

The "Crystal and Valve"

Correspondents in Difficulty

IN the issue of the "Record," dated November 30, 1928, was published a crystal and valve circuit with claims of superiority over the usual crystal and single-valve amplifier. Two or three letters have come to "Pentode" in which the constructors seem to be having a little trouble with the valve. Apparently it is not functioning properly in their cases, and one or two hints for their use may provide a basis for experiment for others who have constructed this set. The writer explained the construction of a set from which he has had good results but in this, and in all cases where a valve is called upon to function as high and low frequency amplifier, care has to be exercised to see that the amplifying valve does not rectify. A valve cannot rectify and amplify at high and low frequencies together. Assume the reader has the set in front of him; take out the crystal and listen with the phones. If music is heard at all the valve is rectifying. Instead of explaining why the valve is detecting, a few suggestions will be given to remedy this trouble. First increase the B battery supply, and at the same time give the correct amount of grid bias as specified by the manufacturers of the valve in use. This bias is inserted between the F—terminal on the on, the secondary of the transformer, and A—.

The $\frac{1}{2}$ -meg. grid leak can be replaced by one of 100,000 ohms or better still a high frequency choke can be substituted. The construction of a suitable choke is given in the "Radio Record" dated December 21.

To repeat the hint regarding the type of valve to use. A high frequency or resistance capacity audio valve is quite unsuitable. Preference should be given to one of the 201 A type. In general, a valve with an impedance between 6,000 to 10,000 ohms should be used, and with 90 volts B battery a $4\frac{1}{2}$ VC battery can be used. Give the grid a negative bias by connecting the F—terminal to C— on the bias battery.

By applying these few tests to the receiver, the results will well repay the little trouble and expense incurred.

Results Too Weak.

I WOULD like to know some particulars about the crystal valve set you described last week in the "Radio Record." I made it up, and followed the diagram closely, made all the wiring as short as possible, but the result was a failure. I could get 2YA all right with it, but then it was nowhere near as good as the crystal and valve amplifier; in fact, it seemed sort of half smothered and thick. As for 3YA and 4YA, all I could hear of them was the faint whistle and no more. I can't understand why the same outfit changed from one to the other should be so unsatisfactory. I really expected to hear boisterous volume from the local station for I get plenty of volume at present, using the crystal and amplifier. I can pick up the Australian stations and Christchurch weak speaker strength, so this

district cannot really be blamed for the poor result. My aerial is about 180 feet long, and 40 feet high, and well out in the open. I would very much like to make your set up, if you can tell me how and where I made a mistake, if any. I used the exact materials you specified. This set would oscillate, and the reaction was good, but—?—(C.D. McG., Wellington).

TRY tapping the aerial coil and give fewer turns, say 15 to 25; then test the valve to find whether it is working as an audio amplifier alone. Do this by disconnecting the .0001 m.f.d. condenser, short-circuiting the $\frac{1}{2}$ -meg. grid leak and turning reaction to zero. If 2YA doesn't come in at speaker strength then the trouble is either transformer or crystal. Test the crystal by listening with the phones across the P and B of primary with valve turned out. Across the secondary winding of the transformer the signal strength should be slightly less.

Assuming everything is OK, slip in the grid leak and listen. If the music is distorted or there is a great loss of signal strength, try a new leak, or, better still, substitute an H.F. transformer. Now slip in the .0001 condenser, and if the trouble recurs the valve is rectifying instead of amplifying.

There are one or two remedies for this which have been dealt with above.

Which Circuit is the Better?

"ALTHOUGH I get fairly good results from my crystal set with valve amplifier, I feel impelled to construct one of the sets described recently in the 'Radio Record.' I would use the same components for the amplifier, but would ask which will give the better results—the set described in the issue of 30/11/28, using reaction, or the double tuning system, and connected to amplifier in the usual way?"

Although the circuit employing two crystals is an improvement on the usual single detector one, the results do not equal those of a circuit in which a single detector is used with the addition of reaction. In this case probably the set employing regeneration is to be preferred as a general receiver. But if, on the other hand, the only station desired to be received comes in powerful enough to operate the detector successfully, then the full wave set is to be preferred, and will give considerably more volume from the local station.

Auckland Notes

(By Listener.)

WE have had, as we anticipated, a real radio Christmas. The spirit of good-will has come through the air to so many homes, that one wonders if those who are not listeners realise how much they are missing. Of course, Christmas Eve is a late night; crowds throng the shops, where assistants toil heroically in a vitiated atmosphere; then both classes wend their way homewards, tired, but not too tired to tune-in

and to hear the age-old Christmas music such as was broadcast from 1YA. Thus it was that thousands sat up till the clock struck 12, in tired but satisfied enjoyment, soothed by the peace of mind which the loudspeaker conveyed to them. The continuation of the 1YA programme until midnight was a splendid touch. It brought the music of the festive season to many who otherwise would have been denied it. The carol service was highly appreciated, excellently rendered as it was by Madame Mary Towsey's band of vocalists. The earlier portion of the programme was in keeping with the occasion.

CHRISTMAS morn, too, was a radio one in countless homes. Children had been awake early to pry delightfully into stockings and to play with innumerable varieties of toys. Then at 9 a.m. came Cinderella and her visitors to give a delightfully bright hour to the kiddies. All at the studio microphone seemed to exude cheerfulness, and with story, music, and greetings the hour sped all too quickly. Not the least interesting part was the conveying of birthday greetings to the many tiny listeners whose natal day was December 25. They were all remembered and called, and one can picture their delight at the occasion. Followed at 11 a.m., a relay of the Christmas service from St. Mary's Cathedral, a service which took the joyous music and the imposing ritual of the Anglican Church to homes far and wide. Thus ended Auckland's radio participation in the great day. We missed 1YA from the air at night, but Wellington was there for all valve set owners, and none would grudge the staff of the local station their well-earned Christmas respite, all too brief though they must have found it. Greetings poured in to them from many sources, and were duly reciprocated.

IN the coming days of the holidays there will be busy hours for the station staff, for the collection, arrangement, and rapid broadcasting of all the sporting news which the public craves at this time is far from a light task. Most interest centres here upon the seven days' racing carnival, and despite lack of facilities once accorded, 1YA will handle results of all races expeditiously.

THERE is every chance that the Municipal Band, the finest of its type in Australasia, will again be heard regularly over the air. Representations have been made to the City Council, and when these have been duly considered it is hoped that an agreement will be reached which will be satisfactory both to the Broadcasting Company and to the council itself. The writer can think of no more pleasant surprise for listeners during the New Year than to hear once again through their radio sets the band which we have come to appreciate in a manner that only broadcasting could make possible.

TRADE has been brisk with radio dealers during the past week—much brisker than it was at this time last year, and the body of listeners will grow as a result. It is noticeable that the crystal set is giving place rapidly to the multi-valve one. Thus the number by which licensees will increase during the month cannot be taken as a fair indication of the business done, for in numerous cases no additional license will be necessary. The ear-phones will have given place to the loudspeaker. There will, of course, be a slackener time for radio business between now and March 31, but thereafter another mild boom in the trade may be anticipated.

THERE should now be no scarcity of tried and proven radio plays, for the B.B.C. has adapted and used quite a number with most satisfactory criticisms from listeners. Among the latest presented have been "The Man from Toronto," "The Landing of the Shark," and W. H. Roberts's "Temperament."

APPROXIMATELY ten letters are received daily by the management of 2YA, from listeners from all parts of the globe. Their nature is very varied. Quite frequently two letters will come in, one 'blasting' their transmission, while the other says that it was the finest that they have ever listened to.

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