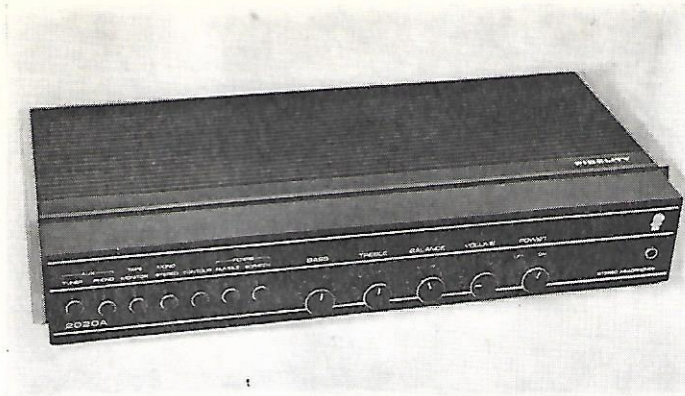


FIDELITY RADIO

Service Card



20-20A HIGH QUALITY STEREO AMPLIFIER

The 20-20A is a solidstate stereo amplifier designed to DIN 45-500 standards and incorporating 47 semiconductor devices. The LH and RH amplifier channels each employ 17 transistors and one IC. Four diodes are used as a bridge rectifier. Five further diodes are used to stabilise supply points. Two transistors are used in an electronic protection circuit to protect the amplifier against accidental short circuits.

Inputs

Five 5-pin DIN sockets are provided at the rear to accept the following inputs:

PHONO: input from magnetic pickup, pins 3 (LH) and 5 (RH).—3mV into 50k Ω . Input from ceramic pickup, pins 1 (LH) and 4 (RH).—70mV into 50k Ω .

TAPE: accepts input from tape recorder (pins 3,5) and supplies output to tape recorder amplifier (pins 1,4). Input—250mV into 25k Ω .

AUX: auxiliary input, pins 3 (LH) and 5 (RH), 250mV into 25m Ω .

QUAD: Insertion of plug disconnects the preamplifier from the power amplifier, simultaneously providing a connection to each of the outputs from the preamplifier and to each of the inputs to the power amplifier. The two outputs (pin 1 LH, pin 4 RH) may be fed to a quadraphonic

specification

Output Power

20W per channel sinewave, into 8 Ω
30W per channel speech/Music power, into 8 Ω .

Harmonic Distortion

Less than 0.2% overall, at 20W
Less than 0.1% power amplifier only, at 20W

Frequency Response

20Hz to 26kHz ± 2 dB
30Hz to 16kHz ± 1 dB

Signal-to-Noise Ratio

Magnetic input, 65dB
Other inputs, 70dB

Crosstalk

50dB at 1kHz
40dB at 250Hz to 10kHz

Scratch Filter

-3dB at 6kHz (12dB/octave filter).

Rumble Filter

-3dB at 100Hz (10dB/octave filter).

