

QUAD

## DESCRIPTION

The Quad 50E is a single channel amplifier designed for Broadcast, Recording and other applications in the Audio Industry.

The input is 0.5Vrms unbalanced, via a pre-set gain control, with provision for 600  $\Omega$  line bridging by means of an internal plug-in transformer, available as an optional extra. The output is isolated and provides up to 50W continuous power into almost any impedance from 4  $\Omega$  to 200  $\Omega$  (See Fig. 1).

The output windings terminate in a multiple socket to facilitate selection of output impedance. (See Fig. 2.)

The amplifier is virtually proof against misuse and no harm can be caused by such factors as gross overload, continuous operation on short circuits, heavy reactive loading, inadequate ventilation, etc. If misuse is such as to cause excessive heating, the maximum power output will reduce as necessary, restoring automatically when more normal conditions prevail.

## INSTALLATION—Mounting

The amplifier may be used either free standing or mounted in a cabinet. In the latter case it may be fixed to the supporting shelf by 4BA screws of suitable length passed through the shelf and into the tapped bushes in the baseplate normally carrying the plastic feet, preferably retaining the latter as spacers to assist

circulation of air under the amplifier. The enclosed template shows the 4BA clearance holes at A.

It also shows cut-outs required in the shelf when the plastic feet are omitted or there are other ventilation problems. In the latter case exit vents should also be provided in the top of the cabinet, totalling about 20 square inches (130cm<sup>2</sup>) per amplifier, unless an extractor fan is fitted.

## Mains Supply

The mains supply is wired to the detachable 3-pin socket. This is marked internally:

- "L" for the live mains connection.
- "N" for the neutral mains connection.
- "E" for the safety earth connection (to be used when the amplifier is not satisfactorily earthed via associated equipment.)

The voltage selector should be adjusted so that the range marked on the cap which includes the nominal mains supply voltage, lies opposite the horizontal mark. The selector is adjusted by withdrawing the cap, rotating to the required range and then pushing fully home.

## Signal Input Connection

The signal input is via a 7 way socket whose pin connections are shown in the attached circuit diagram. Pins 2, 4 and 6 are used when the 600  $\Omega$  bridging input transformer is plugged into the socket behind the front panel. Pin 5 carries an unregulated DC supply which varies between 33 & 40 volts according to operating conditions, and which may be found useful for ancillary equipment drawing up to about 100mA. It is recommended that the supply be stabilised in the external equipment. The pre-set input level control is adjustable through the front panel and carries a numbered scale.

A screened lead should be used to carry the input signal to the Quad 50 input plug in order to prevent coupling between input and output circuits. This screening is particularly important when the 50-100V line output connections are used, and the input is fed from a high resistance signal source.

## Output Connection

The output signal is isolated from the chassis, and each section of the output windings is brought out to the 19 way socket. These sections may then be linked in the mating plug, as shown in Fig. 2, to provide whatever output voltage is required.

## MAINTENANCE

The base plate may be detached after removing the four securing screws. The six top cover screws are now visible along the lower edge of the chassis.

With the chassis inverted, the printed wiring board may be hinged about its terminal side by releasing the plastic clips on the choke side of the chassis. (See Fig. 3.)

If any component is replaced, the output stage quiescent current must be re-set, and links are provided in the supply to the output transformer where meters may be inserted to measure the current taken by each side of the output stage. These are shown as arrows on the circuit diagram and by dotted lines from the common HT tag to tags Tr8 and Tr9 respectively on the transformer itself. Potentiometers RV2 and RV3 should be adjusted to provide a quiescent current of between 30 and 40mA each side when the amplifier is cold (15°-30°C).

RV1 adjusts the set point of the early stages. It should be set to produce +5.5V from Tr3 emitter to chassis.

## SPECIFICATION

*Power Into Load:* See Fig. 1.  
Maximum power transfer at 5.8, 12.5,  
23, 50 and 200  $\Omega$

*Power Response:* -1 dB at 30 Hz and 20 kHz referred to  
50 watts.

*Distortion*  
(with unrestricted bandwidth):

40 Hz	< 0.35%	} any level up to 50 watts
1 kHz	< 0.1%	
10 kHz	< 1.0%	

*Output Source Impedance:* 0.5  $\Omega$  in series with 25  $\mu$ H for 5.5  $\Omega$   
connection.  
Others in direct proportion.

