WIRELESS WEEKLY

Registered at the G.P.O., Sydney, for transmission by post as a newspaper.

VOL. 5. No. 11. 3D FRIDAY, JANUARY 9, 1925.

REPORT REINAR

Feature

LOW LOSS APPARATUS

VL

Phones, Redfern 964 and 930.

Official Organ of the New South Wales Division of the Wireless Institute of Australia, with which is incorporated the Affiliated Radio Societies and the Australian Radio Relay League.

VOL. 6. No. 11. FRIDAY, JANUARY 9, 1925.

CONTENTS:

EDITOR: A. W. WATT — The Editor will be glad to consider Technical and Topical Articles of interest to Australian Experimenters. All Manuscripts and Illustrations are sent at the Author's risk, and although the greatest care will be taken to return unsuitable matter (if accompanied by stamps), the Editor cannot accept responsibility for its safe return. Contributions should be addressed to the Editor, "Wireless Weekly," 12/16 Regent Street, Sydney, N.S.W.

SUBSCRIPTION RATES — Twelve months (52 issues), 13/-, post free. Six months (26 issues), 6/6, post free. Single Copies, 3d. each, or post free, 4d.

QUESTIONS and ANSWERS DEPT. — Except in the case of subscribers, all Technical Questions, or those entailing research work or drawings, must be accompanied by a postal note or stamps to the value of 1/-.

ADVERTISING — Advertising Rates may be had on application to the Advertising Manager. Copy must be in the hands of the Editor by the Friday preceding each issue. If copy is not received in time, the previous week's advertisement will be repeated.

All accounts should be made payable to Publicity Press Ltd., 12/16 Regent St., Sydney.

Agents in Great Britain: The Colonial Technical Press Ltd., Dudley House, South ampton Street, Strand, W.C. 2.

EDITORIAL

THE QUESTION OF INTERFERENCE.

THOSE immortal lines of Bracken's—"Not Understood"—are as much alive to-day as they were in the dim past when they were written, and particularly so with regard to the listeners-in and the experimental transmitters of Sydney—or at least some of them. Quite a respectable portion of our mail each day consists of complaints from listeners-in concerning interference from amateur transmitters—and upon occasions we have received epistles from experimenters complaining of the howling valves of broadcast listeners-in. The opinion on the one hand seems to be that the experimental transmitter is a mere blot upon the ether and should be suppressed and on the other hand that the broadcast listener is an intruder and should not be permitted to twiddle the dials of a regenerative receiver.

These opinions are no doubt prompted by good and sufficient reasons in some cases, because it goes without saying that an amateur transmitter who operates in any part of Sydney during the broadcasting hours MUST interfere with somebody or other, and to look casually at the other point of view—well, one has only to listen in on the broadcast wavelengths to hear the re-radiating receivers of listeners who are no doubt blissfully unconscious of the fact that quite unintentionally they are badly chopping up the programme for somebody else.

It seems to us that these interferences—and for that matter, the complaints themselves— arise out of a total misunderstanding of the circumstances affecting experimenters and broadcast listeners, and they must continue to cause a certain amount of dissatisfaction unless there is a clear understanding of the ownership of the ether. Primarily, to quote the politicians and Mark Twain, it belongs to the "peepul," whose rights in a matter that is all Dutch to most of the populace, are cherished and safeguarded by the Government. Amongst those who may fairly lay claim to a fair proportion of the ether are (1) Defence; (2) Coast Stations (3) Broadcasting Stations, and (bracketed) experimenters and broadcast listeners. So that each may work unhampered by the others, a right of way, or a wavelength has been laid down for the first three mentioned from which they may not depart. The stations of the experimental transmitters, however, while subject to stringent regulations are permitted somewhat more latitude in that they may under certain restrictions transmit on practically any wavelength under 230 metres, a band which is so far removed from that of broadcasting and commercial stations that the latter would not be subject to any interference, nor for that matter should the broadcast listeners, provided they use proper tuning devices. The broadcast listener, although his license is primarily for the reception of broadcasting, is unique in the position of having with his receiver the whole wide world at his feet, so to speak. With his coils and dials he can tune in almost anywhere without restrictions of any kind.

This important fact should be remembered. The experimental transmitters were in the field long before broadcasting was even thought of—in fact it is largely owing to their activities that we have broadcasting in Australia. They were in a sense the pioneers of wireless in this country and are in the majority of cases not the slightest bit interested in the art of broadcasting. Their mission is to carry out experiments, and the very fact that the wavelengths they use are so low and so far separated from the nearest broadcasting station (2BL) ought to be sufficient to ensure that they do not interfere with the enjoyment of broadcast listeners.

However, with inefficient or badly tuned receivers, no matter how sharply tuned are the amateur transmitters, it is always possible that a certain amount of energy radiated will "break through" —thus causing interference. A considerable amount of so-called heterodyning may be traced to this cause, and it is no exaggeration to say that if those who complain of interference from stations operating on other wavelengths paid a little attention to the design of their receivers and perhaps tried more selective circuits, then the interference would automatically disappear. However, perhaps many are unaware that quite of their own accord, and without any prompting, a large number of amateur transmitters mutually agreed to observe silent periods during the hours of broadcasting, and it is distinctly to their credit that they have rigidly adhered to their self-imposed conditions. There are, of course, others who regard such restrictions as intolerable, and take the attitude that being first in

the field, they are entitled to priority and to disregard the rights of the broadcast listeners. This of course, is a pure fallacy and may be ascribed to the same reason as that responsible for faddists and extremists in other walks of life. Happily however, these transmitters are few and far between and constitute no serious barrier to the satisfactory reception of broadcast reception. It is interesting to note here that in the United States a broadcast listener who happened to live next door to an amateur transmitter, actually went to court to get an injunction restraining the transmitter altogether, and although no record is yet to hand showing how the case was settled, it at least illustrates that Australia is not the only country where there is friction.

In voluntarily refraining from operating during broadcasting hours, local transmitters pursued a most excellent course, but one which, after all, was the only one open to them, for the reason that where there are so many inefficient home-made receivers carelessly operated, interference from nearby amateur transmitters is inevitable, and sooner or later would have started an agitation that could harm only the amateurs themselves. One or two cases have been reported to us of amateurs allegedly transmitting during broadcasting hours, under fictitious call signs, but these are clearly subjects for inquiry on the part of the Radio Inspector, and the amateurs in general can certainly not be pilloried for occurrences over which they have no control. Irresponsibles will always be with us, and they can only be dealt with as they are detected.

Now, after the broadcasting hours, the experimenters—and rightly so—regard their claim to the ether as justifiable, and that they have made good use of the limited hours allotted to them is well known. There are, however, numbers of broadcast listeners who, ever on the alert for something new, sit up until a late hour endeavouring to tune in 6WF or some other distant broadcaster, and the unfortunate tendency, in cases where interference arises, is to blame it all on the amateurs. This is distinctly unfair, and a moment's reflection will show that, having kept religiously off the air until local broadcasting stations have closed down, then amateurs are entitled to carry on without regard to the few who are hunting for far away broadcasting stations. Again there are numbers of listeners who, naturally keen to pick up overseas amateur stations, tune their receivers on the band between 80 and 100 metres, and on frequent occasions have actually hampered results which local experimenters have spent months to reach. All of these unfortunate incidents could be avoided if only a little thought and common sense were used, and an understanding of the other fellow's point of view would undoubtedly lead to a tolerant, friendly attitude towards each other. Let the amateur remember that the broadcast listener is entitled to his programme without interruption, and it is equally incumbent upon the broadcast listener to reflect that the amateur is entitled to that consideration he himself has shown in confining the possibility of interference to a minimumm.

A little thought and tact will result in there being plenty of room for all.

Radio in Poland

By Salo Grenkamp-Kornfeld.

(Editor's Note—This little contribution reached us from Jaslo, Poland, and was written in Esperanto which was kindly translated for us by Mr. Leslie E. Pfahl, Hon. Secretary, Sydney Esperanto Society. Mr. Salo Grenkamp-Kornfeld is an editor and a collaborator of some important journals in Cracow, and is the National Secretary for Poland of the International Radio Association.)

HOPING up to the time of writing that you know nothing of the development of the radio movement here, I intend to detail the present state and commencement of the movement.

At first as it always is possible the same everywhere, the newspapers, especially those of the extreme right were against the introduction of radio, because of the danger of spies, unpatriotic nationals of other nations and Bolsheviks who would use it as a means of mutual understanding.

Often one reads of the discovery of a radio station which had been in touch with Bolsheviks, etc., etc., and in truth students (once even two of 13 and 14 years tried to build such dangerous sets).

During my stay in Geneva last April as a delegate of Poland to the Esperanto conference I had the pleasure to be invited to the radio conference of the 22nd and 23rd April.

As an ordinary member I asked permission to speak before the conference about the absolute refusal in some states, such as ours, of the private use of wireless telephony, even for amateurs.

The conference accepted my motion with applause which was as follows: "The conference expresses the desire that some states which still forbid the use of radio telephony, be good enough to re-consider their decisions and allow the amateurs to use their sets."

At the same time the newspapers which were favourable attacked the government for its reten-

(Continued on Page 16, Column 2.)

