

lar state of affairs exists with the 4-volt battery used on a 4-volt valve.

3. Why do some sets require much less grid bias than others?

A.: This depends on the last valve, which does not always adhere to the maker's curves.

Cannot get Distance.

WHY can we not get past Australia? asks "C.I." (Motueka). We have a five-valve Neutrodyne with batteries almost new. One and a half volts are applied to the valves. The earth and the aerial are both good.

A.: The valves in your Neutrodyne should be supplied with 5 volts on the filament, but we think you must have made some error, for you certainly could not get Australia with 1½ volts on the filament. Getting past Australia is not particularly easy, especially with a Neutrodyne of only five valves. There is no royal method of getting Japan and America other than good aerials and earlins, fully charged batteries, and good components. If your set has been in use for some considerable time, you should have the valves tested.

Origin of Morse.

WHAT is the origin of the Morse received sometimes with station 2FC, and at times on 220 and 550 metres,

A.: This is a question of no mean dimensions. Morse may originate from a hundred and one difference sources, and unless you or a friend can identify the source we cannot help you.

Matching the 245.

HOW many turns should I put on my moving coil loudspeaker to match the impedance of the new 245 power valve?

A.: The impedance of this valve is 2000 ohms, so that 70 turns will have to be put on.

2. Will the output transformer carry the current?

A.: Yes, OP4C will carry the current from this valve. It is doubtful if cheap transformers would. The writer has been using the Pilot transformers for some considerable time with a pair of these valves. There has been no tendency to choke, and no semblance of a burn-out.

Short-wave Adapter.

WE have a screen grid 7-valve all-electric set, writes T.N. (Nelson). Is it possible to use the screen grid short-wave adapter described in the "Listeners' Guide"?

A.: Yes, quite. It will require, however, the use of batteries. All electric short-wave adapters are possible, and when we get the opportunity we shall describe one in the "Radio Record." An adapter used with an electric set connects just as with a DC set.

2. Would it be better to use the dynamic speaker supplied with the set, or earphones?

A.: For use with the adapter alone use the phones, but when the amplifier is attached it will be necessary to use the speaker. If telephones are used after an amplifier noise is amplified to a very great extent. This spoils the reproduction, and makes listening unpleasant.

Coils for the All-Electric.

WHY cannot low lost coils be used for the AC Browning-Drake? asks "New Chum" (Tauranga).

A.: We remarked in the article that coils that were previously used in a Browning-Drake were quite suitable. This includes space wound coils. These are more efficient, but with the efficiency of modern valves and transformers, one can afford to lose a little efficiency on the coils. For this reason, they are made as simply as possible.

2. I read in the "Record" that the B.D. was notoriously unselective. Is this a printer's error?

A.: No. The Browning-Drake as described is certainly a little unselective, but this lack of selectivity will not worry those people who are away from a powerful station. Selectivity is gained by a loose coupling in the aerial coil, and

more than one stage of radio frequency. This type of Browning-Drake has neither of these attributes, though the introduction of a fixed condenser in the aerial lead will quite frequently sharpen selectivity, and with certain coils increase the volume.

R.F. Booster.

"SCREEN GRID" (Ngaio) complains that he cannot prevent feedback when using a S.G.R.F. booster. This is unshielded, and situated some 10 inches from the set.

A.: Shield grid boosters are not always satisfactory. The trouble occasioned by feedback is very great. The correspondent should have some shielding arranging it so that the plate wire from the top of the valve is entirely shielded from the grid. The lead should be encased in lead, and this grounded. The best arrangement is the valve built in the set, and shielded from the coil as described.

Applying C Battery

Method of Improving Tone

IT is surprising the very large number of sets at present in use without a "C" battery. This small battery, the price and upkeep of which is almost negligible, is very frequently omitted by set designers and constructors. Its purpose is twofold:—

1. To improve the tone by impressing the voltage swing on the centre point of the valve's curve.

2. To reduce the drain of "B" battery current.

A "C" or grid bias battery is very easily connected up. Examine the last stage and it will be noticed that on one side of the transformer a wire goes to the valve socket (G) and another to the "A" negative. This is the offending wire. Break the connection and take it instead to the negative terminal of a suitable battery. The positive of this battery is connected to "A—." The value of such a battery will depend upon the valve used in the last stage.