*Hum & Noise:* Better than 80 dB referred to full  
output.

*Frequency Response:* Unbalanced input:  
-1 dB 30 Hz and 20 kHz referred to  
1 kHz. 600  $\Omega$  bridging:  
-2 dB 30 Hz and 20 kHz referred to  
1 kHz.

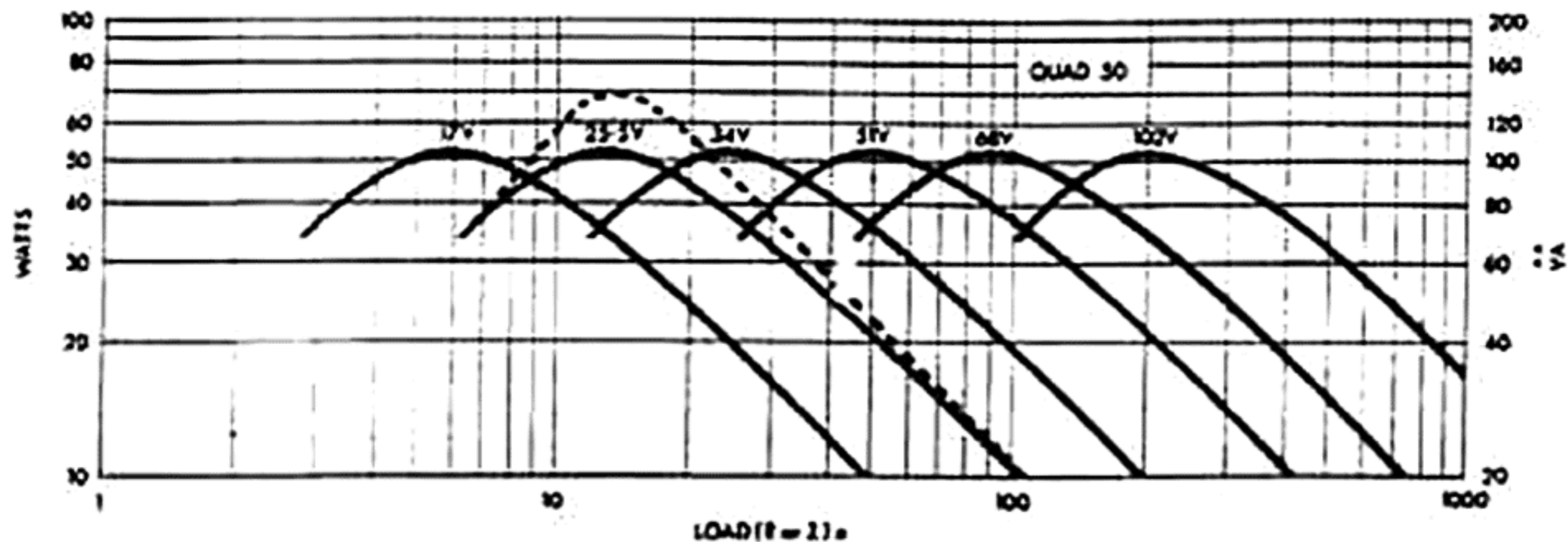
*Input Level:* 0.5V for full output, balanced or un-  
balanced.  
Preset adjustment for higher levels.

*Input Impedance:* Unbalanced:  
14-50 K  $\Omega$  depending on preset gain.  
600  $\Omega$  bridging.  
> 14 K  $\Omega$  in parallel with 50 H.

