Owner's Manual

Model VTM200

MONOBLOCK POWER AMPLIFIER

audio research
HIGH DEFINITION®

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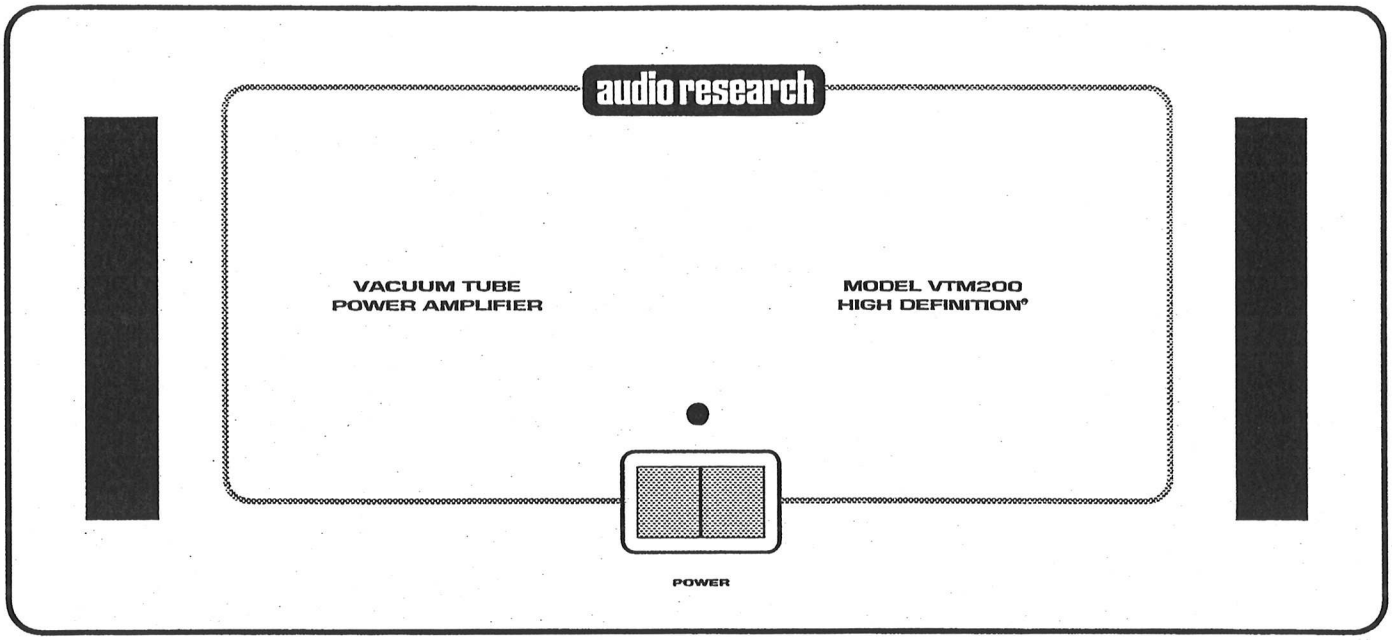

