



## **BM6A Service Manual**

Revision **3.1** / 2001

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### **IMPORTANT:**

The BM6A amplifier has been redesigned: the "Mk. II" version.

The main differences are:

- Low voltage supply has now its own secondary taps on the transformer.
- Voltage selector is now a rotary switch type.
- New test points added.

BM6As with serial no. LOWER than 694457 are fitted with the Mk. II module,  
- however exceptions might occur...

### **Service Manual History:**

- version 3.1: Mk. II module, C21 and C34 changed from 150pF to 47pF
- version 3.0: Mk. II module introduced
- version 2.0: first pdf version

## BM6A Active Nearfield Monitor - Service Manual

### Precautions:

Servicing should be undertaken only by a qualified person and in a proper workshop environment, with anti-static precautions taken and a full compliment of tools and instruments.

If powering up the module out of its cabinet beware of mains voltage on the mains connector, switches and capacitor.

### Possible Faults

If a single LF or HF drive unit seems to have failed then remove and test it. However, if there is no output at all, the amp module may be faulty.

If no LED is lit then first check the mains fuse and replace it with the correct value for the mains voltage used if necessary, if the mains fuse is intact the internal fuses may have blown.

If the red LED is lit it means that the power MOSFET mounting bracket has overheated (more than 70°C) or a DC voltage has arisen at an amp output.

### Disassembly

The drive units and the amp module are held in place using Allen head M4 bolts. These should be moderately tight; the factory setting is correct, do not over-tighten.

### Drive Units

Support the weight of the drivers while removing the bolts; they must not hang on their wires. The color code for the bass driver is red to the positive terminal and black to the negative; the tweeter wiring is blue to the positive and black to the negative. The black wires are interchangeable. Be careful not to bring anything into contact with the diaphragms, especially the tweeter, which is easily damaged.

### Replacement Driver Part Numbers

Driver	Description	DA Item No.	TC order code
Tweeter	D-260 DA with protector	81622	795005011
Woofers	17W75XL08 DA	84862	795019011

### Amp Module

The amp module can be taken out with the cabinet face down if it is certain that nothing impinges on the drive units or LED's, but it is best removed with the speaker standing vertically on a solid support with access all round. The bolts should first be loosened so that they can subsequently be removed with one hand while supporting the weight of the module (it's heavy) with the other hand by holding the heatsink.

When all the bolts are out, withdraw the module a little way and unlatch the small 4-pin connector and LED cable at the top of the circuit board. The large 4-pin connector with speaker wires near the centre of the board needs to be rocked slightly from side to side while disconnecting, taking care not to bend the pins.

## Fault Finding

If powering up the module out of its cabinet beware of mains voltage on the mains connector, switches and capacitor.

Connect the extension lead for the LED's but not for the drive units. Inspect the on-board fuses. If they are blown the likely cause is failed output MOSFETs.

To test the MOSFETs, look for a low resistance between positive and negative power rails, putting meter probes on the sources of a pair of MOSFETs (pinout: 1-gate, 2-drain, 3-source. Please refer to figure 1) or on the lower terminals of R93 & R96. Both MOSFETs in an output pair will usually fail and to trace which pair, test for a low gate/source or gate/drain resistance. These devices effectively go to short circuit when blown. Replace MOSFETs in pairs.

The drain resistors R25, R49, R64, R87 and the driver transistors Q1, Q3, Q5, Q9 should be tested if the MOSFETs are blown.

If the HF amp MOSFETs has failed please test the HF limiter circuit Zeners (ZD1 & ZD2) with a diode tester and test the lightbulb (LDR1-A) with a resistance tester.

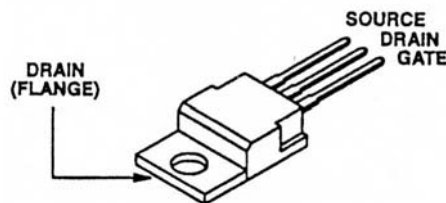


Figure 1 -Pin configuration of Transistors in BM6A

A rare fault might be for example the failure of a single MOSFET or a driver transistor or op-amp, or the relay drive circuit itself may be faulty.

If the module can be powered up without blowing the on-board fuses, check PSU voltages on R93 and R96. Voltages on the lower terminals are nominally  $\pm 45V$ , and on the upper,  $\pm 25V$ . The low voltage power supply is  $\pm 15V$  measured at the supply pins of the op-amps. If PSU voltage (close to  $\pm 15V$ ) appears on any of the op-amp outputs (pins 1, 7, 8 & 14 on U1 & U2; pins 1 & 7 on U3), this would show a fault in the signal handling circuitry.

To find a DC voltage at a power amp output, measure voltages at test-points 1 - 5. Test points 1, 2, 3, 4 connect to the drain resistors of MOSFETs Q2, Q4, Q6, Q10 respectively. When the module is fully functional, test points 1 & 4 should be at  $+6mV$ , test points 2 & 3 should be at  $-19mV$ , these figures nominal, refer to quiescent current setting procedure. Test point 5 is 0V. If any of a pair of MOSFETs has failed, there will be a voltage of close to  $\pm 45V$  at some of these pins. DC voltage can't be measured at the output terminals because these will be out of circuit if the relay is open.

### Replacing Components

To replace output MOSFETs, the transformer has to be removed. Take off the connector at the board end and remove the centre bolt. Remove the thermal switch nut and bolt and the MOSFET mounting clip screws, not allowing the clips to rotate. Desolder the XLR connector wires, remove the screws holding the board and lift it off.

If MOSFETs are to be replaced, make sure they sit at exactly the same height and reach as the original devices. It is essential for reliability to ensure that the MOSFETs have a proper, high pressure mounting to the heatsink.

Bend the pins of the MOSFETs in order to get correct position before mounting/soldering using a flatnose plier without stressing the devices.

