POLARIS

SUMO

INTRODUCTION

Welcome to the world of SUMO. POLARIS is the culmination of many years of audio amplifier research. It contains some of the most advanced circuitry ever incorporated into an audio component and achieves a sonic purity which is simply unapproached by competitive products.

An electronic component as sophisticated as POLARIS places certain demands on its owner. Please read this operating manual carefully, so that you may realize the highest level of performance and versatility of which POLARIS is capable.

UNPACKING

Immediately upon receiving POLARIS, inspect the carton for evidence of mishandling during shipment. Then, carefully unpack the amplifier and inspect it for any sign of damage which might have occurred.

Please save the shipping carton and all the associated packing materials for later use. The shipping materials have been carefully designed to transport your amplifier with a minimum of disturbance.

NOTE: In the event that you discover some damage that has occurred in shipping, please contact your dealer immediately.

PRECAUTIONS

POLARIS is a wide-band amplifier with substantial power output capability. Certain precautions must be taken to ensure that the amplifier is operating safely.

1. Be careful when lifting POLARIS. The unit weighs more than 25 lbs.

2. Never expose POLARIS to moisture

3. Never plug an input cable into the amplifier while the power is on. This may cause extensive damage to loudspeakers.

4. NEVER apply the "thumb test" (touching the hot lead of the input cable with your finger) to the tip of the input cable or input jack of the amplifier. R-F rectification and/or hum will almost surely damage your speakers. Also, you may blow one or more of the internal fuses which require dismantling of the amplifier to replace. Please note again: ALL AMERICAN AUDIO WILL NOT BE RESPONSIBLE for damaged loudspeakers due to improper use of its equipment.

5. Take care to see that a short circuit is not connected to the output of the amplifier.

6. Avoid restricting the airflow around POLARIS. Air circulation around the amplifier is necessary for proper operation.

7. Do not plug POLARIS' AC power cord into preamplifier's convenience outlets, since they are unlikely to be able to manage the amplifier's power requirement.

8. Avoid recycling POLARIS' power switch from off to on repeatedly within a short period of time, since doing so may damage the power supply.

9. Make sure that any speakers used with POLARIS can handle its power at the corresponding impedance. The amplifier's warranty does not cover damage to loudspeakers with an inadequate power rating.

INSTALLATION

Although POLARIS contains 600 square inches of heat dissipating fin area, the cooling system's efficiency can be severely reduced should the air flow to the fins be restricted. Avoid locating POLARIS in cabinetry which might block the air flow. Provide adequate air vents or ports behind and above the amplifier. Care should be taken to see that the amplifier is not installed near hot air vents, which can impair the effectiveness of POLARIS' cooling system.

When installing these amplifiers into a standard 19" component rack, we recommend that you isolate the chassis and metalwork from the rack so as to insure no electrical contact between the two. Ground loops resulting in audible hum may occur if this precaution is not observed.

ELECTRICAL CONNECTIONS

In order to have the wiring concealed, all electrical connections are made in the rear of the unit. CAUTION: ALL connections should be made with the AC power cord UNPLUGGED and the power switch in the off position. UNDER NO CIRCUMSTANCES should you attempt to make any input or output connections while the power is on.

INPUT CONNECTIONS

A pair of well-shielded audio cables should be used for the input connection to POLARIS. The input jacks on the amplifier have been plated to provide low contact resistance, long life, and minimal susceptibility to corrosion. Be sure to use only high quality, shielded coaxial cable with standard RCA-type pin jacks to connect your preamplifier to POLARIS.

OUTPUT CONNECTIONS

Either dynamic or electrostatic loudspeakers may be connected to the output binding posts. Each individual speaker requires two leads: the positive or hot lead is connected to the amplifier's red binding post. Connect the left speaker to channel A, the right speaker to channel B.

All wiring should be done with wire no lighter than 16-gauge. Two-conductor plastic-insulated lamp cord (zip cord), obtainable from any hardware store or high-fidelity dealer, is adequate for this purpose. For distances exceeding 25 feet, 14-gauge wire is desirable to minimize power loss and maintain good electrical speaker damping. For lenghts over 50 feet, 12-gauge wire is recommended.

CAUTION: Care should be taken that short circuits between the speaker wire leads are avoided.

COMMON GROUNDING

Although both the negative side of an input cable and the negative lead of a speaker terminal are often referred to as "ground" they are not the same in a high-powered audio amplifier and must never be connected together. If they are connected, a feedback circuit may result, causing instabilities (such as "motor boating") which may damage the amplifier. For the same reason no speaker lead should ever be interconnected with any part of the amplifier chassis or input cabling.

SPEAKER PHASING

To obtain proper stereophonic phasing and correct bass response, it is necessary that the left and right stereo speakers are connected in phase. To make this in-phase connection, observe the wire or cable coding on the cord being used. Most often a ridge or groove can be observed on one edge or on one side of the lamp cord insulation. Sometimes one of the wires is silver-colored, while the other is copper-colored. Another method often used is to provide a thread tracer along one of the wires.

