

Price: \$5.00

MODEL M300
MONAURAL POWER AMPLIFIER
OWNER'S MANUAL

3-12-87

audio research corporation

6801 SHINGLE CREEK PARKWAY
MINNEAPOLIS, MINNESOTA 55430

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PREFACE

Please take time to carefully read and understand these instructions before you install or attempt to operate your M300 power amplifier. Because the M300 is an extremely powerful amplifier incorporating an unusual hybrid circuit topology, familiarizing yourself with a few important facts and operating procedures will assure you of maximum musical satisfaction and years of reliable operation. The time and effort you expend now will be well rewarded!

INTRODUCTION

Recently, Audio Research Corporation developed and patented (pending) new circuitry allowing hybrid utilization of Field Effect Transistors (FETs) with vacuum tubes in ways which can bring out the best in both devices. This circuitry is used in the widely-acclaimed SP11 Preamplifier. Audio Research has now applied this proven circuit topology to a new hybrid power amplifier design, designated the M300 -- a monaural amplifier rated at 300 watts into 2, 4 or 8 ohms.

Most hybrid power amplifier designs use small signal-input vacuum tubes, then rely on FETs for the output stage. Audio Research has chosen instead to eliminate these low-level input tubes -- tubes which can be prone to problems with hum, noise, microphonics, drift and, of course, require periodic replacement. The new M300 FET "front end" is combined with Audio Research's patented cross-coupled circuit to provide a design offering exemplary stability, reliability (low maintenance) and superior performance.

These design advances have been coupled with yet another Audio Research patent: an output stage utilizing vacuum tubes, and partially cathode-coupled (as all previous Audio Research vacuum tube amplifiers have been), but with the screen (or accelerating) grids operating with a signal voltage precisely in phase with the cathode voltage. True "pentode" operation and efficiency is thereby achieved; however, all the advantages of partial cathode coupling are maintained. Advantages include:

Efficiency up to 60% and above. (Class "A" designs achieve 25% to 50%, typically 30% to 35%.)

Inherently better cross-coupling.

Output transformer with lower "turns" and "impedance" ratios, resulting in greater bandwidth.

Partial cancellation of saturation effects of the "DC" in the output transformer's core.

Switching transients essentially eliminated, rendering the question of class of operation ("A," "AB," etc.) irrelevant. The virtues of Class "A" operation without the usual drawbacks.

Bias adjustment is essentially non-critical.

Output tubes need not be matched, although slightly better performance will result if they are.

Lower internal impedance improves handling of complex speaker loads.

Representing a major advance over conventional vacuum-tube amplifier designs, the M300 will provide superior performance when used with associated equipment of equivalent caliber. In this regard, a wide variety of loudspeaker designs will yield highly satisfying musical results when driven by a pair of M300s through quality speaker wires; even better performance may be expected from properly-configured bi-amplified systems using four M300s. It is important that you follow carefully your loudspeaker manufacturer's recommendations for proper set-up and amplifier connection. Your Audio Research dealer can also be of assistance in "fine-tuning" your music system.

Like every Audio Research product, your M300 power amplifier has been designed and carefully handcrafted in the U.S.A. using precision mechanical parts, electronic components and assembly procedures common to the manufacture of military equipment, commercial aircraft and scientific instruments. To further assure close conformation to specified M300 performance standards, each unit is visually inspected, burned-in, electronically tested and sonically evaluated following final assembly.

This time-consuming "perfectionist" approach to the design and manufacture of your M300 is intended purely to provide you with greater musical satisfaction -- so that you might experience, and enjoy, music reproduction which is dynamic and realistically "staged;" harmonically neutral, yet "rich" as only live music can be; and extremely revealing of individual textures, timbres and tonal details.

PACKAGING

Save all the packaging. 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. It is also important, again because of the units' weight, to pack each tube separately in its own carton.

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.

REMEMBER: Remove all the vacuum tubes from their sockets and package them in the individual cartons to avoid damage in shipment. Mark each tube with its "V" number so that proper relocation can occur at re-installation.

UNPACKING

The M300 is packed within two cartons (inner and outer) which have polyfoam 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 in 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 knife or razor blade 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 foam filler panels aside. Now slit the inner carton's bottom flaps taped edges. 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 M300 sitting upright, undamaged and uncartoned. Carefully remove the plastic warp. Now, while you remember how, reassemble the carton system for future use.

ACCESSORIES

- 1 - Phillips screwdriver (for cover removal)
- 1 - Plastic screwdriver (for adjustments)
- Spare Fuses:
 - 2 - 1/2 Amp AGC 250V normal-blow with 100V, 120V and 220/240V units
 - 2 - 7 Amp MDX 125V slo-blow with 120V units
 - 2 - 8 Amp MDX 125V slo-blow with 100V units
 - 2 - 4Amp MDA 250V slo-blow with 220/240V units

WARNINGS

1. To prevent fire or shock hazard, do not expose your M300 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 M300 is equipped with a standard three-prong grounding plug. If used normally, it will provide a safe earth ground connection of the chassis. Refer to the Section on Grounding Instructions for detailed information.
4. For continued protection against fire hazard, replace fuses only with the same type and rating of fuses as specified at individual fuse holders.