LDR/Lightbulb assembly: Solder the LDR on the circuit board and bend the legs of the bulb so the bulb lies flat on top of the LDR. Solder the bulb and fit the heatshrink tube on top. Shrink the tube and while the glue in it is still hot, close the top with a flat nose plier forming a light tight "hat" for the lamp/LDR.

### Reassembly

Replace the board and the securing screws leaving a little vertical play. Use high efficiency heatsink pads (Bergquist Sil-Pad K-10-43) to mount the MOSFETs and thermal switch, having removed the heatsink paste if it is an earlier module. Make sure the mounting clips are level and tighten them all the way.

Resolder the XLR wires and fit the transformer connector. Finally locate the heads of thermistors R14 and R76 inside the mounting tab holes of their respective MOSFETs, and apply ample heatsink paste in the hole and around the heads.

### Setting Quiescent Current

Install T1A fuses in case there is a fault remaining. Check that there is a high resistance between +45V and -45V power rails, and set the Iq preset (R34/R67) on the channel whose devices have been replaced, to zero resistance. N.B. Grey 10mm presets have zero resistance turned clockwise. blue 6mm presets -anticlockwise. Check for zero resistance across thermistor terminals.

Power up the module monitoring the voltage between test-points 1 & 2 for the HF section, and 3 & 4 for the LF. The voltage in each case is to be set to 21mV about two minutes after switch on from cold; and with the mains supply at 230V. At 110V mains, the equivalent voltages should be 19mV @ 110V. The mains voltage should be monitored during this process and if it is found to be more than 2% out, a variac should be used to set it correctly. The Iq settings have an NTC characteristic, i.e. the tendency is for current to reduce as temperature increases. For example, when the module has been driven hard for a period of time and is quite hot, the settings will be up to 20% down.

If all is well replace the fuses with spiral wound T2A type.

## Verifying Frequency Response

Measure the frequency response at the output terminals. The gain switch should be set to +4, and the trim pots first set to maximum. The generator signal should be -10dBu.

First measure the LF output, which is presented to the bottom pin on the speaker connector. Make two runs: the first run with the LF trim pot set to 0dB (max), the second with the pot set to -4dB (min). Measure the HF output next (top speaker pin), again make two runs: first run with the HF trim pot set to 0dB (max) second set to -4dB (min).

The output should be within +/-1 dB of the values shown below:

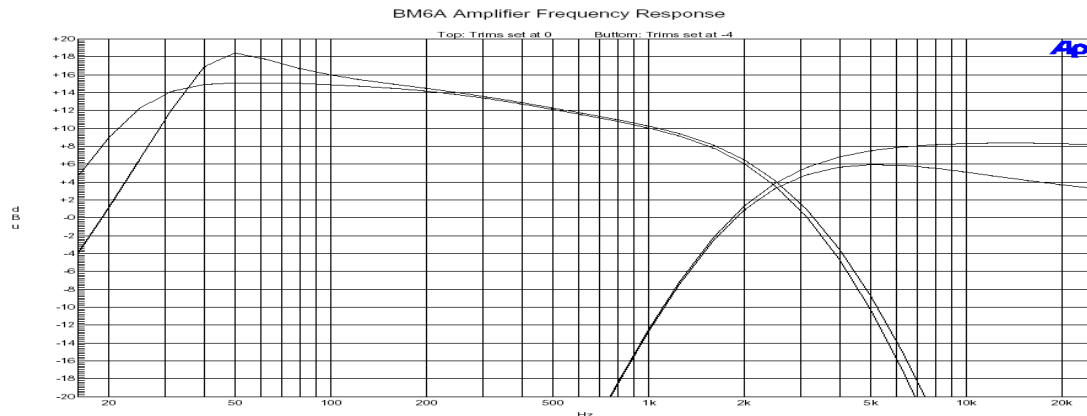


Figure 2: Amplifier Frequency Response, Input: -10dBu

LF Amp. Freq	trim -4dB dBu	trim 0dB dBu	HF Amp. Freq	trim -4dB dBu	trim 0dB dBu
20 Hz	8,9	1,1	500 Hz	-32,2	-32,1
25 Hz	12,2	6,5	630 Hz	-25,4	-25,2
31,5 Hz	14,1	12	800 Hz	-18,6	-18,4
40 Hz	14,9	16,9	1 kHz	-12,7	-12,5
50 Hz	15,1	18,4	1,25 kHz	-7,5	-7,2
63 Hz	15,1	17,7	1,6 kHz	-2,6	-2,2
80 Hz	15	16,7	2 kHz	0,8	1,3
100 Hz	14,9	16	2,5 kHz	3,2	3,8
125 Hz	14,7	15,4	3,15 kHz	4,8	5,6
160 Hz	14,5	14,9	4 kHz	5,7	6,8
200 Hz	14,2	14,5	5 kHz	5,9	7,5
250 Hz	13,8	14	6,3 kHz	5,9	7,9
315 Hz	13,3	13,5	8 kHz	5,5	8,2
400 Hz	12,7	12,9	10 kHz	5,1	8,3
500 Hz	12,1	12,3	12,5 kHz	4,6	8,4
630 Hz	11,5	11,6	16 kHz	4,1	8,3
800 Hz	10,8	11	20 kHz	3,7	8,3
1 kHz	10	10,2	25 kHz	3,3	8,2
1,25 kHz	9,1	9,4			
1,6 kHz	7,8	8,1			
2 kHz	6	6,5			
2,5 kHz	3,5	4,1			
3,15 kHz	0	0,8			
4 kHz	-4,8	-3,6			
5 kHz	-10,3	-8,8			
6,3 kHz	-17,1	-15,1			
8 kHz	-25,1	-22,5			
10 kHz	-33,2	-30			

