

# Owner's Manual

Definition Series

**DS450M**

Power Amplifier

**audio research**  
HIGH DEFINITION®

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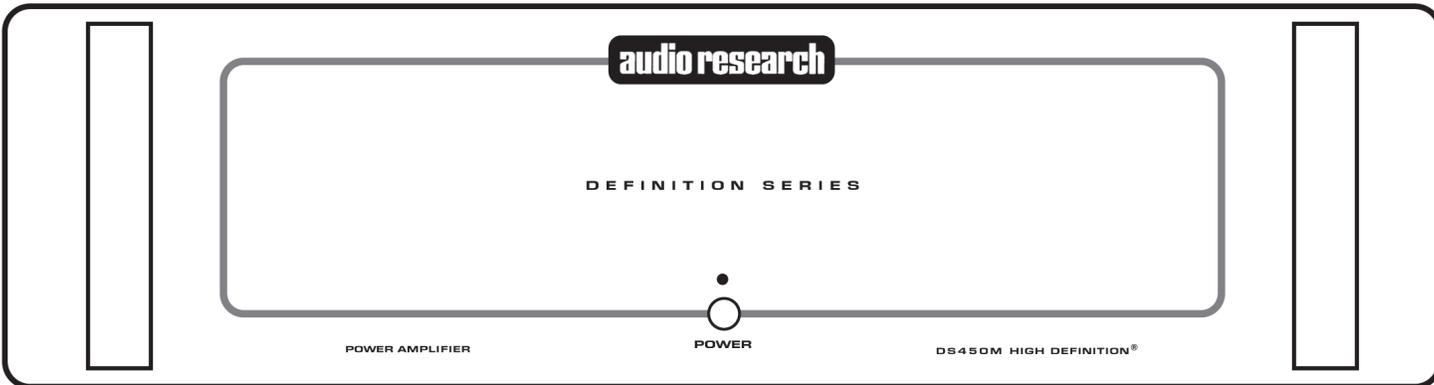
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**INPUTS**



BALANCED



SINGLE - ENDED



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





IN      OUT  
12V REMOTE

**MODEL DS450M**  
POWER AMPLIFIER

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

**CAUTION**  
FOR PROTECTION AGAINST  
FIRE HAZARD, REPLACE ONLY  
WITH SAME RATING FUSES.



6A FUSE SLO-BLO  
(T3.2A 230V)



MAX POWER CONSUMPTION  
720 W 50/60 HZ ~



VOLTS

SERIAL

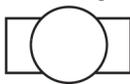
**WARNING**  
TO PREVENT FIRE AND SHOCK HAZARD, DO NOT  
EXPOSE THIS DEVICE TO RAIN OR MOISTURE.  
UNIT MUST BE OPERATED IN A HORIZONTAL POSITION.  
-DO NOT OPERATE WITH COVERS REMOVED-  
UNIT CONTAINS VOLTAGES WHICH MAY BE HAZARDOUS

**WARNING!**  
RISK OF HAZARDOUS ENERGY!  
MAKE PROPER SPEAKER  
CONNECTIONS  
SEE OWNERS MANUAL

**OUTPUT**

-

+



## 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.



### Warnings

- 1. DO NOT POWER 'ON' THIS AMPLIFIER WITHOUT INPUTS OR SPEAKER LOAD CONNECTED TO IT.**
2. To prevent fire or shock hazard, do not expose this product to rain or moisture.
3. This unit operates on voltages which can cause serious injury or death. Do not operate with covers removed. Any necessary servicing should be carried out by your authorized Audio Research dealer or other qualified personnel.
4. The 12-gauge, 3-conductor power cord on this unit 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 section on 'AC Power Connections' for detailed information.
5. For safe operation and protection against fire hazard, replace fuses only with those of the same type and rating of fuses as specified.

## Packaging

Save all packaging accompanying this product. You have purchased a precision electronic instrument, and it should be properly cartoned any time shipment becomes necessary. It is very possible that this unit could be damaged during shipment if repackaged in cartoning other than that designed for it. The original packaging materials help protect your investment from unnecessary damage, delay and added expense whenever

shipment of this unit is required.

