H E Y B R O O K H I-F I L I M I T E D

ENGINEERS MANUAL

Schematic Diagrams and Comprehensive Parts List

For

Heybrook C2 Control Amplifier

Heybrook P2 Power Amplifier

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Schematic Diagrams

C2 PRE-AMPLIFIER PARTS LIST

MOVING COIL AND MOVING MAGNET STAGE

Capacitors

Part Number	Value	Type
C1-A / C201-A	100uF	Tantalum
C1 / C201	100uF	Tantalum
C2 / C202	22NF	Polyester
C3 / C202	10uF	Tantalum
C4 / C204	10uF	Tantalum
C5 / C205	100uF	Tantalum
C6 / C206	2N2	Tantalum
C7 / C207	10uF	Tantalum
C8 / C208	10uF	Tantalum
C9 / C209	47PF	Polystyrene
C10 / C210	0.47uF	Polyester
C11 / C211	8.2uF	Polystyrene
C12 / C212	22NF	Polystyrene
C13 / C213	3N3	Polystyrene
C14 / C214	100PF	Polystyrene
C15 / C215	2.2uF	Polyester
C16 / C216	0.47uF	Polystyrene

Resistors

R1 / R201	6.2 K	Metal Film
R2 / R202	15 K	Metal Film
R3 / R203	68 ohm	Metal Film
R4 / R204	100 K	Metal Film
R5 / R205	15 K	Metal Film

Resistors continued...

Part Number	Value	Type
R6 to R15 / R206 to R215	471 ohm	Resistor Network
R16 to R25 / R216 to R225	151 ohm	Resistor Network
R26 / R226	1 K	Metal Film
R27 / R227	2.7 K	
R28 / R228	10 ohm	Metal Film
R29 / R229	4 K7	Metal Film
R30 / R230	82 K	Metal Film
R31 / R231	150 K	Metal Film
R32 / R232	1 M2	Metal Film
R33 / R233	1 M5	Metal Film
R34 / R234	1 K	Metal Film
R35 / R235	220 ohm	Metal Film
R36 / R236	1 K	Metal Film
R37 / R237	1 K8	Metal Film
R38 / R238	6 K8	Metal Film
R79 / R279	680 K	Metal Film
R40 / R240	10 K	Metal Film
R41 / R241	160 K	Metal Film
R42 / R242	1 K8	Metal Film
R43 / R243	6 K8	Metal Film
R44 / R244	1 K	Metal Film
R45 / R245	5 K	Metal Film
R46 / R246	1 K	Metal Film
R47 / R247	33 K	Metal Film
R48 / R248	470 ohm	Metal Film
R49 / R249	120 ohm	Metal Film
R50 / R250	120 ohm	Metal Film

Semiconductors

D1 / D201

D2 / D202

Transistors (Denoted by 'T' or 'Q')

Part Number	Value	Type
Q1 to Q10 / Q201 to Q210	ZTX 384	
Q11 / Q211	ZTX 214	
Q12 / Q212	ZTX 384	
Q13 / Q213	ZTX 214	
Q14 / Q214	ZTX 384	
Q15 / Q215	ZTX 384	
Q16 / Q216	ZTX 214	(On Circuit Board Identified as Another Q10)
Q17 / Q217	ZTX 384	
Q18 / Q218	ZTX 384	
Q19 / Q219	ZTX 384	

LINE AMPLIFIER STAGE

Capacitors

Part Number	Value	Type
C18 / C218	4uF	Polyester
C19 / C219	220uF	Electrolytic
C20 / C220	10uF	Tantalum
C22 / C222	4u7	Polyester

Resistors

R51 / R251	1 M	Metal Film
R52 / R252	120 K	Metal Film
R53 / R253	560 K	Metal Film
R54 / R254	8 K2	Metal Film
R55 / R255	4 K7	Metal Film
R56 / R256	220 K	Metal Film
R57 / R257	1 K	Metal Film
R58 / R258	1 K	Metal Film
R59 / R259	6 K8	Metal Film
R60 / R260	2 K7	Metal Film
R61 / R261	1 K8	Metal Film
R63 / R263	10 K	Metal Film
R64 / R264	22 K	Metal Film
R65 / R265	6 K8	Metal Film
R66 / R266	120 ohm	Metal Film
R68 / R268	330 ohm	Metal Film
R69 / R269	100 K	Metal Film

Transistors

Part Number	Value	Type
Q20 / Q220	ZTX 384	
Q21 / Q221	ZTX 214	
Q22 / Q222	ZTX 384	
Q23 / Q223	ZTX 384	
Q24 / Q224	ZTX 214	
Q25 / Q225	ZTX 384	
Q26 / Q226	ZTX 384	

Miscellaneous

Balance - Potentiometer	50 K	2 - Gang
Volume - Potentiometer	100 K	4 - Gang

MUTE / RELAY SECTION

Capacitors

Part Number	Value	Type
C23	47uF	Electrolytic
C24	10uF	Tantalum
C25	10uF	Tantalum
C27	0.22uF	Polyester
C28	22uF	Electrolytic
C29	22uF	Electrolytic
C30	4700uF	Electrolytic
C32	100uF	Electrolytic
C33	0.01uF	Polyester

Resistors

R70	68 K	Metal Film
R71	8 K2	Metal Film
R72	1 K	Metal Film
R73	3 K3	Metal Film
R74	1 K	Metal Film
R75	1 K	Metal Film
R76	8 K2	Metal Film
R77	1 K	Metal Film
R78	1 K	Metal Film
R79	150 ohm	Metal Film
R80	150 ohm	Metal Film
R81	82 ohm	Metal Film
R83	See Miscellaneous Components	
R84	4 K7	Metal Film
R85	470 K	Metal Film

Resistors continued ...

