

QUESTIONS AND ANSWERS

J. R.C. (New Plymouth): I have just built the "Conqueror Superhet," described in the 1934 "Radio Guide," and it is giving me splendid results. Why is it necessary to have a step-down transformer between the driver valve and the class "B" output stage?

A.: During the half-cycle in which a grid of a class "B" valve becomes positive, the grid to filament resistance becomes very low, and grid current flows. If the effective internal resistance of the secondary winding of the transformer is high, this current will reduce considerably the voltage actually applied to the grid, and the wave-form will be distorted. Consequently, it is necessary to keep the effective internal resistance of the secondary winding as low as possible. This effective resistance depends on the impedance of the driver valve, as well as on the actual ohmic resistance of the winding. By using a step-down transformer, the impedance of the valve is stepped down to the required value for current operation.

J. R.K. (Christchurch): I have a filament transformer with a 74-volt winding. I am using a 171 valve in the last stage of my set, and I would like to use this transformer to supply the filament current. I have tried placing a resistor in series with one side of the winding, but this produces excessive hum.

A.: In order to keep the filament current of the valve in a balanced condition (which is necessary to keep hum at a minimum) the potential on each side of the centre tap of the transformer must be the same. If resistance is added on one side, the voltage on that side of the filament is reduced and, the filament is unbalanced. If the centre-tap on the transformer is not used, and a variable voltage divider or potentiometer is employed for the centre-tap of the filament circuit, the adjustable arm of the resistor may be used to counteract the unbalancing. The best way of overcoming the difficulty, however, is to place two resistors in the circuit, one in each side of the filament supply. In this way the voltage on each side of the centre-tap is kept the same, and hum is reduced to a minimum. The actual values of the resistors depend on the filament current and the amount of voltage reduction required. From Ohm's law, the resistance equals the voltage drop divided by the current in amperes, i.e., $R = 2.5 \div .25 = 10$. Thus, a 5 ohm resistor should be connected in each side of the filament.

"2B7" (Auckland): You would probably find that by connecting the pick-up across the load resistor of the 2B7, as shown in the "Comet Superhet Five," described in the September "Radio Times," the leads to the pick-up terminals would be much shorter. In this case, the terminals should not be shorted when the set is being used for radio reception.

J. C.P. (Westport): I have built the "Explorer Four" shortwave set described in the "Radio Times," and am getting splendid results from it. However, lately I have been troubled with an annoying crackling, which I cannot trace.

A.: Crackles and similar noises may be due to a defect in the receiver, in the aerial, earth or batteries, or to atmospheric disturbances or interference due to electrical machinery. A brief test may be applied to the receiver by disconnecting the aerial and earth leads, and if the noise then ceases it may fairly safely be assumed that the receiver is in order. It should be noted that this does not mean that the aerial and earth themselves are in order, and it is advisable to examine the lead-in wires, insulators, and the joint between the earth lead and water-pipe or earth tube. The intensity of the noise caused by atmospheric disturbances varies from time to time. It is less in winter than in summer. Interference caused by electrical apparatus is often similar to an "atmospheric" background, and may be picked up by the aerial or earth.

Crackling due to a fault in the receiver may be due, amongst other things, to bad switch contacts, defective components or valves, bad wiring connections or faulty batteries. The spring contacts of the wavechange and on-off switches should be examined to make sure that a firm, springy grip is made, and if the contacts appear dirty they should be cleaned carefully with very fine sandpaper. The valve pins should be cleaned, and care should be taken to see that they fit tightly in the valve holder sockets. In some cases the internal connections of valve holders develop faults, and it is worth while examining these. The vari-

ous joints, terminals and insulated wires in the receiver should all be looked over and remade or tightened up where necessary.

If two resistances of equal value are connected in parallel with each other, their effective resistance is only half that of one of the resistances. On the other hand, if two equal value resistances are connected in series, the total resistance is doubled.

A certain cure for poor selectivity in a receiver is to add an extra tuned circuit at the aerial end of the set. At least two tuned circuits are needed for a reasonable order of selectivity.

Do not run your loudspeaker leads underneath the set or in close proximity to the aerial or earth leads, as this is a common cause of unwanted inter-action and audio instability.

A flash-lamp bulb mounted in the base of an old valve and connected to the filament terminals makes a very handy tester for checking filament circuits.

By dividing the set's total filament consumption into the actual ampere-hour capacity of your accumulator, you can tell about how many hours the latter should last without recharging.

Pick-up leads can be shielded to eliminate instability. The shielded covering should be earthed.

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RADIO ON SMALL SHIPS N.Z. LAW BEING REVISED MINISTER'S STATEMENT

Attention is being given to radio regulations governing vessels which, under 1600 tons, at present are not compelled to have radio installations, so that there is a probability of New Zealand ships being controlled in a manner similar to that shortly to be put into operation in Australia as announced by a cable from Canberra in yesterday's "Post."

"The New Zealand regulations governing radio installations on ships are at present under revision," stated the Minister under revision, Hon. J. G. Cobbe (the Marine) (the new Australian regulation, he said, applied particularly to Australian inter-State vessels. "Our Shipping and Seamen Act provides that vessels that carry more than twelve passengers or more than a complement of nineteen persons all told, must be wireless-equipped.

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