SAE
Scientific Audio Electronics, Inc.

5000A
Impulse Noise Reduction System

OWNER'S MANUAL

Congratulations on your selection of the new SAE 5000A - the 2nd generation Impulse Noise Reduction System from the same company who first introduced such a product four years ago. Your 5000A is another of the innovative high technology products which have made SAE world renown as the largest manufacturer of "State of the Art" audio products.

Since the 5000A is an extremely unique product and since a great deal of care and quality materials have gone into its design, we urge you to read this Owner's Manual thoroughly in order to realize maximum pleasure from your system.

WHAT IS IMPULSE NOISE?

One of the unavoidable obstacles which has challenged recorded music since the very first phonograph is impulse noise — those annoying "pops" and "clicks" which (in an alarming number of instances) appear even on a brand new record and increase with record play. These noises are the result of scratches, dirt, mistracking, warping, static electricity and even normal record wear. The fact that they are generally unavoidable doesn't make them any less unnerving.

Like its predecessor, the SAE 5000A has been designed specifically to reduce these impulse noises and help you to once again enjoy even those irreplaceable records you might have written off as hopelessly scratched.

Other types of background noise such as tape hiss and static sound often heard between cuts on an album are of an entirely different nature and therefore not affected by the 5000A. There are several excellent units currently available which can greatly reduce this type of noise. These systems are quite compatible with the 5000A and when used together the two can effectively eliminate almost any type of program noise. However, should you choose to use the 5000A in conjunction with a surface noise (hiss) reduction system, be sure to position the 5000A first in line.

DESIGN & PHILOSOPHY

Since the impulse noise is audibly different from music, it therefore must contain some unique properties. After extensive electronic evaluation and statistical analysis, two such unique characteristics were identified.

The first of these characteristics is an unusually rapid attack and decay time. While a few musical instruments have an equally fast attack time, their decay times are much slower. The second unique characteristic is the tendency of impulse noise to be out-of-phase while the actual musical content of the program is primarily in-phase.

A logic circuit within the 5000A constantly monitors the musical program, searching for the unique combination of conditions which indicate an impulse noise. When such conditions are detected, a Noise Removal Circuit automatically shuts down the music. A Music Restoration Circuit which has been evaluating the musical information surrounding the impulse noise, then replaces the impulse noise with an extrapolation of the music it has been monitoring. The result is a significant reduction of impulse noise with no sacrifice of musical continuity.

Unlike other noise reduction systems, the 5000A does not alter the dynamic range or frequency response of the program. However, it cannot return any fidelity lost through record abuse. Your dealer can suggest some of the many fine record care products available today. Remember, your records are one of your most expensive and important investments in audio. If handled with care, they will provide many hours of enjoyment; and as the unavoidable impulse noises appear (and they will appear), the SAE 5000A will reduce them to a minimum.

UNPACKING

As part of our system of strict quality control, your 5000A was thoroughly inspected before leaving the factory to ensure a flawless appearance. The shipping carton and packing materials were carefully designed to reduce to a minimum the possibility of transportation damage. Should you find that your unit has been damaged, notify your dealer immediately so that a written claim to cover the damages can be initiated.

THE RIGHT TO ANY CLAIMS AGAINST A PUBLIC CARRIER CAN BE FORFEITED IF THE CARRIER IS NOT NOTIFIED PROMPTLY AND IF THE SHIPPING CARTON AND PACKING MATERIALS ARE NOT AVAILABLE FOR INSPECTION BY THE CARRIER. SAVE ALL PACKING MATERIALS UNTIL THE CLAIM HAS BEEN SETTLED.

We strongly suggest that you save the carton and packing material for use should you ever need to ship the unit in the future.

CAUTION: To prevent fire or shock hazard, do not expose this equipment to rain or moisture.

