

Symetrix
SX204
Headphone Amplifier

Owner's Manual

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Batteries not included.
This manual will not play in reverse.
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1. Introduction

The Model SX204 Headphone Amplifier is a 1-in 4-out amplifier designed to drive multiple headphones of any impedance. Symetrix' proprietary high voltage converter technology gives the SX204 the ability to drive high impedance headphones with the equivalent output *voltage* of a much larger power amplifier, yet provides more than ample *current* for low impedance phones. The four stereo outputs automatically adjust output power to match the load impedance.

Controls provided are input level, output level for each individual amplifier, and a stereo/mono switch.

The STEREO/MONO switch allows the amplifier to be used several ways. As a "normal" stereo amplifier (with four outputs), the left and right inputs are used for stereo signals, which feed the left and right outputs. Switching to mono with a stereo input provides a quick check of the mono compatibility of a stereo mix.

As a mono amplifier, one signal fed to either input will feed both outputs. Also in mono mode, when two *different* mono signals are fed to the left and right inputs, they will be combined to feed both the left and right outputs.

The inputs are electronically balanced, but will operate normally in an unbalanced configuration when 2-conductor 1/4" plugs are inserted. The outputs are 1/4" stereo connectors.

2. Using the SX204

CAUTION: Do not use any AC adapter other than the Symetrix PS-2. Do not short the outputs. Do not stick your finger in a light socket.
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2.1 Impedance, Sensitivity, Loudness

Loudness is directly related to the impedance and sensitivity of the headphones. Impedance determines how much power the headphones will draw, while sensitivity indicates how much of the electrical signal delivered to the headphones is converted into sound.

Because low impedance headphones draw more power from the amplifier they will sound louder, at the same control settings, than high impedance headphones. Also, headphones of higher sensitivity will sound louder than those of lower sensitivity. Check the manufacturer's spec sheet for impedance and sensitivity information.

Proprietary high voltage converter technology allows the SX204 to drive even high impedance head headphones to maximum levels, because the amplifiers are capable of very high output voltage swing. However, to get a loudness equivalent to that of low impedance headphones, the controls will have to be set much higher with high impedance headphones. This is normal.

If low and high impedance headphones are combined on the same channel, the low impedance headphones will be much louder. As a result, when a combination of high impedance and low impedance headphones is used, only those of like impedance should be used on the same channel. This allows each listener to properly adjust loudness, without regard to the impedance and sensitivity of the other headphones.

2.2 Maximum Amplifier Load

The minimum operating impedance, or maximum load, for each output of the SX204 is 8 ohms. Use as many pairs of headphones as desired, as long as the total combined impedance (per output) does not fall below 8 ohms. Table 2.1 shows how many headphones of various impedances may be used with *each* output of the SX204.

Table 2.1 - Combined Impedance Values (approx. 8:)

Impedance of Headphones	Maximum Number/Channel
8 (see note 1)	1
16	2
32	4
100	10
200	20
400	40
600	60

Note 1: The quantities given above reflect usage with typical wide-range musical signals. If you are driving low-impedance phones (16-ohms or lower *actual* impedance), and you intend to drive them to the brink of amplifier clipping, then you should revise the number of headphones possible (per SX204) to 2 8-ohm phones or 4 16-ohm phones (for the 8-ohm case, you'll have two amplifier channels that aren't doing anything). It is OK to use any remaining amplifier channels with higher impedance phones (50 ohms or higher).

For maximum output with all channels driven, try to restrict the lowest combined load impedance to 50 ohms per channel. Lower impedance loads simply reduce the maximum output possible.

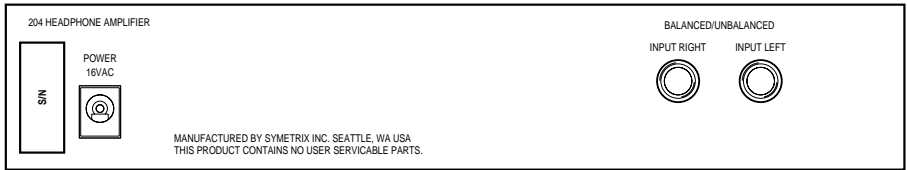
Note 2: Many headphones are spec'd as being suitable for eight-ohm outputs. They are, but this does not mean that their actual impedance is 8-ohms. In most cases, the actual impedance is substantially higher. This is good (rather than bad). For whatever it's worth, most decent phones have actual impedances ranging from 50 ohms and up.

