



SERVICE INFORMATION

DCM250 POWER AMPLIFIER

CONTENTS:

OPERATION MANUAL

CIRCUIT DESCRIPTION

SET-UP / TEST PROCEDURE

SCHEMATIC DIAGRAMS

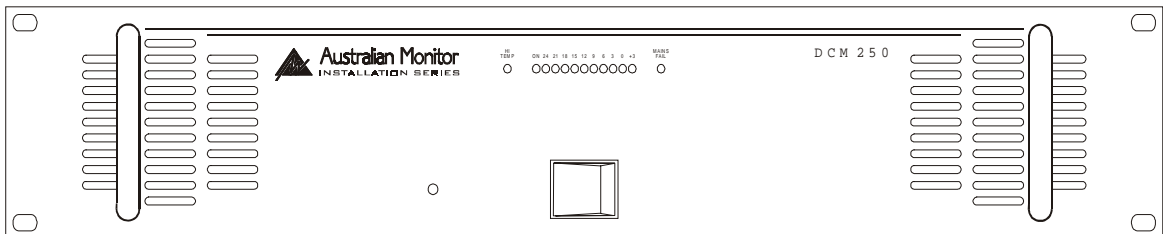
PCB OVERLAYS

COMPONENT LISTS



DCM250

250w Power Amplifier

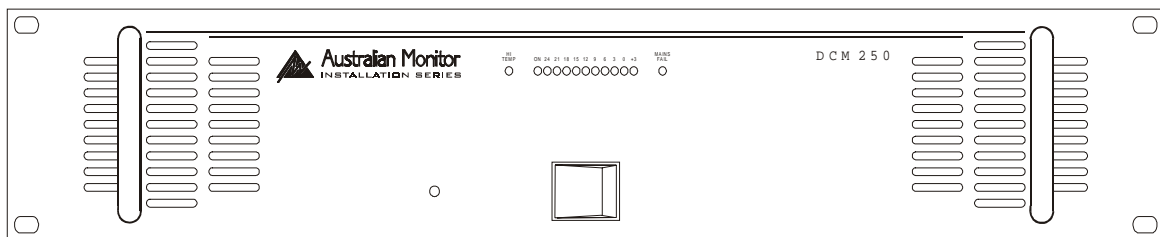


Operating Manual

DCM250, 250 Watt Power Amplifier

Product Description

The DCM250 is a 250 watt power amplifier designed for commercial installations. It can be used for either low impedance (4 ohm) or 100v line speaker systems. The amplifier can be mounted in a standard 19" equipment rack or it can be used on a shelf or table. The DCM250 features a line level input (with parallel output) and is normally used with mixers, mixer amplifiers or other power amplifiers. The DCM250 will operate from 230/240 VAC @ 50 Hz (115 VAC @ 60 Hz with factory modification) or 24 VDC and will meet its full performance specification on either voltage supply. The DCM250 also features a DC battery trickle charge facility, auto-sensing fan cooling, plus overload, short circuit and over temperature protection.



Front Panel Features

Power Switch

The rocker switch located in the front centre of the panel turns AC power on to the DCM250. Rocking the power switch to the right to turns the AC power 'on'. When the AC power is 'on', a blue LED will glow. Please note that this switch does not switch DC voltage. If a DC voltage supply is connected to the DCM250, the amplifier will operate as soon as the connection is made, regardless of the position of the AC power switch. If both an AC and DC voltage supply are connected and you rock the AC power switch to the 'off' position, the DCM250 will automatically continue to operate normally from the DC supply (and the 'mains failure' LED will also glow under these conditions).

Level Control

The output level control is located in the centre of the front panel, just to the left of the mains rocker switch (recessed screwdriver adjustable pot). Turning the control clockwise will increase the output of the DCM250 towards its maximum output level while turning the control counter-clockwise will decrease the output level. Adjust this control for the desired output level depending on the level of the input signal (from a mixer or other signal source). The factory default setting for this control is such that a 1 volt input will give a 100 volt output.

Amplifier Status Display

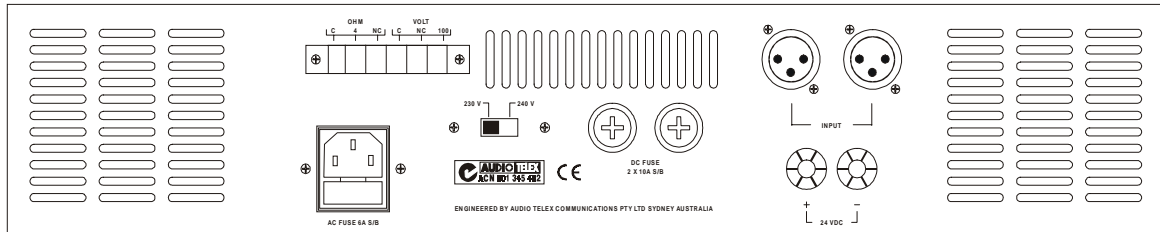
The amplifier status display highlights the operating condition of the DCM250. The status display indicates:

High Temperature: This red LED glows if one of the fans has failed and the amplifier has been shut down by its temperature control circuitry. If this LED is glowing and the fans have not failed, it means that the amplifier is operating in an ambient environment that is too hot for fan cooling to make any difference to the temperature of the amplifier.

Power: This LED glows blue if AC power is switched on to the DCM250. Note that this LED does not indicate the presence of a DC supply voltage.

Mains Failure: The LED glows red if there is a failure in the AC mains power supply. However, this LED will only glow if there is a DC supply voltage present. If no DC supply voltage is present then this LED will not glow.

Output Level VU Meter: A 10 segment LED VU meter is provided to give an indication of the output signal level of the amplifier from -25 to +3 dB. During normal operation, the LED's will oscillate with changes in the program signal. Care should be taken to avoid more than occasional illumination of the red LED's. If the LED's in the red zone are lit continually, then the output level control (or the level of the input signal to the DCM250) should be adjusted to reduce the output level. Too much output level can cause distortion, activate the internal limiter or possibly damage the connected speaker system.



Rear Panel Features

AC Power Inlet

The 3 pin IEC power inlet is located on the bottom left of the rear panel and accepts a standard mains power lead fitted with an IEC connector. Before plugging in a power lead, please check the rear panel of the amplifier to ensure that the voltage label shows the correct AC operating voltage for your part of the world.

The inlet is equipped with an in-built AC fuse holder fitted with a 6 Amp slow blow fuse plus a spare fuse. **Please ensure that the mains power cord is disconnected before attempting to check or replace this fuse.** Power consumption is 400 VA (max).

Speaker Output Terminal Strip

Located on the top left of the rear panel is the speaker output terminal strip. Reading from left to right, the connections are:

- COM** Common or “-” for low impedance speaker loads (4 ohms).
- 4** The “+” for 4 ohm speaker loads (use with common)

- COM** Common or “-” for 100v speaker loads (maximum load of 40 ohms at 100v)
- 100** The “+” for 100v line speaker loads (use with common)

Please ensure that the correct “Common” is used. Low impedance and 100v loads can be used simultaneously but please pay careful attention to the overall speaker load. When used individually, the low impedance load should be 4 ohms or higher while the 100v line load should not fall below 40 ohms. When both outputs are used simultaneously, ensure that neither output is loaded to maximum.