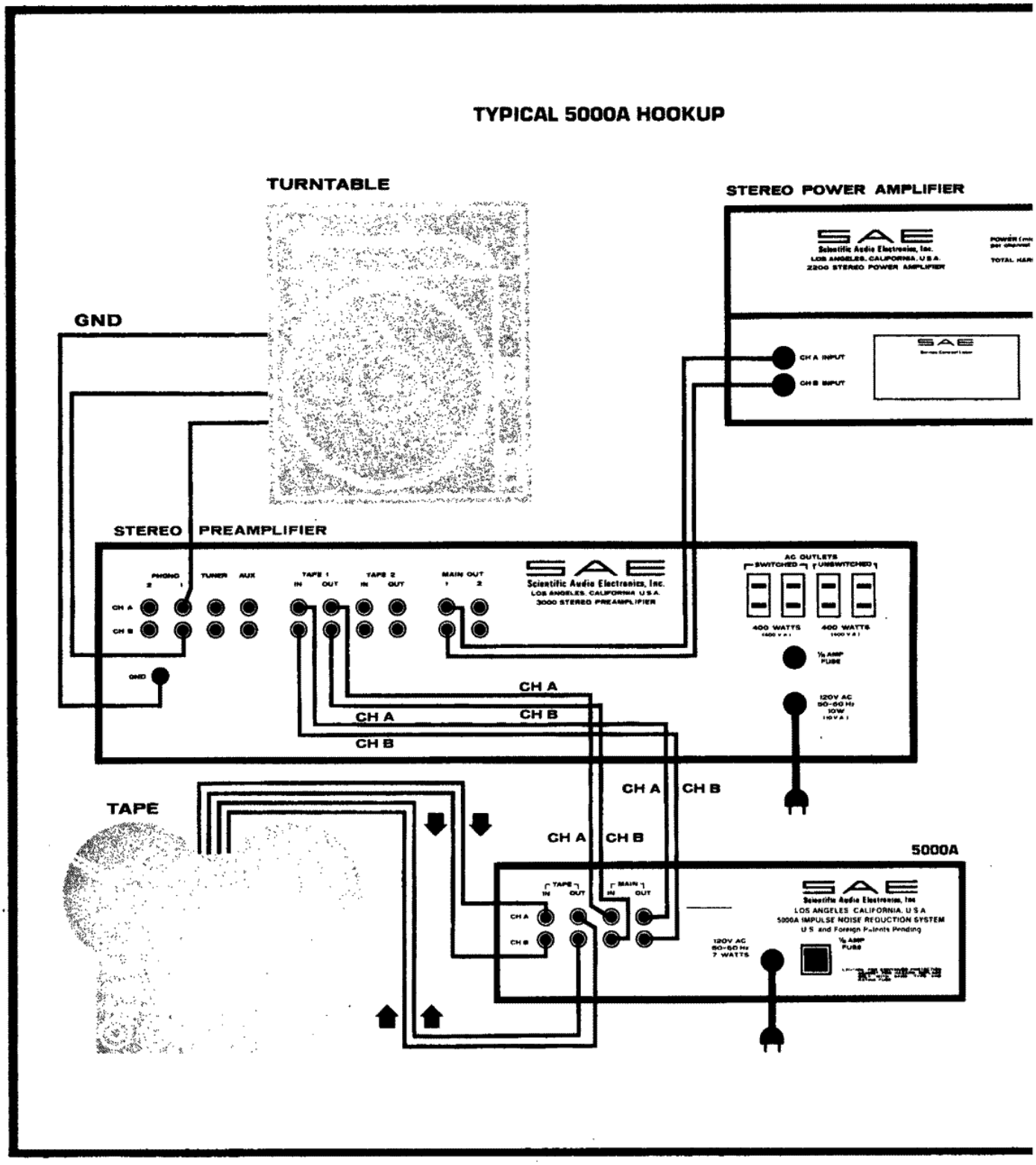
CONNECTIONS

Your SAE 5000A is designed to be connected into the tape monitor loop of a preamplifier, integrated amplifier, or receiver. If your control amplifier or receiver does not have a tape monitor function, some modification of the control amplifier/receiver may be necessary. If this is the case, please consult your dealer.

The 5000A may be installed between a preamplifier and power amplifier. However, the sensitivity control on the 5000A will have to be readjusted with every change in volume level. At very low volumes, the output from some systems may not be adequate for the 5000A to be usable even at its most sensitive setting. *For these reasons, we strongly suggest a tape monitor loop connection whenever possible.*

NOTE: Before making any connections, turn off the power to all components.

