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## **Modèle VT100**

**AMPLIFICATEUR DE PUISSANCE STEREO**

## **Modell VT100**

**STEREO-ENDVERSTÄRKER**

## **Modello VT100**

**AMPLIFICATORE DI POTENZA STEREO**

## **Modelo VT100**

**AMPLIFICADOR DE POTENCIA ESTEREOFÓNICO**

## **Model VT100**

**STEREO POWER AMPLIFIER**

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# Model VT100

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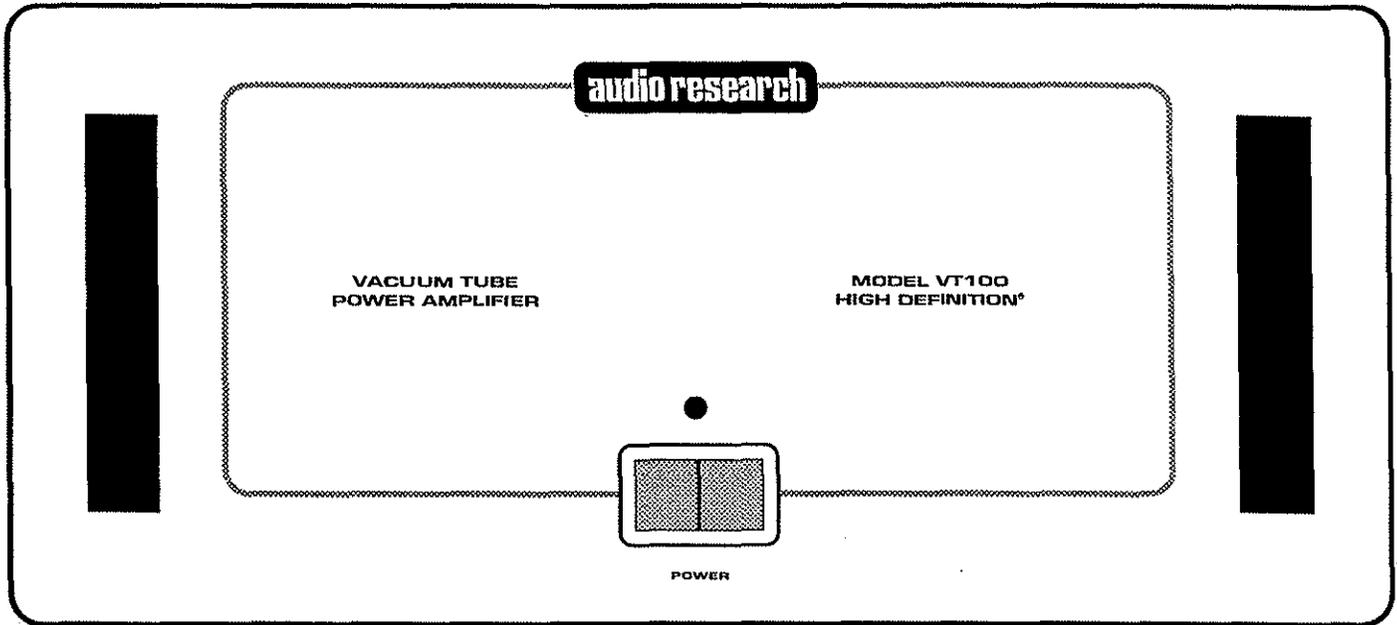
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# Model VT100



**MODEL VT100**  
STEREO AMPLIFIER

**WARNING**  
TO PREVENT FIRE AND SHOCK HAZARD, DO NOT EXPOSE THIS DEVICE TO RAIN OR MOISTURE. UNIT MUST BE OPERATED IN A HORIZONTAL POSITION.  
- DO NOT OPERATE WITH COVERS REMOVED - UNIT CONTAINS VOLTAGES WHICH MAY BE HAZARDOUS.