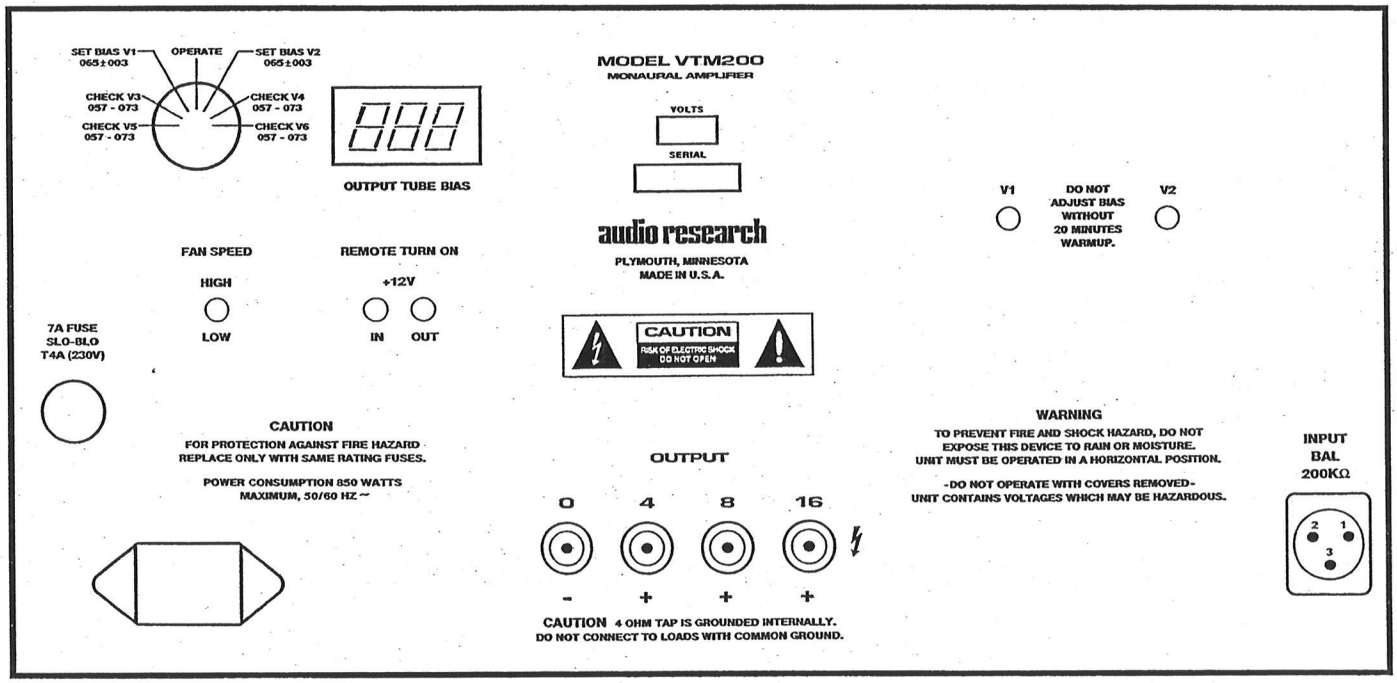

Important: VTM200 fuse value change

The VTM200 line fuse values have been changed from 7A to 10A on 100V and 120V units, and from T4A to T6.3A on 220V, 230V and 240V units. This unit is already equipped with the higher-value fuse.

This information supercedes the original smaller fuse values printed in the owner's manual and on the rear of the amplifier chassis by the fuse holder post.

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Model VTM200

Preface

Please take time to carefully read and understand the following instructions before you install or attempt to operate this equipment. Becoming familiar with the product and its correct operating procedures will help assure you of maximum musical enjoyment and reliable operation. The effort you invest now will be well rewarded in the years ahead.

Packaging

Save all the packaging in a dry place. Your Audio Research amplifier is a precision electronic instrument and should be properly cartoned any time shipment is made. Because of its weight, it is highly probable that the unit will be damaged during shipment if repackaged in cartoning other than that designed for the unit.

You may not have occasion to return the unit to the factory for service, but if that should prove necessary, or other occasion to ship it occurs, the original packaging may save your investment from unnecessary damage, delay and expense.

Unpacking

The VTM200 is packed within two cartons (inner and outer) which have impact-absorbing panels in between. Because of the weight of the unit and because it is a precision electronic instrument it is necessary to take reasonable care of its unpacking and preparation for use.

It is best to have a large, open work area with two people available to help. Set the carton upright in the center of the work area and with a small knife carefully slit the taped edges of the outer carton's top flaps. Fold the flaps to the sides and while holding the inner carton in place, roll the unit upside down. You can now lift the outer carton off and set it and the filler panels aside. Now slit the inner carton's taped seams on the bottom (now facing upward). Again, fold the flaps over and while holding the unit in, roll it over as before. You can now lift the inner carton off to find your VTM200 sitting upright, undamaged and uncartoned. Carefully remove the plastic wrap. Now, while it is fresh in your mind, reassemble the carton system for future use.

Accessories

1 – Phillips-head screwdriver for cover removal

User replaceable spare fuses include:

1 – T4A slo-blo with 220V and 240V units (external)
1 – 7 Amp MDQ slo-blo with 100V and 120V unit (external)
1 – 0.25 Amp AGC fast-blo (internal)
1 – 4 Amp MDQ slo-blo with 100V and 120V unit (internal)
1 – T3.15A slo-blo with 220V and 240V units (internal)

Warnings

1. To prevent fire or shock hazard, do not expose your VTM200 to rain or moisture.
2. This unit contains voltages which can cause serious injury or death. Do not operate with covers removed. Refer servicing to your authorized Audio Research dealer or other qualified personnel.
3. The 12-gauge, 3-conductor power cord on your VTM200 is equipped with a standard 3-prong grounding plug. If used normally, it will provide a safe earth ground connection of the chassis. Refer to the section on "AC Power Connections" for detailed information.
4. For continued protection against fire hazard, replace fuses only with the same type and rating of fuses as specified.

