

TRACE ELLIOT

SERVICE MANUAL NO. SM00019

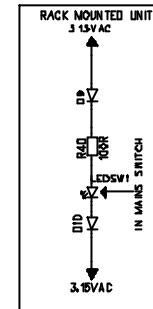
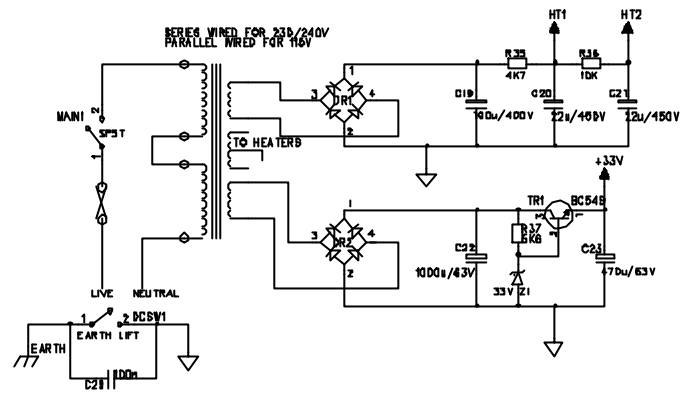
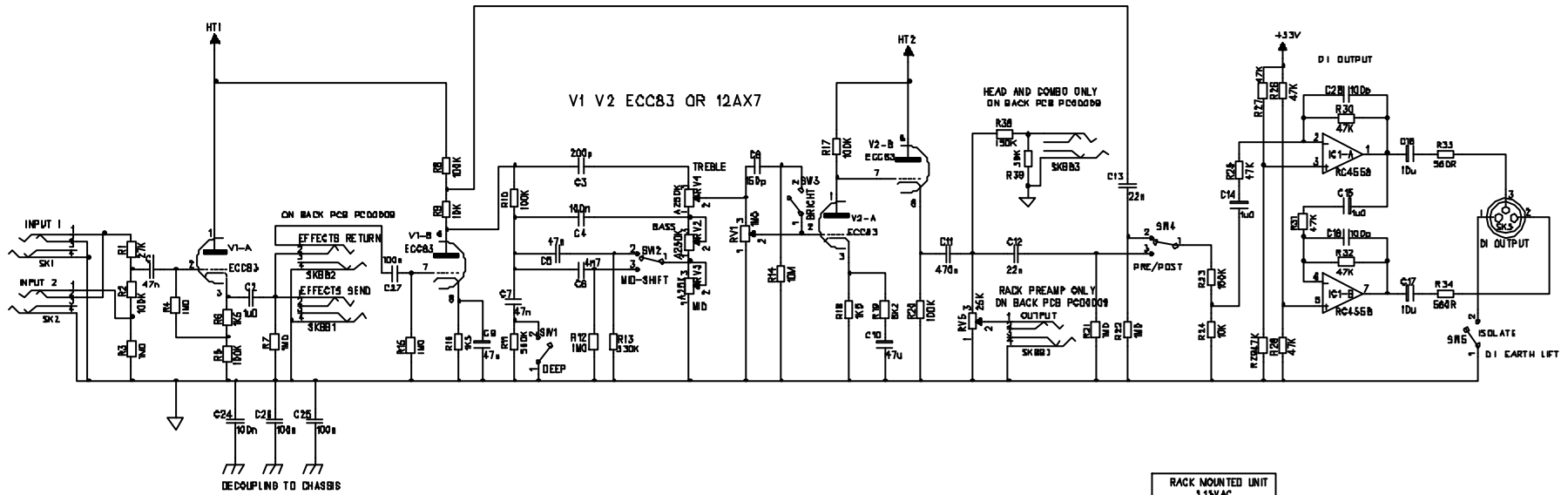
ISSUE 1

Date: October 28, 1996
Product Code : T0105
Model No : V-Type V4 Head
Technical File No : TE00019

Issued by:

**Trace Elliot Limited.
Blackwater Trading Estate
The Causeway, Maldon
Essex CM4 4GG.**

CHANGE NOTE DATE	CHANGE NOTE DATE	CHANGE NOTE DATE



CIRCUIT DESIGN BY A. EWEN

TITLE	VALVE PREAMP CIRCUIT	TRACE ELLIOT LTD
PROJECT No	V-TYPE BASS	BLACKWATER TRADING ESTATE
DATE	02/09/09	BLACKWATER
DRAWN BY	J B REELES	TEL: 01292 281151
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V-Type

V TYPE PREAMPLIFIER

V Type preamplifier is used in the following units:-

V-type head - 220 watt all valve amp. head.

