3.5 Economical Transistor Power Amplifiers

3.5.1 Circuit 17 – One Watt Stereo Pick-up Amplifier

Performance specification, each channel:

nominal power output	900 mW into 8 Ω load
sensitivity (1000 Hz) for P_o = 900 mW from 1000 pF source	600 mV
frequency response (−3 dB)	110 to 11 500 Hz at max. volume
tone control	−12 dB at 10000 Hz
nominal supply voltage	9 V
current consumption at P_o = 900 mW	160 mA

This circuit has been selected as an example of a design that uses the absolute minimum number of components yet ensures good performance. Four transistors are employed in a direct coupled circuit with a complementary symmetry output stage. Feedback is used to achieve a high

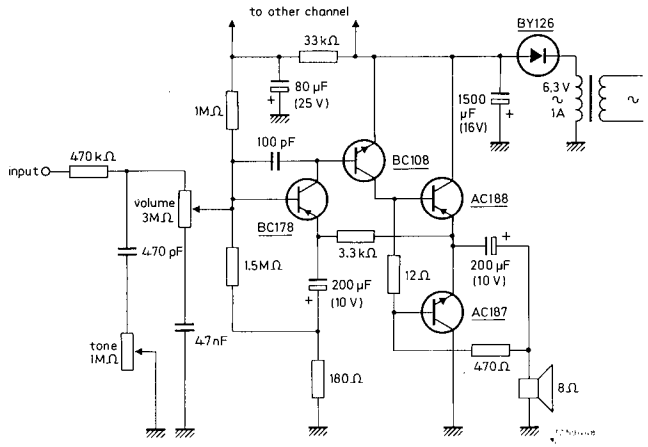
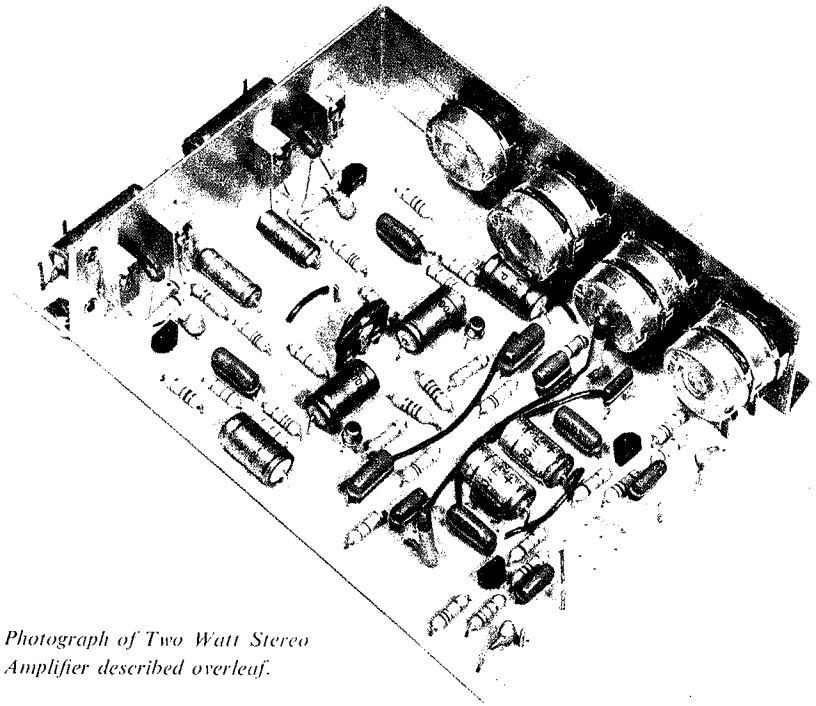


Fig. 3.10. One watt stereo pick-up amplifier circuit. Nominal supply voltage to transistors must not exceed 9 V.

input impedance, and a good low frequency response is obtained with a capacitive source such as a ceramic pick-up.

Only one channel is shown in Fig. 3.10, the simple power supply consisting of a low voltage transformer with a single rectifier diode and reservoir capacitor common to both channels. The bias circuits for the input transistors of each channel are decoupled by a common RC filter network. The power transformer has a 6.3 V, 1 A secondary winding, its core size depending upon the ratio of r.m.s. signal power to music power required. The supply voltage to the transistors must not exceed 9 V because, since this is a low-cost circuit, no temperature compensating resistors are used in the output stage. A higher supply voltage and/or a lower speaker impedance will necessitate the use of an NTC resistor connected between the bases of the output transistors and also the use of emitter resistors.

Ganged toned controls, with separate or dual-concentric volume controls for each channel are recommended. In each case these may be of the linear type.



Photograph of Two Watt Stereo Amplifier described overleaf.