Preparation for Use

Your VTM200 amplifier is shipped with the vacuum tubes packed in foam blocks. These must be unpacked and installed before you attempt to operate the amplifier. Included are six matched 6550C output tubes, two 6N1P dual triodes, two 6L6GC and two 6AS7G tubes. Proceed according to the following instructions.

DO NOT ATTEMPT TO OPERATE THIS EQUIPMENT BEFORE INSTALLING THE VACUUM TUBES IN THEIR PROPER SOCKETS.

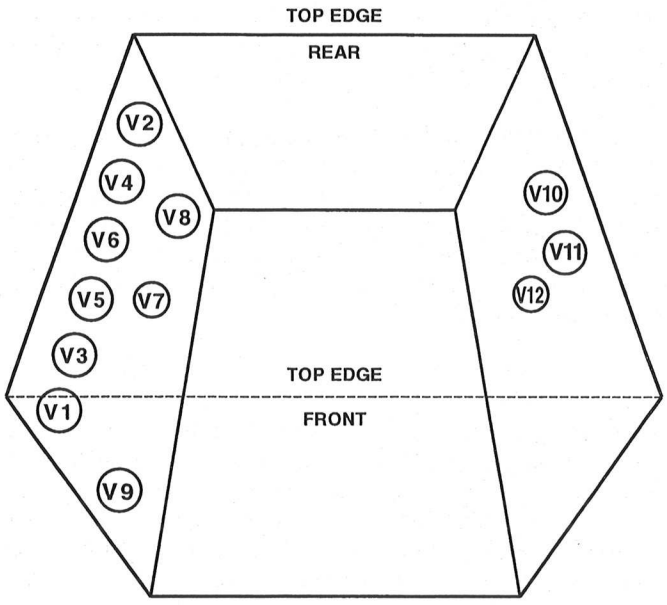

Diagram indicates relative positions of all (12) tubes located on two circuit boards as viewed from the front and looking down from above the amplifier.

1. Using the Phillips-head screwdriver provided, remove the top cover assembly, setting it and the retaining screws aside.

2. Carefully remove each vacuum tube from its protective foam and match its location "V" number (written on the base of the tube) to the "V" number printed next to each socket on the circuit board (see accompanying tube location diagram). ***Firmly seat each tube in its matching socket, taking care to "key" the tube pins to the socket hole.*** Retain the foam blocks with other packing materials for possible future use.
3. Once all vacuum tubes have been installed, reposition the top cover assembly over the chassis and, fasten with screws.

Note: In general, contact enhancers are not recommended for use on vacuum tube contact pins. With continual exposure to heat and air, these substances can form gummy, dust-collecting residues which actually reduce contact and degrade sonic performance. Proper external use of these preparations – on interconnect plugs, speaker connections, etc. – is subject to the discretion of the owner. Contact Audio Research for specific recommendations.

Front Panel Controls

The front panel has:

1 – Switch:	1 - Power line On-Off
1 – Indicator:	1 - Power "On" LED (Green)

Use of Front Panel Controls

POWER ON-OFF SWITCH: Initiates/terminates AC line power to the amplifier. Power "On" function is indicated by illuminated green LED above switch.

Note: Audio Research does ***not*** recommend leaving your VTM200 on 24 hours a day as is the custom of some audiophiles to achieve maximum sonic performance on demand. While this is often recommended for solid-state equipment, Audio Research does not recommend this procedure for vacuum tube power amplifiers. (2,000 hours of tube life will pass by in 84 days!)

Installation

To insure normal component life and safe operation this unit ***must be operated only in a horizontal (upright) position.*** Adequate air flow and proper cooling thereby can occur only if there is no restriction around the unit. ***Allow at least 12 inches of unrestricted ventilation space above the VTM200 top cover during operation.*** For best sonics, allow at least two feet of space between VTM200s.