VOLTS  
[ ]  
SERIAL  
[ ]

**audio research**  
MINNETONKA, MINNESOTA  
MADE IN U.S.A.

**CAUTION**  
RISK OF ELECTRIC SHOCK  
DO NOT OPEN

**CAUTION**  
FOR PROTECTION AGAINST FIRE HAZARD REPLACE ONLY WITH SAME RATING FUSES.  
POWER CONSUMPTION 750 WATTS  
MAXIMUM, 60/60 HZ

**RIGHT OUTPUT**

0    4    8

-    +    +

**CAUTION** 4 OHM TAP IS GROUNDED INTERNALLY. DO NOT CONNECT TO LOADS WITH COMMON GROUND.

USE JUMPER FOR SINGLE-ENDED

RIGHT INPUT    LEFT

SE 100K $\Omega$     BAL 200K $\Omega$

USE JUMPER FOR SINGLE-ENDED

**LEFT OUTPUT**

0    4    8

-    +    +

8.25A FUSE SLO-BLO (4A 240V)

**CAUTION** 4 OHM TAP IS GROUNDED INTERNALLY. DO NOT CONNECT TO LOADS WITH COMMON GROUND.

## **Addendum to VT100 Owner's Manual pertaining to VT100MKIII version.**

The information in the VT100 Owner's Manual applies to the VT100MKIII, but with the following additional features and specification changes for the MKIII version:

Removable IEC power cord

Cooling fan

A BAL/SE input switch replaces the shorting links needed in the XLR connectors for SE operation in previous versions.

The VT100MKIII uses four 6H30 tubes, replacing the eight 6922 tubes found in the VT100 and VT100MKII. The output tube complement of eight 6550 output tubes remains unchanged. Because of differing heater currents, 6H30 tubes cannot be used in the VT100 or VT100MKII, nor can 6922 tubes be used in the VT100MKIII.

A larger value line fuse (the value is stated on the chassis next to the fuse post).

Power Supply Energy Storage: approximately 540 joules.

Weight: 66.7 lbs. (30.3 kg) Net; 83.7 lbs. (38.0 kg) Shipping.

**(OVER)**

## REMOTE TURN-ON CONNECTIONS

The VT100MKIII 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 VT100MKIII. Two identical paralleled jacks are provided to allow chaining connections to control two or more VT100MKIIIs 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 VT100MKIII for the duration of amplifier on-time. Do not use a momentary or data pulse control signal.

The front power rocker switch on the VT100MKIII 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 VT100MKIII off if the front power rocker switch is left on. The front power rocker switch will not turn the VT100MKIII off if the remote system is on.

The +12VDC remote jacks have polarity protection, so they will not operate if a -12VDC signal is accidentally connected, or if the control wires are reversed. The 12V remote relay in the VT100MKIII has click suppression to protect circuits in the master control system.

## OUTPUT TUBE BIAS ADJUSTMENT

Instead of adjusting bias to 130mVDC at each of two resistor test points as in the VT100 and VT100MKII, the VT100MKIII has four bias adjustments consisting of four bias adjustment pots labeled 1-4, and four corresponding resistor test points, one above each pair of output tubes (each test point is labeled 1-4 and marked 65mV). Adjust each of the four pots to read 65mV at each of these corresponding test points. (Refer to 'Output Tube Bias Adjustment' section in manual for remainder of procedure, voltmeter requirements and cautionary statement before proceeding.)

