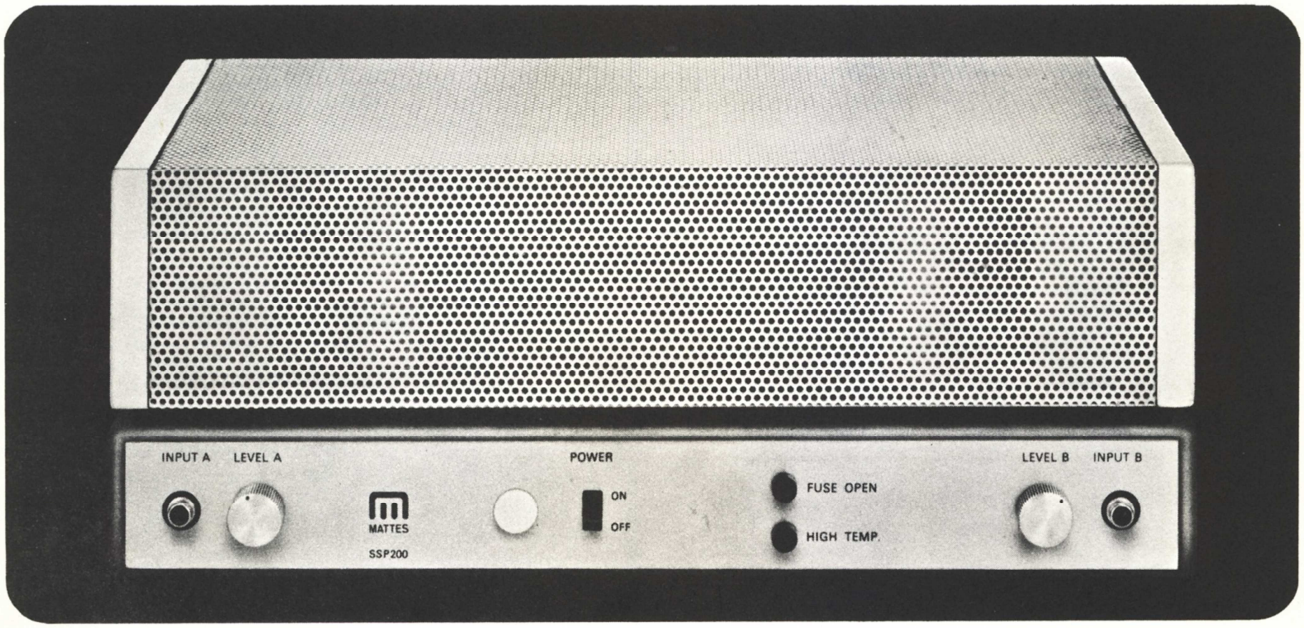
Installation and Operating Instructions
Mattes SSP/200 Power Amplifier



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MATTES ELECTRONICS INC. 4937 WEST FULLERTON AVE., CHICAGO, ILLINOIS 60639

Introduction

The Mattes SSP/200 is a power amplifier of extraordinarily high output and exceptional fidelity, designed for professional use in broadcast or recording applications, and for home music systems of highest quality.* The SSP/200 is carefully assembled and thoroughly tested before shipment; it will perform for many years without attention, when properly installed. The following precaution is of particular importance.

Under no circumstance must an inexperienced person be permitted to open the chassis of the amplifier in an attempt to repair or modify it.

Mattes Electronics Inc., its field representatives and dealers are always ready to assist music system owners in the installation and proper operation of their systems.

Preliminary

The unusual circuit of the SSP/200 makes the amplifier virtually immune to accidental failure, permitting Mattes Electronics to offer a strong guarantee, protecting the owner of the amplifier. Like any precision instrument, the SSP/200 requires a normal respect for its complexity, and simple good judgment in its application. Observe the proper line voltage limit: 130 volts maximum; do not abuse the amplifier merely to demonstrate its robustness; remember that the SSP/200 is designed for music and speech reproduction, and not for servo or alarm applications. If connected properly, according to these instructions, the SSP/200 will probably never require attention.

