

Symetrix



A-220

STEREO AMPLIFIER

OPERATING

MANUAL

VERSION 3.1

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FOREWORD

This manual contains all the information you need to operate the A-220 Stereo Amplifier. There are seven chapters. The individual sections of each chapter are labeled first with the chapter number, then with the section number. For example, the first section of the first chapter is labeled 1.1, and the third section of the fourth chapter is labeled 4.3, and so on. Use the numbers referenced in the Table of Contents to quickly locate the information you need.

Several different notation conventions are used to indicate various facets of the A-220's features:

SMALL CAPS indicate a marked feature on the A-220, like the **LEVEL 1** control, or the **POWER** switch.

Boldface and *italics* are used for emphasis. Bold type carries more weight than italic type.

Some of the text in this manual is set apart by one of the headings **NOTE:**, **CAUTION** or **WARNING!**

NOTE: is used to convey useful information that's included to make certain functions more obvious, and to supply extra information about processes, techniques, connectors etc.

CAUTION indicates a potential danger to the A-220 or associated equipment. An example of a **CAUTION** can be found below.

WARNING! indicates a potential danger to the user. An example of a warning can be found on page 8.

CAUTION

Save the original box, packing material, and purchase receipt. If ever it's necessary to ship your unit it must be packaged in its original box to prevent damage, and the receipt may be required as proof of purchase for warranty repairs. (See Section 6.)

Table of Contents

	Page
1. Introduction	1
2. Using the A-220	2
2.1 Getting Started.....	2
2.2 Block Diagram.....	2
2.3 A-220 Rear Panel.....	3
2.4 A-220 Front Panel.....	4
2.5 Signal Levels.....	5
2.6 Installation.....	5
3. Setup Diagrams	6
3.1 - Input/output connections for 2-channel or stereo operation.....	6
3.2 - Control and switch settings for stereo operation.....	6
3.3 - Input/output connections for mono-bridged operation.....	6
3.4 - Control and switch settings for mono-bridged operation.....	6
4. Specifications	7
5. Troubleshooting Guide	8
5.1 Troubleshooting Sequence.....	8
5.2 Troubleshooting Table.....	8
6. Service Information/Schematics	9
6.1 In-Warranty Repairs.....	9
6.2 Out-of-Warranty Repairs.....	9
6.3 Schematic Diagram, Parts Layout.....	10-11
APPENDIX A - Using Electronically Balanced Inputs	12
WARRANTY STATEMENT	13

1. Introduction

The Model A-220 Stereo Amplifier is a compact, high performance power amplifier configured for use in professional and commercial audio systems. The A-220 may be operated as a two channel amplifier with 20 watts per-channel, or as a single channel amplifier capable of 40 watts (in bridged mode). The amplifier is intended for use with near field monitors, small speakers used for "radio reference" and audio for video, and with headphones. In stereo mode the minimum load is 4-ohms, in mono-bridged mode the minimum load is 8-ohms.

For convenience, the A-220 is equipped with both 1/4" and XLR-3 input connectors, which will accept either balanced or unbalanced input signals. Full power output can be produced with an unbalanced .5 volt (-6dBv) input signal, or a 1 volt (0dBv) balanced input signal. Since the A-220 can be used as a true stereo amplifier, as a 2-channel amplifier, or as a single-channel mono-bridged amplifier, the input level control configuration may be switched to reflect the usage. For stereo, use the DUAL TRACKING position, for 2-channel use the INDEPENDENT position. See Section 2 for more information on the function of the INPUT LEVEL switch.

CAUTION

All power amplifiers generate heat. Be sure adequate ventilation is provided around the amplifier, and that the slots on both the top and bottom panels have free air flow. When the unit is rack mounted, it is recommended that the spaces above and below the amplifier be left empty (or covered with perf metal) for maximum air flow. For table-top use, apply the adhesive rubber feet supplied with the unit to allow air to flow into the bottom panel vent slots.

2. Using the A-220

"When all else fails, read the directions."

2.1 Getting Started

This section of the manual provides the information you need about the A-220's controls, switches, inputs and outputs. For fast setup information, please see Section 3, Setup Diagrams.