A table showing the number of grid volts for various valves would involve a large amount of space, but the manufacturers mark clearly on each carton the amount of bias to be applied, and this should be the value of the battery. If a complete battery with this voltage is not obtainable, either connect two in series or arrange the tapings so that the difference between the two is the voltage required.

The last valve of a multi-valve set is not the only one that should be biased. It is preferable to put a small bias of 4½ volts on the second audio valve. This is done in the same method as previously described.

If your set is not biased, make this small outlay in expense and you will be surprised with the remarkable improvement.

IF you have a milliammeter connected in the common B+ lead, remember that it should be shunted by a large condenser.

WHEN rigid wires are to be soldered together they should not be placed end-on, but one should be bent to run parallel with the other for a ¼ of an inch or so, to provide an ample surface for the joint.

Tips and Jottings

A Makeshift Drill.

IT sometimes occurs that a small hole is required in an ebonite panel, and no drill is available. An ordinary bradawl will make a very good substitute, and it is surprising how quickly it bores a hole. The method of using is to rotate the tool backwards and forwards through about half a turn, pressure being applied to the handle. It is advisable to occasionally to lift the point out of a hole and place it back in a different position, so as to ensure that a really circular hole is made.

Indoor Antenna.

AN indoor antenna is quite efficient for short-wave work, as, when working on high frequencies, height and length do not matter very much. Many short-wave amateurs, in fact, use such an antenna in preference to an aerial, and excellent results have been obtained by some with a vertical indoor antenna only six feet long. Atmospherics are considerably reduced in strength by the use of such a system. Indoor antenna should not be made too long, and should be run near an outside wall of the house. This will help to keep it away from the house lighting system, thus avoiding the chance of picking up hum.

A "Mains" Precaution.

ONE of the easiest and most effective precautions that can be taken with a receiver, using an eliminator, is to insert a fixed condenser in both the aerial and the earth leads at the point where these enter the set. When buying large fixed condensers for this use, remember that they should not be worked at their "test" voltage. Usually the working voltage should not be more than half the test voltage, so that for use on 200-volt mains, condensers tested at 400 volts or over should be used.

An Aerial Hint.

AERIALS which are quite taut during wet weather, slacken considerably when conditions are dry. This

Short-Wave

(Concluded from page 32.)

TLO, at 5.30 a.m., a carrier only could be heard. By 5.45 a.m. a piano was well received at R3-4. Signals increased to R7-8 by 6.30 a.m. Slight crackling static and a slow fade were noticed.

On 43.6 metres (about) and 49.2 metres weak foreign voices could be heard.

5SW, Big Ben was very "gurgly" at R8. Talk was about 75 per cent. readable at first, but went off considerably.

2ME and GBX were R9 and R8 respectively at 8 p.m. with duplex telephony. KZRM was tuned in at 9.30 p.m., when a clock struck the hour of 6 p.m. This was quite a novelty in the way the hour was struck. The nearest I can describe it is "Doo, Dah, Doo, Dah," was repeated six times, each "Doo, Dah" being in place of the usual single stroke. The call KIXR was also given.

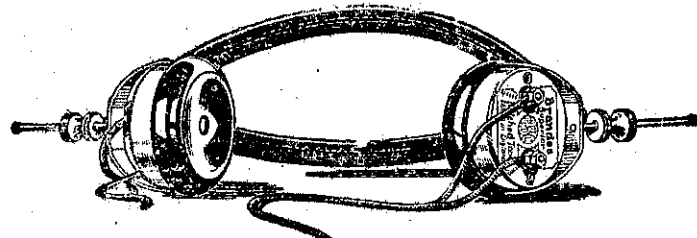
Interesting Test

I THOUGHT you would be interested in the test carried out on October 20 by VK2ME and GBX. VK2ME was R9, with slight fades. GBX was R7 at best period. Mr. Hughes's conversation with Sir E. Binn in London was very plainly heard from VK2ME. With regard to the station of the General Electric Company, W2XAC is the call sign, and it transmits on 34 metres (8824 kilocycles).—S. Saunders, Wellington.

sagging generally means that the lead-in, which would previously clear the house, is now dangerously near it, and a slight wind may swing it against metal gutterings. Thus signal loss is caused, or more often a series of irritating noises occur which are frequently attributed to atmospheric trouble. Whenever there is a long spell of dry weather, an aerial should always be slightly tightened to avoid this unwanted sag, though if too much slack is taken in, a break would probably occur when the aerial becomes we once more.

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