24 Volt Power

Located on the rear panel are the red and black connection posts for 24v power. This feature can be used as either a back-up facility (if mains power fails) or for applications where AC power is not available. The left side red post is the + (positive) terminal while the right side black post is the - (negative) terminal. The DC current drain is 15 Amps maximum at full power. This socket also provides trickle charge to a DC battery supply (if connected) when the DCM250 is operated from AC mains power. The level of trickle charge is 300 mA, maximum.

XLR Audio Input and Parallel Output

The input to the DCM250 is transformer balanced @ 10K ohms. When signal is connected to one XLR, the other XLR becomes a line level output allowing the input signal to be distributed (split) to other amplifiers. In some projects, the same input may be looped through to multiple amplifiers using this method. Up to 6 amplifiers can be looped together without any noticeable loss in level. A distribution amplifier should be used when more than 6 amplifiers need to be looped.

The XLR's are wired as follows: **Pin 1:** Shield. **Pin 2:** Hot, +, Positive. **Pin 3:** Cold, -, Negative

Twin DC Fuse Receptacles

Located on the rear panel are two DC fuse receptacles. Access each DC fuse by turning the cap counter-clockwise with a screwdriver. The value of the fuse is 10 Amps slow blow. **Please ensure that the AC power switch is in the 'off' position and that the mains power cord is disconnected before attempting to check or replace this fuse**

Cooling Fan (Air Intake)

The cooling fans are temperature sensitive and will only switch on when the temperature of the DCM250 had reached a pre-determined range. The fan will stay on and only switch off again once the temperature of the DCM250 has fallen below a pre-determined level. If the DCM250 is operating continually at conservative levels and proper load conditions, it is possible that the cooling fan will not switch on at any time during normal operation. When operating, the fan works with air flow from the front to the rear of the DCM250.

Fuse Sizes

Mains, 240 VAC : 6 Amperes Slow Blow.

Important Safety Information

1. **Save the carton and packing material even if the equipment has arrived in good condition.** Should you ever need to ship the unit, use only the original factory packing.
 2. **Read all documentation before operating your equipment.** Retain all documentation for future reference.
 3. **Follow all instructions** printed on unit chassis for proper operation.
 4. **Do not spill water or other liquids into or on the unit,** or operate the unit while standing in liquid.
 5. **Make sure power outlets conform to the power requirements** listed on the back of the unit.
 6. **Do not use the unit if the electrical power cord is frayed or broken.** The power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles, and the point where they exit from the appliance.
 7. **Always operate the unit with the AC ground wire connected** to the electrical system ground. Precautions should be taken so that the means of grounding of a piece of equipment is not defeated.
 8. **Mains voltage must be correct and the same as that printed on the rear of the unit.** Damage caused by connection to improper AC voltage is not covered by any warranty.
 9. **Have gain controls on amplifiers turned down during power-up** to prevent speaker damage if there are high signal levels at the inputs.
 10. **Power down & disconnect units from mains voltage before making connections.**
 11. **Never hold a power switch in the “ON” position if it won’t stay there itself!**
 12. **Do not use the unit near stoves, heat registers, radiators, or other heat producing devices.**
 13. **Do not block fan intake or exhaust ports.** Do not operate equipment on a surface or in an environment which may impede the normal flow of air around the unit, such as a bed, rug, weathersheet, carpet, or completely enclosed rack. If the unit is used in an extremely dusty or smoky environment, the unit should be periodically “blown free” of foreign matter.
 14. **Do not remove the cover.** Removing the cover will expose you to potentially dangerous voltages. There are no user serviceable parts inside.
 15. **Do not drive the inputs with a signal level greater than that required to drive equipment to full output.**
 16. **Do not connect the inputs / outputs of amplifiers or consoles to any other voltage source,** such as a battery, mains source, or power supply, regardless of whether the amplifier or console is turned on or off.
 17. **Do not run the output of any amplifier channel back into another channel’s input. Do not parallel- or series-connect an amplifier output with any other amplifier output.**
- Audio Telex Communications Pty Ltd is not responsible for damage to loudspeakers for any reason.*
18. **Do not ground any red (“hot”) terminal. Never connect a “hot” (red) output to ground or to another “hot” (red) output!**
 19. **Non-use periods.** The power cord of equipment should be unplugged from the outlet when left unused for a long period of time.
 20. **Service Information** Equipment should be serviced by qualified service personnel when:
 - A. The power supply cord or the plug has been damaged.
 - B. Objects have fallen, or liquid has been spilled into the equipment
 - C. The equipment has been exposed to rain
 - D. The equipment does not appear to operate normally, or exhibits a marked change in performance
 - E. The equipment has been dropped, or the enclosure damaged.

DCM Series

Circuit Description

The DCM series are power amplifiers designed for commercial installations. They can be used for either low impedance (4 ohm/8 ohm) or constant voltage line speakers (100v/70v). These amplifiers can be mounted in a standard 19" equipment rack or they can be used on a shelf or table. The DCM series feature line level input (with parallel output) and are normally used with mixers, mixer amplifiers or other power amplifiers. The DCM series will operate from mains voltage or 24VDC. The DCM series also feature a DC battery trickle charge facility, auto-sensing fan cooling, plus overload, short circuit and over temperature protection.

Power Switch

This switch controls the switching of AC power to the amplifier. A blue 'On' LED will indicate whether the amplifier is switched on or off. This switch will not switch DC power on or off in DC operation. In DC operation mode, the amplifier is always on and the blue power LED will always be illuminated. If both AC and DC voltage supply are connected and the AC power switch is in the off position, the amplifier will continue to operate normally from the DC supply and the mains fail LED will indicate.

Level Control

The output level control is located in the centre of the front panel. It is a fully recessed screwdriver adjustable pot. Turning this pot cw will increase the gain of the amplifier. At maximum setting the input sensitivity is 300mV. The amplifier ships from the factory with the sensitivity set to 1V.

Amplifier Status Display

This VU meter indicates the output level of the amplifier. The sensing for the circuit is taken on the amplifier side of the output transformer. The 0dB level is referenced to 100V. This is an RMS meter, not a peak meter.

Protect

The protect LED will illuminate when the amplifier cuts out because of either over current or high temperature. The amplifier will switch back on after approx 4 sec for an over current trip. The amplifier will switch back on after the amplifier has cooled to 60degC for a thermal trip.

Limiter

The limiter is a hard limiter with an attack time of about 1msec. It is defeatable by removing the jumper on the solder side of the front pcb. This however is not recommended as voltage overload and speaker transformer current saturation may cause the amplifier to cut out under normal program material.

Current Limit and Setup

Current limit is controlled by a microprocessor (PIC12C509A). The detection is done by sensing voltage across the emitter resistors. Trimpot P1 on the front pcb is accessible through the hole in the top right of the chassis return (only visible with the lid off). Turning the trimpot ccw will decrease the point at which the amp cuts out ie the amp will cut out earlier. (P1 resistance is increased.)