Table 1: Amplifier Frequency Response, Input: -10dBu

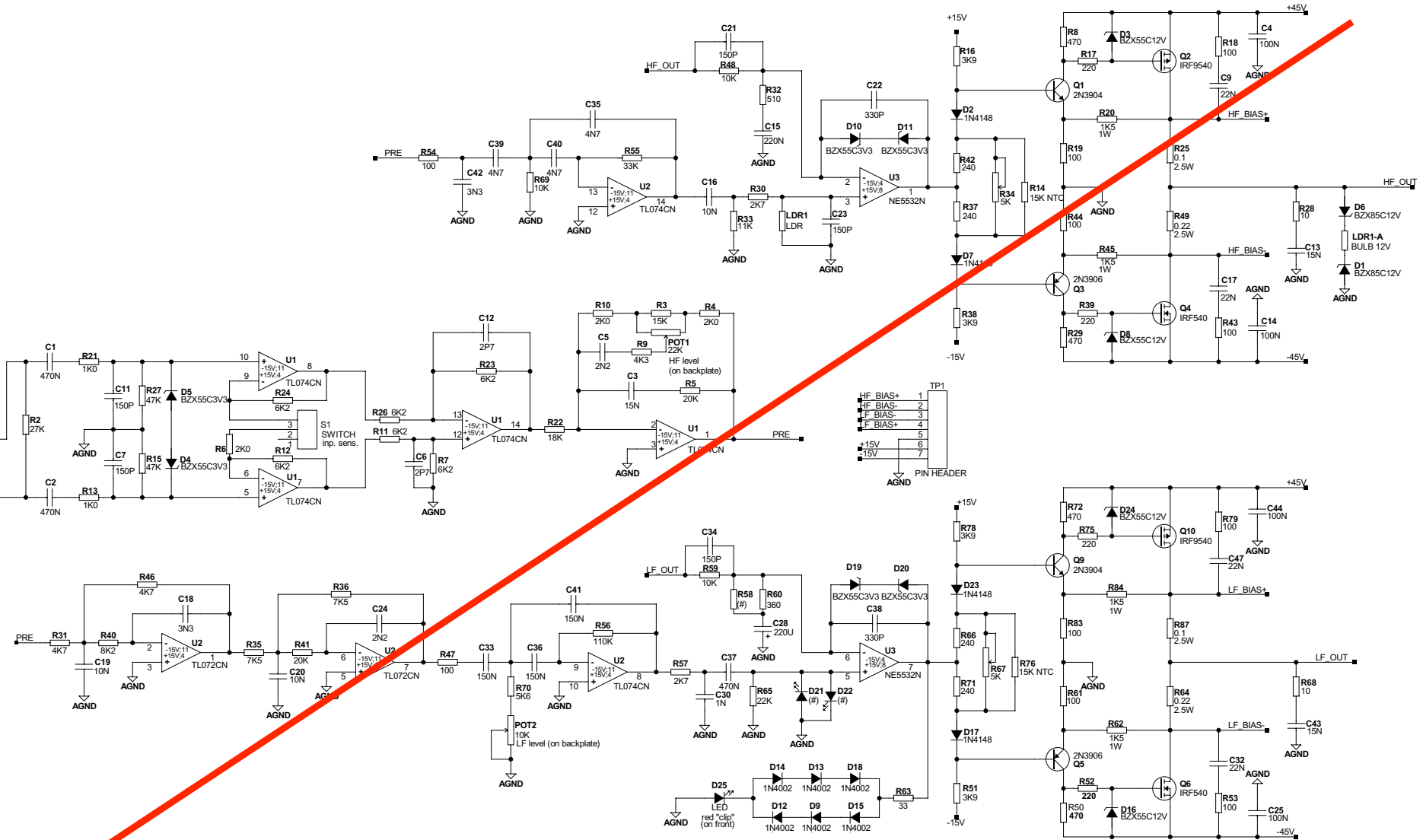
**Mk. I module Part List:**

Ref.	Value	Description	Type	Ref.	Value	Description	Type
BR 1	BU8D			D1	BZX85C12V	12V 1.3W	
C1, C2	470n 5% 100V	Polyester 7.5mm		D2	1N4148	National/Fairchild only	
C3	15n 50V	Polyester 5mm		D3	BZX55C12V	12V 0.5W	
C4	100n 50V	Ceramic 2.5mm		D4, D5	BZX55C3V3	3.3V 0.5W	
C5	2n2 50V 5%	Polyester 5mm		D6	BZX85C12V	12V 1.3W	
C6	2p7 100V 5%	Ceramic 2.5mm		D7	1N4148	National/Fairchild only	
C7	150p 100V	COG Ceramic 2.5mm		D8	BZX55C12V	12V 0.5W	
C8	100n 50V	Ceramic 2.5mm		D9	1N4002		
C9	22n 50V 20%	Ceramic 2.5mm		D10, D11	BZX55C3V3	3.3V 0.5W	
C10	100n 50V	Ceramic 2.5mm		D12-D15	1N4002		
C11	150p 100V	COG Ceramic 2.5mm		D16	BZX55C12V	12V 0.5W	
C12	2p7 100V 5%	Ceramic 2.5mm		D17	1N4148	National/Fairchild only	
C13	15n 100V 5%	Polyester 5mm		D18	1N4002		
C14	100n 50V	Ceramic 2.5mm		D19, D20	BZX55C3V3	3.3V 0.5W	
C15	220n 100V 5%	Polyester 7.5mm		D23	1N4148	National/Fairchild only	
C16	10n 50V 5%	Polyester 5mm		D24	BZX55C12V	12V 0.5W	
C17	22n 50V 20%	Ceramic 2.5mm		D27-D29	1N4002		
C18	3n3 50V 5%	Polyester 5mm		D30	BZX85C12V	12V 1.3W	
C19, C20	10n 50V 5%	Polyester 5mm		F1, F2	FUSE 2AT 20x5MM		
C21	150p 100V	COG Ceramic 2.5mm		K1	Relay 12V/5A DPNO Omron G5Z-2A 12V		
C22	330p 100V	COG Ceramic 2.5mm		LDR1	LDR ORP12 10mm dia.		
C23	150p 100V	COG Ceramic 2.5mm		LDR1-A	BULB 12V 80mA Wire ended Ø5MM		
C24	2n2 50V 5%	Polyester 5mm		POT1	POT 22K Hex Adj. Meggit Piher PT10MV22K		