HEADQUARTERS
Royal Society's House
5 Elizabeth St.
SYDNEY, N.S.W.

Wireless Institute of Australia
N.S.W. Div. Inc.
Incorporating the Affiliated Societies and The Australian Radio Relay League

Phil. Renshaw, Hon.Sec.
Box 3120 G.P.O. Sydney
Phone B2235
A.H.Perrett Publicity Officer.

APATHY.

The question has sometimes been asked: "Is the average experimenter apathetic?" This question could be answered in at least two ways.

From the clubs' standpoint it is safe to say that he is decidedly apathetic in the majority of cases. From the point of view of key punching it is very much the reverse. The man that has a keen interest in wireless as a rule will often sit up late at night and rise early in the morning, so that he may get long distance results. In many cases he is burning the candle at both ends, to get the results for which he is anxious and which are nearest and dearest to his heart. He will labour carefully and laboriously, winding coils and connecting up circuits. He will build transformers and manufacture rectifiers, from odd scraps of material. He will improvise and extemporise in an almost uncanny way, and moreover he is never satisfied with the results he is achieving.

He is always striving to do better, and his only source of satisfaction is, that he never comes to the end of his labours but has always something more to accomplish.

He performs wonders with a few watts of power, he is not satisfied until he has reduced his power still further. All this keen activity is indeed laudable, but the question can and will be asked, "Is it sufficient?" Has the experimenter such a narrow outlook on life that the claims of scientific bodies must be ignored?

In speaking in this way reference is only made to those clubs and societies which are working along scientific lines, those of the more social nature being left out of the question for a time.

The experimenter joins the club or society with a definite object of obtaining assistance in his work, but frequently what takes place is his repeated absence from meetings. He complains that there is nothing of interest to him there. Whose fault is this?

Is it fair to lay the whole responsibility on those who carry on the active work of the society? It has unfortunately been the experience of all scientific bodies, not only those connected with wireless, that the work of running the association is left entirely to one or two only, and the prosperity or otherwise of that particular body depends entirely upon the capabilities of the willing horse.

Criticism is freely offered, but if any suggestion is made that the one offering the criticism should shoulder some of the responsibility, excuses more numerous than plausible are readily forthcoming. Only those who hold a responsible executive position in a live club know the enormous amount of work involved in keeping matters running smoothly, and to say the least of it, it is highly disappointing to see their efforts rewarded by a meagre attendance at the meetings. Why is it that so few, comparatively, make a point of regularly attending all the meetings of a club?

Is it that the matter offered is uninteresting? Is it that the standard of papers read or lectures delivered is above the standard of the majority of members? Is it that they are too much occupied with their own narrow circumscribed sphere, of experimental action? Or is it apathy, purely and simply? In any case whose fault is it? Those responsible for the papers and lectures would be only too glad to have offers of assistance from others who think that lectures of another type would be more useful to the Society.

If the matter already being put forward is too advanced for members, here again the fault does not lie with the lecture committee, but with the member himself who should be only too anxious to educate himself to a higher standard. It is only by attending meetings and lectures, hearing papers read and asking questions on obscure points that such education can be obtained. It is true that much can be learnt from textbooks and periodicals, but by far the quickest way and the most congenial way is to talk it over with your fellow ex-

perimenters. One may may have been making a speciality of a particular type of modulation. Another may have concentrated on rectification. Another man may know something more than the average, of reception, on short wavelengths, and if they are willing to devote one evening to lecture to their fellow experimenters, the latter would then be able to acquire specific knowledge, in a quicker and happier way, than would be afforded by months of experiment and study.

By asking questions on any points which may not be quite clear, much interesting matter may be unearthed.

Have you ever tried writing a paper yourself? Do you realise that it is one of the most instructive things that you can take up? You will be surprised how much you can learn yourself in a very short time, and the benefit that you will confer upon your fellow members will also be great. It is time that those in the experimental and amateur movement awoke to the fact that everyone should take an active interest in the affairs of his club. It is seldom that the various office-bearers will adopt such a "dog in the manger" attitude that he will be unwilling to give a volunteer—a job which he can undertake.

Put your shoulder to the wheel. Take the serious view of things, do not wait to be asked what you can do for your club, but approach your Secretary with an offer of assistance. Attend every meeting and get to know your fellow experimenters. Find out what there is to know. Seek to co-operate with them, in every way possible. Organise your club to carry out practical tests between different members' stations, collect the data so obtained, co-ordinate and tabulate it and place it upon the records of your club. There are many ways for the enthusiastic member to find an avenue for his activities. Do not sit down and growl because you are not supplied with lectures or experimental work from your club just as you think it should be supplied, but offer instructive (not destructive) criticism, and give all the help YOU can in pushing your Club to the forefront as far as scientific investigation is concerned. It is truly a dog in the manger attitude to sit at home and merely work your own set. You will be well rewarded by taking an interest in affairs outside you own station. If you have been elected to fill one of the executive offices of your club, make sure that you are doing your duty. Regard it as an obligation. It means regular work which must not be set on one side. You would not neglect a business appointment. Treat this in the same way and do your best to further the interests of your association. If you are in a fortunate (or unfortunate) position of being the main spring of your society, the one who does all the work, and, incidently get all the kicks, don't try to carry on with the air of a martyr. Invite co-operation from members of your club. Do not ignore the youngest member because you think he may be incompetent. Do not slight the help of the oldest members, because you may think they are too antiquated, but welcome every willing hand in the same spirit in which it is offered, and let the coming year be one, not only of goodwill amongst all experimenters, but one of active (not passive) co-operation.

Wake up! Wake up!! Do not be apathetic; apathy is the greatest curse of the experimental movement at the present time. See how much you can do for other experimenters. Work all the stations you can, do not merely log them, and then ignore further correspondence. Instead of seeking for long DISTANCE try for long TIME, and see how long you can hold and work a comparatively nearby station. See what 2CM has to say on the subject in his article at the end of these notes and take his words to heart. Let our watchword throughout the coming year be "progress," but let it be progress in the right direction. Work for the cause of wireless generally not merely for your own selfish ends, and make 1925 the most successful wireless year Australia has ever seen.

A. H. PERRETT,
Publicity Officer.

Personal Felicitations for 1925

To all genuine Experimenters and Hams from A. H. Perrett, Publicity Officer, W.I.A., N.S.W. Division.

A PLEA FOR UNITY AMONG AMATEUR WIRELESS EXPERIMENTERS.

Looking back over the history of the Wireless Institute the fact that stands out most in my mind is the friendship, unity, and loyalty that used to exist among its members.

These things are to a great degree sadly missing at the present time. Of unity there is none, and of friendship, very little.

Now, why is this? Perhaps we may, to a certain extent blame the rapid advancement of the science. Most present day experimenters are trying so hard to keep pace with the times that they cannot find time to either lend a helping hand or join in any co-operative work.

Quite recently a very determined effort was made by a few enthusiasts to form an Australian Radio Relay League. After months of hard organising work the project practically fell through, due to lack of co-operation and enthusiasm and was handed over to the Wireless Institute in the hope that, with its large membership some success might result, but so far this hope has not been realised.

It is not only in club matters, however, that the lack of friendly co-operation exists. To prove this, let any experimenter who owns a transmitting set endeavour to link up and carry out some tests with a station in another State or New Zealand. If he is lucky, there may be a brief pause in the "DX world working," during which he may get an answer to his call, but it will be like a fine week-end short and sweet, thus: "QSA O.M. NM HR NW GN."

I think we are drifting rapidly in the wrong direction and dropping the substance for the shadow. Our motto should be, not "How many stations can we exchange calls with," but rather "How long can we communicate with other friends and how much can we learn from the working."

It is a great and glorious feeling to send your signals across to England and America and when you have done this several times just to convince yourself that it was no freak then is the time to try something new. You are the trail blazer, and having shown what can be done let the commercial companies attend to development while you conquer fresh fields.

Above all remember that you can do very little without friendly co-operation. A little friendly rivalry helps, too, but be sure it is friendly. We are at present going through a phase of distinctly unfriendly rivalry amongst experimenters, probably brought about by jealousy arising from the recent successes of a few in carrying out two-way communication with England and America. Let us hope that this will soon pass and that the New Year will see experimenters once more grasping hands and working in harmony not only when "on the air" but in the most important branch of wireless experimentation—The Club and Institute.

CHAS. MACLURCAN.
President W.I.A., N.S.W. Division.

When the "A" battery is some distance from a receiving set, it is a good plan to have the wires rather heavy to reduce resistance. No. 14 rubber covered will do well for this purpose. The same rule also holds for the "B" battery.

(Continued from Page 13)

tion, and the results were effective. The Government, not wishing to belong to those States mentioned at the conference, immediately commenced to deliberate and create laws.

The 1st June they were to be ready, and the radio enthusiasts were rejoiced, although the regulations were not as good or as liberal as were expected. But better something than nothing, says the proverb. It was a beginning and we shall go ahead slowly in proposing the adding of new resolutions which will be more favourable for our movement.

But up to the present we waited in vain for the appearance in the official newspaper of the regulations: because not till then will it have any value. They were to appear on the 1st August, afterwards on the 1st October, and so we have waited from month to month.

In the meantime we are organising so as to gain sufficient strength to influence the Government and to forbid the addition of any regulations unfavourable to the already accepted radio regulations.

