NOVEMBER 1933

AMATEUR RADIO

AND BROADCAST MONTHLY.

240-B CLASS B BATTERY AMPLIFIER
STATION DESCRIPTION
VK AMATEUR NOTES

6D.

AMATEUR RADIO and Broadcast Monthly

Published Monthly for Experimenter, Listener and Constructor.

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Contents

Experimental Activities

KNOWLEDGE is a limitless, immensurable quantity, for the art of printing has enabled us to accumulate the total knowledge of many individuals. To acquire sufficient knowledge to permit one to live, the law insists that each and every normal individual shall spend several years of his early life at school, where a rudimentary knowledge of many things is imparted by experienced teachers. If one's knowledge was restricted to this limited amount life would be a very dull affair — a mere existence in which one lives to eat, and does not eat to live. Then there is knowledge obtained by self-instruction, and what a vast limitless store it is ! upon which, within the limits of our mental capacity, we all can draw without restriction.

An experimenter, in no matter what field of research, is a seeker after knowledge which has not yet been revealed to man. In the field of radio investigation there must be not less than 50,000 experimenters, so-called and licensed by national laws to operate radio transmitters and receiving equipment. Of these, what proportion justify the appellation "experimenter," and how many are virtually seekers after knowledge by the process of self-instruction ? Under the latter heading we may include mutual instruction by co-operative effort, where it exists.

This condition of affairs was quite in order some years ago when there was plenty of unoccupied space in the ether, but today we are approaching saturation in those portions of the spectrum which have been found to be most useful. We might ask the question "Is the seeker after knowledge entitled to inconvenience his neighbour ?" We all are agreed that he is not; but listening on some of the amateur bands leads one to think that apparently might is right.

The position cannot continue indefinitely, and ultimately the stronger forces will overcome the weaker — a fundamental law of Nature.

There are many profitable avenues for research open to all experimenters, and which do not cause the slightest inconvenience to anyone else — in fact, the converse is true, for it may be that discoveries will be made which will have a beneficial effect on the human race.

It is part of our policy to endeavour to effect co-operation amongst Australian and New Zealand experimenters, to protect their just and reasonable interests, to place on record useful items of knowledge and to endeavour to indicate, from time to time, in what direction research and experimental work can be usefully applied. Every genuine experimenter can rely upon our assistance, no matter where he may live or to which club he may belong.

Contributions are invited but no responsibility is accepted for M.S. being returned if not suitable for publication.

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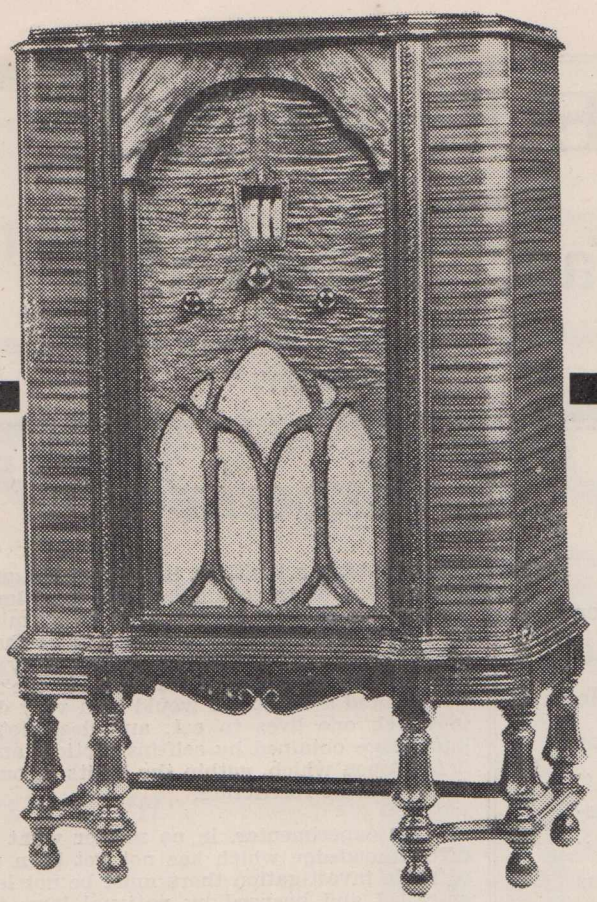

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11 WATT STREET, NEWCASTLE —— KEEN STREET, LISMORE —— ELIZABETH STREET, BRISBANE

Two Watts Output from the
240B Class B BATTERY AMPLIFIER

The Latest Development, Simple, Economical and Efficient

By A. ALEXANDER

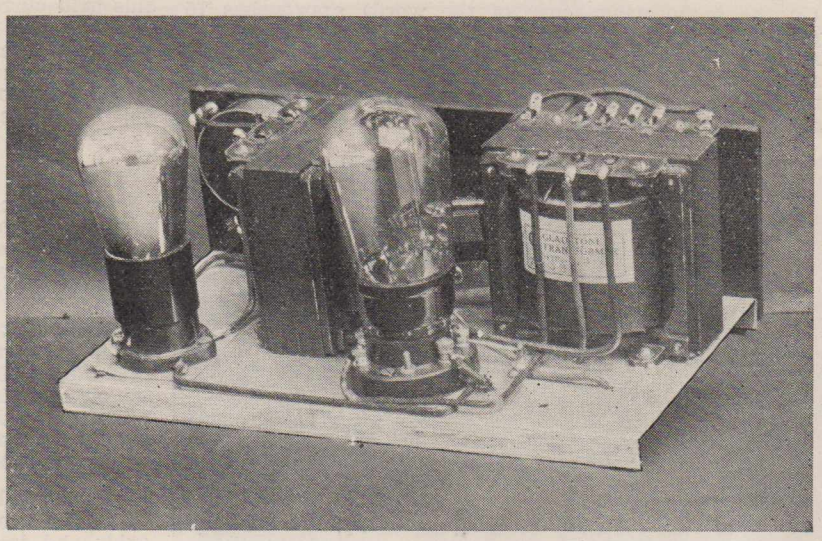
NOW that efficient and economical superpower valves of the 2-volt battery type have been produced —and in this direction the British manufacturer leads the field — all of the advantages and none of the disadvantages of the all-electric receiver are available to those who have, of necessity, to use battery-operated receivers.

When the electrically operated A.C. receiver was first introduced commercially it became popular immediately, due to it being self-contained, easy to instal, cheaper to operate and better performance, as far as volume was concerned.

Naturally there were exceptions, but these applied in general to the average commercial set. I myself had a battery superheterodyne fitted with triodes throughout, which still outperforms most A.C. supers, while a small Stromberg four valve self-contained portable will tune-in interstate stations without any external connections, and free from the noise which is characteristic of the average A.C. sensitive set. The battery super required two large size 45-volt B batteries every three weeks and the A battery consumption was 2½ amperes at 6 volts, the power output being about 1½ watts when driving either a big Western Electric or a Magnavox speaker. It had wonderful sensitivity, volume and quality, but it was rather expensive. Today, by using the newest battery valves, operating costs would be but a fraction of the original. There were many very fine battery sets sold a few years ago, and as they are still in use, and must of necessity remain in use, it would be advantageous to bring them up to date. With very little trouble and at very little cost they can be modified to give volume equal to that of all-electric sets and at the same time reducing the cost of battery maintenance by two-thirds. Then again we have the portable receiver, much appreciated by its owners, but generally neglected by the radio trade as a whole.

With these new valves radio dealers have a wonderful opportunity of extending their business, while buyers can now obtain a portable for the car or for the weekend which is at least equal to their larger A.C. home console.

After listening to one of these new battery receivers fitted with a Class B amplifier this opinion is confirmed and at the same time one is impressed with the wonderful improvement in the tonal quality of the reproduction. It is even better in many respects than that of an all-electric instrument, which no matter how good it may be has a light background of electrical noises, the strength of which varies and which is very noticeable when receiving distant stations. For long distance work the battery receiver has always been preferred because of its quietness in operation, and now that the volume has been raised, it has been given a new lease of life. One of the good features of this form of amplification is its amazing economy in high tension batteries, as the average high tension current has been reduced to the vicinity of 10 milliamperes. This means that instead of three weeks life from B batteries one can expect to use them for from six to twelve months. In a superheterodyne the radio frequency valves consume a portion of the current, the amount depending, in the case of variable-mu valves (R.F. penthodes) upon the operation of the volume control, and the degree of sensitivity required. It should be understood that the addition of a Class B amplifier will not effect any improvement in this part of a receiver, but owing to the excellent quality together with high gain, some sensitivity can be sacrificed, thereby effecting a further economy in high tension current.



The amplifier is very compact, and though small will make itself heard.

Valve design is never at a standstill, and just as the R.F. penthode has superseded the screen-grid valve for high frequency amplification, so it would appear that the Class B valve is about to replace the single battery type amplifying valve in all but the cheapest receivers. The reason is obvious for, the volume and reproduction being equal to that of an A.C. set, the usual grouse of the battery set user — that he must be contented with only mediocre power output unless cost of operation is unimportant — is disposed of once and for all.

AMPLIFIERS.

Up to the present two main forms of L.F. amplification have been available to the battery set user. That generally used is the ordinary Class A system in which the output valve is biassed to the mid-point of its characteristic curve. In this case the D.C. anode current drawn from the battery is steady and does not vary with the strength of the signal applied. Furthermore, the maximum input voltage which the valve will accommodate is limited by the fact that no grid current must flow at any instant. The largest commercial power valves normally used in this form of amplifier had an output of around 1¼ watts and as they drew 40 milliamperes from

the high tension battery they were somewhat expensive to maintain. The second system is a hybrid pushpull arrangement, known in England as Q.P.P. Here two valves are used in the output stage, and both of them are biassed sufficiently to very nearly cut off the plate current when no signal is being received. Under this system the anode current drawn from the high tension battery is not now constant but varies in a manner roughly proportional to the strength of the signal received. Again the capacity of the valves is limited by the fact that no grid current must flow, but nevertheless the system is a good one and has been used quietly in this country for many years, and is used today in at least one high-grade commercial instrument. Under certain circumstances this system is the best, and its efficiency (in the engineering sense of the word) approaches 75 per cent. As the greatest efficiency of the standard Class A amplifier used in all A.C. sets and in previous battery sets is only 50 per cent at best (usually it is about 35 to 40 per cent) it will be appreciated that the Q.P.P. system has its merits.

This is the input transformer — actual size.

In the Class B system, another form of pushpull amplification, the limitation due to grid current considerations does not exist, as the double valve is designed to operate with positive grid bias. The output therefore is limited only by the physicial size of the valve in its electrical sense — such as filament emission and size of its elements.

In addition the anode current drawn from the high tension battery is proportional to the strength of the signal received. The physical characteristics of the Cossor 240-B valve, kindly supplied for this amplifier by Mr. Charles Maclurcan, are such that it provides an output of two watts, with a peak anode current in the vicinity of 9 milliamperes. Such an output is of course equal to that of a large A.C. set and better than a good many commercial A.C. sets. Now for normal operation an output of about ¼ watt is sufficient for home use, so that the average plate current will be much less than this — about 5 milliamperes is the usual value — but the valve can take care of loud passages of music without distortion or without making any alterations or adjustments to the set. As the signals increase in strength so the valve draws more current and produces more power automatically. It also uses power in its input or grid circuit, the current in which may reach 2 or 3 milliamperes. Were it not for this fact the efficiency of the valve would be about 98%, but as the grid current is a loss of energy its efficiency is in the neighbourhood of 80% — quite a remarkable figure for any man-made device.

The input transformer must be designed to withstand this grid current as efficiently as possible, and the resistance in this part of the circuit must therefore be kept to a minimum. This current also imposes a load on the primary of the transformer and upon the preceding valve, so it is apparent that these two units must be built to suit the operating characteristics of the Class B valve.

THE DRIVING VALVE.

The driving valve must be capable of supplying the power lost in the secondary of the input transformer, which if distortion is to be negligible should have good regulation, and the D.C. resistance of the secondary should not exceed 300 ohms.

This point is of great importance, and if it is adhered to no measurable distortion whatever is introduced at this stage. Except for the design of this transformer the circuit otherwise is simple and presents no difficulties. The driver valve is connected as a low frequency amplifier of the conventional type, preferably resistance coupled to the detector or preceding stage.

The signal voltage to be supplied to the grids of the Class B valve (this valve has one common filament, two grids and two plates) across the full secondary of the driver transformer may rise to 40 volts peak. At this point the lowest impedance is offered by the grid circuit of either half of the Class B valve. In the case of the Cossor 240-B and 220-B type valves, this impedance is about 2500 ohms, and owing to the fact that only one half of the secondary of the driver is in operation at any moment, the effective minimum load into which the driver valve works is 10,000 ohms if the ratio of the primary to full secondary of the driver transformer is one to one.

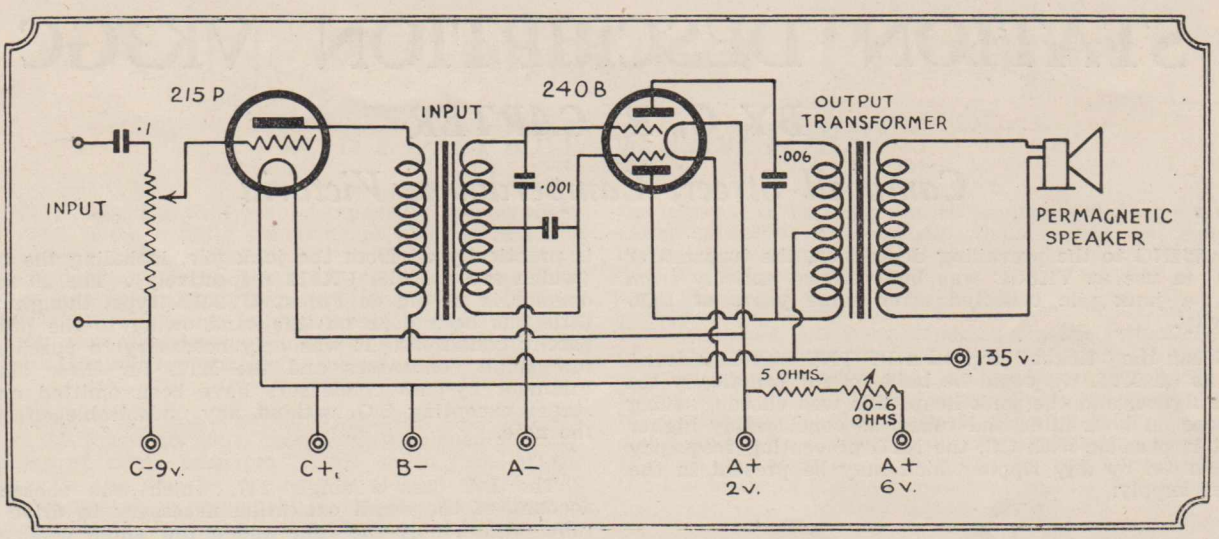
The energy which has to be supplied by the driver valve at this moment is about 70 milliwatts, as will now be apparent. So we first have to select a driver valve which will give this output with the lowest high tension current consumption. This output can be given easily by a Cossor 215-P type valve biassed at —9 volts and with a plate voltage of 120 volts its steady plate current will be about 2¼ milliamperes.

THE INPUT TRANSFORMER.

This is the valve recommended for use as the driver, using a driver transformer with an overall ratio of 1 to 1 —the secondary being centre tapped, giving a ratio of 2 to 1 primary to half secondary. If transformers of higher ratio are used then a different driver valve must be selected in order to get the necessary driving power. For a 4 to 1 transformer the driver valve might be a 210-LF.

We have sufficient data to design and build the input transformer, and as I have described the method on previous occasions it will not be again detailed at present. It is not sufficient just to wind the correct number of turns on a generous core. The inductance of the primary must be high under working conditions, and there must be a minimum leakage inductance and core loss.

The transformers which I designed for this amplifier



The circuit diagram.

have split primaries and secondaries, somewhat like those described by Keith Jones on page 12 in this issue (in fact they were built by him), thus ensuring low leakage inductance, while the cores are made from fine stalloy and are over one square inch in cross section, the core loss being negligible. The D.C. resistance of the windings is less than 200 ohms. The unit is really a power transformer and the illustration reproduced herewith is actual size. The size is also affected by the gauge of wire to carry the current and to ensure low resistance, and by the number of turns necessary to give the correct impedance of 10,000 ohms. Both of these are determined in the manner familiar to electrical students.

THE OUTPUT TRANSFORMER.

It would appear from an examination of the valve's dynamic curves that the impedance of the primary of this transformer should be about 2000 ohms, but as only one half of the primary is active at the one instant a multiplying factor of four has to be introduced, giving a plate to plate load of 8000 ohms. It will be seen that the primary so far as the number of turns is concerned is just a shade smaller than that of the driver transformer. The comparatively low load of 8000 ohms is of great value in output transformer design, both as to efficiency and cost, and a smaller unit could have been used. As however this was built for use subsequently with a pair of 2A3's, it was made large enough for high power work. It has a tapped secondary so that it will match the impedance of the voice coils of the several different brands of loudspeakers, which vary from 2 to 15 ohms. Readers who are looking for good equipment could use this high grade unit for general work, for it also matches a single penthode, a pair of 45's in pushpull and a pair of 46's or 59's in Class B, and will accommodate any brand of dynamic speaker.

CONSTRUCTION.

This amplifier is so simple to build, provided the correct components are used, that the beginner can put it together without any trouble. The amateur, of course, will not need any instructions.

Those who have no A.C. supply available will find this unit to be an ideal modulator.

No details are given for building the two transformers owing to the necessity for specialised training being of paramount importance. Machine winding, oven baking, the use of special transformer varnish, quality of wire, and technical knowledge all affect the quality of the finished product.

The circuit is perfectly straightforward and is arranged to follow the output valve in a radio set or a microphone amplifier. As a modulator this unit will be particularly useful to amateurs who have to use batteries for their transmitters. A certain amount of tone correction was found necessary, as recommended by the valve manufacturers. This is effected by two small condensers (.001) across each half secondary of the input transformer and a .006 across the primary of the output transformer. If these are omitted the reproduction will sound a bit rough.

Only good grade B batteries should be used — not due to current drain, but because they must have a low internal resistance. Generally, B battery eliminators cannot be used instead of batteries without the addition of an additional device which will stabilise the voltage; but of this more anon. If an eliminator is used then the full output may not be obtained. A plate potential of 90 volts will give good volume and good reproduction but less output.

The usual precautions regarding insulation should be observed. If meters are used to check its performance and output it is advisable to protect them with instrument fuses — just as a precautionary measure. Other types of loudspeaker can be employed, and if one of the magnetic type is used, it should be connected in series with two .25 mfd. condensers across the primary of the output transformer, leaving the secondary disconnected. If the dynamic speaker is to be worked further away from the amplifier than four or five feet, then the output transformer should be mounted on the loudspeaker.

