Construction Continued

A FEW FACTS ABOUT THE LAST AUDIO

By "Megohm"

With the increasing use of B eliminators, the quality of reproduction will, on the whole, tend to be raised, especially when dry batteries give way to the more economical method of high-tension supply. Working from the mains, 20 milliamps or more may easily be supplied to the plate circuit of the last valve, accompanied by a suitably high voltage of 150 or so. It should be noted that the current, or millianps, have more effect upon quality than has the voltage, which latter merely provides the means of overcoming the internal resistance of the valve. For a last stage valve the requirements are high plate current (milliamps), high grid bias, but not unreasonably high voltage. In practice these conditions are not entirely fulfilled, though they are aimed at. The range of volume is determined by the amount of current passed by the plate of the last valve, although it is only the fluctuations of this current which operate the loudspeaker. The larger this current, the larger the maximum fluctuation possible, and hence the increased volume. So that the actual steady plate current passed is a good indication of output capacity.

To secure good quality reproduction the last valve must both receive and deliver undistorted signals, and when this is accomplished it must be seen that the speaker will reproduce and further amplify these signals without distortion. A good amplifier will give good amplification on the lowest notes that a broadcast station puts out, and if loudspeakers had arrived at the same point on the way to perfection, then average reproduction would now be at a much higher level of quality than it actually is. Amplifiers are being improved so that their amplification is fairly even over a very wide range of audio frequencies, and coupled to one of the few high-grade types of loudspeaker that exist, results are highly pleasing to a person of musical taste. After all, it is only the music that counts, and experimenters as well as others should accustom themselves to judging the output of their receivers with their musical ear, and make it their greatest care to correct any unwanted tendencies that may be detected in the reproduced sounds. These tendencies are only too often in evidence—woolliness of speech, distortion of low notes, general indistinctness or want of sharpness and clarity, guttiness or raspiness of tone, "tinny" tone, and so on.

Good components will usually give better tone and better general results than will the cut-price variety, and will need less nursing and bolstering up with fixed condensers and other expedients. But even if it has been necessary to purchase some of the less expensive variety, amends can be made to a good extent by careful adjustment and an exercise of common-sense, and the bad tendencies noted above can all be very considerably reduced if not entirely cleared up.

Every receiver will deliver a certain amount of volume without distortion, but whether or not that amount of volume satisfies the owner, depends upon the individual taste, coupled with the capabilities of the receiver. The last audio valve chiefly determines the amount of undistorted volume, provided that the loudspeaker is capable of handling that volume and retain the quality. Take your last audio stage and loudspeaker as one combined unit, you may hitch up before it the biggest receiver with one audio stage that you can get, but the undistorted volume passed by your own audio-speaker unit will only be the same as with your own smaller hook up, provided, of course, that the latter is able to deliver at least right up to the limit where distortion commences.

OUR INFORMATION

ALL POSTAL IN FUTURE

After a few months of dealing with queries sent in by readers, we are able to settle upon a more decided method of dealing with the same. Many queries submitted are of personal interest only, and do not concern the general reader, and many such have always been answered by mail, ensuring an earlier reply in many cases.

This service is intended primarily to deal with any difficulties that may arise in the construction of apparatus described in this column, but other information is willingly given if it does not entail an unfair amount of work or searching. Wherever possible, those seeking information about a particular receiver should enclose a diagram of the circuit. It is not the function of this service to supply a diagram of any circuit that may be demanded, as filed copies cannot be spared.

In future, all replies will be sent through the post, and will be dealt with as expeditiously as possible. Readers will not miss anything by this new procedure, as any queries of general interest that may be sent in will be suitably dealt with in this column, as has frequently been done in the past. From now on, the following rules will be in force.

QUERIES BY CORRESPONDENCE.

1. Every communication enclosing queries must be accompanied by a stamped addressed envelope for reply by post.

2. Questions must be written so that a space is left in which the reply may be added.

3. No charge is made for replies.

Constructors altering the specified gauge of wire do not always realise the great difference that really exists between two even numbers, say, 18's and 20's. The current-carrying capacity is determined by the cross-sectional area. The area of 20's is .001 sq. in., and 18's, 0018 sq. in., or nearly double that of 20's. The current safely carried with liberal margin is 4 1 amps for 20's, and 7 amps for 18's.

