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Introduction

**Please read this manual carefully before commencing servicing!
Only qualified and authorized personnel should attempt to service this product.**



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions.

Classé has a global product support network. For product assistance or to order replacement parts please contact your nearest service center always quoting the unit serial number.

North America

Phone: (978) 664-2870 E-mail: classe@bwgroupusa.com

Europe

Phone: 44 (0) 1903 221 700 E-mail: classe@bwgroup.com

Asia

Phone: (852) 2790 8903 E-mail: classe@bwgroup.hk

Rest of the World

Phone: (514) 636-6384 E-mail: cservice@classeaudio.com

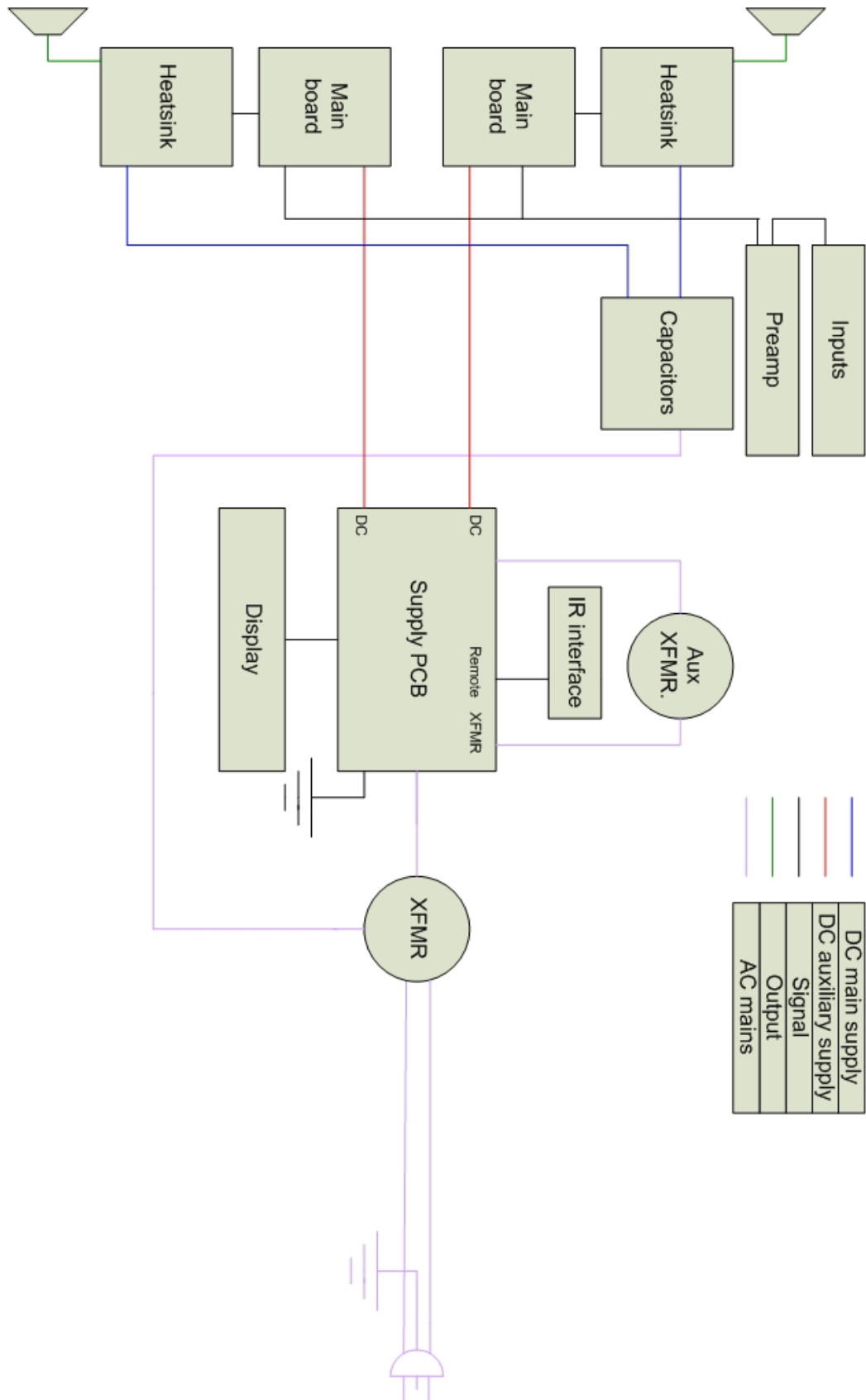
Important Notes on Servicing

1. ALWAYS observe ESD precautions when handling electronic modules or PCBAs.
2. NEVER exchange boards with a different revision number, unless authorized by Classé.
3. ALWAYS use Classé original replacement parts. The use of generic parts may void the warranty of the unit.

Ordering Replacement Parts

There may be a delay in processing incomplete requests. Please be sure to include all required information. Remember to quote the serial number of the unit on all replacement part orders and the Classé order number when returning defective parts for credit.

Block diagrams



Start Up Procedure

When receiving a unit, an assiduous visual inspection must be performed. Do not connect the unit without analysing the symptoms reported by the customer and the results of the inspection.

Using the troubleshooting guide, find the problem and proceed to the repair. Once this step is done, follow these steps, known as the start-up procedure, to ensure that everything in the unit is in working condition.

1. Proceed with a post repair visual inspection. Take the time to check if every wire is reconnected properly, every screw is bolted on, no soldering and/or metal residues lying in the unit, every fuse has been replaced, etc.
2. Turn the bias trim pots, counter clockwise until a click is heard.
3. Since there is no soft-start sequence of the CAP-151, it is impossible to use a bypass to perform a slow start up.
4. Connect Main supply, and turn on the unit.
5. If one or more supply are not within specifications, return to the troubleshooting guide.
6. If every supply is within specifications, report to calibration and adjustments to adjust bias and DC offset. Note that bias can be adjusted to 20mV, and the following tests can be performed before the unit is send to the burn-in bench for a 24 hours warm-up.
7. Connect the unit to a load, and to a source using single ended inputs.
8. Perform a test with a 200Hz, a 2kHz and a 20kHz tone, both sinus wave and square wave. Check the output with a oscilloscope, on 4 ohms and 8 ohms loads. Take special cares about oscillation and phase correlation between channels.
9. Connect the unit to a small speaker, and short the input. Check for any noise.
10. Put the unit on a burn-in bench, and let it sit for 24 hours, then readjust bias. Let the unit on the burn-in bench for another 72 hours.
11. Redo steps 7 to 11 before shipping to the customer.

