

AMPLIFIER BA440/BA440A/BA440B

The BA440 is a plug in quasi-operational amplifier. There are two inputs, a non inverting input at pin 1 and an inverting input at pin 2.

The signal is applied to the non-inverting input at pin 1 and then passes from the isolating capacitor C2 to the base of TR1 which has an input impedance of 47K ohm defined by R3.

The resistor chain R1 and R2 forms a potential divider setting the bias voltage on TR1 base.

The signal is applied to the base of TR2 which is in a common emitter configuration. R5 in parallel with TR2 forms the collector load of TR1.

C3 is an rf suppression capacitor.

TR2 drives TR3 with R6 forming the collector load of TR2.

TR3 drives TR4 such that the TR3 and TR4 configuration has a gain of 4 times as defined by R7 and R8 feeding the unbalanced output at pin 5.

The diode D3 protects TR4 from overloading by removing its base drive just before saturation.

Feeding TR4 is a constant current source consisting of TR6, R10, R11 and R12 which contributes to low overall distortion.

TR5 provides base bias for the output pair TR6 and TR7 and being thermally coupled to them, stabilises the quiescent current.

TR6 is also thermally compensated by D1.

C5 is a decoupling capacitor across the supply line.

The gain of the amplifier may be increased by decreasing the feedback voltage to the emitter of TR1. This voltage is decreased by connecting an external resistor between the inverting input at pin 2 and B- at pin 3, thus forming a potential divider with the internal feedback resistor R4.

The output stage consists of a pair of complementary transistors TR7 and TR8 connected as emitter followers.

The bias voltage and thus the quiescent current of TR7 and TR8 is derived from TR5 and is set by the adjust on test resistor R16.

The inverting input at pin 2 presents a very low input impedance, but is not d.c isolated. Consequently an external isolating capacitor must be used. This input may be used for mixing different signal sources via suitable resistors in series with the input capacitor.

SPECIFICATION BA440/BA440A/BA440B

Pin

- 1 Non inverting input
- 2 Inverting input
- 3 B-
- 5 Output
- 6 B+

Supply Requirement:

24V d.c at 200 mA maximum (BA440,BA440A)

30V d.c at 105 mA maximum (BA440B)

Distortion:

Does not exceed 0.02% measured between 20 Hertz and 20K Hertz at 18 dBm output level.

Noise:

Does not exceed -96 dBm over bandwidth 20 Hertz to 20K Hertz, with input short circuited and gain at 20 dB.

Frequency Response:

Within ± 0.1 dB from 20 Hertz to 20K Hertz, measured at 20 dB gain.

Maximum Output:

+18 dBm into 15 ohms load.

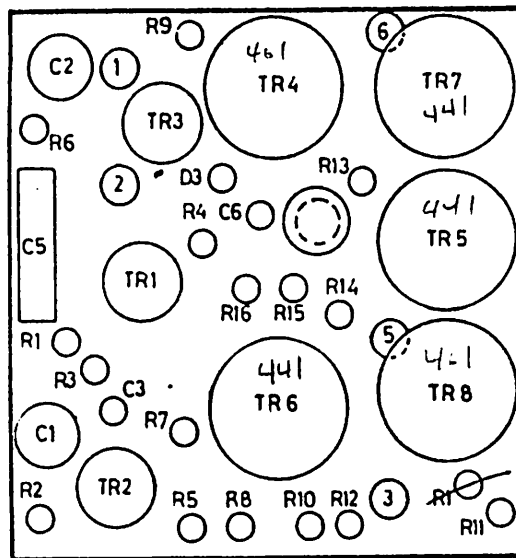
Supply Mode Rejection:

40 dB at 1K Hertz.

Slew Rate:

7.3 volts per microsecond.

