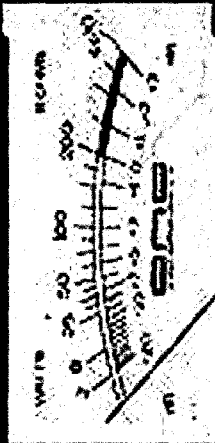
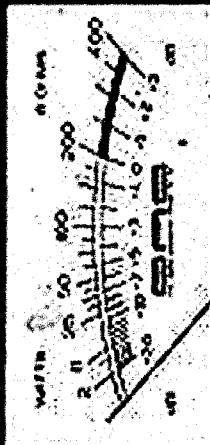


OWNERS
MANUAL

AMPZILLA II

AMPZILLA



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SPECS

AMPZILLA II

POWER OUTPUT

4 OHMS	Minimum 350 Watts per channel, both channels driven, 20 Hz to 20 KHz
8 OHMS	Minimum 200 Watts per channel, both channels driven, 20 Hz to 20 KHz
16 OHMS	Minimum 125 Watts per channel, both channels driven, 20 Hz to 20 KHz

TOTAL HARMONIC DISTORTION & I.M. DISTORTION

4 OHMS	Less than .15% at any frequency or combination of frequencies, and at any power level to clipping.
8 & 16 OHMS	Less than .05% at any frequency or combination of frequencies, and at any power level to clipping.

INPUT SENSITIVITY: 1.6 Volt RMS for 200 Watts into 8 Ohms.

INPUT IMPEDANCE: 75K Ohms

CROSSOVER NOTCH Non-existent

FREQUENCY RESPONSE (Power Bandwidth) at rated power or any level less than rated power.

4 OHMS	Better than ± 0.2 dB, 20 Hz to 20 KHz Better than ± 2 dB, 1 Hz to 100 KHz
8 & 16 OHMS	Better than ± 0.1 dB, 20 Hz to 20 KHz Better than ± 1 dB, 1 Hz to 100 KHz

RISE TIME AT 8 OHMS: Better than 2 μ seconds. AT FULL POWER AT 20 KHz.
Slew rate equal to 50 Volts per μ second.

HEAT DISSIPATION SYSTEM:

Low-noise integral fan operating over 1200 sq. in. total fin area.

DUTY CYCLE: Continuous operation at ambient temperatures up to 125° F.

STABILITY: 100% stable into any load angle 0° to 90°, capacitive or inductive, regardless of waveform — sine, square, or triangular. No oscillations or modulation noise evident.

DAMPING FACTOR: 150 @ 20 Hz to 1 KHz

OVERLOAD PROTECTION & FUSING:

Transistorized dynamic short-circuit protection. Thermal breaker also protects against overheating. 4 @ 5, 5 — power supply fuses, 1 AC slow-blow power fuse.

NOISE: Better than 100 dB below full power (unweighted, wide band), 117 dB below full power (wide band with R.F. filter).

SIZE: Set: 17 $\frac{1}{2}$ " (W) x 7" (H) x 9" (D).
Rack Mount: 19" (W) x 7" (H) x 9" (D).

SHIPPING WEIGHT: 59 lbs.

INTRODUCTION

Your AMPZILLA amplifier is the electronic equivalent of a magnificent musical instrument. It contains some of the most sophisticated and elegant circuits used for home music applications. We are certain that when properly installed and used with responsible stereo component equipment, your AMPZILLA will give you years of great enjoyment.

AMPZILLA is manufactured by the Great American Sound Company, a group of engineers and craftsmen who really care about the art of sound reproduction. We appreciate the vote of confidence that your purchase of AMPZILLA has given us.

AMPZILLA'S power design has already established itself as an audio industry classic. AMPZILLA'S entire computer from input to output is 100% fully complementary. This is a concept considered essential by technicians world-wide to be the foundation of Great American Sound Co. Consequently, every product made by factory or G.A.S. Co. shops has complementary industry throughout.