V-type combo - 250 watt hybrid 15" combo.

V-type rack mount 1u all valve preamplifier.

TECHNICAL SPECIFICATIONS

Inputs	Passive bass	Impedance 1M OHM Input range 25mV to 1.5V (peak-peak)
	Active bass	Impedance 100K OHMS Input range 25mV to 6.0V (peak-peak)
	Effects return	Impedance greater than 1M OHM Nominal input level 0dBu (0.775VRMS)
Outputs	Effects send	Impedance less than 1K OHM Nominal level 0dBu
	Line output (Head and combo)	Impedance 8K OHMS Nominal level 0dBu (0.775VRMS) Maximum level +4dBu (3V RMS)
	Line output (Rack mount)	Impedance 25K OHMS Nominal level 0dBu (0.775V RMS) Maximum level +20dBu (14VRMS)
	DI output	600ohms balanced Nominal level 0dBu (pins 2 and 3)
Frequency response		-3dB at 22Hz and 25kHz
Sensitivity	Passive input	13mV
	Active input	56mV

FACTORY DIRECT TECHNICAL HOTLINE TEL: (44) 621 840959 FAX: (44) 621 851932

V-Type

V TYPE CIRCUIT DESCRIPTION

Input SK1/SK2

SK1 and SK2 are the instrument inputs to the V type pre-amplifier. A signal entering SK1 is passed to the first stage via R1 with R2 in parallel. Resistor R3 is to decouple any D.C. appearing on the input to ground.

A signal entering SK2 is passed to the first stage via R2, again with R3 as a D.C. path to ground. This time, however, R1 has one end connected to ground via the switched contact on SK1. This provides a high degree of attenuation to input 2 for use with active or high output basses, with the combination of R2 and R1 acting as a potential divider across the input.

First stage (effects loop).

The first stage consists of one half of V1 which is a "cathode follower" stage to provide a low impedance output to feed the effects loop. R7 is there to decouple any D.C. to ground. SKBB1 and SKBB2 form a serial effects loop with the switching contacts on SKBB2 (effects return) providing the "break" into the circuit. Therefore SKBB2 can also be used as a "line in".

The signal from the effects return is passed via C27 (D.C. blocking) to the second half of V1.

Second stage (Tone network).

The tone circuit forms the anode load for the second half of V1. C3 and RV4 form the treble circuit, C4 and RV2 form the bass circuit and C5 and RV3 form the mid range circuit. RV3 incorporates a pull switch which switches C6 into the mid circuit and C5 out. This alters the point at which the mid range circuit works, upwards to about 2kHz. R12 and R13 provide D.C. paths to ground from the mid-shift contacts to reduce switching noise.

V-Type

Deep and bright switches.

The deep switch (SW1) provides a MID and TREBLE cut to accentuate the bass response by shorting out R11 and bringing C7 into the tone network.

The bright switch (SW3) brings C8 into circuit placing it in parallel with the top half of the gain control RV1. This creates a high-pass filter with a shallow roll off to accentuate the high frequency response. This function is disabled when the gain control is at a maximum as the capacitor is then by-passed. R14 is used to decouple any D.C. on the switch to ground.

Third stage.

The output from the tone network is fed from RV4 to RV1 (gain control) and then directly into the first half of V2. This is a gain stage to bring the signal up to a suitable level to drive a power amplifier.

The signal is then fed directly into the second half of V2 which is a "cathode follower" stage. This provides slightly less than unity gain but is designed to give a low impedance output to drive a power amplifier. The output signal is passed via C11 to the volume control RV5 and then onto the output jack socket SKBB3. This is only true for the rack mount version. In the head and combo the signal from RV5 pin 2 is passed directly to the power-amp. section, and a fixed level signal is taken from RV5 pin 3 to the line out socket. This is attenuated by a potential divider network of R38 and R39 to give a line level signal output.

D.I. output

A pre-eq D.I. signal is taken from the junction of R8 and R9 in the anode circuit of the second half of V1 before the signal is passed through the tone network, via C13.

The post-eq D.I. signal is passed via C12 from the output (cathode) of V2.

SW4 selects each of these signals with R21 and R22 providing a D.C. path to ground. The signal is then attenuated by the potential divider of R23 and R24 to provide a suitable level for the I.C.. The signal enters the inverting input of I.C. 1 via C14 and R25. The output on pin 1 of this half of the I.C. is passed via C16 and R33 to provide the negative or anti-phase D.I. signal on pin 3 of the XLR (SK5). The signal from pin 1 also enters the inverting input of the second half of I.C. 1 which re-inverts it to give the inphase (positive) D.I. signal on pin 2 of SK5. C18 is present for high frequency stability.

