

ANDROMEDA

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INTRODUCTION

Welcome to the world of SUMO. ANDROMEDA 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 ANDROMEDA 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 ANDROMEDA is capable.

UNPACKING

Immediately upon receiving ANDROMEDA, 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

ANDROMEDA 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 ANDROMEDA. The unit weighs more than 30 lbs.
2. Never expose ANDROMEDA 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: **SUMO 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 ANDROMEDA. Air circulation around the amplifier is necessary for proper operation.
7. Do not plug ANDROMEDA's AC power cord into a preamplifier's convenience outlets, since they are unlikely to be able to manage the amplifier's power requirement.
8. Avoid recycling ANDROMEDA's 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 ANDROMEDA 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 ANDROMEDA contains 750 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 ANDROMEDA 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 ANDROMEDA's 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 (down) 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 ANDROMEDA. 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 ANDROMEDA.

OUTPUT CONNECTIONS

Although the output terminals are labeled (+) and (-), this does not mean that negative is ground, but rather shows the phasing of the terminals. The positive output lead will go positive when the input is driven positive--meaning that the input and positive (+) output are in phase with each other (non-inverting). Note that there are no binding posts or terminal strip connections for the outputs but rather totally recessed banana jacks. You must use dual banana plugs with the amplifier for connections to your audio system.

WARNING! ANDROMEDA has no limiting circuitry and is protected by internal power supply fuses. To avoid excessive fuse blowing, read following paragraphs when using the amplifier with headphones or switching systems.

ANDROMEDA AND SWITCHING SYSTEMS

This amplifier is a full wave balanced bridge--there are NO common grounds except at the input. DO NOT connect outputs into any switching systems of any kind whether speaker switchers or headphone boxes unless you first determine that there are no common ground connections. To determine whether there are common connections, simply connect an ohmmeter between the negative terminals of the switching system or headphone box. If there is any resistance at all, then you cannot use it. Also, if there is an instant drop followed by a rate of change showing "charging" up, then you cannot use the system.

If you attempt to use these devices without making sure of the foregoing, fuse blowing will certainly result and/or internal damage to the amplifier might occur.

ANDROMEDA AND STEREO HEADPHONES

ANDROMEDA if properly connected can be used with common ground headphones. Unlike model NINE, ANDROMEDA does have a common grounded power supply. When connecting headphones either separately or through a headphone box (adapter) use only the + (plus or in phase) outputs on the rear of amplifier. The -(negative) wires coming from the headphones or box should be connected under one of the rear chassis screws (preferably the lower left or right corner with the lockwashers). This connection is common to the center-tapped power supply.

ANDROMEDA AND BRIDGING ADAPTERS

Under NO circumstances should you attempt to use ANDROMEDA with ANY type of active or passive bridging adapters. It cannot be bridged either for MONO or STEREO operations.

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. No loss of sound should become apparent when the preamplifier is switched from stereophonic to monaural model if the speakers are correctly phased.

SPEAKER RATINGS

Because of ANDROMEDA's 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 ANDROMEDA at the corresponding impedance to protect the speaker from possible damage. SUMO cannot be held responsible for damage to a loudspeaker whose power rating is lower than that of ANDROMEDA. 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:

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

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).

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

If the speakers have the same impedance, the combined impedance is twice that of one 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 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.

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 ANDROMEDA and must never be connected together. If they are connected, fuse blowing may occur, possibly causing damage to the amplifier. For the same reason, no speaker leads should ever be interconnected with any part of the amplifier chassis or input cabling.

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 at 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 7 1/2 A SLO-BLO type. Using a higher rated fuse will void the warranty and cause damage to the amplifier.

TESTING

Since some SUMO amplifiers are unique in the sense of having totally balanced outputs, you CANNOT TEST THESE AMPLIFIERS IN THE NORMAL, TRADITIONAL WAY.

PLEASE READ THE FOLLOWING CAREFULLY, in order to fully understand the required procedures.

1. ABSOLUTELY ALL TEST EQUIPMENT MUST BE TOTALLY FLOATING. The 3rd wire ground MUST be TOTALLY disconnected or otherwise bypassed on ALL instruments.