To set the current limit:

1. Reset the trimpot P1 turning fully clockwise.
2. Connect the amplifier to half it's minimum load (10ohm for DCM500, 20ohm for DCM250, 40ohm for DCM120).
3. Run an rms 1kHz sine wave into the amplifier and set the input level so that you read 425mVDC (DCM250/500) or 825mVDC (DCM120) across the emitter resistor, measuring the side which has the higher current (measured as a voltage across the emitter resistors).
4. Turn the trimpot P1 ccw till the amplifier cuts out. The amplifier is set to the factory default.

Thermal and Fan control and Setup

The thermal cutout and fan is controlled by a microprocessor (PIC12C509A). The temperature is sensed using a 10k@25degC NTC. The fan is normally off and turns on to full speed at 60degC. This temperature is fixed and not adjustable. The thermal cutout temperature is set using the trimpot accessible through the hole in the top left side of the chassis return (only visible with the lid off). Turning the trimpot cw will decrease the point at which the amp cuts out ie the amp will cut out earlier.

Power Amp

The power amplifier is a push pull single supply amplifier driven by a class A transformer coupled front end. The drive is provided by HEXFETs (RF9520/9530) into NPN BJTs (TIP35C). When replacing the FETs it is recommended that you replace both FETs. The matching of these FETs determines the balancing of the emitter currents in the output devices. For optimum performance the emitter currents in each side should match to within 30% of each other.

Bias Setup

The amplifier is set with a bias setting of 1mV measured across the emitter resistors.

Bias is set using the trimpots located on the power pcbs on each side of the amplifier.

Turning the trimpots cw increases the bias.

If the HEXFETs have been replaced the resistor in series with the pot may need to be changed. Use a lower value resistor if the bias cannot be turned off or a higher value if the bias cannot be turn on.

AC Power Inlet

The operating voltage is 230/240 VAC @ 50 Hz. The 3 pin IEC power inlet is located on the bottom left of the rear panel and accepts a standard mains power lead fitted with an IEC connector. Before plugging in a power lead, please check the rear panel of the amplifier to ensure that the voltage switch is set correctly for your part of the world.

The inlet is equipped with an in-built AC fuse containing the rated fuse and a spare.

24 Volt DC Power Inlet

The DCM series feature optional 24VDC power to run off a battery back-up if required. This is connected via the rear binding posts. The front panel Power Switch will not switch DC power 'on' or 'off' in DC operation. In this mode the amplifier is always 'on'.

The trickle charge resistor across the diode is a 47ohm/5watt wire wound resistor. The maximum trickle current is 300mA supplied from internal 35V rails.

230V/240V Slide Switch

The operating voltage of the amplifier is user selectable between 230V and 240V via a slide switch located on the center of the rear panel. This switch should be set to match the AC voltage of your country. The mains transformer is wound with a 230V winding plus a 10V winding internally connected.

Speaker Output Terminal Strip

The screw terminals located on the top left of the rear panel allow access to the direct speaker outputs of the amplifier. Reading from left to right the terminals are:

| | |
|-----|---|
| COM | Common or “-” for low impedance speaker loads (4 or 8 ohms) |
| 4 | Positive “+” for 4 ohm speaker loads (use with common) |
| 8 | Positive “+” for 8 ohm speaker loads (use with common) DCM120 only |
| COM | Common or “-” for 70v or 100v speaker loads |
| 70 | Positive “+” for 70v line speaker loads (use with common) DCM120/500 only |
| 100 | Positive “+” for 100v line speaker loads (use with common) |

Please ensure that the correct “Common” is used. Low impedance and 70/100v loads can be used simultaneously but please pay careful attention to the overall speaker load.

Note: The minimum impedance (or maximum load) at 100 volt line should be no less than

DCM120 – 80 ohms
DCM250 – 40 ohms
DCM500 – 20 ohms

XLR Audio Input and Parallel Output

The DCM series includes both male and female 3 pin XLR connectors per channel. While the female is normally used as the input to the amplifier, both XLR's are connected in parallel so either will work.

The XLR's inputs are transformer balanced and wired as:

Pin 1: Shield.

Pin 2: Hot, +, Positive

Pin 3: Cold, -, Negative

Fuse Sizes

(DCM120)

Mains: 230 VAC 4 Amperes Slow Blow HRC 20x5mm

DC: 10 Amperes Slow Blow HRC 20x5mm

(DCM250)

Mains: 230 VAC 6.3 Amperes Slow Blow 20x5mm

DC: 2 x 10 Amperes Slow Blow HRC 3AG

(DCM500)

Mains: 230 VAC 10 Amperes Slow Blow HRC 20x5mm

DC: 2 x 35 Amperes Slow Blow 3AG

TESTING PROCEDURE OF DCM 120/DCM 250/DCM 500

I. PRE-TESTING (of complete sets).

- **Check**

- 1.1 All screw for tightness (Bridge rectifier and transistor bolts)
- 1.2 Earth Connection for good contact (solder and crimpling)
- 1.3 This setup has signal input to the Amplifier through male (XLR)
- 1.4 Check with Multimeter that there is a DC resistance of about $250\ \Omega$ between Pin2 & Pin3 of each of XLR's. Also between (Pin 1 & Pin 3) and (Pin1 & Pin2). There should be very high resistance. (IE: no reading).

2. Electrical Check

2.1 Fuse Check:

| | DCM 120 | DCM 250 | DCM 500 |
|-------------|----------------|----------------|----------------|
| Mains fuse: | 4AT | 6.3 AT | 10 AT |
| DC fuse: | 10AT (x1) | 10AT (x2) | 35AT (x2) |

2.2 Connect the Amplifier to the setup (Variac voltage = 0V) set all presets on front board (only) fully clockwise, voltage selector switch to 230V

2.3 Slowly increase the input voltage to 230V, keep watching the input current should not exceed 0.1A for DCM-120, 0.1A for DCM-250, 0.1A for DCM 500.

2.4 Check and reset if necessary all emitter resistor voltages with the help of preset. (Each emitter resistor voltage should be between 0.5 mV to 0.8 mV)

2.5 Check DC voltage Main rail = 33V

7815 input = 30V

7815 output = 15.5V

2.6 Give input signal of 500 mV to get outputs as follows (@ $4\ \Omega$ output load)/ 22V for DCM 120, 32VAC for DCM250, 44.7VAC for DCM 500. Check 100V O/p at 100vV line, Remove the input signal

II. FINAL TESTING

(This setup should have signal input to Amplifier through female (XLR)
(The limiter link should be out of circuit initially.)