The six special non-marring elastomer feet provide adequate ventilation spacing only from a smooth, hard surface. ***Never operate the unit while it is sitting on a soft, irregular surface such as a rug or carpet.***

If the unit is to be operated in an enclosure such as an equipment rack, make certain that adequate air flow above and below the unit is provided. The ambient operating temperature should never exceed 120°F or 49°C. Audio Research Corporation Rack Mount Ventilators (RMV-3) must be used above and below each unit. Improper installation will cause premature tube failure and will affect your warranty, as well as the service life of the unit.

It is normal for a vacuum tube power amplifier to run quite warm, and if used for prolonged periods, hot to the touch. All components within are, however, operated at safe, conservative levels and will not be improperly affected thereby, providing the requirements outlined above are adhered to.

Rear Panel Connections, Controls/Display

The rear panel has:

1 – XLR balanced Input connector.
4 – Output binding posts for 4, 8 or 16 ohm speaker connections
1 – Power line cord
1 – Power line fuse holder
2 – Jacks (in and out) for +12V remote turn-on
1 – Fan speed control switch with High/Low positions
1 – Rotary control for setting and checking output tube bias
1 – 3-digit LED meter for output tube bias reading
2 – Bias adjustment pots for V1 and V2 output tubes

Connection Instructions

The amplifier should always be turned on and off via its own power on-off switch. (See Remote Turn-on Connections section for alternate turn-on/off method.) Because of the very high energy storage within this amplifier, special warm-up circuitry is provided which gets its sequencing from its own power on-off switch. Further, other discrete components of an audio system should be turned on first. Otherwise, with some equipment, the amplifier will reproduce warm-up thumps, etc., some of which could be harmful to your speaker system. ARC preamplifiers have automatic warm-up muting, and are much less likely to exhibit this problem; however, good operating practice says ***"Turn the amplifier on last, and turn it off first."***

The VTM200 input is "balanced" and therefore requires a preamplifier with a balanced output.

IMPORTANT: Use the best available speaker wires and interconnects. Audio Research cannot emphasize this enough. As better components and systems are developed, it becomes increasingly important to avoid the limitations of inferior system interconnections. For best results we recommend Audio Research LitzLink 2® interconnects and LitzLine 2® speaker cables.

It is important sonically that your entire system be connected so that the audio signal arriving at the speakers has correct, or "absolute" polarity (i.e., non-inverted). Connect the black or "–" speaker terminal to the wire that connects to the "0" terminal on the VTM200. Connect the red or "+" speaker terminal to the wire that connects to the "4", "8" or "16" ohm impedance terminal on the VTM200. Use the best available speaker cables and tighten all connections securely to ensure best sonic results.

MATCHING: It is important to use as close as possible an impedance match between the amplifier and speaker for optimum transfer of power to the speaker with minimum distortion. In the case of speaker systems with significant variations in impedance throughout the frequency spectrum, such as most electrostatic types, the best impedance match should be determined by listening.

Connect the VTM200 input to the preamplifier or electronic crossover, using only the highest grade of audio interconnect cables. To avoid sonic degradation use the shortest practical length of cables.

AC POWER CONNECTIONS: It is essential that the VTM200 amplifier be connected to a wall AC power receptacle, or a similar heavy-duty source. If it is connected to convenience receptacles shared by preamplifiers, etc., the full sonic capabilities of both the VTM200 and the preamplifier may be compromised. Furthermore, the proper control of start-up and shut-down surges may not occur unless the Power switch on the front of the VTM200 is actually used for on/off control of the amplifier (or use of remote turn-on/off option). The AC power source for the VTM200 amplifier should be capable of supplying 10 amperes for 100 or 120 volt units, or 5 amperes for 220 or 240 volt units.

For the very best performance on domestic 100 or 120 volt circuits, the VTM200 should be connected to its own AC power circuit branch, protected by a 15 amp (or greater) breaker, or by connecting a pair of VTM200s to a single 20 amp breaker if two separate 15 amp breakers aren't available. The preamplifier and other audio equipment should be connected to a different power circuit and breaker. Avoid the use of extension cords. If they must be used on a temporary basis, use 12-gauge or heavier cords.

The VTM200 utilizes a compatible grounding system that generally does not require a "ground lifter" adapter plug on the AC power cord to minimize hum. The detachable power cord on your VTM200 has a standard three-prong grounding plug to provide maximum safety when it is connected to a ground wall receptacle. If there is any question regarding the safety of grounding procedures, be certain to seek competent help with the installation.