C25-C27	100n 50V	Ceramic 2.5mm		POT2	POT 10K Hex Adj. Meggit Piher PT10MV10K		
C28	220u 16V	Electrolytic 2.5mm pitch		Q1	2N3904		
C29	100n 50V	Ceramic 2.5mm		Q2	IRF9540 INT. RECTIFIER ONLY		
C30	1n 50V 5%	Polyester 5mm		Q3	2N3906		
C31	100n 50V	Ceramic 2.5mm		Q4	IRF540 INT. RECTIFIER ONLY		
C32	22n 50V 20%	Ceramic 2.5mm		Q5	2N3906		
C33	150n 50V	Polyester 7.5mm		Q6	IRF540 INT. RECTIFIER ONLY		
C34	150p 100V	COG Ceramic 2.5mm		Q7-Q9	2N3904		
C35	4n7 50V	Polyester 5mm		Q10	IRF9540 INT. RECTIFIER ONLY		
C36	150n 50V	Polyester 7.5mm		Q11	2N3904		
C37	470n 5% 100V	Polyester 7.5mm		Q12, Q13	2N3906		
C38	330p 100V	COG Ceramic 2.5mm					
C39, C40	4n7 50V	Polyester 5mm					
C41	150n 50V	Polyester 7.5mm					
C42	3n3 50V 5%	Polyester 5mm					
C43	15n 100V 5%	Polyester 5mm					
C44	100n 50V	Ceramic 2.5mm					
C45, C46	22u 63V	Bipolar Electrolytic 3.5mm					
C47	22n 50V 20%	Ceramic 2.5mm					
C48	100u 25V	Electrolytic 2.5mm pitch					
C49	220u 16V	Electrolytic 2.5mm pitch					
C50	100u 25V	Electrolytic 2.5mm pitch					
C51, C52	10u 16V	Tantalum 2.5mm					
C53, C54	100u 25V	Electrolytic 2.5mm pitch					
C55	10000u 50V	Electrolytic 10mm pitch					
C56	47n 50V 5%	Polyester 7.5mm					
C57	10000u 50V	Electrolytic 10mm pitch					
C58	100n X2	Suppression Cap (mains inlet)					
C65	100n 50V	Ceramic 2.5mm					
C70-C78	100n 50V	Ceramic 2.5mm					
C82, C83	100n 50V	Ceramic 2.5mm					
C86	100n 50V	Ceramic 2.5mm					
C88, C89	15n 100V 5%	Polyester 5mm					

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**Mk. I module Part List, continued:**