Just before closing it might be mentioned that the more tone control is effected before the Class B valve the greater will be the economy in high tension current.

THESE ARE THE PARTS REQUIRED :

1 — Aluminium Chassis.
1 — Seven-Pin (Special), 1 — Four-Pin Socket.
1 — 5-ohm Resistor } for 6-volt accumulator only.
1 — 6-ohm Rheostat }
1 — Stepdown Input Transformer (Class B).
1 — Output Transformer.
Condensers — One .01, two .001, one .006.
1 — .500,000 ohm Potentiometer.
10 Terminals (insulated type).
1 — Two-volt Accumulator.
3 — 45-volt B Batteries.
1 — Permagnetic Dynamic Speaker (Note: This speaker can be obtained fitted with the special Class B Transformer).

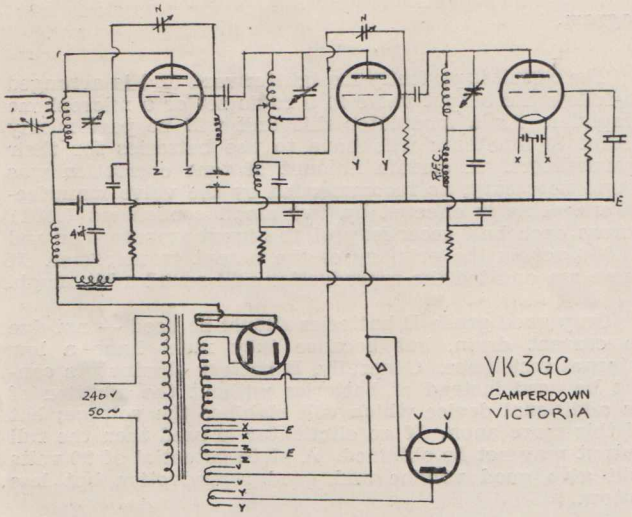
STATION DESCRIPTION VK3GC

BY G. R. CARTER

Campbell Street, Camperdown, Victoria

OWING to the prevailing depression, the transmitter in use at VK3GC was built almost entirely from a junk pile collected after some years of BCL activity.

When the "ticket" arrived a PP-TNT was considered, but as an XTL rig could be built up for practically the same figure, and the junk heap, this was chosen, saving expense on both filter and tubes, as considerably higher input is possible with CC, the XTL preventing frequency modulation by any ripple which may be present in the power supply.



The rig is built into a frame with four shelves and normally uses three stages, but a fourth is available for use on 20 mx when required.

The power supply consists of a 500-0-500 transformer with 5 and 2½v. windings, which was on hand, 4-volt windings for the 4v. tubes being added. A 280 rectifier, 30 henry choke and 8 mfd. of filter condensers.

As the choke has only a low rating it was thought advisable to have a maximum of filtering on C.O. and doublers; the current for PA does not pass through it, but is only filtered by the 4 mfd. condenser on the input side of the choke.

A 2 mfd. condenser assists in filtering the supply to each doubler and C.O., and as these are also of a low rating they are connected at the low voltage end of dropping resistors. The resistors used are of the 2-watt type and no trouble has been experienced due to overheating. The only components that did not come from the junk box for this unit were a 280, the necessary resistances and a 4 mfd. 1500v. test condenser.

The next tray holds the keying tube, bias batteries, etc. BCL key click qrm was experienced and an old 245 was pressed into service in order to overcome this trouble. This was quite effective and since installation no further trouble of this nature has been noticed.

Thi third tray holds the C.O. and doublers. This unit is practically all from the junk pile, including the tubes (which are a B406, UX112 respectively). The 20 metre doubler is an old de Forest UV201A type, though very little has been done on this band owing to the present patchy conditions. It was only necessary to purchase a few small condensers and the XTL for these stages. Filament by-pass condensers have been omitted on all stages excepting C.O. without any undesirable effect on the note.

The PA uses a single 247, which was chosen on account of the small excitation necessary to drive this tube. Again only the tube and a few small condensers had to be purchased.

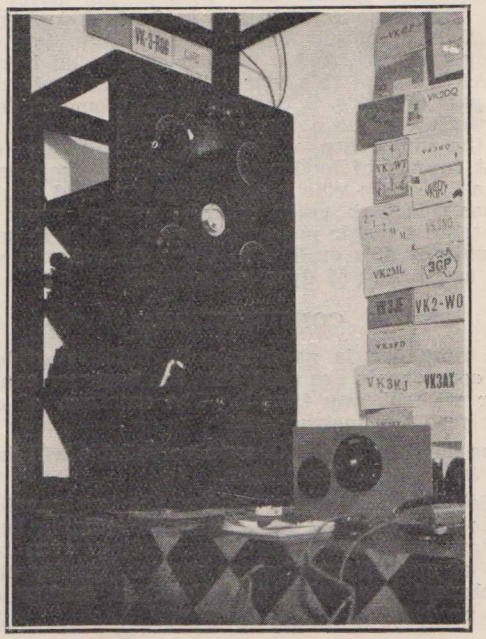
The total outlay for the transmitter was only of the order of £3, all sockets, variable condensers, wire etc. being available in the junk box, as well as the C.O. and doubler tubes.

The receiver is an ordinary Schnell detector and two audio using A415's and a 409, battery operated.

The antenna is a full-wave 40 metre Zepp and is used also for the receiver, a double pole DT switch being used to throw the ant over to receiver and also connect filament supply.

While this station has only been on the air a short time good reports have been received from all W, EAR, G etc., with an input of 25 watts.

In conclusion, although the whole station has been built from the gear lying around the shack, it has given the owner every satisfaction and has been a great pleasure to operate, being quite reliable without any tricks.

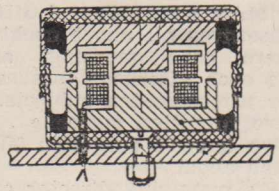


A New Condenser Principle

BY ALFRED SCHNEIDER

UNTIL recently the radio components were considered to be definite construction and fundamental improvements were believed to be out of question. The development of the Ferrocart coils by Hans Vogt however, has shown that there is still a wide field open for new discoveries and improvements and we may be sure that the new development thus initiated still will disclose various other surprising new things.

Starting from this conviction besides the research work re the Ferrocart coils, Hans Vogt developed a tuning condenser of novel principle. Same as in case of the tuning coils, the variable condensers did not suffer from any fundamental improvement since the beginning of radio technique. True the losses in the condensers are practically eliminated by using air condensers, however, these condensers are large and expensive and therefore cannot be used for cheap one and two-stage sets, rejector circuits and the like. The hard paper condensers on the other hand, which now are used for these purposes produce considerable dielectric losses and thus will increas the damping and reduce the selectivity and sensitivity.



This is the actual size of the Ferrocart coils referred to above.

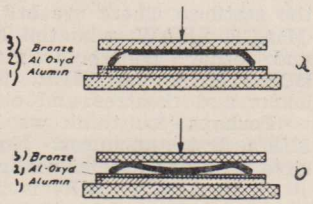


Fig. 1.—The principle of the new Vogt flat condenser. 1, Circular stationary electrode of aluminium; 2, Special low loss dielectric material; 3, Elastic counter electrode of bronze; 4, Press plate of insulating material; Stage A, Initial position — minimum capacity; B, Intermediate position —increased capacity.

Hans Vogt therefore undertook to create a small and cheap variable condenser with very low losses. The new principle will be seen from Fig. 1. A circular stationary electrode of Aluminium (1) is covered with a very thin layer of a special dielectric material (2) which is produced electro-chemically on the Aluminium plate after a special process. The dielectric layer thus produced is very hard and thin and in particular has very low dielectric losses. Opposite to the stationary electrode an elastic electrode of bronze (3) is arranged two opposite edges of which are bent down to the stationary electrode. Now when pressing down the press plate (4) by a sort of angle lever effect the medium part of the elastic electrode is first approaching the stationary one so that the increase of capacity is accelerated. When further pressing down the plate (4) only the remaining portions of the elastic electrode are moved down and the further progression of the capacity takes place more slowly accordingly. By properly choosing the curvature of the elastic electrode, the increase of capacity can be so arranged, that a quadratic capacity characteristic that means an equally divided wave length scale is resulting as shown in Fig. 2.

Regarding losses the new condenser is almose identical to an air condenser especially in the critical range of the shorter waves, the two electrodes are in the position of maximum distance and the condenser is practically acting as an air condenser; only with longer waves, when the plates are in close face to face position, the solid dielectric is of influence at all. As explained, however, it likewise has very low losses and by the curves Fig. 3 the low losses of the new condenser will be demonstrated.

The new condenser is not suitable for multistage sets, at least, in its present form it is difficult to be ganged in mass production. Hans Vogt is however working further in the matter to make it fit for this purpose too. Anyway it is the ideal condenser for one and two stage sets, for rejector and selection circuits and for reaction and coupling condensers, in other words, for any purpose, where ganging is not necessary.

Fig. 4 shows a practical execution of the new principle.

The Commercial Development of the Ferrocart Matter in Great Britain.

Readers will be interested to learn that the Ferrocart raw-material in future will be manufactured by the General Electric Company. Considering the progress in radio coil design, involved in the use of this material, the English radio trade will appreciate to be able to buy British material and to save the import duty.

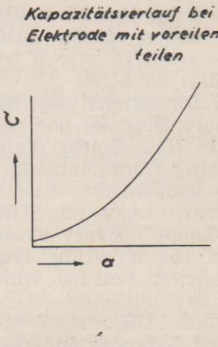


Fig. 2. — By properly choosing the curvature of the elastic electrode the quadratic capacity characteristic shown above is resulting, meaning an equally divided wavelength scale.

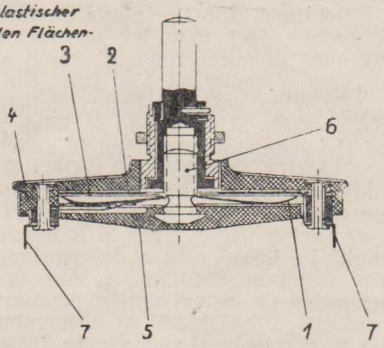


Fig. 4.—Practical execution of the new condenser: 1, elastic bronze electrode; 2, Stationary aluminium electrode; 3, Insulating casing; 4, Movable cover.

Continued on Page 27

2UE, the Pioneer Broadcasting Station

AND SOME REASONS FOR ITS TREMENDOUS POPULARITY

By ISABELLE GRACE

"All the world's a stage,
And all the men and women merely players——"

SO WROTE Shakespeare. Perhaps the fundamental truth in these words is the reason why the majority of radio listeners (and there are over half a million license-holders in the Commonwealth) love a good broadcast play. Realising this, 2UE has made one of its biggest features the broadcast of plays chosen so as to cater for a wide variety of tastes. This does not mean sensational melodrama, for the average man and woman enjoys such productions as "Lady of the Camellias" from the famous novel by Dumas, "The Monkey's Paw" by W. W. Jacobs, and "Mata Hari," to mention only a few.

LIONEL LUNN is the man who directs the New 2UE Players, and the success of his productions is sufficient proof of his capabilities. The enterprise of 2UE was recently emphasised when the management decided that 2UE listeners should not only be given the facility for listening to first-class plays, but should also be afforded the opportunity of writing plays themselves, should they have the ability.

A Radio Play Competition was inaugurated with prize-money amounting to £50. Entries were invited from interstate and overseas listeners, and conditions were cut down as much as possible.

Anyone was eligible to enter, and adaptations could be submitted, although preference would be given to original scripts. In next month's issue we hope to have the pleasure of giving you an interview with the fortunate winners of this Radio Play Contest. The 2UE Players themselves are headed by those two very well known personalities, Chandra Parkes and Mayne Lynton, supported by other well known radio performers including Ronald Morse, Victor Gouriet and others.

CHANDRA PARKES is not only a versatile character actress, but is also responsible for the writing and adaptation of a number of the plays that are produced. MAYNE LYNTON has appeared in many J. C. Williamson plays and has also produced "My Old Dutch," etc., in Sydney.

So much for the plays performed by the New 2UE Players. And now let us review some of the other avenues of entertainment which are open to you if you possess a radio set and turn the dial to 2UE.

Sporting enthusiasts are catered for extensively, and as a result 2UE is said to have more than 80 per cent of the listeners interested in sport in New South Wales.

HARRY SOLOMONS, 2UE's Racing Commentator, is only young, but he knows his job backwards. Just at present, we may mention, he is very busy on 2UE's own racing paper "The 2UE Form Guide." Every Friday night he broadcasts a description of the wrestling from the Balmain Stadium, a new broadcast feature which promises to be extremely popular.

DON BRADMAN is a member of 2UE's staff, and he is certainly the one man to keep listeners informed about cricket doings. A recent letter received from L. W. Watts, Round Mountain, Murwillumbah, reads: "I have listened to, and enjoyed immensely, the talks given by Mr. Don Bradman from your station, 2UE. When I state that *I* have listened, I should say that every cricket-lover in the district has visited our house at some time or other to either listen to Don or inquire about what he had to say. Therefore, I am only voicing the appreciation of all the cricket enthusiasts of our area. It may seem strange to you to know that we tune in to 2UE when we are only eighty miles or so from the Brisbane stations, but nevertheless this is so. I am not the one to throw bouquets; still, I must say that 2UE is far the best of all stations both for volume and clarity."

Other all-round sporting men on 2UE's staff are SI MEREDITH and S. B. GRAVENALL. The latter was coach last season for the N.S.W. Australian Rules team.

The "Man Outback" is supplied with advice concerning pastoral and agricultural matters by C. HONEYFIELD, who works in conjunction with the Agricultural Department. An expert from the Agricultural Department speaks every Friday night at 8 o'clock. For instance, W. B. Gurney, entomologist, will speak on "Fruit Fly and its Control" on November 10, and N. L. Jones, supervising architect, will deal with "Silos and Fodder Conservation" on November 24.

AGGIE is the bright person who conducts the Early Morning Session from 6 a.m. onwards, and the Hospital Cheerio Session, commencing at 3 p.m.

SI MEREDITH is M.C. at the 2UE Old Time Dances, reads the serial each day, and is Uncle Si beloved of the small listeners. Of course, we mustn't forget Ambrose, who is punctually in the studio at 5.30 each night for the children's session, in which he assists Uncle Lionel.

And now a word about the women announcers on the station. There are MRS. MAY FILMER and MISS GRACE SHAW, who tell housewives all about cooking and other household matters each morning, and DOROTHEA VAUTIER, who each afternoon discusses books and theatres and other afternoon-tea subjects.

Perhaps you think we have forgotten someone . . . 2UE's first announcer. No, we haven't forgotten . We have an extra special paragraph about him.

C. V. STEVENSON is 2UE's managing director and was formerly well known on the air as "Uncle Hughie." Mr. Stevenson was granted the first B class license in New South Wales, and with Mr. Murray Stevenson (his son) has been wholly responsible for the technical side of the building of Station 2UE. He is a man of untiring energy, and even with his managerial duties can still find time, occasionally, to act as an announcer. When Aggie toured the North Coast with Don Bradman and 200 schoolboys, Mr. Stevenson personally conducted the early morning session.

There has been an addition to 2UE's announcing staff in the person of Mr. NORMAN BARNES. Mr. Barnes, besides possessing a pleasing speaking voice, is also a brilliant baritone, and was a gold-medallist at the City of Sydney Eisteddfod. He has appeared in leading roles with the Mosman Musical Society.

2UE's listeners are as widespread as they are enthusiastic. A special session dealing with "Calls to Distant Listeners" is conducted each Saturday night from 9 o'clock onwards, the calls interspersing the dance programme which is presented by REX SHAW's Orchestra.

One letter, for instance, comes from Minnesota in the United States. It reads: "This Tuesday morning at 4.13 a.m., our time, I was lucky enough to be able to pick up your wonderful station. The programme was coming in very clear, and at times with very much volume. I suppose to you this is 'just one more listener in the States,' but to me it shows that when a station cares to, it can be heard at a distance of more than five thousand miles away."

2UE News in Brief.

Sid Haines, interlocutor at the 2UE Old Time Minstrel Show every alternate Monday, was a member of the original Fisk Jubilee Singers.

Continued on Page 27

PROFITABLE INVESTIGATIONS FOR AMATEURS

By A. ALEXANDER

No. 1.—A Protective Device For Stone Crushers.

As the foundation of our modern civilisation is its system of communications, any device, either mechanical or economical, which will improve this system in any way is of interest not to any one nation or group of individuals but to every nation, and to every civilised being. Possibly seventy five per cent. of all patents issued to date affect communication undertakings in some way whether they be by sea, road, rail, telephone, cable or radio, but there are still plenty of improvements to be made. In Australia alone there are thousands of tons of rock, limestone and basalt used for making roads, for concrete and for railway ballast. This material is quarried, broken up into pieces so that it can be carted to crushers where it is crushed into smaller pieces according to the use to which it is to be put. Without going into details of the crushing and grading processes we can find at least one weak link in the chain which increases the cost of production and at times disorganises the whole system. When the material is blasted away from the quarry face it falls in large blocks which have to be broken up into smaller pieces called spawls. These are loaded either on drays or lorries or direct to a belt conveyor which carries the spawls to the battery of crushers.

Unfortunately hammers, steel wedges and even crowbars are loaded along with the material and find their way into the crushers, with disastrous results. Although the jaws and mantles of the crusher are made from the hardest of manganese steel, they are not able to digest steel, and therefore something breaks. If the main spindle should fracture bang goes £100 and the hammer or wedge is only worth a shilling or two. Naturally the owners and executives are not at all pleased and the staff are enjoined to at all times be watchful and careful to see that this does not happen. Now this lowers the efficiency and reduces the output of the plant and notwithstanding all this, hammers and wedges and the like still find their way into the crushers. In one large quarry a huge electro-magnet was installed, as an experimental device, directly over the conveyor belt to pick out any steel or iron pieces which had found their way amongst the spawls and smaller rocks. While this was effective the cost of operating this magnet was too high an insurance against damage and was therefore dismantled.

This is the problem which still remains to be solved, and the successful inventor is going to make some real good money, not in shillings but in thousands of pounds.

Here is one possible solution.