Part Number	Value	Type
R86	10 K	Metal Film
R87	100 K	Metal Film
R88	2 K7	Metal Film

Semi-conductors

Transistors

Q29		TIP 31A
Q30		BC 239C
Q31		BC 416C

Diodes

D5		IN 4005
D6		IN 4005
D7		IN 4005
D8		L.E.D.
D9		IN 4005
D10		IN 4001
D11		5V1 Zener
D12		5V1 Zener
D13	BR 8256	Bridge Rectifier

Miscellaneous

R83 (UR83)	4 K7	Preset
T1	Custom Made	Transformer
RL1	Z4V DC	Relay
IC1		CA 3140E

C2 - PRE-AMPLIFIER

OPERATING CIRCUIT DESCRIPTION

Upon switch on there is a five second delay to allow circuits to stabalise before the O/p of the C2 is allowed to pass to a Power Amplifier.

1.) During switch on the delay is governed by the time delay network operated from the discharge of C28.
When the relay contacts are open the left and right signals are allowed to pass. With the contacts closed the left and right outputs are earthed. The mute button operates the relay directly without time delay.

2.) The voltage supply for operating the relay comes from the 0 volts Centre Tap of the Mains Transformer.
The total 36V A.C. output from the transformer is placed up the bridge rectifier. The D. C. output of the rectifier is 60 volts D. C.

The power supply cleans and sets the voltage to 40 volts D.C. to feed the Line Circuit, the M. M. Circuit and the voltage is dropped across. R27 and R227 to 6.7 volts D.C. to feed the M. C. stage.

The 0 volt Reference (chasis earth) is isolated from the transformer.

3.) The positive supply rail is smoothed by C30 and the voltage is controlled by IC1.
Pin 2 has the set reference voltage of 5 volts from D11.
Pin 6 output changes by turning VR83 pre set. This varies conduction governing positive Rail voltage

4.) The moving Coil signal is fed through C1/A with T1 to T11 giving multi-stage gain. The signal is then fed through R28, C4, C5 and R34.
The signal is then fed to the Moving Magnet stage

5.) The Moving Magnet signals are coupled via C6.
T12 and T13 supply gain while T14 allows supply control.
The capacitor configeration C10 to C13 is the R.I.A.A. Correction Network.

Transistors T15, T16 and T19 give further gain. While T17 and T18 act as Control Transistors.
The signal is then finally coupled through C15 to the Line stage.

6.) All line 1/p signals are fed via the 820 ohm resistor. The signal is then passively attenuated by the main 4 gang potentiometer.
The signal is then coupled through C18 and amplified by T20 and T21.

Transistor T22 gives gain control by varying the voltage at T21 emitter. This operates in conjunction with the 2 rear Wipes of the 4 gang potentiometer (on diagram points A and B)

The signal is then fed via R61 to the base of T23 giving gain. The signal is then finally coupled through C22 and R68.

REFERENCES VOLTAGES FOR C2 - PRE-AMPLIFIER

C2 POWER SUPPLY SECTION

A) The Positive Supply Rail should be set at +40 volts.
The voltage is dropped by R81 and set by VR83.
No noise should be present on teh supply rail if looked at on oscilloscope.

B) The base of T29 should read approximately 580mV, the collector at 10.7V and the emitter at 0 Volts.

C) The voltages around IC1 should read:-
Pin 6 = 1.4 volts, Pin 3 = 5.27 volts, Pin 2 = 5.2 volts

D) Mute / Relay Voltages

Voltage at D6	Cathode	27.3 volts
Voltage at T30	Emitter	5.1 volts, Collector = 6.3V, Base = 5.8V
Voltage at T31	Emitter	27.3 volts, Collector = 27.3V, Base = 26.5V

E) M. C. Gain Stage

T1 to T10 = Base = 700mV, Collector = 5.8V, Emitter = 187mV

F) 1st Stage of M. M. Gain

T12	Base = 2.9V,	Collector = 21.3V,	Emitter = 2.4V
T13	Base = 21.9V,	Collector = 2.4V,	Emitter = 21.2V
T14	Base = 24.9V,	Collector = 40V,	Emitter = 25.5V

G) Final Stage of M. M. / M. C. Gain

T15	Base = 4.3,	Collector = 20.1V,	Emitter = 3.8V
T16	Base = 20V,	Collector = 3.8V,	Emitter = 0V
T17	Base = 600mV,	Collector = 1.2V,	Emitter = 0V
T18	Base = 1.25V,	Collector = 37.8V,	Emitter = 600mV
T19	Base = 20.7V,	Collector = 37.8V,	Emitter = 20V

H) Line Stage Reference Volatges

T20	Base = 4.4V,	Collector = 23.3V,	Emitter = 4V
T21	Base = 23V,	Collector = 4V,	Emitter = 23.8V
T22	Base = 25.5V,	Collector = 40V,	Emitter = 24.9V
T23	Base = 23.8V,	Collector = 39.6V,	Emitter = 23.4V
T24	Base = 39.6V,	Collector = 23.4V,	Emitter = 40V
T25	Base = 628mV,	Colelctor = 1.2V,	Emitter = 0V
T26	Base = 1.2V,	Collector = 23.4V,	Emitter = 628mV

C2 - PRE AMPLIFIER FAULT FINDING HINTS

TYPICAL FAULTS:-

1.) Resistor R39 may go open circuit causing the Bias voltage at the base of T15 to drop. This will switch T15 off completely, causing the M. C. and M. M. outputs to appear vary distorted.

2.) Resistor R32 feeds a vary small bias voltage to the base of T12. R32 can sometimes become inherently noisy. This is most noticeable when the M. M. input is selected and is not loaded with a cartridge.

3.) If a difference in channel output occurs this can be one of two things. Firstly there could be a hairline fracture of the copper signal track arount the volume potentiometer. Secondly a tracking error may have arisen between the wiper and the carbon track of any one of the four tracks of the 4 gang volume potentiometer.

