

CLASSE AUDIO
DR-3
PURE CLASS A
POWER AMPLIFIER

DR-3
OWNER'S MANUAL

NOTE : We all know that the use of a power amplifier does not require great amounts of wisdom or technical prowess. But owner's manuals can prove to be enlightening. So even if you are already listening to the DR-3, please read this manual. We're sure you will learn something about your new amplifier that you did not know before.

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DESIGNER'S INTRODUCTION

When the DR-2 amplifier was introduced in 1981, it quickly established itself as one of the most "musical" amplifiers on the market. That adjective still holds today; in its price range, the DR-2 and the improved DR-2A are hard to surpass for sheer musicality and drive capability, not to mention the "build quality" that is synonymous in all Classé products.

Great masterpieces of music are timeless, but technology is not. So it was our duty to look at, moreover scrutinize, those new techniques and components which could provide sonic improvements in our products. In power amplifiers, the DR-3 was the result. Evolution of the DR-3 did not come easily. Countless hours of subjective listening had to be weighed against objective analysis of each and every change. Recreating music could not compromise technical accuracy. And where present technology did not satisfy our requirements, we advanced it ourselves, as in the case of our custom-made output connector.

At Classé Audio, we pride ourselves in releasing a new product only after lengthy periods of experimentation and trial. In effect, our new products are already third or fourth generation, providing musical longevity and in-bred reliability.



Dave Reich,
Designer & President

LIMITED FOUR YEAR WARRANTY

Classé Audio Inc. warrants each DR-3 amplifier to be free from defects in materials and workmanship for a period of four years from date of purchase.

In the event of failure of a DR-3 amplifier, Classé Audio Inc. will repair, recalibrate, or at our discretion, replace the unit in accordance with and providing that all the clauses contained in this warranty are met.

In order to initiate service of any kind, it is required to OBTAIN PRIOR FACTORY AUTHORIZATION, and SHIP THE UNIT PREPAID. For units coming from the U.S., contact the factory for our U.S. forwarding address.

Any of the following conditions shall void the warranty :

- 1) Operation not in accordance with this manual.
- 2) Accident, abuse, tampering, or unauthorized modification, as determined by Classé Audio Inc. exclusively.
- 3) Removal, defacing, or falsifying the serial number plate.
- 4) Shipping without the complete factory packaging.

CLASSE AUDIO INC. SHALL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES REGARDING THE OPERATION, FAILURE, TROUBLE-SHOOTING, OR REPAIR OF A DR-3 AMPLIFIER.

WARRANTY REGISTRATION : Please fill out and return the form below to the factory within 10 days of purchase. It will allow us to provide expedient service, and information regarding updates and new products.

DR-3 SERIAL NUMBER _____ PURCHASE DATE _____
AUTHORIZED DEALER _____
PURCHASER'S NAME _____
STREET ADDRESS _____
CITY _____ STATE/PROV. _____
COUNTRY _____ ZIP/POSTAL CODE _____

SEND TO : Classé Audio Inc. - Product Registration
227-G Brunswick Blvd.
Pointe Claire, Quebec, Canada
H9R 4X5

OPERATION

Set-up :

Because your DR-3 is a Pure Class A amplifier and normally runs very warm, you must provide adequate space for its natural convection cooling. Place the unit on a solid, flat surface and allow at least six inches of space above the heat sinks and three inches on each side.

DO NOT ATTEMPT TO FAN-COOL YOUR AMPLIFIER. IT HAS BEEN DESIGNED TO RUN WARM AND IS QUITE HAPPY TO DO SO. COOLING THE UNIT WILL "FOOL" THE TEMPERATURE SENSITIVE CIRCUITRY AND WILL RESULT IN AN "OVER-BIAS" STATE.

The DR-3 is also rack mountable -- the solid construction permits total support by the faceplate if so desired.

The two power transformers in your amplifier are compactly wound with square (cross-sectional) wire, producing very high flux density and magnetic fields. This could be picked up as a hum by sensitive low level circuitry and cables in the surrounding area. Turntables, step-up devices, and preamplifiers should be kept a few feet or more away from the amplifier to avoid this problem.

Connections :

The power cord for your amplifier is detachable to facilitate safer and easier moving of the unit. Always use the cord supplied or one of equivalent electrical rating. Insert the cord firmly into the receptacle on the back of the amplifier BEFORE plugging the other end into the wall.

Connections for inputs and outputs are clearly marked on the back of the amplifier. Output connections for STEREO are marked above the connectors, while connections for BRIDGED use are marked below the output connectors. When working "by feel" from the front of the amplifier, it will be helpful to note that connections are oriented from the front of the unit, so that the LEFT channel output binding post is closer to the left side of the unit, and the RIGHT channel output binding is closer to the right side. The two input jacks are similarly arranged. Therefore, the input jack closest to the left side of the amplifier is the LEFT channel input, etc.