If we surround the belt with a small coil of wire and connect to the wire an oscillator, what will happen just as soon as a piece of iron passes through the coil? Obviously the inductance of the coil will be changed, as will be the frequency of the oscillator. This change can be utilised to operate an alarm signal and if necessary cut off the power from the motors driving the conveyor. Possibly instead of a coil of wire we could use a condenser, consisting of two plates one below and one above the belt. In this case may be we can even dispense with the oscillator. It should be appreciated that the best device is that which is the simplest, cheapest and most robust. It must be infallible and must not give too many false alarms, if any at all. Furthermore, it must not need the services of a skilled operator; and it must be automatic and so designed that it can be switched on in the morning and switched off when work finishes. It will have to do this five days every week and, having to operate under all weather conditions, will be exposed to sun, wind and rain. Another condition is that, as an electrical device, it must be safe, so that it could be touched externally without risk of a serious electric shock. Again it must not radiate its energy too far and so cause interference to radio reception. All-electric operation would be preferable but not necessarily essential; if battery operated it should not require constant adjustment to compensate for voltage drop as the batteries age. The problem obviously is not one that can be solved in five minutes, or even mathematically, otherwise I would be drawing the profits. All the necessary experimental equipment is on hand at most amateur workshops and the conditions can be set up on the floor of the shop using a piece of canvas and a shovelful or two of assorted stones (not ironstone) bluemetal or coke.

If any experimenter is successful we will be pleased to show him how to obtain patents and will introduce him, or maybe her, to the parties who are now interested in the purchase or lease of the invention for their own use. While this service is available to all readers naturally subscribers have preference. While we would not wish to know details or secrets of the invention, we would want to be sure that it was effective in order that neither our time nor that of commercial interests would not be wasted unnecessarily.

Until the next problem is presented in detail, here are a few headings which may give experimenters some ideas of solutions of still more problems.

Automatic colour selection and grading.

Detection of spurious coins.

A temperature control sensitive to small changes in extreme heat and cold.

A reliable portable transmitter-receiver with a range of fifty miles, and using British tubes.

A device for destroying bacilli.

A device for seeing through fog, mist or clouds.

The preservation of foodstuffs supplementary to or without refrigeration.

The detection of hidden flaws in steel girders, rails, tubes, rods and the like.

Secret communication.

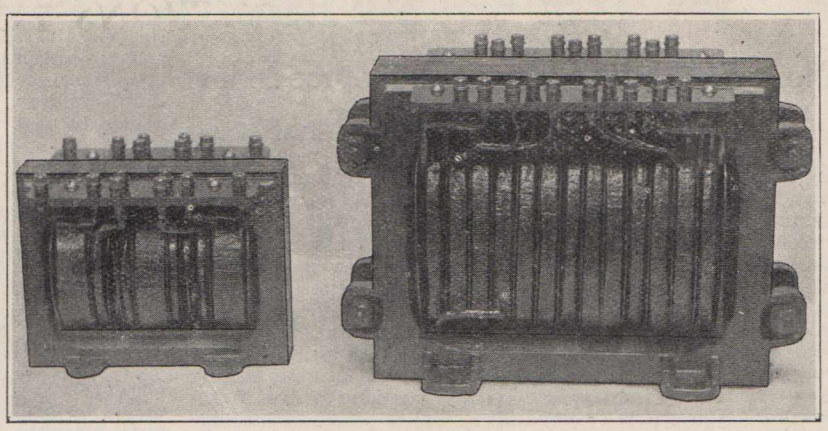
Detonating explosives electrically by wire, and by remote control.

The experimenter who is lucky enough to find the solution to any of these problems will soon be on the road to prosperity; the fifth, sixth, seventh and eighth in the above list are worth millions, particularly that dealing with foodstuffs as there are quite a number of foods which cannot be frozen without deteriorating the food.

In addition to these problems we have those peculiar to radio itself but in this case it is necessary to differentiate between inventions, self-instruction, and re-inventing something discovered or forecasted by mathematicians many many years ago. In any case we wish all experimenters the best of luck, and thank all readers who have written to us about this aspect of radio experimental work.

We frequently receive letters from experimenters who appear to have gained such a knowledge of the technique of Radio Science that they feel that they are in a position to undertake a serious investigation into practical problems which are awaiting solution. The only obstacle from their point of view is that they are not aware of the nature of the problems which are capable of solution with the equipment at their disposal, hence their requests for the assistance of our technical staff. As this is an excellent idea, it is proposed to state in these pages as a regular feature some investigations which can be profitably undertaken by the amateur experimenter.

High Efficiency Power Transformers *for the* Amateur Transmitter



By Keith H. Jones.

Power transformers, which are to have their output rectified and filtered, should be designed and constructed with this in view. A secondary that is balanced perfectly in regard to its position on the core and its relative position to the primary, also balanced in resistance, and in shape, and in size (both electrically and mechanically), will help, to a great extent, the full wave rectifier and filtering circuits to do their job in producing a D.C. that is free from ripple as much as possible. Another feature of balanced winding is: that the life of the rectifying tubes will be considerably prolonged due to the equal load always placed on each tube, or (in the case of full wave tubes) on each half of each tube.

To obtain best results, "pie" winding of the secondary is absolutely necessary, which can be wound either separately and insulated one from the other, or layer wound side by side, making each pie a replica of the other. In the former method, of which an example is pictured with this article, the primary can be layer wound on first and the secondary pies fitted over the finished primary, or primary and secondary can be both wound in pies and fitted in some regular and balanced manner.

The latter method is to layer wind the full primary on first, then layer wind the secondary sections side by side, the width of each section being determined by the number of pies and the margin between them. From the efficiency standpoint, pie winding of all windings and interleaving the primary with the secondary is by far the better design.

All pies must be so designed that the *peak* potential that will be induced in them will be at a safe level to ensure of no break-down of insulation between primary and secondary, between layers, or between all windings and frame. The peak voltage would be 1.414 times the R.M.S., but will peak to a much greater extent at the closing or opening of the primary circuit. In high-tension transmitting transformers this is a very important factor.

Transformer regulation is another feature that must be considered, especially in transformers that are to be subjected to intermittant or varying loads. In the case of transmitting transformers that are to be used for telegraphy, it is advisable to have a separate filament transformer as the drop in potential of the output, due to keying, and thus pulling full load, also drops the potential of the filament windings of the rectifying tubes just when the filaments should be at their brightest if the filament windings are incorporated with the plate supply. To obtain good regulation, a core of ample cross-sectional area should be used, and of all designs, the fully enclosed core with all the windings on the centre leg, is most efficient. Also the windings must be correctly designed. Too many turns per volt for the cross-sectional area, will result in over saturation of the core, bad regulation, and efficiency. Whilst inadequate turns will result in a quick rise in temperature with disastrous results. For the turns per volt, no more than 50.000 line per square inch should be allowed for silicin steel. The ignoring of the frequency of the A.C. is another reason for bad regulation. The lower the frequency becomes the lower the inductance and consequently the required reaction is too low.

Pictured with this article are two transmitting transformers. The smaller is the filament supply having a primary 240-250v. at 50cyc., giving four lots of 5v. at 4., and one 6v. at 4a. C.T. All pie wound. The plate supply has a primary 240-250v. at 50cyc., and a secondary that is wound in four sections (2 pies to each section) giving 535v. R.M.S. each side of C.T. The arrangement of the pies in this case is as follows:

|prim|sec|sec|prim|sec|sec|prim|sec|sec|prim|sec|sec|prim

Each pie is taped, varnished and baked, and separated one from the other by 1/32in. bakelite.

The method of rectification with this outfit is by the use of two 280's (plates in parallel) on each section using an input choke of 20h. Thus each section is being rectified and filtered separately and wired in series giving 1,500v. D.C.

In the selection of material, cot-enamel covered or double cotton covered wire is to be preferred for a life-long job, but enamel covered can be quite satisfactorily used if correct insulation is used between layers and the design is such as to allow for the use of it. Impregnation should be thorough and varnish should penetrate right through each coil. This is for holding each layer, (in fact, each turn), rigid so as to eliminate humming of the finished job and any movement of the turns, as well as to make the coils moisture proof. Only the best stalloy should be used for the core.

SOME AMERICAN IMPRESSIONS

By CHARLES FORREST.

Managing Director, International Radio Co. Ltd.

THE World Fair is the best thing that Chicago has ever known. Six months ago it was the most stricken city in the United States. Today it is the most prosperous city in the country — simply because of the money that is being spent all day and every day by the visitors to the Fair."

So said Mr. Charles E. Forrest, founder and managing director of the International Radio Company (importers of National Union Valves and Jensen Speakers), and one of the most successful men in the radio game in this part of the world, to a representative of the "Radio Record" this week. Mr. Forrest, who originally started in Wellington, but later sold out and established his business in Sydney, has just returned from America, where he spent a considerable time visiting the principal cities.

"It is estimated that there are half a million visitors daily to Chicago for the Fair, and that each of them spends on an average 10 dollars a day. Total that out for yourself over 6 months and you'll guess why the Chicago people are looking on the Fair as a gift from Heaven. Every railroad company, too, is helping the scheme along by offering return fares from any part of America for a single fare plus sixpence, on condition that the traveller returns within 10 days.

"The Fair itself is wonderful. It is designed to show a century of American progress, and various courts show the advance of science and transportation and so on. There are no goods for sale —except hot dogs and beer—but many manufacturers are reporting better business as a direct outcome of the Fair. The radio sets being displayed are very much the same as the sets that are being sold in Australia today.

"Television ?" Mr. Forrest smiled. "There's not a radio firm of any standing in America today that is selling television kits or parts. One or two of the B class stations are playing round with it, and the attempts that I saw were pretty crude. It's bound to come, of course, but, surprisingly enough, it may not be in the hands of the radio people when it does. More money is being spent by the film industry than by the wireless, and the banking house of Pierpont Morgan is working in with several talkie magnates on the perfection of television.

"But Roosevelt is the man that America is looking to. Until he started beating things up with his National Recovery Administration nobody cared a damn. The country was so near to revolution that it didn't matter, but in a few short months all that has been changed. Hundreds of department stores throughout the country were not paying their assistants any wages — just commission on sales. Roosevelt stopped all that. 'Pay them commission if you like,' he said, 'but you've got to pay a living wage, too.'

"In the radio industry wages have increased 50 per cent. I know of one little town in Indiana that was paying the workers in a radio manufacturing factory 10 to 20 cents an hour. The makers were able to transport the sets into the big cities and more than compete with the large manufacturers who were paying their employees 25 to 30 cents an hour. But all that has been changed — wages have been brought to a basic level and, while the big concerns are faced with a 50 per cent wage increase the little 'gyp' outfits like the one in Indiana find their wage bills increased 200 to 300 per cent.

"The N.R.A. is going to have its effect on Australia shortly — American goods will go up in price, radios probably about 25 per cent. Until the act came into force there wasn't one radio company in America that was working at a profit. They were not losing 100,000 dollars a year but millions. Any firm in America selling below the cost of production today is liable to a heavy fine, and its principals to imprisonment. The Radio Manufacturers' Association, which is a concern absolutely representative of the whole of the trade, has produced figures to show that not more than five per cent of the total American output is exported to the whole world. From this it can be seen that Roosevelt's legislation is far reaching, and that his policy of no-sales-below-production-costs will have a beneficial effect on the makers of 95 per cent of the sets sold.

"Roosevelt is out, too, to clear America of its gangsters. He has organised the Federal police to stop the kidnapping menace which has grown enormously in the last few months. Since these police have been on the job many of the biggest kidnappers have been put safely behind the bars.

"Was there a story in the papers here about a big shooting in Kansas City ? It appears that a well known gangster was being brought in by train with five police officers in charge of him. The train arrived at Kansas at mid-day and the man was being taken to a waiting car when a machine-gun from a nearby car opened fire, killing the five officers and the prisoner. The ordinary police weren't able to trace the criminals, but the Federal police caught them in ten days."

MR. CHARLES FORREST TALKS ON THIS AND THAT

It is estimated that 25,000,000 *people will have paid to see the World Fair before it closes at Christmas.*

The film "Cavalcade" is still drawing crowded houses in New York.

Six to ten pounds is the average cost per head for an evening at one of the more select of New York's night clubs.

Charles (Buddy) Rogers, formerly a well known film star, is running a night club in Chicago. Mr. Forrest was charged 8/- for two bottles of ginger ale at this club.

Living in America is about twice as dear as in New Zealand. One pound a day is an ordinary charge for a hotel bedroom and bath — and there are no meals thrown in.

Anybody with a good English voice can get a job at an American broadcsating station.

Travelling by aeroplane in America is as cheap as travelling by train — and about four times as fast. The train takes twenty hours for the New York-Chicago run, a plane four and a half hours.

ARTISTIC RADIO FURNITURE

(By courtesy of Beale & Co. Ltd.)

The Radio Cabinet has grown up. It has developed from an uninteresting, inartistic, stained, turned-leg monstrosity into a fine piece of furniture that typifies sheer beauty in line, figure and lustre. Beautiful speciments of high grade cabinet work in Queensland Walnut, Queensland Maple Blackwood, Satinwood, English Burr Walnut, are to be seen at the new showrooms of Beale & Co. Ltd., who are responsible for this transformation, and to whom we are indebted for information on the subject of artistic furniture.

TREES AND TIMBERS

AUSTRALIAN CABINET WOODS

TREES are like men. Heredity, environment, circumstances, are causes which differentiate one man from another. No two are ever just alike. Similarly, one tree differs from another because of variation in environment, soil, climate, culture. Apart from distinguishing family traits, no two trees are ever really twins. It is this diversity in Nature, this variety of habit, verdue and fruitage, which constitutes the glory of the forest and intrigues our mutual admiration.

There is an unwritten biography in the heart of every tree. Something akin to tragedy and adventure, joy and sorrow, are interwoven in its life experience as it yields its boughs to the vicissitudes of the seasons. The ruthlessness of winter and the desolating drought, not less than the benediction of sun and shower, have recorded their indelible impress upon the tapestries of its heart. Beauty and strength have been won at the cost of its life-struggle.

Some of the loveliest effects in figured timbers are due entirely to climatic causes. Australia, with its variable climate—tropical in certain regions, with extremes of cold and heat in others—has been richly endowed by Nature with beautiful and decorative timbers.

The timber resources of our country have been classified into not less than 5000 different varieties—grouping themselves principally under two categories:

(1) Constructional Hardwoods; (2) Cabinet woods.

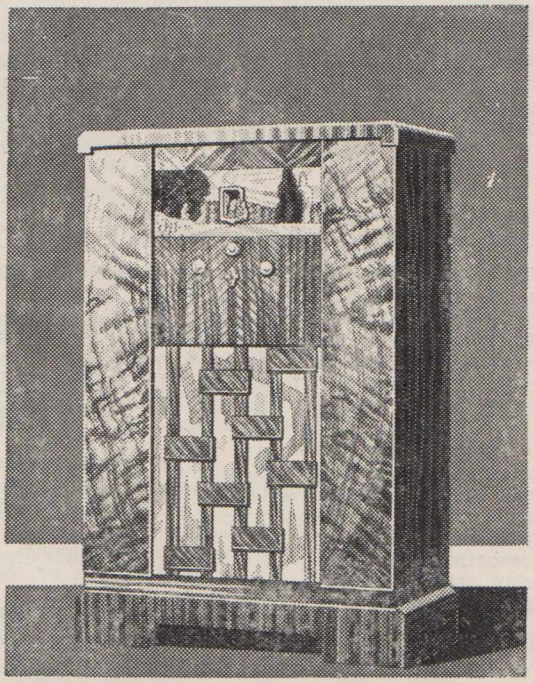
It is in the last named group that our present interest centres.

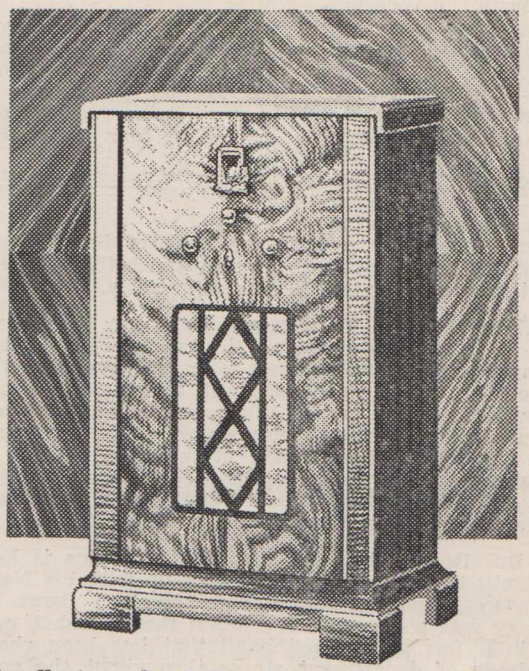
The finer cabinet woods of the Commonwealth surpass those of other countries in figure, grain, weight, and texture. These qualities are claimed for them in general, whilst many are unique in other respects, possessing characteristic features which distinguish them as Australian. What Cabinet wood, for instance, could be so typically Australian as

Queensland Maple! This precious timber may be said to hold first place in the esteem of lovers of beautiful Australian woods. It is one of the prime cabinet woods of the world, ranking with Cedar, Mahogany and Walnut. This timber grows only on the tropical highlands of North Queensland. It possesses a character and refinement all its own. Judged on similar standards it is wholly superior to the famous Honduras Mahogany. Its pearly sheen, its high lights, transfigured by beautiful waterwave and cloud effects, are most effective . It veneers and plies perfectly, bends satisfactorily under steam, and "takes glue" excellently. It stains readily and can be polished to a very high lustre. Throughout the Commonwealth it is the most popular wood for shop and office fittings, mantlepieces, wainscotting, veneered panels for high-class furniture, and architectural interior decoration of walls, ceilings, doors, etc. Indeed, for cabinet work generally it has no equal. Its toughness and strength is availed of for laminated bulkheads and propellers in aeroplane construction. Sir Ross Smith finished his historic flight from England with a maple propeller made in Queensland.

Queensland Walnut: This splendid timber is peculiarly a Beale product—in the sense that this Company were the pioneers in commercialising it. Thirty-five years ago our research and study into the baffling and unique problems of sawing and handling Queensland Walnut were com-

(*Continued on Page* 25)





Excellent workmanship distinguishes these Beale radio cabinets.

INSTRUMENT PROTECTION

Instrument Fuses.

"Anybody can cut prices, but it takes brains to make a better article." From Warburton-Franki Ltd., agents for Weston and Jewel Meters and Instruments, we have details of a new series of fuses the purpose of which is to provide inexpensive protection to that class of delicate electrical equipment operating principally in the range below one ampere.

INSTRUMENT HIGH - SPEED LITTELFUSES.

This line is designed especially for the protection of such delicate equipment as galvanometers, microammeters and milliameters, radio tubes, testers, radio B circuits, small radio and rectifier tubes, etc.

MECHANICAL CONSTRUCTION.

