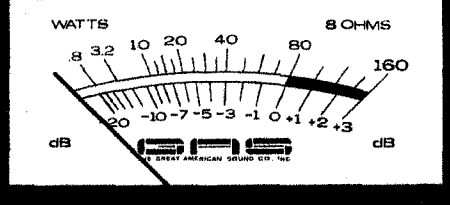
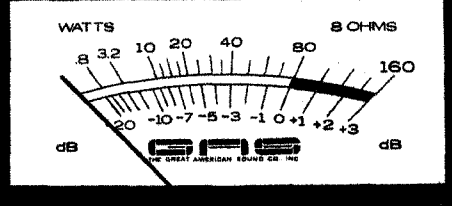
SON OF AMPZILLA

OWNER'S MANUAL





SON OF AMPZILLA

GAS

SPECS

ɔWER OUTPUT

4 OHMS	Minimum 150 Watts per channel, both channels driven, 20 Hz to 20 KHz
8 OHMS	Minimum 80 Watts per channel, both channels driven, 20 Hz to 20 KHz
16 OHMS	Minimum 50 Watts per channel, both channels driven, 20 Hz to 20 KHz

(Industrial rack-panel mount version provides 250 Watts per channel at 2 Ohms)

OTAL HARMONIC DISTORTION & I.M. DISTORTION

4, 8, & 16 OHMS — Less than .08% at any frequency or combination of frequencies, and at any power level to clipping.

ɴPUT SENSITIVITY — 1.0 Volts R.M.S. for 80 Watts into 8 Ohms.

ɴPUT IMPEDANCE — 75K Ohms

ROSSOVER NOTCH – NON EXISTENT

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

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

ɪISE TIME AT 8 OHMS — Better than 2μ seconds. AT FULL POWER AT 20 KHz.
Slew rate equal to 40 Volts per μ second.

ɪEAT-SINK DIMENSION
& DUTY CYCLE — Over 1000 sq. in. total, providing continuous operation at ambient temperatures up to 125° F.

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

ɔVERLOAD PROTECTION & FUSING:
Transistorized dynamic short-circuit protection. Thermal breaker also protects against overheating. 4 B+, B– power supply fuses, 1 AC slow-blow power fuse.

NOISE — Better than 100 dB below full power (unweighted, wide band). 112 dB below ful' power (wide band with R.F. filter).

SIZE:

Std.:	16¼" (W) x 5¼" (H) x 11" (D).
Blk. Panel:	17" (W) x 5¼" (H) x 11" (D).
Rack Panel:	19" (W) x 5¼" (H) x 12" (D).

SHIPPING WEIGHT: 25 lbs.

INTRODUCTION

Your SON of 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 amplification. When properly installed and used with comparable associated equipment, we are certain that your SON of AMPZILLA will give you years of sonic enjoyment.

SON of 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 selection of the SON of AMPZILLA has given us.