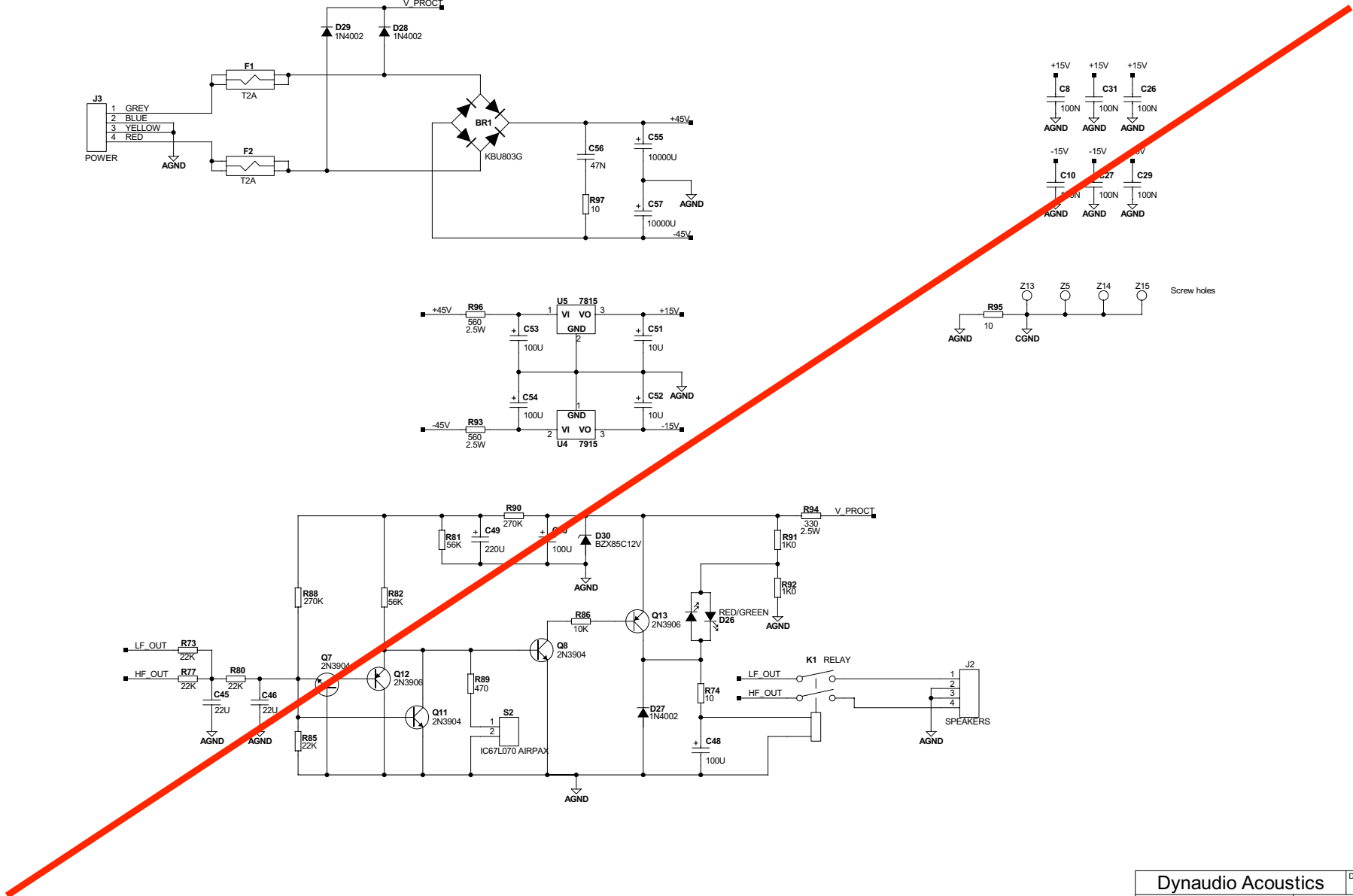
R1	47R	0.4W 1%	MRS16T	R56	110K	0.4W 1%	MRS16T
R2	27K	0.4W 1%	MRS16T	R57	2K7	0.4W 1%	MRS16T
R3	15K	0.4W 1%	MRS16T	R59	10K	0.4W 1%	MRS16T
R4	2K0	0.4W 1%	MRS16T	R60	360R	0.4W 1%	MRS16T
R5	20K	0.4W 1%	MRS16T	R61	100R	0.4W 1%	MRS16T
R6	2K0	0.4W 1%	MRS16T	R62	1K5	1W 5%	PRO1
R7	6K2	0.4W 1%	MRS16T	R63	33R	0.4W 1%	MRS16T
R8	470R	0.4W 1%	MRS16T	R64	0R22	2.5W 5%	AC03
R9	4K3	0.4W 1%	MRS16T	R65	22K	0.4W 1%	MRS16T
R10	2K0	0.4W 1%	MRS16T	R66	240R	0.4W 1%	MRS16T
R11, R12	6K2	0.4W 1%	MRS16T	R67	5K POT	1/4" Sealed Cermet, Top Adj.	
R13	1K0	0.4W 1%	MRS16T	R68	10R	0.4W 1%	MRS16T
R14	15K NTC	PHILIPS		R69	10K	0.4W 1%	MRS16T
R15	47K	0.4W 1%	MRS16T	R70	5K6	0.4W 1%	MRS16T
R16	3K9	0.4W 1%	MRS16T	R71	240R	0.4W 1%	MRS16T
R17	220R	0.4W 1%	MRS16T	R72	470K	0.4W 1%	MRS16T
R18, R19	100R	0.4W 1%	MRS16T	R73	22K	0.4W 1%	MRS16T
R20	1K5	0.4W 1%	MRS16T	R74	10R	0.4W 1%	MRS16T
R21	1K0	0.4W 1%	MRS16T	R75	220R	0.4W 1%	MRS16T
R22	18K	0.4W 1%	MRS16T	R76	15K NTC	PHILIPS	
R23, R24	6K2	0.4W 1%	MRS16T	R77	22K	0.4W 1%	MRS16T
R25	0R1	2.5W 5%	AC03	R78	3K9	0.4W 1%	MRS16T
R26	6K2	0.4W 1%	MRS16T	R79	100R	0.4W 1%	MRS16T
R27	47K	0.4W 1%	MRS16T	R80	22K	0.4W 1%	MRS16T
R28	10R	0.4W 1%	MRS16T	R81, R82	56K	0.4W 1%	MRS16T
R29	470R	0.4W 1%	MRS16T	R83	100R	0.4W 1%	MRS16T
R30	2K7	0.4W 1%	MRS16T	R84	1K5	1W 5%	PRO1
R31	4K7	0.4W 1%	MRS16T	R85	22K	0.4W 1%	MRS16T
R32	510R	0.4W 1%	MRS16T	R86	10K	0.4W 1%	MRS16T
R33	11K	0.4W 1%	MRS16T	R87	0R1	2.5W 5%	AC03
R34	5K POT	1/4" Sealed Cermet, Top Adj.		R88	270K	0.4W 1%	MRS16T
R35, R36	7K5	0.4W 1%	MRS16T	R89	470R	0.4W 1%	MRS16T
R37	240R	0.4W 1%	MRS16T	R90	270K	0.4W 1%	MRS16T
R38	3K9	0.4W 1%	MRS16T	R91, R92	1K0	0.4W 1%	MRS16T
R39	220R	0.4W 1%	MRS16T	R93	560R	2.5W 5%	AC03
R40	8K2	0.4W 1%	MRS16T	R94	330R	2.5W 5%	AC03
R41	20K	0.4W 1%	MRS16T	R95	10R	0.4W 1%	MRS16T
R42	240R	0.4W 1%	MRS16T	R96	560R	2.5W 5%	AC03
R43, R44	100R	0.4W 1%	MRS16T	R97	10R	1W 5%	PRO1
R45	1K5	0.4W 1%	MRS16T				
R46	4K7	0.4W 1%	MRS16T	S1	S/W TOGGLE .5VA TT SERIES		
R47	100R	0.4W 1%	MRS16T	S2	67L070 THERMAL SWITCH AIRPAX		
R48	10K	0.4W 1%	MRS16T				
R49	0R22	2.5W 5%	AC03	U1, U2	TLO74CN		
R50	470R	0.4W 1%	MRS16T	U3	NE5532N		
R51	3K9	0.4W 1%	MRS16T	U4	7915CV	-15V 1A	
R52	220R	0.4W 1%	MRS16T	U5	7815CV	15V 1A	
R53, R54	100R	0.4W 1%	MRS16T				
R55	33K	0.4W 1%	MRS16T				