Protection Modes and Indicators

The front LED display shows the status of the amplifier. When starting up normally, the CAP-151 will show a countdown from 20 to 0. However, there is no protection on the CAP-151. The CAP-151 is equipped with four rail protection fuses. In the event that one or more of these fuses would blow, the technician will first need to identify and cure the cause of failure (please report to troubleshooting guide). When the cause has been identified, disconnect the unit from the system including the AC power. Remove the top cover and look for damaged or burned components. If no other components than the fuses appear to be damaged, the technician can then replace the broken fuses with the same value and rating (please report to fuses section). The rail fuses are located on the main board. When replacing fuses, please make sure that the fuse holder are holding the fuses very tightly. A loose fuse holder can translate into distortion on top of the signal.

Troubleshooting Guide

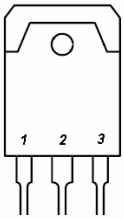
Symptom	Possible cause
Unit won't turn on	Check connections; Check fuses; Check soft-start circuit; Check relays; Check power supply circuits (positive rail, negative rail, Mosfet supply).
Smoked and/or burned components	Check for short between components and ground; Check output transistors; Check output relays; Check power supply circuits (positive rail, negative rail, Mosfet supply).
Blown fuses	Check for short between fuse and ground; Check power supply circuits (positive rail, negative rail, Mosfet supply).
No output	Check connexions; Check output relays; Check power supply circuits (positive rail, negative rail, Mosfet supply); Check output transistors.
Unit turn into protection	Check for smoked and/or burned components; Check power supply circuits (positive rail, negative rail, Mosfet supply); Check source and load; Check protection circuit; Check sensor wires between sensor PCB and control PCB; Check outputs transistors and Mosfet drivers.
Excessive buzz and/or hum	Check electrical lines; Check for a ground loop in the system.
Oscillation	Check source; Check capacitors on main board; Check 4.7Ω resistor.
Intermittent signal	Check connections; Replace shield wires.

Output Transistors Testing and Replacement



PLEASE NOTE THAT THESE TESTS ARE ONLY EFFECTIVE ON BIPOLAR TRANSISTORS. DO NOT PERFORM THESE TESTS ON MOSFET DEVICES, AS THEY ARE LIKELY TO BECOME SHORT DURING THE TEST.

You should check all pin combinations, as there is a chance that only one side of the transistor is short. When replacing output transistors, the technician should first disconnect both outputs and main board to check if the blown outputs were caused by a faulty component on the amplifier's base. Blown output transistors should be replaced by kits, not individually. These kits contain matched transistors for both rails of one channel. When replacing blown output transistors, you must also replace positive and negative Mosfet drivers and bias transistor. Carefully inspect 4.7Ω resistor and 10Ω soft start resistor, and replace if necessary. Replace any burnt component or board.



Pins : 1 Base
 2 Collector
 3 Emitter

You should have these results, if the transistor is good.

2SC3264 (NPN)

Positive lead	Negative lead	Result
B	C	Conductive
B	E	Conductive
C	B	Infinite
C	E	Infinite
E	B	Infinite
E	C	Infinite

2SA1295 (PNP)

Positive lead	Negative lead	Result
B	C	Infinite
B	E	Infinite
C	B	Conductive
C	E	Infinite
E	B	Conductive
E	C	Infinite

Calibrations and Adjustments

Bias adjustment:

Note: Bias adjustment should be made without any load connected to the amplifier's output, and no signal connected to the amplifier's input.

1. Since it is impossible to connect a multimeter to both emitter's resistors in order to measure and adjust bias without disassembling the heatsink from the chassis, we provided a test point to ease the bias procedure. It is located near the bias trimpot.
2. Connect the positive probe of a millivoltmeter to the test point and the negative probe to the positive speaker post of the channel to be adjusted.
3. Turn trimpots counterclockwise until it reaches 0Ω . A click should be heard.
4. Turn on amplifier, and let it warm up for 15 minutes on idle.
5. Adjust trimpot to get a 20mV reading.
6. Let the amplifier warm up for a 24 hours period with signal and load.
7. Remove signal and load, and reconnect the multimeter.
8. Readjust to 24mV.

DC offset:

Note: DC offset adjustment should be made without any load connected to the amplifier's output, and no signal connected to the amplifier's input.

On these units, DC offset can't be adjusted. Measure DC offset using a voltmeter connected to the output posts, scale setted to mV. DC offset should be less than 10mV.

Parts List

This is not a detailed part list. It is a list of major chassis parts and PCBs. If you need to order a specific part, please contact Classe Audio with the part location, PCB number, and model and serial number of the unit. If you need a complete PCB, please replace the (x) in the Classe part number with the revision number printed on the board.

Parts	Description	Classe part number
B231X	Complete PCB, input	B231XR(x)
B232X	Complete PCB, supply	B232XR(x)
B0F3X	Complete PCB, heatsink	B0F3XR(x)
B0F4X	Complete PCB, amplifier	B0F4XR(x)
B235X	Complete PCB, caps	B235XR(x)
B236X	Complete PCB, preamp	B236XR(x)
B237X	Complete PCB, front panel	B237XR(x)

Updates

1. On board B0F3X (both PCBs), replace R109 and R110 with Classe part number RN55D6650.
2. On board B232X, replace R5 and R6 with Classe part number A211-1004.
3. Replace shield wires with newer type.

Fuses



EXTRA PRECAUTIONS SHOULD BE TAKEN WHEN REPAIRING, MODIFYING, OR TROUBLESHOOTING IN THE POWER SUPPLY AREA. UNIT MUST BE DISCONNECT FROM MAIN SOURCE AND CAPACITORS MUST BE DISCHARGED USING A 100W INCANDESCENT BULB.



WHEN REPLACING FUSES, PLEASE MAKE SURE THAT THE FUSE HOLDERS ARE HOLDING THE FUSES VERY TIGHTLY. A LOOSE FUSE HOLDER CAN TRANSLATE INTO DISTORTION ON TOP OF THE SIGNAL.

Main fuses:

For 100 – 120v units: 5A slo-blo, Classe part number GDC-5A

For 220 – 240v units: 4A slo-blo, Classe part number GDC-4A

The main fuse is located at the back of the unit, on the rear panel. On newer models, main fuse is located on supply board (B232X)

Rail fuses: 4A, Classe part number GDB-4A

The rail fuses are located on the heatsink board (B0F3X).

Control board fuse: 0.75A, Classe part number 225.750

The control board fuse is located on top of the supply board (B232X)

Mosfet fuses: 0.50A, Classe part number 225.500

The Mosfet fuses are centered on the heatsink board (B0F3X)

Voltage Change



EXTRA PRECAUTIONS SHOULD BE TAKEN WHEN REPAIRING, MODIFYING, OR TROUBLESHOOTING IN THE POWER SUPPLY AREA. UNIT MUST BE DISCONNECT FROM MAIN SOURCE AND CAPACITORS MUST BE DISCHARGED USING A 100W INCANDESCENT BULB.