P2 POWER AMPLIFIER PARTS LIST

MAIN BOARD (Both Channels)

Capacitors

Part Number	Value	Type
C1	2N2	Polyester
C2	2N2	Polyester
C3	4N7	Tantalum
C4	0.1uF	Polyester
C5	1NF	Polystyrene
C6	100PF	Polystyrene
C7	100PF	Polystyrene
C8	33NF	Polyester
C9	4N7	Tantalum
C10	2N2	Polyester
C11	120PF	Polystyrene
C12	10NF	Polyester
C13	10uF	Tantalum
C14	220PF	Polystyrene
C15	2u2	Polyester
C16	2u2	Polyester
C17 (On small P.C.B.)	0.1uF	Polyester
C18	0.1uF	Polyester
C22	50PF	Polystyrene
C23	1000PF	Ceramic

Resistors

R1 to R8	0.47 ohm	2½ watt	Wire Wound
R9 to R12	8.2 ohm	½ watt	Carbon Film
R13	2R7 ohm	7 watt	Wire Wound
R14	100 ohm	¼ watt	Metal Film
R15	10 ohm	¼ watt	Metal Film

Resistors continued ...

Part Number	Value	Type
R16	1.2 K ¼ watt	Metal Film
R17	100 ohm ¼ watt	Metal Film
R18	100 ohm ¼ watt	Metal Film
R19	820 ohm 1 watt	Carbon Film
R20	100 ohm ¼ watt	Metal Film
R21	680 ohm ¼ watt	Metal Film
R22	680 ohm ¼ watt	Metal Film
R23	390 ohm ¼ watt	Metal Film
R24	820 ohm ¼ watt	Metal Film
R25	18 ohm ¼ watt	Metal Film
R26	820 ohm ¼ watt	Metal Film
R27	4 K7 ½ watt	Carbon Film
R28	2 K2 1 watt	Carbon Film
R29	2 K2 1 watt	Carbon Film
R30	5 K6 ¼ watt	Metal Film
R31	5 K6 ¼ watt	Metal Film
R32	2 K7 ¼ watt	Metal Film
R33	10 K ¼ watt	Metal Film
R34	1 K2 ¼ watt	Metal Film
R35	680 ohm ¼ watt	Metal Film
R36	33 K ¼ watt	Metal Film
R37	180 ohm ½ watt	Carbon Film
R39	100 K ¼ watt	Metal Film
R40	1 K5 2 watt	Carbon Film
R41	1 K5 2 watt	Carbon Film
R42	10 ohm ½ watt	Metal Film
R43	100 ohm ¼ watt	Metal Film
R44	22 K ¼ watt	Metal Film
R45	6 K8 1 watt	Carbon Film
R46	150 ohm ¼ watt	Metal Film
R47	1 K2 ¼ watt	Metal Film

Semi-Conductors

Transistors

Part Number	Type
Q1	BD 911
Q2	BD 911
Q3	BD 911
Q4	BD 911
Q5	BD 912
Q6	BD 912
Q7	BD 912
Q8	BD 912
Q9	BD 912
Q11	MJE 243
Q12	MJE 243
Q13	MJE 253
Q14	MJE 253
Q15	2N 5551
Q16	2N 5401
Q17	MPS A43
Q18	MPS A93

Diodes

D1	IN 4148
D2	IN 4148
D3	IN 4148
D4	IN 4148
D5	IN 4148
D6	IN 4148
D7	IN 4148
D8	IN 4148
D9	BZY 88C/12V
D10	BZY 88C/12V

Semi-Conductors continued ...

Miscellaneous Components

Part Number	Type
IC1	LM 318
L1	3.0 uH

P2 POWER AMPLIFIER POWER SUPPLY

Capacitors

Part Number	Value	Type
C20	2 of 10,000uF	Electrolytic
C21	2 of 10,000uF	Electrolytic

Miscellaneous

T1	Transformer	Custom Built
TH1	75°C	Thermal Switch
FS1	6.3 A	In-Line Fuse

Semi-Conductors

D11	25 Amp	Bridge Rectifier
D15		L.E.D.

HEYBROOK C2/P2 SERVICE MANUAL

C2 PREAMPLIFIER

1. CASE REMOVAL

Use a 2mm ALLEN KEY to loosen the grub screws in the Volume and Balance knobs and remove both knobs. Use a 2.5mm ALLEN KEY to remove the six button head screws located under each side of the case. Remove the black switch buttons by pulling. Remove the top of the case and front bezel by sliding it forwards.

2. VOLTAGE CHANGE

For UK and European countries and Australia, the C2 preamp is supplied set to 200v. For USA, Canada and Japan the setting is 100v. For Hong Kong the setting is 200v. These settings will maintain the regulated power supply at 40 volts DC for a wide range of input voltages. To change the setting unsolder the leads from the primary winding tabs on the top of the transformer and resolder, together with links, to the new setting.

3. AC MAINS LEAD CHANGE

Unscrew and remove the crosshead screw located just above the lead entry hole. Carefully remove the internal clamp block from its shroud without disturbing the shroud in the rear panel. Loosen the screws in the AC mains lead connecting block and withdraw the lead. Push the new lead through the hole in the rear panel keeping the clamp shroud located. Insert the bared flex ends into the correct terminals in the connecting block and tighten the screws. Insert the clamp block into its shroud and tighten using the screw inserted through the rear panel.

4. REMOVAL OF PCB

Remove the three screws holding the rear panel onto the base of the case. Remove the two screws holding the switch bank onto the front panel. Remove the nuts and washers affixing the volume and balance controls to the front panel. Unplug the leads to the power supply from the transformer. Push the front of the LED in the front panel so that it can be withdrawn from its plastic locating bush.

Remove the screws holding the PCB onto the main case - DO NOT remove the three screws holding the PCB onto the rear panel. The PCB and rear panel can then be withdrawn from the main case by sliding to the rear end and lifting to allow the volume control to clear the transformer.

C2 CIRCUIT DESCRIPTION

MOVING COIL INPUT

Signals from moving coil cartridges are fed to a moving coil pre-amplifier module consisting of ten parallel transistors T1 to T10. Input is via two Tantalum capacitors C1 and C1A. R5, R4, R2 form the biasing circuit for the bases and C3 decouples the base supply voltage. If C1, C1A and C3 have excessive leakage currents then the base voltage will drop causing a loss of output. The voltage at the junction of R4/R5 should be approximately 6.8V.

MOVING MAGNET INPUT

Signals from moving magnet cartridges are fed to the base of T12 via capacitor C6. With the MC/MM switch in the 'out' position moving magnet signals are shorted to ground and the signals from the moving coil stage are fed via C4, C5 to the emitter and collector of T12, T13. The signal then undergoes R1AA correction before being fed to the disc output stage T15, T16, T19.