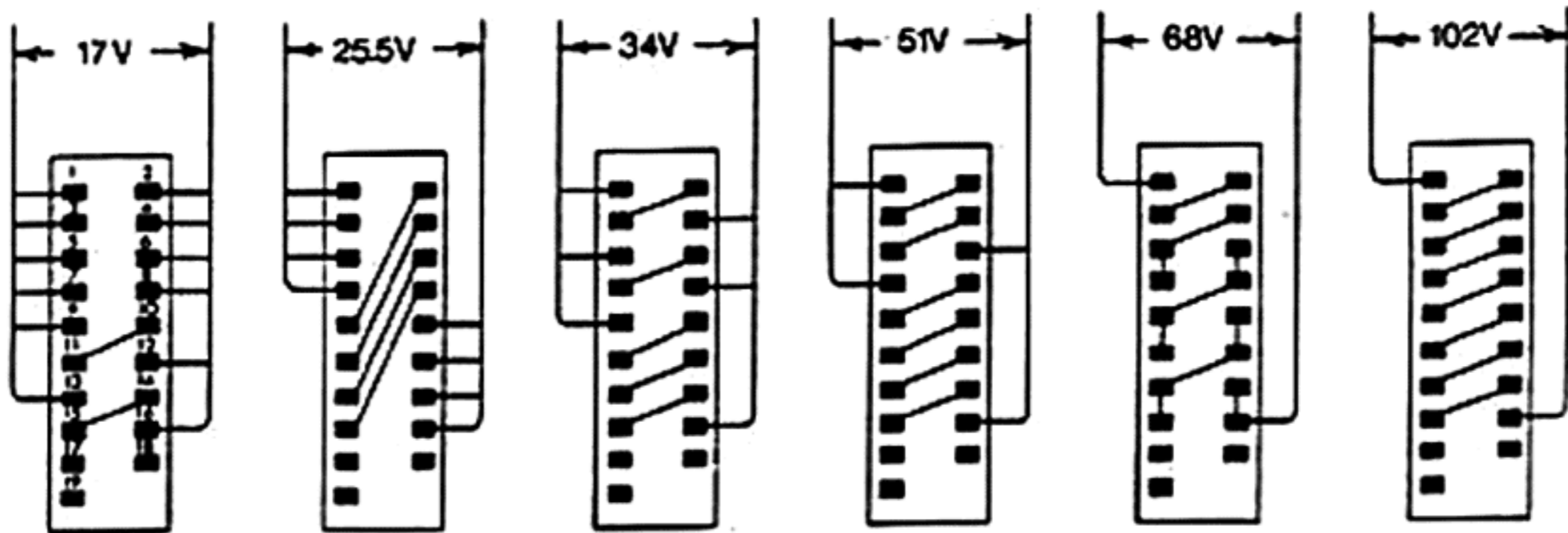
*Stability:* Unconditionally stable with any load.

*Power Input:* 110, 120, 220, 240V 50-60 Hz.  
24-150 watts depending on signal  
level.

FIG. 1



——— POWER OUTPUT v RESISTANCE FOR VARIOUS OUTPUT CONNECTIONS  
 - - - - - VA FOR REACTIVE LOAD, 25.5V CONNECTIONS OTHER CONNECTIONS SIMILAR



NOMINAL  
LOAD

58n

12.5n

23n

50n

85n

200n

Drawing A 12115—OUTPUT CONNECTIONS (as viewed from connections to plug)