## Unpacking

The DS450M is packed within two cartons (inner and outer) which have foam supports in between. Because of the weight of the unit and because it is a precision electronic instrument it is necessary to take reasonable care during unpacking and preparation for use. It is best to have a large, open work area with available 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 DS450M 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

Spare Line Fuses:

- 2 – 6 Amp MDA slo-blo (100 & 120V)
- 2 – T3.2A Amp Super-Time-Lag TT (220 - 240V)

## Description of Controls

The front panel has:

- 1 Power line On-Off switch
- 1 Power 'On' LED (Green) indicator

**POWER ON-OFF SWITCH:** Press the power switch to initiate or terminate AC line power to the amplifier. When the LED is illuminated the amp is 'on' and ready to play.

## Connections

The rear panel has:

- 1 – RCA input connector, for single-ended connection

- 1 – XLR input connector, for balanced connection
- 2 – Output binding posts, (+) and (-)
- 1 – Power line fuse holder
- 1 – Power line cord IEC connector for removable
- 20A power cord (supplied)
- 2 – 12V remote start in and out jacks
- 1 – Switch for XLR or RCA input operation

**IMPORTANT:** Use the best available speaker wires and interconnects. As your system improves in resolution from the addition of quality components, it becomes increasingly important to avoid the limitations of inferior system interconnections.

It is important sonically that your entire system be connected so that the audio signal arriving at the speakers has correct absolute polarity or phase (i.e. is *not* inverted). Connect the black or (-) speaker terminal to the wire that connects to the (-) binding post on the amplifier. Connect the red or (+) speaker terminal to the wire that connects to the (+) binding post on the DS450M. Using the knurled black knob, tighten the binding posts firmly to assure good contact for best sonic results.

For bi-wired loudspeaker systems (i.e. running separate wires to bass and treble speaker terminals), simply repeat the above instructions, taking care that all connections have the same (+) or (-) polarity.

**AC POWER CONNECTIONS:** It is essential that the DS450M 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 amplifier and the preamplifier will be compromised.

The AC power source for the amplifier should be capable of supplying 15 amperes for 100 or 120 volt units, or 8 amperes for 220 or 240 volt units.

For the very best performance on domestic 100 or 120 volt circuits, the DS450M 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 DS450M 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 DS450M 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. Do not substitute a lighter gauge power cord for the one supplied with this unit.

If an electronic crossover or other AC powered equipment is used with the amplifier 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.

## Single-Ended Operation

The single-ended input 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 input, set the rear-panel toggle to SE position. Disconnect any balanced cable.

## Balanced Operation

The balanced input can be used with a preamplifier (or electronic crossover, etc.) having balanced outputs. When using the balanced input, set the rear panel toggle to BAL position. Disconnect any single ended cable.

## Installation

The amplifier may be installed in a ventilated cabinet; observe the following guidelines to maximize the performance and service of your amplifier.

With proper installation, the DS450M may be left on continuously for maximum performance on demand; it will draw approximately 55 watts of AC power at idle. However, the DS450M has been designed and engineered to minimize any 'warm up' necessary for best sonics; generally, a half-hour or 45 minutes of actual playing time will bring the amplifier around to more than acceptable performance levels, with some additional improvement noticeable over the next hour or two. Warm-up characteristics will depend upon ambient room temperature at start-up, the nature of the installation and the resolving power of the associated equipment.

Operate the DS450M only in a horizontal (upright) position. Adequate airflow and proper cooling can be maintained only if there is no restriction around the unit.

The five (5) non-marring feet provide adequate spacing and mechanical damping 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 degrees F or 49 degrees C. Improper installation will cause premature component failure and will affect your warranty, as well as the service life of the unit.

It is normal for the DS450M power amplifier to run lightly to moderately warm to the touch. All components within are operated at safe, conservative levels and will not be improperly affected, providing the requirements outlined above are adhered to.

## Remote Turn-on Connections

The DS450M 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 mini plug to connect to the +12V IN jack on the rear of the DS450M. Two identical paralleled jacks are provided to allow chaining connections to control two or more DS450Ms 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 20mA per DS450M for the duration of amplifier on time. Do not use a momentary or data pulse control signal.

The front power switch on the DS450M must be off to use the remote turn-on. Front power switch is disabled when 12 volt trigger is energized. The front power switch will not turn the DS450M off if the 12 volt trigger is energized.

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.