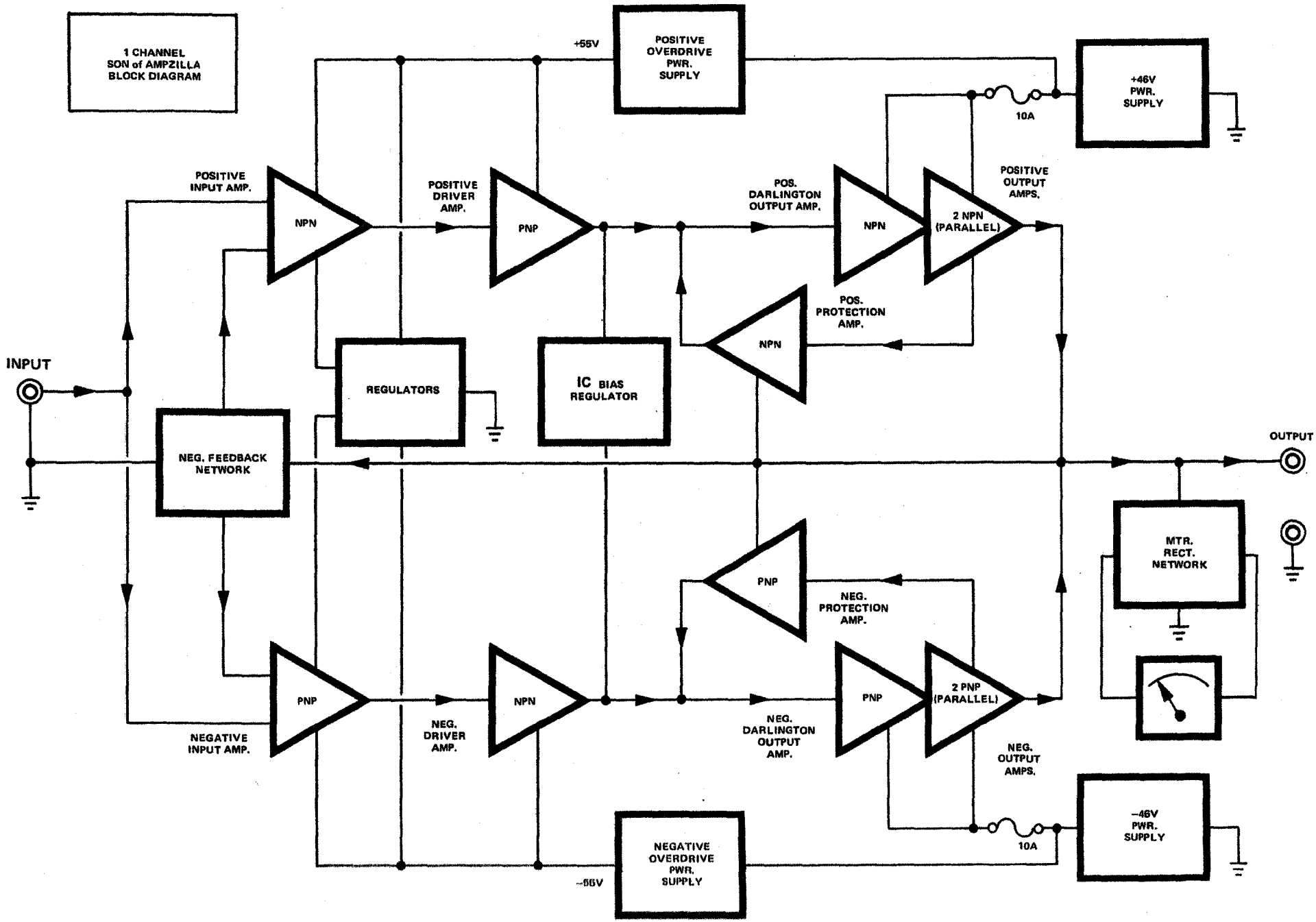
The SON of AMPZILLA is a lower-power-output version of AMPZILLA which has already established itself as an audio-industry classic design. Just as with AMPZILLA, the SON'S entire circuitry from input to output is 100% fully complementary. This is a concept considered essential to optimum sound quality by the founders of Great American Sound Co. Consequently, every product manufactured by G.A.S. Co. utilizes full-complementary circuitry throughout. In addition, all power transistors used in G.A.S. Co. products are manufactured with an epitaxial base which provides a high-frequency response extension five-fold that possible with conventional power transistors. Epitaxial-base power transistors also provide lower saturation resistive power losses than other types popularly used.

Another important SON of AMPZILLA feature is the use of an integrated-circuit output bias system to provide negligible crossover-notch distortion at all signal levels and at all normal operating temperature ranges. This superior bias system also permits the output stages to be operated in class A at all levels below 2 Watts (at 8 Ohms). This important low-level operating characteristic is one which often distinguishes AMPZILLA and the SON of AMPZILLA from many competitive amplifiers in A/B listening comparisons as well as with distortion-analyzer comparisons.