AN EFFICIENT WAVE-TRAP

A CONVINCING TEST.

A reader residing at Roseneath, less than half a mile from 2YA's transmitter, writes the following: "I must say a word about the efficiency of the wave-trap circuit published in your column. Although I live in Roseneath and have an unselective Browning-Drake set, I can easily cut out 2YA and bring in 3YA and 1YA. I have not tried 2BL as yet, but will do so when conditions are more suitable. I find it best tapped at the 18th turn in preference to the 10th."

This circuit was published on January 13th, and is an adaptation of the selective crystal set circuit, which makes a good trap when constructed complete. Readers have already been advised to find the tapping best suited to their situation, and in some cases the inclusion of the whole coil may be found better than a tapping. The crystal set was described on January 6th.

A quality music-reproducing audio transformer now obtainable in New Zealand is the Igranic-Pacent Super Audioformer, having the high primary impedance of 124 henries and a ratio of 3 to 1. The published curve shows a flat or even amplification from 4000 down to 300 frequencies, which is quite unusual, and, moreover, was made clearly evident by a practical test. In the second stage large volume was handled with wonderful clarity down to the lowest frequencies usually transmitted, and in the first stage results were also highly satisfactory. The International Radio Co. Ltd., Courtenay Place, Wellington, has just landed a supply of these latest transformers.

During the past few weeks quite a number of constructors of the Browning-Drake receiver have written reporting splendid reception of New Zealand stations, but stating that all Australian stations have been very weak. The reason is chiefly attributable to the fact that whilst daylight saving is in force in New Zealand, the Australian stations cannot be received at good strength until a late hour. Having in mind the usual amount of interference in these stations, the writer seldom troubles to tune them in at the present time.

(END OF CONSTRUCTION SECTION)

Reception on Short Wave

INTERESTING NOTES ON WEEK'S PROGRAMMES

Mr. F. W. Sellens (Northland) writes:—Since writing last, PCJJ has been heard at something like its old-time strength. This is probably on account of the days getting shorter again.

The schedule of JHBB, Japan, has been heard "over the air," particulars of which I will give later on in my notes.

On Saturday afternoon, February 4, KDKA was heard at quite good volume, with talks, music, weather reports, etc. Modulation was not good, or else conditions were not favourable, as speech, although loud enough, was not clear enough to be readable.

As PCJJ was "on the air" early on Sunday morning, I got up for a short time—4 a.m. till 4.45 a.m.—and heard some organ music at splendid volume and modulation. They were transmitting from 2.30 till 5.30, our time, which is too early for most of us.

On Sunday afternoon 2XAF were heard relaying the evening programme of WGY, Schenectady, and WMAK, Buffalo, signing off at 11.57 and 15 seconds, E.S.T. (time more exact than ever). KDKA was very weak.

3LO started at 7 a.m. on Monday morning on 32 metres with the "Washington Post March," which was splendid strength and modulation.

2LG, Goulburn, N.S.W., was testing in the evening.

At 10.45 p.m. JHBB, Japan, commenced their evening test with "Hullo, Hullo. Here is JHBB. . . Here is Radio Laboratory, Japan. Wavelength, 37½ metres." The hours of transmission were given as "Monday, Wednesday, and Friday, 06.00 till 07.00, 10.00 till 13.00, and 22.00 till 23.00, Greenwich mean time." (This is Monday, Wednesday, and Friday, 6.30 till 7.30 p.m., 10.30 p.m. till 1.30 a.m., and Tuesday, Thursday, and Saturday, 10.30 till 11.30 a.m., New Zealand summertime.) After these particulars, which were heard perfectly clear on the speaker in good English, the call, etc., was given in other languages. Then a long talk followed in another voice till 11.38 p.m., when JOAK was announced. At 11.40 p.m. JOAK was called by another voice, followed by a few words, evidently the name of the musical item, which followed, a string instrument and man singing. They appear to be very fond of this class of music. Modulation was very good and steady, but static was troublesome.

On Tuesday morning the 40-metre stranger was heard. 2XAD was tuned in at 5.45 a.m., when a piano with man singing was faintly heard. At 5.50 a.m. 5SW was calling: "Hullo, 2XAD It is still half daylight; we will soon be saying good afternoon." Reports of reception were read, first by 5SW and later 2XAD was heard reading reports of reception of 5SW by him. This was just strong enough to understand the nature of the talk, but not enough to follow properly.