About 20 radio societies have been founded officially without receiving apparatus.

A good fortnightly paper has already appeared now in the second month of issue and for the benefit of enthusiasts of other lands the national chronicle is printed in Esperanto (Address Varsovio Pollando ul Ziel na 20).

But do you think that we are waiting the appearance of the regulations before buying our sets? You would be mistaken. It is a well known secret that so and so has such and such an apparatue and that Mr. so and so's set is not too good because he can't hear anything. Myself for example have not an official set.

INTERESTING EXPERIMENTS.

Mr. A. W. Thurston (A2AV) with the object of noting the distances covered by howling valves around Sydney proposes to conduct some interesting experiments during the coming month. He has built the standard P1 circuit and with a key in the plate circuit will transmit with a plate voltage of from 10 to 120. Modulated buzzer and phone signals will also be tried. His aerial is a single wire 40 feet high and 100 feet long pointing E.S.E. with the lead in at the western end. Readers are asked to listen in to these tests and forward reports to Mr. Thurston at Argyle Road, Penshurst.

With Our Readers

THANKS

29/12/'24.

(To the Editor)

Sir,—I must write my acknowledgments to Wireless Weekly for the excellent Reinartz one-valve all-wave tuner, detailed by Mr. W. A. Stewart in your issue of 5th September last. About that time I was in much trouble with a standard honeycomb coil set using a stage of radio (tuned anode) with which I could only get very poor results at Cullen Bullen, near Portland, N.S.W. This is only a little over 70 miles air-line, so I wrote to Mr. Stewart for advice. I was informed that Cullen Bullen was a "dead spot" and that I was wasting time. Since then, however, I have tried out the Reinartz circuit above mentioned, and results are splendid. Three valves operate the loud speaker for Sydney broadcasting stations, and even 3LO was audible in the loud speaker. Mr. Stewart's informant was probably not aware what the Reinartz could do. A number of my friends get American stations regularly with it. The part about this set that appeals most to me is the simplicity of tuning. You pick up the carrier with one condenser and tune the music in with the other over quite a wide range on the dial. The detector rheostat is very effective in the tuning also, but not critical. As a broadcast receiver having a minimum of controls for distance reception it is admirable. I have one coil which covers from about 220 to about 380 metres, and another from 1,000 to 2,000 metres. Using .0005 condensers I found that coils wound on a 2½ inch former were not large enough and that 3½ inches gave nearer results when using the formula of turns 1-3-1. The earth connection does not seem to be important with this circuit. Disconnect the earth and it only seems to alter the tuning. The loss in signal strength is not noticeable when operating around Sydney. In the country, static seems to be ever so much more troublesome than on the coast, and if you would recommend an improvement on this circuit which will reduce static noises you will considerably enhance its value for country use. My copy of the September 5th issue is almost unreadable, and I would be much obliged if you would post me say six copies, so that I can pass some on to my wireless friends.—Yours, etc.

WILLIAM J. TIDEX.

11c Castlereagh St., Sydney.

Xmas Eve, 1924.

Sir,—'Tis the festive season and on the eve of Christianity's great thanksgiving day when we will be greeted on all sides with the slogan of "Peace on earth and goodwill to all men," it would be unseemly to reply to Mr. Nolan's defence in anything but sympathy and kindness. No doubt this gentleman is in earnest, and as I stated in a former letter his transmissions in every section entitled him to No. 1 position in the late Wireless Weekly Test, but until quite recently his transmission was certainly all wave embracing, as dozens of amateurs will agree. However, that is of the past and he has apparently overcome the difficulty and more than that has with many other amateurs disappeared to the lower regions of radiodom where there is ample scope for research without the aid of a gramophone. In passing may I be permitted to ask by what mathematical process has Mr. Nolan determined that the width of his carrier wave is one or two metres? Like most amateurs I am always willing to learn any new device and if the gentleman will explain exactly what he means it will prove interesting and instructive to your readers. I think it was rather unfair to quote 2HM and 2GQ in support of his contention. What about all the local amateurs quoted by me as "sharp" and who are all radially close up to me? I cannot refrain from commenting on the extraordinary statement of Mr. Nolan that "Everyman to his own image" but his is not "Wireless." If that be so, I want to know why he possesses a wireless set and claims to be a wireless experimenter because it is one of the main conditions laid down by law that the experimenter must justify his existence as such by original research, the object of such research being obviously for the purpose of discovery and invention. The rule of thumb idea quoted and illustrated by the tale of the young man who discovered the value of roast pork is rather an unfortunate proposition, because not anyone has really determined the value of pork in any shape or form—as a matter of fact the Jews have assessed its value for ages as "nil." Mr. Nolan hopes that his remarks will be of value to those who consider the "air" to be the property of the broadcasting companies—I know of none so insane as to conceive such an idea, but it is generally understood that the "'air" should be exploited in the same way as any other human thoroughfare and that is with courtesy and regard for the feelings and convenience of every other wayfarer.

In conclusion I may claim having assisted Wireless Weekly in bringing about a measure of relief from the gramophone grinding horror. It is,

however, only in a measure. There is still one amateur who is a perfect fiend at the game and will have to be stopped. On Sunday week he commenced grinding from 10.30 a.m. and continued all day till nearly midnight with a few breathing pauses only. He must have turned on quite 200 records and it was beyond a joke. A quotation from a distinguished radiographist, Mr. Hugh S. Pocock, Editor of "Wireless World," might be of value to the band of "experts" operating round Sydney: "The average wireless amateur usually reverses the normal order of things and requires a fair practical knowledge of wireless apparatus first, leaving theoretical study to a later date. There are many who ignore theory altogether, believing it can be acquired from practical experience. This is fallacious. It is only by properly understanding the function of each component that one is able to modify circuits and conduct experimental work with confidence in obtaining results and an appreciation of the effect which various modifications will have"—and I might add inter alia without the aid of hideous gramophone renditions. The veriest tyro knows that records are never improved by transmission and that they are always infinitely better straight from the machine at close quarters.

A large number of the general public have accepted my invitation to inspect the set spoken of in my last letter and have expressed astonishment, but so far not a single "expert" has deigned to step down from his pedestal, and I therefore cancel the invitation as from to-day.

Wishing success and prosperity to Wireless Weekly and a prosperous New Year to all humanity.—Yours, etc.

S. A. MACROW.

55a Brown St., Paddington.

30/12/'24.

(To the Editor)

Sir,—Are our transmitters mere copyists or are there certain words used internationally? If the latter is the case, will you please tell me the meaning of the (to me) utterly unintelligible remark, "Hi, Hi," which, during the last few weeks, has spread like a bad cold among Australian amateur transmitters? For instance, here is a case in point when A2DS was working Z4AG quite recently. Z4AG to 2DS (after other remarks): "Blew a 50 watt tube last night, Hi, Hi"—and 2DS to Z4AG: "Sorry you blew that tube o.m. Hi, Hi." Why Hi, Hi, and not Ho, Ho, or Ha, Ha? Being an ordinary common or garden citizen I like to know things, but no one else seems to be able to enlighten me. It cannot be universal, because 2CM doesn't use it. I can stand "Bottle" for valve, and the abbreviations which are bandied about, but when our transmitters get to hurling such inane nonsense as Hi, Hi at each other every few moments, then the sooner we get Esperanto the better. Yours, etc.

PLAIN AUSTRALIAN.

(The first portion of your question is answered in the affirmative so far as Hi, Hi is concerned. The expression arrived in Australia via New Zealand (and "QST") from America. So far as we understand it, it seems to be an ejaculation which may be used during any period of the conversation and may be likened to a dig in the ribs during an ordinary personal conversation, by way of emphasizing some particular point or points.—Editor.)

LIGHTNING ARRESTERS.

(To the Editor)

Sir,—Having just recovered from Mr. Taplin's onslaught, may I be permitted to re-open the discussion on the above subject? I purposely refrained from replying to Mr. Taplin during the Xmas season, as his style of controversy is hardly seasonable. Of course he was in error in taking my remarks of censure on the Underwriters as personal to himself, and I hope he will take my word for it that I do not regard him in any sense as a fool, but merely as one who has been misled by popular and stereotyped misconceptions. If his misquotations of my own letter are to be taken as a sample of his methods of study it is no wonder that he knows very little of modern views of lightning and atmospheric electricity generally. So far from advising listeners in to defy the lightning, I was insistent on the fact that it is the insurance companies who urge and in fact require them to do this. Will Mr. Taplin do me the courtesy to re-read the passage he has misquoted? His other remarks are beside the point. He recapitulates facts that have no bearing on the relation between lightning and the aerial. The whole mistake made by Mr. Taplin is in confusing the inductance effects of atmospheric discharges on very long transmission lines with their almost negligible effects upon an aerial wire of about 100 feet. If Mr. Taplin will be patient enough to compare these two effects he will see that most of the preconceived notions he is firing at me are merely hot air, and do not deal at all with the very cogent points raised in my former letter. For example, suppose the regulation 500 volts were set up by a distant discharge in the low resistance wire of the usual aerial, what current would flow? The answer is obvious. In conclusion I advise Mr.