D.C. biasing for I.C. 1 comes from the potential dividers of R29 and R27 and R8 with R26 which halve the +33V supply to provide the reference points for the signals. SW5 isolates the ground connection pin 1 on SK5 to eliminate earth loops when connected to external equipment.

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V-Type

Pre-amp power supply.

In the rack mount version all supplies are derived from a single toroidal transformer. This provides 250V A.C. for the HT lines, bridge rectified and smoothed by C19, C20 and C21. R36 is present to stop any signal from HT2 getting onto HT1 which could cause feedback problems. It also provides 6.3V AC for the valve heaters and 40V A.C rectified and smoothed by C22 for the I.C. supply. This is regulated by a BC549 transistor, a 33v zener diode and a 5K6 resistor with C23 for smoothing purposes.

The same transformer is used in the combo version in conjunction with a larger toroidal to supply power to the output stage.

In the Head version the large mains transformer used for the phase splitter and output valves is also used for all the pre-amp. supplies.

Mains on indication

For the head and combo versions a 6.5V A.C. lamp is used for "mains on" indication. Power for this is derived directly from the 6.3V heater supply.

For the rack mount version, the 6.3V heater supply is rectified by D9 and D10 to supply a D.C. voltage to the LED built into the mains on switch. R40 is used as the current limiting resistor.

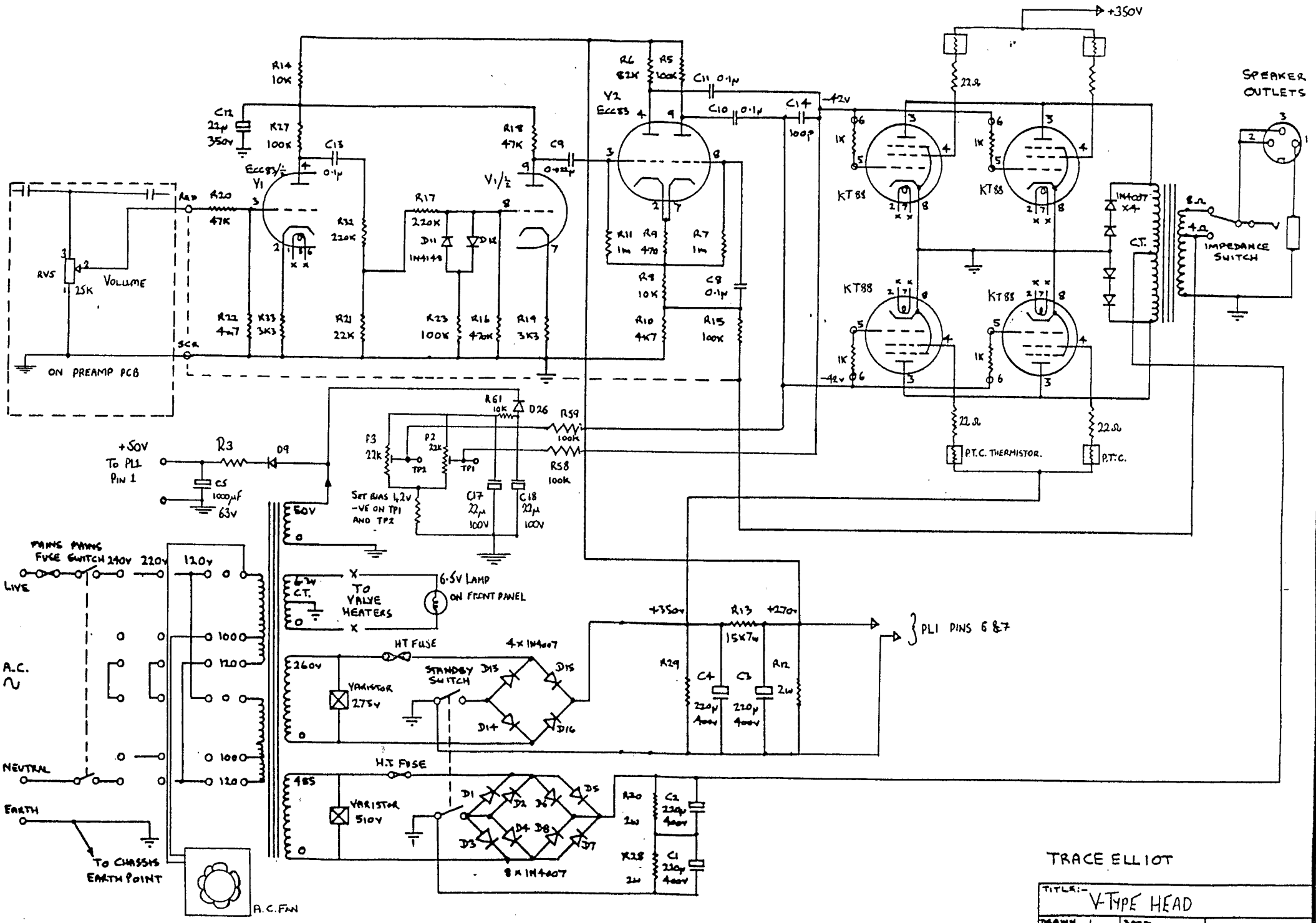
C12-PCB-VTYP-C/Hx1.

