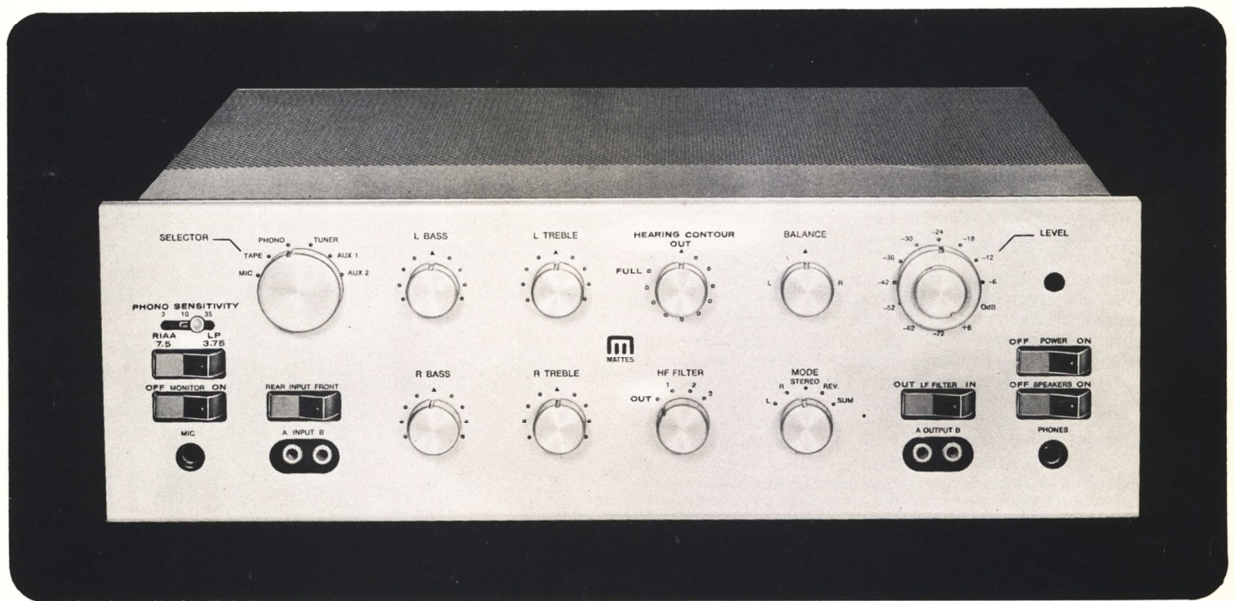




Model SSA/200

## MATTES 200 WATT SOLID STATE INTEGRATED AMPLIFIER

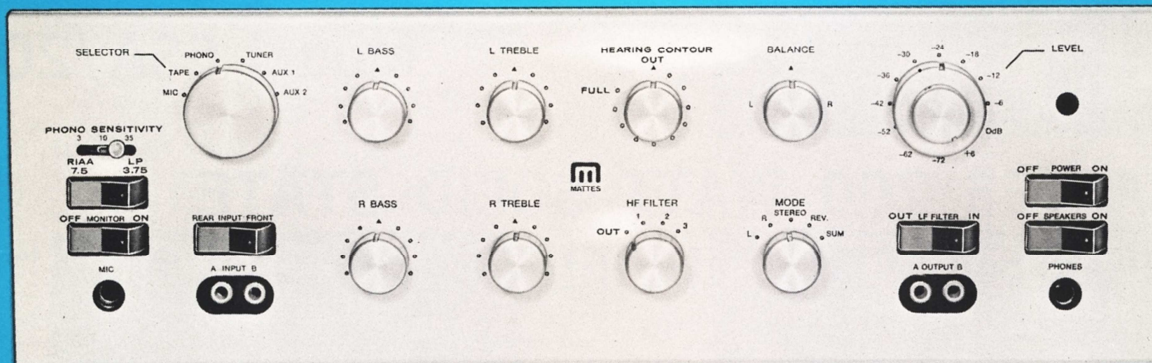


### A NEW HIGH IN COMPLETE SOLID STATE ELECTRONICS FOR HIGH FIDELITY

The new SSA/200 Integrated Amplifier is another first by Mattes. It is the first amplifier to combine in one unit complete high gain preamplifier and control facilities with such high output power—the highest available from any amplifier on the market today. It incorporates the 200-watt Sharma circuit solid-state power amplifier, first introduced in the Mattes SSP/200 Power Amplifier, which was unanimously endorsed by leading equipment reviewers and testing laboratories.

