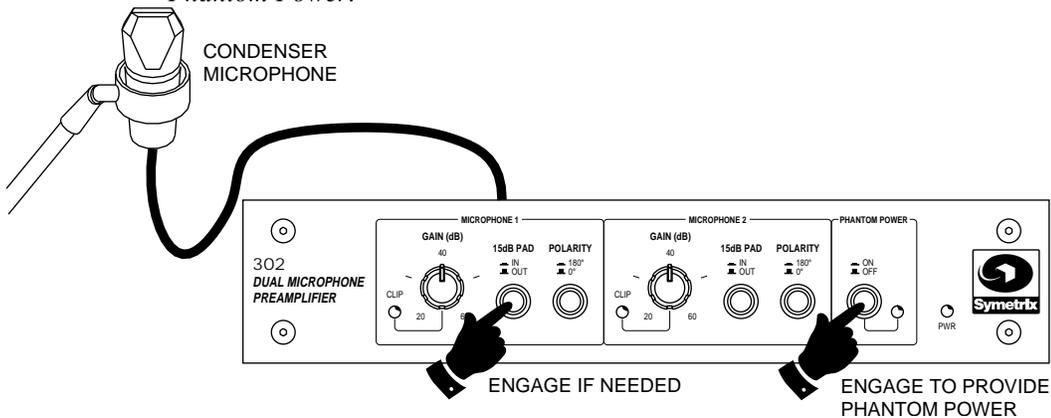
Condenser Microphone

When using a condenser microphone that requires Phantom Power with the Symetrix 302, use the following control and switch settings:

GAIN:	Completely counter-clockwise
PAD:	Out
POLARITY:	Out
PHANTOMPOWER:	In

Slowly turn the GAIN control clockwise until the desired output level from the 302 is achieved. Condenser mics typically have a higher output than dynamic or ribbon mics, so the final GAIN setting will typically be lower for a condenser mic than for a dynamic or ribbon mic. If needed, engage the PAD and POLARITY switches.

Caution: If your condenser microphone uses *T* system powering, do not engage the Phantom Power.



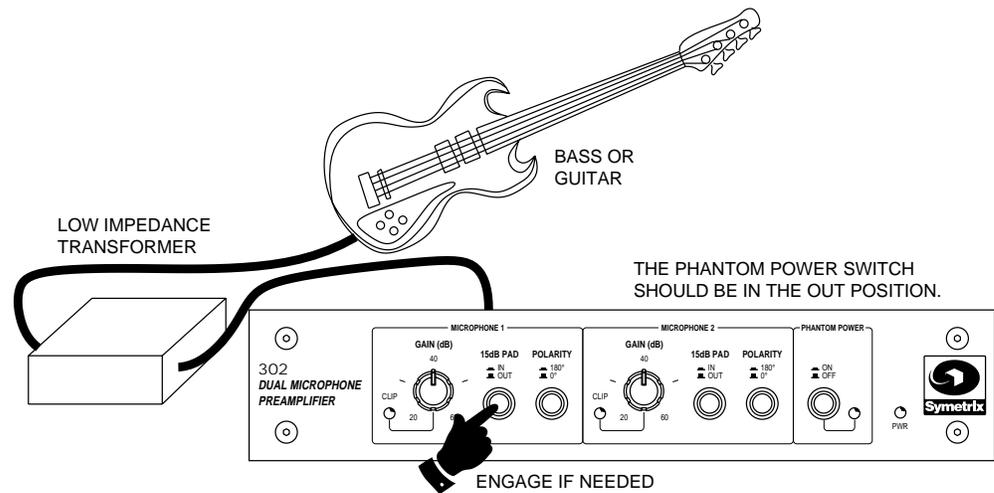
Guitar or Bass Pickups

The typical output level of guitar or bass pickups falls about halfway between mic level and line level. Because the Symetrix 302 is designed to accept the output of the hottest condenser microphone, the pickup output (**not the amplifier output!**) of a guitar or bass can generally be connected to the input of the 302 *through a 1:1 low-impedance transformer*, without overloading the input of the 302. *Never connect the guitar or bass directly to the mic input of the 302.* The transformer connected between the guitar/bass and the 302 protects the circuitry of the guitar/bass from Phantom Power, and it protects the 302's Phantom Power from short-circuiting. The transformer also balances the unbalanced output of the guitar/bass before it reaches the input of the 302.

When using a guitar or bass as the input to the Symetrix 302, use the following control and switch settings:

GAIN:	Completely counter-clockwise
PAD:	Out
POLARITY:	Out
PHANTOM POWER:	Out

Slowly turn the GAIN control clockwise until the desired output level from the 302 is achieved. Engage the PAD and POLARITY switches if necessary.