## Operating Procedure

1. Make sure you have read and followed the INSTALLATION and CONNECTION instructions prior to attempting operation.
2. Secure all rear panel connections between DS450M, and input source, and loudspeakers.
3. Make sure the amplifier is properly connected to a high-current AC power receptacle via the supplied power cord (see CONNECTIONS).
4. Your preamplifier should be 'On' and muted and/or set at minimum gain.
5. Turn Power switch from 'Off' to 'On'. Unit is ready to play when LED is on. Note: if the power indicator LED fails to light, turn the Power switch to 'Off' and check the appropriate fuse for possible failure. Extra fuses for AC power are included with the unit. If green light is blinking after turn on, a low line voltage condition exists—turn

off amplifier and check line voltage.

- Your amplifier should now operate satisfactorily. It may be played immediately, although best sonic performance will in most cases not be achieved for an hour or so (see INSTALLATION for further details.)

## Start-Up Following 'Protect'

### Shutdown:

The DS450M amplifier uses a sophisticated, non-fused sensing circuit to protect the amplifier from DC at the input, from thermal overload, and from shorting conditions at the output (e.g. defective speaker leads, etc.). This circuit also helps prevent damage to your loudspeakers.

When the amplifier senses a fault condition in either channel from excessive DC or excessive output current, it will automatically shut off left or right outputs from the amplifier. Amplifier will automatically return to normal operation when fault is removed. If the amplifier fails to resume normal operation after removal of a fault condition, contact your authorized dealer for further assistance.

## Servicing

Because of its careful design and exacting standards of manufacture, your DS450M amplifier should normally require only minimal service to maintain its high level of performance.



**CAUTION:** The DS450M 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.

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). When ordering a service manual from Audio Research or an authorized dealer, be sure to identify the serial number on your amplifier.

## 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 paintbrush is effective in removing dust from bevels, the recessed nameplate and other features of the front panel.



## Disposal and Recycling Guidelines

To dispose of this electronic product, do not place in landfill. In accordance with the European Union Waste Electrical and Electronic Equipment (WEEE) directive effective August 2005, this product may contain regulated materials which upon disposal require special reuse and recycling processing. Please contact your dealer or importing distributor for instructions on proper disposal of this product in your country. Or, contact Audio Research Corporation (763.577.9700) for the name of your importing distributor and how to contact them.

Packing and shipping materials may be disposed of in a normal manner.

## Limited Warranty

Audio Research Corporation products are covered by a 3-Year Limited Warranty, 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:** 450W into 8 ohms (650W into 4 ohms), 1% THD.

**POWER BANDWIDTH:** (-3dB points) 5Hz to 45kHz into 8 ohms.

**FREQUENCY RESPONSE:** (-3dB points at 1W) 5Hz to 45kHz into 8 ohms.

**INPUT SENSITIVITY:** 2.9V RMS for rated output (26dB Gain) single-ended or balanced.

**INPUT IMPEDANCE:** 150K ohms single-ended, 300K ohms balanced differential.

**OUTPUT POLARITY:** Non-inverting from single-ended input. Balanced pin 2+ (IEC-268).

**OUTPUT REGULATION:** 0.02dB 8 ohms loaded to open circuit (Damping factor 440).

**OUTPUT CURRENT:** ~35 amps peak at protective shutdown.

**SLEW RATE:** 5 volts/microsecond. (20% maximum duty cycle).

**RISE TIME:** 8.0 microseconds.

**HUM & NOISE:** <300 microvolts RMS (105dB below rated output IHF A-weighted).

**POWER SUPPLY CAPACITANCE:** 176,800 uF total 684 Joules.

**POWER REQUIREMENTS:** 100-125VAC 60Hz (200-250VAC 50Hz) 550 watts at rated output (450W into 8 ohms), 700 watts at 650W into 4 ohms, 700 watts maximum, 55 watts idle.

**DIMENSIONS:** 19" (48 cm) W (standard rack panel) x 5.25" (13.3 cm) H x 14.25" (36.2 cm) D (front back panel). Optional handles extend 1.5" (3.3 cm) forward of the 3/8" thick front panel. Output connectors extend 1.5" behind rear panel.

**WEIGHT:** 37.2 lbs. (16.9 kg) Net; 43.3 lbs. (19.7 kg) Shipping.

Specifications subject to change without notice.  
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