

The Multi-Valve Receiver

Little Alteration Probable

from Present Type

(By M.I.R.E.)

RECEIVING AUSTRALIAN PROGRAMMES.

Dealers have recently been inundated with requests for assistance where owners of five-valve sets have been unable to hear Australia. In this article "M.I.R.E." shows why such reception is difficult at present, and indicates the improvement which may be expected as the summer advances, and the longer evenings bring about better reception conditions. At present, owing to daylight saving, there is a difference of two and a half hours between New Zealand and Australian time, this making conditions very difficult for the receiving set. Failure to receive Australia at present does not indicate any fault on the part of the set.

THE THREE-DIAL RECEIVER.

There have been no revolutionary alterations to multi-valve receivers during the last year, although minor improvements tending towards greater simplicity in operation have been effected. The three-dial receiver is still the standard, and the public can rest assured that there is little likelihood of radical change as far as the average-priced set is concerned. It should be emphasised that single dial control, while undoubtedly giving more simple operation, does not increase the efficiency of the set. It is highly improbable that there will be any big price reductions within the next few months, and prospective buyers cannot therefore do better than purchase now. They will save money, for the effect of the recently-increased duties will be to raise the cost of multi-valve sets.

OWING to the Christmas season and the consequent intense buying activities of the public, it has been necessary to break away from the programme laid down for this column and deal briefly with the purchase and operation of crystal and small valve sets, owing to their popularity amongst the majority of this month's shoppers. This week it is accordingly proposed to pick up the threads of the original discussion and revert to points of interest in connection with receivers of a general multi-valve design, and sets having three valves or more will be the consequent centre of interest. The attention of prospective purchasers who are considering an early decision to buy in January is especially directed to the subject matter of this discourse.

SUMMER RECEPTION.

First of all the trade are being inundated just now in the service calls as a result of a complete failure of the average five-valve set to bring in Australian stations. It should be realised that in mid-summer nothing but the most powerful equipment will accomplish this at this time of the year, where the receiving locality is average or below the average, in its receptivity. This is very largely because New Zealand is two hours and a half ahead of the eastern States of Australia, owing to daylight saving. The 8 p.m. programme from Australia, therefore, commences at 10.30 p.m. New Zealand summer time, and at 8 p.m. in Sydney or Melbourne the sun has scarcely set, and it is still comparatively daylight across the Tasman Sea. It is generally understood by laymen that radio signals on standard broadcast wave-length carry infinitely better during the night than the day, this phenomenon being due to a damping effect on daylight transmissions primarily due to the presence of the rays from the sun.

Under ordinary circumstances summer time is not a suitable season to expect distance searching to yield much satisfaction, but with another hour of daylight signals to the west are that much worse off, while those coming from the east, although that much better off, are still at the disadvantage of the adverse seasonal conditions.

LONGER EVENINGS.

If a multi-valve set has apparently been gradually becoming less sensitive, do not attribute it to anything else than a gradual falling off in actual signal strength unless in possession of other

facts which would seem to definitely point to trouble. The longest day was experienced on the 21st of this month, and the days will be commencing to get shorter from now on, with a corresponding increase of signal strength (both during the day as well as at night, but principally the latter) as the sun moves further north again.

Set owners are, therefore, assured that there is no necessity to imagine that the set is a dud, and is wearing out, or that something equally alarming is in the air, but give the dealer or service man an opportunity to discuss things over the telephone for instance before dragging him out on a fruitless and (to him) expensive quest. If you think the set requires a look-over, then be prepared to defray his expenses and time, and it will be found a good investment, because the dealer will always be found an invaluable help in keeping the equipment not only in good order and condition and working up to "concert pitch," but also equipped with all the latest fittings of interest and benefit to the set-owner.

Now, with regard to multi-valve receivers, it is proposed to discuss in a purely popular and general fashion the main types in service on the New Zealand market to-day.

MULTI-VALVE TYPES.

All multi-valve receivers take relatively the same theoretical form, and consist of an aerial tuning device attached to a valve, and then either more stages of valves with intervening coupling arrangements for tuning purposes, or else with small sets, a detector valve, followed by further amplification of the "detected" or audible electrical effects. These latter consist of at least one, but usually two, stages, and sometimes three stages, of "audio" amplification.