LINE OUTPUT

Signals via the input switches are fed to the balance control which has a 'centre off' zero resistance position. One stage of the volume control then gives partial attenuation to the signal entering the line ouput stage via C18. The second stage of the volume control operates in parallel with R56 to alter the operating characteristics of the line output circuit to provide increase in overload levels with progressive attenuation of the signal. The output transistors T24, T26 provide a low impedance output via C22 and R68. Note that OUTPUT 1 and OUTPUT 2 are fed from individual series resistors.

POWER SUPPLY

The C2 power supply uses a sophisticated regulated power supply giving a noise free DC voltage of 40V. This voltage can be adjusted via the potentiometer R83. Note that resistors R81, R79 and R80 run very hot under normal conditions. There is no supply decoupling at individual parts of the circuit, so the output of a correctly operating power supply will show no discernable noise, especially if an oscilloscope probe is connected close to R81. T29 regulates the DC voltage through R79, R80, its base being controlled by the comparator IC1. This compares the voltage on pin 3, set by R83, to the zener reference D11.

P2 POWER AMPLIFIER CIRCUIT DESCRIPTION

The initial stage of amplification in the P2 Power amplifier centres around the LM 318 N 8 pin OP-Amp. The signal is fed onto pin 3. At pin 6 the voltage gain divides through D3 to D8 onto transistors Q17 and Q18.
Q17 handles the positive half swing of the applied signal, while Q18 handles the negative.

The signal is then coupled to Q16 and Q15. Both devices are biased on quite hard. Transistor Q9 gives full current control and determines the voltage potentials supplied to teh bases of Q11, Q12, Q13 and Q14.
This in turn biases on Q1 to Q4 and Q5 to Q8 the output transistors. The preset PR1 at the base of Q9 allows full control.

Transistors Q15 and Q16 act as signal pre-drivers. Q11 to Q14 are the driver transistors giving current gain to drive all the output transistors.

Please Note:- The D.C. offset voltage is measured between 0 volts and the signal O/p terminal. (Typically -80mV)
This is governed by Pin 6 of the LM 318 N 8 pin OP-Amp.

REFERENCE VOLTAGE FOR P2 POWER AMPLIFIER

INJECT:- A.) 1 volt P/P to input.

B.) Connect an 8 ohm 10 watt resistive load to the output terminals.
Expected output for 1 volt input is 28 volt 10 watt/R.M.S.

EXPECTED MEASUREMENTS:-

1.)	Pin 3 of LM318N		1 volt	peak to peak
2.)	Pin 6 of LM318N		5 volts	peak to peak
3.)	Base voltage	Q17	5 volts	peak to peak
4.)	Base voltage	Q18	5 volts	peak to peak
5.)	Collector voltage	Q15	28 volts	peak to peak
	Emitter voltage	Q14	28 volts	peak to peak
	Emitter voltage	Q13	28 volts	peak to peak
6.)	Emitter volatge	Q12	28 volts	peak to peak
	Emitter voltage	Q11	28 volts	peak to peak
	Collector voltage	Q16	28 volts	peak to peak
	Collector voltage	Q9	28 volts	peak to peak

7.) Output voltage at Terminals = 28 volts peak to peak

8.) D.C. Conditions No Signal Applied

a.) LM318N OP Amp Pin 6 -59mV

b.) Base Q17 = 1.8V

c.) Base Q18 = -1.8V

d.) Emitter Q17 = 1.2V

e.) Emitter Q17 = -1.2V

f.) Junction of R21 and R22 (-27.3mV)

g.) Base Q16 = 45V

h.) Base Q15 = -45V

i) Collector Q16 = 1.2V

j.) Collector Q15 = -1.2V

k.) Emitter Q11 & Q12 = 600mV

l.) Emitter Q13 & Q14 = -600mV

m.) Base Q9 = -1.3V

P2 POWER AMPLIFIER FAULT FINDING HINTS

Typical Faults:-

A.) The output transistors when mis-used (i.e. shorting the output or amplifying a distorted signal) can go short circuit.
When this occurs the mains fuse will naturally blow. If a loudspeaker is connected the 5 Amp protection fuse can also blow as well.
The output devices can be checked for short circuit condition by correcting a multimeter between the positive rail and measuring the resistance at the transistor emitters.
If the resistance is less then 0.8 ohm, the device can be considered short circuit. (Check the four devices on the positive rail and then the four transistors on the negative rail)

B.) Also Q11 and Q14 MUST be checked before power up.

C.) Bias control problems are rare. However if there is a problem transistor Q9 should be checked. (Please note, if Q9 goes open circuit this can also result in output transistor damage.)

D.) If audio distortion occurs when normal signal program material is being fed.
The problem will typically be a fault in the Driver stage.

P2 POWER AMPLIFIER

1. CASE REMOVAL

Use a 3mm ALLEN KEY to remove the six bolts located under each side of the case. Remove the top of the case together with front bezel by sliding it forwards. NOTE - it is important that when the cover is replaced, these bolts are fully tightened to ensure continuity of heat transfer.

2. VOLTAGE CHANGE

It is important for reliable operation and in order to meet the specification, that the mains AC transformer voltage settings are accurately matched to the AC supply voltage. To change the setting from that marked on the rear panel of the amplifier, unsolder the leads from the primary winding tabs on the transformer and resolder, together with links, to the new setting.

3. AC MAINS LEAD CHANGE

Unscrew and remove the crosshead screw located just above the lead entry hole. Carefully remove the internal clamp block from its shroud without disturbing the shroud in the rear panel. Loosen the screws in the AC mains lead connecting block and withdraw the lead. Push the new lead through the hole in the rear panel keeping the clamp shroud located. Insert the bared flex ends into the correct terminals in the connecting block and tighten the screws. Insert the clamp block into its shroud and tighten using the screw inserted through the rear panel.