PREPARATION FOR USE

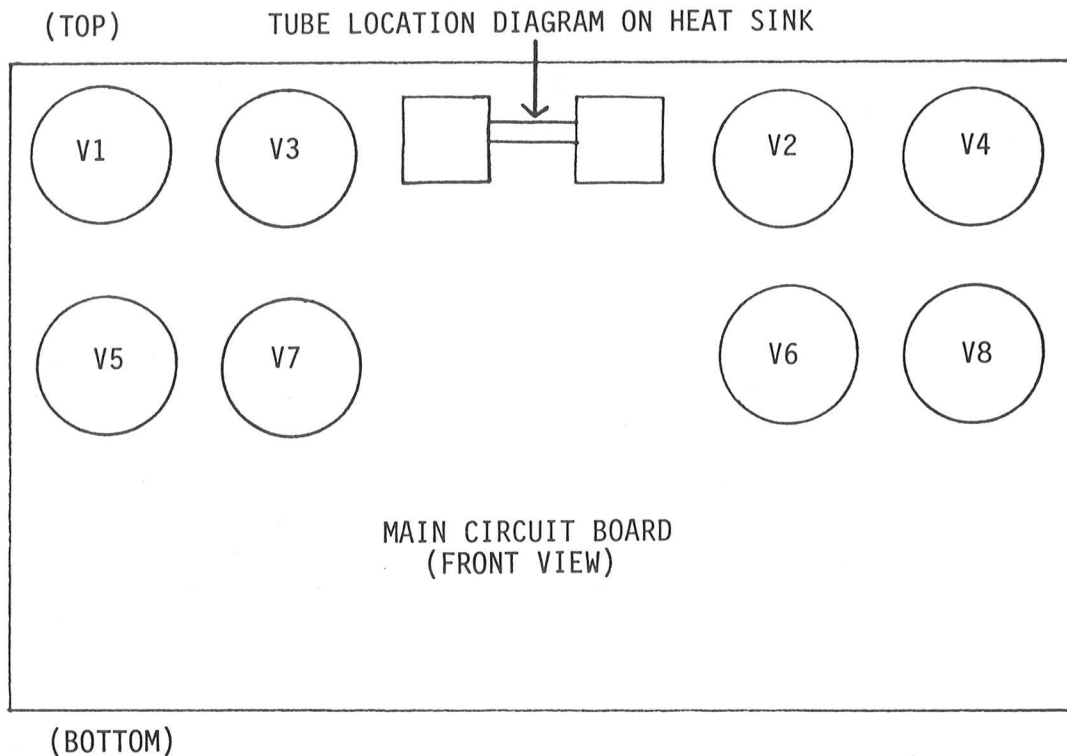
Your M300 amplifier is shipped with all of the vacuum tubes removed, packaged and wrapped so that they will not be broken or internally damaged in shipment. It is necessary to install these before using your amplifier.

Your M300 utilizes a total of 8 vacuum tubes. All are type 6550 power output tubes.

These tubes are packed separately in individual cartons located under the protective cage. It is important to carefully install these vacuum tubes in their proper locations, observing the "V" markings of each tube and their corresponding sockets. A tube location chart is included on the next page. Proceed as follows:

- A. Using the Phillips screwdriver provided, remove the top cage, momentarily setting it and the screws aside.
- B. Remove the 8 tubes individually from their cartons and insert them in their proper sockets.
- C. Re-install the protective cage.
- D. Save the Phillips screwdriver and the vacuum tube cartons for possible future use. Storing these items within the M300 packaging carton is a good way to assure finding them again.

TUBE LOCATION CHART



FRONT PANEL CONTROLS

The front panel has:

- 3 Switches: 1 - Power Line On-Off
 1 - Standby-Operate
 1 - Hi-Lo Fan
- 2 Fuse Holders: 1 - Power Line
 1 - Screen
- 4 Indicators: 1 - Power "ON" (Green)
 1 - Standby (Yellow)
 1 - Operate (Green)
 1 - Screen Power (Green)

USE OF CONTROLS

POWER-ON SWITCH: Initiates/terminates AC line power to the amplifier. Function indicated by green LED at right of toggle switch.

STANDBY-OPERATE SWITCH: Because of the M300's high power capability (a total of 330 watts available at "clipping"), and its relatively high input power requirements (approximately 450 watts at idle, with peaks up to 900 watts), a "Standby" switch has been provided. This switch, which increases the bias on the output tubes so that they are "cut off" or in a non-conducting state, reduces the power consumption to approximately 130 watts.