1. Set the jumper position according to the table below.
2. Replace the varistor, according to new line voltage, following Classe's recommendations. If varistor is not available, remove old varistor and leave it empty.

Jumper positions, main transformer

Mains	Jumper 1	Jumper 2	Jumper 3	Varistor
100VAC	A	E	F	221
120VAC	A	C	D	221
220VAC	B	E	-	391 / 441
240VAC	B	D	-	391 / 441

Jumpers, auxiliary transformer

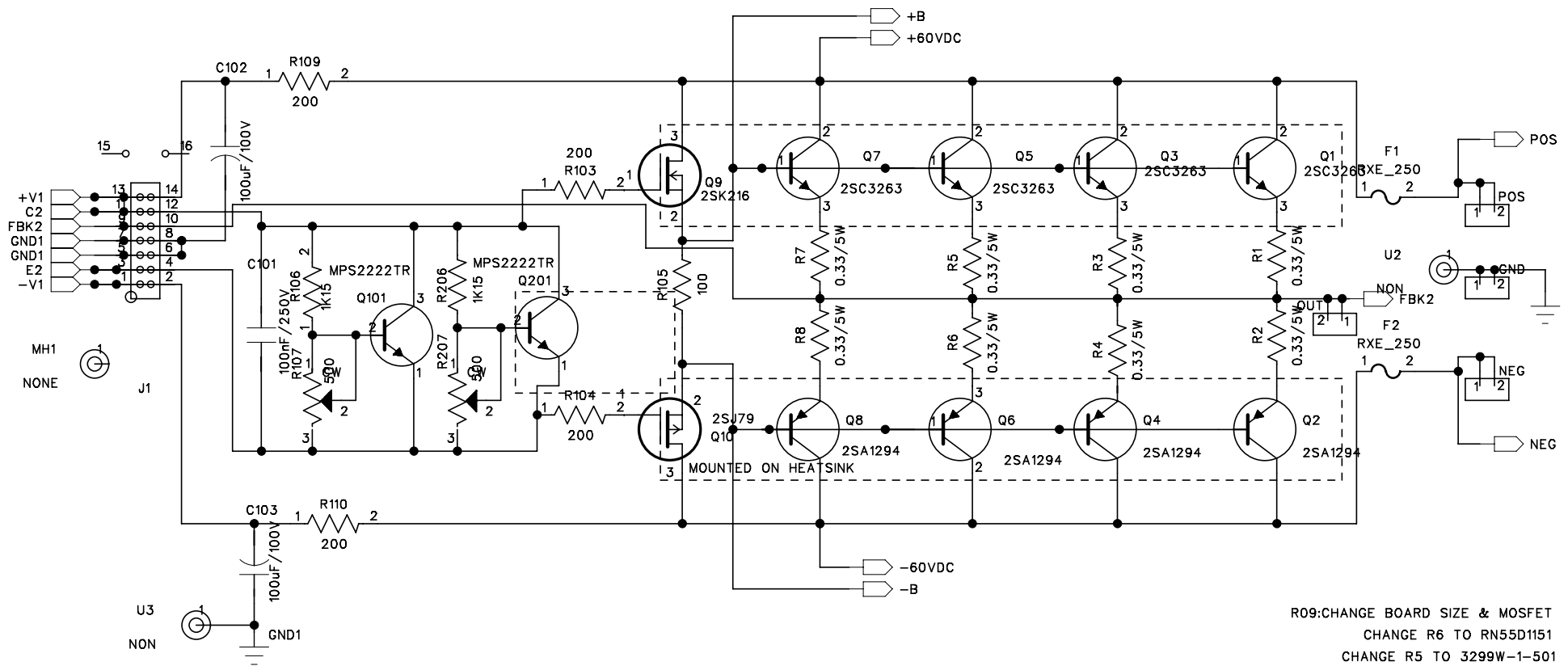
Mains	Position 1	Position 2	Position 3	Position 4	Position 5
100/120VAC	In	Out	Out	Out	In
220/240VAC	Out	Out	In	Out	Out

IR Interface Information

Press and hold:

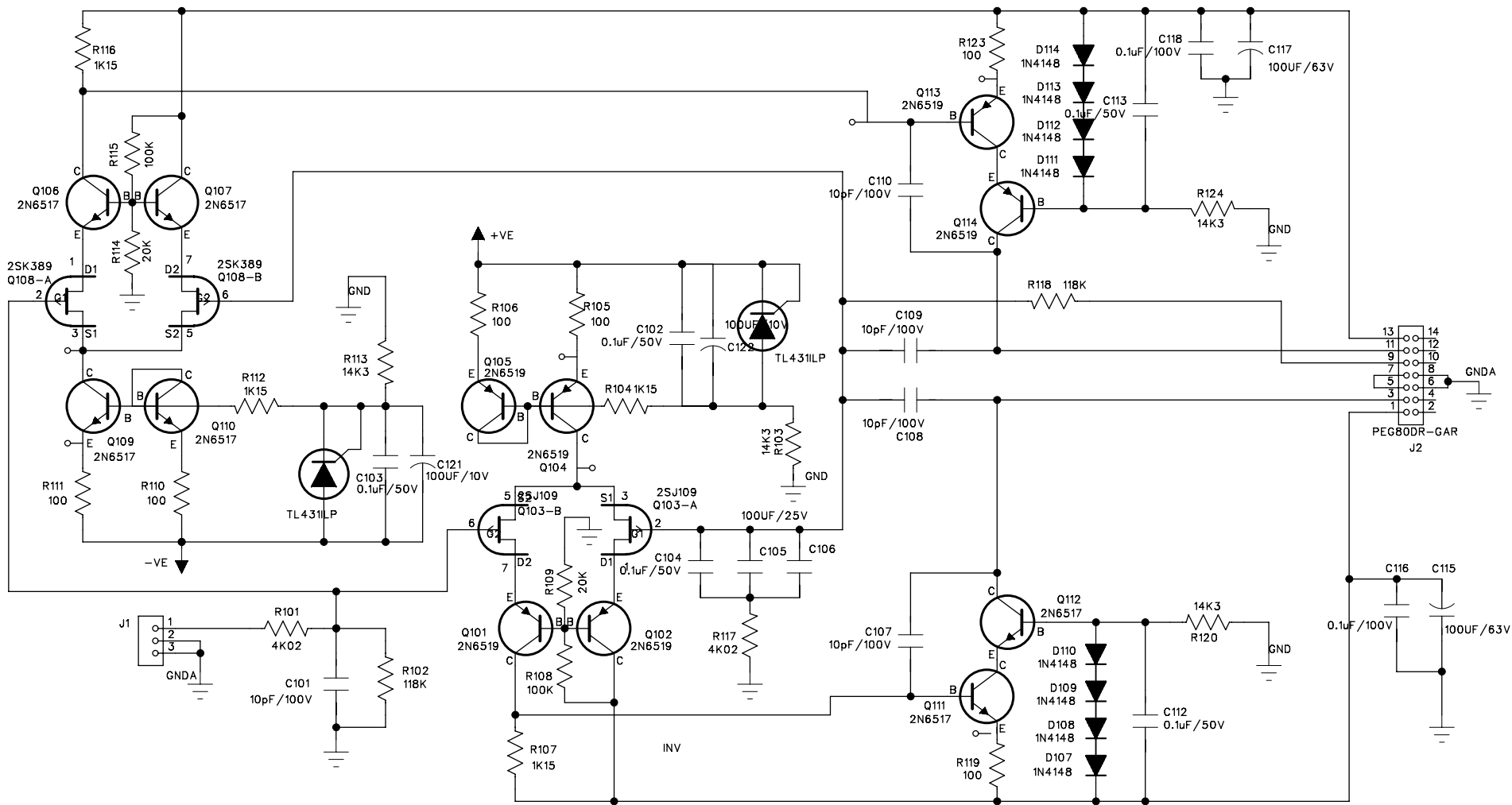
AMP	+	LINE 1 =	Turns on Amplifier # 1
AMP	+	LINE 2 =	Turns on Amplifier # 2
AMP	+	LINE 3 =	Turns on Amplifier # 3
AMP	+	BAL 1 =	Turns on Amplifier # 4
AMP	+	BAL 2 =	Turns on Amplifier # 5
AMP	+	BAL 3 =	Turns on Amplifier # 6