V-TYPE COMBO/HEAD PREAMP MAIN BOARD.
ISSUE 1 INSERTION LIST. ANDY EWEN 11/8/98.

DESCRIPTION	PART CODE	QTY	WHERE USED
PCB PC00008 ISSUE 2	73-PCB-PC00008	1	
ZENER DIODE 27V	72-D-BZX55C27V	1	ZD1
DIODE	72-D-IN4007	10	D1-D10
RES 2.5W 4K7	72-RWW4K7-2.5W	1	R35
RES 2W 100K	72-RC100K-2W	4	R8 R10 R17 R20
RES 1/2W 10K	72-RC10K-.5W	2	R9 R36
ZERO OHM LINK	72-RCZERO	28	AS MARKED
RES 1/4W 100K	72-RM100K	2	R2 R5
RES 1/4W 100R	72-RM100R	1	R40
RES 1/4W 10K	72-RM10K	1	R24
RES 1/4W 10M	72-RM10M	1	R14
RES 1/4W 150K	72-RM150K	1	R23
RES 1/4W 1K5	72-RM1K5	3	R6 R16 R18
RES 1/4W 1M	72-RM1M	7	R3 R4 R7 R12 R15 R21 R22
RES 1/4W 27K	72-RM27K	1	R1
RES 1/4W 330K	72-RM330K	1	R13
RES 1/4W 47K	72-RM47K	8	R25-R32
RES 1/4W 560K	72-RM560K	1	R11
RES 1/4W 560R	72-RM560R	2	R33 R34
RES 1/4W 5K6	72-RM5K6	1	R37
RES 1/4W 8K2	72-RM8K2	1	R19
CAP 1uF POLY BOX	72-C1-250VP	1	C2
CAP 1uF ELEC RADIAL	72-C1-63VER	2	C14 C15
CAP 10uF ELEC RADIAL	72-C10-35VER	2	MOD ACROSS R28 & R29 +ve legs nearest IC1.
CAP 10uF ELEC RADIAL	72-C10-63VER	2	C16 C17
CAP 1000uF ELEC RAD.	72-C1000-63VER	1	C22
CAP 100N POLY BOX	72-C100N-250VP	5	C4 C24 C25 C26 C27
CAP 100P CER DISC	72-C100P-100VCD2	2	C18 C28
CAP 150P CER DISC	72-C150P-50VCD	1	C8
CAP 200P Polystyrene	72-C200P-630VPA	1	C3
CAP 22uF ELEC AXIAL	72-C22-450VEA	2	C20 C21
CAP 22N POLY BOX	72-C22N-400VP	2	C12 C13
CAP 47uF ELEC RADIAL	72-C47-63VER	2	C9 C10
CAP 470uF ELEC RAD.	72-C470-63VER	1	C23
CAP 470N POLY BOX	72-C470N-250VP	1	C11
CAP 47N POLY BOX	72-C47N-100VP	1	C1
CAP 47N POLY BOX	72-C47N-400VP	2	C5 C7
CAP 4N7 POLY BOX	72-C4N7-400VP	1	C6
CAP 100uF ELEC RAD.	72-CAP-100400V	1	C19