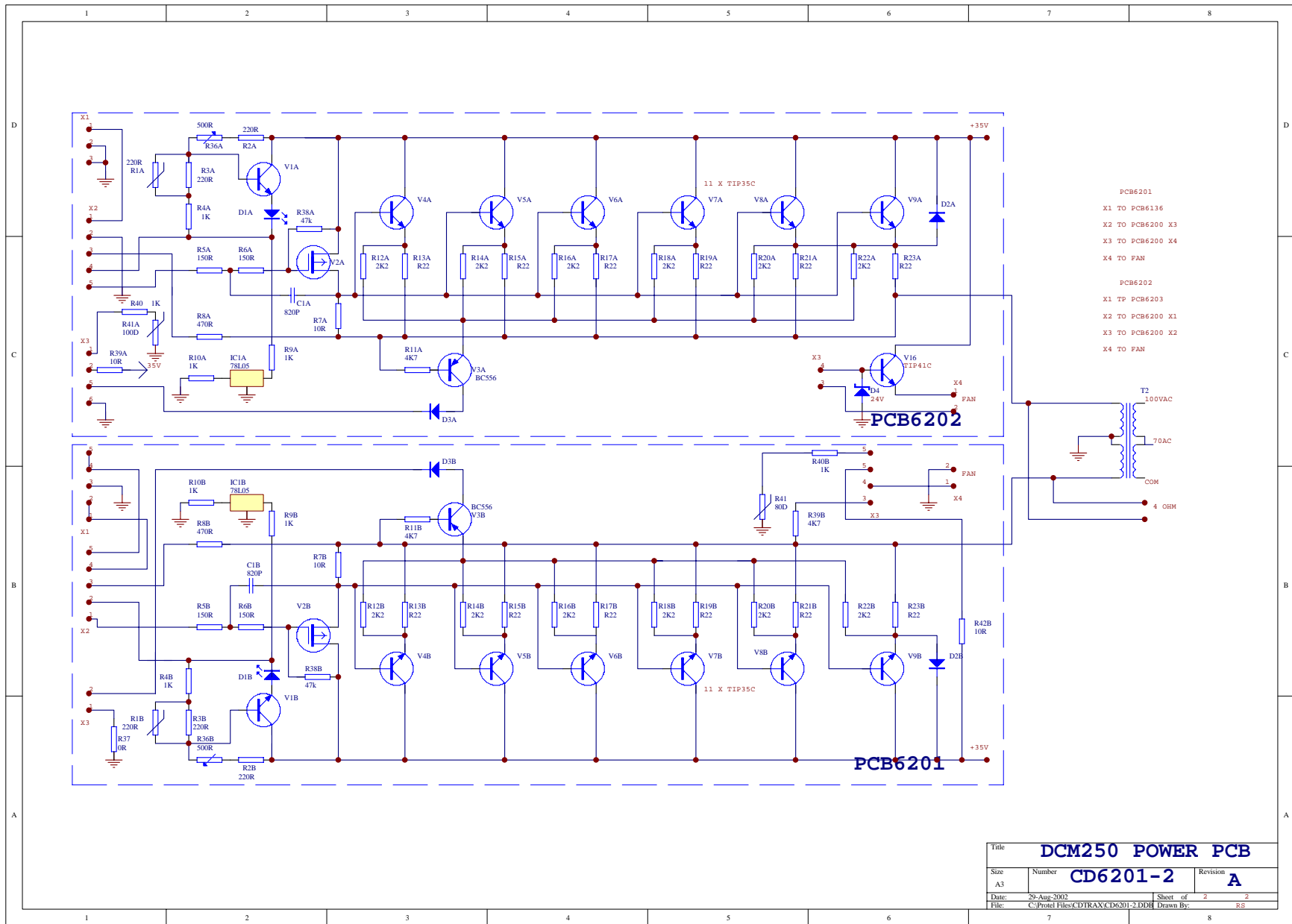
1. Connect the Amplifier to the setup, set voltage selector switch to 240V
2. Switch ON the set to 240VAC.
3. Slowly increase the input signal (of 1kHz) keep watching the 24dB LED, it should glow at approx 9V output. Increase the input signal to get 70VAC output.
4. Check Dc voltage of all emitter resistors, Minimum value should be within 30% of the maximum value.
5. Slowly increase the input signal, keep watching the 0db LED, it should glow at 100V \pm 5V output voltage.
6. Set 100V 1kHz as 0db reference. Change frequency to 10kHz check dB level drop. It should be 2.5dB \pm 0.5dB.
7. Change the frequency to 1kHz, reduce signal level to get 10VAC output. Half the output load.
8. **Overload setting:** - Check the DC voltage at the emitter resistors having the maximum voltage value. Increase input signal to get 820mV for DCM 120, 425mV (for DCM250 & DCM 500). Turn preset (P2) anticlockwise such that it just mutes the output signal and signal returns back slowly after 2 seconds.
9. Reduce the signal & re check whether the signal mutes at the corresponding above stated voltages.
10. Again make the output load to original full value. Turn volume preset fully anticlockwise, set input signal strength to 1V, set volume preset clockwise to get 100V output.
11. Set input signal strength to get output 110V VAC. Insert limiter link, the signal should reduce to 100V \pm 5V.
12. Remove the input signal and check noise. It should measure less than 25mV.

III. THERMAL & SOAK TEST

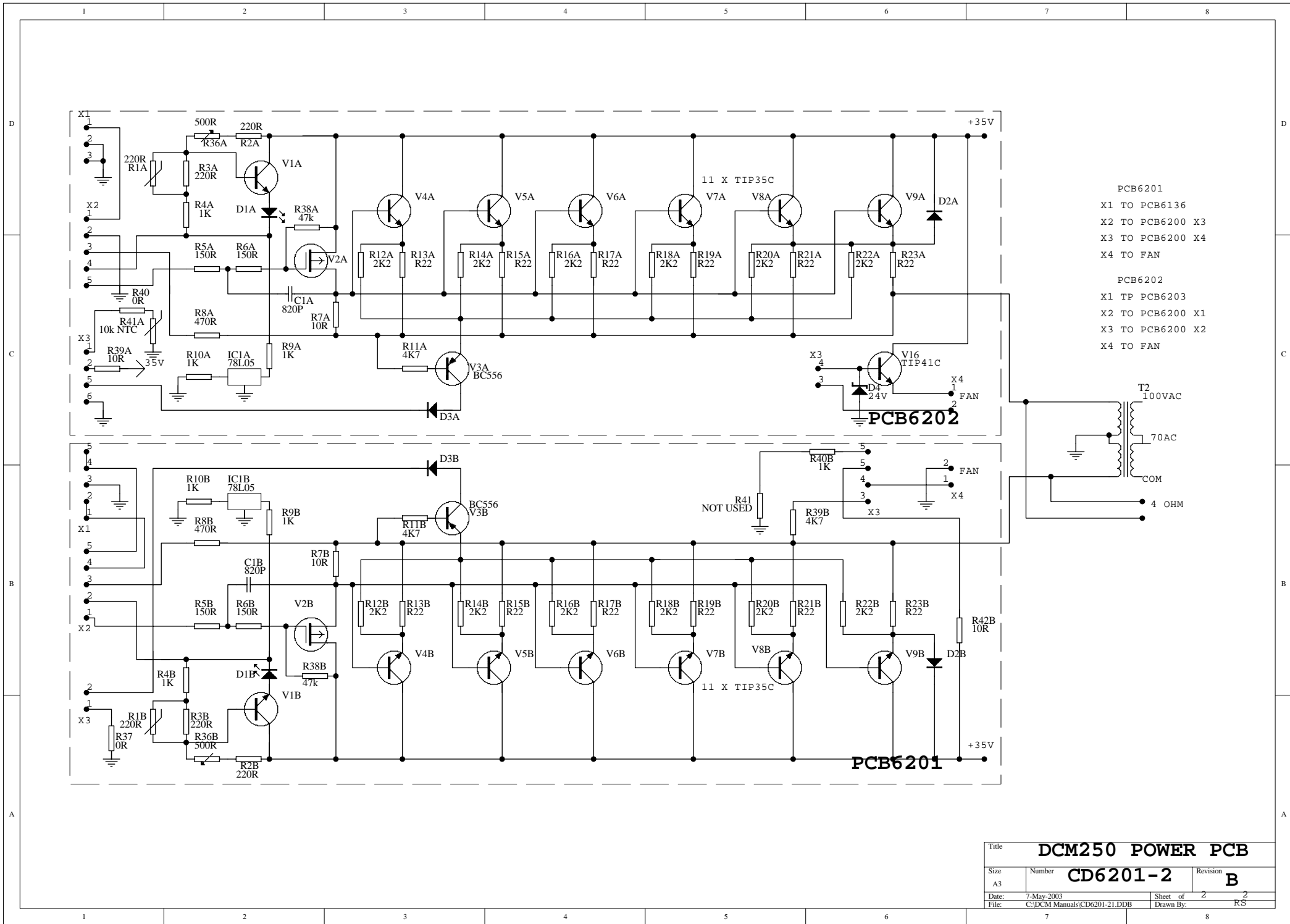
1. Connect the Amplifier to the setup : Output load = 4 Ω Output Voltage: (DCM 120): 14V. (DCM 250):20V. (DCM 500): 40V
2. Set the Amplifier thermal cut off temperature at around 105°C with the help of preset P4.
3. Leave the unit "ON" (with lid fixed, if possible) for 24 hours.