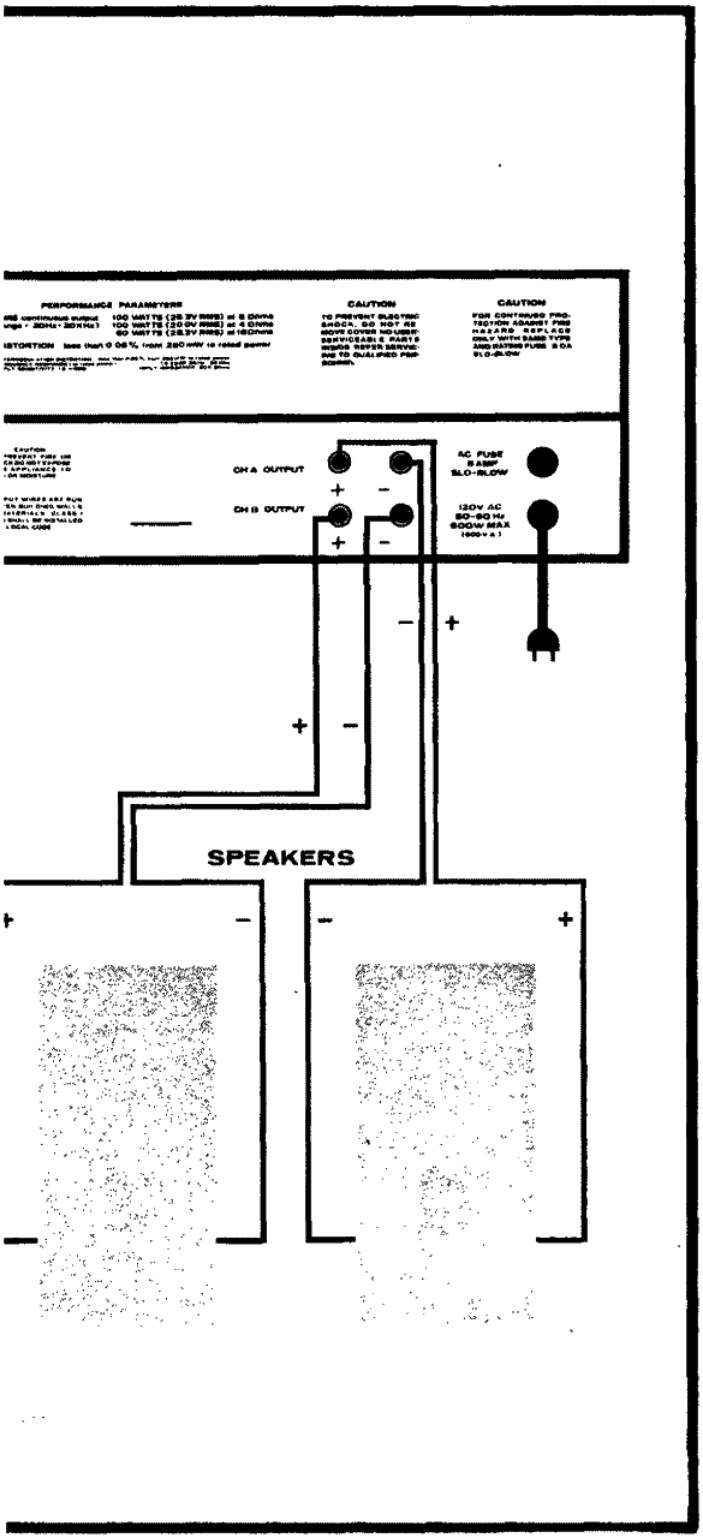
(1) Disconnect any tape recorder or signal processing accessory you may already have installed into the tape monitor loop of your control amplifier or receiver. (Instructions on how to reconnect this equipment follow under #4.) If your system has multiple tape monitor loops, the 5000A should be installed into the first one.



(2) Using one pair of the shielded two-conductor audio cables provided, connect the left tape output of your control amplifier/receiver to the terminal marked MAIN IN CHA on the rear panel of your 5000A, and connect the right tape output of your control amplifier/receiver to the MAIN IN CHB terminal on your 5000A.

(3) Use the remaining pair of audio cables to connect the MAIN OUT CHA terminal of your 5000A to the left channel tape input on your control amplifier/receiver; and connect the MAIN OUT CHB terminal to the right channel tape input.

(4) If the tape circuit in which you have installed your 5000A must also be used for a tape recorder and/



or other signal processing accessories, be sure to install this equipment **after** the 5000A. This insures that the 5000A receives the program material before it has been altered by any signal processing device, and it allows the benefits of the 5000A's impulse noise reduction to be captured on tape.

The 5000A has been designed with its own tape monitor loop. Any tape recorder or signal processor connected into this loop will receive the program after it has passed through the impulse noise reduction circuitry. To install equipment into this loop, connect the left tape recorder (or signal processor) input to the output marked TAPE OUT CHA on the 5000A; and connect the right recorder (or processor) input to the TAPE OUT CHB output. Connect the left output of the recorder/processor to the TAPE IN CHA input and the right output to the TAPE IN CHB input.

