

"Tetrode" Crystal and Amplifier

Very Low Maintenance Cost

(By "GALENA")

IN the Special Crystal and Portable Number, December 14, 1928, the writer described a crystal set and amplifier to work from 22½ volts B battery and dry cells for the A.

Numerous satisfied correspondents and constructors have testified to the efficiency of this receiver, and this encouragement has prompted the description of the improved set with condenser controlled reaction.

The original was in no way a freak circuit, the secret of its success lay in the type of valve used as amplifier—the tetrode or double grid. With the combination the reception of overseas stations has been reported in more than one case, but this can not be held as a feature of the set. It has been designed to give good speaker reception of the local station at a low running cost. Generally speaking, the amplification is the same as a good general purpose valve with a high amplification factor operated with 90 to 135 volts on the plate. Some have stated that the set is the equivalent of a two-valve amplifier, but this must be questioned. The set to be described should equal a two-valve amplifier.

A feature of the "Tetrode" Crystal Set and Amplifier is that it can be made from an existing one valve amplifier at a minimum of cost and trouble—and if carefully made will give satisfaction.

Use of Tetrode Valves.

EXAGGERATED ideas exist with regard to the use of these valves. The writer's experience is that as single stage amplifiers for crystal sets they are difficult to excel, but in multi-valve sets they are not satisfactory. They give the amplification but can be overloaded very easily with the consequent ruination of the tone.

Double grid valves have been used widely in France, and in glancing through French magazines one is struck with the very large number of circuits still employing them. They are termed Bigrilles (two grids), and this name has been seen in this country in the Micro Bigril valve. This was the first valve of its type used by the writer, and was on the "Radio Record" stall at the exhibition. The base was unconventional, a special socket had to be constructed, but the Philips A441 may now be used with the ordinary holder. An extra terminal is provided at the side for the second grid.

In both the set to be described and in the original set a Pentode valve may be used to advantage, but a high voltage in the order of 135 volts will have to be applied.

The Circuit.

EXAMINATION of the circuit will show that there is nothing in the way of "freak" combination. The crystal set is the usual with an extra winding on the aerial coil for reaction. The amplifier is slightly complicated by the addition of reaction devices, but is nevertheless simple. The aerial coil is tapped in preference to a separate primary. This, while not conducive to selectivity is the best arrangement for sensitivity and this is the main attribute of this circuit.

The constructor is advised not to attempt to dispense with any of the components, all have been selected only after a careful test and all are necessary, with perhaps the exception of the R.F. choke.

The Components.

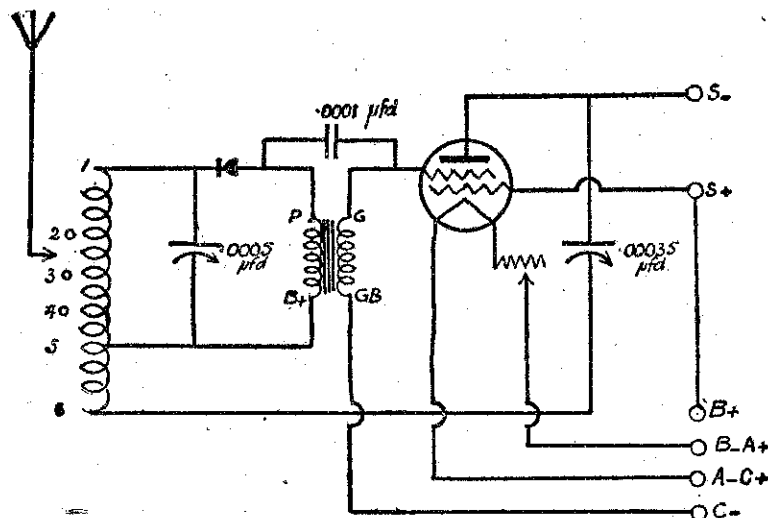
THE selection of the components is left to the constructor who will adapt the quality of these to his pocket. "Nothing but the best" is a good motto, but first-grade components are very expensive and as the object is to keep expense to a minimum, this rule will no doubt be deviated from. Second-grade parts may be used with a slight sacrifice to efficiency, but providing the transformer and the fixed condenser are of good quality little will be lost in cutting the price on the others. A reasonably good transformer may be

inch, is preferable in the front. This should be bevelled off to give a neat appearance. When complete, smooth with sandpaper, stain, varnish, and allow to dry. Not until thoroughly dry is it advisable to carry on with the assembly.

The Assembly Layout.

THIS aspect of the construction is of paramount importance and unless there are very definite reasons that described should be followed. The only component that can be constructed satisfactorily and economically is the coil. Coil construction was dealt with by "Megohm" a few weeks ago and the prospective constructor can refer to this if he desires to construct a type of coil other than that described here.

The simplest and most efficient coil is wound with unspaced D.C.C.



had for 15s. Cheap ones soon burn out, besides their tone is poor. A list is appended.

A Suitable Cabinet.

THE usual procedure in construction is to build a set comprising a base-board panel and components, and connect these by long leads to batteries, either concealed or lying about the set. A cabinet may be constructed, but usually not till some time afterwards, if then.

This time procedure is reversed and the cabinet is constructed first, and the amateur will not find this difficult. Diagram 1 will give an idea how this should look when finished.

The timber is half-inch, well-seasoned heart: 8 x ½ inch dressed lining is very suitable, and is readily obtainable from a timber yard for a very small sum. About 7½ feet will be ample.

Space will not permit full constructional details of the cabinet. Measurements are fully given, and no difficulty should be encountered. Outside measurements are given in each case.

The front portions should be joined as in Diagram 2. The edges can then be rounded off and polished. It is advisable to fit the bottom and back into the front and sides; that is, like the end of a fruit box.

The top forms a lid and is provided with hinges. A small overlap, say half-

wire on a three-inch former. Obtain six inches of cardboard former from a dealer. Now make a sma" aperture in this about one inch from the end. Through this pass about six inches of wire and, making this secure, commence winding so that each succeeding layer lays snugly against its neighbour. At every ten turns pause in the winding, pierce the former with a penknife, scrape the wire clear of insulation and pass a loop through the slit. From the inside pass a thicker wire through the loop and double it over to prevent slipping. Now draw the coil wire tight and proceed with the winding. In this way complete 40 turns. The reaction coil has now to be wound.

Without cutting the wire, make the join already described and wind on 25 turns. Pass the end through the former and secure by means of a small nickel bolt through the former. With the soldering iron run a little solder into the joints in the inside of the former.

The fate of these tapings rests with the constructor. If the local station only is required all that is necessary on completion of the set is to try each connected with the aerial to ascertain which gives the best result, and connecting this with the aerial terminal, disregard the others. Those wishing to search for other stations should

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