Taplin to read Sir Oliver Lodge's book on Lightning Guards, and recent reports by the American meteorological authorities, and above all to readjust his ideas to cover wireless aerials, which are the subject under discussion, and not to switch off on to transmission lines when he gets cornered.

Yours sincerely,

ION.

Melbourne, 30/12/'24.

WHAT NEXT?

(To the Editor)

Sir,—On Christmas night while listening in to the concert broadcasted by 2FC, there was a sudden cessation of signals. No matter how I tuned, the elusive wave could not be coaxed back again. A young lady living here happened to put her head out of the window and heard the missing concert outside, about 10ft. from the set, and called the remainder of the family who would not believe her, to hear it. There were the signals, faint yet distinct, apparently radiating from a corner of the yard, while nothing could be heard in the phones. This lasted for fully ten minutes when it disappeared and the concert was again heard in the phones. My set consists of a P1 circuit with two stages of audio frequency amplification, using Marconi "R" type valves with 60 volts on the plate. The aerial is an inverted "L" type, double, 60 feet long and 50 feet high. Perhaps you may be able to offer an explanation of this "freak" occurrence through your valuable paper or perhaps some of your readers may be able to do so. Though this may sound incredible it is actually what occurred, being heard and commented on by no less than six persons.—Yours etc.,

L. PUNCH.

29 College St., Newtown.

(To the Editor)

Sir.—A short time ago I noticed in your columns that you desired to hear from readers who have received distant stations on a crystal set. Being rather interested I have been looking out for replies but was disappointed in the response and rather surprised that you would waste space by publishing in your last issue a letter from a reader who has a loose coupler on which someone else has heard VIM—and he calls it a freak! Might I suggest that instead of inserting letters such as the one referred to, which is likely to mislead the beginner, you publish instead a short article on what might reasonably be expected from a decently made crystal set under average conditions.

I might mention that with a loose coupler I regularly receive with good strength the following in order of loudness:— VIA, VIB, VIA, VLA, VIM, VIT, VLD and VLW. The last two stations are rather weak and cannot be heard through strong QRN. The V.J.Q. (Boonah) was once received working with VIA on the day after leaving Fremantle and the GBE ("Niagara") has frequently been heard the other side of New Zealand. An article such as I suggest may encourage a few to acquire a knowledge of the Morse code—a thing that will be very useful when the valve stage is reached and DX work undertaken. Probably the letter from the reader who thinks he heard Morse from 2HM Armidale on a crystal would not have appeared had he a knowledge of the code for although none will deny that 2HM is very QSA on a valve he is most unlikely to come in on a crystal and with the number of amateur calls as well as harmonics from 2ME, VKQ etc., on the lower wavelengths late in the evening anyone not conversant with the code could not say definitely what station is being received.

Yours faithfully,

("X.C.L.")

23 Martin Place, SYDNEY.
22 December, 1924.

(To the Editor)

Sir,—Kindly allow me to explain my theories on electricity by means of your valuable paper. I agree with Mr. Joseph that the hum of a transformer is caused by the molecules moving according to the amount of current passed around the core. This would cause them to be moving continually and thus a hum would be caused. This, of course, is magnetism and as "Frequency" puts it, is caused by electricity. So I really think Mr. Joseph and Frequency agree indirectly upon this matter. I will now endeavour to explain a little experiment which should prove of interest: If the core of a transformer is taken out and a slightly smaller one substituted, the hum should not be as loud (if the vibration theory of molecules moving is correct). There would, in this case be fewer molecules to vibrate, while if a larger core was substituted the hum should be louder. Again, if a buzzer were placed in the circuit the hum should be very low as the current passing around the core would be almost uniform, whereas if the vibrations were caused by a voice they would be far from uniform. Thus the core would remain evenly magnetised and would not be changing its degree of magnetism as in the case of voice vibrations. The above experiments could also be carried out by a current from a battery being passed through the wire winding of the transformer. There should in this case be no hum. The experiments would also prove

that the molecules turn and cause vibration. Now about the terminals causing noises! As the particles rush along the wire (as it is believed they do) the diameter of the wire would be constantly altering (owing to the position of the atoms on the wire as they move). Thus vibration is caused, and from this a noise results. The above also accounts for the jacks vibrating, but I have not shown that electricity is vibrations; because I do not believe it is. My theory is that electricity is the rushing of atoms along a conductor, that it is not vibrations, but that it causes vibration where it comes in contact with another conductor or in the case of magnetism. Trusting this letter may be of interest.—Yours, etc.

C. E. GUSTO.

Killarney Woolshed, Narrabri.

Collarenebri, 29/12'24.

(To the Editor)

Sir,—On the 26th November I received KGO on two valves (detector and audio) just as this station was closing down. As near as I can remember the announcement was as follows: "KGO, General Electric Company, San Francisco, KGO. This concludes our programme of dance which was as usual (static) from the San Francisco Hotel, Station KGO, we are closing down now, time is 1 a.m. Good morning!" This corresponds with 7 p.m. here.

I have recently built a 3 valve receiver similar to that described in the W.W. of November 14th, and with this set I have been receiving Melbourne (3LO) with equal if not better strength than 2FC. Both these stations can be received in daylight, although "signals" are fairly weak but readable strength. Static has been very bad for the last month, and although daylight reception is fairly clear, most nights are impossible. A letter from Mr. L. M. Wilson, published in W.W. of December 12, tells me similar experiences. I also agree with Mr. Wilson that the appearance of the atmosphere is not always an indication of what reception will be like. I have noticed that a clear cool night can sometimes be worse than a hot cloudy night.—Yours etc.,

R. H. CLARK.

(To the Editor)

Sir,—Just a line to convey congratulations on your Christmas number. It is a regular goldmine of information, and I consider the best number you have ever issued.—Yours, etc.

A. A. FLAHERTY,

Box 105, Murwillumbah.

362 Victoria Street,
Darlinghurst,
2/1/'25.

(To the Editor)

Sir,—By the tone of your editorial on amateur transmitters it seems that you are looking for a job as Chief Manager of Wireless. Believe me, such an outburst was not expected this far north.

You argue in favour of the transmitters with excellent DX records, who have shown what can be done by the skilful application of modern apparatus. But, Mr. Editor, what about the chap whose sole interest in wireless is from the scientific point of view. The real experimenter is not the one who holds DX records and papers his house with Q.S.L. cards.

In my opinion "transmitters" can be divided into two classes quite simply, and these two classes are as wide apart as Sydney Heads.

Might I suggest the following divisions?

(a) The amateur operator whose sole delight is to work two way traffic with the U.S.A., Europe or other Australian stations.

(b) The experimenter who is conducting scientific research.

In the light of recent affairs it appears that Australian wireless officials are not sufficiently farsighted to realise the value of scientific research in radio. There are theories to be proved and disproved and new systems of transmission and reception will be evolved.

I think that if the experimental and broadcast license fees were made equal, half the friction in wireless circles would disappear and the transmitter who has a license as an ornament, if any such exist would then have 15/- worth less attraction for it.

Trusting that these will lines will enlighten you and many of your readers on this subject.—Yours etc.

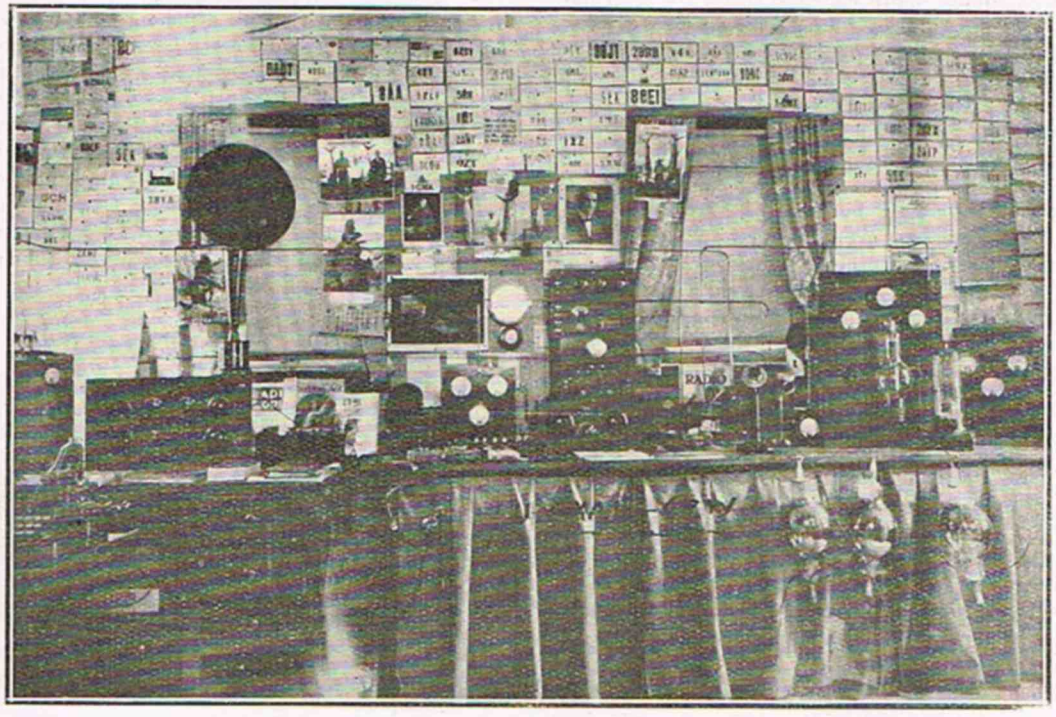
PERCY L. SEWELL

Wires which connect various parts of your wireless apparatus should be kept short. Always scrape bright the ends of wires before fastening the terminals. Also see that the terminals are clean where the wires join.