Specially featured in the SON of AMPZILLA is its TWO-Ohm operating capability. This feature is particularly useful for multiple (parallel) speaker installations. Capability of over 11 Amperes output current per channel (250 Watts at 2 Ohms) is provided in the SON of AMPZILLA by 8 total output transistors (4 in parallel per channel) mounted on heat sinks with over 1000 sq. in. total surface area. In spite of the generous usage of transistors in the SON of AMPZILLA, its circuitry is uniquely elemental with just three definable stages (1 - input amplifier, 2 - driver amplifier, and 3 - compound Darlington-connected output amplifier). The resulting reduction of higher-order distortion components is readily discernible with careful listening. Circuit stability considerations are also simplified as a result of this reduction in stages providing unconditionally stable performance with all reactive loads — capacitive or inductive.

Another unique feature of the SON of AMPZILLA is the inclusion of supplementary positive and negative driver power supplies. These supplies extend the driver amplifier output capabilities beyond the normal linear-region requirements of the output stages. The resulting over-drive voltage capability eliminates the possibility of distortion due to inadequate-linear driver power when the SON of AMPZILLA is driven at or near its peak clipping point. This feature is especially important with 16 and 8-Ohm operation.
Rear-lighted left and right channel power-output level meters are provided with both output Wattage calibrations and VU level indication. Meter movements have minimized damping to follow rapid changes in program level.

OPERATIONAL THEORY


1 CHANNEL
SON of AMPZILLA
BLOCK DIAGRAM
+55V
POSITIVE
OVERDRIVE
PWR.
SUPPLY
+46V
PWR.
SUPPLY
10A
POSITIVE
INPUT AMP.
NPN
POSITIVE
DRIVER
AMP.
PNP
POS.
DARLINGTON
OUTPUT AMP.
NPN
2 NPN
(PARALLEL)
POSITIVE
OUTPUT
AMPS.
POS.
PROTECTION
AMP.
NPN
INPUT
REGULATORS
IC BIAS
REGULATOR
NEG. FEEDBACK
NETWORK
OUTPUT
MTR.
RECT.
NETWORK
PNP
NEG.
PROTECTION
AMP.
PNP
NPN
PNP
2 PNP
(PARALLEL)
NEGATIVE
INPUT AMP.
NEG.
DRIVER
AMP.
NEG.
DARLINGTON
OUTPUT
AMP.
NEG.
OUTPUT
AMPS.
10A
-46V
PWR.
SUPPLY
-55V
NEGATIVE
OVERDRIVE
PWR.
SUPPLY

UNPACKING

Immediately upon receiving the SON of AMPZILLA, 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 occured.

Please save the shipping carton and all the associated packing materials for later use should the occasion arise requiring the subsequent rehandling of the amplifier. The shipping materials have been carefully designed to transport your SON of AMPZILLA with a minimum of disturbance.

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

CAVEATS

It must be remembered that the SON of AMPZILLA is an extremely wide-band amplifier with extensive output power driving capabilities. Certain considerations must be exercised when operating it. Read and observe these precautionary considerations carefully before connecting or using the SON of AMPZILLA.

1. Never plug an input cable into the amplifier while the power is on. This may cause R-F burn-out of the output transistors and is not covered under the warranty.

2. Never apply the "thumb test" (touching with your finger) to the input jack. Speaker damage and/or amplifier damage is a strong possibility due to R-F rectification and hum. The Great American Sound Company Inc. is not liable for speaker damage caused by improper use of its equipment.

3. Loads below 2 Ohms impedance should not be connected to the amplifier. Although no damage should result, the power is restricted below this impedance and repeated fuse blowing may occur.

4. Do not restrict the airflow near the heat dissipating fins of the amplifier. Even though the SON of AMPZILLA is designed to operate with moderate heat rise, air circulation around the amplifier is necessary for proper operation.

5. Turn-on of SON of AMPZILLA should be avoided when its inputs are not connected to a preamplifier output or equivalent load source. In addition, it is recommended to have a speaker or equivalent load connected to the output terminals of the SON of AMPZILLA before power is supplied to the amplifier.

6. Because of the power limitations of some hi-fi preamplifiers' AC convenience outlets and AC power off-on switches, do not connect SON of AMPZILLA's power cord into your preamplifier AC convenience outlets unless you are fully certain that their power ratings are capable of 7 Amp. @ 120 V continuous duty and 50 Amp. @ 120 V surge. Great American Sound Company will not be responsible for damage incurred to an underrated preamplifier AC power switch or outlet.