Contour

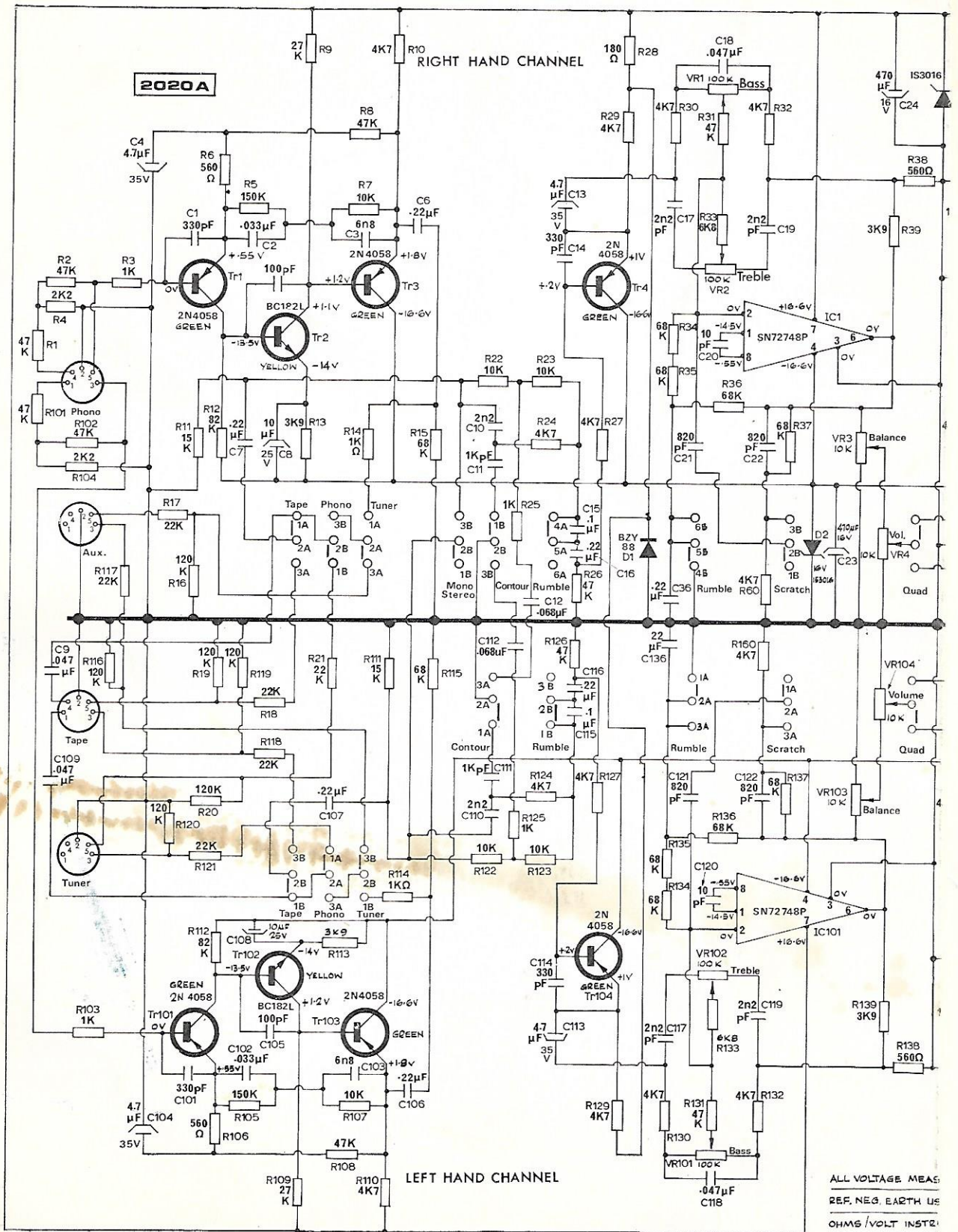
+16dB at 50Hz. +9dB at 10kHz

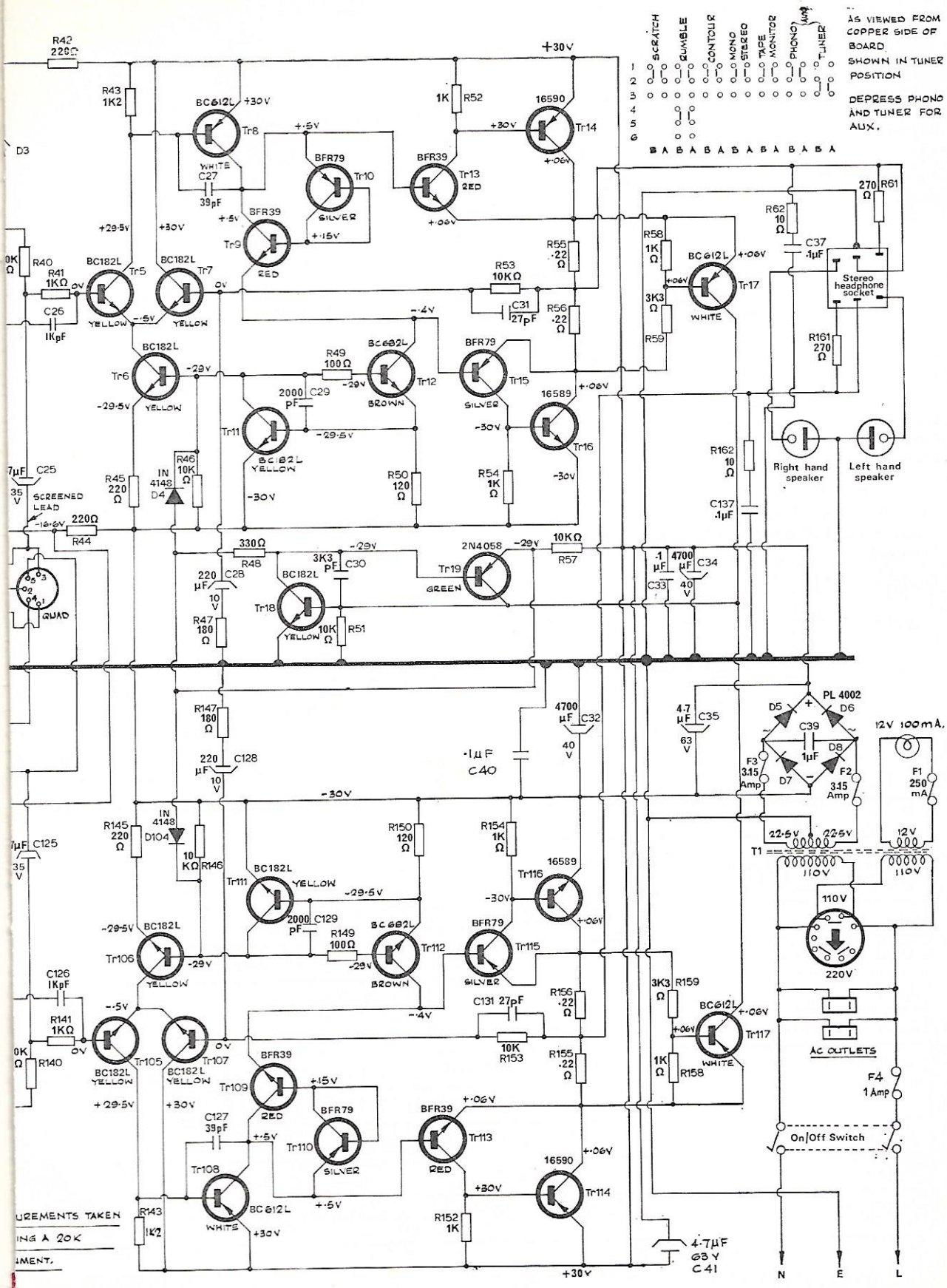
Tone Controls

Bass: +16dB -18dB at 50Hz
Treble: +16dB -15dB at 10kHz

FIDELITY RADIO LTD

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AS VIEWED FROM
COPPER SIDE OF
BOARD
SHOWN IN TUNER
POSITION
DEPRESS PHONO
AND TUNER FOR
AUX.

1 SCRATCH
2 BUMBLE
3 CONTOUR
4 MONO
5 STAGEO
6 TAPE
MONITOR
PHONO
TUNER

W A B A B A B A B A B A B A

MEASUREMENTS TAKEN
WITH A 20K
METER.

R114
52
13
TR
R143
C12
R133
R132

decoder, giving four outputs. Two of these outputs may be fed back to the power amplifier (pin 3 LH front, pin 5 RH front). The other two may be fed to an auxiliary stereo power amplifier to drive the LH rear and RH rear loudspeakers.