J3	J2	J1	J0	ADDRESS	RC Button	Auto ON	Note
X	X	X	X	0	Amp1	No	QC setting
X	X	X	Out	1	Amp2	No	
X	X	Out	X	2	Amp3	No	
X	X	Out	Out	3	Amp4	No	
X	Out	X	X	4	Amp5	No	
X	Out	X	Out	5	Amp6	No	
X	Out	Out	X	0	Amp1	No	
X	Out	Out	Out	0	Amp1	Yes	On with AC
Out	X	X	X	0	DC	No	
Out	X	X	Out	1	DC	No	
Out	X	Out	X	2	DC	No	
Out	X	Out	Out	3	DC	No	
Out	Out	X	X	4	DC	No	
Out	Out	X	Out	5	DC	No	
Out	Out	Out	X	0	DC	No	
Out	Out	Out	Out	0	DC	Yes	On with AC



R09:CHANGE BOARD SIZE & MOSFET
 CHANGE R6 TO RN55D1151
 CHANGE R5 TO 3299W-1-501

COMPANY:	CLASSE AUDIO INC.		
TITLE:	CAP INTERGATED AMPLIFIER		
DESC:	OUTPUT SECTION		
DRAWING NO:	BOF3XR09		
DRAWN:	NDN	DATE:	NOV 5, 02
		SHEET:	1 OF 1



B

A

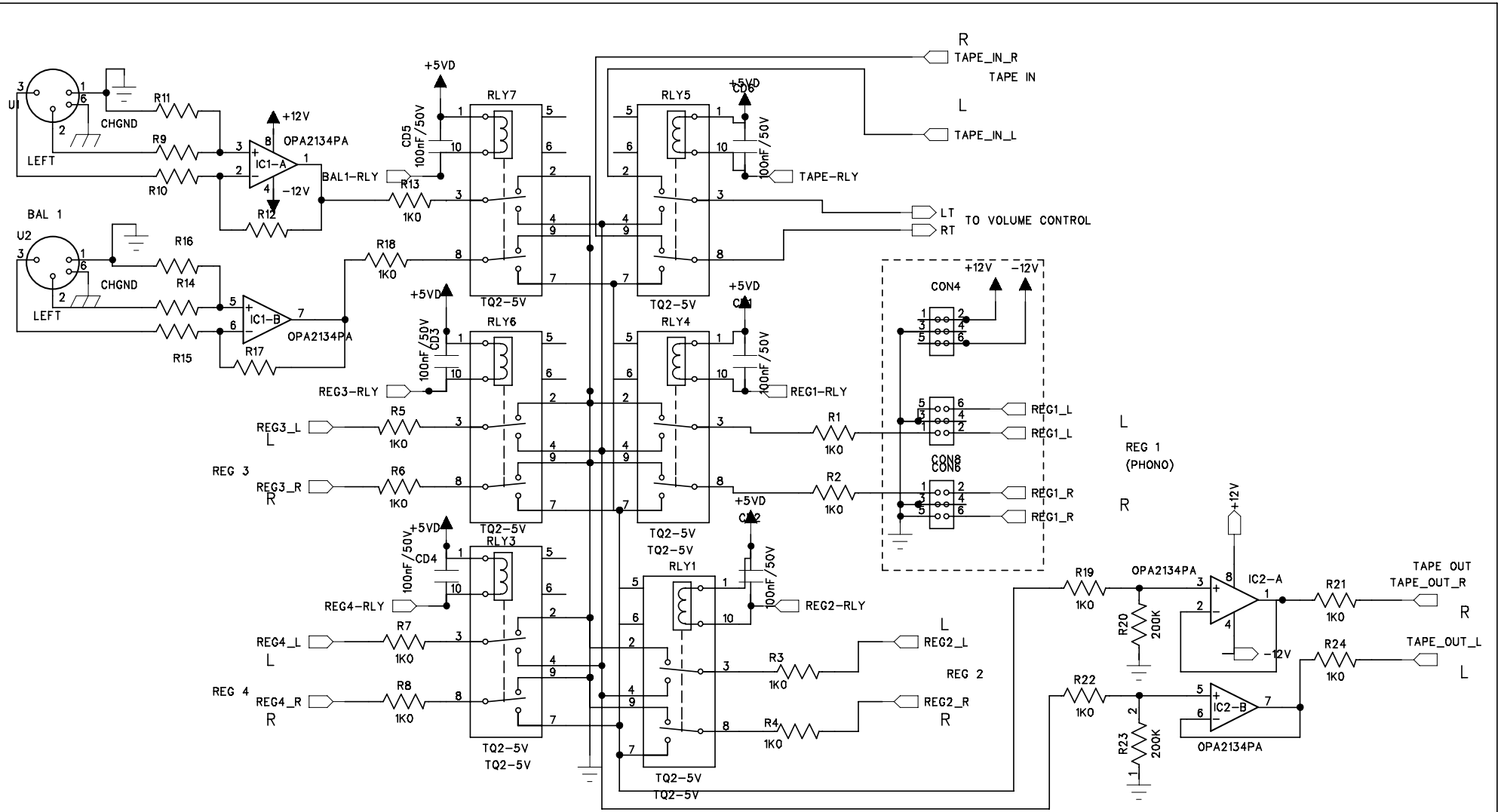
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COMPANY:
CLASSE AUDIO INC.