2.2 Block Diagram

The functional block diagram in Figure 2.1 illustrates the signal flow into, inside of, and out of the A-220. The levels and impedances at the inputs and outputs are designed to match all common line level systems (see 2.5 - Signal Levels). The input connectors and speaker terminations are on the rear panel, all switches and controls are on the rear panel. The stereo headphone jack is on the front panel.

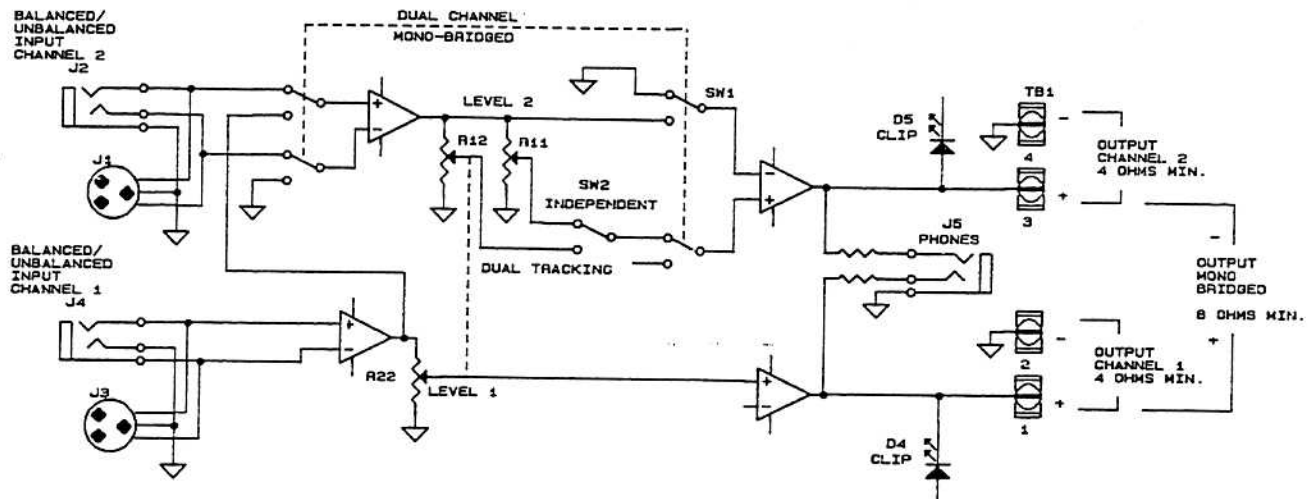
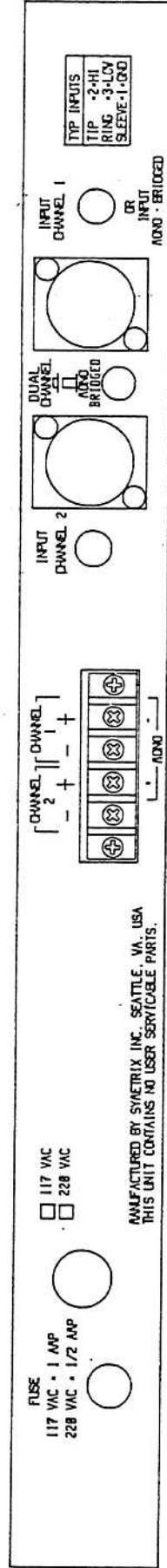


Figure 2.1 - A-220 Block Diagram

2.3 A-220 Rear Panel

■ **INPUTS 1 & 2 (1/4")** - TRS (tip-ring-sleeve) connector accepts balanced or unbalanced input signals. Input impedance is $\geq 10k$ ohms. Tip = + (high), Ring = - (low), Sleeve = ground. Maximum input level = +18dBv. Input sensitivity (for full power output) = 475mv (-6dBv) 2-channel, or 350mv (-9dBv) mono-bridged, RFI protected.

■ **OUTPUTS CHANNEL 1 & CHANNEL 2** - #6 spade lug terminals for speaker connections. See Setup Diagrams on page 6 for specific 2-channel and mono-bridged speaker wiring details.