Glass enclosed; size 1in. x .250 in. dia. of end caps. Instrument Littelfuses have an unusually strong assembly for the caps whereby any cements which might loosen under severe climatic conditions and vibration are eliminated. As shown in the sketch, the ends of the glass tube are formed to a slight constriction. The special solder used comes above this constriction and "locks" the caps to the tube at the same time hermetically sealing the filament. The rugged strength secured is important, since a loose cap might break the delicate filament used. The bead bridge construction is used on the 1/100, 1/32, and 1/16 bridge. The use of platinum wire in the 1/100 and 1/32 amp. sizes eliminates the unavoidable irregularities formerly present when using metallized quartz fibre. This platinum wire is the finest in commercial use in the world, being only about 1/30th the dia. of a human hair. This, and other improvements in the line, permit the new protection guaranty.

CURRENT RATING.

Littelfuses are rated at their approximate blowing point. Since the ultimate blowing point varies with the the rate at which the current is raised, a 10 second interval to the rated current is used in the values given. The variation in regular stock is given. Rating of Littelfuses must not be confused with that of higher capacity fuses. The time lag which might be quite an advantage in a 10 amp. fuse would be disastrous in instrument protection.

VOLTAGE RATING.

All Instrument Littelfuses may be used on 250v., DC or AC. The smaller sizes particularly may be used on much higher voltages where there is considerable resistance to act as ballast. The tendency to arc drops rapidly with the speed that the fuse blows, with increase in resistance and as the current values are diminished.

RESISTANCE.

The average resistance of Littelfuses is given below. The maximum variation is about 15 per cent. If close resistance limits are required, they can be furnished at a slight additional charge.

TEMPERATURE COEFFICIENT.

In order to reduce this factor to a practical working basis, the temperature co-efficient is expressed in terms of ohms per milliampere load. The ambient temperature need not be considered.

INSPECTION, PACKING, ETC.

In addition to production inspection, for accuracy, mechanical strength and resistance, every Littelfuse receives a close final inspection immediately before shipment.

LOW - RANGE FUSES.

Instrument Littelfuses are designed for the definite purpose of protection to very delicate instruments, meters, radio tubes, and allied equipment. Their rating and performance must therefore not be compared to that of other fuses probably designed for an entirely different function.

Instrument Littelfuses are constructed to have the minimum time lag possible to produce in a commercial fuse. It is this high speed characteristic that is most important in the protection of delicate equipment.

It may seem unreasonalbe that a 1/32 ampere Littelfuse will protect a 0.1 mil. meter. The protection, however, is real. Instruments are not usually burned out at two or three times their normal current—that merely puts them off scale. Under short circuit conditions the peak current through a meter, may, for a few thousandths of a second, have a value several hundred times the scale value of the instrument. It is in these few thousandths of a second that the Littelfuse does its work in opening the circuit—before sufficient heat has been dissipated to burn out delicate wires or springs, or before the inertia of the needle is overcome sufficiently to drive it across the scale.

Round-Table Phone Q.S.O. on 3.5 m.c.

ON SUNDAY night Sept. 3 at 8.45 p.m. the writer was listening to an international round-table qso between VK2HC, VK2RS, ZL2AX, ZL 2BE, ZL1BQ, ZL2FI. As regards strength all the ZL's were QSA5, R Max at the writer's location, ZL2AX (Vance Kyle) having a plus punch. However, VK2HC gave ZL2AX R7, so he could not have been getting in there so well. While busy chasing from one conversation to the other ZL1CD was heard calling K6CIB at 9 p.m. S.M.T. ZL1CD contacted K6CIB okay and gave K6CIB QSA4, R5 (he was stronger here —QSA4, R7, qrn dropping qsa 1 point). ZL1CD then proceeded to call in ZL1BQ (who was then in the middle of the VK-ZL qso), whose fone K6CIB sed was getting into Honolulu at R6. ZL1BQ was duly hooked and qsoed the K6. Then ZL1CD informed ZL2BE that he had a K6 on the hook who wanted to contact him, so Jimmie Mills (ZL2BE) sed he was in the middle of the VK-ZL qso but he would be able to go ahead in a few minutes. K6CIB told ZL1CD that ZL2BE was QSA5, R7 in Honolulu. In due course ZL2BE clicked with K6CIB and so the three ZL's, 2BQ, 2BE and 1CD, had a round-table qso with Hawaii lasting from 9 p.m. until 11.30 p.m., S.M.T. The K6 wanted to qso a VK and could probably have done so if you had not gone to bed, Ray ! You were about R25 here ! The writer would not hear the K6 at 11.15 on account qrm power line. ZL2FF was apparently supposed to have been in the qso; he called ZL2BE at 11.15, but at that time he was qso ZL1CD. The K6 was using 50 watts and sed qrm was bad in Hawaii. The receiver used here was the old "Companion Short Wave Four," which now has 2 tuned RF stages and we were listening on first audio, 30 foot indoor antenna (*Any comments pse.? Ed.*).

Uncle George Features on 2GB.

"Must an announcer be mad before he can carry on year after year telling bedtime stories ?

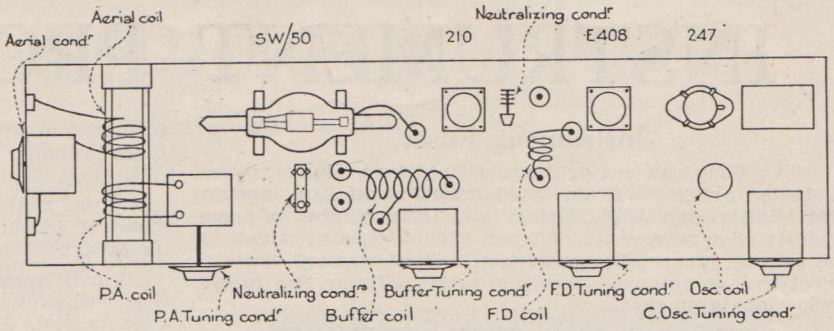
Uncle George : "Not exactly mad, but funny.' '

"Do you make good money for the long hours you put in ? "

Uncle George : "Yes, what there is of it is good."

Station Description

VK 2BA



This diagram shows the layout of the transmitter.

VK-2BA has been on the air since the first day in 1931, when a 201A first put a RAC signal over to 2HU who then lived across the road.

Since that time many transmitters have been tried. Self-excited sets gave good results, but were soon displaced by a crystal-controlled outfit.

That set blew up the tubes, condensers, crystal and almost everything in it.

A new set was built, and this time care was taken that nothing was overloaded.

The present transmitter is crystal-controlled, and has four stages to permit operation on several bands. The tubes used are oscillator 247 1st F.D., 247 2nd F.D., TCO4/10, and a 210 as the P.A.

When operating on 7 MC, the TCO4/10 is operated as a buffer. A 3.5 MC crystal which has been silver-plated is used.

As a lot of operating is done on 14 MC, the writer soon became tired of changing bands, and so a separate transmitter was made for 7 MC.

A large, home-made D.P.D.T. switch, with blades shaped like a boomerang, is fastened to the ceiling, so that by pulling a cord at the operator's elbow the antenna may be switched on to either set.

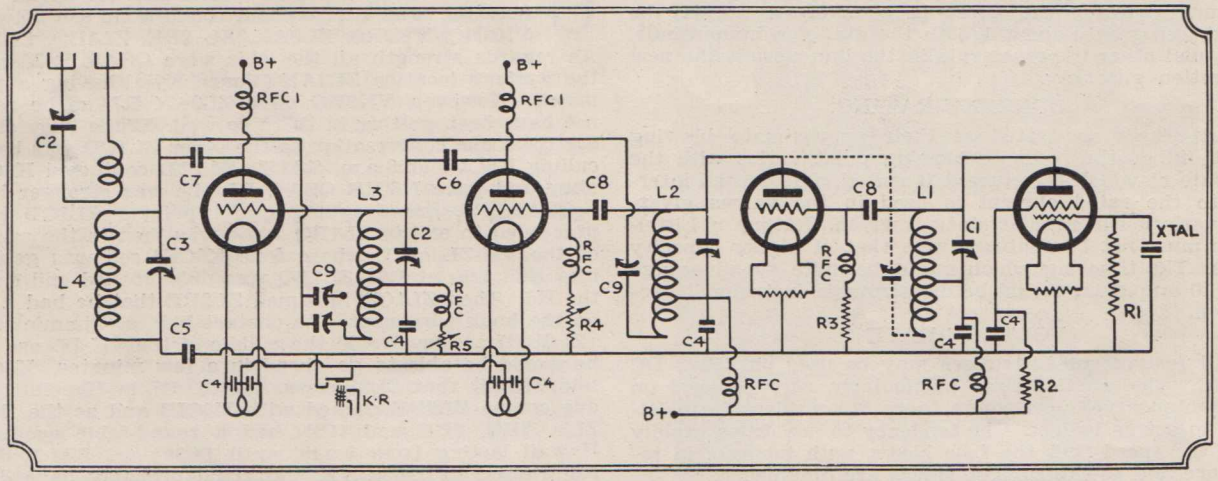
A Zepp. antenna 133 feet long, with a 30-foot feeder, is used. An extra 19 feet of feeder connects the 14 MC set with the antenna switch, and the 7 MC set is connected by a 3-foot lead.

Keying is done in the centre tap lead of each transmitter, a relay being used for the 14 MC set, which is located on the far side of the room.

The receiver is a seven-tube superhet., using a tuned R.F. detector, oscillator, two I.F. amplifiers, a second detector, and a resistance coupled audio stage.

Quite a little DX has been heard on this set.

The monitor-requency meter uses a B406 in the usual two-coil circuit; and although operating on the 3.5 MC band it gives strong harmonics on the higher frequency bands.



Power supplies, antenna, and keyleads could all be switched over, so that one could change bands in less than 10 seconds.

This arrangement proved so satisfactory that the 14 MC set was tuned to 7 MC, where it operated more efficiently, and a new transmitter was made for 14 MC. The set uses four stages—47 C.Osc., E408 F.D., 210 F.D., and an SW/50 as P.A.

An 80-metre crystal is at present used; but a 60-metre one is being ground, so that the 210 stage may act as a buffer to fully excite the power amplifier.

Power supply for the oscillator, frequency doubler, and buffer of the 7 MC uses an 800-volt centre-tapped transformer, an 83 rectifier, and a 4 mfd. condenser.

A choke is in series with the oscillator or power lead, and 2,500 ohm resistance drops the voltage to a safe value.

Plate supply for the oscillator and frequency doubler of the 14 MC set is obtained from a "B" eliminator.

Two 281 rectifiers in full-wave circuit, with 500 or 750 volts on the plates, deliver the "juice" to the amplifier of either set.

KEY TO DIAGRAM.

C1—.0005 Variable.
C2—.00025 Variable.
C3—.0001 Variable.
C4—.002 Variable.
C5—.001 Variable.
C6—2.002 in series.
C7—.002 1500v. working.
C8—.00025.
C9—11-plate double-spaced.
RFC—Radiokes 3.20.
RFC1—2 chokes in series.
R1—25,000 ohms, 2 watt.
R2—20,000 ohms, 2 watt.
R3—25,000 ohms, 2 watt.
R4—50,000 variable, with 2000 ohms, fixed in series.
R5—10,000 ohm variable, with 2000, fixed in series.
K.R.—Keying relay.

An old three-way telephone switch turns on the montor for use as a frequency meter, leaving the receiver working or turns off the receiver, turns on the monitor, and connects the earphones to it so that signals from the transmitter may be checked.

Although 2BA is not on the air a great deal, 46 countries have been QSO'd.

All continents have been worked on 14 and 7MC, and WBE on 14 MC.

Association of Radio Amateurs (N.S.W.)

A.R.A. PAGE OF SCANDAL —— ZONE NOTES

Zone 2.

From the Riviera of the North.

Practically all Zone 2 hams still ragchewing on 8T mx. Condix have been good generally, but skip very noticeable at times. Good DX has been heard on this band. Dozens of Yanks have been coming thru fb just after sunset hour; also had a coupla Japs here at good strength about midnight. J1ES was heard calling CQ at QSA5, R5 and fb.

The inter-zone contest wid ZL went off fin good style but the North Coast gang were too much for the opposition and had a vy fine victory over Zones 2 and 7. VK2OU was the outstanding performer and was well supported by the crowd in the "Garden of Eden." FB work, om's, and congrats to you all. The scores in Zone 2 were: 2BE 13, 2HC 9, 2CR 2, 2KR 2. However, although we were well stitched we all had sum fb fun and everyone hr was flat out like the jew lizard. After all, it is the attempt that counts, hi.

2HC is on very little at present but is on wid the usual A.R.A. and B.E.R.U. broadcasts on Sunday nites and gets sum fb repts. on it. FB work, om. Shearing will be in full swing at "Yarraman North" ere these notes are out so guess Ray will be nearly qrt for a few weeks.

VK2BA does a bit of DX. He is seated in front of his shortwave superhet. (A.C. operated and noiseless).

2CR of Tamworth has been active on 3.5 mc wid his usual vy fb fone. 1st op Toddy was qso hr one day and was fb to hear him again. Toddy has a mo'bike and is overhauled their RX and it is gng fb now, much to 2KR's gng to take on dirt track racing soon hi. They have delight hi.

2LM has been on a good deal lately and comes in hr wid plenty of kick. Les has been making a lot of alterations to the gear and is vy psed wid the result. Has erected a coupla 50 ft. masts wid steps to the top of each fb. Hw abt trying a heliograph sum time, Les, for the top hi. He is also using an 8T mx receiving doublet and says they are the goods.

2KN is active on 3.5 and 7 mc and getting fb repts fm ZL. He has his fone gng vy nicely and records are fb Ed. oc. It is reported he causes qrm on the BCL band 15 miles from his qra wid an input of 8 watts hi. Was a hard trier in the ZL test but qrm fm 2BE must have been fb hi. He is qrl wid work and qrm fm the AC lines often makes him qrt at the weekends. FB, isn't it, Ed., hi. Is a promising Davis Cup man, hi.

2KR of Gunnedah active on 3.5 mc. Cess has redesigned his station and says she is the goods. Sa Cess, have you a wavemeter hi. Puts out fb fone at times but 2CR says his music is excellent — so ask him for a demonstration gang wen qso next, hi.

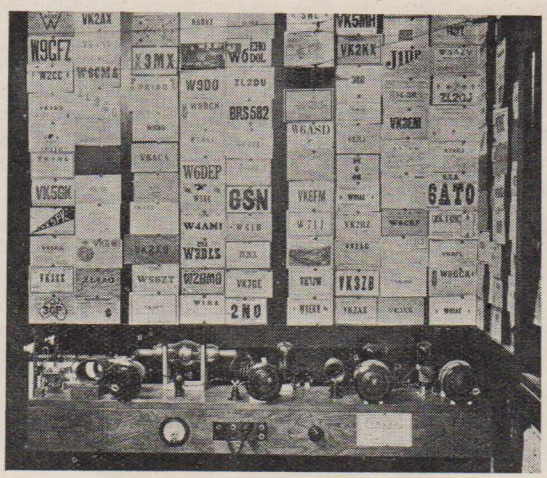
VK2JF qrt, but putting out fb R Max music at the local talkies, fb.

2HV of Inverell (The Noise of the North) has been vy active of late and getting fb repts fm ZL. He is using a 210 in a Hartley and motes okay. He and his sec. op. have bought a flat and are going to move their rig to it so guess they will be living up to his reputation as the "Noise of the North" hi. Wud like to c u sum time on 3.5 mc Harry oc.

2NA is the efficient P.M. at Delungra but no pwr in that city but he is thinking of investing in a coupla B batts so may hear him soon on qrp. Believe he is keen on Yanks. Also hrd that he had an fb time at the last Soldiers' Reunion according to repts hi.

2ZP of Inverell is on at times but am told that that peculiar form of qrm prevents him fm being on more often hi. He is using a 210 in a Hartley and gets out fb. Has his RX mounted in a tea tin fb.

2WH of Forbes is active on 3.5 mc and works 2LM a lot on sked. He wants to know whose zone he is in. Think it Zone 6 oc, but we can do wid a few more hams for our next ZL test hi.



The new transmitter at VK2BA, illustrated diagramatically elsewhere in this issue.

2JO is in his new qra, Goran Lake, a piece of fb country near Spring Ridge, which is abt 30 miles N.W. of Quirindi. He has no pwr suppli out there but gess he will be on the job soon. Hw the cows oc ? hi.

2BE active on 3.5 and 7 mc, using 3-stage CC, 247 CO, 247 buff es 210 PA es she seems to mote okay. 2BE with 2nd op. Ivan and an offsider tried to put up a 50 ft. mast but only got it to abt 30 degrees when the aforementioned mast broke and fell on 2BE. Ivan who was abt 20 yards away thought this an fb joke hi.

Well gess that's the issue but wud like to congratulate oc 2RJ on his K7 qso on 3.5 mc. Fb om.

Cheerio es 73's cul.

JOHN, op. VK2BE.

ZL Contest Results.

On Sunday afternoon 30th July, a contest between Zones 2, 3 and 7, to see who could contact the most ZL's in four hours, took place between the hours of 5 p.m. and 9 p.m., everyone was on time with a CQ as soon as the clock struck 5, there was plenty of fun for all who took part and QRM was a straight out winner HI! calling CQ was O.K. but when it came to listening for any

ZL that may call you there was QRM gallor from the top of the band to the bottom. We all enjoyed ourselves and are looking forward to another contest in the near future. The Garden of Eden, Zone 3 had an easy win, with Zone 2 and 7 a deadheat. The winner of the GOLD CUP donated by 2BE for the highest individual score, was won by VK2OU and the miniature Silver cups also donated by 2BE will go to each member who took part in the winning Zone. the following are the results of the contest:

ZONE 3 :		ZONE 2 :		ZONE 7 :	
VK2OU ..	21	VK2BE ..	13	VK2PN ..	16
VK2XO ..	13	VK2HC ..	9	VK2FI ..	2
VK2YK ..	1	VK2CR ..	2	VK2LB ..	5
VK2GH ..	1	VK2KN ..	2	VK2WA ..	3
VK2CU ..	1	VK2KR ..	0	Total ..	26
Total ..	47	Total ..	26		

Zone 3.

"The Garden of Eden."

Conditions on this band are patchy but is still the most popular band. The gang up North have been very active of late getting their rigs ready for the ZL test which took place on Sunday the 30th July. The North Coast gang had an easy win, VK2OU topped the score with 21, ZL's in 3 hours 20 mins. he being off the air for 40 minutes due to his crystal xtal going west. Sid. has now installed a half wave zepp and is getting excelent reports. VK2GH has had a bad time with the "flue" and left his bed for an hour to have a fly at the ZL's. VK2YK the QRP merchant was badly QRM in the test was a good trier. Roy was QSO 2 NR using one fortieth of a watt which equalls 10,000 miles per watt FB Roy.

Zone Notes No. 4.

Newcastle Amateur Radio Club.

Headquarters: 101 Tudor Street, Hamilton, N.S.W.