If your variable condenser "scrapes" during operation, two or more of the metal plates may be touching, and they should be carefully separated by a thin table knife. The trouble may be caused by particles of dust or filings, which can be removed by brushing with a feather pipe cleaner.

When using two steps of audio frequency amplification, and they do not work well, try the simple expedient of changing the amplifier tubes from one socket to another. Sometimes the tubes work better in one step than another. Better turn off the "A" battery while making the change.

The use of "spaghetti" tubing in a set can be of considerable advantage, especially where the wiring is close and has a chance to touch. It may also be used in different colors, such as red for the positive battery wires, black for the negative wires, green for the grid and brown for the plate. This will look neat and will make the tracing of the circuit much simpler.



6XAD—6ZW.

The station (or stations) of Major Laurence Mott (U.S. Army Signal Corps), located on Catalina Island, California, and well known in connection with the first trans-Pacific tests. Major Mott, who worked W.N.P. (the "Bowdoin") at a record distance, also put up splendid results in working 2ADM, Schenectady, N.Y., across the Continent in full daylight, the one and only occasion it has ever been done. 6XAD works on 58 meters, using 500 watts, and pumping 5.8 amps into a 35ft. cage aerial. Cards have been received from both England and France. Mott is trying to find time to instal one of the new Western Electric water cooled 5 k.w. tubes, and expects to use this on 100 meters, so look out for him any old time now working after 11 p.m. Catalina time.

In the photo, reading from right to left—100 watt transmitter, with two Western Electric tubes. 250 watt transmitter, with 1 General Electric 250 watt tube. Aerial—earth—counterpoise change over switch. Grebe C.R.5 receiver. Western Electric 2 stage amplifier, with W.E. 7-A amplifier. 100 watt transmitter, with two Western Electric 50 watt tubes. Another WE amplifier. Grebe C.R.-7 receiver, 600 to 30,000 meters. 20 watt transmitter, with four 5 watt W.E. tubes. Hanging in front are three English tubes, one 500 and two 250 watters. Who wouldn't like a little collection like that?

Incidentally, Major Mott is associate editor of that excellent journal, "Radio" (San Francisco).

BRINY REMINISCENCES

By "BRASSO."

THE memory of John Darley sitting on the floor of the wireless cabin, his face covered with blood, while every few seconds the thunderous roar of exploding depth charges shook the ship like a leaf and the din of the 4.7 gun on the poop added to the racket of hundreds of men bawling excitedly at each other, fills me now with a poignant regret that I hadn't the presence of mind to take a snapshot of him in the peculiar attitude induced by being hurled violently from the operating chair by the sudden impact of a torpedo, and having an electric bulb burst on his face. No doubt John, in his motor garage over in Perth would love to gaze upon such a photograph dangling upon the wall above the Citroens and Morris Oxfords, for the palmy days of peace have lured him away from the care and maintenance of a 2½ k.w. motor generator to monkeying with nuts and bolts on various makes of automobiles. John was the full blown junior op. of H.M.A.T. "Barunga," and from the day he joined the ship in Sydney, garbed in a brand new uniform with the wavy line of gold braid on the sleeves, everyone took to him like a nigger to a watermelon. During the long trip across the Pacific, through the big ditch at Panama and up through the West Indies his naturally cheery manner won him friends all over the ship and his uncanny fondness for cleaning the brass work of the spick and span 2½ k.w. Telefunken set filled me with a deep joy in the feeling that of all the juniors afloat I had the pick. The "Barunga" was an ex-German vessel captured on her maiden voyage to Australia. Her commander, Captain R. A. T. Wilson was about the cheeriest old timer one could meet and the fact that he was well aware that by virtue of his initials he was universally called "Rat," didn't for one moment remove him from the genial free and easy perch upon which he must have climbed when quite a youth in the old sailing ship days. The rest of the crowd aboard were must the same—a typical, hard-living bunch of hoboes out to make the best of things in general and making a fairly good job of it.

During the six weeks we were in London sampling the music halls and mingling with the demi-mondes of the Corner House and the "Pop" in Piccadilly, a gang of workmen came aboard with their paint pots and transformed the ship into a species of striped Zebra—camouflage they called it. A man from Siemens Bros., arrived one day and rigged an emergency cage aerial from the funnel to the wing of the bridge—because a number of ships that had been torpedoed had lost their aerials overboard, thus rendering the wireless useless. More of this emergency aerial anon. It had a brief and unhappy history. While we were basking in the smiles of the elite on the Strand, the "Boorara" and the "Kyarra" went down Channel to pick up a crowd of returning Australians at Plymouth and both failed to reach their destination owing to prior engagements with German torpedoes, so the "Barunga" was commissioned to proceed on the errand. Off Hastings, within a quarter of a mile of the beach filled with bathers on a calm

Captain and Officers of 'Barunga."

July day, we were attacked by a submarine and narrowly missed being hit by the single torpedo which she fired at us. Our "Allo" call brought over an airship within a few moments, and leaving her to drop bombs from a height of a 100 feet or so, we scudded away down the Channel on a zigzag course. The "Allo" call was used only in the event of sighting or being attacked by an enemy submarine. It went as follows: "Allo" (5 times) —position—name of ship, followed by call sign. When actually hit, the usual SOS call was used. In the case of being held up by a raider on the high seas the three letters "BBT" were supposed to be sent, followed by the ship's position, but minus the name. Actually, however, there is only one case on record where these letters were sent, be-

cause no captain had the nerve to order the operator to send this call with the guns of a raider concentrated on the wireless cabin. The case in point was the "Hitachi Maru," but her call was jammed by the raider and a six inch shell went right through the Jap's wireless cabin within a couple of seconds. The "Matunga" and the others were taken entirely unawares and there was no chance of sending out a warning. However, the next break in the monotony of our trip occurred when we had just rounded Start Point and a destroyer dashed up alongside and through a megaphone, her commander demanded of "Rat" whether he knew he had just passed over a mine field. As a matter of fact, "Rat" didn't know it, and his feelings when he reflected that, while he had been blithely prancing up and down the bridge his ship had missed kingdom come by sheer luck, can perhaps be classified as mixed. This down Channel run was a melancholy affair, the route lined with the projecting masts of vessels which had met with a sudden ending, notably a British India steamer which hit two mines at once, sunk in 68 seconds and took 96 out of her crew of 112 with her, including the three "ops." who even in that time managed to get an SOS out.

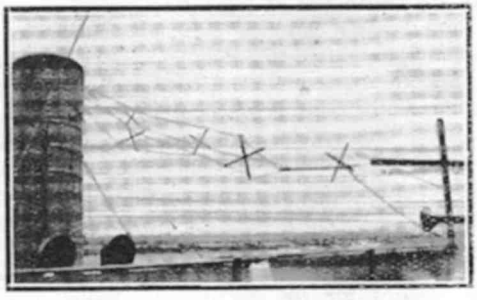
In Plymouth (or at least Devenport) nine hundred and twenty Aussies climbed wearily up the ramps and prepared to settle down for their long trip back to Australia and included among them were five army sisters. Without exception the men were unfit for service, comprising T.B. patients, shell shocks, and limb and armless. I have no recollection now what particular units they represented, but if any of them happen to read these lines they will remember the "Barunga" and the 18th July, 1918. Every Xmas I never fail to send out a thought for the digger who pulled me out of the water alongside the destroyer, because had it not been for him, there would have been no more Christmasses for me.

Escorted by H.M.S. "Kent" and three destroyers, the "Barunga" moved slowly down Plymouth Sound, her decks lined with war worn soldiers. On the Hoe, away up above a huge crowd sang "The Long, Long Trail,' 'and from a Yankee destroyer a band played "Australia will be There." Swinging out through the boom at the entrance the little convoy got into formation, the cruiser "Kent" about a mile ahead, and the destroyers grouped one on either side and one immediately behind the "Barunga." Zigzagging steadily ahead at full speed, the land quickly faded astern and by dusk, except for our escorts, we were alone in the world. In the wireless cabin a close and careful watch was kept in case of a sudden warning from the "Kent," and the audion bulb was put on one side and a home made but very rugged Bornite Zincite crystal detector hooked up to the Telefunken tuner. This gave us an approximate daylight range of 150 miles, but in an emergency it could absolutely be relied upon. John Darley kept the 2 p.m. to 8 p.m., 2 a.m. to 8 a.m. watches and I filled in the other hours. We relieved each other for meals and whoever was off watch was never at other times further than 20 feet away from the cabin. In those days there wasn't much fun in the game and the long, nervy and unnatural hours induced a form of sleeplessness from which I and others I know of, have never quite recovered. It took the Royal Australian Naval Radio Service about four years to discover that an efficient and reliable watch could not be kept by two operators on account of the horrible tendency to fall asleep on watch. However, that night, except for the usual half-dozen or so sinkings proved uneventful, and daylight disclosed the escorts still in position. On the "Barunga" extra precautions were taken to guard against attack. At certain positions all round the ship men were posted with glasses, each man scanning a particular area of water, while extra look-outs on the foremast and mainmast swept the horizon with telescopes. About 10 a.m. the "Kent" drew gradually further and further ahead, followed by the destroyers, until by noon they were out of sight just across the rim of the horizon, and we were alone on the wide ocean.