2. The chassis or grounds of ALL test equipment should be isolated from EACH OTHER. DO NOT violate this rule.
3. The generator output ground must NEVER be connected IN ANY WAY TO ANY OTHER PIECE OF TEST EQUIPMENT other than the input ground of the amplifier under test.
4. Since the outputs of the amplifier are TOTALLY floating and TOTALLY isolated from each other (channel to channel), you can only measure ONE CHANNEL at a time.
5. Do not test the amplifier at or near full power into 4 Ohm loads for extended periods of time as this will cause the internal 7A fuses to blow. If blown, replace the fuses with the same type and rating.
6. DO NOT ever attempt to connect either of the output terminals to chassis or any of the test equipment chassis' grounds.

NOTE: The sole exception to the rule is when using Sound Technology equipment which has true balanced differential inputs. Under these circumstances, the jack on the Sound Tec--labeled chassis-- may be connected to, or under a screw on the rear of the amplifier chassis. DO NOT connect this lead to the minus (-) output terminal or the input ground.

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. All SUMO products take full advantage of these new devices so that, even if no feedback were applied, the output stage of ANDROMEDA would exhibit a distortion factor of less than 0.05%. SUMO amplifiers, therefore, represent up-to-the-minute engineering.

Although the concepts of balanced bridge operation are not new, previous attempts have not been very rewarding due to lack of understanding of all of the parameters in the applications of these concepts. All the circuits in these amplifiers are 100% completely balanced utilizing push-pull quadrature feedback from EACH side of the speaker load.

ANDROMEDA's circuit topology is a step further beyond what fully complementary--symmetry push-pull amplification is all about; it guarantees perfect symmetry of positive and negative cycles or in phase and out of phase signals. The resulting control that is maintained over the loudspeakers is truly awesome and must be experienced to be appreciated.

GENERAL MAINTENANCE AND SERVICE

Great care has been taken by the SUMO staff to insure that ANDROMEDA 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 solution of liquid detergent and water. UNDER NO CIRCUMSTANCES should a lye solution or any abraasive cleanser be used on any part of the unit.

SUMO 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, an authorization number must be requested from SUMO before the unit is returned. Under no circumstances should the unit be shipped to SUMO without prior authorization. Please contact:

SUMO Products Group
Customer Service
21300 Superior St.
Chatsworth, CA 91311
(818) 407-2426
TLX 658234 SUMOCORP WKVG

ELECTRICAL AND MECHANICAL SPECIFICATIONS:

All aluminum anodized with massive extruded heat sinking for efficient heat dissipation.

Standard 19"/8.75" aluminum rack-mount faceplate with heavy duty custom handles.

Military grade G-10 glass epoxy printed circuit boards throughout.

Performance Specifications:

Power output:	200 Watts per chan. into 8 Ohms both channels driven from 20 Hz to 20 KHz at no more than .05% THD.
Power at clipping less than 1% THD at 1 KHz both channels driven:	@ 8 Ohms: 260 Watts RMS per channel @ 4 Ohms: 375 Watts RMS per channel @ 2 Ohms: 450 Watts RMS per channel
Intermodulation dis. (SMPTE): TIM:	.05% max. (0.25W to 200W at 8 Ohms) Unmeasurable.
Hum & noise below rated power: Hum & noise below 1 Watt ref. 0 dBW:	118 dB (20 Hz to 20 KHz) 95 dB (20 Hz to 20 KHz)
Frequency response:	+0.1 dB from 20 Hz to 20 KHz +0,-3 dB from 0.1 Hz to 120 KHz
Input sensitivity at rated output:	1.8 Volts RMS
Input sensitivity at 1 Watt ref. 0 dBW:	130 mV RMS
Input impedance:	100 KOhms
Damping factor:	200 minimum from 20 Hz to 1 KHz
Rise time:	2 microseconds
Separation:	Greater than 80 dB (20 Hz to 20 KHz)
Dimensions (W x H x D):	19" x 8 3/4" x 7" (48cm x 22cm x 18cm)
Shipping weight:	35 lbs (16 Kg)

LIMITED WARRANTY

THIS PRODUCT IS WARRANTED 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 DATED 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.