Notes for Beginners: *By M. I.R.E,*

Important Advice on Purchase of Sets

In various issues this column has discussed features of consequence to be observed—not only in the purchase of a multi-valve set, but also the performance to be expected of general types of equipment. In the last issue the question of choosing a speaker was dealt with, and the importance of using a type of producer which would be at least in keeping with the quality of apparatus it would be connected to. The speaker was shown to be of equal importance with the receiver.

This same consideration can be shown to be applicable to the other units constituting the "accessories" necessary to put a machine into operation. The loudspeaker, nevertheless, takes place of prime importance, and its performance at maximum efficiency bears a definite relation to the design of the valve it is coupled to in the last stage of amplification, or "output" valve of the receiver.

Seeing that the correct design of valve must be used in the last stage of the receiver naturally in order to get satisfaction, this fact directs attention to the other valves in the receiver, and the natural question is as to whether the other valves should be of any particular design. This is certainly so because there are really very few multi-valve receivers which are not designed by the manufacturers for valves with certain characteristics Such a statement is liable to cause the average individual to come to the conclusion that radio after all is a very involved subject, and best left alone because of its complexity.

THE MOTOR ANALOGY.

Such is not the case. To return to the inevitable motor-car, which is such a valuable object for making an analogy when discussing any matter of mechanics. There are very few motor-car owners who can intelligently discuss the different makes of carburettors, vacuum tanks, or designs of balloon tires, etc Every car-owner naturally has a perspective of the subject, and can swap experiences with other car owners. When purchasing, or in days of trouble, he relies on the car distributor's garage, or service was for his expert advice. Of course, all sorts of wild claims are made by the inevitable inventor, who turns up periodically like the proverbial bad penny, usually with a claim for a petrol-saving device that doubles the miles per gallon.

The radio world has precisely the same experience to show to the set owner or prospective purchaser, and the confidence of such people is invited towards the radio trader as being capable of handling his special worries providing the dealer consulted is a recognised agent for the apparatus in question. The crank is always about who has a cure for static by putting up barbed wire for an aerial, for instance, and also there is another type (and he has many pals to keep him company), who, for sake of politeness, we shall say is afflicted with imaginitis, but should be classed with Ananias

It is not the purpose of these articles to enter too highly into technicalities, consequently the question of valve design with regard to receiver types will receive sufficient popular consideration to convey a perspective rather than a description likely to confuse a layman.

THE NEUTRODYNE RECEIVER.

Undoubtedly the most popular type of receiver to-day, is the neutrodyne, as it has been for two years or more. A neutrodyne is a receiver which employs a lay-out and connection of component parts such that certain undesirable features found in multi-valve receivers of earlier design are eliminated or 'neutralised" out. In other words, extreme simplicity of control is obtainable without any inefficiency attached to the elimination of multiple controls and ability to control the separate functions of the receiver separately. Now, a receiver is neutralised when built to take a certain type of valve and the use of other types may readily put the receiver out of adjustment. The distributor or dealer who supplies the set will know what make of valve is demanded. Furthermore, the receiver itself will invariably carry a specification with it in the form of a book of instructions, which will give all the necessary information.

The super-heterodyne type of receiver in practically all its forms falls under the same heading as the neutrodyne, and its efficiency becomes seriously impaired if the manufacturer's specifications are not adhered to.

The effect may be likened to the carburettor of a car, which can be accurately adjusted to give maximum performance providing a certain grade of petrol is used, and other factors remain constant. If an inferior grade of petrol is used, obviously the efficiency of carburetion must be impaired.

It may be definitely stated that there is a type of valve to suit every style of set, and this type of valve will always be recommended by the manufacturers of the equipment. Naturally, there are many makes of general purpose apparatus, which will perform in an average fashion with any type of general purpose valve, but the final finishing touches to the performance of a receiver can only be obtained by having the right type of valves in the right valve sockets. Strong signals may be obtained from distant stations, but a sacrifice of tone will probably result without the correct valves. Distortion will certainly result when a set adjusted for distant reception is tuned to a strong local station, unless a power valve is used finally to feed the speaker and unless the tuning dials are thrown out of adjustment in order to cut down the moment of amplification used. Of course, the filaments of the valves may be dimmed, but if this is carried too far, distortion will again result. Again, if the design of filament resistance in the receiver is suited to another type of valve, the resistance may dim too quickly to get the required adjustment or the other extreme may be met with and the filament resistance be incapable of causing any dimming because the valves are not passing enough current to allow the filament resistance to break down the voltage from the filament battery and cause dimming to take place.