Since most other power amplifier designs employ only a single differential input circuit and a single driver transformer, they are essentially single ended designs. Virtually all power amplifiers can accurately reproduce sine waves fed into their inputs. However, it is not necessarily true that all amplifiers will accurately reproduce music and vocal signals which are generally asymmetrical and thus rarely have positive and negative peaks that are equal in amplitude. A solution to amplifying these asymmetrical music and vocal signals accurately is to use separate amplifiers for the positive and the negative half cycles. If the amplifiers are identical, it is then possible to obtain a virtually "perfect" symmetrical amplifier. Due to its unique (asymmetrical complementary) power stage design, AMPZILLA is an almost perfect symmetrical amplifier. The positive and negative half cycle amplifiers in AMPZILLA also share a common feedback loop at advantage for any loads that must drive the amplifier.

AMPZILLA also employs a unique integrated circuit testing system that contains five operational amplifiers. The top three in this IC track the equivalent output current in each wire as to contribute separate measured dissipation levels as well as to make thermal runaway impossible.

The output stage of AMPZILLA operates entirely in a class-A mode, while the driver and base output stages are operated class A for the full cycle. Only the driver output is switched to operation class B. However, these transformers do not carry from positive to negative. Rather, they travel back through the class-A region of the power output stage. This system uses the processes of both push-pull and push-pull after active amplifiers. The complementary differential output pairs are switched to either the positive and negative or the negative and positive with the positive or negative half cycle output through a common transformer.

The output stage of the amplifier is fully complementary when operated, employing optional base driver transformers that feature high frequency reduced size load that of conventional output transformers.

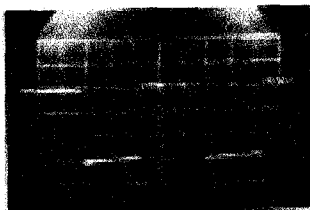
The driver transformer has a special built-in winding of heavy gauge copper with a square cross section. The built-in winding technique isolates the center tap exactly to eliminate ground loops thus insulating the listener of power supply hum.

The main filter capacitor has an unusually high capacity value of 15000 μ F so that only the minimum amount of feedback need be used to optimize the stability factor and also provide reserves of power output at 20KHz. Other circuit design tips have been included which provide proper operation even when driving the variable speakers which are required by a 20KHz load.

Real signals (left) and right channel driver output from meters are provided with both output voltage (volts) and VU level indicators. Meter indications have been added changing to follow signal changes in program level.

OPERATIONAL THEORY

Amplzilla achieves absolute neutrality to distortion of any kind, at any frequency, as shown in these photos.



200W square waves into 8 Ohms at 200 Watts R.M.S.



200W square waves into 8 Ohms at 200 Watts R.M.S.