The purpose of this switch is to allow maintenance of the M300 at operating temperature so that the serious listener can return it to full operation without a one-half hour wait for full stabilization of circuits and maximum sonic performance. It also reduces stress upon the output tubes between periods of active operation and thus helps prolong tube life.

NOTE: Audio Research does not recommend leaving your M300 in "standby" 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.

The M300 will in fact operate or play in the "Standby" mode. However, the output tubes operate in a Class C condition which will, of course, yield serious sonic distortion. Operation in this mode will not harm the M300, but sonic performance will be unacceptable. If you notice distorted sound when other operational functions appear normal, then check the "Standby-Operate" indicator lights to determine that the "Standby" mode is not activated. Yellow indicates "Standby;" green indicates "Operate."

HI-LO FAN SWITCH: The "Hi-Lo" fan switch allows selection of two levels of cooling efficiency for the power output tubes. The higher level will help prolong tube and component life by reducing operating temperatures during extended periods of high-volume play. During low-volume play, however, the "Hi" mode may be noticeable as additional ambient room noise. The "Lo" setting should be selected under these circumstances, as well as for extended "Standby" use.

FOR EFFICIENT FAN OPERATION: To insure smooth start-up of fans under all line voltage conditions, set to "Hi" mode before turning on power. Once fans are up to speed, set to "Lo" and mode to "Operate." This will normally reduce warm-up time needed for superior sonics to approximately 15 minutes (particularly after several weeks' "break-in" use). When you are through listening, set fans to "Hi" and mode to "Standby" for at least 15 minutes prior to shutdown, or prior to extended "Standby" mode with fans on "Lo." This will insure uniform cooling of internal components and help maximize tube life.

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 below, behind and above the unit.

The five (5) special non-marring elastomer feet provide adequate spacing only from a smooth, hard surface. Never operate the unit while it is sitting on a 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.

CONNECTION INSTRUCTIONS

The rear panel has:

- Input Connector
- Input Level Control
- Output Barrier Terminal Block
- Power Line Cord

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 High Definition* speaker cables and interconnects.

CAUTION - DO NOT CONNECT GROUNDED LOADS TO BALANCED OUTPUTS. Your M300 provides both balanced and unbalanced output connections to accommodate virtually all types of speaker systems. However, it is very important to determine which connections are appropriate for your system.

For best sonic performance all Audio Research tube and hybrid amplifiers, including the M300, have balanced output stages with partially cathode-coupled circuits. Most conventional speakers have no common connections between the left and right stereo speakers, and are ideally suited for "balanced line" connections. Screw terminals are provided on the M300 for 2-ohm, 4-ohm or 8-ohm balanced loads. Balanced merely refers to both wires in each speaker cable being driven with equal signal voltages with opposite polarities, with neither wire connected to a common ground terminal.

Most electrostatic loudspeakers are well suited to balanced connections, even though they may have power cords from left and right speakers connected to a common AC power receptacle. The speaker connections themselves are still fully isolated from any common ground connection.

Some complex loudspeaker systems, such as the bass section of Infinity RS-1 systems, for example, utilize a common ground connection between the left and right speakers for special electronics that serve both channels. These special electronics may be designed for crossover networks preceding the power amplifiers, or motional feedback from the speakers, or for amplified center-channel sub-woofers, or other special effects. These unbalanced systems may not be identified by the term "unbalanced." If in doubt, consult your speaker instruction manual, speaker dealer or speaker manufacturer.

Many headphone/speaker switching systems also use common grounding. These, too, are unbalanced loads and must be connected accordingly.

Unbalanced loads must be connected to the unbalanced (one side grounded) output terminals on the M300. Connections are provided for 1-ohm and 2-ohm unbalanced loads. Higher speaker impedances should be connected to the 2-ohm output. These unbalanced outputs are non-inverting (or in-phase) and do not require any phase reversals elsewhere in the system.

If unbalanced loads are inadvertently connected to M300 balanced outputs, severe distortion, greatly reduced output power, large thumping oscillations or blown M300 fuses may result. Caution should be taken when connecting the M300 to bench test systems including distortion analyzers, etc. Connect M300 balanced outputs only to test equipment having balanced input provisions. If in doubt, connect to M300 unbalanced outputs.

Note that the M300 is a non-inverting or in-phase amplifier, regardless of whether balanced or unbalanced outputs are used. It is important sonically that your entire system be connected so that the audio signal arriving at the speakers has correct absolute polarity, or is non-inverted. Connect the black or "-" speaker terminal to the wire that connects to the LO or "-" terminal on the M300. Connect the red or "+" speaker terminal to the wire that connects to the HI or "+" terminal on the M300. Use the best available speaker cables and tighten the screw terminals securely with a large screwdriver 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, determine the best impedance match empirically for best overall sonic results.