Whatever the method employed, identify the wire lead which is attached to the (-) terminal on the amplifier. Connect the other end to the negative terminal of the loudspeaker system. Finally, attach the remaining wire lead to the (+) terminal on the amplifier and the other end to the positive loudspeaker terminal. Follow the same procedure to connect the other channel to its respective loudspeaker.

Verification of proper phasing is achieved by noting a unity of sound when solo vocalists perform during stereo operation. A more obvious verification can be observed by setting the preamplifier for monaural operation (left and right channels blended) and playing a mono recording.

SPEAKER RATINGS

Because of POLARIS' power output, it is important to determine the maximum input rating of the speaker used with it. This rating must equal or exceed that of POLARIS at the corresponding impedance to protect the speaker from possible damage to a loudspeaker whose power rating is lower than that of POLARIS. Most speakers have either 16, 8 or 4 Ohm impedance ratings. Consult the specifications of the speaker to determine its impedance. If no rating can be found, measure the speaker's impedance with an Ohmmeter. The rating is usually 20% to 30% higher than that indicated by the Ohmmeter.

If two sets of stereo speakers are to be driven simultaneously, the combined impedance can be derived from the following formula:

$$\text{Parallel Connection:} \quad \frac{R1 \times R2}{R1 + R2} = Zp \quad (Z=\text{impedance})$$

If the four speakers (two per channel) each have the same impedance, the combined impedance is one-half that of one speaker (for example, two 8-Ohm speakers connected in parallel result in a combined impedance of 4 Ohms).

$$\text{Series Connection:} \quad R1 + R2 = ZS$$

If the speakers have the same impedance, the combined impedance is twice that of the speaker (for example, two 8-Ohm speakers connected in series result in a combined impedance of 16 Ohms).

For public address applications requiring the use of more than four speakers, it is common practice to use matching transformers with each speaker. Two common techniques used to determine the rating of the needed transformer are based on a 70-Volt system and a 25-Volt system. Because the 70-Volt system would require an additional transformer at the output of the amplifier, the 25-Volt system is recommended. With this lower-voltage system, the speaker line may be fed directly from the amplifier output. Consult your dealer for information regarding selection of transformers and proper connections.

OPERATION

Other than caution concerning the power output capabilities of this amplifier, there are no special notes on operation. ALWAYS turn on the complete system FIRST--waiting at least 30 seconds before turning on the amplifier. A great many pieces of associated equipment emit LARGE transients on turn-on and continue to do so several seconds afterwards. Therefore, protect your speakers by the proper sequencing. The reverse procedure applies when turning off the system--ALWAYS turn the amplifier off FIRST, waiting at least 15 seconds for the power supply to discharge. Then turn off the rest of the system.

A.C. FUSE

Replace ONLY with 5A MDX SLO-BLO type. Using a higher rated fuse will void the warranty and cause damage to the amplifier.

CIRCUIT DESCRIPTION

The circuit topology of SUMO power amplifiers benefits from two inherent design advantages. First, all SUMO amplifiers are designed to operate sympathetically with modern loudspeakers. The amplifier and speakers influence the performance of each other to a greater degree than any of the components in an audio system, and it has been the focus of SUMO engineering to insure that its amplifiers perform as well under real-life conditions as they do on a test bench.

Second, the rapid advancement of transistor technology has quite recently developed into a watershed, resulting in solid-state devices of outstanding capability.

POLARIS is a 100 Watts per channel MOSFET design with proprietary AGMC (active trasconductance correction circuitry) topology that assures the higher level of accuracy and sonic purity of reproduced music.

AGMC is a closed loop servo which dynamically corrects for transconductance error of the MOSFET output stage thus dramatically decreasing all of distortion components. The fully complementary MOSFET output stage driven by buffered class A circuitry is capable of delivering adequate energy effortlessly into any load regardless of it's impedance or reactance characteristics. The additional benefits of MOSFET devices encompass inherent temperature stabilization and freedom from secondary breakdown resulting in safety for loudspeaker systems and reliability for years of trouble-free performance.

Designed as a main stereo amplifier for the state-of-the-art sound systems, POLARIS can also be used to drive subwoofer, tweeter-midrange or other complex multi-transducer installations.

GENERAL MAINTENANCE AND SERVICE

Great care has been taken by the SUMO staff to insure that POLARIS is as flawless in appearance as it is in performance. The front panel is finished with a high grade anodizing process for durability as well as beauty. It can best be cleaned with a soft cloth dampened with a soluition of liquid detergent and water. UNDER NO CIRCUMSTANCES should a lye solution or any abrasive cleanser be used on any part of the unit.

ALL AMERICAN AUDIO has a Customer Service program to answer all questions regarding the installation and operation of your SUMO components. Please feel free to write us at any time and we will attempt to offer prompt advice.

