

Primary Voltage for Battery Eliminator.

"H.S." (Brooklyn) writes: I am on the old voltage at present and contemplate building "Pentode's" "Crystal Set to Work from Mains," to work from the A.C. mains. The specifications are for a primary to work from 230 volts. How should I adjust this so that it may work from either of the two voltages?

A.: Wind on half the number of specified turns, calling the input "1" and the end of this coil "2." Now commence winding the remaining turns to complete the full winding, and call the commencement of this "3" and the finish "4." There is no connection between 2 and 3. To work from 110 volts, connect Nos. 1 and 3 and from No. 3 take a lead to one of the A.C. mains. Connect Nos. 2 and 4 and from No. 4 take off the other main's tapping. To convert this to operation on 230 volts, connect Nos. 2 and 3 and bring a lead in from the mains to Nos. 1 and 4.

Would this affect the output of the transformer?—No.

I desire to use an aluminium panel. Can I earth the transformer plus, grid bias plus, and potentiometer through this?

A.: Earthing may take place through the panel, but it is advisable to earth the negative of the transformer rather than the positive.

Are two 2 mfd. condensers sufficient or would two 4 mfd. be better?

A.: These latter would be preferable, but they should be able to stand up to very high voltage, say, 400 volts, tested for 500.

Would the "B" supply be sufficient for two audio valves?

A.: No. "Pentode" designed the transformer to operate one valve only, and the current is rectified by a 201A, which would not deliver sufficient to operate more than one valve. However, the correspondent would find that this set will deliver him ample volume on the local station.

Can I use 36 enamelled wire for the winding of the choke?

A.: Yes, providing the number of turns are correct. When finer wire is used, a few more turns should be added.

Rheostat Inoperative.

"G.I." (Hastings) complains that the R.F. rheostat does not make any difference to strength of signals, and that reception is much louder with the plate current of the R.F. valve shut off. The set went wrong suddenly, and was then tested with 'phones and battery, and everything seemed all right. There is a decrease in signals when the R.F. valve is pulled out. We are assured that the valve is all right.

A.: It is very difficult to determine what would be wrong when one is assured that everything is all right. The R.F. valve, despite the correspondent's remarks, should be suspected from the description of the trouble. Try another

valve in its place, and take the suspected valve to a dealer at first opportunity and have it tested. The 'phones and cell method is only approximate, and in a case like this, it seems that finer instruments would be necessary. This would be the work of a radio service man.

The 2-R.F. Browning-Drake.

ANOTHER correspondent in trouble over the 2-R.F. Browning-Drake. This time, "S.McC." (Dunedin). The set was made exactly as detailed in the "Radio Record," and since then, R.F. chokes and condensers have been added as subsequently recommended. "On the lower wavelengths particularly the set is very difficult to handle, and I find tuning

ADDRESS WANTED.

IN our issue of March 8, on page 30, we published a correspondent's letter regarding the Screen Grid Browning-Drake. We should be pleased if the writer of this would again communicate with us.

in this region almost impossible. Could the split primary method of neutralising be used with success? Should turning up the detector rheostat increase volume, for I can put 2 to 4 volts on this valve with no increase in volume. My neutralising condensers are American, and the valves PM 3's."

A.: Despite the assertion to the contrary, one cannot but think that the set was not made up exactly as recommended, for no difficulty would be experienced, as the actual set described was made up and is working perfectly. Altering the system of neutralisation cannot be recommended. In all probability the trouble lies in the fact that the neutralising condensers are designed for valves with a low impedance, of the 201A type, consequently when a high resistance valve is introduced, some difficulty in neutralising is encountered. Lower impedance valves of the order of 6 to 10,000 ohms resistance should be tried, and a consequent adjustment made on the tickler. Details as to the number of turns for various valves have already been published, and will be reappearing in this week's "Beginners' Corner." Additional hints for neutralising were published in "Questions and Answers," Volume 2, No. 28.

Questions and Answers

Some constructors have had difficulty in tuning in to the lower wavelengths because the grid condenser has been screwed to the baseboard and the high frequencies have been short-circuiting through the timber.

A Valve Query.

"F.M." (Te Kuiti), whose previous reply was answered by "Pentode" in his article in Volume 2, No. 38, is still in difficulty. He states that his list of valves is PM5X, 5B, and 6. He asks if "Pentode" has made a mistake in specifying PM5.

