

Sanders Sound Systems

Magtech Amplifier

OWNERS MANUAL

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INSTALLATION

LOCATION

To provide for adequate ventilation, you should allow at least two inches of unobstructed space above the amplifier. Cooling air must be able to flow upward through the heat sink fins on the side of the amplifier. So do not block the bottom of the fins by placing the amplifier directly on a thick carpet. It must be placed on a firm, flat surface like a shelf so the amplifier's feet can hold the heat sinks up off the floor.

Because of its large power supply, the amplifier produces a small local magnetic field that may be picked up by low-level circuitry such as preamplifiers, turntables, and the like. For this reason, you should also provide at least four inches of space between the amplifier and these low-level components.

INPUT CONNECTIONS

Signal input is made through two rhodium-plated RCA (unbalanced) or two XLR (balanced) type connectors. Use one or the other. Do not use both RCA and XLR connectors at the same time as they will load each other improperly.

OUTPUT CONNECTIONS

The output to your speakers is made through heavy-duty, gold-plated, five-way binding posts. Be sure of the correct speaker phasing by connecting the speaker cables to the same color posts for each channel.

Check and double-check that the speaker terminals are not shorted together by any loose strands of wire. Check at both the amplifier and speaker connections. Shorting the output terminals together will blow the output fuses and can damage the amplifier.

POWER CONNECTIONS

Be certain all associated equipment is turned off before making any connections. Insert the power cord into the AC LINE INPUT on the back panel and then connect it to an appropriate power source.

This an extremely powerful amplifier. It should be plugged directly into a mains receptical. A power conditioner is not needed or recommended. If you feel you must use a power conditioner or generator, it must be able to deliver at least 3000 watts of power to the amplifier.

ELECTRICAL PROTECTION AND FUSES

Although not essential, it is a good idea to use a surge protector to prevent damage to the amplifier in the event of an electrical storm or other causes of abnormally high mains voltage. These are inexpensive and can be obtained from any hardware store.

OPERATION

There is a switch on the back panel that may be used to turn the amp on and off. But the **MAGTECH AMPLIFIER IS DESIGNED TO BE LEFT "ON" CONTINUALLY**. It is extremely efficient. It only draws thirty watts at idle (less than most preamps), so feels cool and does not waste much electricity.

Electronics last longer when they are left on, as repeatedly switching them on and off is stressful to them. You can expect an indefinite life-span if you just leave it on. Also, when left on, the amplifier will stabilize its internal temperature and produce the lowest distortion levels.

Check that the cables are properly phased (that the cables are connected to the red and black terminals on the speakers and amplifier identically for both channels). Out-of-phase connections will result in an image that is diffuse and directionless rather than having pin-point precision.

Some preamplifiers produce large turn-on and turn-off DC voltages, which you will hear as a "thump." If your preamplifier does this, be aware that these surges probably will briefly drive the amplifier to full output. When an amplifier has as much power as the Magtech Amp, such voltage surges can damage speakers and/or blow fuses. Well-designed preamps won't do this, but it is surprising how many expensive preamplifiers have this problem.

To avoid such problems, *turn on your preamplifier first*. Within five seconds, solid state preamplifiers will have stabilized so you can safely turn on the Magtech amplifier. If your preamplifier uses vacuum tubes, you should wait a full minute before turning on the amplifier.

When turning off the system, *turn off the amplifier first*, wait about a half minute for the power supply capacitors to mostly discharge, then turn off the preamplifier. An excellent way to avoid this cumbersome start-up and turn-off procedure is to always leave your preamplifier and amplifier on.

OUTPUT FUSE REPLACEMENT

The amplifier has a 10 amp, fast-blow, output fuse for each channel. These are located on the back panel near the red speaker binding posts.

The amplifier will deliver over 600 watts/channel on music when using these fuses. If you have relatively delicate speakers, you may wish to replace these fuses with 2 amp, fast-blow fuses to protect your tweeters. These fuses are American AGC types, which are standard fuses that measure $\frac{1}{4}$ " diameter by $1\text{-}\frac{1}{4}$ " long.