(5) Since the 5000A does not have a power switch of its own, plug the line cord into a "switched" outlet on one of your other components. If a "switched" outlet is not available, the unit can be left on at all times without an undue consumption of power.

FRONT PANEL CONTROLS

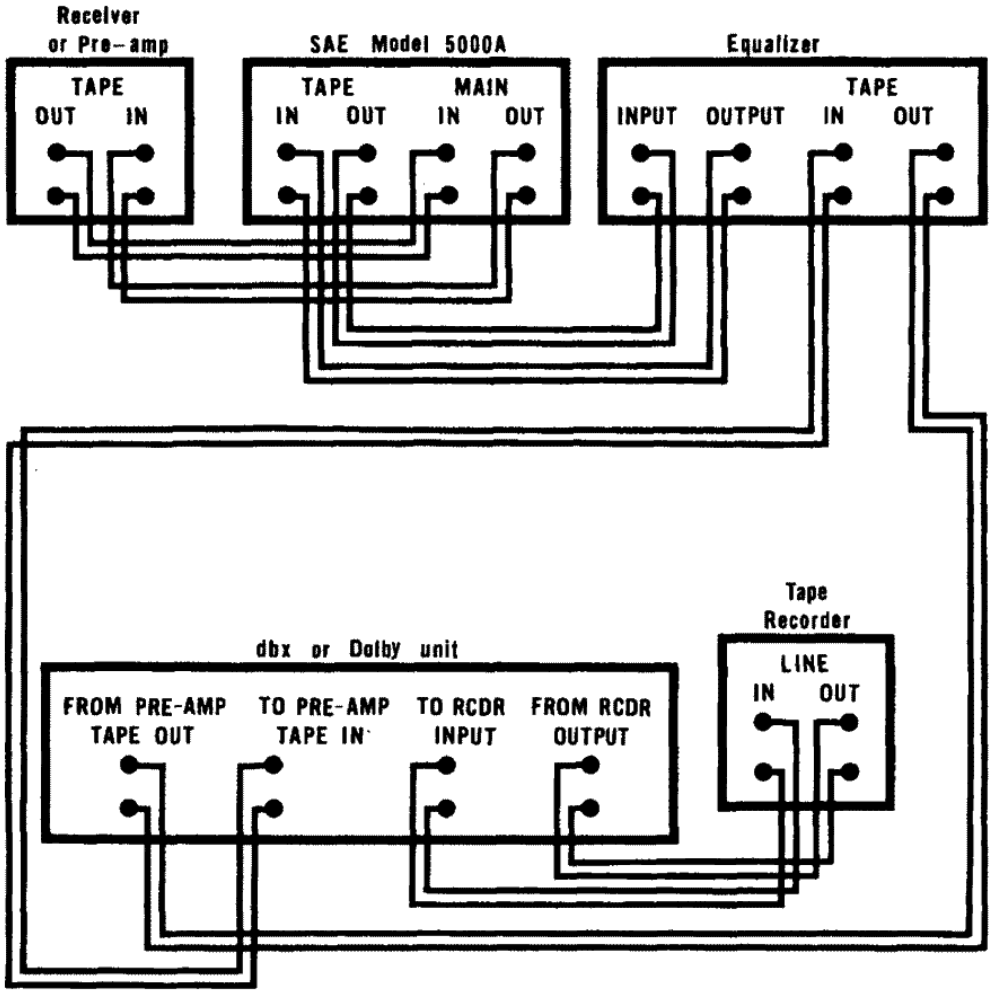
INVERT BUTTON - Allows you to listen to the signals which are being removed by the impulse noise reduction system. When this button is pushed in, the music is defeated and only the "pops" and "clicks" are allowed to pass. CAUTION: Do not activate this button when your system is playing at a high volume level. Loud impulse noise can damage your speakers.

CAUTION: *Do not push the invert button while taping, unless the tape recorder is connected before the 5000A. Activating the invert button will cause only the "pops" & "ticks" to be captured on the tape.*

DEFEAT - Reroutes the audio signal such that it bypasses the impulse noise reduction circuitry. When this button is pushed in, the program will pass straight through the 5000A without being altered. Any equipment connected to the tape monitor loop will still function, but the impulse noise will not have been removed.