7. Note that some meter movement when SON of AMPZILLA is turned on is normal.

INSTALLATION

Although the SON of AMPZILLA contains over 1000 sq. inches of heat-dissipating fin area, its effectiveness can be severely reduced should the air flow to the fins be restricted. Avoid locating the SON of AMPZILLA in cabinetry which might block the air flow to the fins. Provide adequate air vents or ports both below and above the amplifier to achieve a chimney effect. Care should also be exercised that the installation is not made near hot-air vents that might affect the efficiency of the SON of AMPZILLA's fin-cooling system.

If more than one SON of AMPZILLA is used in an enclosed installation, a low-noise "whisper" fan might be provided to augment the air flow.

Where the SON of AMPZILLA is to be inserted into a cabinet panel, a 16½ inch by 5¼ inch cutout must be provided. A supporting shelf, or rails should be used in addition so that the front panel need not support the entire weight of the unit. Provide openings and/or vents for proper ventilation as described above.

RACK-MOUNTING: A special version of the SON of AMPZILLA is available from your dealer for use with a 19-inch-wide metal rack. Be certain that insulating plastic bushings (provided with the panel) are used under each mounting screw to provide electrical isolation of the unit from the metal rack.

CAUTION: Under no circumstances should you mount the unit with the panel uppermost. This might cause overheating of the unit.

ELECTRICAL CONNECTIONS

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

CAUTION: All connections should be made with the AC Power cord disconnected. Under no circumstances should either input or output wiring be attempted while the amplifier is powered. Be certain before plugging in the line cord that the preamplifier power switch is in the OFF position.

SPEAKER OUTPUT WIRING

Either dynamic or electrostatic-type loudspeakers may be connected to the output 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 second 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 diagram on page 7.)

All wiring should be done with wire no smaller than 16 gauge. Two-onductor plastic-covered lamp cord (zip cord), obtainable from any ardware store, electrical-appliance store, high-fidelity dealer, or even ome drug stores, is ideal for this purpose. For distances exceeding 25 eet, 14-gauge wire is desirable to minimize power loss and maintain ood electrical speaker damping. For over 50 feet, 12-gauge wire is ecommended.

CAUTION: Care must be exercised that short circuits between the eads are avoided which will activate the amplifier's short-circuit pro-ection systems. The use of dual-banana plugs to connect your loud-peaker system to the SON of AMPZILLA greatly reduces the chance f accidental short circuits. In addition, they will provide an automatic isconnection should someone accidentally trip over the speaker abling.

SPEAKER PHASING

o obtain proper stereophonic phasing and correct bass response, it is ecessary that the left and right stereo speakers are connected in hase. The simplest way to achieve proper phasing is to interconnect oth speakers with the identically same lead orientation.

o make this in-phase connection, observe the wire or cable coding on he cord being used. Most frequently a ridge or groove can be observed n one edge or one side of the lamp cord wire pair. Sometimes one of he wires is tinned (silver colored) while the other is bare (copper olored). Another technique sometimes used is to provide a thread racer along one of the wires.

Vhatever tracer is used, it should be used to identify the wire lead vhich is attached to the black terminal on the amplifier and the nega-ive (—) terminal on the loudspeaker system. The same tracer identifica-ion procedure must be used in attaching the other channel with its ssociated loudspeaker system.

Verification of proper phasing is achieved by noting a unity in sound vhen solo vocalists perform during stereo operation. A more-evident erification is an enhanced-bass response when speakers are connected n phase compared to a reduced-bass response when the speakers are onnected out-of-phase (phases opposing).

SPEAKER RATINGS

Because of the high-power capability associated with the SON of AMPZILLA, it is important to determine the Power Capability Rating f the speaker used with SON of AMPZILLA. This rating must be quivalent to or exceed that for the corresponding impedance for the SON of AMPZILLA to protect the speaker from possible damage. Great American Sound Co. cannot be responsible for damage done to a speaker where the speaker rating is lower than that obtainable from SON of AMPZILLA.