The all solid-state preamplifier section is not only universal, with unusually complete rear and front input facilities, but includes precision controls of equalization and volume never offered before, which makes flexible, exact settings easy and positive for the discriminating professional and audiophile.

The SSA/200 is an ultimate purchase . . . available now . . . for those who seek fine equipment with assurance that it will meet the demands of the future.



Front panel is designed for precision control of function, level and equalization. Rocker switches provide instant selection of input and circuit conditions.

### SSA/200—GREATEST ADVANCE IN HI-FI ELECTRONICS

Never before has a high-gain preamplifier been combined with a high (or even medium) power amplifier in a single compact unit. Add to this the facts that the SSA/200 has controls of unprecedented range, accuracy, flexibility and convenience for every demand of fine music reproduction—plus the highest power output with low distortion available today (200 watts total) . . . and you will see why we say that the SSA/200 is an advance into the future of the hi-fi electronic system. When the pluses of all solid-state circuitry and the totally cool-running efficiency of the Sharma circuit power system are considered, the discriminating audiophile will find a totality of features to commend the SSA/200.

### ABOUT THE CONTROLS

The front panel illustrated above gives a quick picture of the comprehensiveness and versatility of control and switching available to the operator for all possible variations of input source, equalization and emphasis, and level of the reproduced sound. Some switching is "set and forget" for the most-used modes of operation and individual preferences—but with instant options to meet special conditions; labeling is clear and unequivocal. To insure absolute tracking of both stereo channels, active filter tap-switch controls, which are completely independent of any other function are used for a number of controls, an exclusive MATTES feature. The individual channel BASS and TREBLE boost and cut controls have nine positions, provide an unusual 24 dB of upward and downward control in 6 dB steps with an attenuation tolerance of only 2 dB in total attenuation at each step. The VOLUME control is a 12-step attenuator, with a continuous vernier which may be used as a continuous conventional full-range control, or for between-step adjustment. HEARING CONTOUR (usually labeled "Loudness") and BALANCE are continuous for exact settings to meet listener preference.

### ABOUT THE SHARMA CIRCUIT POWER AMPLIFIER

The MATTES Sharma circuit<sup>1</sup> is a unique approach to high power solid state amplifier design which is the subject of USA and foreign patents granted and pending.

The Sharma circuit produces its unprecedented high rated power of 100 watts per channel with these remarkable advantages: (1) the cost of the power amplifier in terms of dollars per watt is the lowest of any comparable unit; (2) the efficiency of the output circuit, expressed as the ratio of audio output power to power supplied, is the highest of any solid state or vacuum tube amplifier in the high quality field; (3) this extremely high efficiency leads to a cool-running unit which eliminates the heat problem and permits

very compact dimensions, both of which simplify and provide a new flexibility to the installation problem. Cool operation, of course, extends the life of all electronic components in the unit.

How does the Sharma circuit achieve these remarkable advantages? For a detailed explanation of basic circuit details, the reader is referred to the footnote reference. In essence, however, the Sharma circuit permits the output transistors to operate without the bias current that all other transistor circuits require for amplification on a favorable distortion basis. This bias current is a waste in that it uses up a substantial portion of the heat capacity of the output transistors which is consequently not available for handling the audio signal. In the Sharma circuit, no current flows through the output transistors when no signal is present. Hence, the full capability of the transistors may be used for the useful audio signal.

1. "A 200-Watt Solid State Stereo Amplifier," Madan Sharma, Journal of the Audio Engineering Society, July, 1965.