If you should blow a fuse, you may access the fuse by pressing firmly inward on the cap and turning it $\frac{1}{4}$ turn counter-clockwise (bayonet type). The cap will then spring out and can be removed, the fuse replaced, and the cap reinstalled.

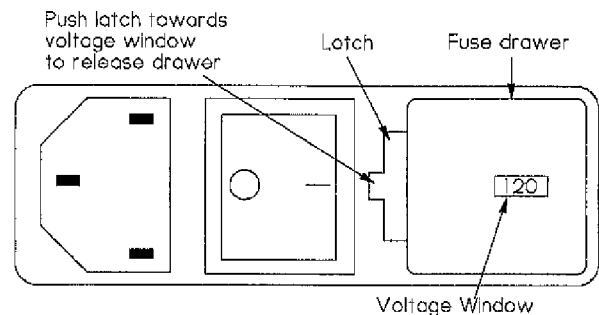
You should never blow a fuse. If this occurs, you should find the problem and correct it. Note that by far the most common cause of blown fuses is changing speaker cables while leaving the amplifier on. It is hard to avoid touching the two cable ends together when changing cables, and shorting the cables will usually blow the fuse. So always turn the amplifier off and wait 30 seconds for the capacitors to discharge before changing cables.

LINE FUSE AND VOLTAGE SELECTOR

There are a pair of line fuses inside the fuse drawer that is located on the back of the amplifier. This drawer also has a window in it that shows the mains voltage that the amplifier uses.

To change the fuses or the mains voltage you must open the drawer. The drawer is spring loaded and will pop out if you release the latch that holds it.

To release the latch, you will need a small tool such as a small screwdriver or ball point pen. Put the tool in the notch as shown in the drawing, and push the latch towards the voltage window. The drawer will release and you can gently grasp it and pull it out of the amplifier.



With the drawer in your hand, you will see the fuses. You can simply pull them out of their spring clips and replace them.

A fuse blows to protect the amplifier for a reason. You should identify the cause and correct it before replacing the fuses.

The correct fuse size is a metric, 5mm x 20mm. For 200+ volt circuits, a 10 amp, slow-blow type should be used. For 100+ volt circuits, a 15 amp, slow-blow type should be used.

The mains voltage can be selected so that the amplifier can be used anywhere in the world. To do so, remove the fuse drawer and look inside where the drawer fits. You will see a white plastic "star" that shows the voltage on it.

Remove this star by pulling it straight out of the amplifier. You can do this by putting your little finger or a ball point pen or small screwdriver into the recess on the left side of the star and pulling it out.

With the star in your hand, you will see that it has four sides and each side has a different voltage printed on it. These are 100, 120, 220, and 240. Pick the one that best matches the mains voltage in your location. If your mains voltage is 230, use 240 volts on the star.

Orient the star so that your voltage will face outward from the amplifier and show through the window in the drawer, then push it back into the amplifier. You can now slide the drawer back into place and press firmly against its spring until it is flush and the latch "snaps" and holds the drawer in place.

CARE AND CLEANING

If you wish to clean your amplifier, use a diluted ammonia-based cleaner. Window cleaners like "Windex" also work well. *Do not use any abrasive cleaners or chemical solvents* like "Ajax", acetone, or paint thinners.

Use particular care not to damage the aluminum faceplate. Aluminum is a medium hardness metal and although it is anodized, it can be easily scratched by the careless use of tools during installation.

The amplifier may overheat and the finish may fade if exposed to direct, unfiltered sunlight or intense heat for prolonged periods.

Save your box and packing materials. They will be very helpful for moving or if you need to ship the unit for servicing by the factory.

DESIGN PHILOSOPHY

Magnetic speakers require massive amounts of current and power. This causes the power supply voltages in an amplifier to change dramatically (typically by 30%) between idle and full power.

Electronics have their lowest distortion and optimum performance at a specific design voltage. If the voltage varies, the amplifier's performance will suffer.

An additional problem in amplifiers is that they require bias to eliminate crossover notch distortion and determine their class of operation. The bias will vary as the voltage does, which will further degrade performance.