■ **FUSE** - Fuseholder accepts only 3AG type fuses. Use slo-blo fuses of the correct value, as shown on the rear panel above the fuseholder.

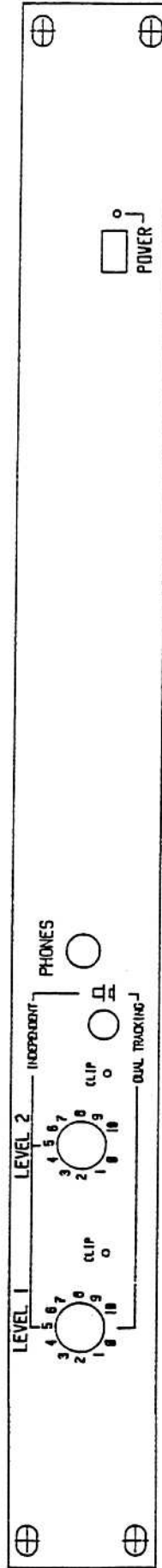
■ **INPUTS 1 & 2 (XLR)** - 3-pin accepts balanced or unbalanced input signals. Input impedance is $> 10k$ ohms. Tip = + (high), Ring = - (low), Sleeve = ground. Maximum input level = +18dBv. Input sensitivity (for full power output) = 475mv (-6dBv) 2-channel, or 350mv (-9dBv) mono-bridged. RFI protected.

■ **DUAL CHANNEL/MONO-BRIDGED** - Switches the amplifier between 2-channel and mono-bridged operation. See Setup Diagrams on page 6 for 2-channel and mono-bridged speaker wiring details.

2.4 A-220 Front Panel

■ LEVEL 1 - Adjusts the signal strength only for amplifier Channel 1 when the input selector switch is "in" (INDEPENDENT). Adjusts *both* channels when the input selector switch is "out" (DUAL TRACKING).

■ LEVEL 2 - Adjusts the signal strength for amplifier Channel 2 when the input selector switch is "in" (INDEPENDENT). However, this control is *out of circuit* in when the Input selector switch is set for Dual Tracking, and when the amplifier is operated in the Mono Bridged mode.



■ PHONES - Amplifier output for stereo headphones of any impedance. *Do not use mono headphones or 2-conductor plugs in this jack. Amplifier malfunction will result.*

■ POWER - Switches AC mains power on/off. Red LED indicates power "on" condition.