### 100 WATTS PER CHANNEL IS IMPORTANT

Our purpose in designing the SSA/200 was to provide an electronic system which would meet the needs of the audiophile and serious music listener not only for the present, but for the remotely foreseeable future. Using present day high-quality low-efficiency loudspeakers, we have confirmed that powers approaching 100 watts per channel are indicated for reproduction of the piano at listening levels which are representative of live experience in moderate size rooms. This study was reported in HI/FI STEREO REVIEW, December 1965. A reprint of this article is available free on request. The piano is a modest example; the powers required by groups up to the full orchestra are surely greater. Although you may not wish to achieve live listening levels, nor require quite so much power because of a small listening space, the 100 watt figure has additional hedges to the future that make it a prudent purchase. One is that future developments in fine loudspeakers may very possibly involve still lower efficiencies, and it is predictable that the availability of high power amplifiers of reasonable cost will encourage development in that direction; your investment in an SSA/200 is insurance for the future.

There are dividends in your choice of an SSA/200. There is ample power for present or future extension speaker systems without starving the primary listening system. And add to all these the fact that reviewer after reviewer has commented that the high power Sharma circuit somehow has a new high in reproduction quality even at moderate to low listening levels.



Rear of unit with multiple inputs, output terminals, test/impedance switch and AC outlets for other components.

## RELIABILITY

The power amplifier of the SSA/200 incorporates all of the experience gained in the field with our first product, the SSP/200 power amplifier. The output transistor system has been made virtually immune to accidental and improperly designed imposed load conditions by a new sophisticated load-sampling circuit. If the built-in limits inherent in the basic circuit design are exceeded by a partial short circuit or an improperly low load impedance which would damage the power transistors, the circuit protector automatically senses the danger and instantly cuts off the power to the affected channel for approximately 1 second; it repeats this process, sampling the load condition for a few milliseconds. This results in a characteristic warning sound which is a clue to the operator to examine the speaker system for shorts, miswiring or incorrect load impedance. When the condition is corrected, the system will operate normally.

The power supply system has been immunized against voltage surges due to appliances connected to the household system, which because of their unpredictable nature, sometimes resulted in rectifier-filter failures.

MATTES, like all manufacturers of sophisticated electronic devices, is in large measure dependent on the quality of components which it purchases from specialist suppliers. To insure against failures to the maximum extent possible, we purchase only premium parts from the most reliable sources. We subject these parts to careful incoming inspection before assembly. After assembly, the complete unit is operated for many hours under abnormal conditions of line voltage and power output to weed out any residual faults. After this "torture" test, the unit is remeasured for specified performance in order to detect components which may not be up to standard even though they did not actually fail. Units which pass all these tests are shipped to your dealer.

MATTES retains responsibility for your amplifier after all of this care and testing for a period of two years from the date of your purchase provided a warranty is on file in your name.

SSA/200 is priced at \$675. Slightly higher in the south and west.

## ABOUT OUR SPECIFICATIONS

MATTES policy is to give complete, meaningful specifications to describe the product. Because many performance

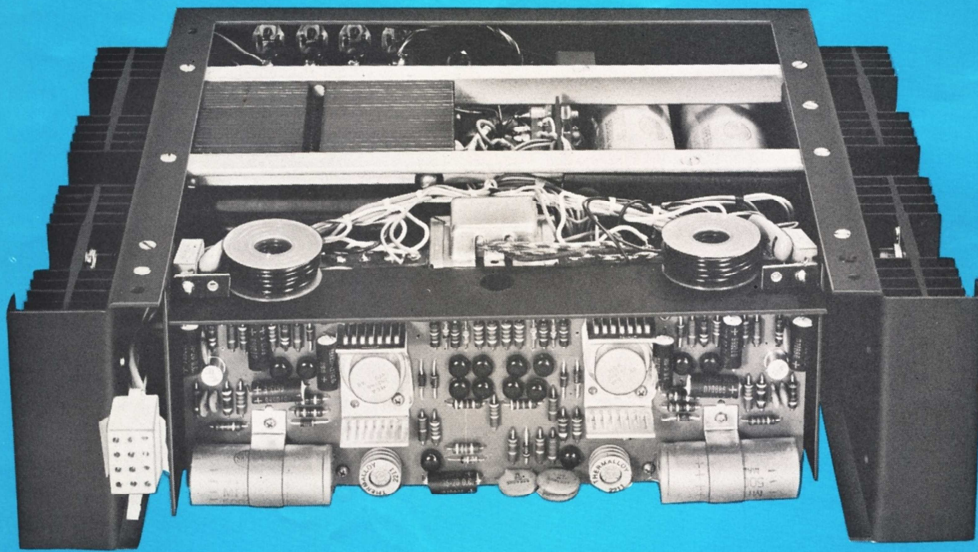
characteristics cannot be expressed by a single, simple number, we give more information than is customary for manufacturers of mass-produced equipment, most of which are in the medium-to-low power category.