An amplifier's voltage will fluctuate wildly as dynamic music is played. This causes the amplifier's distortion and bias to vary constantly and fail to meet its full performance potential.

As if all these problems are not enough, as an amplifier's voltage sags under load, the power it can deliver is greatly reduced. If the voltage would remain stable, the amplifier could produce much more power. Since most audiophile speaker systems require several hundred watts of power to avoid clipping and compression of the dynamic range, power is extremely important.

THE SOLUTION

All quality, line-level electronics use voltage regulation in their power supplies to produce a stable voltage, regardless of load or the mains voltage. Audiophiles would not consider using a source component that did not have regulated power supplies. So why use amplifiers with unregulated supplies?

The main problem is heat. Amplifiers operate at much higher voltages and currents than line level source components. These higher voltages and currents forces conventional regulator designs to waste large amounts of energy, which wastes expensive electricity and causes the amplifier to get very hot.

Also, many regulator designs radiate RF (Radio Frequency) energy when switching high currents and voltages. This RF gets into the amplifier's electronics and can cause instability, oscillation, and noise. As a result of these problems, modern power amplifiers do not use regulated power supplies and fail to take advantage of the benefits available from doing so.

Sanders has solved these problems by developing a voltage regulator that is essentially 100% efficient. There is no heat dissipated by the regulator system. There is no high-power/high-voltage switching that causes heat generation or RF problems.

The regulator in the Magtech amplifier maintains a stable voltage regardless of load or reasonable changes in the line voltage feeding the amplifier. It runs stone cold, produces zero RF energy, and is simple and reliable.

Unlike other amplifiers, the distortion in the Magtech amplifier is virtually unchanged regardless of power level. The bias is stable regardless of load.

The regulator makes it possible to obtain a 50% increase in power over the same amplifier operated unregulated. In its stereo form, the Magtech will deliver 500 watts/channel into an 8 ohm load and 800 watts/channel into a 4 ohm load.

The Magtech is built into the same chassis as the ESL Amp, so it is compact enough (17" wide, 5-1/2" tall, 14" deep) to place on a shelf or into a cabinet. It is also light enough (54 pounds) to be picked up. Like the ESL amp, it runs very cool and may be left on continually without concern for power usage.

The Magtech amplifier also uses the same advanced technology that makes the ESL amp able to drive the most difficult loads without performance-degrading, protective circuitry. The Magtech amplifier is the only amplifier on today's market that features a linear voltage regulator. The result is a compact, yet extremely powerful amplifier that is ideally suited to driving the most difficult magnetic speakers.

SPECIFICATIONS

Rated Power

500 Watts/channel, 20Hz to 20kHz into an 8 Ω load

800 Watts/channel, 20Hz to 20kHz into a 4 Ω load.

Bandwidth

-3dB at 5Hz through 100kHz

Distortion

Less than 0.01% from 20 Hz to 20 KHz at full output

Typically less than 0.004% at small signal levels

Gain

26dB

Slew Rate

500 Volts/microsecond

Input Impedance

47k Ω unbalanced or balanced

Noise

More than 110dB below rated output

Output impedance

Less than 0.02 Ω from 20Hz to 20kHz

Dimensions

17 inches wide by 5.5 inches tall by 14 inches deep
(43 cm W x 14 cm T x 36 cm D)

Weight

54 pounds (23.2 kG)

WARRANTY

Sanders electronics are warranted to be free from defects in material and workmanship for life. The warranty applies to the original owner.

During this period, Sanders will, at its option and without charges, either repair any part or assembly of parts that is found to be defective in material or workmanship, or replace the product with one of comparable quality, subject to the following limitations and exclusions:

This warranty shall not apply to any product which has been subject to misuse, abuse, negligence, or accident.

To obtain warranty service, contact the factory using the contact information listed below. The purchaser must prepay shipping costs to the factory.

Sanders Sound Systems
12054 Deer Trail Road
Conifer, CO 80433
Phone: (303) 838-8130
FAX: (303) 838-8130
E-mail: Roger@sanderssoundsystems.com
www.sanderssoundsystems.com