Outputs

SPEAKERS: two 2-pin DIN sockets are provided at the rear to accept plugs from LH and RH loudspeakers of 8Ω or more impedance. Connection of speakers of less than 8Ω impedance may cause the overload protection circuit to operate.

STEREO HEADPHONES: Insertion of jack plug from stereo headphones to socket on front automatically mutes the loudspeakers. Headphones should have an impedance of not less than 8Ω.

AC OUTLETS: Twin 2-pin mains sockets are provided at the rear which are switched by the front On-Off switch enabling two auxiliary units to be switched by the single control.

Push Buttons

Seven push buttons are provided to select the following functions:

Input selection: Tuner, Phono, Aux, Tape Monitor. Depression of Tape Monitor button allows replay of recorded tape through the amplifier via Tape input socket. When making a recording in conjunction with a tape recorder having separate Record and Replay heads, de-

pressing the Tape Monitor button permits r signal on the tape.

Mono-Stereo: Depression of this button two stereo amplifier channels in parallel, a si input of any socket appearing at both loudspeakers.

Contour: Depression of this button attenuates middle frequencies compared to bass and treble, to compensate for ear deficiencies at these levels.

Rumble and Scratch: Respectively attenuates low frequency and high frequency response.

Fuses

Mains primary, 1 amp (F4)
Lamp low voltage winding, 250mA (F1)
Centre-tapped secondary winding, 2 × 3A

Overload Protection

An electronic overload protection circuit is provided to protect the amplifier against accidental short-circuits applied to the loudspeaker terminals. Should a short-circuit occur, both channels will shut down. To reset the amplifier, the following procedure should be followed:

Switch off. Check for fault condition and remove short-circuit. Switch on for approximately 10 seconds, then switch on again.