Location

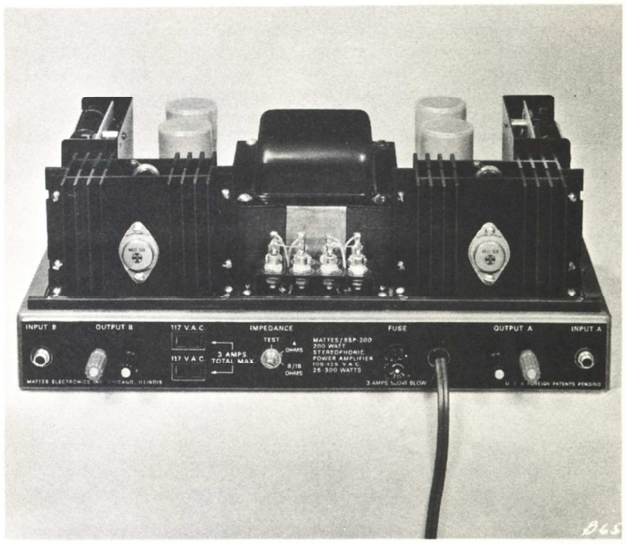
The amplifier can be placed in any convenient location. Some air circulation is desirable, particularly under warm ambient temperature conditions, but because the SSP/200 is unusually efficient, even for a solid state amplifier, ventilation requirements are minimal. The temperature rise is so low that the amplifier may be placed in reasonably close proximity to F-M tuners and record storage space.

Connecting the SSP/200

No tools are needed to install the SSP/200, although a coin or screwdriver is to be used in the very last installation step.

There are seven connections to be made to the SSP/200 to place it in operation: two input plugs, four loudspeaker leads and the a.c. line cord. The illustration shows the rear panel of the amplifier and the location at which each of the connections is made. Make the a.c. line cord connection last of all.

*U.S. and foreign patents pending.



Loudspeaker Connections

Note that the "Impedance" switch on the rear panel has been set at the factory to the "Test" position which limits power output to 12 watts per channel. This has been done to protect loudspeakers which might not be able to sustain the full power output of the amplifier, should this be inadvertently delivered due to an error in installation wiring. It is a good idea to set the switch in "Test" position whenever an adjustment of the system is to be made, since a defective tuner, tape recorder, preamplifier or pickup cartridge might produce a sustained signal which the amplifier would, in turn, transmit at high power to the loudspeaker. The adjustment of the "Impedance" switch is explained at the end of the installation instructions. Do not adjust the switch until set-up is complete.

If desired, loudspeaker connections may first be made to dual General Radio plugs, which can then be inserted into the binding posts provided on the amplifier. Some types which will fit are General Radio 274-MB, E. F. Johnson 108-230, G-C Electrocraft 33-010, Superior SPGK2BC and Pomona MDP. Use of these plugs facilitates removal and attachment of loudspeaker leads when the amplifier is used in laboratory applications. If plugs are not used, the wires may be connected to the binding posts by feeding the stripped ends of the wires through the small holes in the metal centers of the posts, and then turning down the plastic covers to hold the wires securely in place.

The *black* posts are the "ground" (chassis) leads to the loudspeakers; the *colored* posts are the "hot" leads. Correct phasing of the loudspeakers in stereophonic systems is automatic when the same terminals of each loudspeaker are connected to the same posts—black or colored—on the amplifier. If there is no way of being sure of which opposite ends of the loudspeaker wires match, consult the instructions supplied with the loudspeaker systems for a preferred method of phasing.

When making the loudspeaker connections, be certain that stray filaments of wire do not touch the opposite wire or binding post, short-circuiting the output of the amplifier. If this is the case. little or no sound will come from the short-circuited loudspeakers until the fault is corrected. Should the amplifier be operated continuously without location or removal of the short-circuit, it will eventually shut off automatically, while illuminating the front panel lamp marked "high temperature." When the short-circuit is removed, the amplifier will play again without interruption.

Loudspeaker leads may be of 18- or 22-gauge lamp cord, or any heavier or more durable two-conductor wire suited to the installation.

If it is desired to use the SSP/200 with one speaker system only, one of the channels should be left unused and disconnected entirely from the loudspeaker system. This will have no effect upon the amplifier, whether or not the unused channel is driven by a source connected to its input jack. On the other hand, the two output connections should not be interconnected in an attempt to convert the amplifier to a single-channel 200-watt unit.