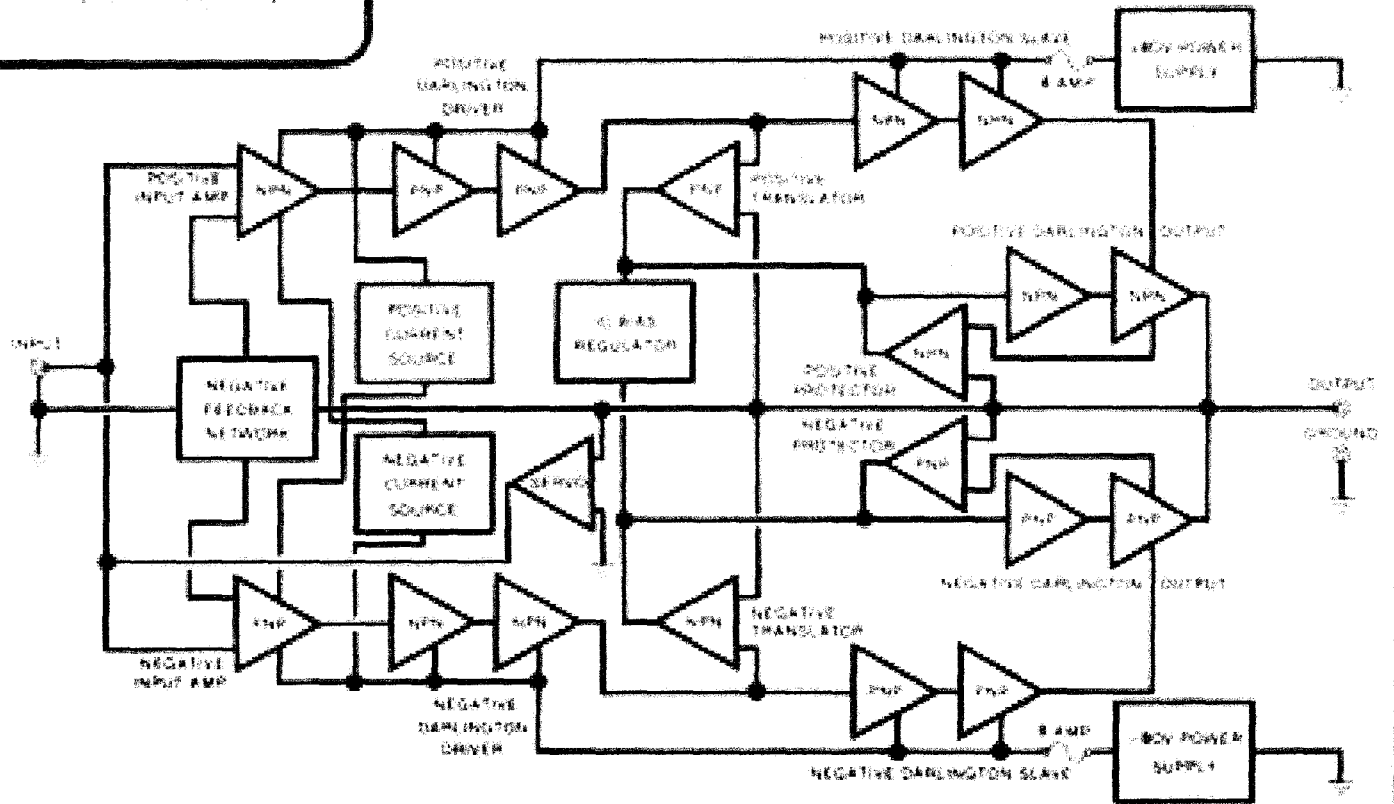


Amplzilla at clipping (240 Watts R.M.S.) at 20 KHz - Note practically zero recovery time.



Competitive unit at clipping at 20 KHz - Note Breakup with delay and distortion.

**AMPZOLA II BLOCK DIAGRAM
(1 CHANNEL ONLY)**



UNPACKING

Immediately upon receiving AMPZILLA, inspect the carton for evidence of fire handling during shipment. Then, carefully inspect 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 should the occasion arise requiring the subsequent re-packing of the amplifier. The shipping materials have been carefully designed to transport your AMPZILLA with a minimum of disturbance.

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

INSTALLATION

Although AMPZILLA contains forced air ventilation with over 1000 sq. inches of heat dissipating fan area, its effectiveness can be severely reduced should the air flow to the fan be restricted. Avoid locating AMPZILLA in cabinets which might block the air flow to the fan intake opening. Provide adequate air vents or ports below and above the amplifier and exhaust to prevent a chimney effect. Care should also be exercised that the installation is not made near hot air vents that might affect the efficiency of AMPZILLA's thermoelectric cooling system. Do not locate AMPZILLA in conjunction with a high rack load as a drag ring which will restrict proper air flow to the fan port.

If more than one AMPZILLA is used in an installation, the fans are staggered to stack the fans with one above the other with no partition in between. The amplifiers should be mounted so that the fan port of the lower amplifier is directly aligned to the air intake of the upper amplifier.

RACK MOUNTING: A special version of AMPZILLA is available from your dealer for use in a 19 inch rack. Be certain that insulating plastic bushings (provided with the panels) are used prior to mounting wires to provide proper electrical isolation of the unit from the rack rack.

COMMERCIAL INSTALLATIONS: For installations requiring heavy duty multiple-cable racks, 24 hour continuous operation, and/or high ambient temperature conditions, a special installation kit containing ruggedized cabling is provided and a high-speed fan is available from your dealer at slight additional cost. Contact your dealer for details.

All connections are made on the rear side of the amplifier so that the internal heating wiring may be completely concealed from view.