TITLE:
CAP151 GAIN STAGE PCB

DRAWING No:
B0F4XR02

SHEET 1 OF 1



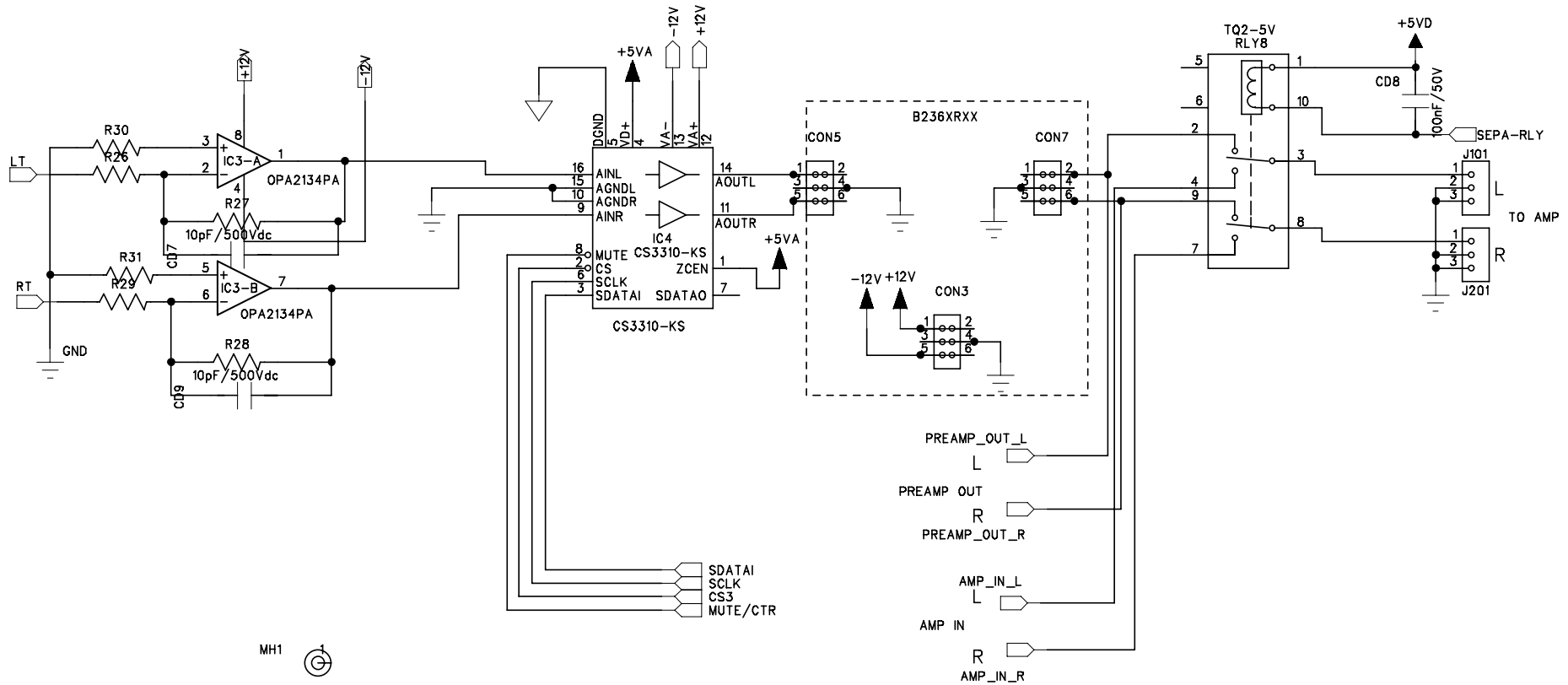
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COMPANY:
CLASSE AUDIO INC.

TITLE:
CAP151 I/P

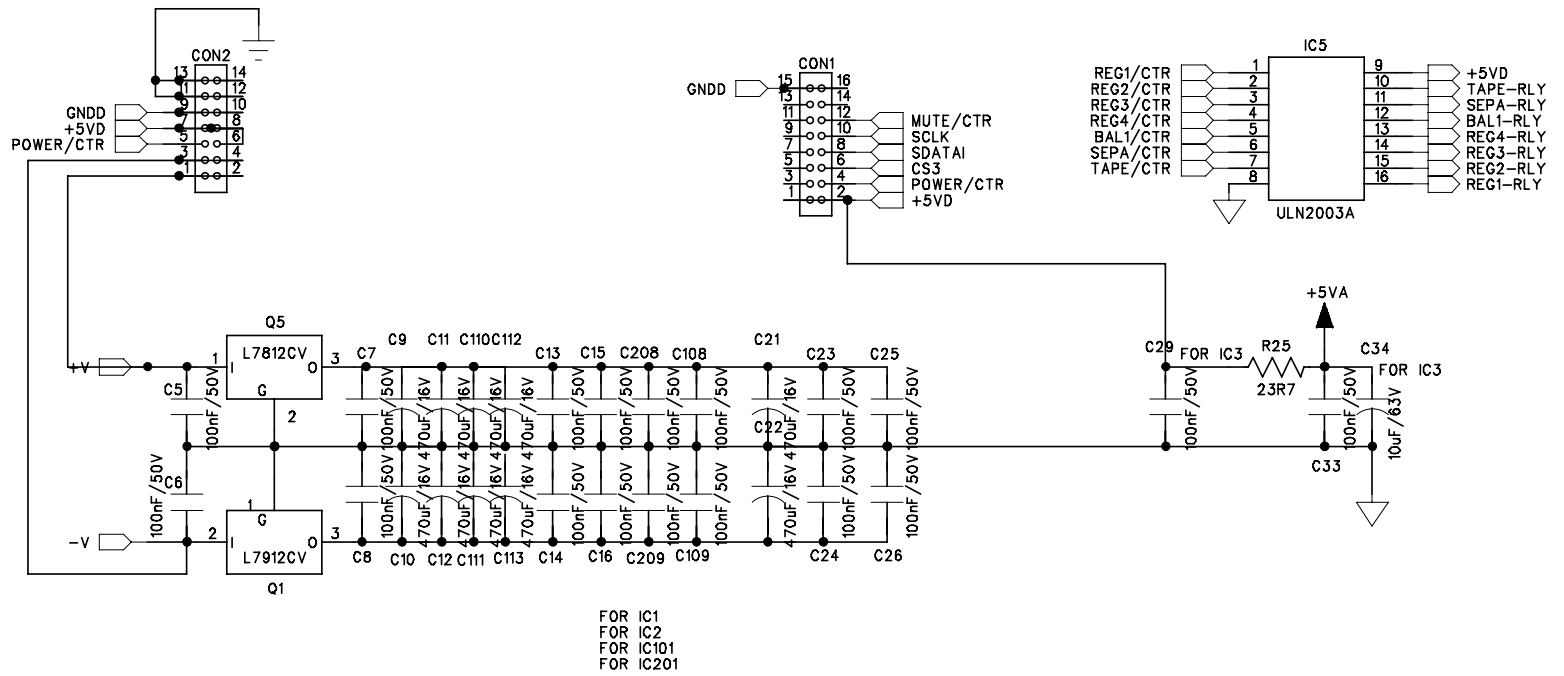
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B231XR06