It would be very enlightening to know just why VK7CD should occupy his time on Saturday night using fone on 40 mx and presumably broadcasting the proceedings of a Radio Club Night. This station was heard here at r9 on Aug. 5th from 9.15 p.m. to 10 p.m. in the centre on the 40 mx band. Apparently quite a number of men were present in the room and code practice of sorts was being indulged in.

One wonders what the world in general thinks of ham radio after hearing such an exhibition of rubbish and nonsense put over the air. To say the least of it some of the "wise cracks," doubtful jokes and nonsense talked by these so-called amateurs make on wonder what Ham Radio is degenerating into. I should like to ask the gentlemen responsible a few questions:—

1. Just why is it necessary to modulate a carrier on 40 mx during dx hours with material calculated to make Ham Radio in VK the laughing stock of the amateur world.
2. What is one expected to gain from listening to such trash.
3. If he must broadcast in this way why use 40 mx ?

Up till this time I had a good opinion of Ham Radio in VK7. I am afraid that opinion has been considerably altered. Perhaps an appeal to some of the more reasonable VK7 hams, and I know there are many, would help to point out to these irresponsible people that they have a duty to their fellow amateurs in other States as well as their own, to perform, and that a more serious attitude towards their work would be a distinct advantage. If we are to retain our privileges there must be no more of this sort of thing.

The Newcastle gang are at last getting interested in Five Metres. 2FN, our youngest ham, was first in the field with a brand new pp Unity coupled job and it is sure a picture. Those who have seen it are already digging down south for the wherewithal to build similar transmitters for themselves. We hope that next month's notes will tell the tale of the first five metre QSO.

Well, the Wyong treat is over and didn't the boys enjoy themselves — I'll say they did. The sight of 2CS carrying his superportable DF set across the showground with pockets full of maps, compasses, protractors, dividers and whatnot was worth going that far to see. Naturally the N.A.R.C. is very proud that their No. 1 car came second. Look out Con for the next one. The ARA Sydney gang are certainly doing their stuff and we congratulate them. What about the First Five Metre Field Day Boys !

2KB is well to the fore in the dx list this month. His best dx has been 6 Yanks in one night and a VE. Not so bad Allen for a newcomer hi. He is talking of putting an 852 on the end of the present rig. There are four hams within a hundred yards of each other in Cooks Hill and you ought to hear the qrm when they all start up. 2OF has shifted qra and is in Adamstown. New antenna is going up and xtal rig built and Gerry is going to show us all how to work dx hi.

Say, what about this for dx—Got a ring on the phone the other night and the operator said "Perth calling." After much delay weak voice from Perth asked if those 800 cattle had arrived. Told him to qrt as I called CQ dx and didn't want to work locals hi. He wanted Hamilton, Victoria — only 500 odd miles out.

2PZ is still off being qrl wid BCL sets. 2YL is now calling regularly on ten mx on Sunday mornings but nd so far. He is working Yanks on 40 mx. Whilst working 4JU, W9 USA started up on top of him. 4JU called him and hooked up and asked him to look for 2YL. Harry was very pleased when he got a report from W9 USA, although the qso was spoilt by qrm. Power on 80 mx was 7 watts — fb Harry om.

2KZ has been putting up new 40 foot ant and looks very fb wid imposing array of guy wires. 2YO is talking Single Signal superhets. 2XH is getting sum fb reports using 10 watts to a 46 toob and says that efficiency is much better than 245. 2KE complains of very cold shack.

Cheerio till next month.

STAN GRIMMETT, 2ZW.

More photos of the Wyong field day. Six months free subscription is available to the four hams in the lower picture if they apply quickly.

Notes from Zone 6.

As usual the 80 metre band holds the main interest for the country gang.

Seems to be fb for qrp in daylight, recently heard 2F1 es 2Y1 having a qso each had less than 1watt input es the distance was over 300 miles using 80 metre band in daylight. 2F1 has an engine and gennys. One is 750 volts but he has to use a 240 volt one to excite the fields

of the former. He hasn't them going yet but should be on qro ere long, his fone on qrp is quite good. We beleive 2Y1 is at Warren and consequently is quite a near neighbour to 2QA, only about 100 miles away. Harry is Contemplating the purchase of an eliminator to work off low voltage D.C. supply. 2LM has taken unto himself a new antenna system 2 fb masts 55 feet high es 138 feet apart. The masts are well guyed es have steps to the top, we believe Len intends using the aerial for tightwire practice — hence the steps. In spite of the new aerial he finds it impossible to get out, using a 2-stage CC job with an input of 20 watts. The qra is in a bad location surrounded by hills, and the screening is very noticeable. We would suggest erecting an aerial on top of the nearest hill es feeding it with a matched impedance transmission line.

2RS has his genny going but doesn't get out any better than with the B batts. Think Rob intends installing Heising modulation, which should effect an improvement. He has a crystal ground near the high frequency end of the band and in consequence should avoid qrm.

Conditions on the 40 metre band seem okay for working interstate in daylight; can hear the Queensland qrp hound 4NG fairly consistently. Roy has a spark coil es his note sounds like an fb. blowfly.

DX on 40 from this location is a minus quantity. Can hear plenty at R1 to R2 but can't raise ani. Can also hear a few ZL stations on 20 at about R2. Never heard any of the Yank fones which come in at R8. Getting back to 80, VK4JU put up an fb performance working W9 (U.S.A.) on fone. 4JU uses a 211E as a Heising modulator and his input is not qro. 2QA has rebuilt his outfit half a dozen times in the last few weeks; has the speech amplifier and modulators ticking over fairly well, also had another mike presented him. Overhauled a public address system, four 250 toobs in pushpull tandem, rewound two of their speakers and hooked one on; started the outfit and burnt the voice coil out, so had to rewind it again; eventually made things work okay, received a BCL report from 4 miles in daylight; borrowed one of their microphones, tried it out on the transmitter es received a report from VK2KH, who told us to bury the old mike we used previously.

The operator of the public address system was so pleased that he presented the new one to us. Thanks for that report Stan hi.

2KH by the way is still putting out fb fone es often rebroadcasts interstate stations, which he receives on his broadcast receiver with the transmitter in the same room. Please take note you broadcast listeners who use junk box twos with the aerial coupled direct to the grid of the detector then complain if you receive an 80 metre station with your tuning arrangement set on about 400 metres. 2QA has also rebuilt the audio end of his receiver which gives a frequency response from about 40 to 8000 cycles using a good dynamic speaker. He is now trying to devise a low note filter, as the hum on the carrier of most fone stations in the amateur bands becomes very objectionable, such hum not being audible on the more usual audio amplifiers. For instance, during the recent ZL-VK Zone contest one VK station was using CC cw es the hum on his carrier was R9 with the receiver out of oscillation.

The contest was won by the North Coast gang with the other 2 zones running a dead-heat. Congratulations 2XO and all your faithful servants. If you want to qso a VK3 on the 80 metre band get up at midnight. Recently qso VK3OR about 1 a.m. He had to qrt es make a few adjustments to his gear; said he would be back on in a couple of hours or so ..— —..

VK30R is the probable winner of the recent VK3 R.A.A.F. Reserve Contest.

You will probably get the dope on the Field Day at Wyong elsewhere, so will qrt till next month. 73 de VK2QA.

Zone 7.

Rain came in gusts beating almost unnoticed on the roof—a few fone stations ragchewing—a Yank echoing in the background calling CQ—an occasional click as someone switches a light on, then, hold tight—wirr-r-r!! bang! woosh CQ ZL, CQ ZL CQZL, the whole band full of R Max signals like jew lizards going for water. Zones 2, 3 and 7 at it in the inter zone test. About 15 starters sounding like 150, from 1 watt to 150 watts and the usual country standard of CC signals. Oh boy, what a contest, lasting 4 hours and guess the ZLs thought it was another earthquake starting. 2LB forgot to switch the aerial onto his receiver for an hour—has been kicking himself ever since. 2FI with batteries and QRP let things fly but luck was against him. 2TA could only coax 17 watts into his 46s instead of the usual 49 watts or so but got over O.K. 2WA with his QRP also made a good effort. 2PN was lucky all the way through and no complaints, a jolly decent test.

Scores for the zone were: VK2PN 16, VK2LB 5, VK2TA 4, VK2FZ 4, VK2WA 3 and VK2FI 2. A total of 34 for the zone resulting Zone 7 second place and VK2PN second place. We must congratulate VK2OU on his good performance especially with the break of 40 minutes which probably lost him about 4 or 5 points. Anyway it was a T9 FB contest and we hope there's more of 'em.

56 megacycle activity has made a definite start in this zone and already two transmitters and receivers are on the way. 2LB hopes to try his transmitter out on a hill just out of Young which can be seen from 2TA's place about 10 miles away, where the receiver will be located. Guess they'll have to use smoke signals to tell each other when the signals are getting through! The other transmitter and receiver is in the making at 2PN.

VK4JN has a nice portable outfit. Hope it doesn't drop off the back of the car.

2FZ at Temora used a three stage crystal rig during the test with an E408N CO a 46 Buffer, and TCO4/10 p/a. Gordon thought the qrm during the test was "lovely"!

2TA has been to Melbourne for a week or so and bought some new gear including a Marconi 10 watter (QRP ??).

2JQ has his xtal rig going now with a 59 crystal oscillator which goes very well in that the rig can be used on either 80, 40 or 20 metres using only two stages and an 80 metre crystal. A coil and condenser tuned to the output frequency being connected between the cathode and auxiliary grid. This type of oscillator gives a very strong harmonic output and only needs a single stage to follow it on any of the three bands.

2EZ found a "T9 YL" and said "No ZL test for me" then blew all the tubes in his receiver and monitor and it rained on the day of the test, so: no test and no YL. Hi! Jack should have new tubes by this time though and a 201A in the transmitter.

2FI might (?) have his long looked for gennie going

by the time you read this unless the horses gets tangled up in the business. His xtal is ground to 3625 Kc.

2YI late of this zone has returned to the backblocks again from Liverpool to Warren (not this zone) where he uses one watt input from batteries.

2DR from Waitara paid a visit to 2LB the other day staying with his brother just out of Young for a holiday and called and saw 2YA at Rugby on the way back leaving a 201A behind him which Rex uses in his QRP rig with the aerial tied onto the wardrobe!

ZL2NM wants to keep a regular weekly sked with someone in N. S. W. on 3.5mc, preferably on Sunday night. Can anyone oblige? if so please let me know or see him direct.

Well chaps don't forget that station description, those tubes would be fb for 56 mc work.

55 from Ross.

Zone 8.

2DN.—Still going strong on 223 mx and is on the air from 8.30 till 10 a.m. every Sunday. Jack will welcome reports. He has just completed a new 3-stage RC amp. for his BC rig and gave it a fly on 7 mx, and it performed nicely. Later qsy-d to 80 where he found condx fb. Jack has got an xtal now and is going to spend a few long hours grinding and coaxing the dear thing hi !

2JJ has opened up on 80 mx again with an fb T9 rig. He is using a 3-stage cc rig with 201A, 240, TCO410. Does not get on the air very much. A bit cold out in the shack these nites, and besides his mg is a bit too noisy for peaceful sleepers hi !

2VF is on the warpath of 46's. His 3-stage cc job is complete, but has not had much success with a 46 as buffer. Had a few qso's using the PA as self-excited and was R7 DC here. His xmitter looks fb and compact.

A new type of "untuned" xmitter (pirate operated) which covers the whole band has been a source of annoyance at 2OJ of late.

Cheerio gang. Best wishes to all.

NOEL, VK2OJ.

Lakemba Radio Club.

VK 2LR

79 Park Street, Canterbury.

President, VK2PX; Secretary, W. Picknell; Treasurer, VK2XD.

Lakemba Radio Club, which meets every second Tuesday night at 79 Park Street, Canterbury, is still going ahead, and will welcome new members.

VK2DL is going well on both 40 metres and 250 metres after Broadcast hours. Bill is thinking of getting a secretary to deal with his QSL correspondence.

VK2CY has not been on the key very much lately, as he is minding the new "op." fb James OM.

VK2PX our President looked very smart at the last meeting with his new permanent wave, and is growling that dx is very poor, only worked 250 Yanks so far this year.

VK2OD and a few of the boys hold a meeting of their own outside the Club after lights out and only shifted when they saw the local milk cart arrive, VK2IC is included with 2OD for talking stakes.

VK2XJ has now altered his gear from xtal to m.o.p.a. a la 2LJ and reports fb dx as a result.

VK2XD—When Ken is not balancing budgets he is whacking his key.

Bill Bell of VK2ED is now well established and the QSL cards are rolling in.

VK2GZ—old Cyril is still burning the midnight oil, and when the exams are over expects to get going again.

VK2FY—Dick says he has been experimenting with different type aerials, also reports dx a little quite lately.

VK2EV—Eric McCredie has now finished shifting his gear to new position, one that we would all like if the OW was agreeable, viz.—in the bedroom. Received his first "W" QSL the other day.

VK2HE is off the air for a while but has great hopes when the football season closes.

VK2LR—the Clubs Call is being used by some one on the 200 metre band, also on 40 metres with a CC note. So if any ham hears VK2LR with a crystal note and R max please drop a line to our Secretary, Bill Picknell. Our Secretary reports having accompanied two other members of VK2LR to the field day outing of the ARA to Wyong and the good time received by all.

VK2JT—old Chas Luckman has arranged a test between G2GB and VKS 2PX, 2EV and 2JT to be carried out each Saturday p.m. and Sunday a.m. during August. G2GB will be using QRP but should get over here well as this time last year JT was QSO G5CM when the latter had a power input of 4 watts. Here's hoping.

Hurstville Radio Club Notes.

Here we are again with a new Publicity Officer hi ! !

Well gang something must have happened to the President and the Tech. adviser, they managed to fill in the papers for the Clubs x mitter Hi!

On Sunday 30-7-33 some of the boys went down to Como with 2XU to test out some portable gear (for our field day which will be all over by the time these notes are published) the x mitter perked O.K. anyway Gilbert qso'd 2 on code, rpt QSA3 R3 not bad for a B406 with .1 watts input. Hi! 2XU was delighted with the results but he likes to see some radiation Hi! How about the Det 1 OM. Hope the speech amplifier is going O.K. now.

The A.O.P.C. class is in full swing now, and I think Wilf. is kept busy what with giving lectures and trying to design a new mast for the Clubs skywire, what is it OM 80ft. self-supporting.

I wish some of you chaps would get a move on and get your "tickets" as I want something to write about.

Inquiries re. the above club should be sent to the Hon. Sec. J. E. Spencer, 46 Rosemont Street, Punchbowl, or come along to the club rooms any Thursday night 8 p.m.

Thats all for this month gang. CUL.

73's de Jim.

Origin of A Call Sign.

Speaking of 2GB as a monument to Dr. Annie Besant, for over quarter of a century president of the Theosophical Society, Mr. A. E. Bennett, Managing Director, told a public gathering on her birthday (October 1st) that when the station was started he proposed to call it 2AB in honour of her. But when the Government of the day did not favour 2AB, he proposed 2GB after Giordano Bruno, a great Italian philosopher. "It is said that Annie Besant in a previous incarnation was Giordano Bruno." Mr. Bennett explained, "so I chose 2GB, and as long as 2GB lasts Annie Besant will be commemorated in the name of the station."

Wireless Institute of Australia

South Aust. Division.

NEWS FOR JULY.

By VK5GR

The general meeting for July was held in the Club Rooms when an auction sale of gear which had come into the possession of the Institute was held. The attendance was not as large as expected, although the weather possibly prevented some; but I am sure that if they had seen the gear going for bedrock bids they would have liked to be present.

The Transmitters' Section Meeting was held on the 12th when Mr. W. Donner, B.Sc. of the Adelaide University, lectured before a good attendance, his subject being "Automatic Volume Control and Noise-Suppression Devices" The lecturer dealt with his subject in a very capable manner and all present gained much useful information.

The Technical Development Section still meets every Tuesday fortnight and continues to do very good work. At present preparations are being made for a demonstration of the apparatus at the next general meeting.

The AOCP Class gathers every Thursday and the attendance has reached the large figure of 35, all very keen. It was certainly a sound move by Council to commence this course and they were fortunate to obtain the services of such a fine lecturer as Mr. H. W. Wheeler, B.Sc.

HAM NEWS.

It is with deep regret that I have to record the passing of one of our keenest and youngest hams — Don Wauchope, VK5WF, who after a long illness passed away a few weeks ago. Don was a real fine fellow and was but 19 years of age and had his transmitting license for only a few months. He had been confined to his bed for a long time, even passing his AOCP while thus confined; and then came the construction of the transmitter etc., in which he was helped by his two friends 5LN and 5LB. The outcome was the operation of a 2-stage cc qrp outfit which helped him to pass the long hours in bed. Nothing was missed, no detail of his hobby omitted; he even joined up with the Wireless Institute, although he knew he could never attend a meeting. He fought on, but it was an uphill fight, for the ravages of T.B. claimed another victim and he passed on for his greatest qso of all.
His action in joining the WIA was very sporting when one thinks of some hams who will not join or pay their subscription to the body which safeguards their interests.

Conditions have only been fair, with more really bad nights than good ones. The 7 mc band is still the most popular one among the local hams — in fact, 3.5 mc is almost deserted and 14 mc is occupied only when dx seems good.

VK5TX is the call of J. Foster, 11 York Street, Kensington, who has been qso ZL on the 3.5 mc band using 1.5 watts on an A415. Power supply is from batteries and a half-wave radiator with a single wire voltage system of feeder. VK5RP worked VP1FF and received the good report of R8. He is using a 210 in a Miesner circuit and has Heising modulation with a 250.

VK5LJ is a new ham with a good pdc on 7 mc. I believe he is using an MOPA outfit.

5LN, also fairly new man, has two-stage xtal with a crystal of his own grinding. Expects to come on with 4 stages and fone later.

5MY heard with fair fone on 7mc using a Hartley with Telefunken modulation. Harry seems to have given up cc — couldn't you get it going satisfactory ?

The Chairman of the Transmitters' Section, 5WP, has altered his outfit and at present has a pair of 210's in pushpull TPTG. Has installed a half-wave aerial with a Wyndom system of voltage feeding.

5MD has been on but finds dx poor. He is now Federal Secretary, so lots of spare time go to that.

I believe 5MF has an outsize in transmitters, using 5-stage cc and a complicated switching scheme for band changing.

VK5BC is a new ham using 25 watts with series feed Hartley, but have no dope on his results.

VK5LP is another new ham — L. Phillis, Leurs Road, South Payneham. He is another ham who passed his AOCP while in bed. At present he has 10 watts on 245 in Hartley. He is in quite a serious position but would welcome a call, so give him a shout gang and make it a cheery qso.

