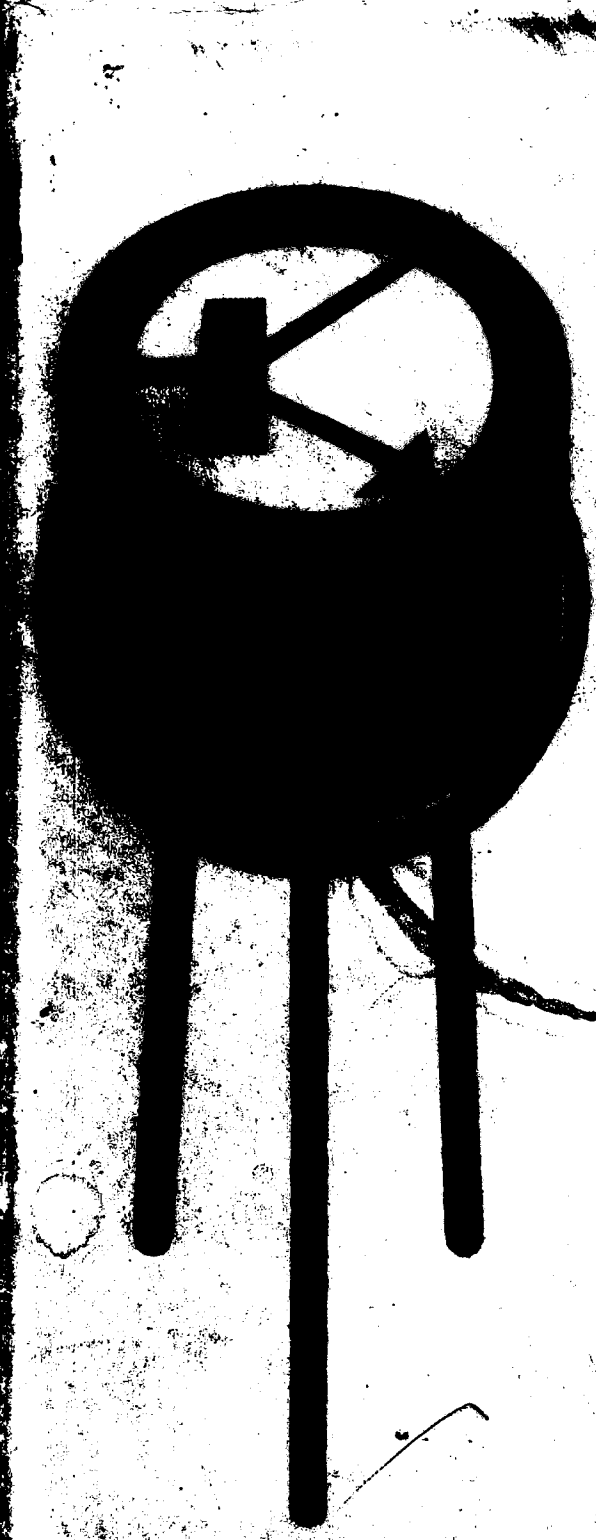

TRANSISTOR AUDIO AND RADIO CIRCUITS

for Radio Receivers, Radiograms, Record Players, Tape Recorders, and Hi-Fi Equipment

Second Edition

Mullard

LAYOUT OF HIGH-QUALITY AUDIO CIRCUITRY

The circuits described in this chapter are capable of high-quality reproduction, but only if they are carefully laid out and constructed. The relative positions of input, output and power supply, and the earthing and screening arrangements are of particular importance, and it is suggested that layouts should be designed with reference to the code of good practice outlined here.

General Layout

It should be remembered that the input sensitivity of an amplifier is typically 3mV at 1kHz, on the magnetic pick-up position, and the output voltage is of the order of 20V, implying a voltage gain approaching 10^4. It is therefore essential to keep the output separated and screened from the input. The magnetic field from the mains transformer may cause hum, so the transformer should be as remote as possible from the input (this is dealt with more fully below).

Earthing

Currents of several amps magnitude circulate in the power supply and output stages. It is important that no wiring carrying these currents is included in the input circuit, otherwise hum or instability, due to the small but significant resistance of the wires, will result. The paths of currents in the output stage and power supply are shown in Fig. 102.

Between points A and B there is a voltage due to TR_1; between B and C a voltage due to TR_2; and between C and D a voltage due to the power supply. The input can be earthed at A, but not at B, C, or D. In practice it is usual to combine A, B, C and D in one common earthing point.

The earthing arrangement for stereo amplifiers is considerably more complex than for mono, since the single power supply and common earth for the two signal inputs make it more difficult to avoid earth loops. The arrangement recommended is shown in Fig. 103.

Point E is the common earthing point. The voltage across the wire AE is effectively in series with the input to the power amplifier. This does not cause any trouble provided the wire is short, because the sensitivity at the input of the power amplifier is 200mV and the output-stage current is taken to the earth point separately.

Magnetic Fields

The principal source of magnetic fields in an amplifier is the mains transformer. Hum due to this cause will be at a frequency of 150Hz because the hysteresis of the core results in the magnetic field being pre-

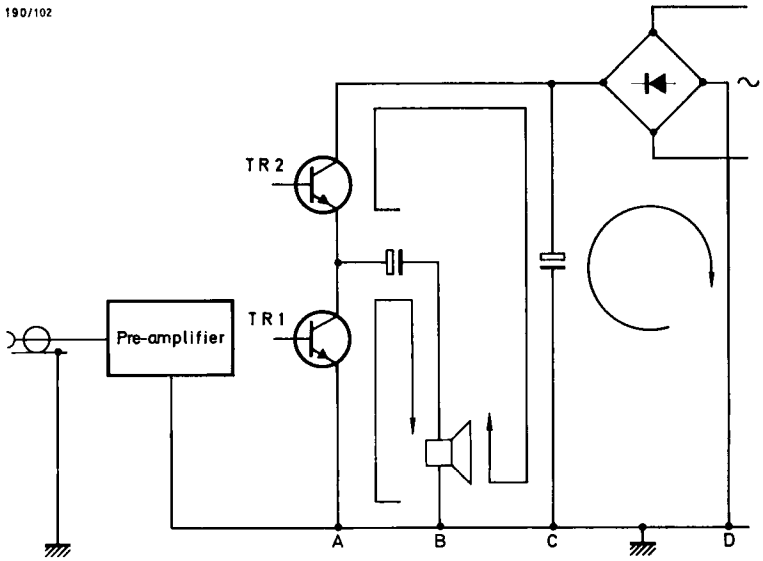

Fig. 102—Current paths in power supply and output stage

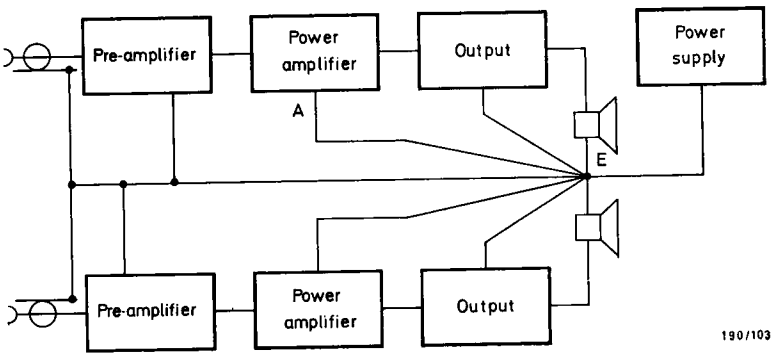

Fig. 103—Earthing arrangement for a stereo amplifier