SHEET 1 OF 3

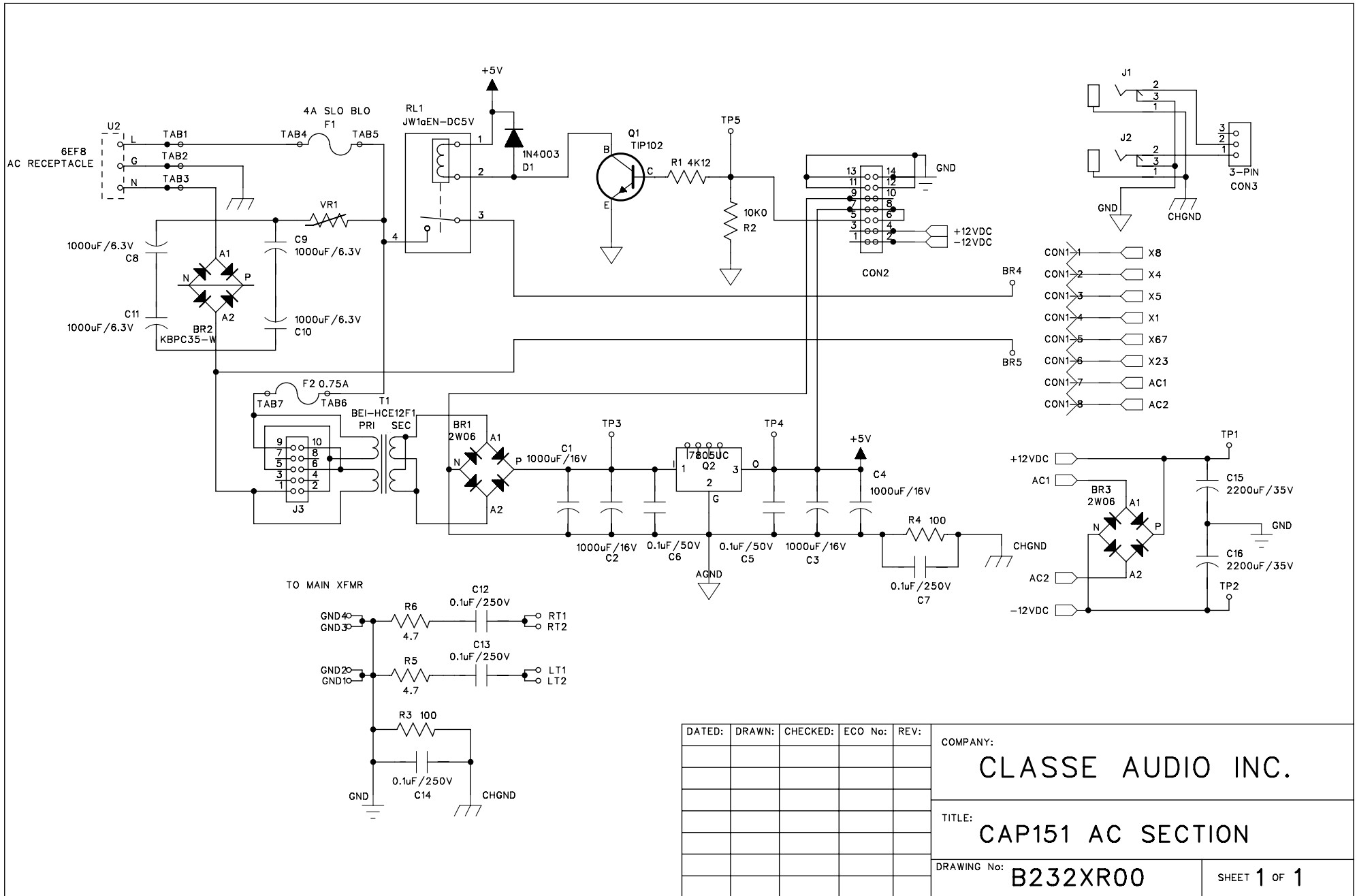


- MH1
- MH2
- MH3
- MH4
- MH5

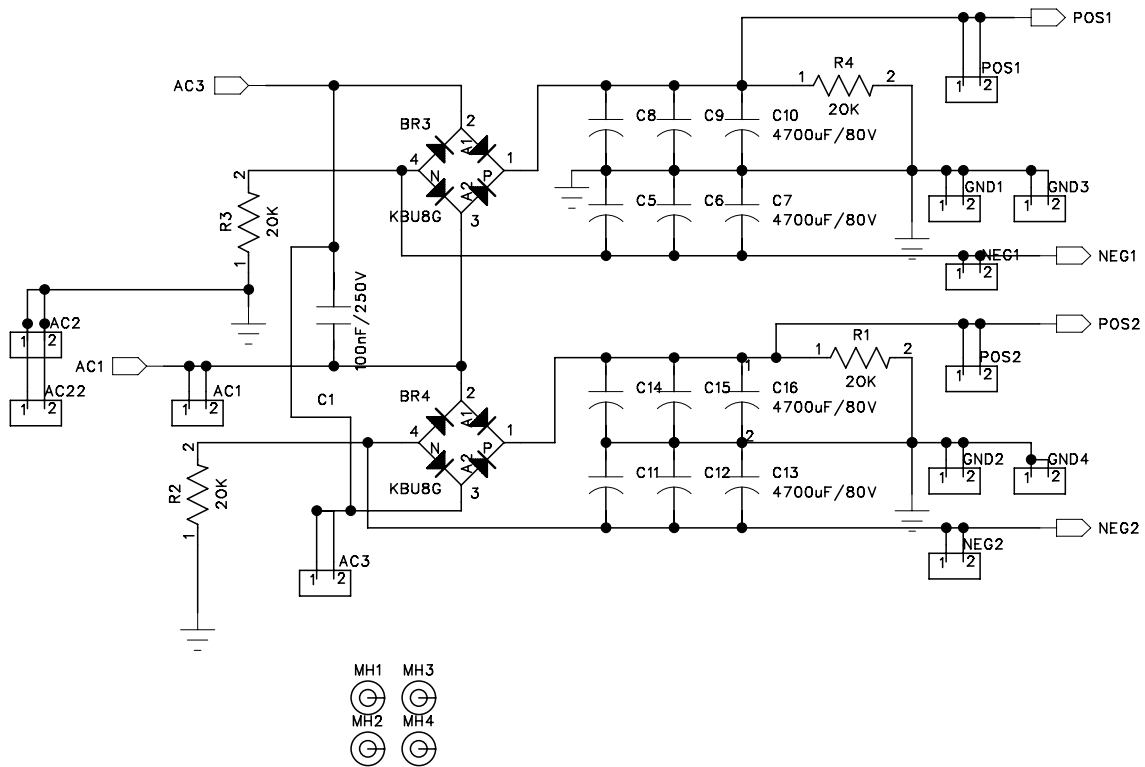
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					CAP151 I/P
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					B231XR06
					SHEET 2 OF 3