(#) : NOT USED

Dynaudio Acoustics		Designer
Module title		CM / JVO
Title	AMPLIFIERS	
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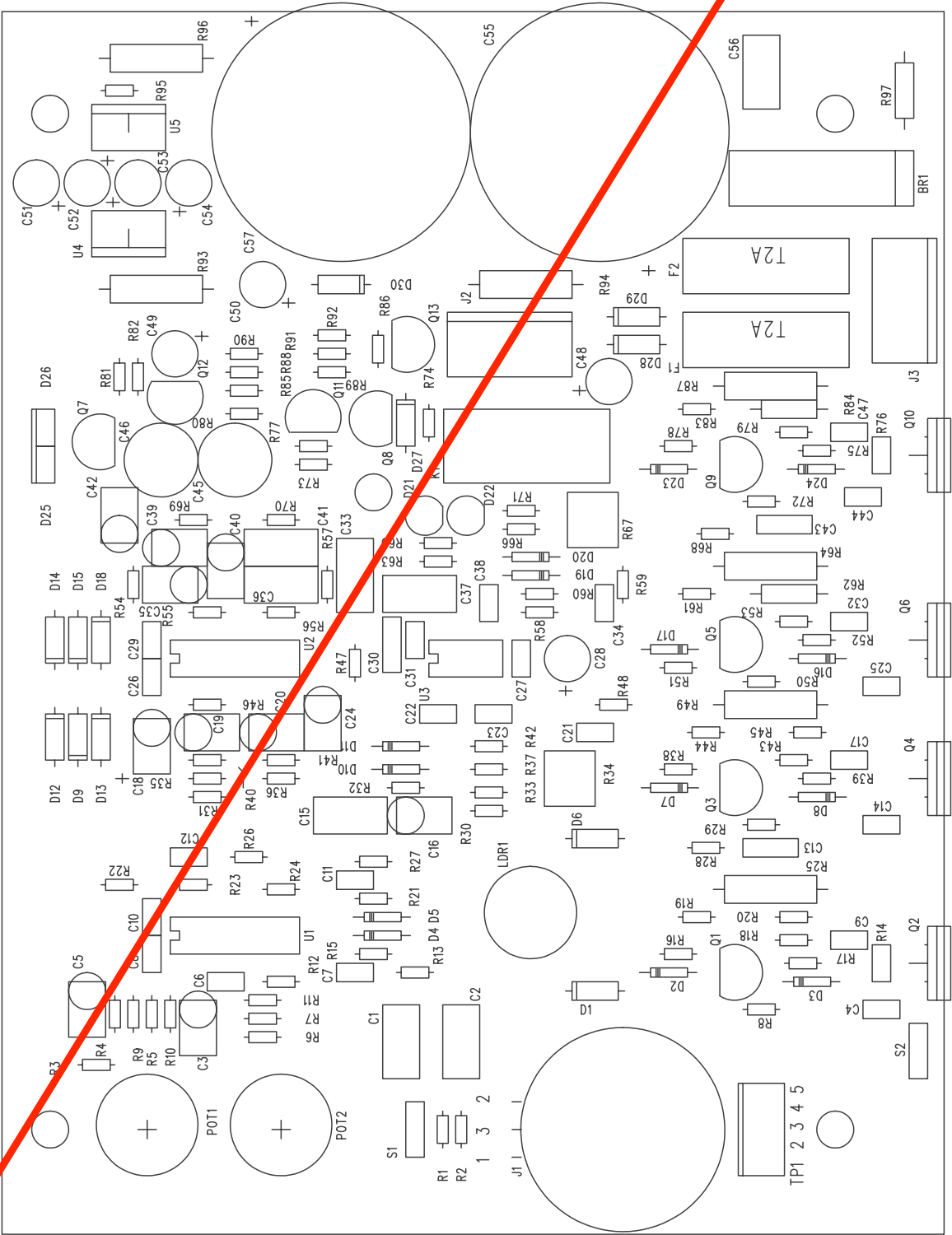




<b>Dynaudio Acoustics</b>		Designer CM / JVO
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# **Mk. I module Circuit Board Component Layout**



