

audio howl was present, which could not be overcome by changing the connections. All three transformers were shielded, and each is of a different make, writes "Home-Built" (Kaitia).

A.: The circuit diagram appears to be correct, though the use of a pentode in the last stage of a 4-valve set is not to be recommended. The pentode gives very great amplification of weak signals, but it can be easily overloaded, and this appears to be the case.

The transformers should be arranged with their axes at right angles to one another. These two factors appear to be the cause of the trouble.

The Browning Drake.

IN a four-valve Browning Drake what advantage has a .00025 over a .0005 mfd. condenser for tuning the regenerative? asks "W.J.S." (Dunedin).

A.: See "Cathode's" article in the "Radio Record," dated August 23, under the heading, "The Technician Explains."

2. I have had to put a .05 mfd. condenser.

2. Is it necessary to use an output choke with a push-pull amplifier?

A.: Decidedly not. The push-pull transformers are so built that no "B" current passes through the speaker winding. They are themselves output transformers or output chokes.

3. How many turns are required on secondary coils 2½ inches in diameter and tuned with a .0005 condenser?

A.: 100 turns of 22 gauge D.C.C. wire wound without spacing.

Push-Pull Amplifier.

WISHING to work a dynamic cone speaker and gramophone pick-up from my two-valve set, I would like the details concerning the push-pull amplifier, asks "Watmel" (New Plymouth).

1. Would a two-valve push-pull amplifier give the best results?

A.: A first audio followed by two valves in push-pull would be O.K.

2. Approximate cost of same?

A.: Good push-pull transformers can be obtained for 30s. each, while a good audio transformer can be obtained for 17s. Three valve sockets each at 3s. 6d., three valves, two at 1s. and one at 12s. 6d. would be necessary.

3. Where can I obtain diagram of circuit?

A.: A D.C. push-pull amplifier was described by "Pentode" in our issue of November 2, 1928, and an A.C. push-pull amplifier will be described in our issue of September 20.

4. What type of dynamic cone speaker would you recommend?

A.: One which will work directly from the A.C. mains or the 100-200 volt D.C. type, if a power amplifier using rectified A.C. current is used. The field winding can then be used as one of the chokes.

Choice of Speaker.

"A. J.D." (Gisborne) asks which is to be preferred: an exponential horn or a linen diaphragm.

A.: Much depends on taste, but the writer prefers the linen diaphragm; but it will have to be made carefully.

License Problem.

IS there a limit to the number of sets a person may use with one license providing they are all used at the same house?

A.: There is no limit, providing this is not a public house, and the set used for public or semi-public purposes.

2. If I sell my radio set, can the buyer have my license transferred to his name?

—No.

Condenser Problems.

"MARCONI" (Timaru) asks:—

1. Would I have to alter the capacity of my two variable condensers if I wished to use a short-wave coil to tune down to 10 metres?

A.: The condenser tuning the grid coil will have to be altered so that the final capacity is no greater than .00025, and preferably .0001.

2. How is the capacity of a tuning condenser altered when the plates are double spaced, and is the tuning range increased or decreased?

A.: Capacity is calculated from the formula:

$$C = \frac{.0885 \times N \times S}{d \times 5,000,000}$$

where C signifies capacity in microfarads, N number of plates, S the area of one plate, and d the distance between them. It can be seen that the greater the distance between the plates the greater the capacity, but the variations will be very small.

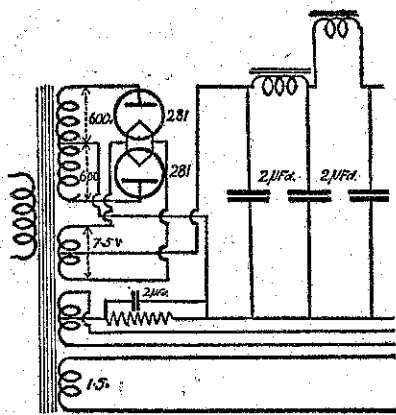
3. Are special coils necessary for a screen grid short-wave set?

A.: Yes, their specifications have been given on page 101 in one edition, and 110 in the other edition of the 1929-30 "Radio Listeners' Guide."