PCJJ was tuned in at 6.30 a.m. on Wednesday, when they started their programme with two band items. This was followed by their usual call, "Hullo! Hullo! Here is PCJJ, shortwave transmitter of Philips Radio Laboratory, Eindhoven, Holland, on wavelength of 30.2 metres. The next item will be, etc."

The volume was very good at first, but gradually decreased till 7.30, when I left them, when it was faint 'phone strength.

Big Ben was heard at 7.30 a.m. through 5SW. The talk following was not readable except for an odd word or two.

At 10.38 p.m. JHBB started their test. Volume was good, and signals readable, but reception was spoilt by jerky, rushing noises.

On Thursday morning the 40-metre was heard. Could only make out "Hullo! Hullo!" Less volume and better modulation would be an improvement.

At 10.40 p.m. I tuned in 2ME, Sydney (I understand this station started earlier, but was not listening before this). They were relaying the programme of 2FC. Reception was excellent.

A short wave friend has heard 2ME from 7.30 a.m. on two mornings recently.

The 40-metre station again heard on Friday morning. PCJJ started at 6.34 a.m. with music on bells; this continued with short intervals till 7.30 a.m., when I closed down. Volume at first was quite good speaker strength, but decreased to weak 'phone at 7.30 a.m.

JHBB was heard in the evening, but reception was spoilt by static and morse interference.

On Saturday morning music was heard faintly from 2XAD about 6 a.m. 5SW was not heard till 6.15 a.m., when "Hullo! 2XAD, 5SW calling. We are sorry we are late, but we had a storm here and lightning —— aerial. We are going to send you gramophone records till 6 o'clock." Several records were then put on. At 6.33 a.m. he again called 2XAD, and repeated the message re storm and closed down without any chat as usual. Signals were faitly strong, but unsteady.

A MYSTERY STATION

SOLUTION SUGGESTED.

A. P. Morrison (Brooklyn) writes:—The past few weeks SW reception has been good with me. On Sunday, January 29, I received an excellent SW programme from Station WLW, Cincinnatti, Ohio, their programme being an anniversary programme. I first logged him at 7.15 p.m. and their programme continued on till 12.15 a.m. Monday morning, and right throughout was good loudspeaker strength, between 8 p.m. and 10 his music was quite audible on one valve with phones. Items heard were selections (musical) by the Stone family, vocal items by Madrigal Quartet, one item ("I Left my Girl Standing in the Rain"), and a talk in regard to a radio competition to be held. The latter part of the programme was made up by Wirlitzer items, two items being ("Rocked in the Cradle") and ("Valencia").

On January 27, Friday, I received the Japanese SW station JHBB operating on a wavelength of 37.7 metres at 10.45 p.m., and he was still going at 12 p.m. when I closed down. I also received this station on Friday, February 3. When first receiving this station his transmission was not too good, but he seems to be improving at each transmission because to-night his modulation is perfect good loudspeaker reception on three valves. This musical item reminds you of the Chinese records you sometimes hear—very funny to listen to. Perhaps I am like your weekly SW correspondent in last week's "Radio Record," no ear for that class of music.

The Mystery Station.

I have often listened to the strange stations on 40 metres between 6 a.m. and 7 a.m., and I believe this station to be a Swedish one, his call sign being SAJ.

Last night, Thursday, February 9, at 11 p.m., I received 2FC, Sydney, SW station 2 ME, operating on 26.5 metres, and had perfect reception. This station has improved somewhat, some of the items heard were studio orchestra, some items being (Pandora) vocal (Blow Winds Blow), (I Hear You Calling Me), a speech relayed from Canberra, I think (given by an engineering president). When this speech finished I heard the announcer say very softly ("Have you finished"), and the reply was ("Yes"). In one part of the transmission they called America and Canada, and thanked those who had sent them letters in regard to above transmissions.

PCJJ comes in at good loudspeaker strength. Last Saturday afternoon I listened to KDKA for a short time, but with me his strength was not too good. He closed down at 4.50 p.m.

3LO ON 36 METRES

EVERY MONDAY MORNING

HEARD IN NEW ZEALAND.