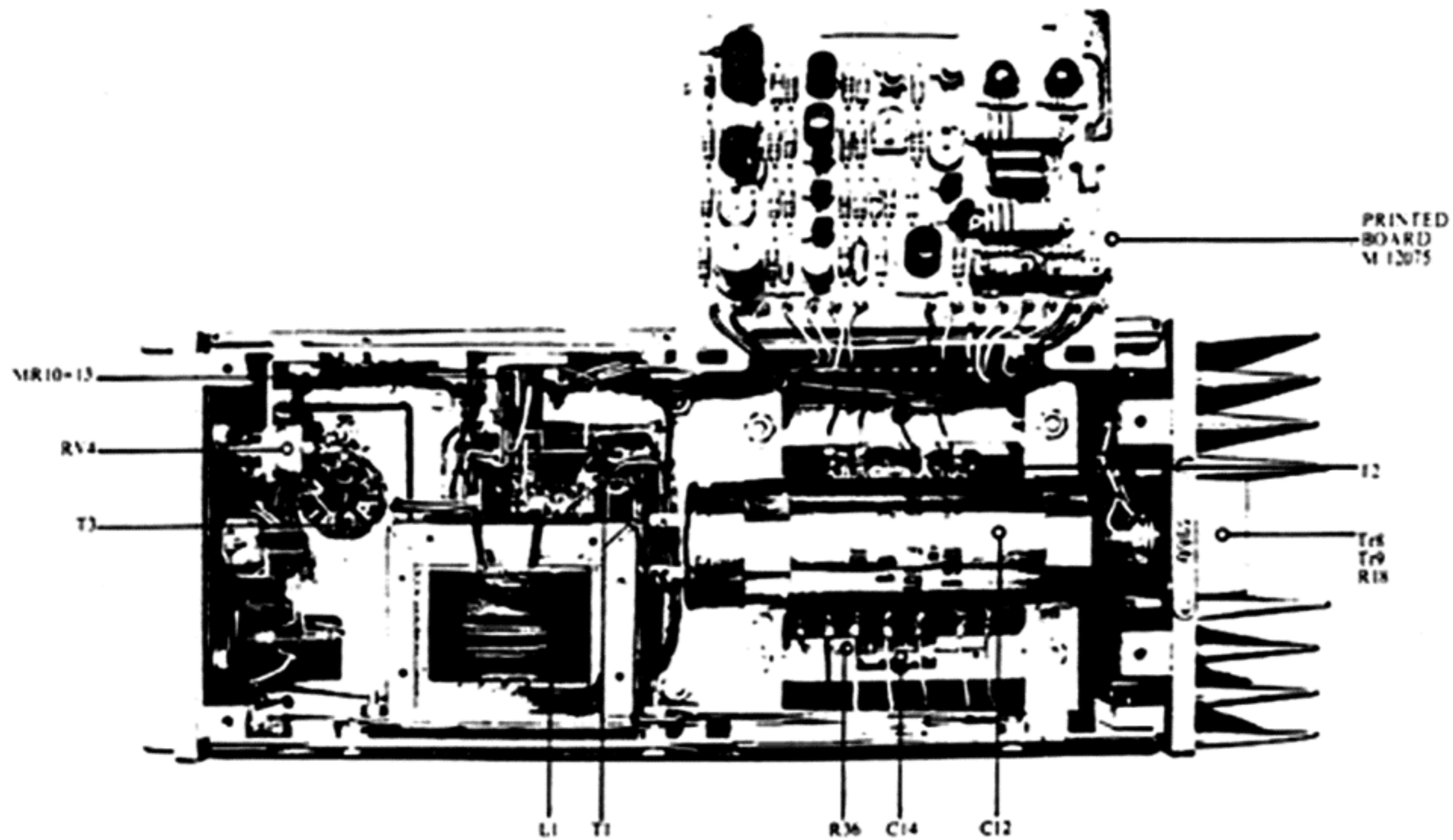
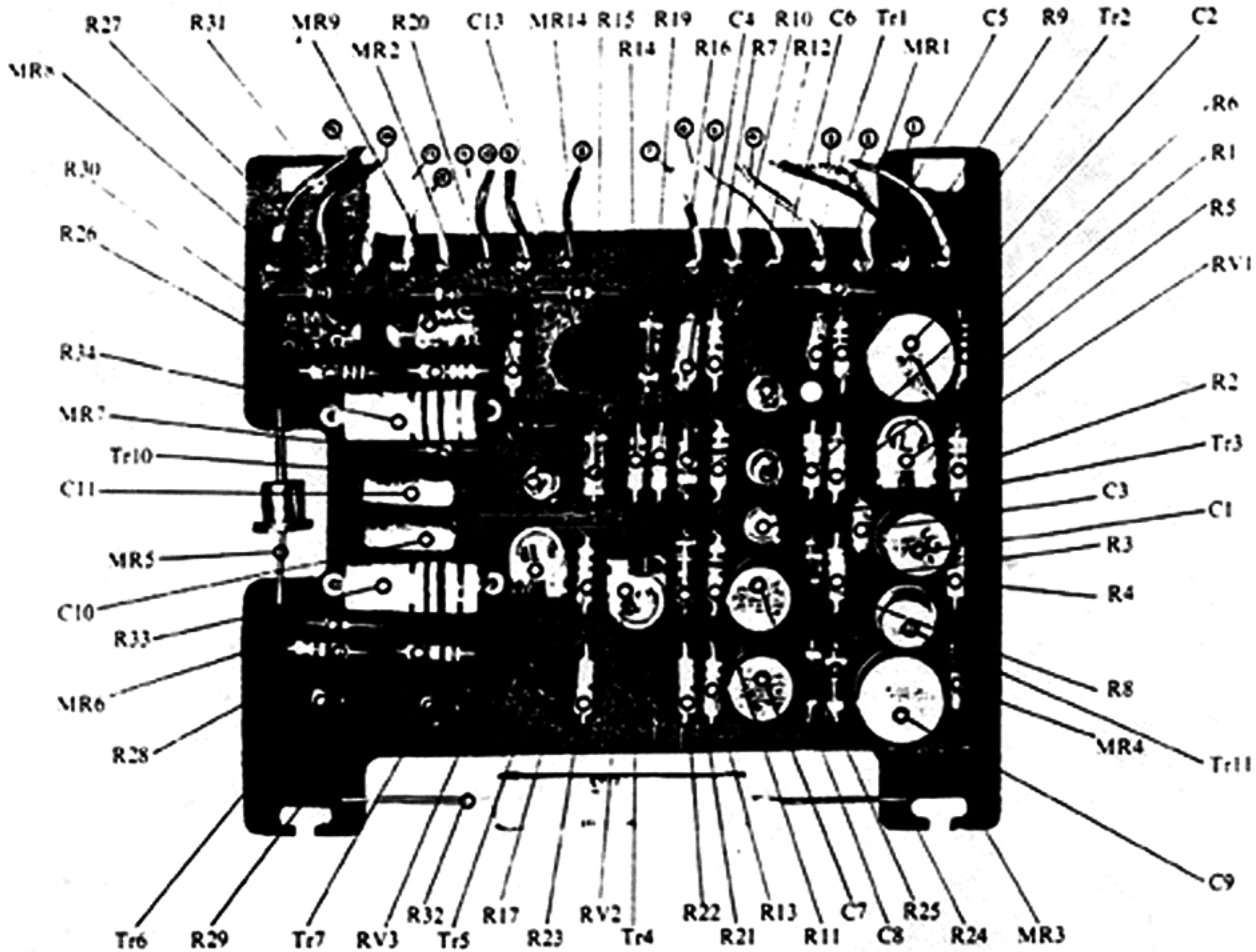