Input Connections

Conventional audio cables with phono plugs are to be used to connect the SSP/200 to the program source, that is, the tuner, preamplifier, tape playback amplifier or high-output pickup cartridge. Since the input impedance of the SSP/200 is 100,000 ohms, it will work well with any vacuum-tube or transistor preamplifier or tuner delivering at least one volt output. The SSP/200, like other solid-state equipment, does not require time to "warm up," as tube equipment does due to filament heating. Because of this, noises produced during the warm-up of a tube preamplifier or tuner may be heard through the SSP/-200 unless the level control of the preamplifier is maintained at zero during the warm-up period.

The input jacks on the front panel are internally wired in parallel with those on the rear panel, and may be used to make the input connection where this is more convenient.

Impedance Selector

The amplifier has been limited to an output power of approximately 12 watts per channel, by the setting of the "Impedance" switch to the "Test" position at the factory. This switch, on the rear panel, should now be turned, using a screwdriver or a coin as a tool. The switch, marked "Impedance," is in the position marked "Test"; turn it to align the slot in the control shaft with either the *4* or *8/16* positions, depending upon the nominal impedance of the loudspeaker systems being used. If, for any reason, the system fails to operate properly, it is wise to protect the loudspeakers by returning the switch to the "Test" position before making any adjustment. When the impedance is correctly matched by rotation of this switch, the system may be turned on and the level controls adjusted. Generally speaking, it is preferable to keep the amplifier off when the impedance switch is being adjusted. Note that the volume will not increase when the switch is turned to *4* or *8/16*; only the clipping point will change.

Final Adjustment

When inputs and loudspeakers are properly connected, turn the level controls counter-clockwise to their stops, check to be sure that the power switch is *off*, and connect the line cord to an a.c. outlet. Check to be sure that the "Impedance" switch is in "Test" position. Move the power switch *on*; the pilot light alongside should now be on. Turn the level controls slowly clockwise, check to see that both channels are operating properly by inserting a signal from a program source, and then turn the level controls counter-clockwise again and turn the amplifier *off*.

Auxiliary A.C. Outlets

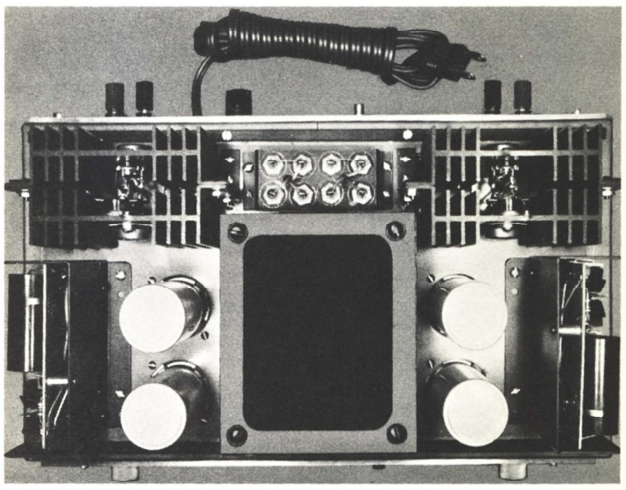
Two auxiliary a.c. outlets are provided on the rear panel for the connection of associated equipment. These outlets are controlled by the power switch on the front panel of the SSP/-200, but are not protected by the fuse of the amplifier. The total current drain of any devices connected to these outlets should not exceed 3 amperes (power consumption of 350 watts).

A.C. Line Voltage Adjustment

The SSP/200 will deliver full power (100 watts per channel) with an 8-ohm load and an a.c. line voltage of 125 volts. Should the a.c. supply voltage in your locality be consistently below 120 volts, available power output at extremely low and high frequencies will be reduced. The low line voltage may be compensated by an adjustment which your dealer can perform, if necessary.

WARNING:

THIS ADJUSTMENT SHOULD BE MADE BY YOUR DEALER. REMOVAL OF THE BOTTOM PLATE OF THE AMPLIFIER EXPOSES WIRING CAPABLE OF DELIVERING DANGEROUS ELECTRIC SHOCK.