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Troubleshooting Chart

<u>SYMPTOM</u>	<u>PROBABLE CAUSE</u>
No output signal	Check cables and connections. Is a microphone connected to the 302's input, and is the 302's output driving a line-level input? Check for AC power presence. Make sure that your microphone and mic cable are balanced. If you are using a mic or mic cable with a switch, is the switch in the on position? If you are using a condenser microphone which requires Phantom Power, did you turn the Phantom Power on?
Hum or buzz in output	Check your cables. Ground loop: check related system equipment grounding. Are all system components on the same AC ground? Make sure that your microphone and mic cable are balanced.
Distortion	Check the level of the input signal on the 302's LED display. Is the CLIP light on all the time? If so, reduce the incoming signal level by turning the INPUT level counterclockwise. Is the incoming signal already distorted? Make sure that your microphone is not broken, and that the mic is not distorting.
Noise (hiss)	Check input signal level. The input signal may be too low. If so, boost the incoming signal (if possible) or move your mic closer to the signal source. Is the input signal already noisy? Verify that all system components are on the same AC ground.
Noise (crackle)	Check for broken mics and/or bad cables.
POWERLED not on	Is the unit plugged in? Is the AC outlet OK?
CLIPLED on constantly	Make sure that you are feeding the 302 a mic-level signal, not line-level. Turn the GAIN control counter-clockwise and/or engage the mic pad. If the CLIP LED is still on, reduce the level of signal that you are sending to the input of the 302. Make sure that you are using the correct power supply for your location. The PS-3 is for locales such as the United States, which use 117V AC mains power, and the PS-3E is for locales, such as Europe, that use 230V AC mains power.

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Architects and Engineers Specifications

The microphone preamp shall be a high-performance, dual channel, unit that is of a single rack space wide and one rack space high.

The unit shall provide two independent channels of pre-amplification designed to boost nominally mic level signals to line level. Each channel shall have a gain control that is continuously variable from 20dB to 60dB of gain, a 15dB input pad, a polarity reversal switch, and an LED indicator that lights in the presence of signal peaks. There shall also be a front panel pushbutton switch to engage phantom power, and an LED that indicates the presence of AC power.

The following connections shall be available on the rear panel. Each channel shall have an XLR3 mic input (wired pin 1 = ground, pin 2 = +, pin 3 = -), a TRS line level output, and a euroblock style removable terminal strip line level output. There shall also be a mix output that provides a sum of channels 1 and 2 via a euroblock style removable terminal strip.

The microphone preamp shall be the Symetrix Inc. model 302 Dual Microphone Preamplifier.

Specifications

Input/Output		Connections	
Input Type	Low Z Balanced, Transformerless	Input	XLR
Maximum Input Level	+14 dBV (with pad "In")	Output	TRS jacks, Euroblock
Maximum Output Level	+24 dBu Balanced, 10k Ohm load	Power In	7 pin DIN
	+22 dBu Balanced, 600 Ohm load		
Input Impedance	>3k Ohms	Physical	
Output Impedance	300 Ohms Balanced	Size (hwd)	1.75 x 8.5 x 6.5 in., 4.445 x 21.59 x 15.875 cm.
	150 Ohms Unbalanced	Shipping Weight	4.5 lbs
Performance Data		Electrical	
Clip Indicators	red LEDs, fire 3dB below clipping	Power Requirements	117V AC nominal, 95-130V AC, 50 to 60 Hz
Frequency Response	20Hz to 20kHz, +0, -1dB		230V AC nominal, 165-255V AC, 50Hz
THD+Noise	.007% (1kHz, 0dBu, 600 Ohms out)		
	.01% (1kHz, +22dBu, 600 Ohms out)		
Signal to Noise Ratio	95 dB (-50 dBV, 150 Ohms in)		
EIN	<-128 dBu (150 Ohms source, 60 dB gain 22 kHz bandwidth)		
Minimum Gain	20dB		
Maximum Gain	60dB		

*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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302 Limited Warranty

Symetrix, Inc. expressly warrants that the product will be free from defects in material and workmanship for (18) months. 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 (18) months from date of shipment, 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 retailer'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.

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 incident

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.

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.

tal 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 302

If you have determined that your 302 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) 778-7728 or email: tech@symetrixaudio.com

In-warranty Repairs

To get your 302 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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Declaration of Conformity

We, **Symetrix Incorporated**,
6408 216th St. SW, Mountlake Terrace, Washington, USA,
declare under our sole responsibility that the product:

302 Dual Microphone Preamplifier

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 50081-1

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

EN 50082-1

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

The technical construction file is maintained at:

Symetrix, Inc.

6408 216th St. SW
Mountlake Terrace, WA, 98043
USA

The authorized representative located within the European Community is:

World Marketing Associates

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