DATED:	DRAWN:	CHECKED:	ECO No:	REV:	COMPANY:
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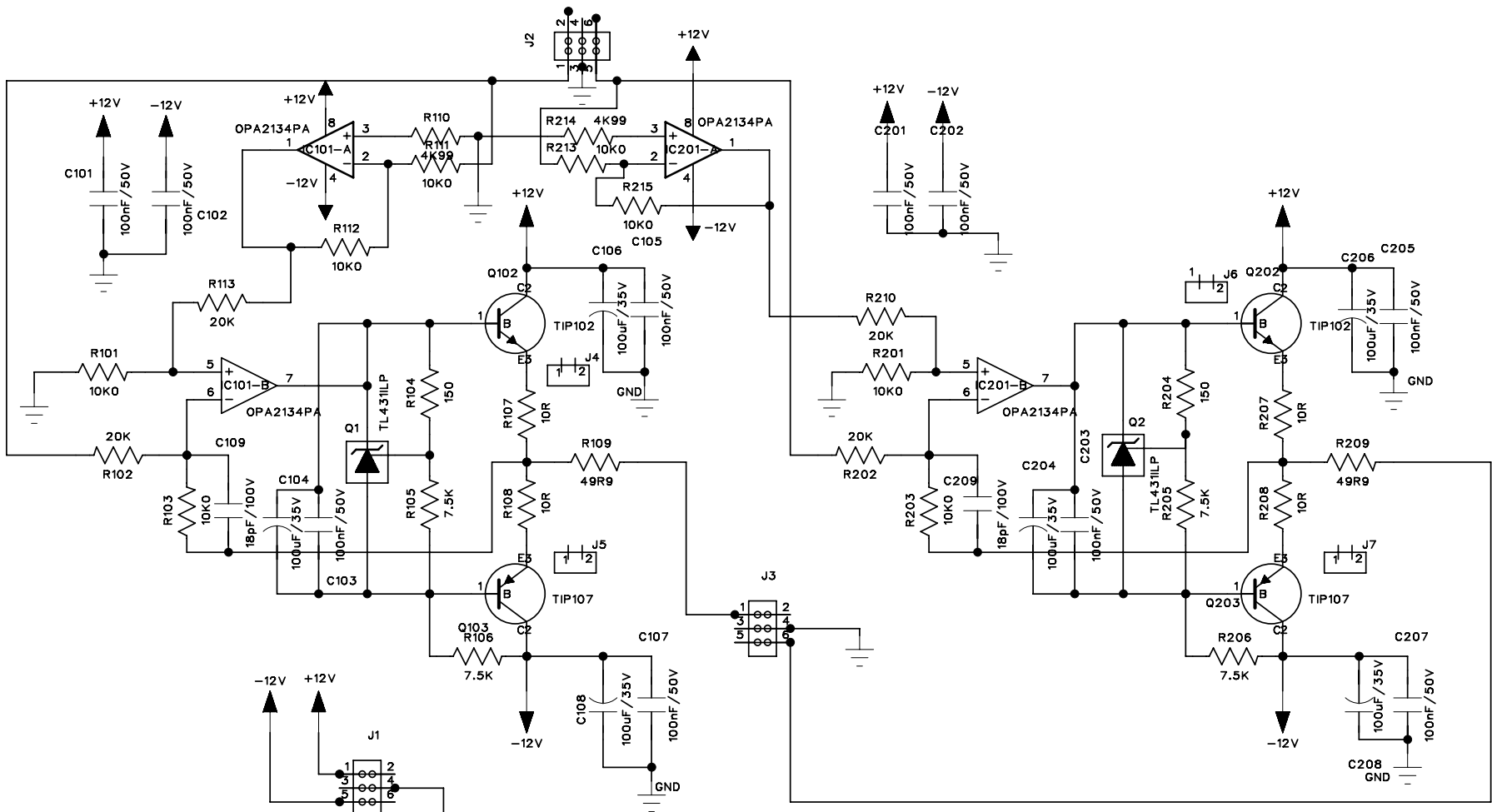


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					TITLE:
					CAP151 AC SECTION
					DRAWING No: B232XR00
					SHEET 1 OF 1