If electronic crossovers or other AC powered equipment is used with the VTM200 it may be necessary to use "ground lifter" adapters on the power plugs of that equipment to minimize system hum. Generally, the lowest hum is achieved when the only direct connection between audio common "ground" and true earth ground occurs in the preamplifier, through its grounded power cord. Other equipment in the system should have some form of isolation to prevent ground loops and associated hum.

Always place the Power On-Off switch on the panel of the VTM200 in the "Off" position before connecting the power line cord to AC power.

Remote Turn-on Connections

The VTM200 has a built-in 12VDC remote turn-on/off circuit for operation by a master control system in a home theater or large audio system. Use a 3.5mm (.140") diameter mono mini-plug to connect to the +12V IN jack on the rear of the VTM200. Two identical parallelled jacks are provided to allow chaining connections to control two VTM200s or other equipment.

The +12V IN jack should be connected to the +12VDC output of the master control system, using a continuous +12VDC signal at 12mA per VTM200 for the duration of amplifier on-time. Do not use a momentary or data pulse control signal.

The front power rocker switch on the VTM200 must be off to use the remote turn-on. The front power rocker switch may still be used when the remote turn-on is connected, but the remote will not turn the VTM200 off if the front power rocker switch is left on. The front power rocker switch will not turn the VTM200 off if the remote system is on.

The +12VDC remote jacks have polarity protection, so they will not operate if a -12VDC signal is accidently connected, or if the control wires are reversed. The 12V remote relay in the VTM200 has click suppression to protect circuits in the master control system.

Use of Controls, Operating and Bias Adjustment/Check Procedure

1. Make sure you have read and complied with the INSTALLATION AND CONNECTION instructions prior to attempting operation.
2. Make sure your VTM200 is properly connected to a high-current power receptacle via the attached power cord (see CONNECTION instructions) with the power switch in the "Off" position. Make certain the cord is firmly pushed in the rear panel socket.
3. Set the bias switch on the rear of the amplifier to the "Operate" position.
4. Your preamplifier should be "On" and muted and/or set at minimum gain.

5. Turn the Power switch from "Off" to "On." The green power LED indicator should glow immediately. Note: If the power indicator LED fails to light, turn the Power switch to "Off" and check the appropriate fuse for possible failure. An extra fuse for A.C. power and two internal fuses are included with your VTM200.
6. Your VTM200 should now operate satisfactorily. However, a full stabilization or warm-up time of approximately one hour is recommended for best sonic performance.
7. Choose fan speed based on the amplifier's environment: "Low" for a normal temperature room, or "High" if the area is warmer than normal. Cooler operation through proper ventilation and higher fan speed will maximize tube life.

BIAS ADJUSTMENT/CHECK PROCEDURE: After about 20 minutes of operation the VTM200 will have fully stabilized to allow output tube bias adjustment and check. Note that it is not necessary to repeat the following tube bias adjustment and check procedure each time the amplifier is turned on. It should be repeated occasionally, however, to determine that all of the power output tubes are operating normally. Should any tube fail to adjust within the normal range specified for it on the rotary switch on the rear of the amplifier, that tube is faulty, and should be replaced.

To adjust/check output tube bias (after allowing at least 20 minutes of warm-up), first set the bias switch to "Set Bias V1" and use a small screwdriver to set the bias potentiometer labeled "V1" (on the right side of the rear panel) to read within the specified range of 062-068 (065 ±003) on the 3-digit bias display next to the bias switch. Allow a few seconds for the numbers to stabilize at each meter position before taking a reading.

Next, without making further bias pot adjustments, rotate the bias switch counter-clockwise through the V3 and V5 "Check" positions. The bias reading for each of these tube positions should read within the specified 057-073 range on the bias meter. If any tube should fail to be within its specified range, it should be replaced.

Now rotate the bias switch to "Set Bias V2" and repeat the above (065 ± 003) adjustment/check procedure just completed for V1, but adjusting the V2 bias potentiometer. Likewise, making no further bias pot adjustments, rotate the bias switch clockwise through the V4 and V6 "Check" positions to check their bias (within 057-073 range) just as for V3 and V5.

When all six output tubes indicate bias within their specified range, return the bias switch to the "Operate" position to resume playing the amplifier.

Servicing

Because of its careful design and exacting standards of manufacture, your VTM200 amplifier should normally require only minimal service to maintain its high level of performance.