Connect the M300 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 M300 amplifiers be connected to a wall AC power receptacle, or a similar heavy-duty source. They must not be connected to convenience receptacles on preamplifiers, etc., or the full sonic capabilities of both the M300s 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 M300 is actually used for on/off control of each M300. The AC power source for each pair of M300 amplifiers must be capable of supplying 20 amperes for 100 or 120 volt units, or 10 amperes for 220 or 240 volt units.

For the very best performance on domestic 100 or 120 volt circuits, each pair of M300s should be connected to their own AC power circuit branch, protected by a 20 amp breaker. The preamplifier and other audio equipment should be connected to a different power circuit and breaker. If the power receptacle for the M300s is more than 25 feet from the building power entrance and breaker box, it would be preferable to use installed wiring capable of 40-60 amperes to minimize voltage drop, still using a 20 amp breaker. Avoid the use of extension cords. If they must be used on a temporary basis, use 12 gauge or heavier cords.

The M300 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 M300 has a standard three-prong grounding plug to provide maximum safety when it is connected to a grounded 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 M300, 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 front of the M300 in the OFF position before connecting the power line cord to AC power.

OPERATING PROCEDURE

1. Make sure you have read and complied with the INSTALLATION and CONNECTION instructions prior to attempting operation.
2. Make sure your M300s are 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. The OPERATE-STANDBY switch may be set in either mode, depending upon how soon you plan to begin listening.
5. The HI-LO FAN switch should be set on "Hi" to insure smooth start-up of fans under all line voltage conditions (see USE OF CONTROLS and INSTALLATION).
6. Turn the POWER switch from "Off" to "Power." The green "Power" LED indicator should glow immediately, as should either the green "Operate" or yellow "Standby" LED indicators (depending upon the setting chosen for that switch). Approximately one (1) second later the green "Screen" fuse LED should also light up, indicating the proper operation of the high-voltage circuits. NOTE: If the "Power" or "Screen" indicator lamps fail to light, turn the "Power" switch to "Off" and check the appropriate fuses for possible failure. Extra fuses for both powerline and screen circuits are packed with your M300.
7. Your M300 should now operate satisfactorily. However, with unit on "Standby," a full stabilization or warm-up time of approximately 1 1/2 hours is recommended for best sonic performance. To reduce warm-up time to approximately 15 minutes, set fans to "Lo" and mode to "Operate." See discussion of fans in USE OF CONTROLS section.
8. The Input Level Control is located on the back chassis of your M300. For best results, keep the M300 Level Control at maximum (i.e. fully open), except to "trim" or compensate for minor imbalance between the left and right speaker channels. When changing input connectors, turn the Level Control on each M300 all the way down (i.e. to minimum), and switch the amplifiers to "Standby" to fully protect your speakers.

ADJUSTMENT PROCEDURE

The M300 utilizes very high quality, commercial and computer grade components which, together with conservative operation of all components and tubes, will provide long service life, if installed and operated within the parameters outlined in this Manual.

The output tubes, for example, are operated with electronically regulated "bias" as well as electronically regulated "screen" voltage. With these voltages regulated the variation in output tube idle current for varying line voltage becomes normally unimportant.

After vacuum tube failure and replacement, it is desirable to readjust the amplifier for optimum performance and tube life.

CAUTION: The following internal procedure should not be attempted by the owner unless he is technically qualified. There are high voltages and currents within this unit which can be lethal under certain conditions. All internal adjustments should be accomplished by a qualified individual. It is necessary to remove the top cover from the M300 for the following adjustment. Unit should be off before removal of cover.

Only the output tube idle current (bias voltage) requires adjustment in the M300. Use the plastic alignment tool provided for this internal adjustment.

The output stages of the M300 are partially cathode-coupled "push-pull Class AB₁," utilizing our tightly-coupled output transformers which provide low distortion and sonic accuracy.

As shipped from the factory, the output "bias" adjustments are set for a nominal 75mA. per tube with a stable power line voltage of 120VAC. (Export models are adjusted for each country's requirements.) Under these idle conditions the tubes are each dissipating approximately 32 watts of their 48 watt rating (42 watt plate, 6 watt screen). This point of operation provides "enriched" Class AB₁, and will satisfy most critical listeners.

Although the main "B+" voltage to the output tubes will vary with line voltage, the "bias" voltage and the "screen" voltage are electronically regulated. Because of this the change in operating point of the output stage does not vary significantly with reasonable changes in line voltage. It is therefore not normally necessary to readjust "bias" except when changing power output tubes.

Make sure that ventilation requirements are met as described under INSTALLATION to prolong tube and other component life.

For best results operate and adjust the M300 at 120VAC line voltage, or at the line voltage that is typical in the final installation. Adjustment must be made under zero-signal conditions after at least 15-20 minutes of uninterrupted stabilization time in the "Operate" mode.

A digital voltmeter capable of accurate measurements with 0.1mVDC resolution is preferred for accurate adjustment (must have 3 1/2 digit display). Use the plastic alignment tool provided to make the adjustments.