IV. Sound Test/Listening test.

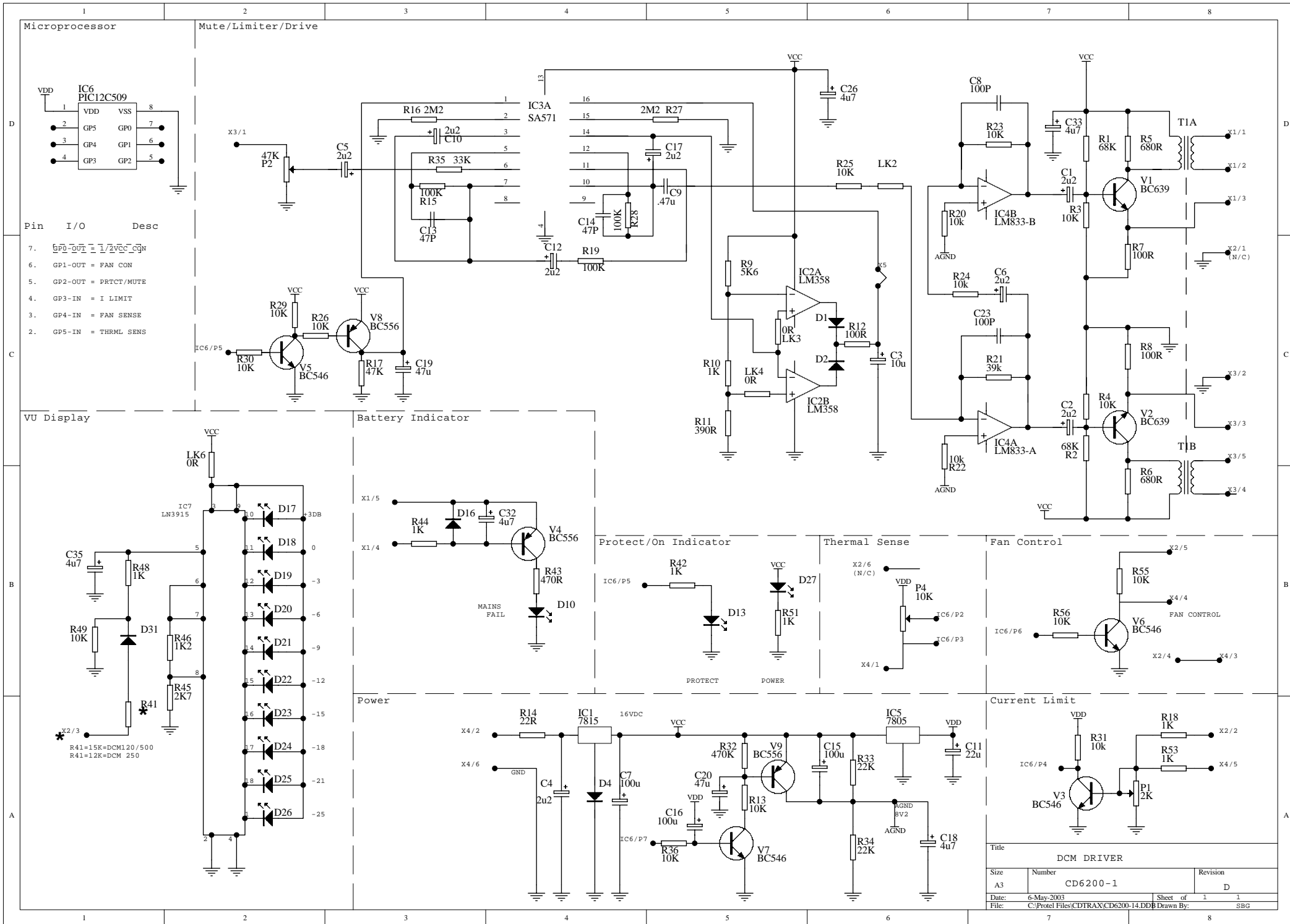
1. Switch On the set. Check for any switch on thump.
2. Connect CD player to the input, listen for irregularities if any.
3. Switch off the set check for switch off noises.