Use high quality interconnect cables and speaker wires, and make all connections tight. Use the nutdriver supplied to tighten the output connectors, placing the wire or lug under the washer. Observe phasing the loudspeaker connections.

Your DR-3 amplifier is extremely stable. However, to protect your loudspeakers from possible pulse damage, secure all connections BEFORE turning on the unit.

Should you wish to change connections, turn off the amplifier FIRST and allow about thirty seconds for discharge. Always turn on your preamplifier before the amplifier. Allow TUBE preamplifiers about five minutes to stabilize before turning on the amplifier. When shutting down the system, always turn off the amplifier first.

BRIDGED OPERATION

Set-up :

The DR-3 already contains an improved, discrete bridging circuit. The INPUT IMPEDANCE in the bridged mode is 25k ohms. (100k ohms in the the STEREO mode).

To switch from stereo to mono, proceed carefully as follows :

- 1) Turn off and disconnect the amplifier completely from the system and the A.C. line.
- 2) Turn the unit upside down, and remove the eight (8) bottom plate screws with a 5/64" Allen (hex) key. Remove the bottom plate.
- 3) On the circuit board closer to the power switch, locate the BLUE BRIDGING SWITCH in the lower left corner of the circuit board.
- 4) On the switch you will see THREE (3) WHITE LEVERS. SWITCH FIRMLY ALL THREE LEVERS TO THE RIGHT. This is easily accomplished with a small, slotted screwdriver.
- 5) Remove the two NEGATIVE (-) screws and washers from the output connectors. Place the supplied BRIDGING BAR over the connectors and secure with the washers and bolts. Tighten with the nutdriver supplied. THE AMPLIFIER IS NOW SET FOR BRIDGED OPERATION AND MUST BE CONNECTED AS EXPLAINED BELOW. DO NOT ATTEMPT TO USE THE AMPLIFIER IN THE STEREO MODE ONCE IT HAS BEEN SET FOR MONO.
- 6) Replace the bottom plate, orientating the VENTILATION SLOTS CLOSER TO THE FRONT of the amplifier.

Connections for Bridged Operation :

- 1) Connect the INPUT to the LEFT CHANNEL input, which is also marked MONO.
- 2) Connect the POSITIVE (+) LOUDSPEAKER WIRE to the LEFT CHANNEL POSITIVE (+ RED) BINDING POST.

Connect the NEGATIVE (-) LOUDSPEAKER WIRE to the RIGHT CHANNEL POSITIVE (+ RED) BINDING POST.

These connections are marked on the back of the amplifier BELOW the output connectors.

Unlike most amplifiers, the DR-3 remains very stable in the bridged mode. It may be used with low impedance loads, and can be turned on with or without the loudspeaker connected. The only two operating precautions are :

- 1) Connect the input before turning the amplifier on, and keep it connected at all times.
- 2) The "NEGATIVE" loudspeaker connections are not true grounds. Always direct wire the loudspeakers to bridged amplifiers. Do not use a common ground or go through a switchbox.

PROTECTION CIRCUITRY

None.

FUSING

The DR-3 amplifier has a total of six fuses - three per channel. All the fuses are the same value : 8 amps (4 amp line fuses for 240 or 220 V.A.C. units). It is unlikely that a line fuse would ever blow. The other two (per channel) fuses, the "RAIL FUSES", are for the positive and negative power supply lines. The 8 amp value of these fuses does not impede the high current capability of the amplifier

Few situations should cause the rail fuses to blow. This may indicate :

- 1) Output stage failure of the amplifier.

- 2) Shorted output connections.
- 3) Too low a load impedance for turn-on.

If an amplifier channel fails to operate, TURN UNIT OFF IMMEDIATELY. Check your loudspeaker wiring. Then check the rail fuses. NEVER REMOVE THE RAIL FUSES WITH THE AMPLIFIER ON. If one or both fuses are blown, replace them. DISCONNECT THE LOUDSPEAKER LOAD. Turn the amplifier on and wait about fifteen seconds. Then, very carefully, BRIEFLY TOUCH the loudspeaker wires to the output binding post. If loud popping or pulsing is heard, this is indicative of severe D.C. offset and probable amplifier failure. TURN THE UNIT OFF, and contact your Classé Audio dealer.

NOTE : THE ABOVE PROCEDURE IS OUTLINED AS A TROUBLESHOOTING AID, BUT IS PERFORMED ENTIRELY AT THE USER'S RISK. CLASSE AUDIO INC. WILL NOT BE LIABLE FOR DAMAGES TO THE LOUDSPEAKERS DUE TO AMPLIFIER FAILURE OR FURTHER DAMAGE DUE TO TROUBLESHOOTING. (SEE WARRANTY).

With very low impedance loads, the positive rail fuse may blow on turn-on. This does NOT indicate amplifier failure. If this happens repeatedly, we recommend disconnecting the loudspeakers BEFORE turning on the amplifier ; then reconnect the loudspeakers after one minute. This will allow the amplifier to stabilize first, after which it can be connected to, and drive the severe load without a problem.