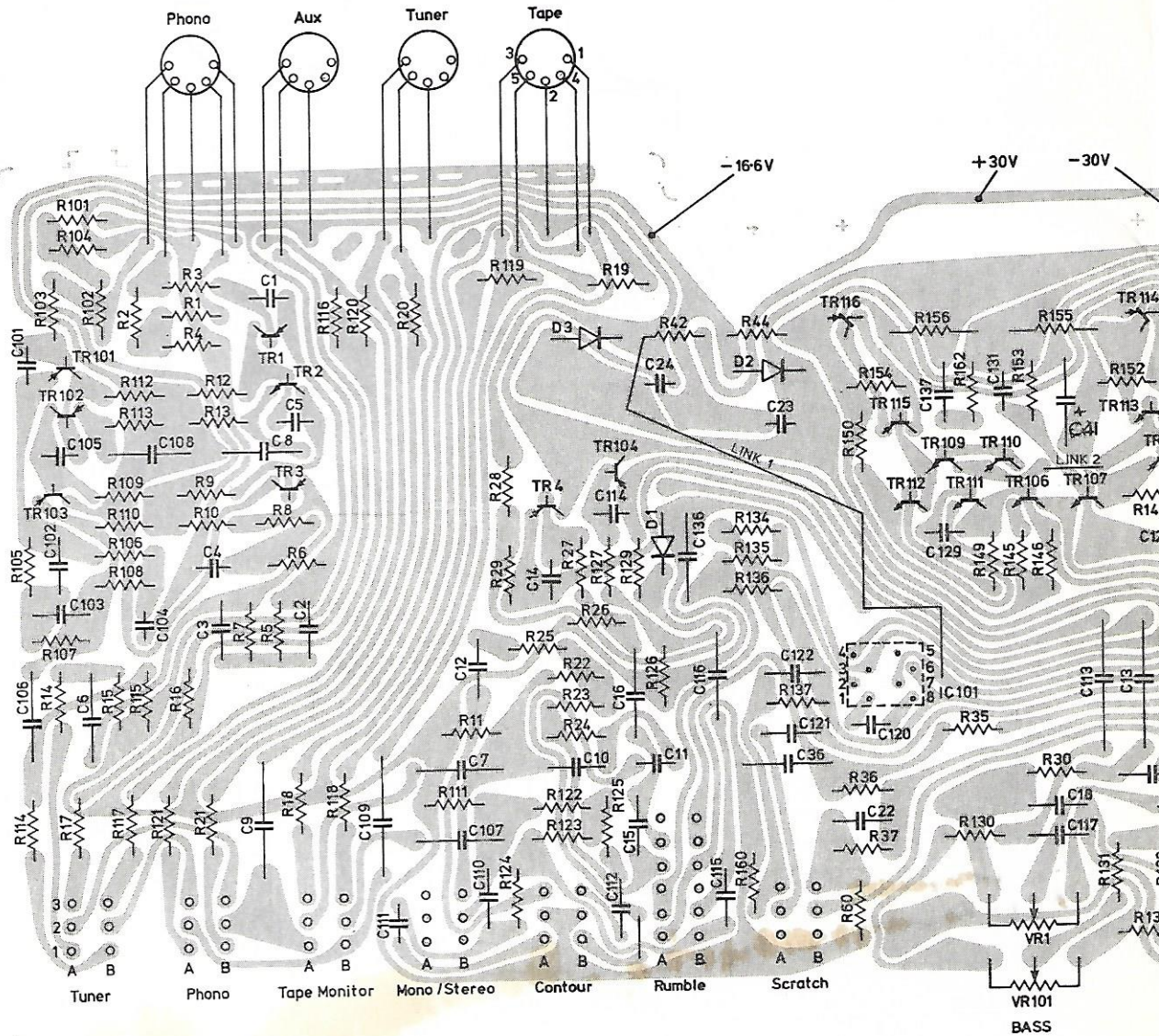
Mains Input

The amplifier is suitable for operation on 50Hz or 110V 50Hz mains supplies. A voltage selector switch at the rear provides for selection of correct input.