CAUTION: All connections should be made with the AC Power Switch on the OFF position. Under no circumstances should any input or output wiring be altered while the amplifier is powered. To make certain that the amplifier is not on, disconnect the line cord and all other connections are completed. Make absolutely sure that before plugging in the line cord the power switch is in the OFF position.

ELECTRICAL CONNECTIONS

SPEAKER OUTPUT WIRING

Either dynamic or electrostatic type loudspeakers may be connected to the put-put binding posts. Each individual speaker requires two leads. One is connected between the amplifier's red binding post and the "hot" or positive terminal of the loudspeaker system. The ground lead is connected between the amplifier's black binding post and the negative terminal of the loudspeaker system.

Connect the left speaker to Channel A and right speaker to Channel B. (See the gram on page 7.)

All wiring should be done with wire no smaller than 18-gauge. Two-conductor plastic-covered lamp cord (lamp cord, obtainable from any hardware store, electrical appliance store, high fidelity dealer, or even some drug stores, is ideal for this purpose. For distances exceeding 25 feet, 18-gauge wire is desirable to minimize power loss and maintain good electrical speaker damping. If over 50 feet, 12-gauge wire is recommended.

CAUTION: Care must be exercised that short circuits between the leads are avoided which will activate the amplifier's short circuit protection systems. The use of dual banana plugs to connect your loudspeaker system to AMPZILLA greatly reduces the chance of accidental short circuits. In addition, they will provide an automatic disconnection should someone accidentally trip over the speaker cables.

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. The simplest way to achieve proper phasing is to interconnect both speakers with the identically same lead orientation.

To make this in-phase connection, observe the wire or cable leading on the back binding post. Most frequently a ridge or groove can be observed on one edge or one side of the lamp cord wire pair. Sometimes one of the wires is twisted (brown colored) while the other is bare (copper colored). Another technique some times used is to provide a thread trace along one of the wires.

Whatever tracer is used, it should be used to identify the wire lead which is attached to the black terminal on the amplifier and the negative (-) terminal on the loudspeaker system. The same tracer identification procedure must be used in attaching the other channel with its associated loudspeaker system.

Verification of proper phasing is achieved by noting a unity in sound when tone controls perform during stereo operation. A more evident verification is an enhanced bass response when speakers are connected in phase compared to a reduced bass response when the speakers are connected out of phase (phase opposite).

SPEAKER RATINGS

Because of the high-power capability associated with AMPZILLA, it is important to determine the Power Capacity Rating of the speaker used with AMPZILLA. This rating must be equivalent to or exceed that of AMPZILLA (for the corresponding impedance) to protect the speaker from possible damage. General American Sound Co. cannot be responsible for damage done to a speaker where the speaker rating is lower than that obtainable from AMPZILLA. To provide some additional protection to the speaker, a fuse of lower current rating may be inserted into the front-panel fuse holder on AMPZILLA. Consult your dealer or the speaker manufacturer for proper determination of this fuse value.

IMPEDANCE RATINGS

Most speakers have either 16, 8, or 4 Ohm impedance ratings. Consult the specifications accompanying the speaker to determine their ratings. If no specific Ohm rating can be determined, the rating can generally be identified by measuring the speaker with an Ohmmeter. The rating is usually 20% to 30% higher than the Ohms read with the Ohmmeter.

It is not recommended that a speaker or speaker system combination be used with AMPZILLA where its resulting impedance is less than 4 Ohms. Although no damage should result, the output power will be restricted by the amplifier's protection circuitry and some of the protection fuses might open (blow).

Where two sets of stereo speakers are desired to be driven simultaneously, their combined impedance can be calculated by the following formula:

$$\text{Parallel Connection: } \frac{R1 \times R2}{R1 + R2} = Z_p$$

If the speakers are identical, then the resulting impedance is one-half of each speaker's impedance. (For example, two 8 Ohm speakers result in 4 Ohms when connected in parallel. Two 4 Ohm speakers result in 2 Ohms.)

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

If the speakers are identical, then the resulting impedance is 2 times each speaker's individual impedance. (For example, two 4 Ohm speakers result in 8 Ohms when connected in series.)