4. REMOVAL OF POWER AMPLIFIER MODULE

Unsolder input leads from the circuit board tags. Carefully pull off the leads which connect the power supply board to the power amplifier PCB. Carefully unsolder the lead connecting the output of the power amplifier PCB to the positive loudspeaker socket. Unbolt the three screws on the underside of the case which locate the heatsink into the case. Remove the complete power amplifier module by lifting it out of the case.

P2 CIRCUIT DESCRIPTION

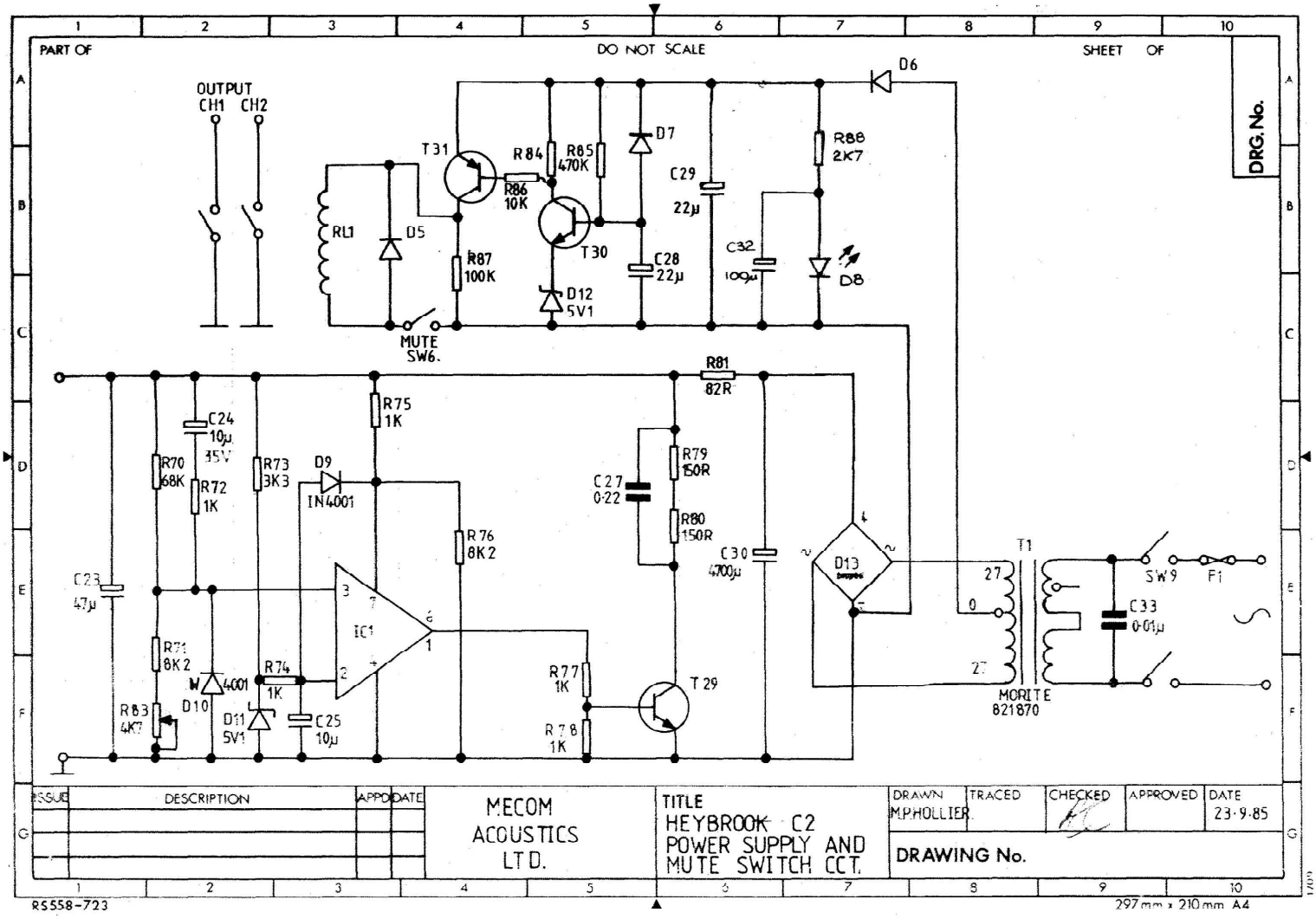
The signal input is fed to pin 3 of IC1 via C15 and R34. Pin 2 of IC1 is connected to a virtual ground via R35 which allows some AC and DC feedback to be applied. Power is provided to the IC via zener diodes D9 and D10. R46 and C17 connect to the case ground to give static and high frequency grounding of the input ground.