At 2 p.m. John took over the phones while I endeavoured to tear off a few yards of sleep on my bunk in the cabin next door. My awakening was quite rude. At exactly 4 p.m., there was a terrific explosion and I was propelled several inches into the air, landing on the hard bunk with a thump. At the same instant the siren blew the general alarm and the gun on the stern commenced firing rapidly. Our position was just 250 miles W.S.W. of Plymouth. My first leap into the wireless cabin revealed a sight that left me unable to determine whether to laugh or cry. In a corner under the charging board sat the redoubtable John, his face covered with blood and an expression no human being could describe. His first words were, "We've been pipped." As he hit the floor an electric light bulb had dropped from its socket and burst on his upturned face, hence the goriness. It took them four days at Plymouth to probe the pieces of glass out of his hide. However, there was little time to discuss the matter, so, knowing these destroyers were somewhere handy, I didn't wait to start up the big generator, but wafted out a swift SOS on the coil. Almost on the instant I had finished a solitary "R" came float-

ing back, and I knew we were O.K. There was a light mist over the face of the waters and visibility was low, but although nothing was in sight, within 8 minutes of that "R" a destroyer was within a quarter of a mile of us creating merry Hades with depth charges. The first message back was within two minutes of my call and read, "Coming up at full speed, state if sinking fast," and "Rat's" reply, "Struck forward, sinking rapidly by head, first boats away!" Then the next: "In sight of you, instruct your gunners keep firing approximate position enemy sighted," and the gunners kept on firing merrily. Strange to say, in those minutes with the bridge speaking tube to one ear and the phone to the other, I thought of those lines from "Westward Ho," they used to drum into us at school over in New Zealand, some bunk about "Spare the slaves and fire on the soldiers," which us kids would warble with great gusto. Meanwhile under my feet I could feel the ship sinking steadily, and an acute feeling of "windiness" prompted me to drop the phones and beat it. All the tales I had read of operators trapped in their cabins floated swiftly through my mind, and it was only the sight of John mopping his bleeding face with a towel while he gathered up a few belongings in his overcoat and tied the bundle around with the sleeves that saved me from geting foolish. Despite the fact that I told him to clear out, he hung around waiting, unwilling to leave me until at last I threatened to chuck him out, and even then he stood on the ladder outside until old "Rat" ordered him to his boat. The last I saw of John was as he slowly descended the ladder, bundle in hand, his mournful face turned upon me until it disappeared —for John loved his ship and during the months we had been together we had formed a friendship not to be measured lightly. The next time I met him was in Perth, W.A., four years later, and the old blase, friendly nature had not altered a little bit.

Left alone I surveyed the scenery with gloomy eyes. By this time a distinct tilt forward was noticeable, and there was that peculiar feeling such as one experiences when descending in a slow goods' elevator. To the port side, to leeward, lay a destroyer, while two others careered up and down astern dropping depth charges which exploded with a fearful concussion. From the after window of the cabin I could look down and see the boats being lowered one by one filled with soldiers clad in singlets and trousers. On account of overcrowding the boats were double banked—that is to say, the outboard boats swung out in the davits while the inboard lifeboats rested on chocks on the decks; thus necessarily those consigned to the inboard lot had to wait until the outboard were filled, lowered away and clear of the ship's side before they could swing their own boats out. My own boat, of which I was in charge, was one of the inboard on the boat deck and from my perch I could see a bunch of soldiers waiting for something to move. There apparently being nothing further for me to do I blew up the speaking tube and asked for orders and the reply, short and snappy, was, "'Op it." From the bridge came the level voice of "Rat" as cool as a summer breeze, giving orders, and now and again his drawly re-assuring tones asked the diggers for no panic. But panic there was when the safety valve on the funnel went off with a tremendous roar and hundreds of soldiers, under the impression that the boilers were about to blow up, threw all the rafts and loose wood lying about over the side and jumped over after them. Wrapping a few of my most treasured possessions in a brown Burberry coat, I stood for an instant or so gazing at the set and the quarters which had been my home for so long, and who could blame me if I wept at the sight of all those personal belongings which I had collected for years, doomed to a watery grave. Emerging on deck, the scene around me beggared description, to quote the popular novelists. By this time, the fo'cstle head was awash; the sea for hundreds of yards around was literally alive with head and human beings clinging to rafts and floating about on all sorts of things, including the hen coop. On the deck was a tangled mass of wires and hoops—'twas the emergency aerial which had been put aboard to save us in time of trouble.



The Emergency Aerial.

To leeward were the three destroyers rolling heavily in the long Atlantic swell, and taking aboard their human freight. Bundle under my arm I waved farewell to "Rat," pacing up and down the bridge, and descending the ladder, crossed the main deck and climbed up to my boat, which was manned besides myself with 3 A.B's., 3 stewards, 2 trimmers, and the firemen's peggy. Clustered about were the soldiers, some of them, poor devils, in a fearful state with excitement and shell shock. After swinging the lifeboat out, we had to lift almost all of our soldier complement in, and it was in the lowering away that our misfortunes commenced. Our boat was certified to hold 32 and there were 36 aboard; but when lowering down the side past the lower deck, the soldiers, fearful of the ship suddenly taking a nose dive, crowded aboard and when we reached the water 72 of us were jammed in like sardines, and worse still, on account of the packing there wasn't the faintest chance of getting at the oars except for two which we managed to prize out, nearly breaking a man's arm in doing so. Thus we had one oar out each side and nothing but shell shocked and exhausted soldiers to man them. There was about 3 inches of freeboard, and as each heavy swell struck us, she lurched dangerously as we drifted slowly away from the ship's side. That experience was the worst I ever had in my life, the whole lot of us packed in so tight we couldn't move an arm or a foot, and every wave threatening to engulf us all. Next to me a shell shocked man cried continuously while the others sat there with blank faces waiting for the end. And lo! six feet away from me I sighted my old friend Jack Garcia whom I hadn't seen since he disembarked from the "Ulysses" at Alexandria early in 1915. There he was, the same old Jack, his face entirely taken up with a wide grin and already starting to crack jokes. I have no doubt in the world that Jack's cheerful sallies to which the diggers quickly responded, saved one or two of them their reason. By great good luck we drifted clear of the ship and commenced slowly moving over towards one of the destroyers. The journey of about two hundred yards occupied three quarters of an hour, and when we got alongside, the swell almost bashed the side of our boat in. With a tremendous effort I managed to extricate myself from the mass of tangled humanity and climbing up on my feet, made a grab at the destroyer's rail, but missing my aim, fell gracefully into the bosom of the broad Atlantic. While I was getting my breath, a big swell caught up the lifeboat and swept her in to the destroyer's side, and this yarn would never have been written if a digger hadn't grabbed me by the scruff and dragged me just clear of the crash.

Ten minutes later, just as dusk fell, the "Barunga" took the final count and as we watched from the heaving deck of the warship, her head slowly disappeared, the stern rose high in the air, and with the Australian flag still fluttering, she hung for an instant as though still fighting, and then slid under. For a few moments there was a commotion in the water, then the long Atlantic swell rolled over the spot where but a short time before had floated a big ship.

All around for miles the ocean was covered with debris and human figures clinging to rafts and pieces of wood. They were all gathered in, and during the long night's run back to Plymouth, the three destroyers speeding along in line, we reflected philosophically that not one life of the thousand or so aboard the "Barunga" had been lost, and as I felt the bulge of the precious audion valve in my inside pocket together with my certificate and discharges, I couldn't help thinking that, generally speaking, things might have been a whole heap worse.

IN ORDER to demonstrate the value of amateur radio for forwarding news despatches in times of emergency, when communication by wire is cut off, sixty-eight messages addressed to as many newspapers were started recently from New York City over the routes of the American Radio Relay League. These messages were addressed to the member papers of the North America Newspaper Alliance whose subscribers are distributed all over the United States and Canada. After leaving the offices of the N.A.N.A. in New York, the messages were transmitted by E. M. Glaser of Brooklyn, N.Y. One of the messages as received by T. E. Graves of Cambridge, Mass., and delivered to the "Boston Post" read: "Thanksgiving greetings from the North American Newspaper Alliance via American Radio Relay League. Here is an example how amateur radio can serve you when communication lines fail."

Amateur radio telegraph signals, starting from the Pacific coast, have nearly succeeded in reaching the tip of the South American continent, according to an announcement of the American Radio Relay League. A message from Maurice E. McGreery, Manager of the League's Pacific Division, states that four western amateurs have communicated in both directions with an amateur radio station in Chile.

The slider on a crystal receiver may make poor contact. This may be remedied by soldering a length of flexible covered wire to the metal part of the slider, and fixing the other end of the wire to the slide rod terminal.

Instructional Article for Listener-in and Experimenter

By Wireless Weekly.

Have you got a valve set? Yes! But do you understand how the valves function? No. Very well then, read this article carefully. It is non-technical and will impart to you a lot of information that will help you to a better understanding of your set and consequently better results.