The four test points of the M300 are approachable from the rear side of the main circuit board, and are referred to in the circuit schematic as TP1-TP2 and TP3-TP4.

Adjust the output "bias" voltage for 30mVDC (.03 Volt D.C.) between TP1-TP2 and between TP3-TP4.

SERVICING

Because of its careful design and exacting standards of manufacture, your M300 amplifier should normally require only minimal service to maintain its high level of performance.

CAUTION: The M300 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.

The eight (8) vacuum tubes inside the M300 are high-quality 6550 power output tubes. Their playing life will be extended considerably by switching the M300 to "Standby" whenever your system is not in active use. Replacement tubes need not be matched, although slightly better sonic performance will result if matched sets are used. (Your M300s come from the factory with matched sets installed.) Reliable, matched, low gas 6550 tubes -- such as those available from Audio Research -- are strongly recommended for maximum performance and longevity. Check bias adjustment after replacing tubes.

Additional questions regarding the operation, maintenance or servicing of your M300 amplifier may be referred to the Customer Service Department of Audio Research Corporation: 612/566-7570.

CLEANING

To maintain the visual appearance of your M300 amplifier, occasionally wipe the front panel and top cover surfaces with a soft, damp (not wet) cloth to remove dust. A mild, non-alkaline soap solution may be used to remove fingerprints or similar smudges. Cleaners containing abrasives should not be used as they will damaged the "brushed" grain of the front panel finish.

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"TUBE SAVER" PROTECTION CIRCUIT

Your M300 power amplifier contains a remarkable new circuit called the "Tube Saver." It's a small secondary circuit board located on the back side of the main board in the amplifier. Primarily, the "Tube Saver" reduces stress to tubes and associated driving FETS. As an overload protection circuit, it is triggered only when abnormal current is sensed from a cause like those listed below. Under even extreme conditions of normal use (i.e. extremely high playback levels), the circuit is designed to remain inactive. When triggered, the circuit immediately shuts down the output stage and indicates protection mode by dimming the "Screen" LED. (This minimizes the nuisance of replacing blown fuses under overload conditions.) At this point, the amp should be manually switched off, then restarted after a period of 30 seconds. (The amp will remain safely in protection mode until switched off for 30 seconds and restarted.) Detailed instructions for the operation of this circuit follow.

Overall, as its name implies, the "Tube Saver" circuit will help prolong tube life and improve general reliability of the M300 under a variety of operational conditions, including the following.

1. Tube "arcs" -- Minimizes high-current stress that could induce an arc, and protects against damage to circuit components and to the tube itself. Some tubes will "clear" following an arc and "Tube Saver" turnoff, and go on to give many more hours of trouble-free performance.
2. Load Shorts -- Shuts down if unit is playing at unsafe levels with a short circuit in speaker cables, etc.
3. Subsonics -- Shuts down from excessive subsonic input from a dropped tonearm, preamp malfunction or bench testing at high power below 10 Hz.
4. Loss of bias -- Shuts down if bias supply or bias fuse fails.
5. Hot restart -- Timed reset circuit after turnoff allows tubes to cool down before power can be reapplied, so that driver circuits can stabilize before output tubes are operational again.
6. Stored charge -- After turnoff, stored energy in the main filter capacitors is quickly discharged, to allow normal restart or safe servicing without shock hazard.

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SONIC IMPROVEMENTS

The new "Tube Saver" circuit, as well as improved capacitors in the power supply, yield stunning new levels of performance. We hear these improvements as the following.

- * Cleaner, less distorted sound top to bottom. How is this possible from a mere "protection device?" In short, because the "Tube Saver" also cleans up and controls screen supply voltage as it monitors the amplifier for aberrant current. Thus, while the M300 now reproduces even more detail than the original, it also exhibits a slightly warmer tonality -- yet remains amazingly neutral overall.
- * Greater dynamic contrasts. Even though the M300 presents a more engaging overall tonality, it seems even quicker and more robust in presenting dynamic contrasts, whether large or small. The new M300 simply has a greater sense of ease in presenting demanding musical program than any other amp we've heard. This improvement is in part due to the new power-supply capacitors.
- * Improved deep-bass extension, clarity and control. If you have the speakers to deliver the full weight and "foundation" of a symphony orchestra, the new M300s obviously take control with authority. We doubt you will have ever heard bass with this depth and realism before.
- * Staging: simply deeper, broader and more convincingly detailed (with good recordings) than ever before. You'll hear the difference on good CD program material, too. The new M300s will put you closer than ever to the recording site.