2.5 Signal Levels

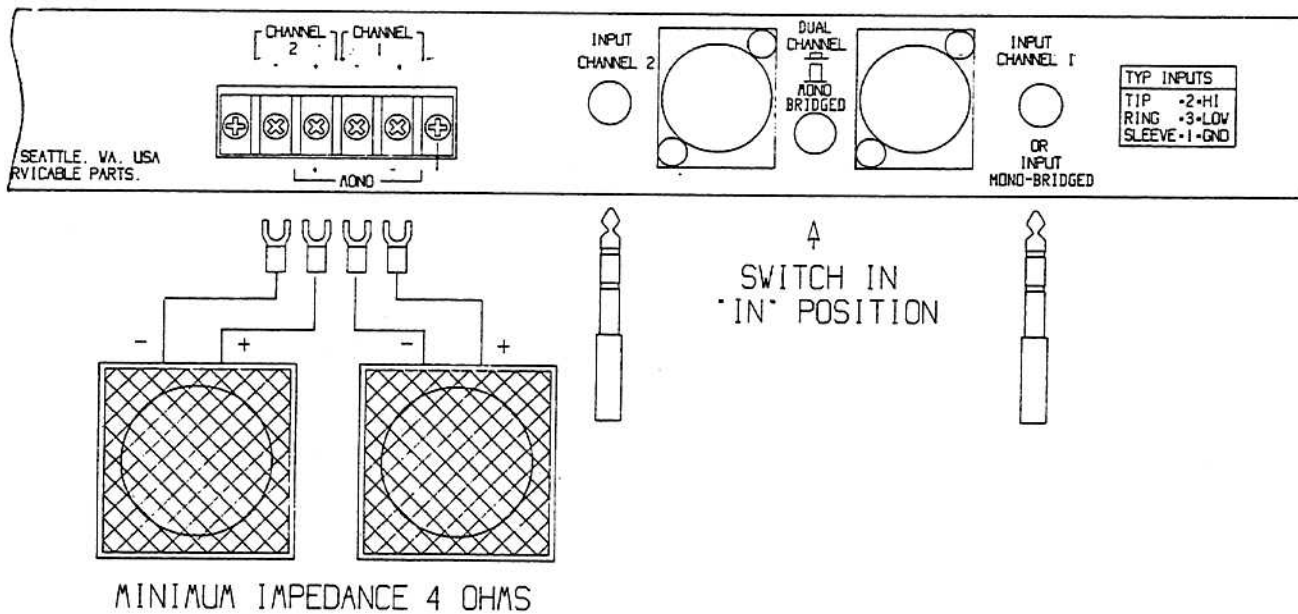
The A-220 is designed to be used post-preamp, at a place in the system where the signals have already been amplified to line levels. However it should be noted that "line level" is a generic term that's been used at one time or another to describe signals ranging anywhere from -20dBm to +20dBm. As a result there's really no way for us to predict what the actual operating levels in your system will be. The A-220's input controls are attenuators, so they will only reduce the signal strength that is delivered to the amplifier's power stages. The specified input sensitivity of the amp is .5 volt (-6dBv) unbalanced, or 1 volt (0dBv) balanced, *with the input controls fully clockwise.*

The overall level in any signal chain is determined to a large extent by the transient content of the program material. Transients, or very short duration signals, are not accurately indicated by VU meters. As a result, the peak reading CLIP LED's on the A-220 may indicate that transients are above the amplifier's maximum output capacity, even though VU meters show normal levels. If clipping is indicated, reduce input levels, or back off the amplifier's input level controls.