Keith Mutton (5ZY) has a TPTG with ?? watts. 5LB is building new 3-stage cc and is putting up fresh aerial and hopes to get out better.

It is rumoured that 5RO intends using cc again — he's much excited upon the receipt of several cards from USA. He proved quite a keen bidder at the junk sale hi.

5GW has discarded his chemical rectifiers and installed an 83 instead.

Have not heard much of the country gang, but 5LR came in at R9 at about sunset. He has 4-stage cc but it did not seem properly neutralised.

Ask 5FM what his power is—or more correctly, ask him the power used but not on the transmitter tubes.

5MK heard with good dc signal from 18 watts on 210. A strong RAC signal with a hefty back wave was traced to VK5GE, but I have no dope on his outfit.

VK5HG has installed new pair of 281's and continues to do the same good work — nuff sed.

VK5MU continues to be the most consistent ham and is on nearly every time I listen. He is proving a capable traffic manager but finds plenty of time for dx.

VK5RD makes a broadcast of Institute news every Sunday and is kept busy with WIA work.

5ML heard with Air Force work on Sunday mornings.

I asked 5LB what he was using and he replied "Type 82 feeding E406," hi hi. Has put up a 132 ft. Zepp but does not find it so good as the former 66ft. length.

5AL not heard much rumoured ZL's.

5MB seldom heard — suppose his work and AOCP class keep him fully occupied.

Quite a lot of the local gang have worked XVK8BA, in Central Australia. A boomerang has been promised to all hi.

VK5BY spent nearly all a Saturday afternoon altering his full-wave Zepp and after making everything nice and tight down she came at 10 p.m. ! What did you say, Dougal ?

Hughie Osman is building up new gear and expects to bring 5RW on the air again in the near future.

The 200-metre gang 5DR, 5DC, 5DX, 5BY, 5CX, 5WB and a couple of others continue to operate most Sundays.

Here at 5GR some rebuilding has been done and new rectifiers installed but qrm from WIA work.

That's all, so 73 till next month.

GORDON, VK5GR.

Queensland Division.

Notes from the Sunny State.

(By 4RB)

General meetings of this division are now attracting bumper attendances. This is a happy contrast to the small roll-ups which were the rule during the earlier part of the year. Room 30, Heindorff House is invariably packed to capacity every first Friday night of the month and the walls are already showing signs of becoming permanently bulged. Secretary Bill, alias 4WT, claims that the increase in attendances is due to the psychological effect of our palatial new QRA, but other opinion is that the efforts of the "old bushorse" himself are beginning to be appreciated by the boys.

Another alteration to the rules of the division is being mooted. One of the amendments will be, no doubt, of considerable interest to other divisions as it aims at raising status of the full member by insisting on a higher technical standard. The proposal qualifications for membership will include the possession of a first-class commercial operator's ticket or its equivalent. These amendments are to be submitted, for approval, to general postal ballot within the next few days and the outcome will be awaited with no mean degree of interest.

Plans for increased social activity are proceeding apace. One of the first steps in this direction has been the formation of a tennis club which will hold its first match on Saturday, August 19th., on 4WT's fine court at Graceville. A ladies committee is now in the forming process and it is expected that this committee will be responsible for practically all future social organisation work.

Secretary 4WT has returned, looking under-worked and over-fed, from a holiday at Maroochydore, where (it is alleged) he spent most of his time fishing and paddling. A portable all-wave receiver was taken away with him but was commandeered by Mrs. WT for listening to broadcasting. "Anyhow s.w. reception up there was rotten" sez Bill.

4AW confines most of his key punching to the early mornings and has a few reliable skeds going on 80 and 40. In private life he is becoming quite an elusive chappie. 4WT reported traces of him at Maroochydore — in fact, the police and myself have shadowed him there several times of late. One wonders what the attraction is. (Fair, dark or indifferent, Art?).

4FK has been cruising around the Barrier Reef in a motor launch. He has his portable gear on board and skeds are being kept regularly with 4AW, 4MM and 4LL. He is using a c.c. mitter running off a 6v-250v dynamotor and lays down good R7 signals here in the mornings but at night bad skip brings him down to R2.

4NG our QRP artist is using a Ford coil to supply H.T. now. Roy has been monkeying with recting and smoothing systems and has coaxed "lizzie" into giving quite decent p.d.c. output.

4JM at Nambour has a mobike engine driving a 240v. alternator. By keeping this outfit out of earshot and using ignition noise suppressors he can twist in the dx on the receiver while the engine is running. He has a pair of 47s in p.p. and raises lotsa Yanks on 40. Using a 245 as Heising modulator he puts some really good 80-metre fone into ZL.

4JH—down from Mackay for the show and put in an appearance at our last general meeting.

4MM is shattering the ether and the nerves of the Toowong b.c.l's with his Telefunken modulated "fifty." He has just finished building a short-wave A.C. receiver of many tubes and uses a 12 inch dynamic speaker instead of phones. The last time I heard dx signals through it I was consious that the neighbours' windows were rattling but Matt was insistent that the outfit had "bugs" in it. His 50-watt mitter is the most flexible thing I've ever seen: f'rinstance the original layout is m.o p.a. but one thump on the shack wall and presto its a Hartley—or ultraudion (depends on how many clips fall off).

4VJ does his bit every other Sunday morning before the condenser mike of 4WI's 200-metre rig. Occasionally brings over a regular harem of snappy YL's to liven up the proceedings—he doesn't risk his own among the boys 'though. At his own station he gets a fair amount of dx on 20 and 40. He claims ownership to a versatile crystal which, when it tires of shimmying on 42.8, does a break on another part of the band. Instead of keeping it as a curio Vince uses the abomination as an oscillator.

I believe one or two of the VK2 boys are aboard the R.A.N. cruisers which are visiting Brisbane for our agricultural show. I have been keeping a weather eye open for them in the local taverns but no luck so far!

4BB comes on occasionally with 80-metre fone. He and junior op are sometimes heard on Sunday nights. Junior supplies a few goos and gurgles now and again.

4RY has his new m.o.p.a. job going and can raise everything he hears. The gear consists of a TOO4/10 working into a screen-grid QOO5/15 with 600 volts on its plate. This mitter is really one of the finest-looking outfits in Brisbane. It is built up in vertical rack form and fitted with aluminum panels.

4WD—Mor bad langwich! Bill's weakness has been blowing rectifiers and filter condensers but this time I believe he has been entirely successful in shooting the whole works.

The Ipswich boys, en masse, paid a visit to Brisbane recently but unfortunately the weather turned out wet and they were able to visit only a few of the local shacks. 4WT, being the nearest to Ipswich, received the full force of the invasion. Here it was that 4PK had a nervous prostration when he lifted the defaced penny of Bill's xtal holder. A quartz outline bearing a striking resemblance to a map of Labrador met his astonished gaze.

4JF—QRL tacking up cards. Jack has been doing a bit of duplex fone with 4ZX on 80 and 40. Readability usually 100 per cent. at both ends.

4DR is our new traffic manager. Dave has a decided leaning towards 46 tubes. He uses them with 600 volts on their plates and says they will stand another 250 easily.

4AM does a bit now and again on 40. Every time I see Mac he is invariably explaining to some deluded unfortunate that he has no cards printed.

4UK was in Brisbane a few weeks ago buying some big tubes and alot of A.C. gear. He is on a D.C. area in Toowoomba at present but expects to be shifting to a place where the alternating breed exists.

A number of the boys, including 4AW, 4RY and 4DR, were operating portable transmitters stationed at strategical points during the Grand Prix, 100-mile, motor cycle race at Kingston recently. The 80 band was used throughout and all points with one exception worked fb.

4TS—Mystery man! Was last seen purchasing two or three dozen lightning arrestors at a city junk sale. All the boys are laying odds as to what he is going to do with them but I think the owner of the crockery is just as much in the dark as anybody. Anyhow they'd make a swell border for the garden path Ted.

4UU has a new A.C. receiver working. It uses a couple of 58s, 47s, etc. and is reported to be working fb. He has pushed up his aerial 55 feet into the sky now and improved DX results have been noted. Works on 20 and 40 fairly consistently but patchy conditions are getting Bill worried. One night recently he bagged ten Yanks within a few hours but the next night not even a VK would answer his CQs.

4GY is rebuilding. His xtal rig which consists of 247 c.o., 46 f.d. and 210 p.a. is to go into a pretty white ducoed cabinet (not icechest I hope, Frank), 5ft. 6ins. high.

4WH at Longreach is only doing a bit during the early mornings. A regular sked is kept with 4AW on 40 every morning at 6.45. He has managed to get the 460 volt d.c. mains laid on and with this increased power on the p.a. of his xtal outfit his QRK has gone up considerably. Bill had the good fortune to have a look over the gear on board the Imperial Airways plane "Astrea." He copied fone from this plane during its flight from Longreach to Narromine.

4AR—Sounds like a new one but it is only Arthur Tonge of Darra who (at last) has decided to take out a ticket.

Bob Browne, 4RB.

QRP Club Notes.

By VK3NQ

After extending the closing date for returns from the May contest to July 7th, only five entries were received from the 17 VK members, which was a very disappointing figure to those who had gone to the trouble to organise the contest. In New Zealand things were even worse, only one first district, and three second district members took the trouble to send in returns. But ZL 2FE's effort made up for all the lads who didn't enter, as by super QRP he ran up the real bobby-dazzling score of 83,269.3 points and carried off the cup. Most of 2FE's points were secured by running skeds with Club members ZL2NX, ZL2AF,and ZL2OC, 5, 9 and 10 miles from him, with a mere 3 volts on the plate, each QSO giving him a high miles-per-wattage.

The second prize went to VK3PG, whose .18 of a watt gave him a score of 41,333 points, even though he only competed for half the contest. Had Norm. gone his hardest for the entire fortnight, we feel sure he could have bettered ZL2FE's score and kept the trophy in Australia. Next in order we have VK2KR, 32,314 points; VK2FI, 26,375; ZL1DA, 15,581.1; VK4KZ, 9599; VK2GT, 5766; ZL2NX, 1300 and ZL2OC, 426, to these hams we extend our good wishes for better luck next time.

The suggestion that the power limit of the Club be reduced to five watts has been considered by Club Headquarters, but they have decided that ten watts is quite low enough to be called QRP and any change in the Club rules now would only result in confusion. To you chaps using one watt and less, ten watts must seem a large figure, but if five watts were made the limit, hams using 6 or 7 watts (which is reasonable QRP) would have to be excluded from the club.

New members this month are Rex Black VK2YA, and Jack Moyle of VK2EZ, formerly second op at VK2GT. To these chaps we extend a hearty welcome, and a hope that they will remain QRP for many moons to come.

We hear that present day QRP records aren't a patch on some of the records put up by the old timers back in the days when ham radio was a pup. For instance VK2CM worked several ZL's with ¼ of a volt on the old 160 mx band. Rather takes one's breath away, eh what! If anyone can improve on that effort we'll make him a life member of the Club, with free entry to all beanos — if any hi!! Now let's take a peep at what the boys are doing.

2FI is gradually getting his power house into shape but is not yet on qro. Being rather fond of life, Athol keeps putting off the big day when he'll switch on the juice — wonder what'll blow up first, om? Has been using fone, only .7 of a watt input, but the ZL's report it QSA3-4, so it must be pretty good.

2GT thinks a few qrp tests with 2EZ will vary the monotony of things, these two stations being very favourably situated for this type of work. Has an A.O.P.C. aspirant under way — hope he's a qrp man, George.

2EZ is a long way nearer Heaven than a lot of hams will ever be. Jack lives away up in the hills and claims to be the loftiest station in Australia. A glance at the fotos of his outfit in July "Radio Monthly" will give you an idea of the neatness of his station.

2KR heard on 7 mc ripping along at a nice bat with his bug.

2KZ finds the ZL gang fb on qsl'ing, but then they all know that Max himself is a 100 per cent qsl'er. 2KZ has at last erected what he terms a decent aerial system —50 feet high, and supported by 660 feet of guy wire and 9 dozen insulators — bet she took a bit of erecting, om. All the gang will be pleased to hear that Max is back in a job again.

2YA, using 100 volts of B batts on a TNT rig, thumps the key by night after thumping kids by day. Rex will be in camp at Liverpool with the Signalling Corps during September, and will take a portable rig along with him, so watch out for him you fellows.

2JJ reported to be testing with an engine driven genny, but no other news of him to hand.

3LP finds VK6's few and far between but has worked all other states and a few ZL's. Tried out some fone and had good local reports. Finds a new aluminium panel in his receiver improves the tuning quite a bit.

3PG tried to erect a 50 footer without any help: at the critical moment a stray puff of wind wandered along and the 50 footer came to earth in a hurry, arriving on terra firma in several pieces. Now has a 201A in place of the overworked TCO3/5, and is looking forward to a busy season on 14 mc.

3NK borrowed 3GC's 15-watt rig and worked 3PG; as as result NK is no longer a member of the Club. We don't like losing members but if you lads will persist in using qro there's only one course left for us to adopt.

3NQ wonders why so few hams have receivers that will tune in the international fone stations. Half the thrill of the game is in listening to overseas BC programmes. Is saving up his energy for a smack at the 14 mc dx this spring.

4KZ has been inactive, but rebuilt his receiver ready for contest, and gets excellent results from it. Uses a SG det., and penthode in audio, and backs it against any det and two audio combination he has heard.

No more till next month, gang — cul, 73.

JIM, VK3NQ.

Ultra Short Wave Transmitters.

2,000,000,000 OSCILLATIONS PER SECOND.

A "Micro-Ray" equipment giving radio communication on the shortest wave-length employed at any radio station in the world, has been ordered by the Air Ministry for use in connection with cross-channel flying services. This equipment will be manufactured by Messrs. Standard Telephones & Cables, Limited, in their Hendon factory. Some eighteen months ago the first demonstration of practical radio telephony on a wavelength below one metre was given by the International Telephone & Telegraph Laboratories of Hendon, working in co-operation with the Laboratories of Le Materiel Telephonique, Paris. On that occasion radio telephonic communication was established between Dover and Calais on a wavelength of approximately 18 centimetres.

The equipment now ordered will operate on an even lower wavelength—in the neighbourhood of 15 centimetres. For communication on this minute wavelength, transmitting and receiving aerials less than 1in. long are used. Micro-Rays oscillating at a rate of about 2,000,000,000 times a second are generated in a special "Micro-Radion" tube. These oscillations are led to the tiny transmitting aerial and are then concentrated by a combination of mirrors into a fine pencil of rays, which are thrown into space from a circular reflector, about 10ft. in diameter. This reflector is focussed onto a similar reflector at the receiving station.

The equipment ordered by the Air Ministry will be located at Lympne Air-port, near Hythe, and will operate in conjunction with a similar equipment ordered by the French Air Ministry to be situated at St. Inglevert aerodrome nearly 7 miles south-west of Calais. It will be used for announcing the arrival and departure of aeroplanes that are not fitted with radio, and for routine service messages. Teleprinters for both receiving and transmitting messages will be used. In this way typewritten messages will be sent across the Channel by radio, thus providing a permanent record at each end. The use of teleprinters will also help to overcome the language difficulty, since it is easier for a man to understand a written message in a language with which he is unfamiliar than a spoken one. Messages can also be received on a teleprinter during the temporary absence of the operator.

Micro-Rays are almost entirely unaffected by atmospheric conditions. Another advantage is that on this extremely low wave band there is practically no interference from congestion of the ether or from nearby machinery.

Variable Condensers :
Stromberg Carlson 2, 3, 4 Gang, New Type.
Saxon 2 or 3 Gang, with or without dial.

Midget Condensers :
3, 7 13, 23 Plate.

Condensers, By-pass :
4, 2, 1, .5, .01, 3 x .5, 2 x .1, 3 x .1 mfd.

Condensers, Tubular :
.5, .1, .02, .01, .002, .001, .00025 mfd.

Condensers Electrolytic
Polymet 8 mfd.
Dulytic 8 mfd.
Lomil 8 mfd.
Solar 8 mfd.

Condensers, Mica :
Simplex .02, .01, .004 to .006, .003 to .001, .0001 to .0005, .00025 mfd.
T.C.C. .01, .001 to .003, .0001 to .00025 mfd.

Cabinets :
Console full finish.
Console De Luxe.
Mantle.

Dials :
Efco Junior Organ, Junior Floral, Senior Ship, Gothic, Avon, Cameo, Lyric, Beam, Gondola.
Radiokes Roman, Peter Pan, Full Vision Spot-light.

Potentiometers :
Marquis, Radiokes.

Voltage Dividers :
15,000, 25,000 ohms.

Speakers :
Jensen 7 inch.
Jensen 10 inch.
Amplion 7 inch.
Jubilee 7 inch.
Saxon 10 inch.

Transformers, Power:
Henderson 80, 125 mil.
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Resistors, Wire Wound:
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Bradley Leaks, 5000 to 1 meg, up to 2 meg.
I.R.C. 10,000 to 1 meg, up to 5 meg.
Chanex up to 2 meg.
Wembley up to 2 meg.

Superhet. Kits :
Lekmek, Complete.
R.C.S.

Sockets :
4, 5, 6, 7 pin.

Knobs :
Large Octagonal, Small Octagonal, Large Round, Small Round.

Valve Shields :
5 pin, 6 pin, 6 pin with tops.

Coils, T.R.F. :
R.C.S., on marquis formers.
Plain coils, 1 inch formers.

Chokes :
Slot Wound.
Honeycomb.
R.C.S. Honeycomb.

Sundries :
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S.G. Clips.
Spaghetti.
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Plugs.
Terminals.
Pack Cans.
Metal Chassis.
Solder Lugs.
Toggle Switches.
3-way Switches.
Hook-up wire.
Earth wire, 7/20.
Aerial wire.
Egg Insulators.
Resin Core Solder.
Audio Transformers.
C.T. Resistors.
Pocket Screw Drivers.

Invincible Chassis (1933 Models):
T.R.F. 3/4, 4/5, 5/6.
Superhets 4/5, 5/6.
1933 Standard 6/7.

PRICES ON APPLICATION.

Artistic Radio Furniture

(Continued from page 14)

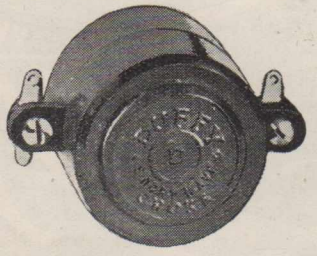
menced. To-day its fame is established far beyond Australia.

Queensland Walnut predominates in the creations of eminent French, German and English designers, as witness the leading Furniture Journals. It is much sought after by American manufacturers, who market it under the trade name of "Oriental Walnut," and who frankly acknowledge its superiority over the American-grown species.