"TUBE SAVER" OPERATION

If your M300 goes into protective shutdown, follow these procedures:

1. You may hear a tiny "tick" from the speaker at the moment of shutdown, and the output will be totally quiet.
2. Check the Screen LED, which will be dimmed to indicate protective shutdown. If one or both LEDs are totally dark, switch power to Off and check fuses or power mains breakers.
3. While the Screen LED is dimmed, shut the power toggle switch to Off.
4. Mute the preamp, or otherwise disable signal input to the M300.
5. Wait at least 30 seconds for the M300 to cool off and reset.
6. Return power toggle switch to On, and make sure the Screen LED is fully lit.
7. Resume normal listening. If the M300 shuts down again, reduce playback level, try a different program source, or check connections to isolate the cause. If the M300 shuts down with no input or load connected, get service assistance. To avoid accidentally activating the protective shutdown by careless tone arm handling, we recommend reducing the preamp gain or muting the preamp when handling the turntable or tone arm.

3-YEAR LIMITED WARRANTY TERMS AND CONDITIONS

1. LIMITED WARRANTY. Audio Research warrants the product designated herein to be free of manufacturing defects in material and workmanship, subject to the conditions hereinafter set forth, for a period of three (3) years from the date of purchase by the original purchaser or no later than five (5) years from the date of shipment to the authorized Audio Research dealer, whichever comes first, excepting vacuum tubes which are warranted for 90 days only (See 6).
2. CONDITIONS. This Warranty is subject to the following conditions and limitations. The Warranty is void and inapplicable if the product has been used or handled other than in accordance with the instructions in the owner's manual, abused or misused, damaged by accident or neglect or in being transported, or the defect is due to the product being repaired or tampered with by anyone other than Audio Research or an authorized Audio Research repair center. The product must be packed and returned to Audio Research or an authorized Audio Research repair center by the customer at his or her sole expense. Audio Research will pay return freight of its choice. A RETURNED PRODUCT MUST BE ACCOMPANIED BY A WRITTEN DESCRIPTION OF THE DEFECT AND A PHOTOCOPY OF THE ORIGINAL PURCHASE RECEIPT. This receipt must clearly list model and serial number, the date of purchase, the name and address of the purchaser and authorized dealer and the price paid by the purchaser. Audio Research reserves the right to modify the design of any product without obligation to purchasers of previously manufactured products and to change the prices or specifications of any product without notice or obligation to any person.
3. REMEDY. In the event the above product fails to meet the above Warranty and the above conditions have been met, the purchaser's sole remedy under this Limited Warranty shall be to return the product to Audio Research or an authorized Audio Research repair center where the defect will be rectified without charge for parts or labor, except vacuum tubes (See 6).
4. LIMITED TO ORIGINAL PURCHASER. This Warranty is for the sole benefit of the original purchaser of the covered product and shall not be transferred to a subsequent purchaser of the product.
5. DURATION OF WARRANTY. This Warranty expires on the third anniversary of the date of purchase or no later than the fifth anniversary of the date of shipment to the authorized Audio Research dealer, whichever comes first.
6. VACUUM TUBES. Vacuum tubes are warranted for the original 90-day period only.
7. DEMONSTRATION EQUIPMENT. Equipment used by an authorized dealer for demonstration purposes is warranted to be free of manufacturing defects in materials and workmanship for a period of three (3) years from the date of shipment to the dealer. Vacuum tubes are warranted for 90 days. Demo equipment needing warranty service must be packed and returned to Audio Research by the dealer at his sole expense. Audio Research will pay return freight of its choice. A returned product must be accompanied by a written description of the defect on an AUDIO RESEARCH RETURNED GOODS AUTHORIZATION form. Dealer-owned demonstration equipment sold at retail within three (3) years of date of shipment to the dealer is warranted to the first retail customer to be free of manufacturing defects in materials and workmanship for the duration of the 3-Year Limited Warranty remaining (as measured from the date of shipment of the equipment to the dealer). Vacuum tubes are not warranted for any period under these conditions of sale. In the event warranty service is needed under the conditions, the owner of

the equipment must provide a copy of his purchaser receipt, fulfilling the requirements described under "2. Conditions" above. The product must be packed and returned to Audio Research or an authorized Audio Research repair center by the customer at his or her sole expense. Audio Research will pay return freight of its choice.

8. MISCELLANEOUS. ANY IMPLIED WARRANTIES RELATING TO THE ABOVE PRODUCT SHALL BE LIMITED TO THE DURATION OF THIS WARRANTY. THE WARRANTY DOES NOT EXTEND TO ANY INCIDENTAL OR CONSEQUENTIAL COSTS OR DAMAGES TO THE PURCHASER. Some states do not allow limitations on how long an implied warranty lasts or an exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

9. WARRANTOR. Inquiries regarding the above Limited Warranty may be sent to the following address:

Audio Research Corporation
6801 Shingle Creek Parkway
Minneapolis, MN 55430

WARRANTY OUTSIDE THE USA

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In the unlikely event of service need beyond the capability of the Importer, Audio Research does, of course, back up the warranty. Such product would need to be returned to Audio Research, together with a photostatic copy of the bill of sale.