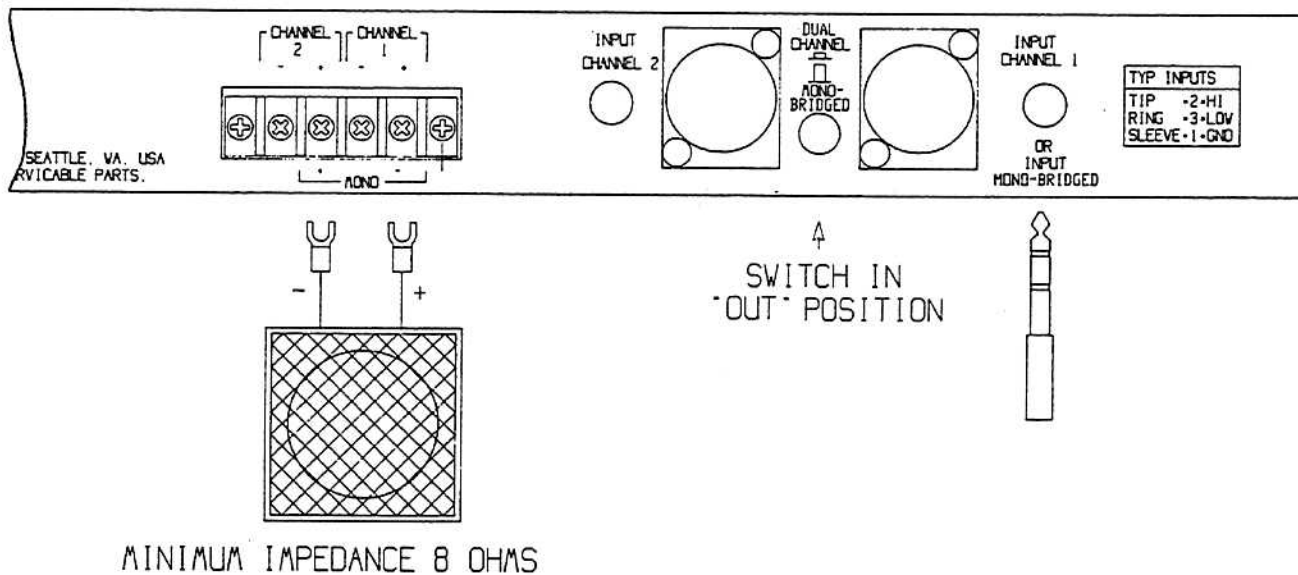
2.6 Installation

The A-220 is designed for mounting in a standard 19" rack, and requires 1 rack space (1-3/4"). To minimize the possibility of induced hum, mount the unit as far as possible from high gain devices, or any other unit that may be susceptible to induced hum (like mic preamps).

3. Setup Diagrams



3.1 - 2-channel, or stereo, operation.



3.2 - Mono-bridged operation.

4. Specifications

Description	two channel, stereo, or single-channel mono-bridged power amplifier
Outputs	
Maximum Power..... driven	20 watts/channel into 8 ohms, both channels 40 watts into 8 ohms, mono-bridged mode 20 watts/channel into 4 ohms, both channels
Speaker Connectors	#6 spade lug barrier strip
Headphone output (front panel)	1/4" stereo
Dynamic Headroom	2.5dB stereo, 5dB mono 2 cycle, 1kHz tone burst
Distortion and Noise	
Measured in 30kHz bandwidth.....	.05%, 20Hz to 20kHz .01% at 1kHz
Input Sensitivity (for full output)5V (-6dBv) balanced or unbalanced (with unused input leg grounded for unbalanced inputs)
Inputs	
Type.....	Balanced, transformerless (may be used unbalanced)
Impedance	> 10k ohms
Maximum Level.....	+ 18dBv
Connectors.....	1/4" TRS, and 3-pin XLR
Clipping Indicator	CLIP LED fires at the onset of clipping
Signal to Noise Ratio	
400-20kHz NBW.....	> 99dB below full output
20Hz-20kHz NBW.....	> 93dB below full output
Frequency Response	20Hz to 20kHz +0dB, -1dB
Power Requirements	115VAC 60Hz, standard 230VAC 50Hz, upon request
Physical	
Size	1.75 x 19 x 8 in. (1U 19" rack mount) (4.45 x 48.3 x 20.3 cm)
Shipping Weight.....	9 lbs. (4.2kg)

The Model A-220 meets the requirements of Deutsche Bundespost. Specifications subject to change without notice.

5. Troubleshooting Guide

5.1 Troubleshooting Sequence

Make the following tests one at a time to isolate a problem you think may be caused by the A-220 (or any other unit).

1. Make sure the unit is plugged in, and that the POWER LED is lighted.
2. Check input, output and sidechain wires and connectors carefully. MOST MALFUNCTIONS ARE WIRE OR CONNECTOR RELATED.
3. Plug headphones into the front panel output to see if there is signal present. If you cannot hear the signal at the unit's output, work your way from the end of the signal chain, back to the beginning of the signal chain until you *can* hear signal. (If you get all the way back to the very beginning of the signal chain without hearing anything, get competent help.) If you hear clean signal at the input to the A-220, the trouble is with the power amp or its associated wiring.

WARNING!

ELECTROCUTION HAZARD! NEVER CHECK THE REAR PANEL FUSE WITH THE A-220 CONNECTED TO THE AC MAINS POWER. ALWAYS UNPLUG THE POWER CORD BEFORE CHECKING FUSES.

5.2 Troubleshooting Table

Use the following table to analyze difficulties before calling Symetrix or a technician for help. You may be surprised at how easy it is to solve problems, and you may save us both some time and money. Thanks.

Problem	What to check - what to do
■ No sound at output	■ Is the unit on? ■ Check the rear panel fuse. Replace only with 1 amp 3AG (DO NOT use "Slo-Blo" fuses in the rear panel fuse holder.)
■ Low or distorted output	■ Check the inputs and outputs and connectors for shorts. ■ Is something patched into the signal chain before the A-220? ■ Is the A-220 powered up?
■ Distortion or crackling	■ Are the CLIP LED's flashing? Reduce input levels. ■ Check level and signal at input, and check sound at output: Is it too high? Is it distorted? ■ Reduce input levels, check for shorts.