The colourations of this wood are typically walnut, revealing themselves in rich definite markings of blacks, browns and chocolates. It has an amazing beauty of figure presenting oftimes the effect of a richly flowered shadow tapestry. Because of its impressive beauty, its fine texture and perfect finish under polish, Queensland Walnut is prescribed for all plywood cabinet work demanding the expression of quality and refinement. For decorative internal panellings, fittings and high grade furniture, it is an ideal choice. Its remarkable effect in interior decoration may be seen in the Commonwealth Buildings at Canberra. The veneered encasements of Beale Pianos and Radio Receivers, for which it is extensively used, also reflect its rare beauty.

SHORT WAVE PRECISION R.F. CHOKE COIL

If careful attention to details which are often neglected, together with the use of superfine components are any criterion, then the Duffy Short Wave transposers are excellent short-wave receivers. The production of an instrument which receives transmissions from Paris, in the city of Sydney at mid-day at full loud speaker strength is a feat of which its designer may well be proud. As this was done by every instrument in the factory, to the satisfaction of the writer, the natural question which occurred was "how was this possible." Mr. Jack Duffy produced one of his radio-frequency chokes and stated that this small component played a big part in making this possible. He went on to explain that it had very little self-capacity, was non-hygooscopic, and once assembled its inductance remained constant, and it continued to perform its normal functions when built into the receiver. It is housed in a moulded bakelite case and is produced entirely in the factory, the standard of accuracy being insured by the use of Weston testing equipment. Illustrated herewith, our sample choke is from the Duffy Radio Co. Ltd. (specialists in short wave radio), 73-75 George Street, Redfern. (Phone MA 3933).



The bakelite case of this shortwave choke coil conceals a low capacity highly efficient coil.

Coils of this type are a necessity and will eventualy replace all others.

The listener-in : "What is the best item on the night's programme, as far as you are concerned, Uncle George?"

Uncle George : "God Save the King."

"When you get a holiday, Uncle George, where do you go."

Uncle George : "To a deaf and dumb institution."

Service Counts

Invincible Radio initiates new system which is already popular.

ANY business which is to continue to expand in these days of competitive prices must be soundly organised and be operated under the direction of a capable administrator. At the same time in addition to the quality, price and performance of the goods manufactured and sold a reliable system of service, both before and after sales is a necessity of which discriminating buyers are nowadays quick to take advantage.

A few years ago suburban and country radio dealers did not know the meaning of the word "service" except as applied to batteries, and even in this particular case, the service was always given by them to their clients. As for the radio dealer being the recipient—well it simply was not done. During a conversation with the manager of the Invincible Radio Co (12 Castlereagh Street, Sydney) Mr. S.C.R. Wolrige recently, it was ascertained that he had instituted a system of service which gave his clients immediate profits, and that those who now are making use of this service are forging ahead of those who do not. The service offered is quite novel in radio circles and it is this: The Invincible Radio Co. will act as your purchasing agent and no matter what you require on receipt of a telephone message, telegram or letter from you, the articles will be inspected, examined and purchased for you and packed and despatched to you, the same day. Suburban dealers may order by phone and collect their goods personally within a couple of hours or they can be forwarded by carrier—the Metropolitan Delivery Coy.—for the usual small delivery charges.

This is a real service which should prove to be a great boon to those who are unable to get into the city to select their requirements in person, and who may not even know exactly what goods are available. For the purchase of replacement parts which are not now stocked everywhere, unless one knew the city well, one might have to spend all day in search of a component which is worth only a few shillings. By making use of this purchasing service which is now available you pass your troubles off onto this company. Naturally one asks what is this going to cost, just as we did. Mr. Wolridge stated that the price paid by the customer is the same which he himself would pay if he purchased direct, so that clients who use this service must show a greater profit than those who do not. Of course this service is based on good faith and a personal acquaintance with the radio trade since pre-broadcasting days. This service is also available to amateurs resident in the country or in any district which comes under the administration of the Australian Commonwealth or New Zealand Dominion governments.

This is something entirely new and has met with the approbation of the many clients of this firm. For the benefit of those who have not yet met Mr. Wolrige we would like to state that he has been through the Marconi School of Wireless, was one of the first six "licenced" dealers in the good days, and served during the war with the 55th Battalion in the Australian Imperial Forces. We found many surprises in this establishment, all pleasant too, and hope to have the privilege of congratulating its enterprising manager on the success of some of his patents.

Jottings from Queensland.

By J. HUGH

I listened to a double-sided character on 80 and 40 mx recently. About the middle of June a VK2 on fone said: "Sorry you are not getting my fone too good om. I got good reports on 40 mx with it. I came up on 80 metres because I agree that fone of any sort should not be used on 40 after dark."

The same station working a Yank on 40 mx three nights after: "Thanks for the vy fb report om and I hope you are getting my fone okay."

After that man's experience I decided that almost every ham who uses fone would forget all about his principles if a Yank came back and said: "Your sigs QSA5, R8-9. Try your fone." Further remarks on this subject will be ignored.

Now about the doings. VK3OZ (who was VK2OW) has removed to his new qra at Glen Iris. He says it is an fb qra and no qrm.

VK2RY is now on 80 metres and with a 2-watt input sounds fb. 2RY complains that 40 metres is overcrowded. VK3LH on fone and CW comes through very nicely on 80 metres, although conditions at 3LH have been scrappy. VK2XO comes in well most of the night on 80 metres. There are times when VK2 fades right down to R1, usually about 7 or 8 p.m.

VK2JG very nice 80 metre fone — VK2KA likewise. VK2GM coming through very nice on 80 also. VK2OC has a thorn in his side in the form of a BCL when he is on 80 metres. VK2AO has made a wonderful change to fone which sounds fb now, Jim. VK2BE is reliable on 80 metres fone or CW. VK2ZW is better on music than speech. VK2SL has cleared the hum from his fone which sounds fb here. VK2KR comes through clear with 80 metre fone. Haven't struck you at your best times, Cec ob. VK2HW comes through clear on 80 metre fone, although the quantity could be greater.

Someone compared 2HC and 2KH. Well, they are both good, but one must recognise the fact that 2HC is the best and most reliable "VK" station on the 80 metre band. From 6 p.m. to 1 a.m. he is QSA5. It is not often that he is heard up to 1 a.m., but any hour between the times stated he is reliable whether qsb or not. The power of these stations is so different and 2HC is modulating his high input admirably. 2KH is very good but only at certain times. The quality of both stations is equal. Our old friend Trev of VK2NS has to be reckoned with and his quality is equal if not better than 2HC and 2KH, while VK2RJ when at his best would give the others a run for their money. While a new ham in 2YX is good, he is not consistently so.

VK3PY is a peppy station on 80 metres, with good fone. VK3AL had the misfortune to lose both of his modulator valves on 80. VK3ZL comes through very well on the peak periods.

VK7DR puts out good 80 metre fone and comes up here at R7, while VK7CK is on R5 at the same time.

VK5MU comes through solidly on 80, as also does 5MY and 5XR. VK6KB also very fb on the 80 mx band.

The following ZL stations were fb over the month on 80 mx: ZL1- HH, HY, BO, GN, GX, GV, DE, CN, CD, BQ; ZL2- FN, DL, NJ, AB, NM, CS, NH, KI, CP, BE, NW; ZL3- NM, DL, AF; ZL4- CK, CR.

VK2FI, 2PZ, 2YL, 2BP, 2YK, 2YI were fb on CW on 80. VK2NO popped up on 80 for a few seconds to try completely new rig and aerial. He certainly has a wallop now. He says his junior op. is still cutting his teeth on WECO valves hi! 2NO has been taking midnight walks across the floor.

VK4MM, 4FK, 4JF, 4RJ, 4HR, 4LL, 4DR and 4ZX use 80 metres. VK4LP is using a new MOPA rig on 80 and 40. VK4YG using 40 metres and working the dx fine. While 4NG and 4TY consistently on 80 and fb too. 4JU on 80 metres got R8 from all ZL, R7 from VK7, R8 VK5 on his fone.

Cheerio!

J. HUGH.

Continued from Page 9

The commercial development of the Ferrocart matter in England now has come a definite stage, the situation being as follows:

Colvern Ltd., Romford/Essex, Mawney's Road, acquired the sole right of making and selling Ferrocart components and kits.

General Electric Company, Ltd., Magnet House, Kingsway, London WC2, acquired (a) the sole right of making Ferrocart material; (b) the sole right for the use of Ferrocart material for electric communication on wire; (c) a licence for making Ferrocart coils for their own receivers and kits.

Electric & Musical Industries, Ltd. (The Gramophone Co., Columbia Graphophone Co., Marconiphone Co.,) Blyth Road, Hayes, Middlesex, acquired a licence for making Ferrocart coils for their own receivers.

Marconi's Wireless Telegraph Co., Ltd, Marconi House, Strand, London WC 2, acquired a licence for the use of Ferrocart material for radio transmitting purposes and commercial receivers.

Licence agreements with other prominent firms for Ferrocart receiver coils are going to be made.

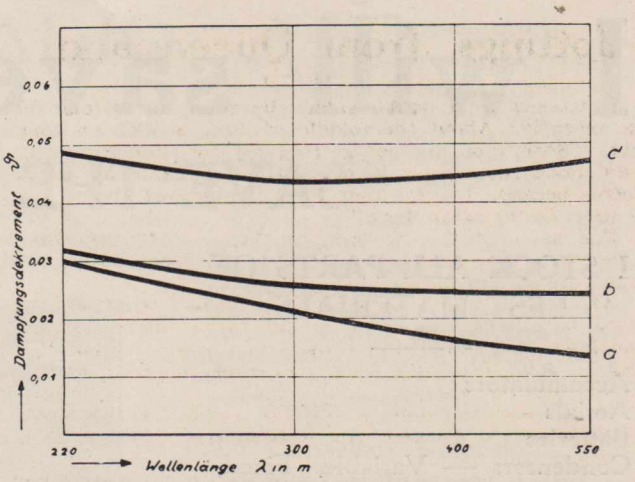


Fig. 3.—Damping curve of : A, an air condenser; B, a Vogt flat condenser; C, a hard paper condenser.

Continued from Page 10

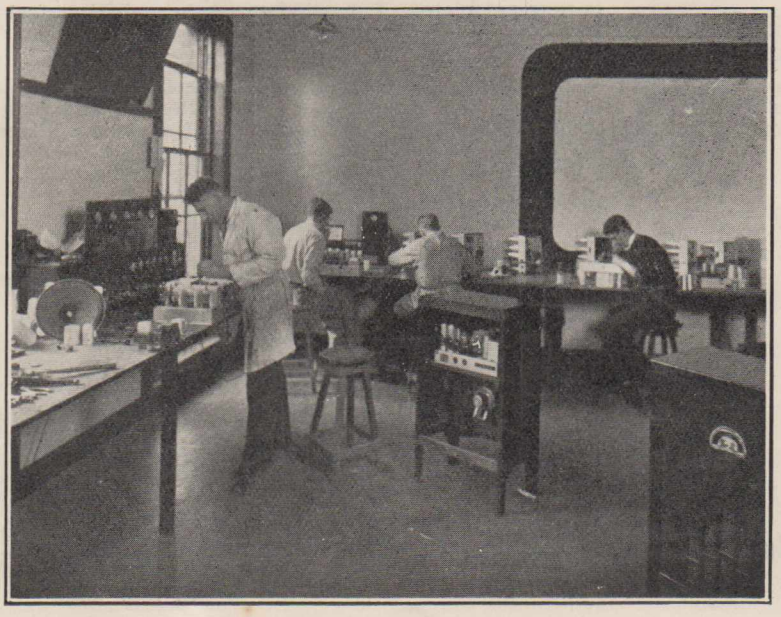
Si Meredith is finding it hard to make time to write the Xmas pantomime for the 2UE Children's Party.

Florence Elkin, flautist of the 2UE Orchestra is only twenty-two years of age. Her father, Clarence Elkin, has had over forty musical compositions published.

2UE features a special request session between 11 a.m. and noon each Sunday.

CUSTOM BUILT RADIO

Many people wonder what "custom built" means. It was explained to us by Mr. E. R. Park, its principal and manager, whose experience in radio dates back to the early days of the Great War, and who is well known in the radio trade, as a sound business policy. It means that a customer may have any chassis built to his own design and incorporate his own ideas and at the same time to benefit by the advice of the firm's engineers. This makes it possible to produce receivers which give satisfaction whether they be for use on direct or on alternating current, for battery operation or for short-wave reception. Only the best of material is used, for Mr. Park states that this practice has enabled him to build a business based on small profit with quick returns, which on a strictly cash basis has established a huge turnover. In the past, business has been transacted with wholesalers and manufacturers only, but it is now Mr. Park's policy to trade direct with the public at prices which are wholesale. Reproduced herewith are illustrations of the showrooms and factory, where personal service and technical advice is available at any time.



British Programmes.

FOR B CLASS BROADCASTERS.

Recorded broadcasting programmes produced by the British Broadcasting Corporation are being made available to the B Class stations of Australia by arrangement with Amalgamated Wireless.

Several of these items were heard in Sydney at a private gathering recently. The idea of the recorded programmes is to enable radio listeners to hear musical and dramatic numbers exactly as performed for broadcasting in the British Isles. Only picked items, of course, are selected for recording.

Canadian Refreshed.

HEARS AUSTRALIAN RADIO.

Mr. A. C. Phillips, of Royal Street, Regina, Canada, writes to Amalgamated Wireless (A/sia) Ltd. that he picked up VK2ME, the long distance short wave staton of A.W.A., one Sunday morning recently, and the signals were so strong he thought it was W1XAZ Springfield, Massachusetts. Though he was using only a 2-valve superhet converter, he had to reduce the power, as the volume was too great for comfort in the room and the loudspeaker was carrying its load limit. "The programme itself," says Mr. Phillips, "was one of the most pleasant I have heard. After the incessant jazz music, yodelling cowboys, singing hackers, old-time fiddlers and the resurrected remains of long dead jokes, to listen to a programme moulded in the fashion of a popular concert is quite refreshing. It is perhaps needless to mention that I shall be up next Sunday morning bright and early with the radio dials set hoping to hear another real British programme from VK2ME."

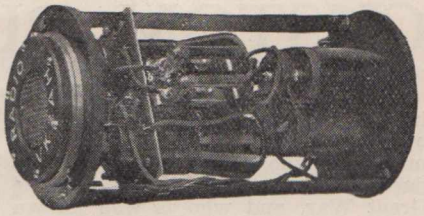
How U.S.A. Hears Us.

AUSTRALIAN BROADCASTING STATIONS.

Writing in the New York "Sun," Captain Horace L. Hall pays a neat tribute to the short wave world broadcasting stations of Amalgamated Wireless (Australasia) Ltd., VK2ME Sydney and VK3ME Melbourne.

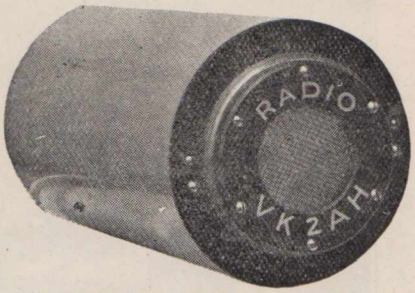
"Invariably when I have occasion to introduce two short wave fans to each other," he writes, "one fan will say to the other within a few minutes 'Have you ever heard Australia?' If the other fellow says yes, they discover they have something in common. Anyone with any tuning ability and any kind of short wave receiver should be able to get both stations located in Australia. As a matter of fact, this is the truth first because their schedules are regular, second because they have sufficient power to reach this part of the United States, third because they are on the air at times when man-made static is not bothersome.

Condensing the CONDENSER MIKE



Showing the microphone and its amplifier with case removed — a neat and compact unit.

By VK2AH
(A. H. Llewellyn)



The complete instrument. A coat of duco enhances its appearance; its performance "speaks for itself."

WITHOUT doubt the condenser microphone is among the finest of these instruments, but owing to the difficulties encountered in the construction they are waning in popularity. The facts that they are not readily portable and necessitate extra gear also contribute their share. However, the mike when finished will be found well worth the while of the ham who wishes natural voice and quality transmission.

Most things are difficult until the objective is clear and concise. In this article the writer attempts to simplify the construction and trusts others will benefit by this dope.

OPERATION.

The operation of a condenser mike is very simple and easily understood. Two elements, one stationary and one flexible, are placed near and parallel to each other. An e.m.f. is applied causing "electro-static lines of force" to exist between them. There is no current flow after the initial charge, but if the flexible element is varied (say by voice frequencies) the dielectric (air) will also vary, causing a changing number of "electro-static lines of force." These represent a movement of current in R1 and the consequent P.D. is applied to the grid of V1 through C1 and amplified.

To obtain any appreciable output the clearance between these elements must be in the order of .0005 inches (½ one thou.) and as nearly uniform as possible. The diaphragm must also be of suitable material, sensitive to small vibrations while not resonating in the audible range.

THE CONSTRUCTION.

This mike follows closely on others previously described, but the construction details will be found readily applicable to almost any size and shape. Also the materials are easily obtained in Sydney.

Manhattan, Cav and some Amplion loudspeaker units are adaptable, sizes between 4in and 2½in. being most suitable. The Manhattan is particularly so, having a screwable back plate allowing very fine adjustment to be had between the diaphragm and stator. The packing details need not apply to this one.

From Figure 1 three rings will be seen. These are facing ring, spacer ring and threaded ring. The face ring is made of ¼in. ebonite or bakelite and has a groove turned to take a protecting screen. The spacer ring is 1/16in. fibre, and the threaded ring is part of the speaker unit turned down. The thread must be reasonably accurate and good fitting. The sizes of course depend on the speaker unit, but as strength and rigidity are necessary a good margin is desired. Approximate proportion can be gauged from Fig. 1. Any turner and fitter will make these for a few shillings. Between six and nine 1/8in. screws will clamp these firmly together. They may be bolts and nuts or the threaded ring may be tapped to receive them.

THE DIAPHRAGM.

Superior quality silver paper between .0005 and .001 inches is used. This material should have a very "crinkly" touch and "cry" loudly when disturbed. Hi. If the mike is a large one, .0015 shim brass (Bennett & Wood Ltd., Sydney) will be found quite suitable. However, experiment with several pieces will reveal good and poor ones.

Place the diaphragm to be used on a sheet of glass and smooth out all wrinkles and marks with a large soft rubber; then in the order shown assemble the rings and fasten screws very firmly and evenly. When doing this be careful not to wrinkle the diaphragm. This section is now completed. Put aside carefully and don't feel the tension, as you will stretch it unevenly.

BACK PLATE.