CAUTION: The VTM200 amplifier contains sufficient levels of voltage and current to be ***lethal.*** Do not tamper with a component or part inside the unit. Even with the power turned off, a charge remains in the energy storage capacitors for some time. Refer any needed service to your authorized Audio Research dealer or other qualified technician.

Replacement vacuum tubes may be obtained through your authorized retailer or directly from Audio Research Customer Service. For best performance, the 6550C output tubes should be a matched set of six.

Additional questions regarding the operation, maintenance or servicing of your amplifier may be referred to the Customer Service Department of Audio Research Corporation at 763-577-9700 (CST).

Cleaning

To maintain the new appearance of this unit, occasionally wipe the front panel and top cover with a soft, damp (not wet) cloth to remove dust. A mild, non-alkaline soap solution or dilute isopropyl alcohol may be used to remove fingerprints or similar smudges. Cleaners containing abrasives should ***not*** be used as they will damage the anodized finish of the front panel. A small, soft paint brush is effective in removing dust from bevels, the recessed nameplate and other features of the front panel.

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Limited Warranty

Audio Research Corporation products are covered by a 3-Year Limited Warranty (all products except CD players, transports, and vacuum tubes), a 2-Year Limited Warranty (CD players and transports), or a 90-Day Limited Warranty (vacuum tubes). This Limited Warranty initiates from the date of purchase, and is limited to the original purchaser, or in the case of demonstration equipment, limited to the balance of warranty remaining after original shipment to the retailer or importer.

In the United States, the specific terms, conditions and remedies for fulfillment of this Limited Warranty are listed on the warranty card accompanying the product in its shipping carton, or may be obtained from the authorized retailer or from the Audio Research Customer Service Department. Outside the United States, the authorized importing retailer or distributor has accepted the responsibility for warranty of Audio Research products sold by them. The specific terms and remedies for fulfillment of the Limited Warranty may vary from country to country. Warranty service should normally be obtained from the importing retailer or distributor from whom the product was purchased.

In the unlikely event that technical service beyond the ability of the importer is required, Audio Research will fulfill the terms and conditions of the Limited Warranty. Such product must be returned at the purchaser's expense to the Audio Research factory, along with a photocopy of the dated purchase receipt for the product, a written description of the problem(s) encountered, and any information necessary for return shipment. The cost of return shipment is the responsibility of the purchaser.

Specifications

POWER OUTPUT: 200 watts per channel continuous from 20Hz to 20kHz. 1 kHz total harmonic distortion typically 0.5% at 200 watts, below .02% at 1 watt.

Approximate actual power available at "clipping" 210 watts (1kHz). (Note that actual power output is dependent upon both line voltage and "condition" i. e.: if power line has high distortion, maximum power will be affected adversely, although from a listening standpoint this is not very critical.)

POWER BANDWIDTH: (-3dB points) 10Hz to 200kHz.

FREQUENCY RESPONSE: (-3dB points at 1 watt) 0.5Hz to 240 kHz.

INPUT SENSITIVITY: 1.7V RMS Balanced for rated output. (27 dB gain into 8 ohms.)

INPUT IMPEDANCE: 200K ohms Balanced.

OUTPUT TAPS: 4, 8, 16 ohms.

OUTPUT REGULATION: Approximately 0.6dB 16 ohm load to open circuit (Damping factor approximately 14).

OVERALL NEGATIVE FEEDBACK: 12dB.

SLEW RATE: 40 volts/microsecond.

RISE TIME: 1.2 microseconds.

HUM & NOISE: Less than 0.2mV RMS – 109dB below rated output (IHF-A weighted, input shorted, 16 ohm output).

POWER SUPPLY ENERGY STORAGE: Approximately 438 joules.

POWER REQUIREMENTS: 105-125VAC 60Hz (210-250VAC 50Hz) 670 watts at rated output, 850 watts maximum, 400 watts at "idle".

TUBES REQUIRED: 3 – Matched pair 6550C (Power output V1-6); 1 – Matched pair 6L6GC (Driver V8-9); 2 – 6N1P (Gain stage V7 and Regular Driver V12); 1 – Matched pair 6AS7G (Regulator V10-11).

DIMENSIONS : 19" (48.3 cm) W x 8.75" (22.2 cm) H x 19.5" (49.5 cm) D. Handles extend 1.5" (3.8 cm) forward.

WEIGHT: 74 lbs. (33.6 kg) Net; 89 lbs. (40.4 kg) Shipping.

Specifications subject to change without notice.

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