The remedy again is simple. There are plenty of people, both in the trade and out, who have extraordinary performances to talk about, and nearly every one is dependent on some reputedly simple alteration which can be carried out by anybody to standard equipment. Do not be misled into thinking that the manufacturers of standard equipment do not know what they are doing. If such simple alterations would cause such wonderful results, these features would have been included in the design of the machine. Too many people have the impression that radio apparatus gets quickly obsolete and that new discoveries are being made every day which should be applied to a receiver continually to bring it up-to-date. This is not so. If not satisfied with the performance of an equipment, write to the agent, distributor or manufacturer, and get his advice. If such advice is not convincing, then get information elsewhere, but do not make any changes, however slight, to the set without hearing the agent's point of view respecting the proposed alterations.

Owing to the fact that radio goods have now become well established as marketable products in New Zealand, overseas manufacturers' agents have poured apparatus of all sorts of quality into the country. The valve manufacturers have not been slow to push their lines, and to-day there are at least a dozen brands of valves selling in large quantities, whereas even twelve months ago there were probably three well-known makes. It is palpably impossible for rude remarks to be made in this column concerning the quality of a lot of the valves offered, but the prospective purchaser cannot go wrong in purchasing the valves recommended by the manufacturer of the receiving equipment in use. The agent or distributor may not necessarily recommend the type of valve selected by the manufacturer, but reliance may naturally be placed on his advice, because the alteration proposed is probably being recommended because of local conditions warranting such a change.

THE TYPES OF VALVES.

The question of types of valves to be used is a most important one, in view of the claims being made by those responsible for distributing them. There is such an array of brands, types, and sizes available on this market that it is bewildering enough for the professional, and it is no wonder that the layman is at a loss to make up his mind. The report may be heard that somebody had a set fitted with valves of a certain type, and these were replaced with a set of valves of another type, with the consequence that all sorts of wonderful things happened. Perhaps there is another technical explanation of why these wonderful things happened, and although the results might have been due to the valve replacements they need not necessarily be attributable to the valves themselves, because it is quite possible that artificially strong signals may be obtained which are damaging the transformer or by-pass condensers in the set and will lead to eventual trouble, and these stroug signals are due to an adjustment having been thrown out In a case where extra volume has been obtained, invariably the tone will have suffered.

THE IMPORTANCE OF TONE.

Sweetness of tone combined with reasonable volume spells satisfaction to the set user. Sweetness of tone may be sacrificed bit by bit by replacing parts of the equipment with presumably superior performing gear. One day, however, the experimenter realises that his search for distant stations, or more volume, has put his set into a condition which is far short of what it was when he first got it. On restoring it to its original connection he is astounded to find that his "improvements" have been very interesting and amusing to himself and very annoying to the family and friends who had been compelled to listen to the clicks, groans and howls from the loudspeaker, but he had got nowhere, except perhaps to learn that the manufacturer of his equipment apparently knew what he was about when he designed the set after all.

Mainly About Construction

(Continued from Page 12.)

Charging B Accumulator.

G.T. (Levin).—It will not take much over a unit a month to charge the B accumulator for reception of daily broadcasting. Double-wave valve rectification is more economical and satisfactory than chemical methods. For the latter the electrodes should be kept small, and two cells are preferable to one, as the extra one adds a certain amount of necessary resistance, and also helps to clean up the rectification.

Lead peroxide for positive and litharge for negative plates. If peroxide cannot be obtained, ordinary red lead is a substitute. These are separately mixed into a stiff paste with dilute sulphuric acid of battery strength.

Rheostat Query.

G.T. (Levin).—If your rheostat appears to give no more current when full on than when only at starting-point, it seems to indicate that its resistance is too low. A 30-ohm rheostat is suitable for a P.M.3. In working these dull emitters filament voltage should always be kept as low as possible, to give required volume. After a certain point no increased volume is gained by increasing voltage, and the life of the valve is shortened.

Charging A Battery.