COMPONENT LAYOUT BA440

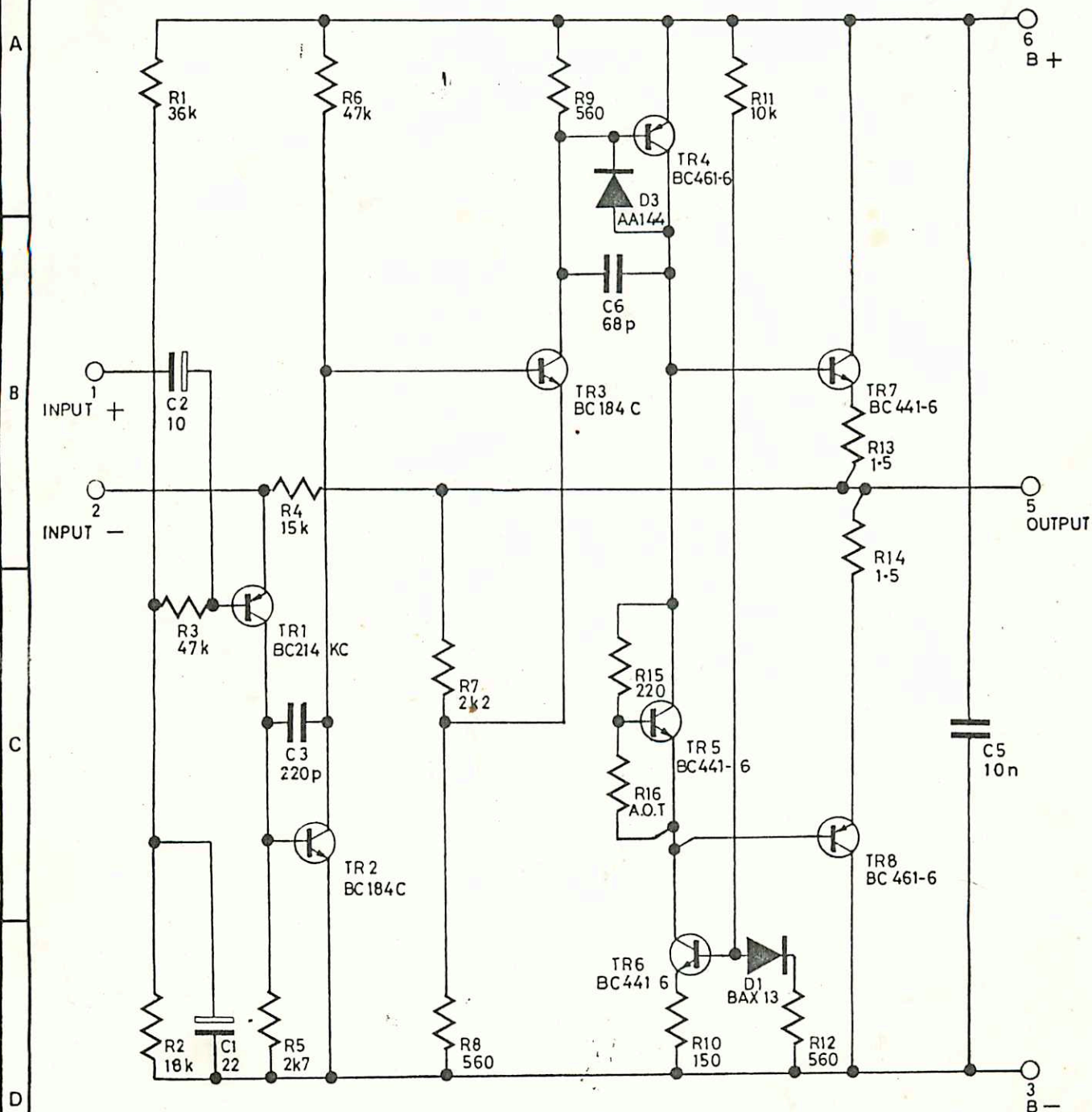


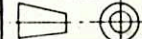
PARTS LIST BA440/BA440A*

Ref.	Description	Part No.
R1	Resistor 36K TR4 2%	RA036KO
R2	" 18K " "	RA018KO
R3	" 47K " "	RA047KO
R4	" 15K " "	RA015KO
R5	" 2K7 " "	RA002K7
R6	" 47K " "	RA047KO
R7	" 2K2 " "	RA002K2
R8	" 560 " "	RA560RO
R9	" 560 " "	RA560RO
R10	" 150 " "	RA150RO
R11	" 10K " "	RA010KO
R12	" 560 " "	RA560RO
R13	" 1.5 CR25	RFO01R5
R14	" 1.5 CR25	RFO01R5
R15	" 220 TR4 2%	RA220RO
R16	" AOT	-
C1	Capacitor 22 μ 16V	CA60223
C2	" 10 μ 25V	CA60100
C3*	" 220 p 63V Suflex HS	CA12200
C5	" 10 n 250V Polycarbonate	CA20100
C6	" 68 p 63V Suflex HS	CA10680
D1	Diode BAX 13	DD10002
D2	" not used	-
D3	" AA144	DD12000
TR1	Transistor BC214 KC	TR12402
TR2	" BC184C	TR16401
TR3	" BC184C	TR16401
TR4	" BC461-6	TR12201
TR5	" BC441-6	TR12201
TR6	" BC441-6	TR12201
TR7	" BC441-6	TR12201
TR8	" BC461-6	TR12201
	Capacitor 47 pF (part of C3)	



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RE-DRAWN FOR THB BY CM	1	ISSUE	FIRST USED ON	MATL.	TOL. UNLESS OTHERWISE STATED		
					LINEAR ±	ANGULAR	HOLES +0.13 -0
3 MAY 76	12 MAR 74	DATE	DRN.	FINISH	3RD ANGLE PRJ. 	DIMS IN	SCALE
		CHANGE NOTE NO	TRACED JDC	TITLE PCB OUTPUT AMPLIFIER BA 440 A	DRG. NO EX 10440/A		
			CHECKED GT				
		CHECKED	 Rupert Neve & Company Ltd.			1974	 A4