All specifications reflect the design decisions inherent in the product concept and the consequent engineering details. MATTES design in the SSA/200 (and in the SSP/200 Power Amplifier) is based on the initial premise that high power capability is essential for highest performance of the entire system when the finest loudspeakers are to be used. This premise has been validated by many hundreds of MATTES owner reports from people who have had extensive listening experience with lower powered amplifiers. In aiming at high power output, there has been no sacrifice in any important specification area; indeed, the SSA/200 exceeds the performance of many lower powered amplifiers in factors which affect listening quality.

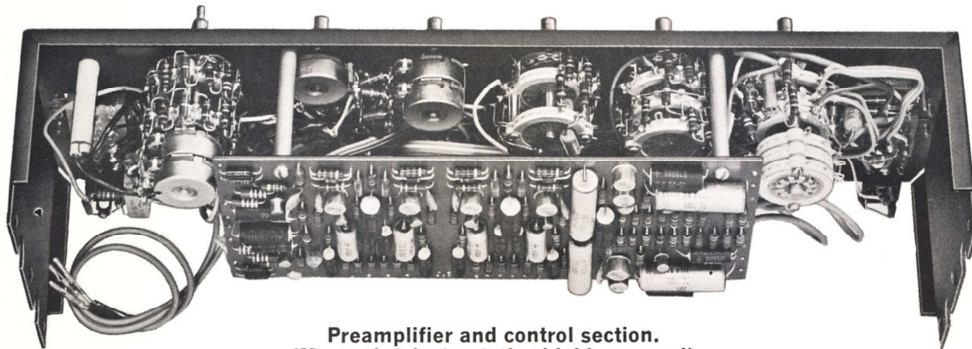
Measurements on very high quality amplifiers cannot be made casually. The first requirement is an intimate knowledge of the rating basis for the particular device under test. Of equal importance is the use of the most advanced, most accurate test instrumentation available. Even initially accurate test equipment can deteriorate subtly and lead to erroneous results and equipment maintenance is therefore of prime importance. Many of the performance measurements on the SSA/200 involve such minute quantities that they strain the capability of the best measuring equipment available with respect to accuracy. The ear is the final and most suitable criterion for quality evaluation under these conditions.

We submit our products for type testing by unbiased, neutral laboratories which we believe to be competent within the limitations of the measurements art as discussed above. The results of these tests are published in due course in high fidelity magazines. Each production amplifier is individually measured by us to insure that our specifications are met. The purchaser receives a report with the equipment on the performance of the individual unit.