6. Service Information/Schematics

Symetrix will service any of its products, no matter when it was manufactured or what condition it's in. However, no goods will be accepted without a Return Authorization number. If we don't know it's coming we won't be prepared to make the necessary repairs, so we won't accept it.

Before sending anything to Symetrix, call for an R/A number. Just ask, we'll gladly give you one. Call (206)282-2555 weekdays, 8 AM to 4 PM Pacific Time, or TELEX 703282 SYMETRIX UD.

6.1 In-Warranty Repairs

The A-220 Stereo Amplifier is covered by a limited warranty for a period of one year from the date of purchase. The Limited Warranty statement supplied with your unit spells out all the legal details, and the generalities that follow are not intended modify that warranty statement.

To get your unit fixed:

1. Call for an R/A number.
2. Pack the unit in its original packaging materials.
3. Put the R/A number on the outside of the box.
4. Ship it to Symetrix freight pre-paid.

Just do those four things, and repairs made in-warranty will cost you only the one-way freight fee. We'll pre-pay the return freight.

However, if you send it to us in some kind of flimsy non-Symetrix packaging we'll have to charge you for proper shipping materials. We won't return the unit in anything but the original Symetrix packaging. And of course, if the problem turns out to be operator inflicted, you'll have to pay for both parts and labor. In the event there is a charge, we'll still pay for the return freight, but all other charges will be C.O.D. (and we do mean CASH on delivery).