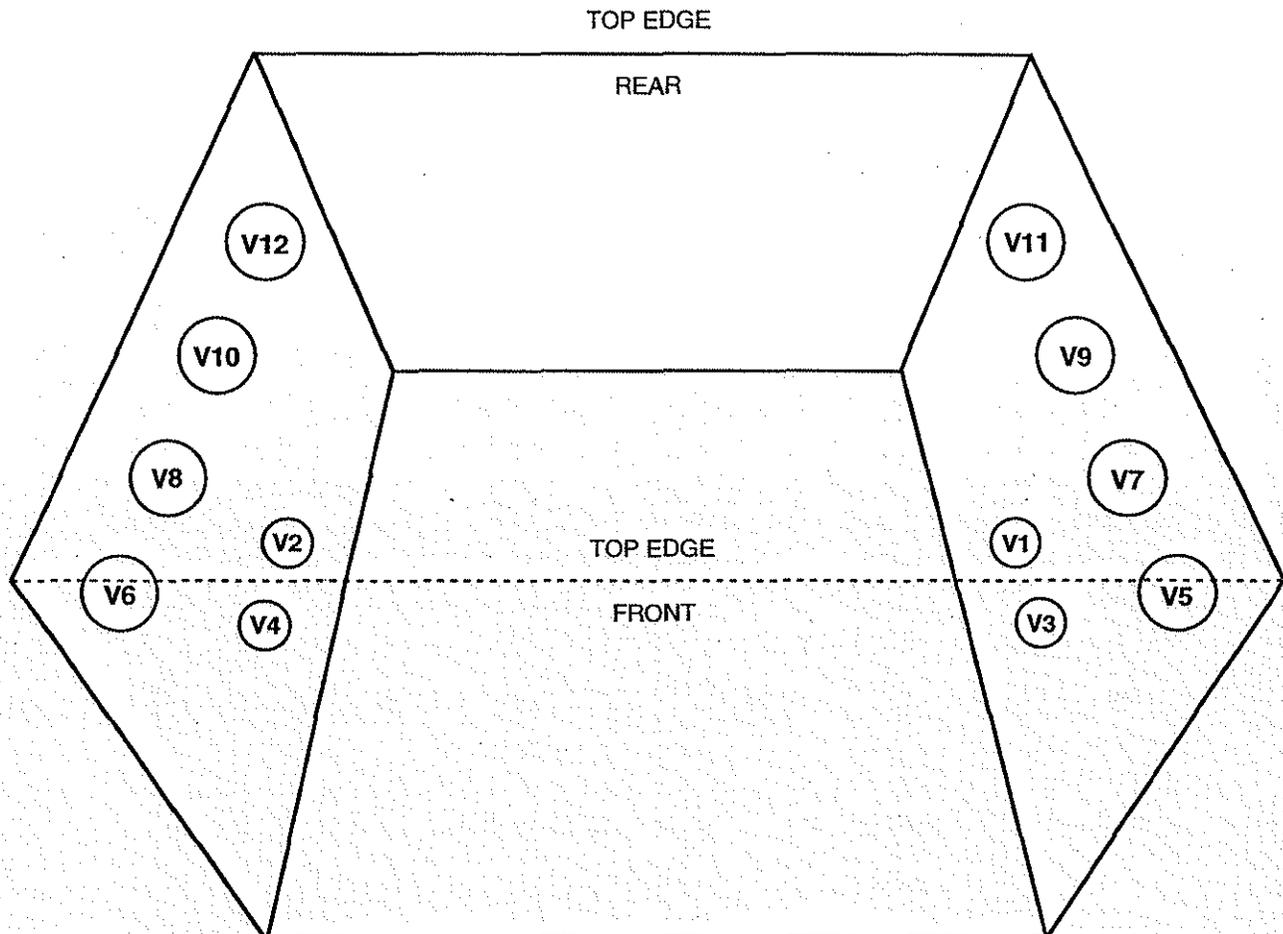
## **Important: VT100MKIII fuse value change**

**The VT100MKIII line fuse values have been changed from 7A to 10A on 100V and 120V units, but remain unchanged at 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.**

# WARNING!

DO NOT ATTEMPT TO OPERATE THIS  
VT100 MKIII AMPLIFIER BEFORE INSTALLING THE  
VACUUM TUBES IN THEIR PROPER SOCKETS.



RELATIVE POSITIONS OF ALL (12) TUBES LOCATED ON TWO  
CIRCUIT BOARDS AS VIEWED FROM THE FRONT AND  
LOOKING DOWN FROM ABOVE THE AMPLIFIER.