Some New Zealand listeners on short-wave are making the practice of having 3LO music at Monday morning's breakfast!

A Melbourne writer says:—"In spite of pessimistic comments in misinformed papers, the long-distance broadcasts on 36 metres every Monday morning from 4.30 to 6.30 (7 a.m. till 9 a.m. New Zealand time) are proving the progressiveness of 3LO Melbourne, and exhibiting consistently good results. Reports continue to arrive almost every mail as to the distance covered and the clarity of the reception in almost every part of the world. If only the average suburban and country listener could properly appreciate the possibilities of short-wave reception, there would be less debating about the utility of these tests. As it is, to get down below 200 metres or so is foolishly regarded as extremely complicated.

NOT A FAD.

"On the contrary, the essential beauty of short-wave, long-distance work is, undoubtedly, that you can't tinker with your set, and so your faculties are set free to 'listen-in.' The adjustments necessary are actually fewer than many medium and long wave sets demand, but for some reason the ordinary mortal 'funks' short-wave reception, and regards it as the fad or perquisite of the inner few. This is an entirely wrong attitude to take up, and if more listeners, even though local, were to tune down to 36 metres on Monday mornings, they would undoubtedly be helping along the progress of this newest development.

"Perhaps some day 3LO Melbourne will broadcast a secret programme on 36 metres and offer a prize or so for those who correctly place the items. Meanwhile, it's not too cold these mornings at 4.30 to 6.30 to get up and practice on this new wave-length, and 3LO Melbourne would welcome reports even from nearby listeners on every aspect of its reception."

THE PUBLIC NOT PLEASED.

A Melbourne correspondent writes:—"Any comprehensive alteration of the wave-lengths such as is apparently contemplated is a serious matter. The listeners have been subjected to the annoyance of changes before, and the radio trade is likewise embarrassed. The change from the long to the short wave-lengths a year or so ago was the cause of considerable complaint. When 3LO started on 1730 metres people purchased sets with a wave-range suitable for that wave-length. The home-assembled sets—and there were many of them—were put together on the same understanding that there would be no need for any drastic alteration in the tuning elements of the receivers.

"Whatever was the cause of it, the 'long' wave-length did not last long, and the agitation for and against the alteration was widespread, but the effect of the alteration was generally satisfactory.

INTERESTING TESTS

RECEPTION STRENGTH.

Interesting experiments and tests on the strength of reception of 3LO, Melbourne, were recently carried out by Mr. R. O. Cherry, a bachelor of science. In a report on his work Mr. Cherry writes:—

"One new and important fact that has come out of the work so far completed is the peculiar effect that hills have on the field strength distribution. From a number of observations it appears that at the top of a hill the field strength is much greater than it is on the level ground at the base of a hill. In one case the ratio was nearly 2.1 on a hill 300ft. high, and effects of the same order of magnitude have been observed elsewhere. The theory of this effect is far from complete, and more observations will be necessary before the full details have been examined.

HILL POSITIONS GOOD.

"This hill effect, as we may call it, plays an important part in determining the nature of the service given to the listeners-in, since the ground rises steadily to the west, north and east of Melbourne, causing a natural increase in field strength over that normally expected. From the observations already taken it appears that it is not merely the height of a hill that determines the increase in field strength, but also its outlook in the direction from which the wireless signals are coming. Thus, at Studley Park (a suburb of Melbourne), at the top of a steep slope facing in the direction of Braybrook (where 3LO's transmitting aerial is located), the field strength is proportionately 25 per cent. stronger than it is at the top of Queen's College tower, 100ft. high, standing on ground higher itself than Studley Park."

AUSTRALIAN WAVE-LENGTHS

ALTERATIONS PROPOSED.

The idea that the Commonwealth Government proposes to alter the wavelengths of the Australian broadcast stations persists in well-informed circles in Melbourne. It is not expected, however, that any of the new wavelengths will be above 500 metres, although it is possible that some of the second grade stations will be placed below 250 metres.

Any reader contemplating the installation of a transmitter should secure a copy of "The Radio Amateur's Handbook," a valuable book dealing with the whole subject from A to Z. Copies of this publication have been difficult to obtain, but a supply has been received by the Te Aro Book Depot, Courtenay Place, Wellington, where the book may be procured for 5s., plus postage. Quite an amount of information of value to the ordinary experimenter is included.