THE object of this article is to explain as briefly and simply as possible the elementary principles of the valve. Every one of the readers of W.W. we feel sure, knows what a valve is, but how many know how it works and why it works? Those who know why, often obtain much pleasure not experienced by those who have no idea of the action of any particular portion of their set. The reader who follows this article through carefully, we feel sure, will have obtained a good grounding of the theory of the valve with a minimum of time and trouble. The three electrode valve is in almost universal use in wireless sets so that time and space will not be taken up here to describe the two electrode valve which was used successfully in all the early experiments in 1912-13.

In Fig. 1 is shown a loop (F) the two ends of which are shown connected to the positive and negative of a 4 to 6 volt battery.

The wire of which the loop F is made has an appreciable resistance. The passage of the current from the battery will raise the temperature and the wire may become red hot or even white hot. In order to control the current flow through this loop and consequently the heat of the loop, an additional and variable resistance or rheostat, is introduced between one side of the battery and the loop of wire. when the temperature of the wire is raised sufficiently, minute negative charges of electricity called electrons commence to be emitted from the wire. These electrons are violently agitated by the increased temperature. In order to obtain a plentiful supply of electrons the wire loop must usually be raised to incandescence, but if this was done in air, the wire forming the loop would very soon disintegrate. In order to be able to maintain the wire at a high temperature without fear of disintegration, the loop F must be sealed into a closed glass vessel from which all (or very nearly all) the air has been withdrawn. Here, then, we have the first stage in the construction of the valve.

A closed glass vessel, exhausted of air and having a filament or loop of platinum, tantalem or tungsten, sealed into the glass, with external connections to which may be attached a battery in order to pass current through the filament and so raise its temperature and a variable resistance so that the flow of current and temperature of the filament can be externally controlled. Under these conditions electrons emitted from the filament simply drop back into it again to be again emitted time and time again. The next step in the development of the valve is the introduction of a metal plate which is marked A in the diagram and which in most modern valves is in the form of an open

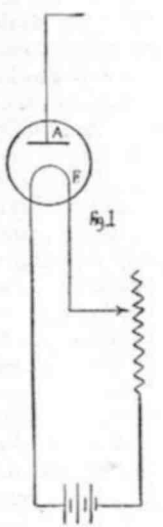


Fig.1

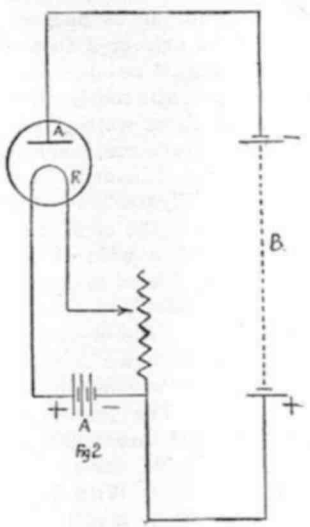


Fig.2

ended cylinder surrounding the heated wire or filament. This plate has a leading out wire sealed in the glass, by means of which connections may be made to an external circuit. See Fig. 2. Note that the negative of the battery which we will term the B battery goes to the plate A and the positive to one side of the heated filament. The plate A is now charged negatived to the heated filament, consequently the tendency will be for the plate to repel the negative electron. The plate itself, not being heated, does

not emit electrons, and under these conditions there will be no flow of electricity through the valve. It will probably be wise to remind you here of the well known law of electrostatics, namely, like charges repel and unlike charges attract.

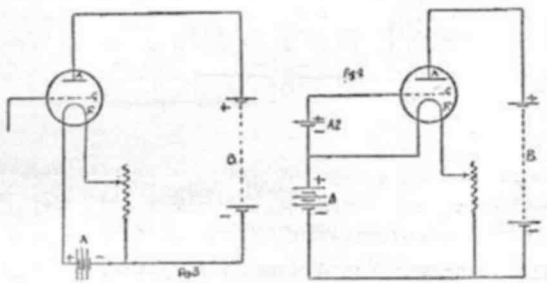
Upon reversing the connections of the B battery however, the plate becomes positively charged and now attracts the negative electrons emitted by the filament. A heavy flow of electrons takes place between the filament and the plate, the rate of flow depending upon the voltage or electrical pressure applied to the plate A and the temperature of the filament F. As was explained before, when the B battery was connected the other way round, no electron flow current occurred. This property of conducting electricity in one direction only is known as undirectional conductivity and from this the valve no doubt derives its name. The technical name given to the metal plate is ANODE, meaning current entering. The filament is sometimes termed the KATHODE meaning, current leaving.

Owing to its undirectional conductivity, an alternating or oscillating potential applied between the anode and filament causes an electron flow at those periods when the anode is made positive to the filament. When the anode is made negative to the filament no flow takes place. Consequently, the applied alternating E.M.F. becomes changed into an undirectional pulse, or, in other words, the alternating or oscillatory currents are rectified. Under these circumstances the valve functions in a manner very similar to that of a non return valve in a water pipe system. Impulses in one direction are allowed to pass whilst all those applied in the reverse direction are stopped. The valve in general use to-day is called a three electrode valve; in addition to the usual filament and plate it has a third electrode in the form of an open spiral of wire surrounding the filament and placed between the filament and anode. This third electrode is called the Grid, and is represented in Fig. 3, as a dotted line. The introduction of this grid between the filament and the anode greatly affects the flow of electrons through the valve. If a battery A2 is connected between the grid and the filament in such a way as to make the grid negative to the filament, it will tend to drive the emitted electrons back into the filament. Reversing the connections of this battery so that the grid is now positive to the filament (see Fig. 4), the grid no longer repels the electrons but permits them to flow readily through the grid spacing towards the anode. The maximum electron flow through any given valve is determined by the rate by which the heated filament can emit electrons and when this maximum flow is attained the valve is said to be saturated.

Between the two extremes of extinction and saturation the increase in the rate of electron flow is by no means uniform and in the practical example of a modern valve, the rate of flow is controlled by the potential of the grid.

The most important points to remember, concerning the action of the valve are that the potential of the grid with respect to filament controls the flow of electrons through the valve and secondly that when a valve is in correct adjustment a small change of grid potential produces a large change of anode current.

The practical function of valves in connection with radio receivers is as amplifiers (H.F. or low



frequency) and detectors or rectifiers. Whatever type of detector is employed in a receiving set, a certain minimum amount of electrical energy must be availed before such detector can work properly. Thus for the reception of long distance telephony the incoming oscillatory currents must be amplified by means of a valve before being passed along to the detector.

Fig. 5 shows a circuit diagram in which the valve acts as a high frequency amplifier followed by a crystal detector. This particular one shows a tuned anode circuit arrangement. The oscillatory current in the aerial circuit (which, of course, is in resonance with the distant transmitting station) are applied to the grid and filament of the valve. This oscillating current it should be remembered is at radio frequency, that is to say, for a 300 metre wave the frequency is 1,000,000 per second. Now remembering the two important points previously mentioned viz., 1, the potential of the grid controls the flow of electrons through the valve, and 2, when the valve is correctly adjusted a small change of grid potential causes a large change in anode current, it

will be seen that oscillating current of the same frequency, but of greater amplitude, will be set up in the tuned anode circuit. Across the condenser in this tuned anode circuit, therefore will be set up comparatively high potentials and these of course, are available for operating the crystal detector and telephone receivers. As the action in the valve is entirely electrical, that is to say there are no mech-

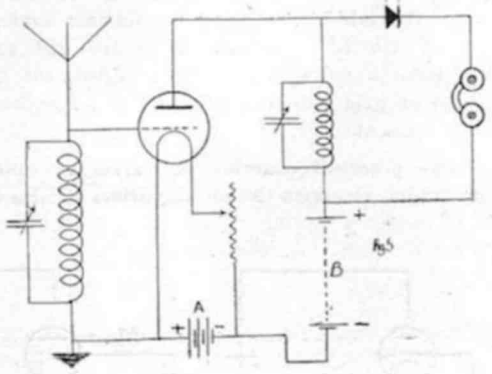


Fig 5

anical moving parts, the valve is able to respond accurately to frequency variations as high as 10,000,000 or more per second.

The Valve as a Low Frequency Amplifier.

Signals are received by a valve or crystal detector, but it is desired to amplify them in order to operate a loud speaker. In this case we are not dealing with oscillatory currents, but with undirectional currents impulses after having passed through the detector. These undirectional impulses are applied to the grid and filament of the amplifying valve and by a cumulative action vary in respect

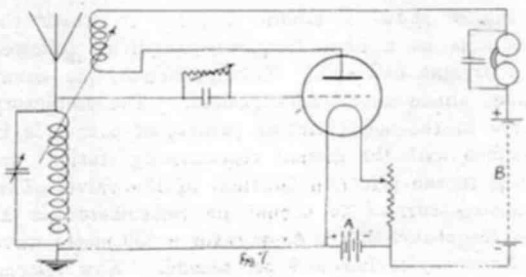


Fig 7

to the filament, thus giving rise to amplified impulses of current in the anode circuit in which are placed the telephone or loud speaker. We now come to the last of the three functions of the valve which was mentioned earlier, viz., rectification.