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 specification 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 SON of AMPZILLA where its resulting impedance is less than 2 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 simul-taneously, their combined impedance can be calculated by the following formulas.

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

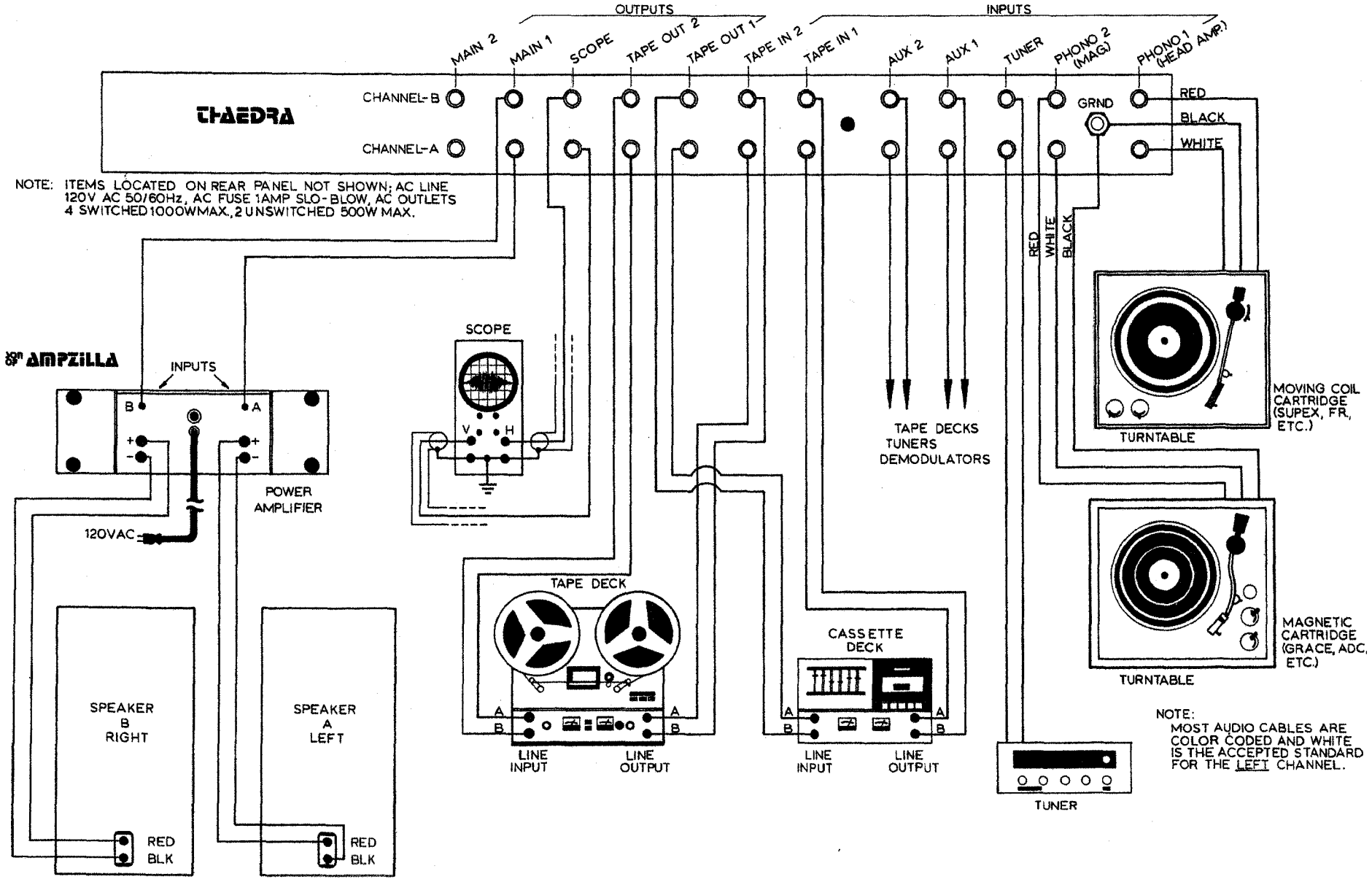
If the speakers are identical, then the resulting impedance is one-half of each speaker's impedance. (For example, two 8-Ohm speakers result in 4 Ohms when connected in parallel. Two 4-Ohm speakers result in 2 Ohms.)