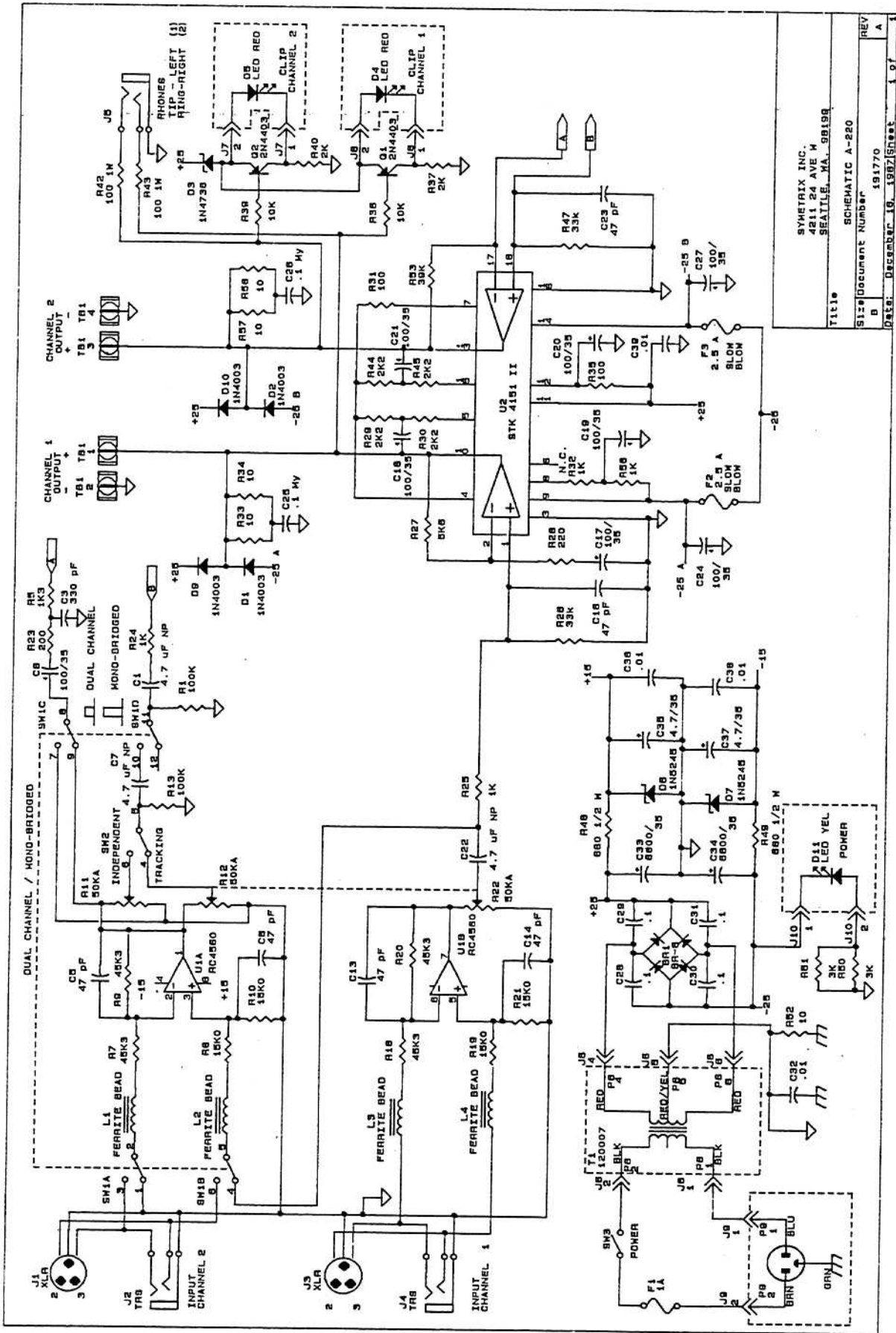
6.2 Out-of-Warranty Repairs

We'll gladly service any Symetrix product, any time. If the warranty period is passed you'll be billed for all necessary parts, labor, packaging materials, as well as any applicable freight charges.

Remember, you must call for an R/A number before you send the unit to Symetrix.

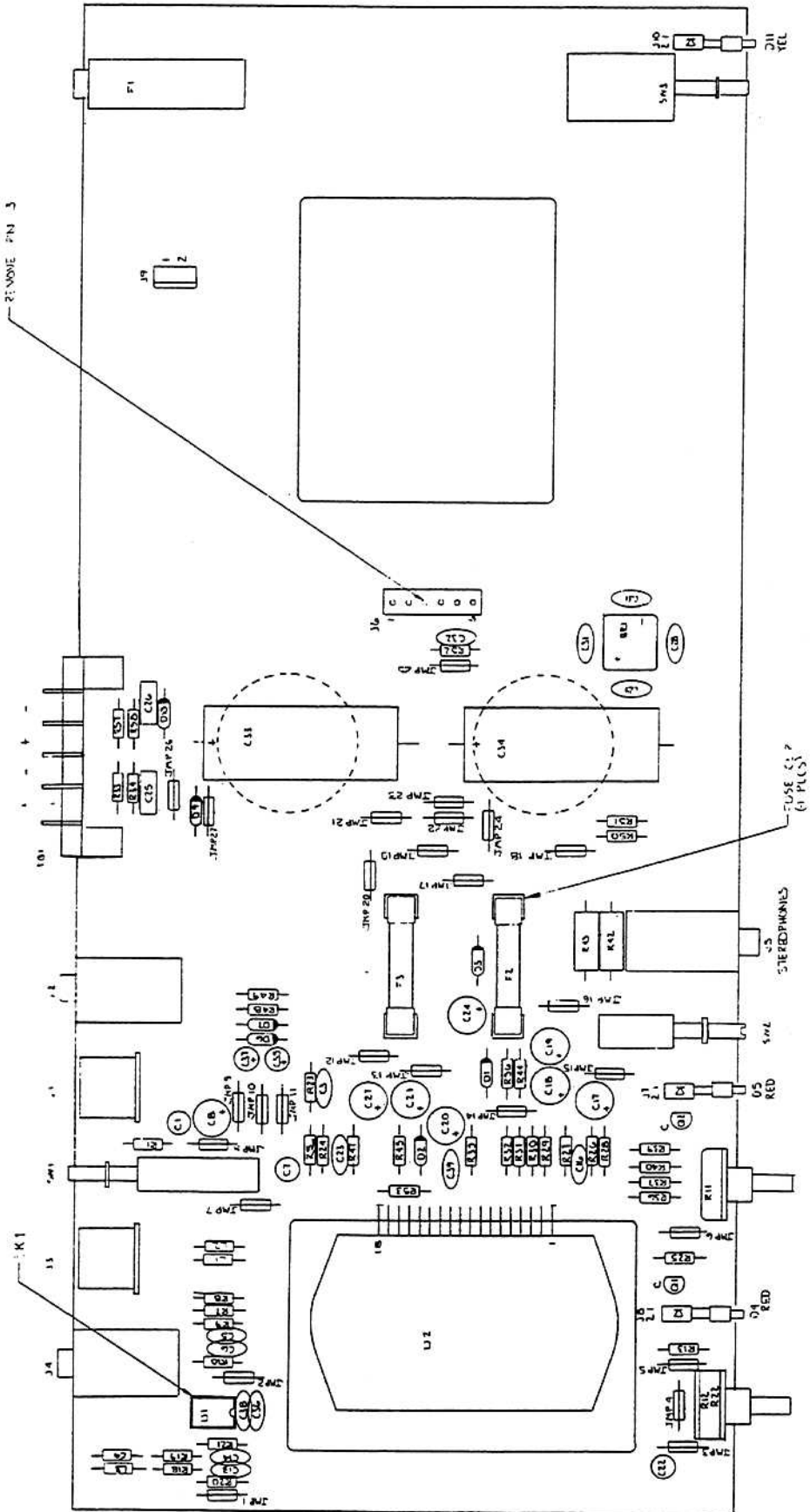
6.3 Schematic Diagram, Parts Layout (pages 11-12)