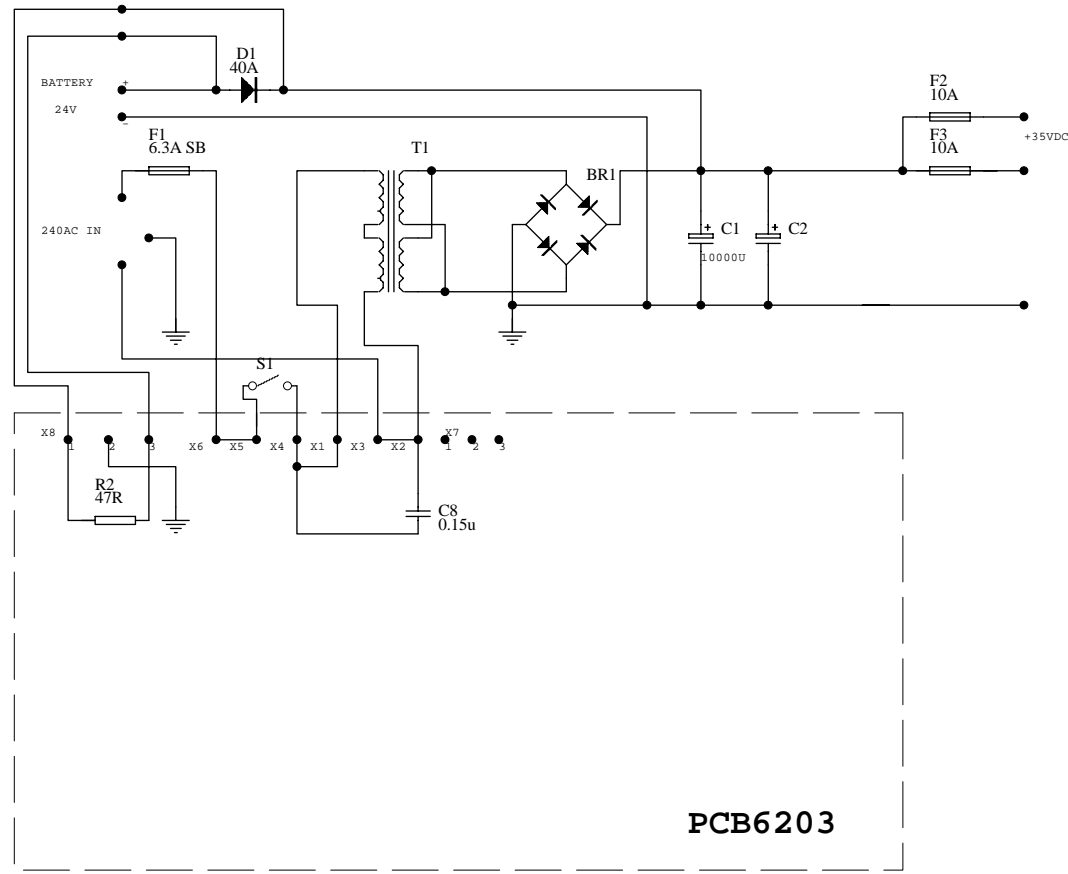


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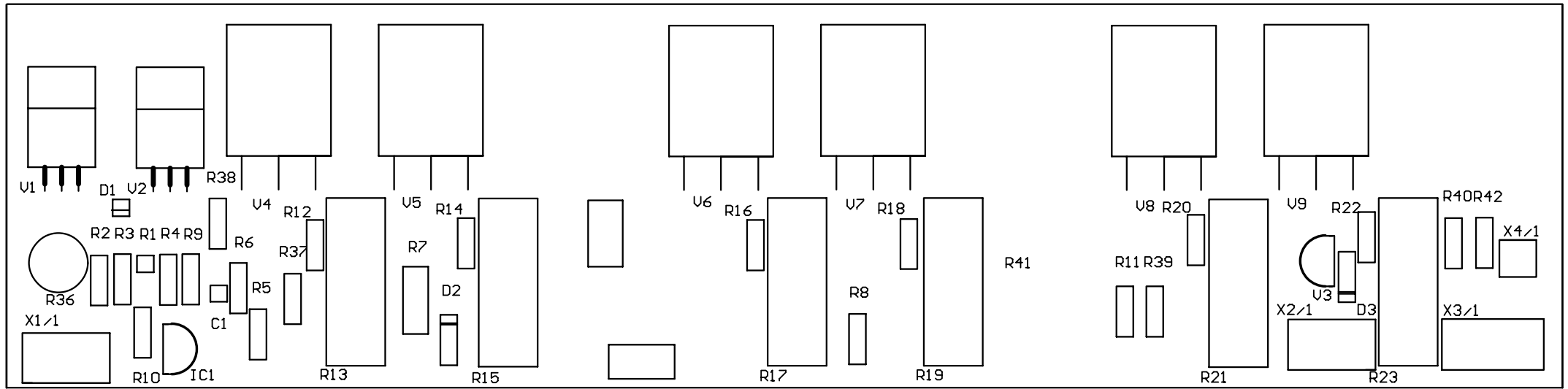
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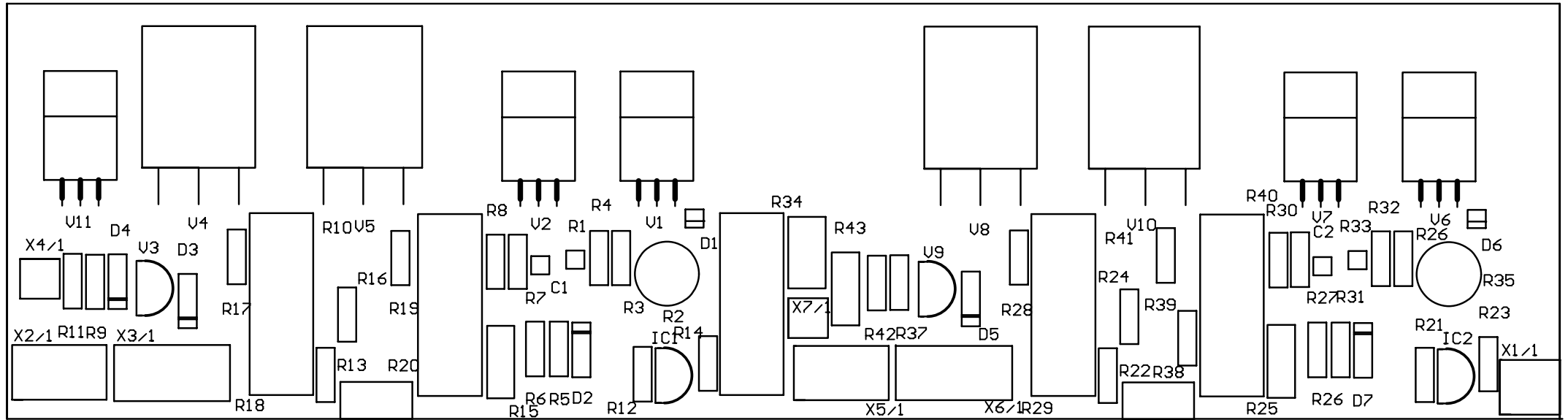