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 series 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 trans-formers with each speaker. Two common techniques used to determine the rating of the transformer to be used 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 connec-tions.


OUTPUTS
INPUTS
MAIN 2
MAIN 1
SCOPE
TAPE OUT 2
TAPE OUT 1
TAPE IN 2
TAPE IN 1
AUX 2
AUX 1
TUNER
PHONO 2 (MAG)
PHONO 1 (HEAD AMP.)
THAEDRA
CHANNEL-B
CHANNEL-A
GRND
RED
BLACK
WHITE
NOTE: ITEMS LOCATED ON REAR PANEL NOT SHOWN; AC LINE 120V AC 50/60Hz, AC FUSE 1AMP SLO-BLOW, AC OUTLETS 4 SWITCHED 1000WMAX., 2 UNSWITCHED 500W MAX.
AMPZILLA
INPUTS
B
A
POWER AMPLIFIER
120VAC
SCOPE
V
H
TAPE DECKS
TUNERS
DEMODULATORS
MOVING COIL CARTRIDGE (SUPEX, FR, ETC.)
TURNTABLE
MAGNETIC CARTRIDGE (GRACE, ADC, ETC.)
TURNTABLE
TAPE DECK
LINE INPUT
LINE OUTPUT
CASSETTE DECK
LINE INPUT
LINE OUTPUT
TUNER
SPEAKER B RIGHT
SPEAKER A LEFT
RED
BLK
NOTE:
MOST AUDIO CABLES ARE COLOR CODED AND WHITE IS THE ACCEPTED STANDARD FOR THE LEFT CHANNEL.

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 electro-static speaker is a capacitive-type load. It is not unusual for its equivalent capacitance as seen by the amplifier output terminals to amount to 10μF.

Such a large capacity represents 1.6 Ohms at 10 KHz and falls proportionately at higher frequencies. Although the SON of 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 the SON of AMPZILLA, with the exception of the Quad ESL of which two pairs may be driven in parallel.

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. This results from the high-power rating required for the controls or pads that are used. Variable attenuator pads having the necessary 150-Watt rating at 4 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 the SON of 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 SON of AMPZILLA. Connect the output of your preamplifier to the inputs of SON of AMPZILLA marked "CH A" and "CH B." Be certain you have interconnected the corresponding cable 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

Before connecting the SON of AMPZILLA power line cord into a power outlet receptacle on your preamplifier, consult both the rating of the receptacle and the associated power off-on switch. SON of AMPZILLA's power consumption requirements are 7 Amperes at 120 Volts continuous duty and 50 Amperes at 120 Volts initial turn-on surge. The G.A.S. Co. cannot be responsible for damage to a preamplifier power switch where its rating is inadequate to handle the power requirements of the SON of AMPZILLA.

COMMON GROUNDING

It is not 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 established which can result in potential instabilities ("motor boating") and possible amplifier damage.

OPERATION

Rotate the volume control on the associated preamplifier to minimum setting (maximum counter clockwise). Now turn on the AC power off-on switch (on the preamplifier). The two meters should be illuminated and the green pilot light should glow. Finally, adjust the volume control (on the preamplifier) for the desired sound output level.

The two meters will indicate the average power levels at which the amplifier channels are being driven. The power Wattage indications are correct for 8-Ohm speakers. If 4-Ohm speakers are being used, double the Wattage indications to obtain the correct power-level readings. For 2-Ohm speakers, multiply the readings four times. You will note that the meters will show a lower average level of power is generally used than you might expect to encounter. Remember, however, that the peak Wattage demands might be as much as 20 times the average reading indicated on SON of AMPZILLA's meters.

HEADPHONES

The SON of AMPZILLA is easily capable of driving any type headphones available. However, frequently the sensitivity of the headphones must be reduced to permit matching their output level to that of most loudspeakers. This can be done by inserting a 50 to 100-Ohm, 5-Watt resistor in series with each phone signal lead.