The schematic diagrams are to be used by qualified service technicians only. There are no user serviceable parts in the A-220. No license to use this information for anything other than normal repairs is implied or given by the inclusion of Symetrix proprietary information in the schematic diagrams. The diagrams are copyrighted.



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Date: December 19, 1982/Sheet 1 of 1



APPENDIX A - Using Electronically Balanced Inputs

Electronically balanced inputs must sometimes be treated differently from transformer coupled inputs.

Balanced output to A-220 input:

When the A-220 is used with equipment also equipped with balanced outputs (of any type):

- Be sure polarities are matched (if desired), then connect:

hi (+) to hi (+)
low (-) to low (-)
ground to ground

The polarity may be changed by reversing the (+) and (-) connections.

Unbalanced output to A-220 input:

When the A-220 is used with equipment having unbalanced outputs:

- To use the A-220's 1/4" TRS inputs with unbalanced outputs, connect:

tip to tip (+)
ring and sleeve to ground

The terminations described above will be the normally result when a 1/4" TS (2-conductor) plug is inserted into the A-220's 1/4" TRS (3-conductor) jack.

The polarity may be changed by connecting the incoming tip to the A-220's ring, and grounding the A-220's tip.

- To use the A-220's XLR inputs with unbalanced outputs, connect:

pin 2 to hi or tip (+)
pin 3 to ground or sleeve
pin 1 to ground or sleeve

The polarity may be changed by connecting the tip to pin 3 and grounding pin 1.

NOTE:

Input sensitivity will be reduced 6dB from .5V (or -6dBv) to 1V (or 0dBv) if the unused input leg is not grounded when the amplifier is driven from an unbalanced source.

LIMITED WARRANTY

The Symetrix A-220 is designed and manufactured for use in professional and studio audio systems. Symetrix, Inc., warrants that the A-220 manufactured by Symetrix, when properly installed, used and maintained in accordance with instructions contained in the manufacturer's operator's manual, will perform according to the specifications set forth in the operator's manual.

Symetrix expressly warrants that A-220 will be free from defects in material and workmanship for one (1) year. Symetrix' obligations under this warranty will be limited to repairing and replacing, at Symetrix' option, the part or parts of the A-220 which prove defective in material or workmanship within one (1) year from the 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 and Buyer will prepay all freight charges to return any products 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.

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The Symetrix A-220 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, limitations 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, Inc. 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 performance on behalf of Symetrix.

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

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