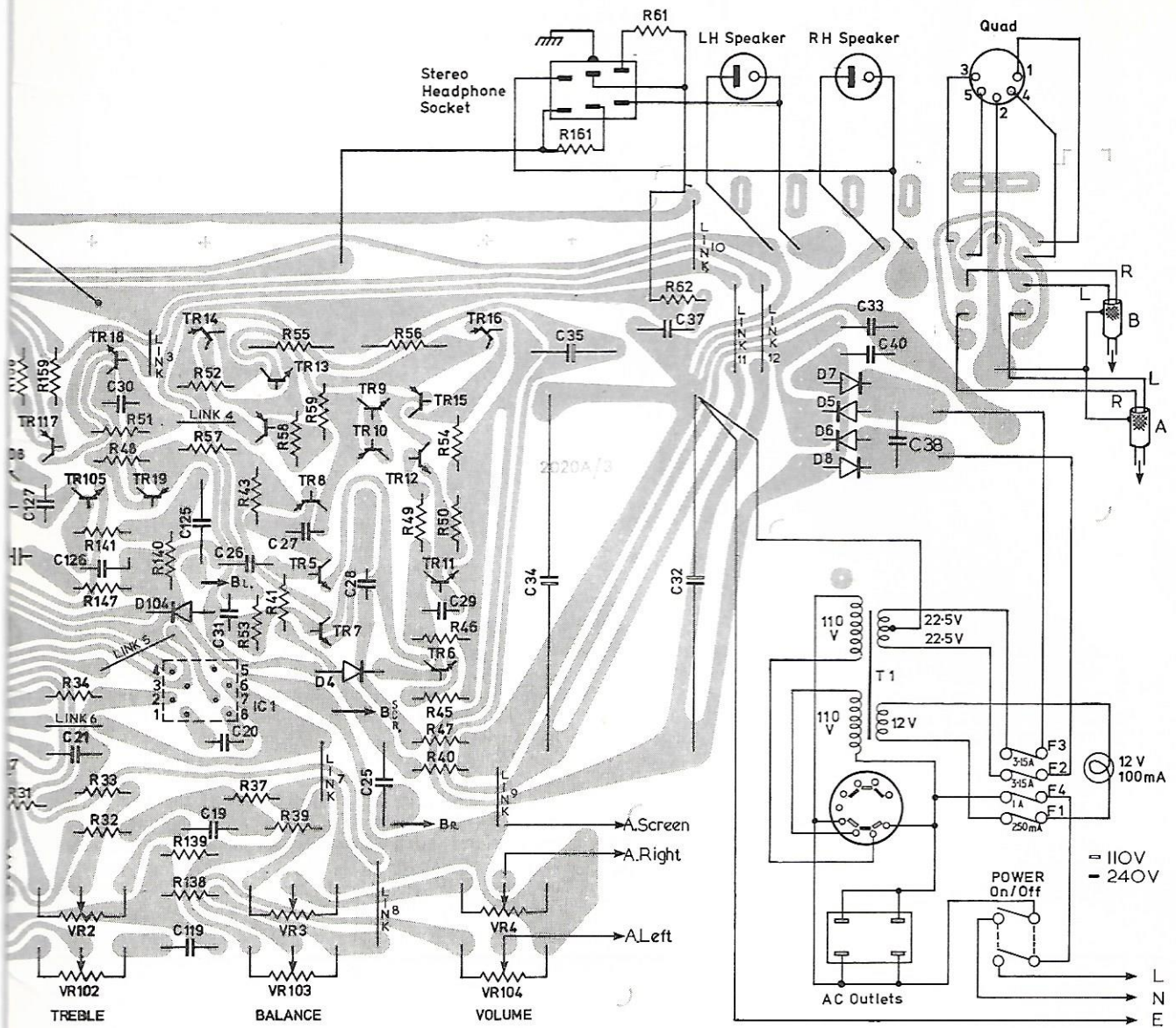
TRANSISTOR VOLTAGES

Ref.	Type	Emitter	Collector	Base	Ref.	Type	Emitter	Collector
Tr1/101	2N4058	0.55	-13.5	0	Tr11/111	BC182L	-30	-29
Tr2/102	BC1821	-14.0	1.1	-13.5	Tr12/112	BC682L	-29.5	-0.4
Tr3/103	2N4058	1.8	-16.6	1.2	Tr13/113	BFR39	0.06	30
Tr4/104	2N4058	1.0	-16.6	0.2	Tr14/114	16590	30	0.06
Tr5/105	BC182L	-0.5	29.5	0	Tr15/115	BFR79	0.06	-30
Tr6/106	BC182L	-29.5	-0.5	-29	Tr16/116	16589	-30	0.06
Tr7/107	BC182L	-0.5	30	0	Tr17/117	BC612L	0.06	0.06
Tr8/108	BC612L	30	0.5	29.5	Tr18	BC182L	0	-29
Tr9/109	BFR39	-0.4	0.5	0.15	Tr19	2N4058	-29	0.06
Tr10/110	BFR79	0.5	0.15	0.15				

All voltages are with respect to negative earth and were taken using a 20,000Ω/V testmeter.



The 20-20A printed circuit board, viewed from the copper side, with components shown as seen through the board.



DISMANTLING

To obtain access to the copper side of the printed circuit board, including the fuse panel, first remove the three screws at the top back of the cabinet, then carefully prise off the top cover, noting that the front of the top cover located with the control panel moulding by means of its slotted section.

To obtain access to the component side of the p.c.b., proceed as follows:-

Remove the three screws on the underside of the control panel moulding. Turn unit over. Take off the top

cover as previously described. Pull off the mains selector indicator knob and release the mains socket (two screws; note shakeproof washers). Remove the two screws securing the fuse panel to the cabinet.

Take out the two screws securing the heat sink to the cabinet. Remove the two screws, one on either side, securing the control panel assembly to side brackets on the main cabinet assembly.

At this stage, the p.c.b. and control assembly can together be separated from the cabinet.