Note 3. When multiple headphones are required with each output, use headphone type "Y" cords, or a "breakout box." A breakout box may have as many paralleled 1/4" stereo jacks a necessary, as long as the numbers in Table 2.1 are not exceeded.

Breakout boxes are available from:

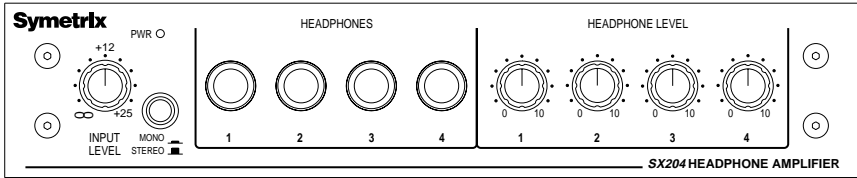
ProCo	800-253-7360
Sescom	702-384-0993
Whirlwind	800-772-9997

3. Rear Panel



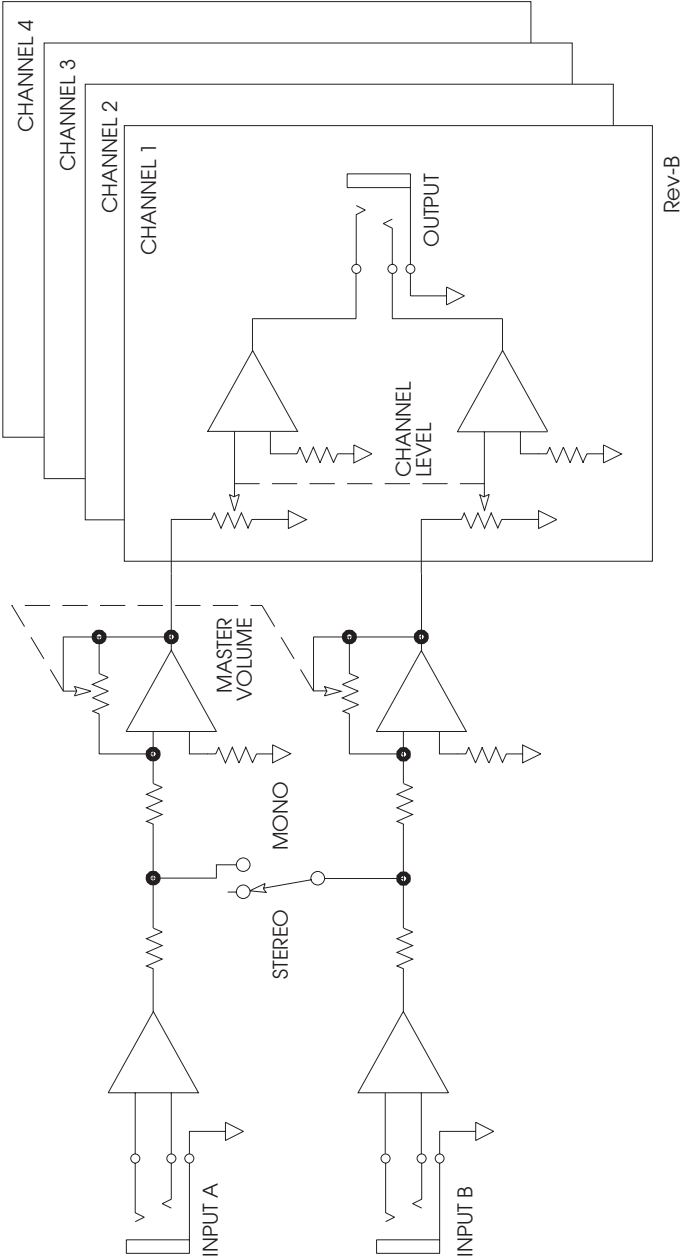
Feature	Description
Power	5mm coaxial jack for power input.; Use only the Symetrix PS 2 16 volt AC power supply. Other similar looking "power adapters" may damage the SX204. Accepts plugs with 2.5mm center pin (Switchcraft 760).
Input A	(Left channel) 3 conductor 1/4" jack for line level balanced or unbalanced input signals. Tip = high (+), Ring = low (-), Sleeve = ground. Maximum input level = +18 dBv. Input impedance is >30 kilohms.
Input B	(Right channel) 3 conductor 1/4" jack for line level balanced or unbalanced input signals. Tip = high (+), Ring = low (-), Sleeve = ground. Maximum input level = +18 dBv. Input impedance is >30 kilohms.