**Mk. II module Part List:**

Ref.	Value	Description	Type	Ref.	Value	Description	Type
BR 1	BU8D			D1	BZX85C12V	12V 1.3W	
BR 2	DB152			D2	1N4148	National/Fairchild only	
				D3	BZX55C12V	12V 0.5W	
C1, C2	470n 5% 100V	Polyester	7.5mm	D4, D5	Not used		
C3	15n 50V	Polyester	5mm	D6	BZX85C12V	12V 1.3W	
C4	100n 50V	Ceramic	2.5mm	D7	1N4148	National/Fairchild only	
C5	2n2 50V 5%	Polyester	5mm	D8	BZX55C12V	12V 0.5W	
C6	2p7 100V 5%	Ceramic	2.5mm	D9	1N4002		
C7	150p 100V	COG Ceramic	2.5mm	D10, D11	BZX55C3V3	3.3V 0.5W	
C8	100n 50V	Ceramic	2.5mm	D12-D15	1N4002		
C9	22n 50V 20%	Ceramic	2.5mm	D16	BZX55C12V	12V 0.5W	
C10	100n 50V	Ceramic	2.5mm	D17	1N4148	National/Fairchild only	
C11	150p 100V	COG Ceramic	2.5mm	D18	1N4002		
C12	2p7 100V 5%	Ceramic	2.5mm	D19, D20	BZX55C3V3	3.3V 0.5W	
C13	33n 100V 5%	Polyester	5mm	D23	1N4148	National/Fairchild only	
C14	100n 50V	Ceramic	2.5mm	D24	BZX55C12V	12V 0.5W	
C15	220n 100V 5%	Polyester	7.5mm	D27-D29	1N4002		
C16	10n 50V 5%	Polyester	5mm	D30	BZX85C12V	12V 1.3W	
C17	22n 50V 20%	Ceramic	2.5mm				
C18	3n3 50V 5%	Polyester	5mm	F1, F2	FUSE 2AT Bussman S504 20x5MM		
C19, C20	10n 50V 5%	Polyester	5mm	F3, F4	FUSE 500mAT Bussman S504 20x5MM		
C21	47p 100V	COG Ceramic	2.5mm				
C22	330p 100V	COG Ceramic	2.5mm				
C23	150p 100V	COG Ceramic	2.5mm				
C24	2n2 50V 5%	Polyester	5mm				
C25-C27	100n 50V	Ceramic	2.5mm	K1	Relay 12V/5A DPNO		
C28	220u 16V	Electrolytic	2.5mm pitch		Omron G5Z-2A 12V		
C29	100n 50V	Ceramic	2.5mm				
C30	1n 50V 5%	Polyester	5mm	LDR1	LDR NORP12 10mm dia.		
C31	100n 50V	Ceramic	2.5mm	LDR1-A	BULB 12V 80mA Wire ended Ø5MM		
C32	22n 50V 20%	Ceramic	2.5mm				
C33	150n 50V	Polyester	7.5mm	POT1	POT 22K Hex Adj.		
C34	47p 100V	COG Ceramic	2.5mm		Meggitt Piher PT10MV22K		
C35	4n7 50V	Polyester	5mm	POT2	POT 10K Hex Adj.		
C36	150n 50V	Polyester	7.5mm		Meggitt Piher PT10MV10K		
C37	470n 5% 100V	Polyester	7.5mm				
C38	330p 100V	COG Ceramic	2.5mm	Q1	2N3904		
C39, C40	4n7 50V	Polyester	5mm	Q2	IRF5210 INT. RECTIFIER ONLY		
C41	150n 50V	Polyester	7.5mm	Q3	2N3906		
C42	3n3 50V 5%	Polyester	5mm	Q4	IRF540 INT. RECTIFIER ONLY		
C43	33n 100V 5%	Polyester	5mm	Q5	2N3906		
C44	100n 50V	Ceramic	2.5mm	Q6	IRF540 INT. RECTIFIER ONLY		
C45, C46	22u 63V	Bipolar Electrolytic	3.5mm	Q7-Q9	2N3904		
C47	22n 50V 20%	Ceramic	2.5mm	Q10	IRF5210 INT. RECTIFIER ONLY		
C48	100u 25V	Electrolytic	2.5mm pitch	Q11	2N3904		
C49	220u 16V	Electrolytic	2.5mm pitch	Q12, Q13	2N3906		
C50	100u 25V	Electrolytic	2.5mm pitch				
C51, C52	10u 16V	Tantalum	2.5mm				
C53, C54	470u 35V	Electrolytic	5mm pitch				
C55	10000u 63V	Electrolytic	10mm pitch				
C56	47n 250V 5%	Polyester	7.5mm				
C57	10000u 63V	Electrolytic	10mm pitch				
C58-C61	100n 50V	Ceramic	2.5mm				
C62, C63	1n 50V 10%	Ceramic	2.5mm				
C66-C78	100n 50V	Ceramic	2.5mm				
C82, C83	100n 50V	Ceramic	2.5mm				
C84, C85	100u 25V	Electrolytic	2.5mm pitch				
C86, C87	100n 50V	Ceramic	2.5mm				
C88, C89	33n 100V 5%	Polyester	5mm				

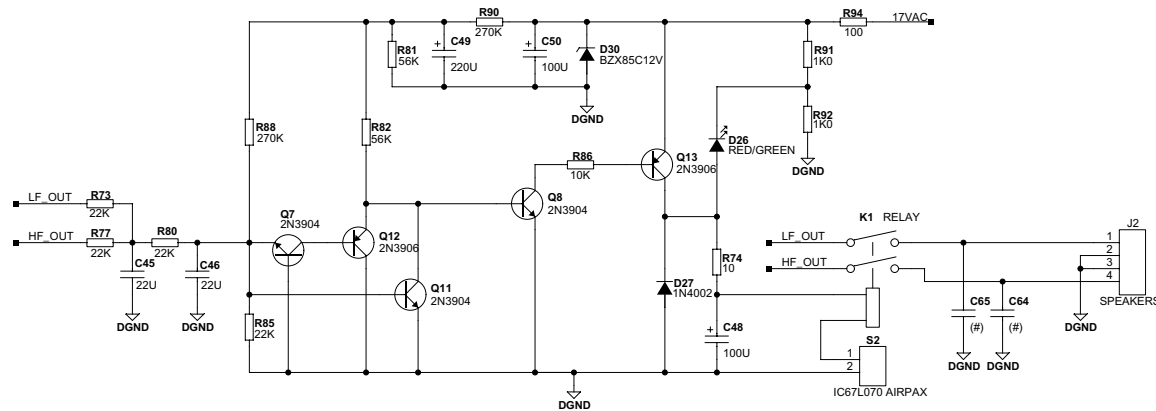
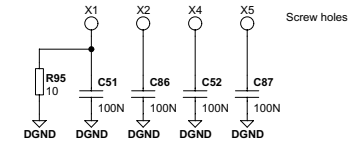
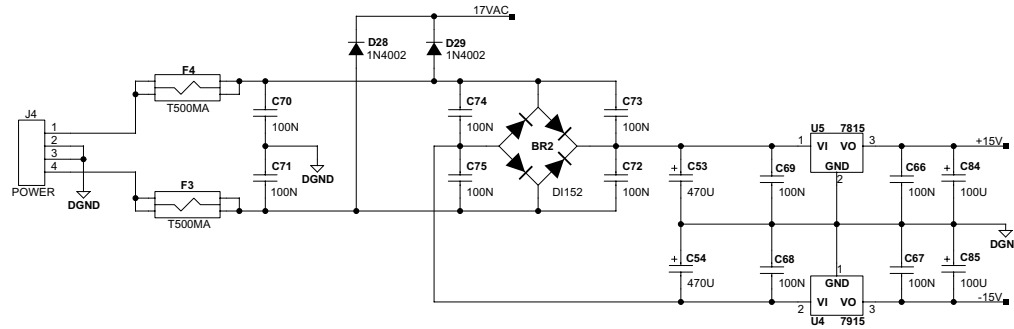
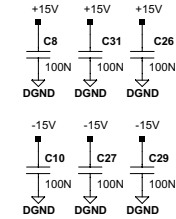
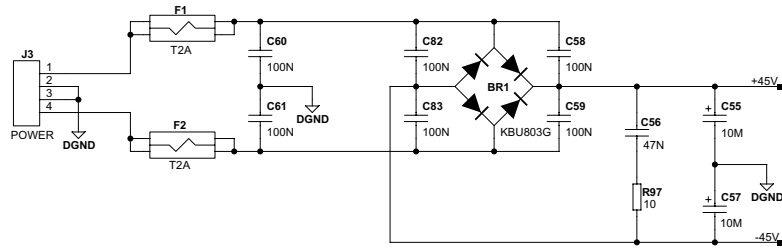
- continued on next page.