FIG. 3 Underside of Chassis with Printed Circuit Board Hinged Open.



Printed Circuit Board. FIG. 4



# COMPONENTS

	Value	Tol.	Maker's Reference	Stock No.		Value	Tol.	Maker's Reference	Stock No.
R1	10K	±5%	Dubilier BTT or Iskra UPM	230/G	C1	12μ	+100 -20%	50v TCC E 1072/9 or Callina KSPC 7-9/1	472/B
R2	220K	±10%	Dubilier BTT or Iskra UPM	187/C	C2	.68μ	±20%	250v Advance Filmcap WR15X	483/A
R3	22K	±10%	Dubilier BTT or Iskra UPM	217/A	C3	100p	±10%	350v Lemco Type 7mm	528/A
R4	22K	±10%	Dubilier BTT or Iskra UPM	217/A	C4	220p	±10%	350v Lemco Type 10mm	526/A
R5	5.6K	±10%	Dubilier BTT or Iskra UPM	237/A	C5	100p	±10%	350v Lemco Type 7mm	528/A
R6	10K	±5%	Dubilier BTT or Iskra UPM	230/G	C6	50μ	+100 -20%	12v TCC E 1072/6 or Callina KSPC 4-4/1	460/A
R7	18K	±10%	Dubilier BTT or Iskra UPM	220/B	C7	4μ	+100 -20%	50v TCC E 1072/8 or Callina K8173	482/A
R8	100K	±10%	Dubilier BTT or Iskra UPM	200/A	C8	4μ	+100 -20%	50v TCC E 1072/8 or Callina K8173	482/A
R9	15K	±5%	Welwyn F20 or Iskra UPM	224/D	C9	50μ	+100 -20%	25v TCC E 1071/5 or Callina KSPC 5-7/1	460/C
R10	270	±5%	Welwyn F20 or Iskra UPM	283/B	C10	22μ	±10%	250v Huas AM 3426 or Mullard C290/AE/A220K	494/C
R11	1K	±10%	Dubilier BTT or Iskra UPM	258/E	C11	22μ	±10%	250v Huas AM 3426 or Mullard C290/AE/A220K	494/C
R12	1K	±10%	Dubilier BTT or Iskra UPM	258/E	C12	5000μ		50v TCC CE 36D PVC Sleeve or Callina LC13-9/1	445/A
R13	2.2K	±10%	Dubilier BTT or Iskra UPM	250/A	C13	100μ	+100 -20%	12v TCC E 1071/4 or Callina KSPC 7-4/1	455/C
R14	1.8K	±5%	Dubilier BTT or Iskra UPM	253/B	C14	47μ	±20%	TCC Metamold M974/9 or Mullard C296AC/A670K	492/A
R15	470	±10%	Dubilier BTT or Iskra UPM	270/E	Tr1			Mullard BC109	
R16	39	±10%	Dubilier BTT or Iskra UPM	312/A	Tr2			Mullard BC109	
R17	2.2K	±10%	Dubilier BTT or Iskra UPM	250/A	Tr3			Mullard BC109	
R18	10K, 20°C	±10%	ST & C KS 14Y	340/C	Tr4			SGS BC 154	
R19	470	±10%	Dubilier BTT or Iskra UPM	270/E	Tr5			SGS BC 154	
R20	1.8K	±5%	Welwyn F20 or Iskra UPM	253/B	Tr6			SGS BC 125	
R21	1.2K	±10%	Dubilier BTT or Iskra UPM	257/A	Tr7			SGS BC 125	
R22	3.3K	±10%	Dubilier BTT or Iskra UPM	244/B	Tr8			RCA 40411	
R23	3.3K	±10%	Dubilier BTT or Iskra UPM	244/B	Tr9			RCA 40411	
R24	470	±10%	Dubilier BTT or Iskra UPM	270/E	Tr10			Mullard BC109	
R25	2.2K	±10%	Dubilier BTT or Iskra UPM	250/A	Tr11			RCA 40408 or SGS BC 142 or ZN2102	
R26	2.7K	±5%	Welwyn F20 or Iskra UPM	248/E					
R27	2.7K	±5%	Welwyn F20 or Iskra UPM	248/E					
R28	100	±10%	Dubilier BTT or Iskra UPM	305/F					
R29	100	±10%	Dubilier BTT or Iskra UPM	305/F					
R30	.5	±5%	AMC 3W	334/A					
R31	.5	±5%	AMC 3W	334/A					
R32	180	±5%	Welwyn F77	290/C					
R33	10	±10%	Iskra 2W	320/F					
R34	10	±10%	Iskra 2W	320/F					
R35	100K	±10%	Dubilier BTT or Iskra UPM	200/A					
R36	470	±10%	Dubilier BTT or Iskra UPM	270/E					