This is the stator or cathode (the fixed element) and is made from an old valve base. Remove the pins by drilling from the inside and clean off all burrs. Place in

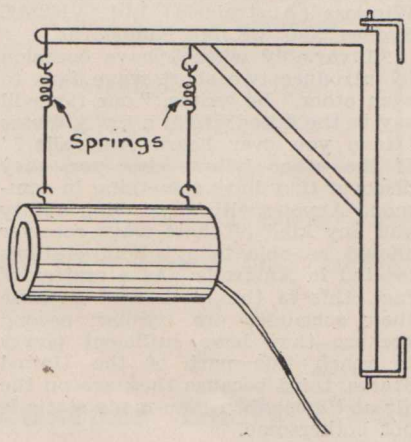


Fig. 2 (left).—Showing the method of mounting.

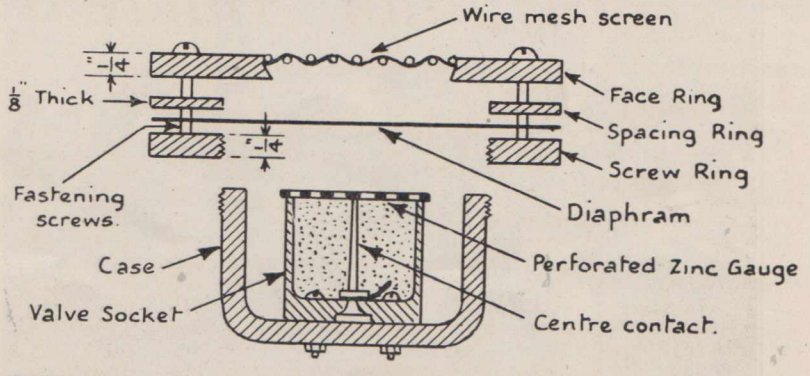
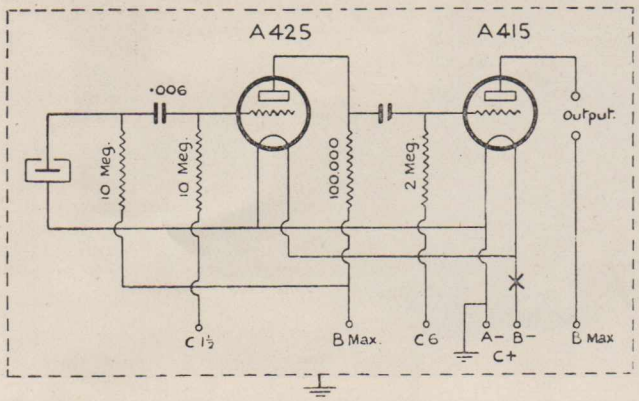


Fig. 1 (above).—Shows that the construction of the mike proper is quite an easy job to any ham.

centre of the case and mark to diagonally opposite holes for attaching screws. Drill and countersink a hole as shown in Fig. 1. Screw it firmly into the case and pare off level with top of case. Remove and pack four sheets of "R.M." under the valve base. Pare down evenly again. The centre contact is now made from a 1/8in. brass screw. Cut off level with the valve base and file the last four threads off. A cable lug for contact is placed under the nut. Replace the valve base in case and fasten down firmly without the packing this time.

Now cut a 1-3/8in. disc of perforated zinc (meat safe gauze), straighten out flat and smooth burrs off with a sheet of sandpaper. Place the centre hole over the contact (countersunk screw) and while slightly depressed solder with a mediumly hot iron. Shave the surplus solder off gently with a knife.

By placing a straight edge across the rim of the case there should be a very thin strip of light deepening towards the centre. This represents the clearance between the elements and should be as near and even as possible (.0005 at edges). (*Note.—The perforated zinc varies slightly in thickness so compensations may be necessary*).



The circuit of the microphone amplifier which is housed in the case.

FINAL ASSEMBLY.

Great care should be exercised in handling as the clearance is so small that a jar may upset it. Terminals on the speaker base may be used but the insulation must be extremely good, or a loss may occur here. Should the slightest piece of foreign matter become lodged between the elements, noises, lack of sensitivity, and even no operation at all will result. Before screwing the face on give the case a petrol bath and dust with a piece of silk. Make certain there are no burrs on the edge of case and screw the face assembly on. As the face is advanced the rim of case will touch the diaphragm and draw it taut. Very slight pressure is needed to break the diaphragm, so be careful.

THE AMPLIFIER.

The requirements of the amplifiers are fidelity, silence and gain. The layout is only important with respect to the mike leads. They are preferably as short as possible. Shielding is essential, not only in the unit but cable also. In the haywire amp. at first tried a loud hum was present although the only A.C. near was the ceiling light. When the shielding was fitted it disappeared entirely, even when quite close to A.C. leads.

Of course many layouts will suggest themselves to individual builders, but if a square shield is used it should be of thick material to avoid a possibility of resonance at some particular frequency.

The amplifier used here gives every satisfaction and has excessive gain. The valves used have been chosen after much experimentation and the combination is ideal. From the photographs a general idea of the layout can be seen. The "A" and "C" supplies are incorporated in the shield, and are three "Ever-Ready No. U2" cells for filament and No. 730 for C battery. The 4-ohm resistor R5 corrects the filament voltage. The 3v. C battery is correct bias for both tubes at these plate voltages. The best grid resistor value is best found by experiment. High quality components are very necessary as any background will be tremendously amplified in the final output. Armored three-wire motor cable is used for external connections.

The question of stages before the modulation seems to depend entirely on the mike output, allowing of course for 100 per cent amp. efficiency. About 70 per cent modulation has been had using the circuit in Fig. 3. Heising modulation, using a 56 type valve after the mike amp. and choke coupled to the 250 easily swings it. However, gain to spare is desirable, and a suggested layout is: two stages before the modulator for pickup work, then the circuit shown for mike and fader. This makes a total of 4 stages and should be sufficient. If difficulty is experienced in getting sufficient gain the mike itself is probably to blame and the clearance of diaphragm should be given the once-over.

A comparative idea of performance from the mike amp. itself can be gauged from this: Using Telefunken modulation and qso with a VK5, he stated that the piano in the background was very clear and natural and half as loud as the speech, although the door was closed and padded to keep the music out. Hi, hi ! It is possible to hear as many sounds with this mike and amp. as can be heard with the ear.

Australian Amateur Convention

THIS heading will give some of you something to think about, and why not ? Surely with close on two thousand amateur transmitters, not to mention the thousands of enthusiasts who are waiting to get their ticket, we can run our own convention. There are plenty of points at issue to be settled, and — what is more important — it would permit the Australian Amateurs to consolidate their position, and to express their opinions and ideas as a collective body. World conventions have been held at which no Australian delegates have been present to take part in the proceedings and to represent the Australian organisations as one body. This is indeed a sorry state of affairs, which may react some day to our disadvantage.

It is with pleasure that we initiate the movement and as this journal is published in the interests of the amateurs as a whole, we will do all we can to make an All-Australia Convention a reality. In its organisation we can assist materially, while our columns are always open to amateurs who wish to express their opinions and to make any suggestions. The preparation of an agenda, the arranging of hotel accommodation and reduced railway fares, visits to factories, pleasure resorts, social events, and meeting halls, are all items in which we can asist materially.

If the Wyong field day is any criterion then the convention should be a wonderful success. Anyway, here is the idea, and if you are interested don't hesitate to say so, and get busy with your suggestions. You might also have it discussed at the Club, and it may be that the Club would send official delegates.—What about it ?

STATION DESCRIPTION CONTEST.

Entries have been received from 4LG, 4RV, 4NG and 5GR. These will be published in due course, and owing to the two months delay in resuming the chronicle of amateur news, the closing date has been extended to 12th December. Note the address — 84 Pitt Street, Sydney.

GLADSTONE POWER EQUIPMENT

SPECIAL RATES TO AMATEURS

These photographs of the Gladstone input and output transformers for the Class B battery receiver described in this issue are here reproduced actual size.

Transmitting transformers, 10 to 1000 watts, built to order as illustrated elsewhere in this issue.

Transmitting chokes and resistances, modulation and microphone transformers with low self-capacity and high insulation.

A.C. to D.C. speaker conversions.
10 to 20 watt speakers kept in stock.

This speaker transformer is reproduced actual size.

Audio chokes, audio transformers, power chokes — built and repaired.

Speakers repaired and rewound.

Meters repaired, rewound and calibrated.

Tube checker transformers.

Armature and stator windings.

Trade repairs of all kinds.

Best quality materials are used. All work is inspected and thoroughly tested before delivery.

R. K. JONES

5 GLADSTONE STREET

BEXLEY, N.S.W.

Phone : LW 4187.

VALVE CHARACTERISTICS

The Golden E452T

(By G. V. HUME)

THE E452T is a high gain general purpose screen grid valve. To obtain the high amplification factor and slope, a special cathode was developed to give increased emission and a lower operating temperature. The cathode is of relatively large diameter and operates at a dull red.

So that the excellent characteristics of the valve could be used in practice it was necessary to make the internal capacity a minimum. This was done by decreasing the size of the plate and furthermore by the addition of a metal coating sprayed on the glass of the bulb. In this way the elements of the valve are completely screened from other components of the receiver, and feed back trouble is greatly reduced. The metal coating in joined by a wire to the cathode inside the valve.

Furthermore, by eliminating these stray couplings, valve cans are rendered unneccessary with this valve, which permits a more economical construction. At the same time stability of operation is assured and valve replacements do not affect the receiver as the characteristics are consistent.

R.F. Amplification.

The variable mu valve E455 is to be prefered for radio frequency amplification, but the E452T may be used when maximum gain is required. The standard radio frequency coil kits now available will operate with the E452T, but the plate and control grid leads must be changed as the plate is on top of the bulb. Figure 1 shows how the E452T is connected for radio frequency amplification.

Detector.

The E452T is an excellent valve for power grid and anode bend detection. Figure 2 gives the circuit for power grid operation. A definite value cannot be given for the screen voltage and this must be found by experiment. This applies also in the case of anode bend detection, the values for which may be found by referring to Figure 3.

Autodyne.

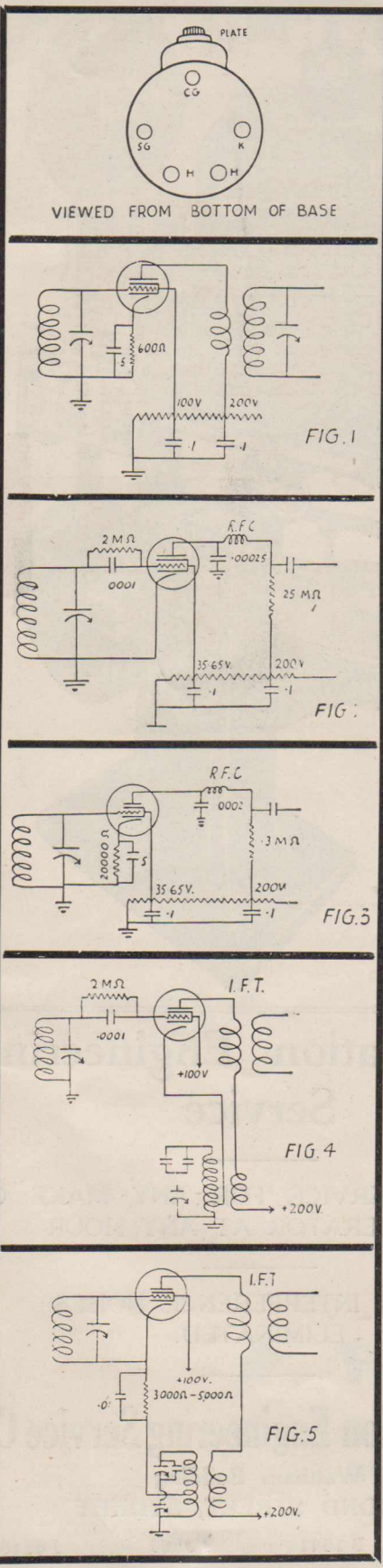
The E452T, by virtue of the metal spraying and therefore consistent characteristics, may be employed to great advantage as an autodyne in superheterodyne receivers. In this application either grid leak or anode bend rectification may be used.

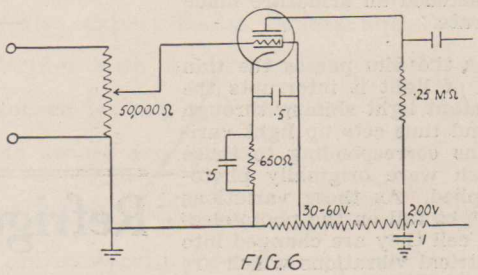
The values are given in Figures 4 and 5. For best results reliable coil kits and intermediate frequency transformers are essential. This valve can also be used in the "Baby Supers" as an autodyne coupled direct to the aerial coils.

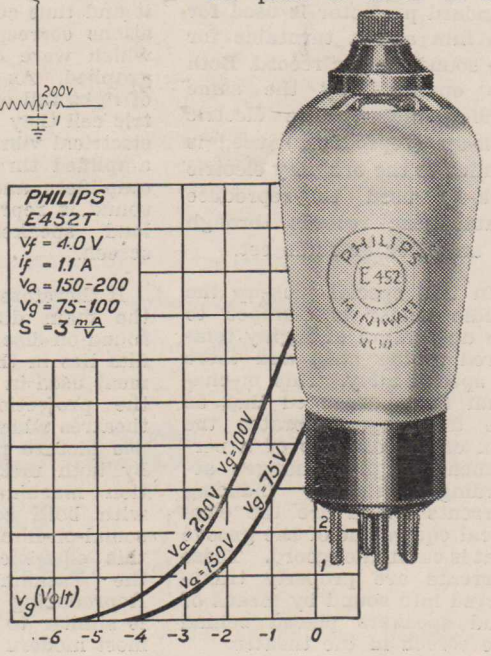
In common with other Philips screen grid valves, the plate is taken to a screw terminal on top of the bulb. With some coil kits the plate and control grid terminals must be changed to suit this valve which may be used for 175 KC or 460 KC work.

Audio Amplifier.

The E452 may be used in audio frequency amplifiers where a pick-up is used to reproduce records. The gain may be varied by the adjustment of screen volts and plate coupling resistance. Fig. 6 gives the values suitable for the generally used output valves. For fidelity of reproduction the new penthodes E443H and E443N are recommended.







TALKING PICTURES

A Brief Explanation.

By S. E. TATHAM.

SYNCHRONISATION of movement and sound on the screen produces the illusion of talking pictures. There are two methods of reproducing the synchronisation of sound with motion pictures, the first known as Sound-on-Disc (Vitaphone) which is achieved by playing a special wax record in conjunction with the projection of the film. The second method is known as Sound-on-Film (Movietone). Alongside the picture on the film is a small track of varied markings known as the Sound-on-Film Track, and when a special light system is projected on to this track vibrations are set up and subsequently converted into sound.

Sound-on-Disc.

In this system of talking pictures a special record is used 16 ins. in diameter, upon which the sound is recorded. It is the function of the sound amplifying equipment to reproduce this sound in perfect synchronisation with the picture so that the illusion of sound coming from the picture is absolutely perfect.

When the picture and sound recorded by this method are reproduced in a theatre, a standard projector is used for the film and a turntable for the sound-on-disc record. Both are operated by the same driving motor. The electric pick-up (reproducer) used is similar to the ordinary electric pick-up used to reproduce gramophone records through an amplifier or radio set.

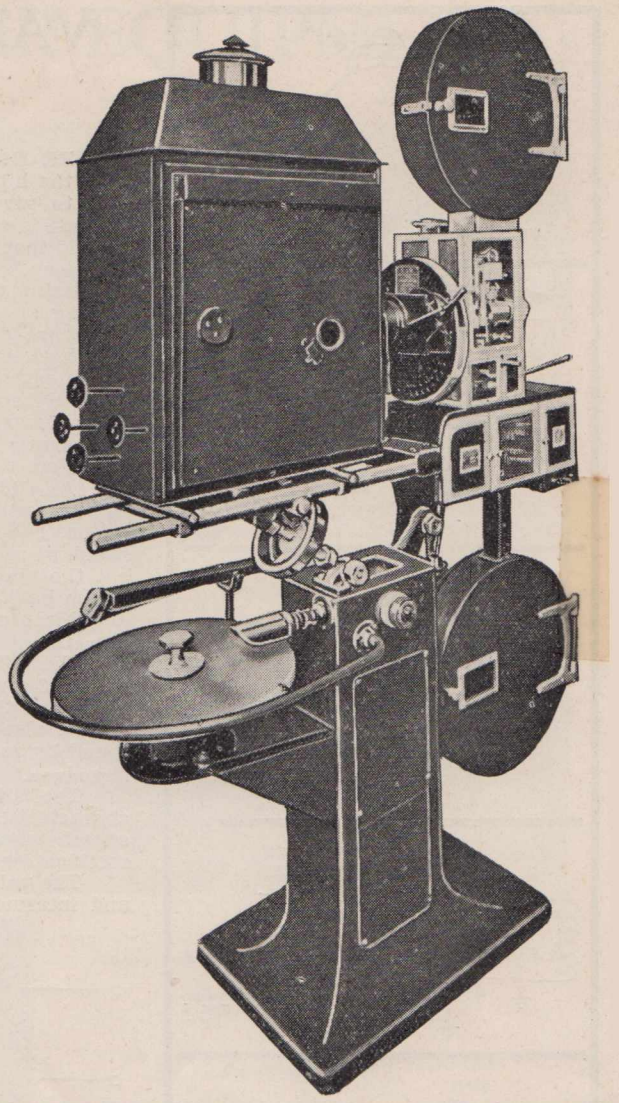
In this special pick-up the needle holder is clamped to the diaphragm of highly tempered spring steel and there of special alloy. This mechanism is so arranged that as the diaphragm vibrates the flux of the air gap of a permanent magnet changes accordingly, thereby inducing currents which are the electrical equivalent of the groove that is cut in the record. These currents are properly transferred into sound by means of loud speakers placed behind the screen in the theatre.

Sound-on-Film.

This system of talking pictures differs from the sound-on-disc system inasmuch as the film used for this purpose has a ladder-like band of microscopic lines running alongside the picture. These microscopic lines (sound track) consist of various shadings of light rays (photography of sound) and when operated through a thin line of light cause a photo-electric cell to is fastened an armature made operate.

As the film passes the thin line of light it interrupts the constant light shining through it and thus sets up light variations corresponding to those which were originally photographed. As these variations of light fall on the photo-electric cell they are changed into electrical vibrations which are amplified through a series of amplifiers and ultimately the sound is reproduced from the loud speakers behind the screen.

It therefore can be seen that the main difference between sound-on-disc and sound-on-film lies in the pick-up equipment used in conjunction with the projection machine. In theatres where it is desired to use picture productions made by both methods the projection machines are equipped with both sound-on-disc and sound-on-film. One example of this equipment is known as the "Tatham-Reprovox" Dual Reproducing Equipment and is similar to that used in the most modern theatres.



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