4. Front Panel



Feature	Description
INPUT LEVEL	Sets the input signal strength. Fully counterclockwise, no signal. Fully clockwise, input signals are boosted by 20 dB.
PWR	Yellow LED indicates power "on".
MONO/STEREO	Combines stereo, or two mono, input signals into one mono output signal (fed equally to both left and right headphone outputs).
HEADPHONES	1/4" stereo jacks for headphones. The minimum impedance is 8 ohms (see Table 2.1 for combined headphone impedances).
HEADPHONE LEVEL	Volume controls set the signal strength at the corresponding output jack (1-4).

5. Block Diagram



6. Specifications

Inputs	
Type	bridging, balanced/unbalanced, transformerless
Input impedance	>10k ohms each leg
Maximum input level	+18dBv
Connector	3-conductor 1/4" (tip-ring-sleeve)

Indicators	
Power	yellow LED indicates power "ON"

Audio Performance	
Frequency Response	20Hz to 20kHz, +0dB, -1dB
THD	.01% (1kHz, 0dBm, 600 ohms) .02% (1kHz, +24dBm, 600 ohms)
Signal to Noise Ratio	95dB
Gain	20dB

Outputs	
Type	low-Z
Output impedance	160 ohms
Maximum output level	>50 volts p-p into 2000 ohms,
Connectors	1/4" stereo (x4)

Power Requirements	16 volts AC, 200mA (Symetrix PS-2, included)
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Accessories	
RM-2.....	Two-unit standard 19" rack mount
SC-2.....	Security Cover
PS-2.....	Spare 16 volt AC power supply

7. Repair Information

Should you decide to return your SX-204 to Symetrix for service, please follow the following instructions.

7.1 Return Authorization

Symetrix will service any of its products for a period of five years from the date of manufacture. However, goods will not be accepted without a Return Authorization number.

Before sending anything to Symetrix, call us for an RA number. just ask, we'll gladly give you one! call (206) 787-3222, weekdays, 8am to 4:30 pm pacific time.

7.2 In-Warranty Repairs

To get your unit 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, etc. and a brief statement of the problem. Your daytime telephone number is very useful if we can't duplicate your problem.
4. Put the RA number on the outside of the box.
5. Ship the unit to Symetrix, freight prepaid. Our address is printed on the title page of this manual.

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

If you don't have the factory packaging materials, then do yourself a favor by using an oversize carton, wrapping the unit in a plastic bag, and surrounding it with bubble-wrap. Pack the box full of Styrofoam peanuts. Use additional bubble-wrap if you must ship more than one unit per carton. We won't return the unit in anything but original Symetrix packaging. Of course, if the problem turns out to be operator inflicted, you'll have to pay for both parts and labor. In any event, if there are charges for the repair costs, you will pay for return freight. All charges will be COD unless you have made other arrangements (prepaid, Visa or Mastercard).

7.3 Out-of-Warranty Repairs

If the warranty period has passed, you'll be billed for all necessary parts, labor, packaging materials, and any applicable freight charges.

Remember, you must call for an RA number before you send the unit to Symetrix.

8. LIMITED WARRANTY

The Symetrix SX204 is designed and manufactured for use in professional and studio audio systems. Symetrix, Inc., warrants that the SX204 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 SX204 will be free from defects in material and workmanship for ninety (90) days. Symetrix' obligations under this warranty will be limited to repairing and replacing, at Symetrix' option, the part or parts of the SX204 which prove defective in material or workmanship within ninety (90) days 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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