GENERAL MAINTAINANCE

Great care has been taken at Great American Sound Co. to assure that your amplifier is as flawless in appearance as it is electronically. All metal work is heavy-gauge aluminum which is black anodized inside and out for protection from corrosion.

The plastic faces of the two meters should be cleaned with only a soft cloth and a mild detergent such as Windex. Use of an abrasive-type cleanser might permanently scratch the meter faces.

FUSE: The amplifier is protected by an AC line fuse on the rear panel. When power is applied to the amplifier and the meter lights and pilot light do not illuminate, check the line fuse. If the fuse seems faulty, replace it with only a slow-blow fuse of equal value. Replacement with a fuse of a higher current rating will not protect the amplifier and void the warranty.

WARRANTY

THIS PRODUCT IS WARRANTED UNDER THE FOLLOWING CONDITIONS:

1. PRODUCT IS PURCHASED THROUGH AN AUTHORIZED G.A.S. CO., INC. DEALER.

2. WARRANTY COVERS NORMAL OPERATING CONDITIONS OF HOME USE.

3. WARRANTY PERIOD BEGINS AS OF DATE OF SALE PROVIDED THIS CARD IS FILLED OUT AND REGISTERED BY THE AUTHORIZED G.A.S. DEALER WHERE THE PRODUCT WAS PURCHASED. REGISTRY PERIOD IS 20 DAYS.

4. DELIBERATE MISUSE, MISHANDLING, FAILURE TO REPORT RECEIVING DAMAGED MERCHANDISE, OR UNAUTHORIZED TAMPERING OR MODIFYING TO THIS MERCHANDISE AUTOMATICALLY VOIDS ALL WARRANTIES.

5. WARRANTY PERIOD FOR ALL G.A.S. CO., INC. FACTORY WIRED PRODUCTS IS 5 YEARS COVERING BOTH PARTS AND LABOR. TRANSPORTATION CHARGES TO AND FROM THE DEALER OR FACTORY ARE EXCLUDED.

6. WARRANTY ON ALL G.A.S. CO., INC. PRODUCTS USED IN ANY OTHER FASHION OTHER THAN STATED ABOVE SHALL REDUCE THE WARRANTY TIME PERIOD AND OTHER CONDITIONS TO NEGOTIATIONS BETWEEN G.A.S. CO., INC. AND PROSPECTIVE USER.

7. THIS WARRANTY SHALL EXTEND TO EACH SUCCESSIVE OWNER PROVIDED G.A.S. CO., INC. IS NOTIFIED BY REGISTERED MAIL WITHIN 20 DAYS OF RESALE BY INITIAL OR PRESENT OWNER. THIS NOTIFICATION SHALL CONSIST OF DATE OF SALE, AMOUNT, NAME AND ADDRESS OF NEW OWNER.

8. G.A.S. CO., INC. GUARANTEES THAT ALL G.A.S. CO., INC. PRODUCTS ARE FREE FROM DEFECTS IN MATERIALS AND/OR WORKMANSHIP FOR THE REQUIRED WARRANTY PERIOD. OWNERS OF G.A.S. CO., INC. PRODUCTS ARE ENTITLED TO FREE PERIODIC CHECKS, AT EITHER DEALER OR FACTORY LOCATIONS, TO INSURE PRODUCT PERFORMANCE TO ORIGINAL SPECIFICATIONS.

   G.A.S. CO., INC. WILL REPAIR OR REPLACE ANY AND ALL DEFECTIVE PARTS AT NO CHARGE, PROVIDED ALL OTHER CONDITIONS OF THE WARRANTY ARE IN ORDER. THIS FREE CHECKOUT SERVICE IS LIMITED TO A MAXIMUM OF ONCE A YEAR, PER UNIT, PER CUSTOMER.

9. THIS WARRANTY IS NOT VALID UNLESS ACCOMPANIED BY SALES SLIP VALIDATION OR PROPERLY STATED INVOICE (COPY).

GAS
THE GREAT AMERICAN SOUND CO., INC.

20940 LASSEN STREET
CHATSWORTH, CALIFORNIA 91311 U.S.A.
(213) 998-8100

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