MONITOR - functions in the same manner as a tape monitor control on a preamplifier, integrated amplifier or receiver. Although the audio signals will appear at the TAPE OUT terminals regardless of the position of the MONITOR button, the button must be **in** if you wish to listen to a tape or to employ any signal processing equipment connected to the 5000A.

SENSITIVITY - controls the sensitivity of the Impulse Noise Detection Circuitry in your 5000A. At the far left setting (1), the circuitry is least sensitive to the unique combination of conditions which indicate an impulse noise. As the slide is moved toward the right (10) the circuitry becomes more sensitive. The optimum setting for this control depends upon your particular system and the musical material you are listening to. Initial set-up procedures are outlined in the next section.



1. dbx is a registered trademark of dbx, Inc.
2. Dolby is a registered trademark of Dolby Labs, Inc.

TYPICAL HOOK-UP WITH TAPE DECK AND SIGNAL-PROCESSING EQUIPMENT

OPERATION

The 5000A has been designed for simplicity of operation. Its circuitry is capable of handling a wide dynamic range and only occasional fine tuning will be required once the SENSITIVITY control has been initially adjusted.

Due to the design of the impulse noise reduction circuitry, any program material fed to the 5000A must be in the form of a stereo signal. You can achieve excellent results with a mono record if you continue to use a stereo cartridge and leave the mode switch of your control amplifier/receiver in the STEREO position.

Your 5000A will perform best with an input signal of 150mV or greater. To determine the level of input that your particular system will provide, divide the output level of your phono cartridge by your control amplifier or receiver's phono input sensitivity and multiply that number by the tape output level of your control amplifier/receiver. That is:

$$\frac{\text{PHONO CARTRIDGE OUTPUT}}{\text{PREAMP INPUT SENSITIVITY}} \text{ X TAPE OUTPUT LEVEL} = \text{INPUT LEVEL FOR 5000A.}$$

If this number is 150 or higher, the signal level will be sufficient.

INITIAL CONTROL SETTING:

1. Activate the tape monitor switch on your control amplifier or receiver. This circuit must be activated for the 5000A and any equipment connected to its tape output to function.
2. Make certain the DEFEAT button on the front panel of your 5000A is out. When the button is in, the signal will bypass the impulse noise reduction circuitry.
The INVERT button should also be out.
3. Select a phonograph with good dynamic range and play the *loudest* passage on the record.
4. Use the SENSITIVITY slide control on the front panel of your 5000A to set the sensitivity of the Impulse Noise Detection Circuitry. As you move the slide slowly to the right (toward 10) the circuit becomes progressively more sensitive; and, as the circuit eventually becomes too sensitive, the music will begin to sound distorted. At that point, the 5000A is removing some of the musical peaks along with the impulse noise. When this happens, move the slide back to the left (toward 1) until you can no longer hear any distortion.

Your 5000A is now adjusted to give you optimum reduction of impulse noise without affecting the musical content of the program. Pushing in the INVERT button will defeat the music and allow you to hear only the impulse noise as it is being removed.

CAUTION: Always lower the volume level of your system before activating the INVERT control. Failure to do so may result in damage to your speakers.

INVERT CONTROL

An alternate method of initially locating the optimum sensitivity set-up is through the use of the INVERT control. When this button is in, the music is defeated and only the material which is being removed by the impulse noise reduction circuitry is heard.

1. Select a phonograph with good dynamic range and play the loudest passage. Even new records of high quality will, in all probability, display some impulse noise. Set the volume of your system just loud enough to hear the program clearly.

2. Move the SENSITIVITY slide all the way to the left (toward 1) and push in the INVERT button.
3. As you slide the SENSITIVITY control to the right (toward 10), you will begin to hear occasional sporadic pops and clicks—this is the impulse that is being detected by the 5000A. Continue to move the SENSITIVITY control to the right until the pops become less random and more frequent, and some of the pops no longer have a sharp high-pitched sound. At this point, the 5000A is also removing musical peaks. Now move the SENSITIVITY control back to the left until you no longer hear these peaks.
4. Release the INVERT button and you will hear the musical program without the impulse noise.

GENERAL MAINTENANCE

The entire line of SAE products is as highly regarded for its "State of the Art" cosmetic design as it is for its superior engineering. The metal panel of your 5000A is finished with a high-grade black anodizing process (MIL Specification 8625-A-Type 2) which was selected for its durability as well as beauty. It should be cleaned using a soft cloth dampened with a solution of LIQUID detergent and water. UNDER NO CIRCUMSTANCES SHOULD A LYE SOLUTION OR ABRASIVE CLEANER SUCH AS SCOURING POWDER BE USED ON ANY PART OF THE 5000A.