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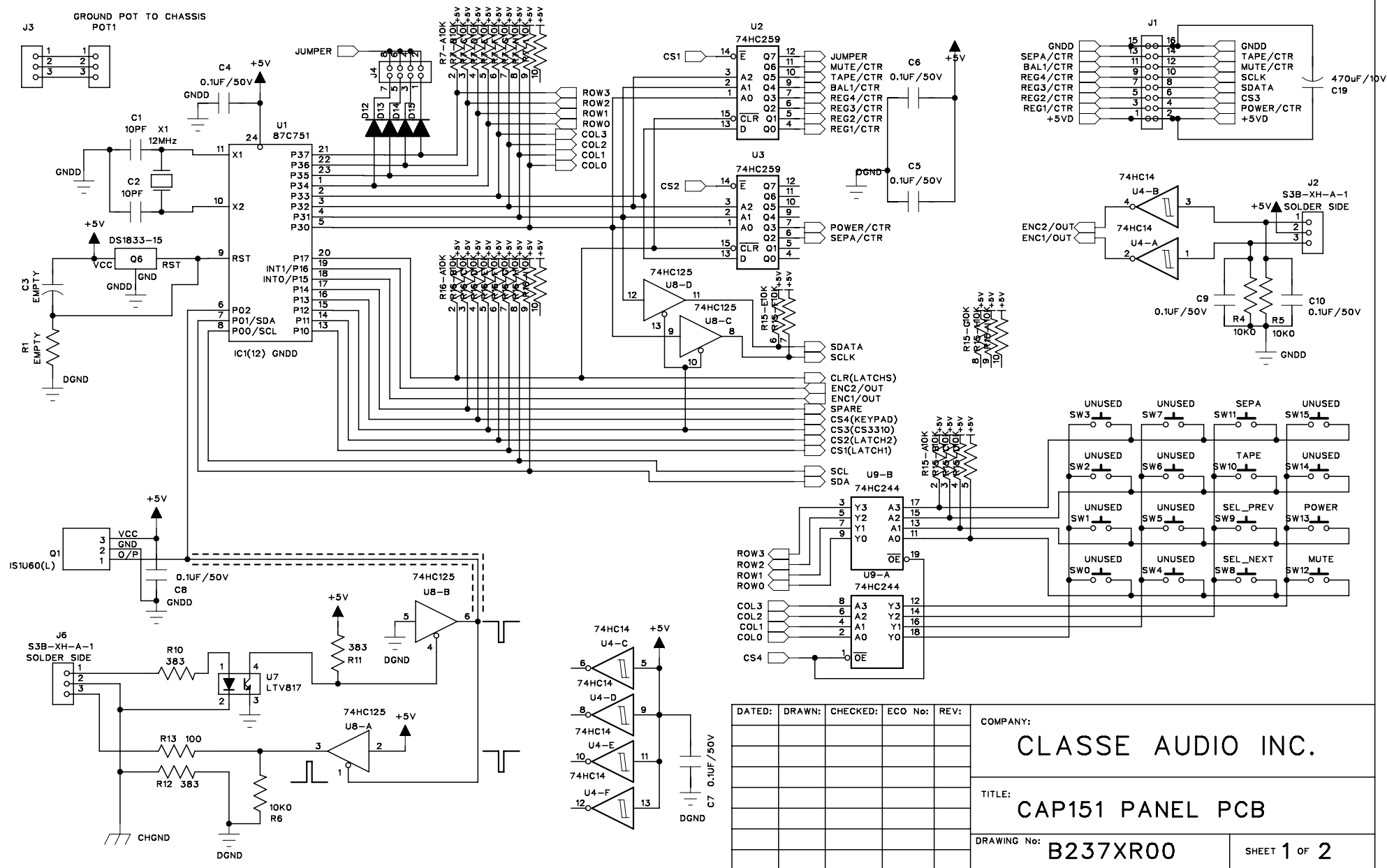
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TITLE:			
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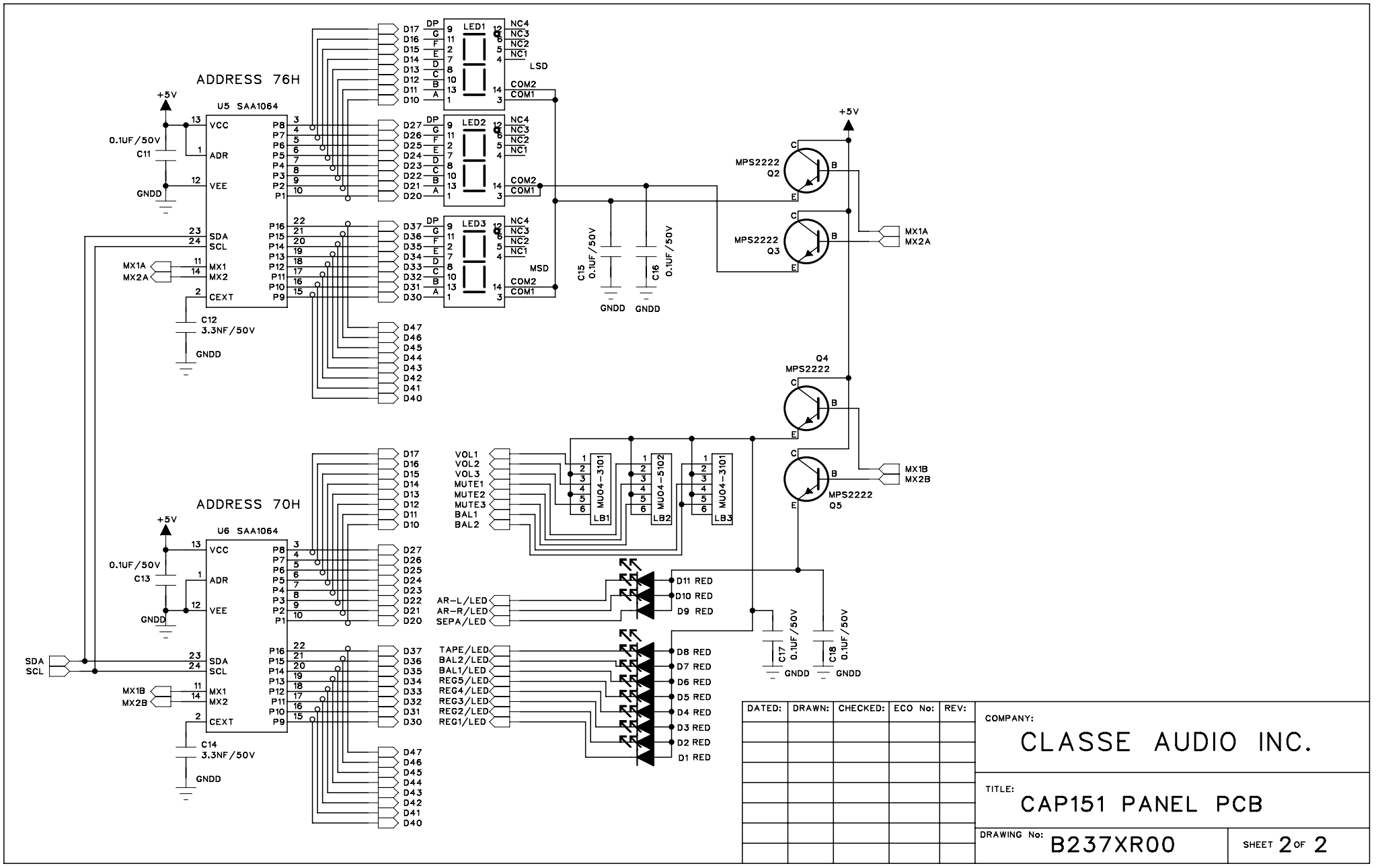
M2
M3

DATED:	DRAWN:	CHECKED:	ECO No:	REV:

COMPANY:		CLASSE AUDIO INC.	
TITLE:		CAP151 PREAMPLIFIER	
DRAWING No:		B236XR01	SHEET 1 OF 1



DATED:	DRAWN:	CHECKED:	ECO No:	REV:	COMPANY:	
					CLASSE AUDIO INC.	
					TITLE:	
					CAP151 PANEL PCB	
					DRAWING No:	SHEET 1 OF 2
					B237XR00	



DATED:	DRAWN:	CHECKED:	ECO No:	REV:

COMPANY:		CLASSE AUDIO INC.	
TITLE:		CAP151 PANEL PCB	
DRAWING No:		B237XR00	SHEET 2 OF 2