This sounds complicated, but is not if the reader will simply imagine a row of gadgets and picture to himself first the aerial, aerial tuning controlled by a dial, next a valve, then another tuning arrangement, another valve, another tuning arrangement, then the detector valve, next a coupling "audio" transformer, another valve, another audio transformer, then the final valve (usually a "power" type), and lastly the sound reproducer or loudspeaker. Such a receiver represents a standard five-valve set, and may be accepted as a standard design on the New Zealand market. Up till a few months back the three tuning arrangements in this receiver were independently controlled by separate dials, and for a long time the most familiar mental picture of a

radio set carried in the minds of the public consisted of a cabinet with a black panel in front, 3 dials, and a couple of small knobs for control purposes. Later designs of receivers have now arrived, with one or two controls operating all the tuning arrangements simultaneously, and the controls are small knobs turning handsomely engraved drums, having figured calibrations which show through a window and are sometimes illuminated by a lamp.

TECHNICAL EFFICIENCY.

So far as technical efficiency is concerned, this new departure is a questionable improvement. Ease of tuning is undoubted, but engineers are very much of the opinion that had the original designs been adhered to, costs of production would have been so reduced as to bring a multi-valve receiver of really reliable manufacture and good quality performance, within the reach of the average buyer. It is very nice to be able to go to a set and twist two knobs to a certain position in order to tune in a certain station. It was just as easy to get the same station with the older method, once the station was picked up and the dial settings recorded.

The new style is undeniably handsome, but it is a fashion in the main, and that is the sum total of it. These remarks are being frankly penned in support and defence of the many thousands of sets in commission to-day in New Zealand of the older design. Users of this equipment are getting the impression that their sets are obsolete and are not as efficient as the newer models. This is definitely not the case. The writer is an avowed three dial set-owner, and can assure three dial set-owners that he does not intend to part with his own equipment of the same design until something more revolutionary than the present fashion comes along. Sets

of three or four years ago rewired slightly to take a power valve in the last stage are all that is required, and their performance leaves very little to be desired.

There are many makes of receivers of the typical three-dial variety still being sold. A lot of these can be obtained at a lower price than the standard retail price, because owing to the change in fashion the dealers are quitting their stocks. Prospective purchasers should have no hesitation in taking advantage of this condition of affairs to get a multi-valve set. Once again, however, it is necessary to warn prospective purchasers only to buy sets of standard recognised makes, so that service and spare parts will be readily obtainable through the dealers from main distributors or manufacturers. An older style of set of a make selling readily and well known on the market to-day is quite a safe proposition.

"SHIELDING."

A question which exercises the minds of many people to-day is the exact use of "shielding" or the placing of sheet-metal round individual stages of radio-frequency amplification in such a way as to completely envelope the complete stage. Shielding was primarily introduced for the purpose of preventing out-of-balance effects between successive stages of amplification when the orthodox five-valve set of last year (previously described in this article) was increased to 6 or more valves, necessitating 4 or more stages of tuning. For technical reasons, in order to still maintain relative simplicity of control, with multiple stages, shielding was introduced and immediately became the fashion, with the result that an erroneous impression has got abroad that no set is complete without it. For six or more valves this impres-

sion is well founded, but for five or less valves it is wrong. All manner of wonderful things are attributed to shielding incidentally, and most of them are purely mythical or merely sales talk. Actually shielding causes inefficiencies which are only warranted in six (or more) valve designs because more is gained in the end through the ability to use more valves with stability of operation and thus obtain a greater ultimate amplification. With five valves or less total shielding causes the same inefficiencies, and these outweigh anything picked up by virtue of shielding having other virtues.

TREND OF DESIGN.

This discussion must not be misconstrued into an attack on the present developments in receiver design. The trend of development is inevitably towards shielded simply-controlled models having an appearance of a gramophone or article of furniture and adaptable to power socket operation. There is every reason from a technical, as well as a commercial standpoint, for the introduction of these principles. It is just a pity that the price of such equipments will be higher than models of six months or a year ago, because a five-valve set on an average aerial certainly gave satisfaction even to distance fiends.