SEE YOUR OWNER'S MANUAL FOR COMPLETE INSTRUCTIONS  
FOR SAFE INSTALLATION AND OPERATION.

# Model VT100

## 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 VT100 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 VT100 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
- 1 - Plastic screwdriver for bias adjustments

User replaceable spare fuses include:

- 2 - 4 Amp MDQ slo-blo with 220V and 240V unit
- 2 - 6 $\frac{1}{4}$  Amp MDQ slo-blo with 100V and 120V units
- 2 - Gold-plated shorting jumpers for single-ended operation

## Warnings

1. To prevent fire or shock hazard, do not expose your VT100 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 16-gauge, 3-conductor power cord on your VT100 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 VT100 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 four matched pairs of 6550C output tubes, and eight 6922 dual triodes used in the input through driver stages. Proceed according to the following instructions.

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

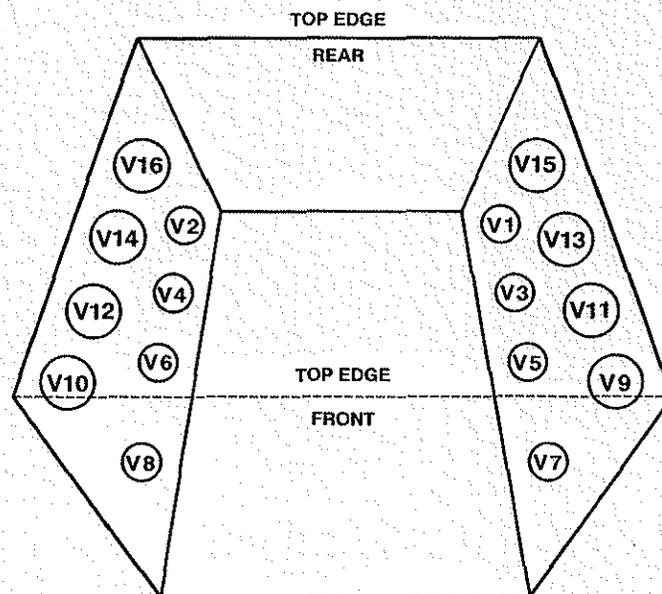


Diagram indicates relative positions of all (16) tubes located on two circuit boards as viewed from the front and looking down from above the amplifier.

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

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# Model VT100

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- 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.
- 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.

## Panel Controls

The front panel has:

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

## Use of 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 VT100 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 VT100 top cover during operation.*

The six (6) 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.

## Connections

The rear panel has:

- 2 – RCA Input connectors for single-ended connection, L & R
- 2 – XLR Input connectors, for balanced connection, L & R
- 6 – Output binding posts (+) and (–), L & R, for 4 or 8 ohm speaker connection
- 1 – Power line cord
- 1 – Power line fuse holder

**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 VT100. Connect the red or "+" speaker terminal to the wire that connects to the "4" or "8" ohm impedance terminal on the VT100. 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.

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# Model VT100

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Connect the VT100 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 VT100 amplifier be connected to a wall AC power receptacle, or a similar heavy-duty source. If it is connected to convenience receptacles on preamplifiers, etc., the full sonic capabilities of both the VT100 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 VT100 is actually used for on/off control of the amplifier. The AC power source for the VT100 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 VT100 should be connected to its own AC power circuit branch, protected by a 15 amp breaker. 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 14-gauge or heavier cords.

The VT100 utilizes a compatible grounding system that generally does not require a "ground lifter" adapter plug on the AC power cord to minimize hum. The power cord on your VT100 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 VT100 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 VT100 in the "Off" position before connecting the power line cord to AC power.*

## Single-Ended Operation

Single-ended inputs should be used with a preamplifier (or electronic crossover, etc.) having single-ended outputs which does *not* invert overall phase or polarity. When using single-ended inputs, make sure the shorting jumper pins supplied for single-ended operation are installed on

the rear panel of the amplifier between the bottom and right socket holes of the balanced input jack, on both channels, as shown in the accompanying rear panel diagram.