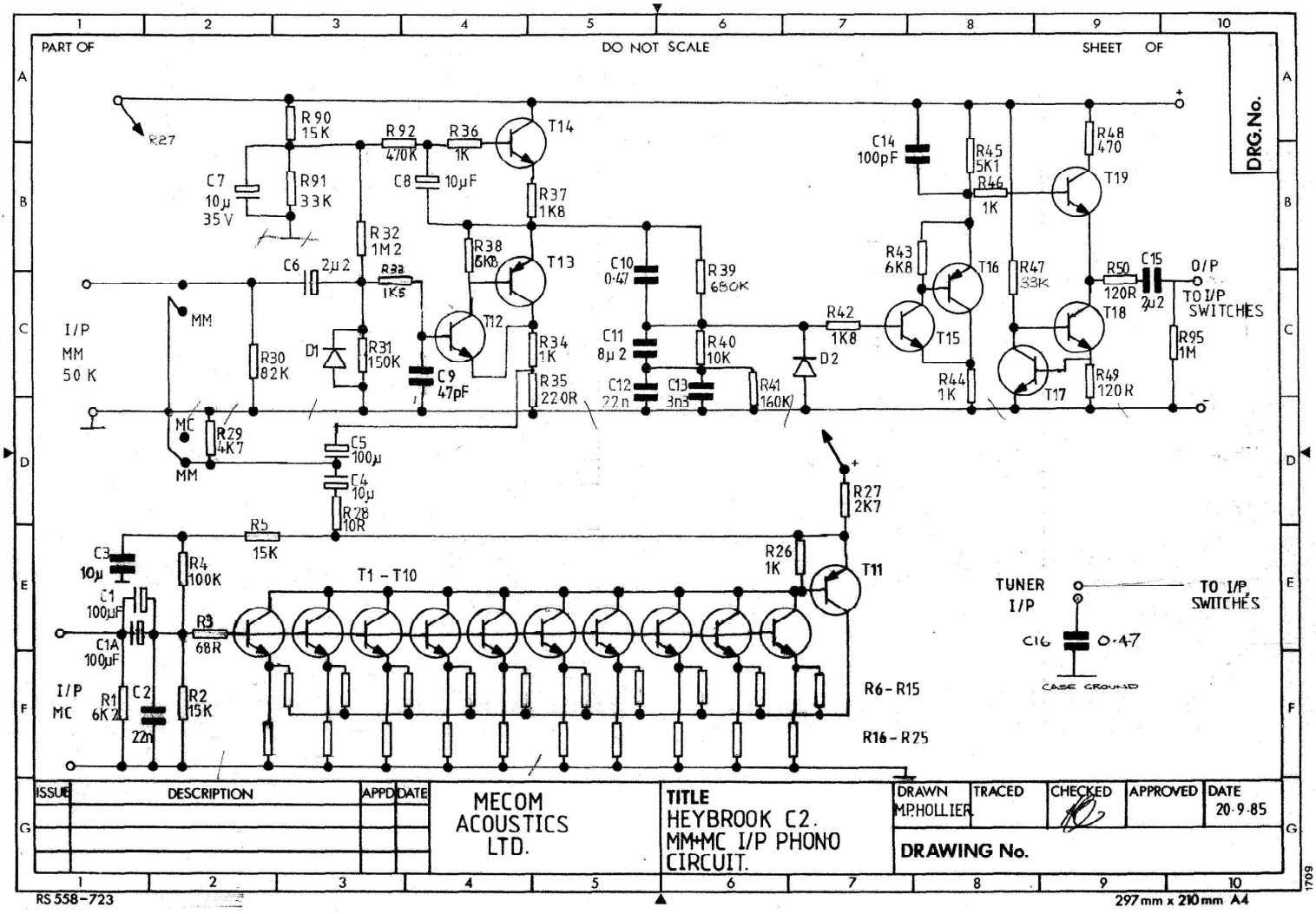
The output stage uses four complementary pairs of transistors whose gain is specified within a certain tolerance in manufacture. It is therefore suggested that a complete power amplifier module be replaced rather than individual output transistors if one of these fails. The use of multiple output transistors allows a high instantaneous peak current output from the amplifier under dynamic music conditions. The output transistors are biased to class B operation with a quiescent current (no signal applied) of approximately 25 mA. These conditions are maintained by Q9 and the temperature compensation diodes D1, D2 mounted close to the heatsink. Output protection is via a quick blow fuse rated at 5A.

SETTING BIAS CURRENT

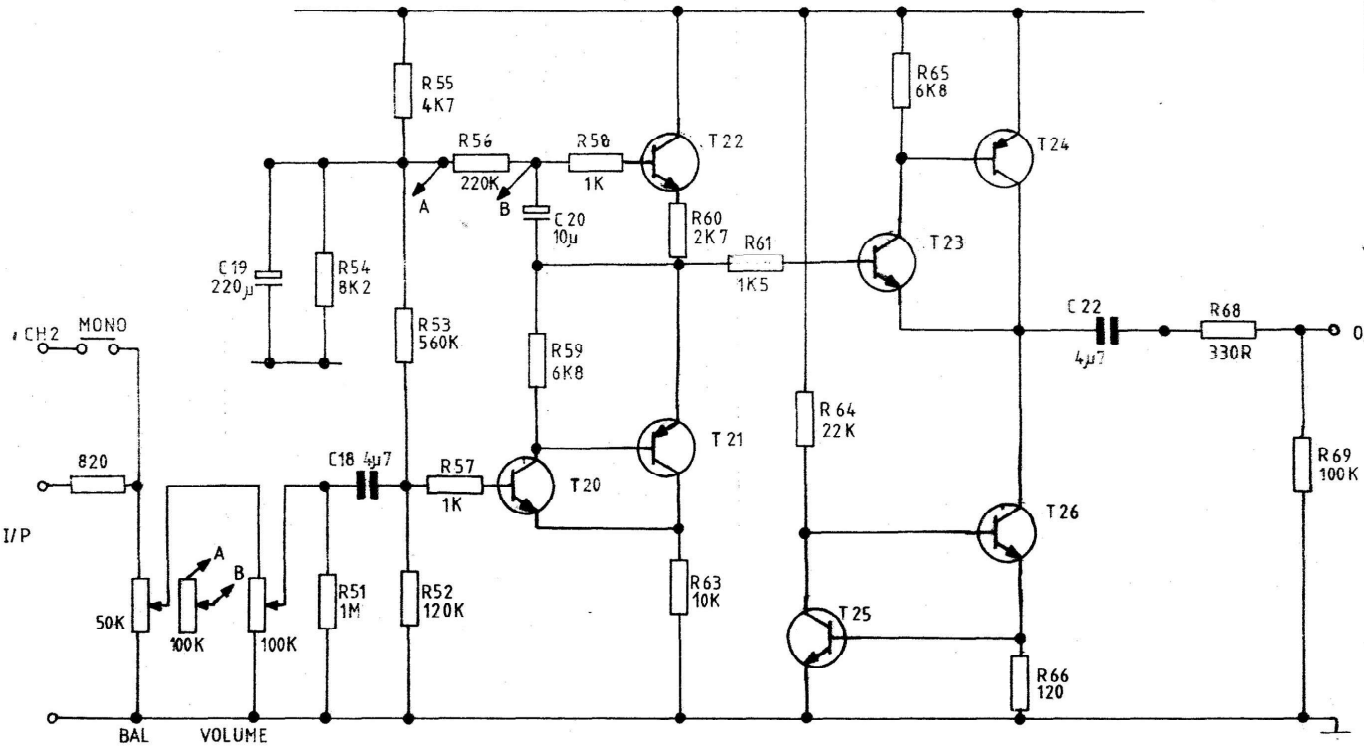
When changing voltage on the transformer primary, or when replacing a power amplifier module, it is advisable to check the quiescent bias current. It is suggested that this is measured using a digital millivoltmeter connected across the resistors R1 to R4 in turn. The easiest method is to connect the negative probe of the millivoltmeter to the pin located to the left of the output fuse, and connect the positive probe to each of the resistors where they connect to the emitters of the transistors Q1 to Q4 near the heatsink. An average reading of 3mV should be noted, though this will vary slightly due to differences between the individual gains of the transistors.

