The Ideal Small Set

How to Get it and How to Work it

(BY M.I.R.E.)

Satisfactory reception does not necessarily entail heavy outlay in the purchase of a set. Excellent results can be secured from inexpensive equipment, properly managed. Here are discussed the various features of moderate priced, efficient small sets, which will give users satisfaction. It is worthy of careful study.

IN our last week's columns information of value to the Christmas shopper and to the seeker after radio programmes was given regarding the purchase of apparatus of modest value, and receivers of crystal design were discussed. Judging by the activity there has been in the radio shops this last week, there will be an additional number of licenses to swell the New Zealand total and bring it nearer the 40,000 mark. Programmes of outstanding merit are promised for Christmas and New Year week, and the country dweller's attention is specially directed towards the fact that a very nominal expenditure will permit of the purchase of a two-valve set, for instance. Complete with batteries, aerial equipment, and two pairs of headphones, or even a small speaker, an outlay of only £10 to £15 is required, and this figure will include the cost of a year's license fee.

A Modest Outlay.

A sum of £20 will enable the purchaser to install apparatus capable of bringing in 2YA, Wellington, anywhere in New Zealand on the 'phones, and will put this station on the speaker within 100 to 150 miles of Wellington. So far as the other three centres are concerned, the results will be commensurate with the power of the stations. Surprisingly effective reception is being obtained all over New Zealand on two and three-valve sets, using head telephones, of course.

It has been explained before that with a crystal set there is a limit to the number of head telephones which can be used if the receiver is situated some distance from the transmitter, and that, just as the distance at which a loudspeaker can be used with a crystal falls off rapidly, so it does with multiple pairs of head telephones in use.

If, however, a valve is added as an amplifier after the crystal, the results are very different, because under these circumstances the energy from the transmitter acts in such a manner as to "impulse" the receiver, and not "drive" it.

The energy which actually drives the sound reproducer (head-telephones or speaker) is released from the batteries attached to the valve, or, in other words, the valve acts as a relay. It will therefore be appreciated what a difference the addition of a valve makes to a crystal set, and incidentally what a difference the addition of an extra valve makes to a two or three-valve set, or even larger set. (There are limits, of course.)

Valve on Crystal Set.

The most marked difference is seen by the crystal user, however, and he quickly becomes satisfied that his expenditure has been warranted, because unless he lives many miles from a transmitting station he now has a reliable receiver and can go and switch on and get satisfactory results maintained throughout the whole programme as a result of one adjustment of the crystal. Only those who have used a crystal set for the reception of weak signals will appreciate just what a huge relief the ability to do that represents. Nevertheless, the main thing a valve does in amplifying crystal detected signals is to release enough battery power to drive a sufficient number of 'phones for the whole family to enjoy the radio instead of a single member. There is nothing more annoying to the family than to see one of their number with his eyes twinkling and a grin on, or with an angelic expression on his face, according to the style of broadcast item, while the remainder of the family is shut out. Invariably the listener is unable to satisfy the curiosity of the others regarding the item just concluded, because the next one has begun, and he's simply not going to miss it!

The addition of one or two stages of amplification means extra cost, of course.

Very few people get something for nothing in this world, and when buying anything electrical very little is purchased with very little, but a great deal may be purchased for a moderate figure.

Proper Selection.

Wise buying consists of a choice of good apparatus without paying an unnecessary amount for useless embellishments of a purely fancy nature. The crystal or small valve set prospective purchaser or owner would be well advised to pass over the cheap stuff and go for good standard lines of apparatus There are many lines offering on the New Zealand market to-day which claim all manner of wonderful performances, and the unwary purchaser is falling every day for substitutes for standard methods of doing things.

There are even substitutes for valves being seriously offered. In the case of mechanical amplifiers for crystal sets, undoubtedly claims of amplification of signal strength without valves are justified, but even with these great care should be taken to see that the tonal quality of the signals is maintained. This is not such an important consideration with the headphones as with the speaker, because tonal faults are naturally much more glaring with the latter than with the former, but the results, nevertheless, are frequently disappointing unless a good price is paid for the apparatus,

In order to definitely classify the forms of apparatus available for the purpose of consideration by prospective purchasers of modest sets, it is necessary to lay them out as follows:—

1. Plain crystal.
2. Crystal and mechanical amplifier.
3. Crystal and single valve.
4. Crystal and two valve.
5. Crystal and three valve (resistance, capacity, amplification).
6. Single valve.
7. Two valves.
8. Three valve.

Two-valve Amplifier.