Signal Light Functions

When the SSP/200 is operated under conditions which cause the output transistors to become hot, as would be the case were a short-circuit applied while the amplifier was driven continuously, an automatic device turns off the amplifier until the temperature of the heat sinks, upon which the power transistors are mounted, drops below a certain temperature. The amplifier will then come on again, without re-setting of any switch or replacement of a fuse. During the inoperative period, the light marked "HIGH TEMP" will be illuminated on the front panel, indicating that the interruption of service is temporary, and due to abnormal temperature rise.

The second warning light is turned on when the fuse opens; this fuse is located in the fuse holder on the rear panel of the amplifier. Should this occur, it is likely that more than 250 watts have been drawn from the amplifier for a sustained period. A spare fuse is supplied with each amplifier, and should be installed with the a.c. power off and the level controls counterclockwise. Should the fuse immediately open again, indicated by the light being again illuminated, it is likely that component failure has taken place. In no event should the fuse be replaced by one of higher value.

While these lights are provided as an aid to diagnosis of an interruption of service, it is worth noting that the probability of either type of interruption occurring is extremely low. The most frequent cause of thermal failure, excessive transistor dissipation, is eliminated in the Sharma Circuit*, used in the SSP/200, by the operation of the output stage without d.c. bias current.

Carton and Packing

Should it ever be necessary to transport the amplifier or ship it to another place, the original shipping carton should be used, or another like it obtained for this purpose. The carton and fillers have been carefully designed to withstand the trials of interstate shipment; both should be saved.

In Case of Difficulty

If there is reason to believe that an SSP/200 requires repair, the nearest Mattes dealer should be contacted for instructions. If this is impractical, write directly to Mattes Electronics Inc., 4937 Fullerton Avenue, Chicago, Illinois 60639, describing the trouble and asking for return authorization.

An enclosed warranty card states the terms of the Mattes warranty. ALL CORRESPONDENCE REGARDING REPAIR OR WARRANTY SERVICE MUST CONTAIN THE SERIAL NUMBER OF THE SPECIFIC AMPLIFIER IN QUESTION. This number is visible through the bottom grille, and is also on the Performance Certificate and the shipping carton. *An amplifier without a serial number is without warranty.*

*Trade Mark

Damping Factor

The damping factor of the Mattes SSP/200 is very high, indicating that the voltage across the loudspeaker terminals will be a direct reproduction of the voltage variations at the amplifier input, regardless of changes in loudspeaker impedance with frequency. One possible effect of this is a reduction in resonant "boom" in underdamped loudspeaker systems. This is sometimes perceived as a decrease in bass response, although it is almost always a smoothing of response which high-quality amplifiers introduce to such systems. This will be found to be true in many custom installations where loudspeakers with very low resonant frequencies have been mounted in closets or walls providing less than critical damping.

Loudspeaker Protection

Musical program material places certain requirements on the loudspeaker systems and amplifier used, if natural sound reproduction is to be achieved. One is that the amplifier be capable of delivering, and the loudspeaker of sustaining, brief signals of three or four times the average power level. On occasion, the ratio may be much higher, a typical value for piano music being five or six times. For this reason, an amplifier capable of reproducing music at an average level of 15 watts must also be able to provide short-term levels equivalent to 75 watts or more, if peaks, such as are produced by drum-beats or cymbals, are to be reproduced without clipping. Under these conditions, the voltage swing available from the amplifier is the number of practical importance: it is 80 volts for the SSP/200.

When the SSP/200 is playing orchestral music at an average level of 25 to 35 watts per channel, short-term outputs of nearly 100 watts are probably being reached frequently, without ill effect upon the loudspeaker because of their brevity. On the other hand, an amplifier rated at 50 watts cannot properly reproduce music above an average level of 10 or 15 watts without clipping the waveforms of the music at times.

The impedance switch on the rear panel of the SSP/200 may be used to limit the power input to the loudspeaker systems, if this is desired. If set to the 4-ohm position and used with 8-ohm loudspeakers, the SSP/200 will deliver 50 watts per channel r.m.s.; if set in the "Test" positon, only 12 watts per channel will be available.