The amplifier should be left switched on for at least fifteen minutes in a position free from air currents and at an ambient temperature of approximately 20 degrees C. All inputs and outputs should be disconnected. A reading of all the voltages across R1 to R4 should be taken and, when summed, should give a total of 12mV with a tolerance of plus 2mV. Turning the potentiometer P1 clockwise slightly will increase the current and vice-versa. If adjustment has been made the amplifier should be left switched on for a further fifteen minutes and checked at five minute intervals.


PART OF
DO NOT SCALE
SHEET OF
DRG. No.
OUTPUT
CH1 CH2
T31
R84
R85
470K
R86
10K
D7
D6
R88
2K7
C29
22µ
RL1
D5
R87
100K
T30
C28
22µ
C32
100µ
D8
D12
5V1
MUTE
SW6.
R81
82R
R75
1K
C24
10µ
35V
R70
68K
R72
1K
R73
3K3
D9
IN4001
R76
8K2
C27
0·22
R79
150R
R80
150R
C30
4700µ
D13
T1
27
0
27
MORITE
821870
SW9
F1
C33
0·01µ
C23
47µ
IC1
R71
8K2
R74
1K
D10
4001
D11
5V1
C25
10µ
R77
1K
R78
1K
T29
R83
4K7
ISSUE
DESCRIPTION
APPD
DATE
MECOM
ACOUSTICS
LTD.
TITLE
HEYBROOK C2
POWER SUPPLY AND
MUTE SWITCH CCT.
DRAWN
M.P.HOLLIER
TRACED
CHECKED
APPROVED
DATE
23·9·85
DRAWING No.
RS558-723
297 mm x 210 mm A4


PART OF
DO NOT SCALE
SHEET OF
DRG.No.
R27
R90 15K
R91 33K
C7 10µ 35V
R92 470K
R36 1K
T14
C8 10µF
R37 1K8
R32 1M2
R38 6K8
T13
C6 2µ2
R33 1K5
T12
I/P MM 50 K
MM
MC
R30 82K
D1
R31 150K
C9 47pF
R34 1K
R35 220R
R29 4K7
C5 100µ
C4 10µ
R28 10R
R5 15K
C3 10µ
C1 100µF
C1A 100µF
I/P MC
R1 6K2
C2 22n
R4 100K
R3 68R
R2 15K
T1 - T10
C10 0·47
R39 680K
C11 8µ2
R40 10K
C12 22n
C13 3n3
R41 160K
R42 1K8
D2
C14 100pF
R45 5K1
R46 1K
R43 6K8
T16
T15
R44 1K
R48 470
T19
R47 33K
T18
T17
R49 120R
R50 120R
C15 2µ2
O/P
TO I/P SWITCHES
R95 1M
R27 2K7
R26 1K
T11
R6 - R15
R16 - R25
TUNER I/P
TO I/P SWITCHES
C16 0·47
CASE GROUND
ISSUE
DESCRIPTION
APPD
DATE
MECOM ACOUSTICS LTD.
TITLE
HEYBROOK C2.
MM+MC I/P PHONO CIRCUIT.
DRAWN M.P.HOLLIER
TRACED
CHECKED
APPROVED
DATE 20·9·85
DRAWING No.
RS 558-723
297 mm x 210 mm A4
1709

PART OF | DO NOT SCALE | SHEET OF | DRG.No.



ISSUE	DESCRIPTION	APPD	DATE

TITLE
HEYBROOK C2
LINE O/P

DRAWN	TRACED	CHECKED	APPROVED	DATE
M.P.HOLLIER				12·9·85.

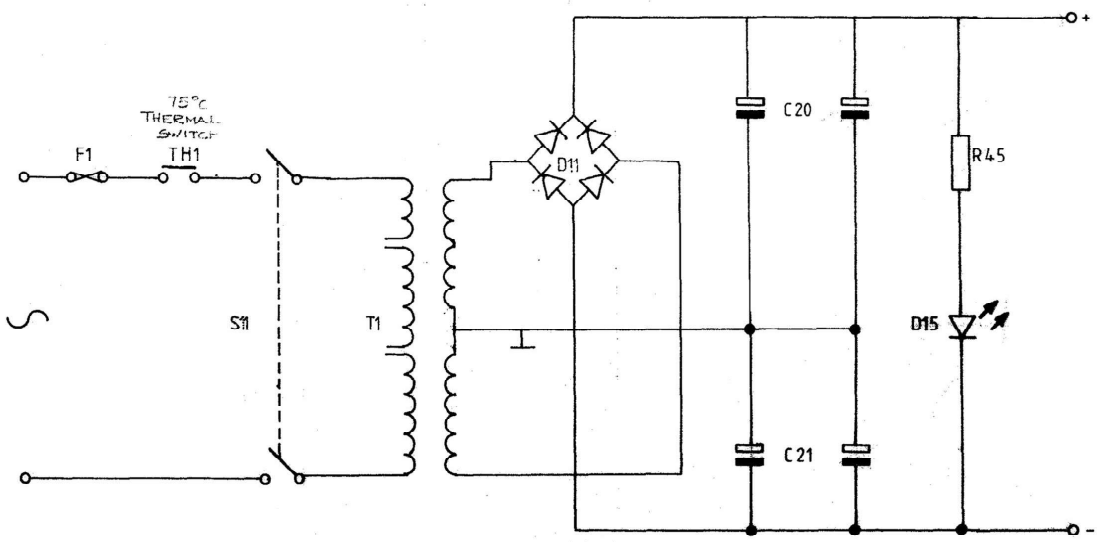
DRAWING No.

