
Model Reference 300

Some loudspeakers and some speaker switch boxes have "common ground" systems, either by hookup between the speakers or in a special crossover device. Most headphone adaptor boxes also have a common ground. In these instances it is important to connect the "negative" speaker leads (or headphone common leads) to the "unbalanced, common-ground" post to avoid shorting the amplifier or causing monaural performance to occur. Use the unbalanced 4, 2 or 1 ohm post for the "positive" speaker leads. Contact your authorized Audio Research dealer or Audio Research Customer Service Department for help with these special cases.

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).

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 Reference 300 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 Reference 300 amplifier be connected to a wall AC power receptacle, or a similar heavy-duty source. Do not connect to convenience receptacles on preamplifiers, etc. The proper control of start-up and shut-down surges may not occur unless the power switch on the front of the Reference 300 is actually used for on/off control of the amplifier. The AC power source for the Reference 300 amplifier should 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 Reference 300 should be connected to its 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 of the Reference 300 is more than 25 feet from the building power entrance and breaker box, it would be preferable to use installed wiring capable of 20 amperes to minimize voltage drop, 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 Reference 300 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 supplied with your Reference 300 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 Reference 300 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 pre-amplifier, 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 switch on the front panel of the Reference 300 in the "Off" position before connecting or disconnecting the power line cord to AC power.

Use of Controls/Operating and Adjustment Procedure

1. Make sure you have read and complied with the INSTALLATION and CONNECTION instructions prior to attempting operation.
2. Make sure your Reference 300 is properly connected to a high-current power receptacle via the supplied power cord (see CONNECTION instructions) with the Power switch in the "Off" position.
3. When the power cord is plugged in, the Line voltage operating range meter continuously monitors incoming line voltage available to the amplifier, indicating the normal range the line voltage should fall within for proper amplifier performance.
4. Your preamplifier should be "On" and muted and/or set at minimum gain.
5. Set the Power switch to "Standby" (indicated by illumination of the amber LED) for at least 5 minutes to warm up the amplifier slowly (extending internal component and tube life) before operation.

Next, rotate the Power switch from "Standby" to "Operate" position (indicated by illumination of the green LED). The amber "Standby" LED will blink for approximately 35 seconds before the green "Operate" LED illuminates.

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After putting the Power switch in the "Operate" position, set the V1-V4/V5-V8 test selector switch in the "V1-V4 test" position and set the V1-V4 Meter indication switch in the "V1" position. As the unit warms up, make a slow preliminary adjustment of the "V1" trim potentiometer using only the plastic insulated screwdriver included with the unit. Adjust the pot so that "V1" reads within the green (normal) portion of the arc on the Power output and tube operating range meter. Continue rotating the V1-V4 Meter indication switch through the V2-V4 positions, adjusting the corresponding trim pot on the front panel in turn so the meter reading for each tube falls within the green (normal) portion of the meter arc. Next, set the V1-V4/V5-V8 test selector switch in the "V5-V8 test" position and repeat the above tube bias adjustment procedure in order on the V5-V8 tubes. After about 20 minutes, a fine adjustment of each tube bias position should be made as needed. During the bias adjustment procedure the amplifier's input is muted.

Note that it is not necessary to repeat the tube bias adjustment 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 of the meter, that tube is faulty, and should be replaced.

6. Return the V1-V4/V5-V8 test selector switch to the "PWR OUT" (center) position for listening. Your Reference 300 is now ready for operation. However, a full stabilization or warm-up period of at least one-half hour is recommended for best sonic performance.
7. During operation, the Power output and tube operating range meter indicates the approximate power output (in watts) of the amplifier.
8. Fan speed and meter illumination controls may be set where desired. Note that a higher fan speed setting (at the cost of only slightly higher fan noise) will increase cooling and extend tube life.

Note: When using the test position for checking or adjusting output tube current, it is normal for the right-hand meter to fluctuate slightly with typical power line fluctuations. The right-hand meter is more sensitive to these fluctuations than the left-hand meter. Use an average meter indication, and disregard these fluctuations. (They do not affect the performance.)

Servicing

Because of its careful design and exacting standards of manufacture, your Reference 300 amplifier should normally require only minimal service to maintain its high level of performance.

CAUTION: The Reference 300 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 vacuum tubes inside the Reference 300 are high-quality 6550, and 6922 types. The power output tubes supplied with your new Reference 300 are matched pairs of 6550's. Reliable, matched, low gas 6550 replacement tubes – such as those available from ARC – are strongly recommended for maximum performance and longevity. Observe the operating and adjustment procedure for adjusting bias when replacing any power output tubes.

Expected service life from a set at 6550 output tubes is approximately 2000 hours, and will vary with conditions of use.

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 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.