TECHNOLOGY, FEATURES, AND QUALITY ASSURANCE

The technique of Pure Class A is thoroughly demonstrated in the DR-3 amplifier. At its specified output power, it does not suffer from "derating", a reduction of Class A power at low impedances. No Class A amplifier escapes this phenomenon at some point - to do so would imply a bias current of infinity and a load impedance of zero, which is impossible. However, the DR-3 does go beyond the textbook requirements of Class A operation to deliver an abundance of Class A power at all impedances.

The DR-3 power supply begins with two 350 VA transformers wound with square (cross-sectional) wire. Similar to that in voice coil technology, the results are higher flux density, greater efficiency, and faster response. The transformers are double varnished and mounted on rubber grommets to minimize mechanical hum. Each one is individually tested for voltage and current output, and noise. Thirty-five (35) Amp bridge rectifiers are followed by a two stage RC filter network to provide high power reserves with low ripple. Total capacitance to the output stages is 160,000 uF, equivalent to 250 Joules of energy

storage. Extensive bypassing with film capacitors is employed. Solid copper, silver plated buss bars combine with the stiff transformers and low ESR capacitors to maintain extremely low power supply impedance.

The differential input stage is current sourced and cascoded. Cascoding increases the input impedance and effectively "elongates" the linear operating region of the devices. The driver transistors are also cascoded, while their current source diodes monitor and maintain the output stage bias current. All the devices are matched for gain and checked for leakage on a Tektronix Curve Tracer. Half-watt resistors are metal-film, 1% tolerance, while emitter resistors are an oversized 10 Watts, wire wound and silicon sealed by hand exclusively for Classé Audio. The fully discrete circuit is mounted on a glass epoxy printed circuit board and soldered with silver content solder. The manufacture of the nine all-new PCB's is computer executed. Most of the boards are double-sided and have eight times more copper than your typical mil-spec PCB. Moreover, the copper on these boards is not sheet-laminated but chemically deposited to the desired thickness, then sealed with a glass-epoxy coating which omits tin-lead on the tracks. In a way, these boards are analogous to hard-wiring discrete components with OFHC (oxygen-free, high purity copper), far and away superior to typical PCB's which generally compromise the sound.

One of the boards contains the additional bridging circuitry and switch. The switch features three DPDT sections -- when not in use, the bridging components are completely disconnected from the rest of the circuit and the power supply. Each PCB is terminated through a 12-pin gold plated connector. This connector features radial pins, each of which can carry over four times the current of the conventional card-edge contact. The connector also facilitates complete PCB testing prior to hook-up in the amplifier.

For each channel, the DR-3 output stage employs four high speed, high power, monolithic devices. It is a costly device which frankly would not be considered by most manufacturers, but it sounds better and allows the use of fewer devices without sacrificing reliability. Nonetheless, Classé Audio subjects these devices to a further two screenings for careful matching and leakage rejection on a Tektronix Curve Tracer. Nominal device capability per channel is 800 Watts/120 Amps. Four massive heat sinks (surface area : 1,965 square inches) are computer drilled, not punched, to accommodate the devices into their high quality sockets.

The DR-3 input jacks are now silver plated and anti-tarnish treated. Classé interconnect cable brings the signal from the inputs to the PCB's. Hook-up wire consists exclusively of selected gauges of a

modified LC-OFC wire. Gone are the five-way binding posts. They've been replaced by our own design - a massive chunk of brass, machined and heavily plated with our modified silver. Tight-fitting bolts of the same nature make the internal and external connections, relinquishing the use of banana plugs.

The DR-3 components are housed in a rigid, eighth-inch thick aluminium chassis that is computer punched and fully welded, as is the transformer cover box. Extensive use of "Allen" hardware is the rule - not a self tapping screw to be found. The quarter-inch thick faceplate is completely milled, then brushed, mil-spec anodized, and finally hand engraved. Completing the unit are the heat sink covers and machined handles, which are brushed and gold anodized.

It has been said that Classé Audio sells only used products. When assembly is complete, each DR-3 is subjected to rigorous burn-in and testing. Idle, stereo sweep, and bridged sweep are carried out for minimums of 24, 24, and 12 hours each, respectively. (Typical burn-in times are often doubled). The sweep cycling consists of a voltage controlled square wave logarithmically swept from 5Hz to 50KHz at full power into 4 ohms.

MAINTENANCE

No periodic adjustments are necessary on the DR-3 amplifier, but it should be kept clean so as not to impede cooling. When dust has accumulated, brush the heat sinks (in and around the fins) with a damp paint brush.

The silver plated input jacks have been treated to resist tarnishing, but may discolor slightly every few months. They can be easily cleaned with a mild solvent (alcohol, Windex or the like).

The faceplate can be polished to look new with a mild furniture polish, one that has a low (but some) oil content. Apply to a soft cloth and wipe along the grain of the faceplate and handles.