RS 558-723

297 mm x 210 mm A4

1709

PART OF | DO NOT SCALE | SHEET OF | DRG. No.



ISSUE	DESCRIPTION	APPD	DATE

MECOM ACOUSTICS LTD.

TITLE
HEYBROOK P2
POWER SUPPLY.

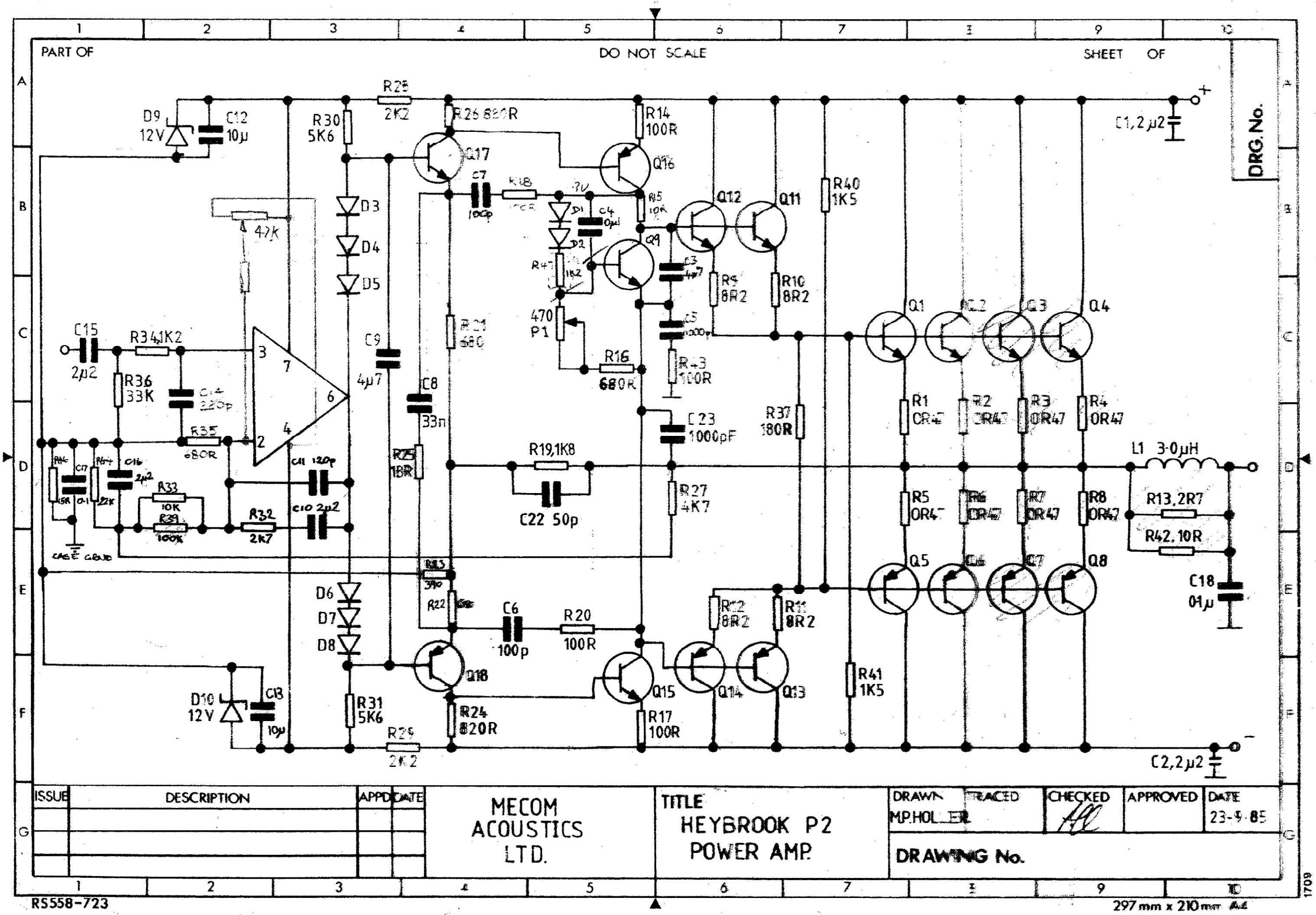
DRAWN	TRACED	CHECKED	APPROVED	DATE
M.P.HOLLIER				23-9-85

DRAWING No.

RS 558-723

297 mm x 210 mm A4

1709


PART OF
DO NOT SCALE
SHEET OF
DRG. No.
D9 12V
C12 10μ
R25 2K2
R30 5K6
R26 680R
R14 100R
Q17
Q16
C7 100p
R18
D1
C4
R15 10R
Q12
Q11
R40 1K5
D3
D4
D5
47K
Q9
C3
R9 8R2
R10 8R2
Q1
Q2
Q3
Q4
C15 2μ2
R34 1K2
C9 4μ7
470 P1
C5
R36 33K
C8 33n
R16 680R
R43 100R
R1 0R47
R2 0R47
R3 0R47
R4 0R47
R37 180R
C23 1000pF
R35 680R
R25 18R
R19 1K8
L1 3·0μH
C22 50p
R27 4K7
R33 10K
R32 2K7
C10 2μ2
C11 120p
R5 0R47
R6 0R47
R7 0R47
R8 0R47
R13 2R7
R42 10R
CASE GRND
R83 390
Q5
Q6
Q7
Q8
D6
D7
D8
R22
C6 100p
R20 100R
R12 8R2
R11 8R2
C18 01μ
Q18
Q15
Q14
Q13
R41 1K5
D10 12V
C13 10μ
R31 5K6
R24 820R
R17 100R
R29 2K2
C1 2μ2
C2 2μ2
ISSUE
DESCRIPTION
APPD
DATE
MECOM ACOUSTICS LTD.
TITLE
HEYBROOK P2 POWER AMP.
DRAWN
TRACED
CHECKED
APPROVED
DATE
M.P. HOLLER
23-9-85
DRAWING No.
RS558-723
297 mm x 210 mm A4
1709