M300 SPECIFICATIONS (AC line set @120V 60Hz for these specifications)

Power Output:

300 watts minimum continuous at 8 ohms from 16Hz to 20kHz with less than 0.8% total harmonic distortion (typically below .005% at 1 watt)

Approximate actual power available at "clipping": 330 watts (1kHz)

(Note that actual power output is dependent upon both line voltage and "condition" ie: 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 60kHz

Input Sensitivity:

.9V RMS for rated output

Input Impedance:

60K ohms, nominal

Output Regulation:

Approximately 0.3dB. 8 ohm load to open circuit
(Damping factor approximately 30)

Negative Feedback:

20dB

Slew Rate:

25 volts/microsecond

Rise Time:

3 microseconds

Hum & Noise:

Less than 2mV RMS 90dB below rated output (broad-bandwidth unweighted, inputs shorted)

Power Supply Energy Storage:

Approximately 350 joules

Power Requirements:

105-125VAC 60Hz (210-250VAC 50Hz) 900 watts at rated output
450 watts at "idle" - 130 watts at "standby"

Dimensions:

19" (48 cm) W (standard rack panel x 10.5" (27 cm) H x 16" (41 cm) D
(front panel back). Handles extend 1 5/8" (4.1 cm) forward of the front panel. Output connectors extend 1" behind rear panel.

Weight:

110 lbs. (50 kg) Net; 126 lbs. (57 kg) Shipping

Tubes Required:

4 - Matched pair 6550 (low gas) Power Output

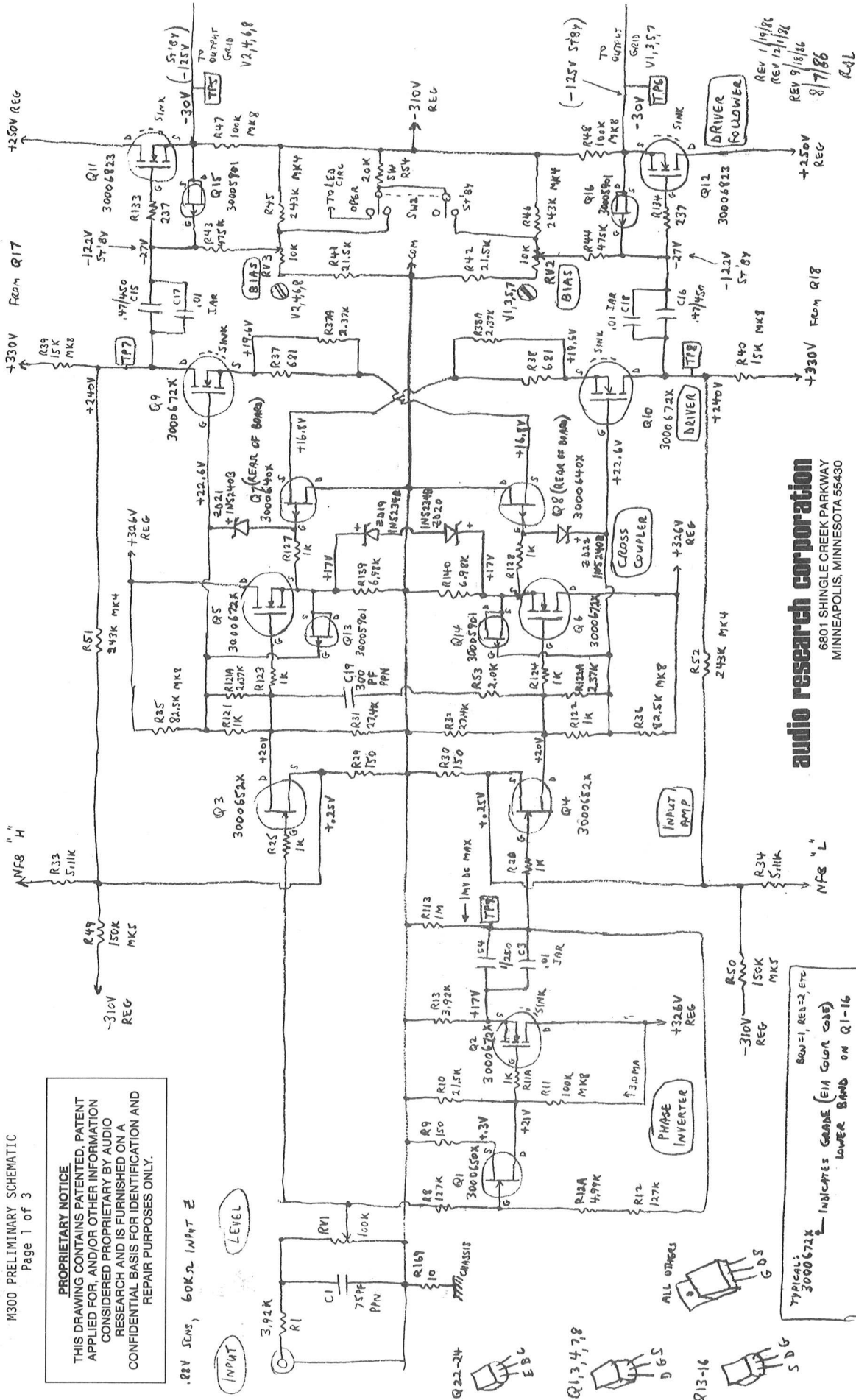
MODEL M300
MONAURAL POWER AMPLIFIER
SCHEMATIC