**Mk. II module Part List, continued:**

R1	47R	0.4W 5%	MRS16T	R56	110K	0.4W 1%	MRS16T
R2	27K	0.4W 1%	MRS16T	R57	2K7	0.4W 1%	MRS16T
R3	15K	0.4W 1%	MRS16T	R59	10K	0.4W 1%	MRS16T
R4	2K0	0.4W 1%	MRS16T	R60	360R	0.4W 1%	MRS16T
R5	20K	0.4W 1%	MRS16T	R61	100R	0.4W 1%	MRS16T
R6	2K0	0.4W 1%	MRS16T	R62	1K5	1W 5%	PRO1
R7	6K2	0.4W 1%	MRS16T	R63	33R	0.4W 1%	MRS16T
R8	470R	0.4W 1%	MRS16T	R64	0R22	2.5W 5%	AC03
R9	4K3	0.4W 1%	MRS16T	R65	22K	0.4W 1%	MRS16T
R10	2K0	0.4W 1%	MRS16T	R66	240R	0.4W 1%	MRS16T
R11, R12	6K2	0.4W 1%	MRS16T	R67	5K POT	1/4" Sealed Cermet, Top Adj.	
R13	1K0	0.4W 5%	MRS16T	R68	10R	0.4W 1%	MRS16T
R14	15K	NTC PHILIPS		R69	10K	0.4W 1%	MRS16T
R15	47K	0.4W 1%	MRS16T	R70	5K6	0.4W 1%	MRS16T
R16	1K21	0.4W 1%	MRS16T	R71	240R	0.4W 1%	MRS16T
R17	220R	0.4W 1%	MRS16T	R72	470R	0.4W 1%	MRS16T
R18, R19	100R	0.4W 1%	MRS16T	R73	22K	0.4W 1%	MRS16T
R20	1K5	0.4W 1%	MRS16T	R74	10R	0.4W 1%	MRS16T
R21	1K0	0.4W 5%	MRS16T	R75	220R	0.4W 1%	MRS16T
R22	18K	0.4W 1%	MRS16T	R76	15K	NTC PHILIPS	
R23, R24	6K2	0.4W 1%	MRS16T	R77	22K	0.4W 1%	MRS16T
R25	0R22	2.5W 5%	AC03	R78	1K21	0.4W 1%	MRS16T
R26	6K2	0.4W 1%	MRS16T	R79	100R	0.4W 1%	MRS16T
R27	47K	0.4W 1%	MRS16T	R80	22K	0.4W 1%	MRS16T
R28	10R	0.4W 1%	MRS16T	R81, R82	56K	0.4W 1%	MRS16T
R29	470R	0.4W 1%	MRS16T	R83	100R	0.4W 1%	MRS16T
R30	2K7	0.4W 1%	MRS16T	R84	1K5	1W 5%	PRO1
R31	4K7	0.4W 1%	MRS16T	R85	22K	0.4W 1%	MRS16T
R32	510R	0.4W 1%	MRS16T	R86	10K	0.4W 1%	MRS16T
R33	11K	0.4W 1%	MRS16T	R87	0R22	2.5W 5%	AC03
R34	5K POT	1/4" Sealed Cermet, Top Adj.		R88	270K	0.4W 1%	MRS16T
R35, R36	7K5	0.4W 1%	MRS16T	R89	1K47	0.4W 1%	MRS16T
R37	240R	0.4W 1%	MRS16T	R90	270K	0.4W 1%	MRS16T
R38	3K9	0.4W 1%	MRS16T	R91, R92	1K0	0.4W 5%	MRS16T
R39	220R	0.4W 1%	MRS16T	R93	16K9	0.4W 1%	MRS16T
R40	8K2	0.4W 1%	MRS16T	R94	100R	2.5W 5%	AC03
R41	20K	0.4W 1%	MRS16T	R95	10R	0.4W 1%	MRS16T
R42	240R	0.4W 1%	MRS16T	R96	1K47	0.4W 1%	MRS16T
R43, R44	100R	0.4W 1%	MRS16T	R97	10R	1W 5%	PRO1
R45	1K5	0.4W 1%	MRS16T	R98	16K9	0.4W 1%	MRS16T
R46	4K7	0.4W 1%	MRS16T				
R47	100R	0.4W 1%	MRS16T	S1	S/W TOGGLE .5VA TT SERIES		
R48	10K	0.4W 1%	MRS16T	S2	67L070 THERMAL SWITCH AIRPAX		
R49	0R22	2.5W 5%	AC03				
R50	470R	0.4W 1%	MRS16T	U1, U2	TLO74CN		
R51	3K9	0.4W 1%	MRS16T	U3	NE5532N		
R52	220R	0.4W 1%	MRS16T	U4	7915CV	-15V 1A	
R53, R54	100R	0.4W 1%	MRS16T	U5	7815CV	15V 1A	
R55	33K	0.4W 1%	MRS16T				



DynaudioAcoustics		Designer CM/JVO
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**Mk. II module Circuit Board Component Layout**