The first has been dealt with in last week's issue of this paper. The second has been mentioned this week, and is recommended as a cheap way of accomplishing amplification. The writer is prepared to pass his personal opinion that the really discriminating purchaser who has the cash available will pay the extra and purchase the third or another alternative if he compares the performances of the item under consideration.

A crystal and two-valve (transformer coupled) amplifier represents the most comprehensive piece of receiving apparatus of a modest value that there is on the market to-day. The distance fiend is warned to leave it well alone, because it will never satisfy him, but for the average individual who wants real entertainment with a minimum of bother and a maximum of "cleanliness" of tone, then here is the outfit to be inquired into.

The fifth alternative, a three-valve amplifier, calls for the same remarks as have been applied to the fourth in the last paragraph. The method of amplification is different, and is of a type which invariably results in particularly distortionless results. The three valves give a total amplification which just exceeds that of the two with the transformer-coupled system of the fourth alternative.

Before passing to a consideration of the other alternatives it should be remarked that in most cases it will be necessary to purchase the various units separately, and either assemble them into a container or place them in a cupboard or on a table, wired together in working order. Such an arrangement is all right till the house-wife arrives with the duster, and then the growls of the "Three Bears" over their despoiled breakfast are simply not in it. The remedy is to purchase a machine which has the various units wired up in a single container, and there are beautifully finished and efficiently performing outfits of New Zealand manufacture now available. It is unusual for battery space to be made available in the receiver case itself, but the batteries may be easily stowed away in a corner and wires run to the receiving set itself.

Single Valve Receivers.

Single valve receivers, as mentioned under heading six, are definitely only of use for headphone reception. When close up against a transmitter.

A single-valve receiver will not perform with the efficiency of a crystal, and undistorted volume can never be forthcoming.

Of course it is more sensitive for distance than a crystal. It is a far better proposition to combine a crystal and a valve by making the valve either a high-frequency amplifier before the crystal or an audio amplifier after the crystal, using the crystal as a detector in each case. The most important consideration, however, is that the "single-valver" is either wittingly or unwittingly the gentleman who should be hung, drawn, and quartered as the chief "howler" and disturber of the peace at present. To get any sense out of a sinble-valve set, reaction simply must be used, and when the very maximum of reaction is necessary to get results the trouble begins and the "veriest expert" is just as much up against it as the most humble layman

A reaction control is really a volume control, but in contradistinction to the volume control of a well-designed multi-valve set, the more the volume control or reaction is turned on the nearer the set gets to the danger point of "spilling over" and annoying the operator himself as well as the neighbours. When reaching out for al weak tation the volume control will inevitably be moved into the danger zones. Nobody can help it In consideration of the community at large the single-valve set should receive mature consideration before deciding on it.

A Vexed Question.

This question of "howling" and consequent interference is a very vexed question, aspecially in New Zealand, where so many people consistently listen to Australian stations. It is purely a question of educating set owners to the right point of view to minimise or eliminate the trouble and attempts in this direction are due for treatment in this column. Nevertheless it is obviously the duty of every person to take this question into very serious consideration when purchasing. It is only necessary to point out to the average citizen that a certain style of equipment will cause trouble to influence him into giving it a wide berth. Even the most self-centred, prospective purchaser must appreciate the fact that he is due to give himself some consideration in this respect.

Two-valve Sets.

The two-valve set is not as dangerous from the point of view of interference as the single valve, but is an offender.

A two-valve set will give loudspeaker signals close in to a transmitter and will give good 'phone signals elsewhere.

The user should understand, however, that he is a potential source of interference to other listeners, and it is to his own and the community's interest to always exercise the very greatest care in working his equipment.

There is one infallible method of knowing whether a certain receiver is "howling," and that is to vary the tuning control, and if a continuous "howl" is heard, or if the frequency on note varies as the tuning is varied, then the set is out of adjustment. In any case, if a set is oscillating or "howling," a breathing noise will always appear in 'phones or speaker, and the set will become ultra-sensitive to static or electrical interference. Received signals will always be blurred, and blurring will always become emphasised if the tuning is altered slightly, and this blurring will finally end up in a "howl," the note of which will alter with a movement of the tuning controls.

Adopt the slogan coined by the British Broadcasting Company in an endeavour to clean up this trouble:

"Don't do it!"

So far as the three-valve set is concerned, there is little cause to recover ground already treated in these columns. It is only necessary to point out that this is the ideal receiver for the person who requires maximum results, measured in entertainment and in terms of minimum expenditure.