Value	Tol.	Maker's Reference	Stock No.	Value	Tol.	Maker's Reference	Stock No.
RV1	±2K	Morganite Type 62H	372 B	T3		Optional Plug-in Input transformer A12133	278Q SP
RV2	100	Morganite Type 62H	350 A			Mains Transformer A12100	—
RV3	100	Morganite Type 62H	350 A	T2		Output Transformer A12079	—
RV4	±2K	Morganite Type L10 DRG A11947 ISS 2	382 C	T1		Printed Circuit Board M.12075 (Copy issue number from Board itself)	—
MR1		Texas Instruments IS920				Printed Circuit Board Mounting Clips	754 I
MR2		Mullard AA 129		—		Printed Circuit Board Connection Pins S.907	751 D
MR3		Texas Instruments IS2075		—			
MR4		Texas Instruments IS2120 or AEI LR120C					
MR5		International Rectifier IZ5.6T10					
MR6		Texas Instruments IS922					
MR7		Texas Instruments IS922					
MR8		Texas Instruments IS920					
MR9		Texas Instruments IS920					
MR10		} AEI PM 7A2					
MR11							
MR12							
MR13							
MR14		Texas Instruments IS920					
FS1		Fuse 2 Amp anti-surge 20 x 5 mm	675/N				
—		Fuseholder F296 Brown	676/F				
PL1		Mains 3 pin input plug P429 Brown	670/E				
—		Mains 3 pin connector P430/SE Brown	671/E				
LPI		Mains Indicator Neon Hivac 29L	699/P				
—		Neon Holder L.T.W. 237-ED-428-00	691/I				
—		Voltage Selector—Plug top A12084	680/D				
		—Socket 83/209	680/C				
SK1		Signal Input Socket 7 way	671/T				
—		Signal Input Plug 7 way	670/O				
SK2		Output Socket 19 way	671/S				
—		Output Plug 19 way	670/Q				
		Socket for Input Transformer T3	701/A				

Note: When ordering any parts not in this list (including British thread screws, etc., not available in other countries) please identify by their position and use to ensure the correct part is supplied.

CIRCUIT CHANGES MAY BE MADE FROM TIME TO TIME WITHOUT NOTICE