## Balanced Operation

Balanced inputs can be used with a preamplifier (or electronic crossover, etc.) having balanced outputs. When using the balanced inputs, remove the shorting jumper pins before connecting balanced XLR connectors. Disconnect any single-ended cables.

## Operating Procedure

1. Make sure you have read and complied with the INSTALLATION AND CONNECTIONS instructions prior to attempting operation.
2. Make sure your VT100 is properly connected to a high-current power receptacle via the attached power cord (see CONNECTIONS).
3. Your preamplifier should be "On" and muted and/or set at minimum gain.
4. 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 is included with your VT100.
5. Your VT100 should now operate satisfactorily. However, a full stabilization or warm-up time of approximately one hour is recommended for best sonic performance.

## Servicing

Because of its careful design and exacting standards of manufacture, your VT100 amplifier should normally require only minimal service to maintain its high level of performance.

**CAUTION:** The VT100 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 matched pairs.

Additional questions regarding the operation, maintenance or servicing of your amplifier may be referred to the Customer Service Department of Audio Research Corporation at 612-939-0600 (CST).

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## Output Tube Bias Adjustment

As shipped from the factory, the output bias adjustments are set for a nominal 65mA per 6550C tube. Under these idle conditions the tubes are each dissipating approximately 27 watts of their 41 watt rating (35 watt plate, 6 watt screen). This point of operation provides "enriched" Class AB<sub>1</sub>, and will satisfy the most critical listener.

For best results, operate and adjust the VT100 at the normal rated line voltage listed on the rear panel. Adjustment must be made under zero-signal conditions after at least 15 minutes of uninterrupted stabilization time.

A digital voltmeter capable of accurate measurements with 1mVDC resolution is preferred for accurate adjustment (must have 3 1/2 digit display). Use the plastic alignment tool provided to make the adjustment. The test points are accessible from the top of the circuit boards above the output tubes. For the VT100 and VT100MKII adjust the bias at one place on each channel for an average reading of 130mVDC (0.13 Volt DC) between test points (across 0.5 ohm resistor). For the VT100MKIII adjust the bias in 2 places on each channel for 65mVDC (.065VDC) between test points (across 0.50 ohm resistor). Caution: resistor is 420V above ground.

## 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.

## 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.

# Model VT100MKIII

## Specifications

**POWER OUTPUT:** 100 watts per channel continuous from 20Hz to 20kHz. 1kHz total harmonic distortion typically 0.3% at 100 watts, below 0.03% at 1 watt.

Approximate actual power available at "clipping" 120 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) 12Hz to 60kHz.

**FREQUENCY RESPONSE:** (-3dB points at 1 watt) 1Hz to 80 kHz.

**INPUT SENSITIVITY:** 1.7V RMS (Bal, 0.87V RMS SE) for rated output. (24.3 dB Bal gain, 32.2dB SE gain into 8 ohms.)

**INPUT IMPEDANCE:** 200K ohms Balanced, 100K ohms Single-ended.

**OUTPUT TAPS:** 8 ohms, 4 ohms.

**OUTPUT REGULATION:** Approximately 0.8dB 8 ohm load to open circuit (Damping factor approximately 11).

**OVERALL NEGATIVE FEEDBACK:** 15dB.

**SLEW RATE:** 8 volts/microsecond.

**RISE TIME:** 4 microseconds.

**HUM & NOISE:** Less than 0.2mV RMS – 103dB below rated output (IHF weighted, Bal input shorted).

**POWER SUPPLY ENERGY STORAGE:** Approximately 540 joules.

**POWER REQUIREMENTS:** 105-125VAC 60Hz (210-250VAC 50Hz) 650 watts at rated output, 800 watts maximum, 440 watts at "idle".

**TUBES REQUIRED:** 4 – Matched pair 6550C – Power Output; 4 – 6H30 Driver.

**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:** 65.9 lbs. (30.0 kg) Net; 82.0 lbs. (37.3 kg) Shipping.

Specifications subject to change without notice.

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