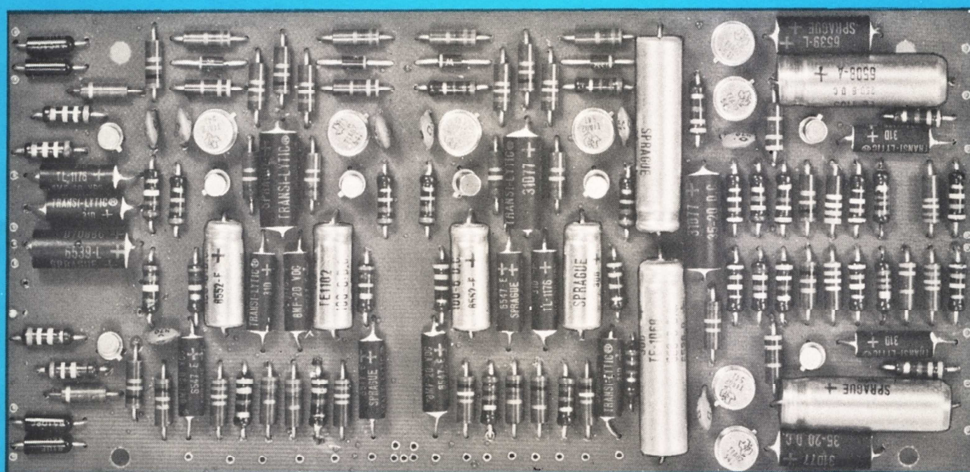
Should the purchaser be inclined to have his equipment tested "free" by a partisan service, we suggest thoughtful consideration of the circumstances and a rereading of the above commentary. MATTES will retest any product for the original owner provided we have a warranty card on file, at any time, at no cost except transportation charges both ways on the equipment.



**Driver and power amplifier assembly. Output transistors are on large heat sinks at right and left sides.**



**Preamplifier and control section.  
(Magnetic/electrostatic shield removed)**



**Preamplifier printed circuit board with  
precision components assembled.**

## MECHANICAL

**SIZE:** Front panel: 14 $\frac{3}{4}$ " wide by 4 $\frac{7}{8}$ " high. Panel thickness:  $\frac{3}{16}$ ". Chassis: 14 $\frac{1}{8}$ " wide by 13" deep by 4 $\frac{3}{8}$ " high. Rear connector projection:  $1\frac{1}{16}$ ". Knob projection in front of panel:  $1\frac{3}{16}$ ".

**WEIGHT:** 33 lbs. net; 38 lbs. shipping.

**FINISH:** Pale Gold. Panel etched in three colors. Normal settings of most controls and switches are indicated by RED positions.

## ELECTRICAL

### FREQUENCY RESPONSE:

20-20,000 Hz; +0, -0.5dB ( $\pm 0.25$ dB)

15-30,000 Hz; +0, -2.0dB ( $\pm 1.00$ dB)

10-50,000 Hz; +0, -3.0dB ( $\pm 1.5$ dB)

**RATED CONTINUOUS POWER OUTPUT:** Not less than 200 watts (100 watts per channel) at 1,000 Hz at 0.1% total harmonic distortion (THD). Not more than 0.75 dB down from 100 watts per channel at 20 Hz for 0.25% THD. Not more than 1.5 dB down from 100 watts per channel at 15,000 Hz for 0.5% THD. Not more than 1.75 dB down from 100 watts per channel at 20,000 Hz for 0.75% THD. (Ratings encompass both 8 and 4 ohm loads, are taken with both channels driven, with rated line voltage. See later specification).

**MAXIMUM CONTINUOUS POWER OUTPUT:** The following typical data indicates the substantial margin of power above the rated values which is available at frequencies from 200 to 2000 Hz which are of great importance in the reproduction of music. At 8 ohms: 128 watts at 200 Hz for 0.25% THD; 128 watts at 1000 Hz for 0.1% THD; 123 watts at 2000 Hz for 0.25% THD. At 4 ohms: 138 watts at 200 Hz for 0.25% THD; 116 watts at 1000 Hz for 0.1% THD; 110 watts at 2000 Hz for 0.25% THD. (Measurements are for both channels driven, with rated line voltage. See later specification).

**INTERMODULATION DISTORTION:** Not more than 0.1% at any power from 100 to 10 watts per channel. Not more than 0.5% at 1 watt.