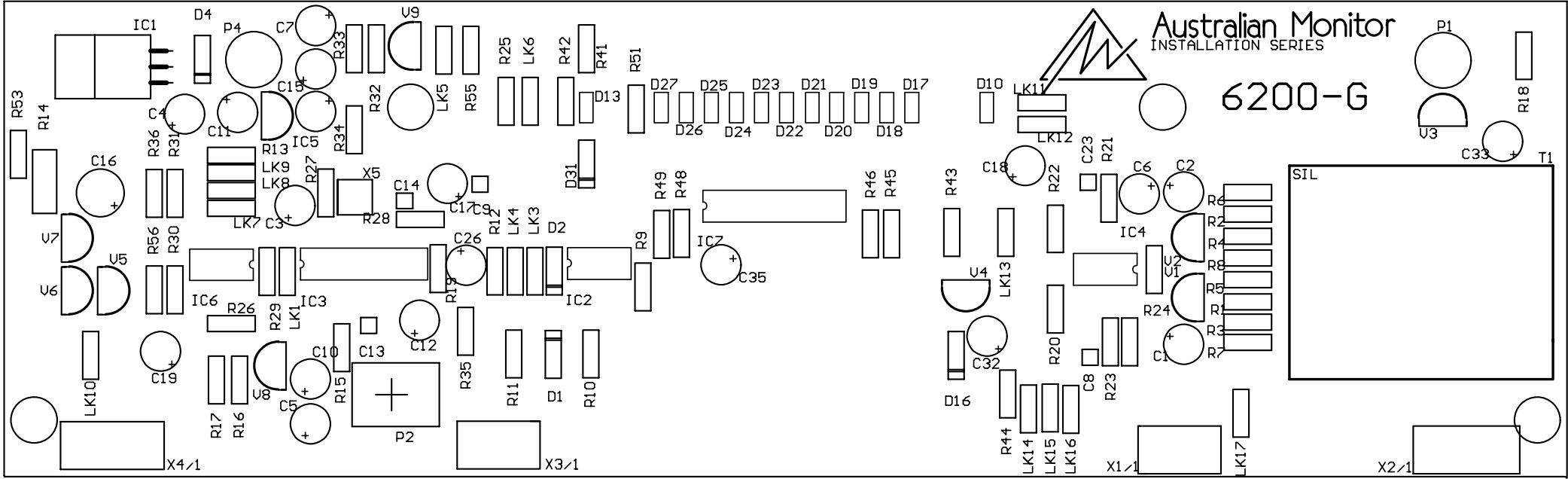


PCB6203

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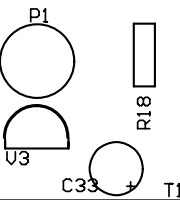




Australian Monitor
INSTALLATION SERIES

6200-G

SIL



X2/1

X1/1

X3/1

X4/1

DCM250 Output Stage Component List

| Designator | Part Type | Description |
|------------|-----------|-------------------------------|
| C1A | 820P | Multi layer Ceramic capacitor |
| C1B | 820P | Multi layer Ceramic capacitor |
| D1A | 1N4007 | Rectifier Diode |
| D1B | 1N4007 | Rectifier Diode |
| D2A | 1N4007 | Rectifier Diode |
| D2B | 1N4007 | Rectifier Diode |
| D3A | 1N4007 | Rectifier Diode |
| D3B | 1N4007 | Rectifier Diode |
| D4 | 1N4007 | Rectifier Diode |
| IC1A | 78L05 | Voltage regulator TO92 |
| IC1B | 78L05 | Voltage regulator TO92 |
| R10A | 1K | Resistor, metal film .5W |
| R10B | 1K | Resistor, metal film .5W |
| R11A | 4K7 | Resistor, metal film .5W |
| R11B | 4K7 | Resistor, metal film .5W |
| R12A | 2K2 | Resistor, metal film .5W |
| R12B | 2K2 | Resistor, metal film .5W |
| R13A | R22 | Wire wound resistor 5W |
| R13B | R22 | Wire wound resistor 5W |
| R14A | 2K2 | Resistor, metal film .5W |
| R14B | 2K2 | Resistor, metal film .5W |
| R15A | R22 | Wire wound resistor 5W |
| R15B | R22 | Wire wound resistor 5W |
| R16A | 2K2 | Resistor, metal film .5W |
| R16B | 2K2 | Resistor, metal film .5W |
| R17A | R22 | Wire wound resistor 5W |
| R17B | R22 | Resistor, metal film .5W |
| R18A | 2K2 | Resistor, metal film .5W |
| R18B | 2K2 | Resistor, metal film .5W |
| R19A | R22 | Wire wound resistor 5W |
| R19B | R22 | Wire wound resistor 5W |
| R1A | 220R | Resistor, metal film .5W |
| R1B | 220R | Resistor, metal film .5W |
| R20A | 2K2 | Resistor, metal film .5W |
| R20B | 2K2 | Resistor, metal film .5W |
| R21A | R22 | Wire wound resistor 5W |
| R21B | R22 | Wire wound resistor 5W |
| R22A | 2K2 | Resistor, metal film .5W |
| R22B | 2K2 | Resistor, metal film .5W |
| R23A | R22 | Wire wound resistor 5W |
| R23B | R22 | Wire wound resistor 5W |
| R2A | 220R | Resistor, metal film .5W |
| R2B | 220R | Resistor, metal film .5W |
| R36A | 500R | Cermet, preset horizontal |
| R36B | 500R | Cermet, preset horizontal |
| R37 | 0R | Link, zero ohms |
| R38A | 47k | Resistor, metal film .5W |
| R38B | 47k | Resistor, metal film .5W |
| R39A | 10R | Resistor, metal film .5W |
| R39B | 4K7 | Resistor, metal film .5W |
| R3A | 220R | Resistor, metal film .5W |

| | | |
|------|---------|--------------------------|
| R3B | 220R | Resistor, metal film .5W |
| R40 | 1K | Resistor, metal film .5W |
| R40B | 1K | Resistor, metal film .5W |
| R41 | 80D | |
| R41A | 100D | |
| R42B | 10R | Resistor, metal film .5W |
| R4A | 1K | Resistor, metal film .5W |
| R4B | 1K | Resistor, metal film .5W |
| R5A | 150R | Resistor, metal film .5W |
| R5B | 150R | Resistor, metal film .5W |
| R6A | 150R | Resistor, metal film .5W |
| R6B | 150R | Resistor, metal film .5W |
| R7A | 10R | Resistor, metal film .5W |
| R7B | 10R | Resistor, metal film .5W |
| R8A | 470R | Resistor, metal film .5W |
| R8B | 470R | Resistor, metal film .5W |
| R9A | 1K | Resistor, metal film .5W |
| R9B | 1K | Resistor, metal film .5W |
| T2 | | |
| V16 | TIP41C | Transistor TO220 |
| V1A | TIP41C | Transistor TO220 |
| V1B | TIP41C | Transistor TO220 |
| V2A | IRF9520 | Mosfet, Hexfet |
| V2B | IRF9520 | Mosfet, Hexfet |
| V3A | BC556 | Transistor TO92 |
| V3B | BC556 | Transistor TO92 |
| V4A | TIP35C | Transistor TOP-3 |
| V4B | TIP35C | Transistor TOP-3 |
| V5A | TIP35C | Transistor TOP-3 |
| V5B | TIP35C | Transistor TOP-3 |
| V6A | TIP35C | Transistor TOP-3 |
| V6B | TIP35C | Transistor TOP-3 |
| V7A | TIP35C | Transistor TOP-3 |
| V7B | TIP35C | Transistor TOP-3 |
| V8A | TIP35C | Transistor TOP-3 |
| V8B | TIP35C | Transistor TOP-3 |
| V9A | TIP35C | Transistor TOP-3 |
| V9B | TIP35C | Transistor TOP-3 |