Filament Windings for 245 Valve.

HAVING built the eliminator described in "Listeners' Guide," "C.R." (Hokitika) wishes now to use the new 245 type valve requiring (filament) ½ amp. at 2.5 volts. These are being used in push-pull, which means that his wiring must supply half an amp. He asks if he can take the filament current for a 227 from this same winding.

A.: The 227 requires 1.75 amperes of current and with the half-amp supplied to the two 245's would make a total of 2.25 amps. To supply this a wire of not



less than 16 gauge should be used. This would present mechanical difficulties in the way of winding so that it would be advisable to make two windings, one of 22 gauge and the other of 18 gauge.

2. Will a B.H. Rathen rated at 300 volts maximum plate handle the 350 delivered by the eliminator?

A.: Not without over-heating. The best plan is to employ two 281 half-wave rectifier as per the accompanying diagram.

A.C. Supply.

"A.C." (Christchurch) asks if an American receiver used with a step-down transformer could be successfully used on the 230 A.C. mains.

A.: Yes, providing the number of cycles per second is the same, but the chances are that it is not.

2. Why is a metal cabinet better than a wooden one?

A.: Where high voltages have to be handled, as is the case with most modern receivers, especially those employing power transformers, very high magnetic fields are set up, and unless these are shielded from the tuning coils of the set, interference is likely to interrupt reception.

3. Is a magnetic speaker better than the ordinary cone speaker?

A.: They are identical, but some older cones used reed type unit.

Airzone Midget Coils.

COULD you publish a circuit for a three-valve set using the Airzone Midget coils?—H. (Wellington).

A.: Airzone Midget coils are ordinary Browning Drake kit. Use this circuit minus the second audio stage.

Motor-Boating

Condenser and Resistance Cure

I HAVE perused with interest your article in "Record" of 16th inst.

on "Motor-Boating" and the cure thereof. Before proceeding any further I would like to say that in my opinion one of the fascinating features of radio is the number of ways one can do a thing wrongly before striking the correct method. Still, it is rather

horrible to think of anyone with a set afflicted with motor-boating quietly wading through all the scheme and detail set out in your article. Motor-boating and threshold howl are only

interesting in the number of things one can do without curing them, and I am of opinion that the whole of the schemes set out in your article come within this category. Motor-boating and threshold howl can both be cured

by placing a 20,000 ohm wire round resistance in the detector power lead before it gets to the transformer and bypassing the set end of the resistance to earth with 2 mfd. condenser. I have

my information from an English magazine, "Wireless Constructor," and I have tried the scheme and found it entirely successful—curing motor-boating

and the threshold howl on both short wave and broadcast sets. The value given of resistance and condenser must not be departed from. I have also tried this and find it is correct. I might also add that this remedy will effect a cure even when the detector is running on a dry battery and the rest of the set on an eliminator.—Diogenes (Cromwell).

[Our article dealt with resistance capacity coupling, in which case the cure is effective.—Technical Ed.]

Technical Tips

RECENT experiments with anti-motor-boating devices suggest that a 4-mfd. fixed condenser is greatly preferable to the 2-mfd. usually employed.

NEVER attempt to drive a long thin screw into a three- or five-ply base-board without drilling a hole for it, or the head is sure to break off just when you are screwing the last few turns.

WHEN winding solenoid coils over a ribbed former it is a good idea to cut little grooves for the first and the last wires to fit into, and there will then be no tendency for the windings to shift along the former, as they will be anchored securely in place by the end turns.

NEW 1930 ATWATER KENT SCREEN-GRID RADIO

Electro-Dynamic
of course!

The Wonder Set from
Radio's Leader
Model 55 complete with F.4
Speaker and Valves £56

SCREEN-GRID—the great new principle—is put to full use in the new Atwater Kent Screen-Grid Set. Here's the set that gets more out of the air and brings more into your home. Here's the reach of a giant—to round up those far-off stations, and needle-point selectivity to keep them from crowding. Yet here's the quietest operation you ever heard—no hum or other mechanical disturbance.

Dealers Everywhere!

N.Z. Distributors: C. & A. Odlin & Co. Ltd., Wellington.