C.S. (King Country).—The solution of salt and water is useless in a chemical rectifier. A strong or saturated solution of ammonium phosphate is the usual liquid. Before charging the battery, the plates, which must be of ample size, must be "formed" by running for an hour without the battery in circuit. As you are charging an 80 amp-hour A battery, the greatest care will have to be taken to see that the rectifier does not get overheated, as if the temperature of the liquid rises above 70 degrees Fahrenheit, its rectifying properties are impaired, and therefore the amount of current passed must not be too large, and then the rate of charging is slow. "Megohm" does not consider it very wise for an inexperienced person to attempt to charge an A battery with a chemical rectifier. With a suitable double-wave valve and correctly wound transformer there is no risk.

AN EXPLANATION.

Sometimes in making up this page the printers fill up a space with a conveniently-sized short article or paragraph sent in by other contributors. "Megohm's" attention has been drawn to such a "fill-up" that appeared some time ago headed "Plus or Minus?" In this article there is given a method of finding the "polarity" of alternating mains, which is, of course, absurd. Whoever wrote the paragraph in question apparently meant to discriminate between the earthed and unearthed mains. "Megohm" mentions this matter because at least one inexperienced reader has been misled by it whilst trying to solve a transformer problem. Extraneous matter is now excluded from the constructional page as much as possible.

WATCH YOUR BATTERIES

When a receiver that usually is efficient in selectivity and distance work fails to perform in its customary way, look first of all to the "A" battery If it has become discharged it may have enough current to light up the filaments of the tube, but not enough to force off sufficient electron emission to work a distant, weak signal. Discharged "B" batteries will also produce the same effect. Locals may come with apparently the same volume, because the energy from these stations is so great as to overcome the deficiency of the batteries, but the weak distant signal will be lost. Low batteries also broaden the tuning of the best and most selective receivers.

POLISHING THE CABINET

When the cabinet or console becomes dull or scratched, the original finish is best restored by the use of polishing wax commonly used for polishing automobile bodies. Furniture polish generally has little body and soon evaporates, leaving the cabinet in the same or worse condition than before. The polishing wax lasts indefinitely, and protects the varnish against further scratches.

Bakelite panels and dials can also be brought to a high polish by the wax, so that an old dull panel will appear brighter than new. Only a very little wax should be used on the bakelite, as an excess gives a smeary appearance that is difficult to remove by any amount of rubbing.

FADING TEST FINALE

A letter has been received from a reader residing on the Taranaki coast north of Waitara, complaining of fading of 2YA and 3YA. Reception of 1YA, over water, is not affected by fading. There are peculiar conditions around Taranaki that affect reception over the land in that district. This correspondent regrets being unable to send in a fading report. "Megohm" has for the present no interest in further letters on the subject. Listeners were given an opportunity of registering all their troubles regarding reception and these have been fully dealt with. Some who were unable to send charts, wrote their own report and in many cases these were very useful. Our correspondent could have done the same, but it is now too late for letters of this nature to be dealt with.

The work of investigating the reports has been a highly interesting task, and has shown that apart from a certain amount of dissatisfaction at the marring of reception by atmospheric and other causes, there is a vast amount of goodwill between listeners and the Broadcasting Company, and a keen appreciation of the programmes put over the ether by 2YA.

ART OF SOLDERING

There is quite a knack in soldering but it is acquired with a little practice.

When soldering a joint, hold the tinned part of the hot iron against the wires to be fastened, and then apply a little of the solder to the wire. The solder will flow over the wire, and, if the iron is then removed, the excess will be removed by the iron. Use the convenient wire-solder which has a rosin core. This rosin core first flows over the joint to be soldered and removes the oxide; the solder then flows upon the clean wire. If ordinary wire solder is employed, a little flux must first be applied to the joint, and after this the solder. Rosin flux should be used because it is non-acid and does not continue to act on the wire after the soldering process is completed. Acid flux sometimes leaves green deposits on the wire, and often is responsible for "noisy joints." The rosin flux takes a little time to do its work and the iron should be held on the joint until the solder "flows" on the wire. When the iron is removed, the joint is not completed until the solder visibly sets or "freezes." The process is really easy after one tries it a few times.

When a three-circuit (primary secondary, and tickler windings) having fixed coupling (the coupling is determined by the distance between the primary and secondary windings) is constructed, the builder has to choose whether to place the primary and secondary windings close together (tight coupling) and get good volume of music but poor selectivity; or to place them farther apart (loose coupling) and get good selectivity but not so much volume The best placing of the primary and secondary will have to be found by experiment, because the proper degree of coupling depends, to a great extent, on the nearness to powerful broadcasting stations. Either volume will have to be sacrificed for selectivity, or vice versa.