In the event that the unit must be returned to the factory, and authorization must be requested from ALL AMERICAN AUDIO before the unit is returned. Under no circumstances should the unit be shipped to ALL AMERICAN AUDIO without prior authorization. Please contact:

ALL AMERICAN AUDIO
Customer Service
21300 Superior St.
Chatsworth, CA 91311
(818) 407-2426
TLX 658234 SUMOCORP WKVG

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

POLARIS ELECTRICAL AND MECHANICAL SPECIFICATIONS:

Power output:	100 Watts RMS per chan. into 8 Ohms both chan. driven from 20 Hz to 20 KHz at no more than .05% THD
Power at clipping with less than .1% THD @ 1 KHz both channels driven:	@ 8 Ohms: 110 Watts RMS per channel @ 4 Ohms: 175 Watts RMS per channel @ 2 Ohms: 250 Watts RMS per channel
Intermodulation distortion (SMPTE) and TIM:	.05% max. (0.25 W to 100 W @ 8 Ohms) Open loop bandwidth exceeds audio bandwidth.
Hum & noise below rated power:	103 dB (20 Hz to 20 KHz)
Hum & noise below 1 Watt ref. 0 dBW:	83 dB (20 Hz to 20 KHz)
Frequency response:	+0.1 dB from 20 Hz to 20 KHz +0.-3 dB from 0.12 Hz to 169 KHz
Input sensit. @ rated output:	1.27 Volts RMS
Input sensit. @ 1 W ref. 0 dbW	127 mV RMS
Input impedance:	47 KOhms
Damping factor:	525 minimum from 20 Hz to 1 KHz
Rise time:	2.5 Microseconds @ 8 Ohms
Separation:	Greater than 80 dB (20 Hz to 20 KHz)
Dimensions (W x H x D):	19" x 5 1/4 x 8 3/4" (48 cm x 13 cm x 22 cm)
Shipping weight:	27 lbs (12 Kg)

LIMITED WARRANTY

THIS PRODUCT IS WARRANTEED UNDER THE FOLLOWING CONDITIONS:

1. PRODUCT IS PURCHASED THROUGH AN AUTHORIZED SUMO DEALER.
2. WARRANTY COVERS NORMAL OPERATING CONDITIONS OF HOME USE.
3. WARRANTY PERIOD BEGINS AS OF DATE OF SALE PROVIDED IT IS REGISTERED BY THE AUTHORIZED SUMO DEALER WHERE THE PRODUCT WAS PURCHASED. REGISTRY PERIOD IS 20 DAYS.
4. DELIBERATE MISUSE, MISHANDLING FAILURE TO REPORT RECEIVING DAMAGED MERCHANDISE, OR UNAUTHORIZED TAMPERING WITH OR MODIFYING OF THIS MERCHANDISE AUTOMATICALLY VOIDS ALL WARRANTIES.
5. WARRANTY PERIOD FOR ALL SUMO FACTORY WIRED PRODUCTS (EXCLUDING FUSES) IS 3 YEARS COVERING BOTH PARTS AND LABOR. TRANSPORTATION CHARGES TO THE DEALER OR FACTORY ARE EXCLUDED.
6. WARRANTY ON ALL SUMO PRODUCTS USED IN ANY OTHER FASHION THAN STATED ABOVE SHALL REDUCE THE WARRANTY TIME PERIOD AND OTHER CONDITIONS TO NEGOTIATIONS BETWEEN SUMO AND PROSPECTIVE USER.
7. THIS WARRANTY SHALL EXTEND TO EACH SUCCESSIVE OWNER, PROVIDED SUMO IS NOTIFIED BY REGISTERED MAIL WITHIN 20 DAYS OF RESALE BY INITIAL OR PRESENT OWNER. THIS NOTIFICATION SHALL CONSIST OF DATE OF SALE, NAME AND ADDRESS OF NEW OWNER.
8. SUMO GUARANTEES THAT ITS PRODUCTS ARE FREE FROM DEFECTS IN MATERIALS AND/OR WORKMANSHIP FOR THE REQUIRED WARRANTY PERIOD.
9. THIS WARRANTY IS NOT VALID UNLESS ACCOMPANIED BY SALES SLIP VALIDATION OR PROPERLY STATED INVOICE (COPY).
10. THIS WARRANTY IS VALID ONLY IN THE UNITED STATES. SERVICE IN OTHER COUNTRIES WILL BE PROVIDED BY THE EXCLUSIVE SUMO REPRESENTATIVE OR HIS AGENTS. BECAUSE OF VARYING GOVERNMENTAL REGULATIONS AND CONDITIONS, THE SERVICE PERIOD MAY DIFFER FROM COUNTRY TO COUNTRY. HOWEVER, IN EVERY INSTANCE, THE SERVICE AGREEMENT CAN BE HONORED ONLY IN THE COUNTRY WHERE THE UNIT WAS PURCHASED.

If your unit requires service, contact your nearest authorized SUMO dealer or factory service department. DO NOT send the unit for warranty service without obtaining factory RETURN AUTHORIZATION.

SHIPPING ADDRESS:

21300 SUPERIOR STREET • CHATSWORTH, CA 91311 • (818) 407-2426

Printed in U.S.A.

8-1499-10-87