DCM Series Drive Stage Component List

| Designator | Part Type | Description |
|------------|------------|-------------------------------|
| C1 | 2u2 | Electrolytic Capacitor 35V |
| C10 | 2u2 | Electrolytic Capacitor 35V |
| C11 | 22u | Electrolytic Capacitor 35V |
| C12 | 2u2 | Electrolytic Capacitor 35V |
| C13 | 47P | Multi layer ceramic capacitor |
| C14 | 47P | Multi layer ceramic capacitor |
| C15 | 100u | Electrolytic Capacitor 16V |
| C16 | 100u | Electrolytic Capacitor 16V |
| C17 | 2u2 | Electrolytic Capacitor 35V |
| C18 | 4u7 | Electrolytic Capacitor 35V |
| C19 | 47u | Electrolytic Capacitor 35V |
| C2 | 2u2 | Electrolytic Capacitor 35V |
| C20 | 47u | Electrolytic Capacitor 35V |
| C23 | 100P | Multi layer ceramic capacitor |
| C26 | 4u7 | Electrolytic Capacitor 35V |
| C3 | 10u | Electrolytic Capacitor 35V |
| C32 | 4u7 | Electrolytic Capacitor 35V |
| C33 | 4u7 | Electrolytic Capacitor 35V |
| C35 | 4u7 | Electrolytic Capacitor 35V |
| C4 | 2u2 | Electrolytic Capacitor 35V |
| C5 | 2u2 | Electrolytic Capacitor 35V |
| C6 | 2u2 | Electrolytic Capacitor 35V |
| C7 | 100u | Electrolytic Capacitor 16V |
| C8 | 100P | Multi layer ceramic capacitor |
| C9 | .47u | Metalised Poly Capacitor 63V |
| D1 | 1N4148 | Rectifier Diode |
| D10 | L-LED(red) | LED 3.0mm |
| D13 | L-LED(red) | LED 3.0mm |
| D16 | 1N4148 | Rectifier Diode |
| D17 | L-LED(red) | LED 3.0mm |
| D18 | L-LED(red) | LED 3.0mm |
| D19 | L-LED(grn) | LED 3.0mm |
| D2 | 1N4148 | Rectifier Diode |
| D20 | L-LED(grn) | LED 3.0mm |
| D21 | L-LED(grn) | LED 3.0mm |
| D22 | L-LED(grn) | LED 3.0mm |
| D23 | L-LED(grn) | LED 3.0mm |
| D24 | L-LED(grn) | LED 3.0mm |
| D25 | L-LED(grn) | LED 3.0mm |
| D26 | L-LED(grn) | LED 3.0mm |
| D27 | L-LED(grn) | LED 3.0mm |
| D31 | 1N4148 | Rectifier Diode |
| D4 | 1N4007 | Rectifier Diode |
| IC1 | 7815 | Voltage regulator I.C TO220 |
| IC2A | LM358 | Comparator, dual IC DIP |
| IC2B | LM358 | Comparator, dual IC DIP |
| IC3 | SA571 | Compander IC DIP |
| IC4A | LM833-A | Dual op-amp IC DIP |
| IC4B | LM833-B | Dual op-amp IC DIP |
| IC5 | 7805 | Regulator IC TO92 |
| IC6 | PIC12C509 | Programmable IC DIP |

| | | |
|-----|-------|---------------------------|
| LK2 | 0R | Link, zero ohms |
| LK3 | 0R | Link, zero ohms |
| LK4 | 0R | Link, zero ohms |
| LK6 | 0R | Link, zero ohms |
| P1 | 2K | Cermet, preset Horizontal |
| P2 | 47K | Potentiometer 16mm |
| P4 | 10K | Cermet, preset Horizontal |
| R1 | 68K | Resistor, metal film .5W |
| R10 | 1K | Resistor, metal film .5W |
| R11 | 390R | Resistor, metal film .5W |
| R12 | 100R | Resistor, metal film .5W |
| R13 | 10K | Resistor, metal film .5W |
| R14 | 22R | Resistor, metal film .5W |
| R15 | 100K | Resistor, metal film .5W |
| R16 | 2M2 | Resistor, metal film .5W |
| R17 | 47K | Resistor, metal film .5W |
| R18 | 1K | Resistor, metal film .5W |
| R19 | 100K | Resistor, metal film .5W |
| R2 | 68K | Resistor, metal film .5W |
| R20 | 10k | Resistor, metal film .5W |
| R21 | 39k | Resistor, metal film .5W |
| R22 | 10k | Resistor, metal film .5W |
| R23 | 10K | Resistor, metal film .5W |
| R24 | 10k | Resistor, metal film .5W |
| R25 | 10K | Resistor, metal film .5W |
| R26 | 10K | Resistor, metal film .5W |
| R27 | 2M2 | Resistor, metal film .5W |
| R28 | 100K | Resistor, metal film .5W |
| R29 | 10K | Resistor, metal film .5W |
| R3 | 10K | Resistor, metal film .5W |
| R30 | 10K | Resistor, metal film .5W |
| R31 | 10k | Resistor, metal film .5W |
| R32 | 470K | Resistor, metal film .5W |
| R33 | 22K | Resistor, metal film .5W |
| R34 | 22K | Resistor, metal film .5W |
| R35 | 33K | Resistor, metal film .5W |
| R36 | 10K | Resistor, metal film .5W |
| R4 | 10K | Resistor, metal film .5W |
| R41 | 15K* | Resistor, metal film .5W |
| R41 | 12K** | Resistor, metal film .5W |
| R42 | 1K | Resistor, metal film .5W |
| R43 | 470R | Resistor, metal film .5W |
| R44 | 1K | Resistor, metal film .5W |
| R45 | 2K7 | Resistor, metal film .5W |
| R46 | 1K2 | Resistor, metal film .5W |
| R48 | 1K | Resistor, metal film .5W |
| R49 | 10K | Resistor, metal film .5W |
| R5 | 680R | Resistor, metal film .5W |
| R51 | 1K | Resistor, metal film .5W |
| R53 | 1K | Resistor, metal film .5W |
| R55 | 10K | Resistor, metal film .5W |
| R56 | 10K | Resistor, metal film .5W |
| R6 | 680R | Resistor, metal film .5W |
| R7 | 100R | Resistor, metal film .5W |
| R8 | 100R | Resistor, metal film .5W |
| R9 | 5K6 | Resistor, metal film .5W |

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|-----|-------------|--------------------|
| T1A | RF2285A | Driver Transformer |
| T1B | RF2285B | Driver Transformer |
| V1 | BC639 | Transistor TO92 |
| V2 | BC639 | Transistor TO92 |
| V3 | BC546 | Transistor TO92 |
| V4 | BC556 | Transistor TO92 |
| V5 | BC546 | Transistor TO92 |
| V6 | BC546 | Transistor TO92 |
| V7 | BC546 | Transistor TO92 |
| V8 | BC556 | Transistor TO92 |
| V9 | BC556 | Transistor TO92 |
| | Please note | * DCM120-DCM500 |
| | Please note | ** DCM250 |