3-12-87

audio research corporation

6801 SHINGLE CREEK PARKWAY
MINNEAPOLIS, MINNESOTA 55430

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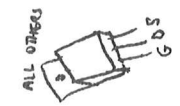


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INPUT
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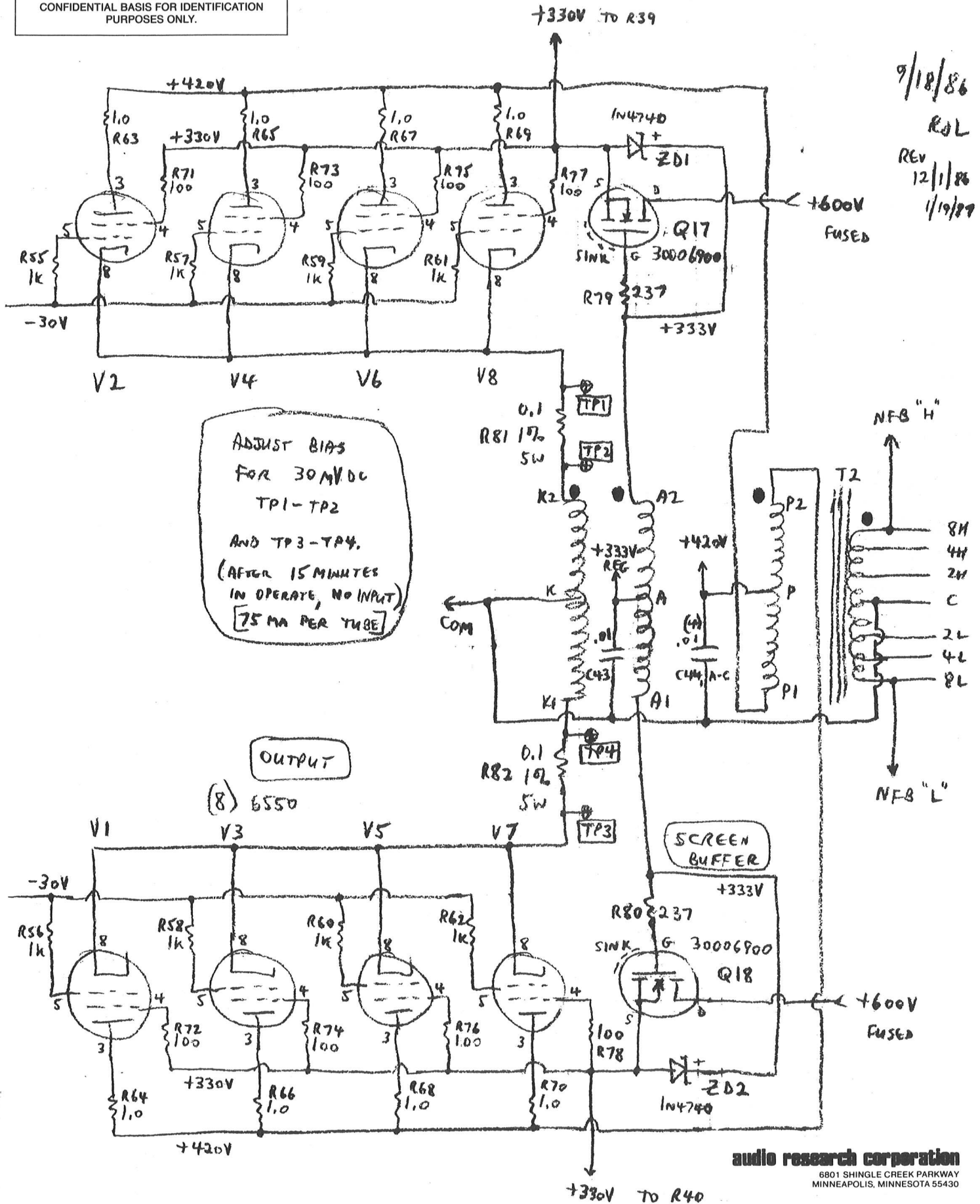
Q22-24
Q1, 3, 4, 7, 8
Q13-16



TYPICAL 3000672K 80W-1, REG-2, ETC. INSTALLED IN CASE (EIA COLOR CODE) LOWER BAND ON Q1-16

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