**TOTAL HARMONIC DISTORTION:** See figures given in specification of rated continuous power output.

**DAMPING FACTOR:** 260 at transistor output, 20 Hz to 1000 Hz; 130 measured at amplifier output terminals (through internal loudspeaker switch leads). (Note: In any amplifier with high intrinsic damping factor, the apparent damping factor at the loudspeaker is dictated almost entirely by the lead resistance between the actual amplifier output and the speaker terminals. For example, a pair of #18 leads 25 feet long will result in a damping factor of about 25 at the loudspeaker if the damping factor of the amplifier is infinite (zero internal output impedance. With the SSA/200, the damping factor at the speaker will be about 23, indicating that the amplifier can be completely neglected as a factor in affecting speaker performance.

The SSA/200 is believed to have by a wide margin the highest intrinsic damping factor of any medium to high power amplifier available. Low lead resistance from amplifier output to loudspeakers will insure maximum possible damping action obtainable as it affects speaker performance.

**AC LINE VOLTAGE:** As shipped, the unit is set on the high line voltage tap to insure that the equipment will not be operated inadvertently outside the proper voltage limits for output transistors and power supply components. Test results at the factory are recorded for the nominal line voltage for this high voltage tap. If the amplifier is subsequently tested for power output and other characteristics which are voltage dependent (as virtually all amplifiers are), the line voltage must be adjusted to 125 volts to obtain correct results. The same results will be obtained with the low line voltage tap at 117 volts if this adjustment has been changed by the dealer to correspond with power service conditions at the installation. It is necessary to lay some stress on this because we find careless technicians and uninformed testers who grind out meter readings with no regard for correct voltage conditions.

Use the high line voltage tap for the amplifier as shipped from the factory if you do not know your line voltage, or if it ranges between 120 and 130 volts. Have your dealer change the unit to the low line voltage tap if you are certain that the line voltage does not appreciably exceed 120 volts during the normal operating hours. Your power company will advise you of line voltage conditions at the outlet where you are operating the equipment. A multivolt model for export is available through our Export Division.

**LINE POWER:** 35 watts no signal. 300 watts at rated power output. Power line frequency, 50-60 cycles.

INPUTS	SENSITIVITY	IMPEDANCE	LOCATION
Microphone	3.5 millivolts;	100,000 ohms;	rear/front
Tape Head	3.5 millivolts;	100,000 ohms;	rear/front
Phono	3.5 millivolts;	47,000 ohms;	rear/front
Tuner	350 millivolts;	200,000 ohms;	rear/front
Aux. 1	350 millivolts;	200,000 ohms;	rear/front
Aux. 2	1 volt;	1,000,000 ohms;	rear only
Tape Mon.	350 millivolts;	10,000 ohms;	rear only
Power Amp.	1 volt;	10,000 ohms;	front only

(Where optional front/rear inputs are specified, front input impedance is 47,000 ohms.)

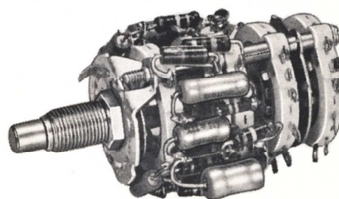
**NOISE:** (including hum, taken with inputs shorted), -80 dB for Phono (10 and 35 mv settings), Tuner, AUX 1 and 2; -75 dB microphone; -65 dB Tape head.

**BASS and TREBLE CONTROLS:** Individual for each channel, each with 9-position switches for flat and 24 dB cut and boost in 6 dB steps at 20 Hz and 20,000 Hz. Accuracy  $\pm 2$  dB. See curves on back page.

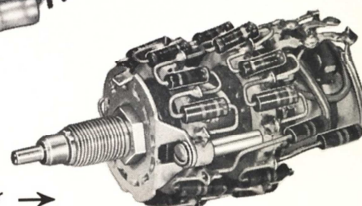
**EQUALIZATION:** Phono record for RIAA and LP and tape head for 3.75 and 7.5 inches per second are provided with an accuracy of  $\pm 1$  dB from 30 to 20,000 Hz.

**HF FILTER:** Four positions from flat to 14, 22, and 33 dB down at 20,000 Hz,  $\pm 3$  dB. See curves on back page.

**LF FILTER:** 12 dB per octave type. 3 dB down at 45 Hz; 22 dB down at 20 Hz; 35 dB down at 10 Hz. See curves on back page.