All natural wood surfaces on your 5000A have been sanded and then hand-rubbed with oil. It is natural for these surfaces to appear to be drying out with age; however, an application of furniture oil will return the finish to "like new" condition.

SERVICE

SAE has a Customer Service Department staffed with experts to answer any questions pertaining to the installation or operation of your 5000A. Please feel free to write us at any time and we will do our best to give you prompt attention. Be sure to include both Model and Serial Number of your unit as well as adequate information concerning the other equipment in your system.

Address your inquiry to:

SAE Inc.
Customer Service Dept.
P.O. Box 60271 Terminal Annex
Los Angeles, Ca. 90060

If a problem arises which cannot be resolved through our combined efforts, we may wish to refer you to a local authorized repair agency. To aid us in selecting the service station most convenient to you, please indicate which major city is closest to your home.

Should we prefer to service your unit at the factory, we will forward an authorization form and packing instructions to you. This authorization form MUST BE RETURNED with your unit. UNDER NO CIRCUMSTANCES SHOULD YOUR UNIT BE SENT TO THE FACTORY WITHOUT PRIOR AUTHORIZATION.

If the original shipping carton has been lost or damaged, a duplicate may be obtained from our service department for a minimal charge.

Always ship your 5000A via recognized freight carriers. Suggested carriers will be listed in the Return Authorization papers. Do not ship via Parcel Post. ALL PARCEL POST SHIPMENTS WILL BE REFUSED.

LIMITED ONE-YEAR WARRANTY

The 5000A is warranted against defects in materials and workmanship for one year from the date of purchase by the original owner. The date of purchase shall be established by the original owner's presenting to Scientific Audio Electronics Customer Service Facility the original or a copy of the original owner's purchase receipt or sales slip showing from whom the 5000A was purchased, the date of purchase and the purchase price of the unit. In the event proof of purchase cannot be established as stated in the preceding sentence, the warranty period shall commence to run on the date of manufacture, provided the serial number on the unit has not been altered in any manner. During the warranty period, Scientific Audio Electronics will repair or, at its option, replace at no charge components that prove to be defective, provided the 5000A is returned in accordance with the shipping instructions which are contained with the unit, shipping prepaid, to Scientific Audio Electronics Customer Service Facility. (Refer to shipping instructions).

This warranty does not apply if the 5000A has been damaged by accident or misuse, or as a result of service or modification by other than a Scientific Audio Electronics Customer Service Facility authorized to service the 5000A.

SCIENTIFIC AUDIO ELECTRONICS SHALL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

THERE ARE NO WARRANTIES GIVEN BY SCIENTIFIC AUDIO ELECTRONICS WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. ALL IMPLIED WARRANTIES OF FITNESS FOR PURPOSE SOLD, MERCHANTIBILITY, DESCRIPTION, QUALITY, PRODUCTIVENESS OR ANY OTHER MATTERS ARE LIMITED TO THE ONE-YEAR TERM OF THE EXPRESS WARRANTY HEREIN STATED. Some states do not allow limitations on how long an implied warranty may last, so the above limitation may not apply to you.

Obligation To Make Changes

Products are sold on the basis of specification applicable at the time of sale. Scientific Audio Electronics shall have no obligation to modify or update products once sold.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

SPECIFICATIONS

T.H.D. (Total Harmonic Distortion) at any level to rated output from 20Hz to 20kHz	less than 0.1%
I.M. (Intermodulation Distortion) at any level of rated output with any 2 mixed frequencies between 20Hz to 20kHz at 4/1 Voltage Ratio	less than 0.1%
Signal-to-Noise Ratio	greater than 90 dB below rated output
Rated Output	2.50 Volts RMS
Frequency response	+1 dB 20Hz to 20kHz
Output at Clipping	greater than 9 Volts into 10K Ohms
Input Impedance	75K Ohms
Output Load Impedance	600 Ohms minimum
Insertion Loss	Less than 1dB
Power Consumption: 119-125 VAC, 50Hz to 60Hz	7 Watts
Shipping Weight	8 lbs.
Dimensions	10.75"W(27.3cm) x 3"H (7.6cm) x 9.25"D (23.5cm)
Rack Mount Panel available	

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