

A Cheap Eliminator for Small Sets

Minimum Cost with Maximum Power

By "PENTODE"



HERE are many who, having purchased a crystal set, have later added a small one or two valve amplifier and are now on the point of looking round for some small, in expensive device to further improve their results. They have heard that an increase of B and C supply will allow of greater undistorted volume, but the idea of buying batteries to give, say, 150 volts, and their added maintenance does not appeal to many. Besides, the average experimenter derives most of his pleasure from the actual making of small devices, and any improvements afterwards is all the more pleasurable. A small one, two or even three valve set, when correctly designed, should take no more than 8 to 10 milliamperes from the B battery, and a small eliminator to give this output can be constructed for quite a moderate outlay. The eliminator derives its power from the A.C. mains, and the actual running costs are negligible. As very high voltages are not required, the smoothing condensers need not have a very high test voltage, and the price will be correspondingly low.

One or two valve amplifiers have been mentioned, but the eliminator described is quite suitable for small receivers employing a valve detector. Slightly more smoothing may be necessary, and this will be dealt with later. First of all the principle will be briefly dealt with and the functions of the individual components described. In

this way the constructor will be able to tackle the job with a better understanding.

The Theory.

An eliminator can be divided into four essential parts. Each of these different operations have to be done properly to ensure a steady and sufficient direct current output. In the first place there is the power supply. In the case under consideration the supply is derived from the A.C. mains and a power transformer is employed to step the 230 volt mains either up or down to suit requirements. After having the correct voltage available the current is rectified, and a valve is employed for this purpose. This direct current is not yet suitable to be applied directly to the amplifying valves, as it is made up of a series of direct current impulses which, if used in this state, would produce a loud hum in the speaker. The next process is the smoothing out of these ripples and is accomplished by a series of iron-cored chokes and large capacity condensers. The direct current should now be quite smooth, but of one voltage only. As

the detector or first audio valve requires less voltage than the final power valve, some form of voltage divider will have to be used. This constitutes the fourth essential in the working of an eliminator.

Commercial power transformers are available, but for the amateur who wishes to construct his own we shall spend some time describing the manufacture of one. For the sake of economy the rectifying valve used is one of the ordinary general purpose valves of which there are two or three makes as low as 2s. 6d. each. A current of 10 m.a. can be drawn quite safely, and the valve can be expected to last quite as long as a set of "B" batteries.

The Power Transformer.

To begin with a description of the power transformer. Winding will be given for both the 110 and 230-volt supply, or the 230 winding can be divided and used for the 110-volt mains by following the directions given. The core is of stalloy, and this will have to be bought in the stampings cut to size. The diagram shows the sizes and shapes of the different pieces. As stalloy is usually of 1.64in. thickness, 64 pieces of each size will have to be used. The quantities and sizes to be obtained are as in the list of components.

Each of these stampings will have to be given a coating of shellac dissolved in methylated spirits and allowed to dry. While these are drying the preparation of the spool can be commenced. Obtain a piece of wood about 6in. long and just over 1in square, tapering very slightly towards one end. Over this wind a strip of brown paper 2 inches wide and about 12 inches long, so that three or four thicknesses form the basis of the spool.

List of Components for Eliminator

Stalloy stampings, 128 pieces, 3in. x 1in.; 128 pieces 1½in. x 1in.
 1lb. 32 s.w.g. enamelled wire.
 1lb. 38 s.w.g. enamelled wire.
 1lb. 24 s.w.g. enamelled wire.
 Valve and valve socket.
 2 burnt-out audio transformers.
 5 x 2 mfd. condensers.
 Resistor and clip 100,000 ohms (wire wound or carborundum).
 Panel, terminals, insulated sleeving, etc.
 128 pieces 3in. x 1in.
 128 pieces 1½in. x 1in.

The paper should be of a fairly heavy type and glue or secotine painted on between each layer. The spool ends can be made out of ¾-inch fibre or formica. Each end is 2½ inches square and has a square hole cut in the centre of each, so that it fits tightly over the brown paper spool centre already mentioned, forming the two ends of the spool. Glue or secotine should be used liberally to fasten these two ends tightly, otherwise the ends will be likely to bulge when the wire is wound



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