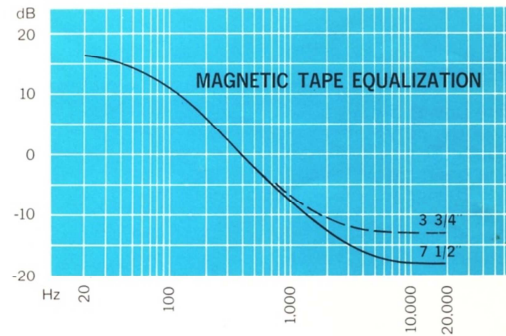
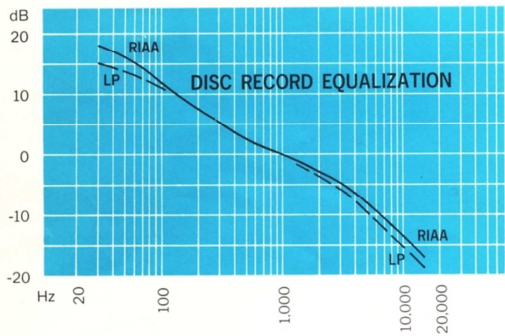
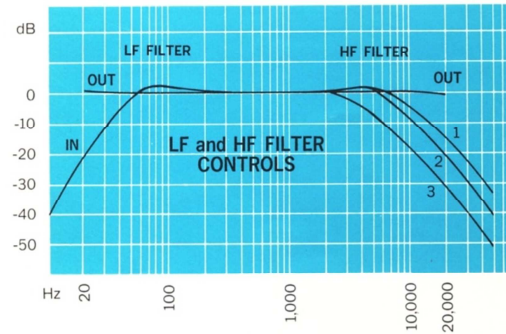
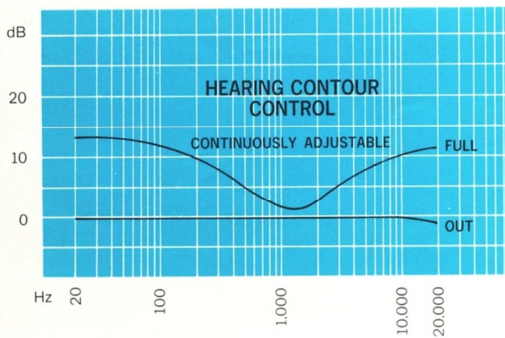
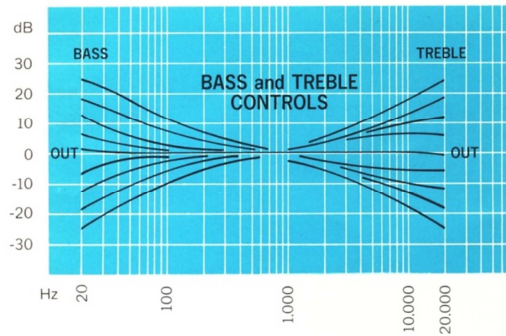
Function selector switch ↑



Stepped level control with continuous vernier →

Two examples of the precision assemblies used in the SSA/200

# SSA/200 CONTROL and EQUALIZATION CURVES



## MATTES SSP/200 WATT POWER AMPLIFIER



This is the basic 200-watt Sharma circuit solid state stereo amplifier for use with separate preamplifiers or other input systems. Provides two 100-watt channels with 1 volt sensitivity for full rated output. Has front and back inputs with individual potentiometer controls for each channel. Has 4,  $\frac{1}{16}$  ohm settings, plus reduced-power TEST position on rear switch. Draws only 25 watts from 50-60 cycle line at no signal input and 300 watts at moments of maximum power output due to the efficiency of the Sharma circuit, resulting in an ultracool, compact assembly. IM distortion less than 0.1% at rated output. For other specifications, ask for free descriptive bulletin. New electronic protective circuit for extreme reliability. \$425, slightly higher in the south and west. Rack adaptor kit \$39.50.

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

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