COSSOR Model 544

General Description: Portable 45-r.p.m. record player using printed-circuit, four-transistor amplifier.

Power Supplies: Two Ever Ready, Type AD28 ($4\frac{1}{2}$ volts each), or suitable equivalents.

Transistors: (V1) OC70; (V2) OC71; (V3, V4) matched OC72.

Record Player: Garrard Type BA1 with GC7 cartridge and sapphire stylus.

Current Readings: Measured with Avo Model 8 at 20° C. ambient temperature. Motor 70 mA. (nominal), 90 mA. (maximum). Amplifier (under no-signal conditions) total 3·8–4·2 mA. Loudspeaker current (balance current) 50 μA. maximum. Collector currents: V1 0·4 mA., V2 2 mA. (taken on H.T. negative side of L1), V3 and V4 150–400 μA. Voltage readings, Collector V1, —8·25 volts (10-volt range); Emitter V1, —2 volts (10-volt range); Emitter V2, —1·25 volts (2·5-volt range).

Dismantling: The amplifier should be switched "off". (1) Unscrew the bolts holding the motor board, which can then be lifted and placed vertically in the slots provided at either side of the cabinet; this gives access to the motor and batteries. (2) Pull off the knob on the volume control. (3) Remove the wood screws and press the board covering the amplifier and loudspeaker towards the batteries. The board may then be removed. (4) Slide out the amplifier, which can rest on the batteries during examination or testing.

Servicing Hints on Transistors

The following important points should be noted before attempting any repairs to a unit containing transistors.

(1) While the connecting leads are soldered in position, they should be held by fine-nosed pliers between the soldered point and the transistor to provide a heat shunt.

(2) The leads should not be bent at a point less than 1·5 mm. from the seal.

(3) A high-resistance voltmeter (at least 1000 ohms/volt) may be used. Disconnecting or shunting a base or emitter circuit component by a low resistance (*i.e.*, a milliammeter) is not permissible. To measure currents, *switch off the amplifier* and break the circuit where the measurement is to be made. Insert the milliammeter, switch on and take the current reading, switching off again while the circuit is reconnected.

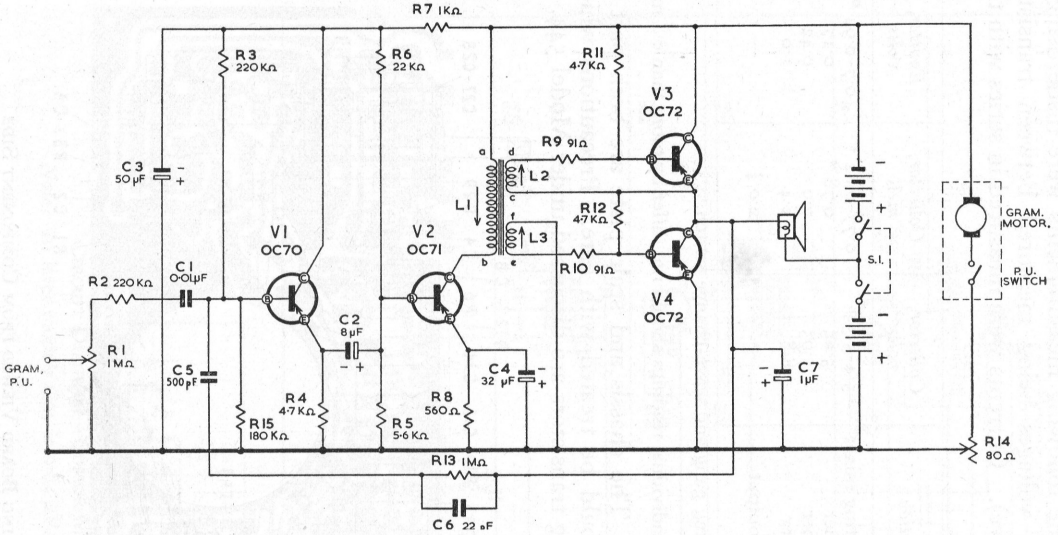
(4) The polarity of the supply should never be reversed.

(5) Ohmmeters should not be used on ranges which incorporate batteries of voltage higher than 1·5. Polarity should be borne in mind in relation to the possible shunting effect of transistors, since their base-emitter or base-collector circuit can act as a rectifier. Most multi-range meters have their

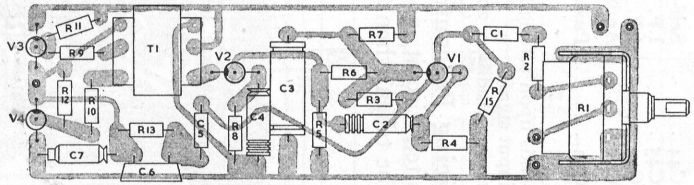
true negative leads labelled positive (and vice-versa) when being operated as ohmmeters.

(6) Mains or battery-operated test instruments should be connected to the amplifier only via an isolating capacitor. Precautions should be taken when earthing instruments, particularly when two are used together.

(7) Since the base-emitter or base-collector circuit of a transistor can function as a crystal diode, care should be taken to ensure that it is not overloaded. The maximum safe continuous current for V1 and V2 is 3 mA. and for V3 and V4, 10 mA.



CIRCUIT DIAGRAM—COSSOR MODEL 544



BASEBOARD VIEWED FROM COMPONENT SIDE

The baseboard has been assumed to be transparent.