A.: No. "Pentode" has not made a mistake. PM5 and 5X are to all purposes identical, but PM5B is a very high resistance valve, and cannot successfully take the place of either of the other two.

Is grid bias necessary with Mullard valves, and where should it be connected?

A.: Grid bias is essential with all valves. The battery should be inserted as follows:—Disconnect the lead from audio transformer which goes to the filament of the valve to be biased. Take it instead to the negative tapping indicating the number of volts to be applied. Now, connect the positive of this to the A.

Does the 22-volt tapping on the battery supply the detector valve?—Yes.

Accumulator Rapidly Runs Down.

"A.J.S." (Wai Piro) writes: "I find that my 'A' battery will run down from 1300 to 1150 in 15 hours. I have two accumulators, and both act the same. I charge my batteries at the rate of 8 amps. per hour, and what would be the result of charging them at a higher rate than this?"

A.: Fully charge the batteries, and leave them stand disconnected. After 15 hours, test them, and if the specific gravity of the liquid has fallen, it is a sure indication that some of the paste in the plates has become loose and fallen, causing a short circuit. The paste may be loosened by the excessive rate of charging, for 8 amps. per hour is far too high for anything except heavy car batteries. Try charging at 2 amps. If the battery does not run down, it can be taken for granted that there is an internal short circuit, and this would have to be traced out by methods that have been described in the "Beginners' Corner." The phones and cell would come in very handy in tracking down a fault of this nature.

I have a loudspeaker with three leads. Which two should I connect?

A.: Usually the two coloured ones, but try different combinations to get the best results.

In connecting up two headphones, should they be connected in series to the loudspeaker?

A.: No, they should be connected in parallel, otherwise the winding may be burnt out by the heavy current supplied by the audio valves.

Concerning a Super-Heterodyne.

"R.H.M." (Dunedin), writes: "A friend has an 8-valve super het., with a frame antenna, which he uses in conjunction with an aerial. Could a solenoid coil after the neutrodyne principle be used instead of a tapped coil and variometer, as now in use between the frame and the set?"

A.: The correspondent should be wary when using a super-heterodyne. An aerial must under no circumstance be used with a straight-out receiver of this type. It must be operated solely from an indoor antenna or a loop. If a screen grid booster is used in front of the super-heterodyne, it may be operated from an aerial.

Controlling Volume.

W.H.Y. (North Auckland) writes: "In order to control volume I have

connected a resistance, 0 to 10,000 ohms between the aerial and the earth terminals, as recommended by the "Radio Record," and I find it necessary to have it nearly full on before it reduces volume. When used on the 3-valve set, it causes the set to howl lustily."

A.: Better results may be obtained if as under these circumstances volume is difficult to control, by connecting the resistor in parallel with the first tuning condenser, that is, across the secondary of the first radio transformer. There would then be a bigger voltage drop across the resistance, and consequently greater loss. It is difficult to explain why it should cause a 3-valve to howl when connected between aerial and earth. If it were connected in series with the aerial, this would be expected, but no explanation can be offered if the resistance is correctly connected. Try shifting its position as recommended.

Can the S.G. valve be added or changed for the detector valve in the "Record" short-wave set without making a Cosser as described in the "Record" last year?

A.: If it is meant that the detector should be replaced by a S.G., this would be impossible, and if the S.G. is to act as a stage of R.F., the correspondent can do no better than see the new edition of the "Radio Listeners' Guide," which deals with the position S.G. on short-wave fully.

"Pentode's" Moving Coil.

"FAN" (Morrington), who is making the moving coil loudspeaker described in the "Record," requires the number of turns of 36 wire to be wound on the moving coil to suit push-pull amplification. Two PM256 are used in the last stage, followed by an output transformer with a 1 to 1 ratio.

A.: Reference to "Pentode's" article in the "Finer Details of Radio" in last week's issue gives the number as 145 when used with a 25 to 1 step-down transformer. If a 1 to 1 transformer is used, something in the vicinity of 3000 turns would be necessary.

A Short-wave Puzzle.

"C.A.D." (Christchurch) is puzzled. His reaction control does not seem to be working correctly, for he states, "Commencing with all the plates interleaved, there is an open sound coming from the speaker and set is oscillating. As the plates are turned out, the rushing noise becomes more pronounced, but

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