Christmas shopping is now over and New Year purchases are being made. Take advantage therefore of the circumstances disclosed in this discussion to become numbered among the multi-valve users, bearing in mind the fact that there are many sets still available which were landed just prior to the recently-announced tariff regulations, and that once these are sold, the selling price of newer models will be vastly increased if only because of increased duties.

EXHAUSTED VALVES

HOW TO REVIVE THEM.

A common cause of failure in modern wireless receivers, and one which the average listener seldom suspects, is the failure of the valves (writes "3BD" in the Melbourne "Argus"). A few days ago a friend asked me to look at his set to see why it was not working. After making an extensive examination of all the equipment, and testing all the batteries, I subjected the valves to a test and found that the filaments of several of them were exhausted. Although the dull emitter types of valves have practically revolutionised wireless reception in the last few years, they are subject to the insidious trouble of filament exhaustion without the filament actually breaking or "burning out." The operation of the dull-emitter valve depends on the inclusion in the filament of some substance—usually the element thorium—which possesses, to a minor degree, the essential properties of radium. The presence of this substance in the filament will cause it to emit a dense cloud of electrons, which are the electrical units conveying the current through the valve between the plate and the filament at a much lower temperature than that at which an ordinary untreated filament will produce an electron cloud of equal density.

SHORT-WAVE BROADCASTS

ENGLISH INDIFFERENCE.

A Melbourne radio writer says:—"One cannot help feeling that the success so far achieved from the British Broadcasting Corporation's short-wave broadcast station 6SW was distasteful to the British Broadcasting Corporation. His conviction is made stronger by the half-hearted efforts which have been made in Great Britain to relay Australian programmes, and by the fact that one of the finest programmes from 2PC, Sydney, which has ever been relayed in Great Britain was cut off in the middle on the pretext that it was fading. Until the problem of establishing an Empire service is approached with a little more courage and enthusiasm by the British Broadcasting Corporation Australian listeners cannot expect much success in the relaying of British programmes from local stations. In contrast to the stand of the British Broadcasting Corporation, it is interesting to note that extensive improvements and extensions are now being made to the Dutch station PCJJ, owned and operated by the Philips Co. It is reported that the station will be working again

shortly, and that extensive experiments on many different wave lengths will be begun at once. Moreover, an entirely new station for PCJJ, which will be far more powerful than the present one, is being built, and it should be working in May, in time for relaying in the winter from Australian stations.

MAN-POWER SIGNALS

FROM AUSTRALIAN INTERIOR.

Progress towards the solution of the problem of providing effective communication between isolated points in the interior of Australia and more settled areas is promised by the new wireless equipment which has been designed for the Australian Inland Mission authorities. The development of short-wave communication a few years ago provided the key to much progress in inland communication, because short-wave equipment will give good service with much less power than is required to cover the same distances using an older long-wave station. So far, however, difficulty has been experienced in producing a practicable power plant for short-wave transmitters for use in the

interior. The method now being adopted is to use man power to work the sets, a small high-tension generator, driven by suitable hand-turned gear being employed. Where plenty of native labour should be available, this method seems quite an effective one. It is by no means new, as similar equipment was used for military purposes before the war. In those days it was found that a more suitable arrangement than the hand-operated generator was a generator attached to a frame resembling a bicycle frame, and operated by pedals. Not only was this system less of a strain on the person operating it, but it was found possible to use more powerful equipment and to obtain a steadier current output when the bicycle-frame generator was used.

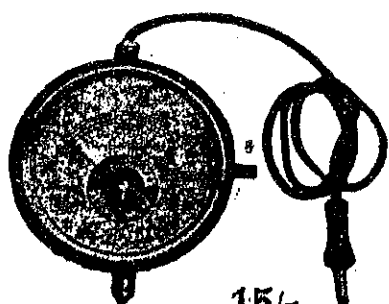
The fourth edition of Scott's annual Radio Handbook is to hand. The publication embraces a wide range of useful information to broadcast listeners, amateur transmitters, and others interested in radio. There are circuit diagrams of the most popular design and constructional details, which should make a strong appeal to home-builders.

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