TRANSISTOR BC549C	72-TBC549C	1	TR1
8-WAY SOCKET	72-SOCKET-8W	1	FOR IC1
IC RC4558P	72-IC-RC4558P	1	IC1
POT A 1MEG	73-POT-A1M	1	P1
POT A 250K	73-POT-A250K	2	P2 P4
POT A 25K	73-POT-A25K	1	P5
POT A25K PULL SWITCH	73-POT-A25K-PS	1	P3
MINI TOGGLE SWITCH	73-SWT-M-TGL-PCB	4	SW1 SW3 SW4 SW5
2-WAY HEADER 0.1"	72-HEAD-2W	4	HP1-HP4 (SEE NB1)
8-WAY HEADER 0.2"	72-HEAD-8W	1	PL1
VALVE BASE 9-WAY	73-VAL-SOCKET	2	VT1 VT2
XLR PLUG NEUTRIK	73-XLR-PCB-M-N	1	XLR1
JACK SOCKETS	72-SKT-JCKBNBG	2	SK1 SK2
FLYLEAD	C00-FLY-HEATER	1	ACROSS HP1-HP4
SIGNAL LEAD	LOOM-00275	1	From L/0(F) to PC00009
SIGNAL LEAD	LOOM-00276	1	From send/return to PC00009
LEAD FOR LAMP	LOOM-00277	1	From PL3 to 6.3V lamp

N.B.1 The four 2-way headers are fitted with their small face to the left. This is with the pots facing you.



TRACE ELLIOT

TITLE:-
V-TYPE HEAD

DRAWN C. BUTTER/A. ELLIOT DATE 3.2.95 CD 00016

PARTS LIST FOR VA250 POWER MODULE FOR V-TYPE HEADS

Description	Part Code	Qty	Where Used
DIODES			
IN4007	72-D-IN4007	13	D1-D9 D13-D16
IN4148	72-D-IN4148	2	D11 D12
RESISTORS			
ZERO OHM LINK	72-RCZERO	2	
22R 2.5W	72-RWW22R-2.5W	4	R39 R40 R41 R42
470R 1/2W	72-RC470R-.5W	1	R9
2K2 1/2W	72-RC2K2-.5W	1	R21
3K3 1/2W	72-RC3K3-.5W	2	R19 R33
4K7 1/2W	72-RC4K7-.5W	1	R10
6K8 4W	72-RWW6K8-4W	1	R3
10K 1/2W	72-RC10K-.5W	2	R8 R14
15K 7W	72-RWW15K-7W	1	R13
47K 1/2W	72-RC47K-.5W	2	R18 R20
82K 1/2W	72-RC82K-.5W	1	R6
100K 1/2W	72-RC100K-.5W	4	R5 R15 R23 R27
220K 1/2W	72-RC220K-.5W	2	R17 R32
220K 2.5W	72-RC220K-2W	4	R12 R28 R29 R30
470K 1/2W	72-RC470K-.5W	1	R16
1M 1/2W	72-RC1MEG-.5W	2	R7 R11
4M7 1/2W	72-RC4M7-.5W	1	R22
THERMISTOR			
PTC THERMISTOR	72-THERMISTOR	4	R24 R25 R35 R36
CAPACITORS			
22nF 400V POLY	72-C22N-400VP	1	C9
100nF 250V POLY	72-C100N-250VP	4	C8 C10 C11 C13
22μF 450V AXIAL	72-C22-450VEA	1	C12
220μF 400V RADIAL	72-CAP-220400V	4	C1 C2 C3 C4
1000μF 63V AXIAL	72-C1000-63VEA	1	C5
SOCKETS			
VALVE BASE	73-VAL-SOCKET	2	VB1 VB2

RIK DANIELS
February 10, 1997

PROCEDURE FOR BIASING V4/V6

ISSUE 1 PS 31/8/99

- 1) Connect 'BIAS KING' valve plug/sockets to rear middle two valve sockets on amplifier chassis.
- 2) Insert matched set of KT88's into all positions.
- 3) Switch unit to Standby mode and allow valves to warm up for at least 1 minute.
- 4) During this time connect unit to appropriate load and set all controls to minimum.
- 5) Switch unit from Standby to fully On.
- 6) By observing the current read out on the LCD display of the BIAS KING and switching between the two valves, adjust the quiescent cathode current to give 30mA (+/- 2mA) on each valve. The trim pots are accessible from the top of the chassis and can be adjusted using a trimmer tool.
- 7) Switch unit to Standby and then Off.
- 8) When cool enough remove BIAS KING from between valves and re-insert them into bases.
- 9) Turn to Standby again, warm up and then switch on.
- 10) Connect a signal generator to the INPUT and set up controls to give maximum power output.
- 11) Check that this is an acceptable power for the unit in question and that there is no excessive distortion.

12) Gently tap each valve with a screwdriver, signal on scope should remain stable.