Where applications require use of more than two speakers, try to arrange the use of 4 identical speakers, which when connected in 2 pairs sets of 2 speakers in parallel, the resulting impedance is the same as that of each individual speaker.

For public-address applications requiring the use of multiple speakers exceeding four speakers, it is common practice to use matching transformers with each speaker. Two common techniques used to determine the rating of the transformer to be used are based on a 10-Volt system and a 25-Volt system. Because the 10-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.

ELECTROSTATIC SPEAKERS

The use of electrostatic speaker systems in high-quality audio systems has become increasingly popular. Because speaker systems incorporating electrostatic speaker elements represent especially difficult loads for audio amplifiers to handle, potential users of this type of equipment should become acquainted with the unique characteristics involved. An electrostatic speaker is a capacitive-type load. It is not unusual for its equivalent capacitance as seen by the amplifier output terminals to amount to 100pF.

Such a large capacity represents 16 Ohms at 10 KHz and falls proportionately at higher frequencies. Although AMPZILLA can drive this type load better than most high-powered solid-state amplifiers, it is an especially demanding situation. Consequently, it is not recommended that more than one stereo pair of electrostatic speakers be driven by AMPZILLA.

SPEAKER LEVEL CONTROLS

Sometimes with multiple speaker installations it is desired to have speaker level controls or attenuator pads attached to speakers. Although this might be considered desirable with high-powered amplifiers, it is not always practical. The results from the high power being required for the controls or pads that are used. Variable attenuator pads having the necessary 200-Watt rating at 8 Ohms are not widely available. Substituting lower-wattage controls is not recommended because of the high-current requirements involved which will eventually overheat the control elements and result in their destruction. It is recommended that where it is necessary to reduce the speaker output volume, this be done only prior to AMPZILLA'S input and not in the speaker circuitry. If it becomes mandatory that a speaker attenuator pad be used to balance the sound in a multiple speaker installation, then a fixed high-wattage resistor pad is recommended.

AMPLIFIER INPUT

Only a pair of well-shielded audio cables should be used for the input wiring to AMPZILLA. Connect the output of your preamplifier to the inputs of AMPZILLA marked "CH. A" and "CH. B." Be certain you have interconnected the input channel on AMPZILLA which corresponds to the preamplifier output with a similar channel identification. The use of color-coded cables is helpful in maintaining proper channel orientation. Be certain the cable plug is inserted adequately into the preamplifier and amplifier jack so that the outer shield circuit prongs are engaged with the jack's outer shell to maintain "ground" circuit continuity.

To prevent loss of high-frequency response, input cabling should generally be limited to 10 feet.

POWER CORD WIRING

Although many preamplifiers offer power outlet receptacles to plug in the power cord from an amplifier or other high-fidelity equipment, it is absolutely not recommended that AMPZILLA'S line cord be connected into one of these pre-amplifier receptacles. These preamplifier power receptacles have power limits that are determined by their internal fused switch capacity which in most cases is

BELOW that required by AMPZILLA. AMPZILLA'S power consumption requirements are 15 Amperes at 120 Volts continuous duty and 100 Amperes at 120V initial turn-on surge and furthermore a 3-wire outlet having the 3rd wire connected to absolute earth ground is mandatory in order not to void the warranty.

Considering the above instructions, we always recommend plugging AMPZILLA'S line cord plug directly into a 3-wire wall socket having the 3rd wire connected to the electrical ground in the wiring system. (Of course, under any circumstances, use a 3 to 2 pin AC plug adapter without connecting the ground cable to the wall socket grounding system.)

COMMON GROUNDING

It is most unusual for installers of audio systems to refer to the negative side of the input cables as "ground" and also to refer to the negative lead of the speaker terminals similarly as the "ground" wire. However, these two connections are not the same in a high-powered audio amplifier and must never be connected together. Because of the high currents involved in the leads connected to the speaker loads, these leads must never be interconnected to any part of the amplifier chassis or input cable connections. Otherwise, a feedback circuit can be easily formed which can result in potential instability ("micro-boosting") and possible amplifier damage.