Fig. 6 shows a circuit diagram of an ordinary grid detecting unit. With this arrangement differences of potentials existing between the ends of the aerial tuning inductance are applied to the grid and filament. The connection to the former is made through a small condenser (C) known as grid condenser, which in turn is shunted with a high resistance preferably variable from 1-5 megohms. Note

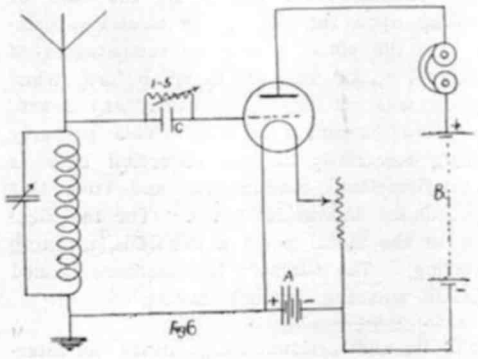


Fig 6

particularly in this instance the lower end of the aerial tuning inductance is connected to the + side of the filament. Under these conditions the grid will have a slightly positive potential to the filament and quite an appreciable steady anode current will be flowing. (In making this connection readers should carry out the particular valve maker's instructions regarding the + or — return for the grid when valve is used as a detector. If no instructions are given a + connection will usually be found the best.)

The grid condenser affords an easy path for oscillating currents, but any direct current flow from the grid must take place via the high resistance leak. During the arrival of actual music, speech, or Morse signals, the opposite ends of the aerial tuning inductance are made alternately positive and negative. The grid will, therefore, become alternately positive and negative to the filament. Each time the grid is positive it intercepts and collects electrons on their way from the filament to the anode; each negative half wave produces no effect upon the grid other than to make it momentary or negative. These excessive negative charges leak away through the grid leak, and the grid resumes its normal potential ready for the arrival of the next series of wavetrains.

Hard Valves.

In the modern hard valve (by hard is meant a valve having an almost perfect vacuum) there is no sharply defined critical point, which means that the plate voltage or filament current is not too

critical. As a general rule 60-80 volts is usually the best for detecting. This article would be scarcely complete if we did not mention the well known P. one circuit diagram. Here the receiving detector valve may be made to act as a feeble generator of continuous oscillations. In this arrangement (see Fig. 7) the second coil (T) which is known as the tickler coil is included in the anode circuit of the valve and inductively coupled to the aerial or primary coil in such a direction that energy from the anode circuit is passed back again into the grid circuit where it undergoes further amplification. When the direction of the respective coils is correct and the coupling is sufficiently tight, the natural loss of energy which occurs in the aerial circuit is more than compensated for by the additional energy from the anode circuit and the aerial circuit is maintained in a state of continuous oscillation. We need scarcely mention that such an arrangement often affects the tempers of owners of other receivers close to the culprit who is not quite satisfied to get just short of this point. Once the position of the coupling a reaction coil is found, it should be left there. If your speech or music is muffled and distorted this is a sure sign that your valve is acting as a feeble generator and should immediately loosen your coupling. If you cannot obtain the required amount of volume without radiating this feeble energy, you must add high or low frequency amplifiers according to circumstances.

INTERSTATE NOTES

VICTORIA.

1925.

In wishing Victorian readers all the benefits that will accrue from their perusal of these columns during the ensuing year, this correspondent ventures to broadcast or forecast what is hardly a prophecy, but may be taken as a pleasurable anticipation of what may happen during the next twelve months if we wish and work for it hard enough. In broadcasting, more power, more variety, more stations, a lower fee for crystal sets, a series of relay stations for the inlander, cheaper sets for the cottage homes. In experimental work, the displacement of Morse by DX telephony and finally television; the further development of dull emitters; the adaptation of valves to work on supply circuits, and particularly A.C.; the simplification of the aerial, and the clarification of the loud speaker. In trade interests, more co-operation, less importation, development of local manufactures, and particularly a series of traders' broadcasting stations, similar to the B.B.C. That is enough for one year!

The Psychology of First Results.

Have you ever dropped a screw or a needle on the floor amongst other rubbish and hunted longingly for it, without result? Then comes some lynx-eyed helper, and perhaps pounces upon it in a moment. "Here it is!" says the lynx-eyed one, probably in a tone of fine scorn, and you see at once that it was right under your nose all the time. It only required pointing out, and you feel that any fool, including yourself, could have found it long ago. You knew it was there, yet could not locate it. Suppose now you apply this to first getters of DX in wireless. They were the first that ever burst into that silent sea, whose waves roll over England and U.S.A. But the remarkable fact is not so much their own individual achievement, because we all knew they were the ones who would do it. Nobody doubted that Bell and Cox and Max Howden and 2CM would be first. But a week after these everybody who wanted to was doing it da caps et crescendo ad lib. Why? It is a very curious phenomenon. One almost feels as if the pioneers must somehow burst a veil in some sacred temple that afterwards anyone may enter without the preliminary vigils and fastings of the first crusaders. It is also extraordinarily like the breaking down to an insulation, that takes a very high potential to accomplish, but much less to maintain, once the arc is established. Probably, however, the homely illustration of the dropped screw or needle comes very near the mark in most cases. The average DX worker hunts for he knows not what, and especially in reading code there is a lot of guess-work. Even the immortal Max mistook the call of G2OD at first reading, although once identified it became so characteristic that everyone now knows it as we know words without spelling out the letters. How often in England, we may well wonder, has the call of A3BQ been heard and dropped in the mush, until G2OD, the lynx-eared, heard it and knew that the circumnavigation of the

ether was accomplished, and then within the month every little 3 decker in either port could read these calls with the halliards disconnected! Now what we are all wondering is why on earth Messrs. Howden, Simmonds, & Co., didn't hear each other ages ago. It is so absurdly easy!

Freak Transmission.

The achievement of freak receptions is probably an essentially amateur function, but the palm for transmissions of the like character must surely be awarded to 3LO, which would hardly feel complimented if labelled an amateur station. The entrepreneur who stage-manages its programmes, however, appears to be a devout disciple of St. Paul, in that he strives to be all things to all men, though he rather overdoes it by striving to unite several incompatibles into one session's entertainment, except on his immortal Thursday evenings, which are usually Carlyon to the core. But even there the impish spirit of 3LO occasionally delights in interpolating phonograph records, that get sadly truncated when the moment to jazz arrives before the record has run out. Similarly it might be remarked that the recent Liedtertafel gathering at the Town Hall was a function too portentously convivial to be transmitted by mere wireless. The sounds of hilarity and genial conversation indistinctly heard during the long intervals were too tantalising to those who merely listened in. It might be invidious to suggest that at the other extreme missionary, evangelistic and political addresses are not any fare for wireless devotees, and that the enforcement of fees by a paternal government should not be exploited in the interests of any particular newspaper or business firm, yet the suggestion could not be half so invidious as these practices are themselves. The picture of poor Ulysses tied to the mast while Miss 3LO, siren, whispers soft nothings from a newspaper report into his unstuffed ear is too pathetic for this workaday world. It would be more appropriate to tie 3LO herself to her mast and stuff her mouth, before it gets polluted with party politics or denominational devotions.

Alleged Low Power Transmissions.

The preface to this dissertation is that I tell the tale as it was told to me, and also that if I were a New South Welshman as I am a Victorian never would I have raised the question, never, never, NEVER! These preliminaries being completed, I ask with bated breath and whispering humbleness whether A2CM does or did actually and in very dead use an input as low as the records state, for some of his DX achievements in transmission. I would most certainly like to cry with all my heart credo quia impossible, but a trifling difference in geographical longitude, possibly makes me yearn for more exactitude. How could .006 of a watt energise the aerial of a listener-in at the distances claimed? Or is his own aerial directional beyond the dreams and beams of Marconi? Being a bit of a joker, myself, I have learned with what doubts a credulous world receives the serious moments of an accomplished humorist like 2CM. If he were to shed tears of the deepest dye that would the multitudinous seas incarnadine, the delighted audience would clap vigorously and shout: "Isn't he just too awfully lovely for anything!" in between their loud guffaws. There is a twinkle in the roguish eyes of 2CM's published photograph that proclaims him an inveterate crural extender and yet his contributions to the exact science of wireless are equally evidenced in his fair large front and open brow. I look at that photograph, and the name that is also the same as that of Australia's best feathered mimic dies frozen on my lips. How could 2CM be that sort of bird? Moreover, he has been corroborated by a whole corroboree of figures, data and an expert or so, and were it not that even mathematical tables have been known to err and instruments to say the things that is not, and wishes to be prenuptial fathers of delightfully discreditable thoughts, even the very devils ought surely to believe and tremble. But a forefather of mine was named Thomas, and he was the father of all such as cry when you slip on a piece of orange-peel, "Do it again, I didn't see it!" Can it be that 2CM has slipped? . . . . .

South Yarra Club Exhibition.

Materially assisted by local dealers and a city firm, the South Yarra Club staged a good collection of exhibits in the Old Town Hall, Prahran, and succeeded in showing a margin after paying expenses. The weather was deplorably unfavourable, and merited the worst comments made on it, but as the popular idea is that unseasonable weather is "radio weather" perhaps the club deserved all it got. The hall was never at any time crowded, which speaks ill for the intelligence of Prahran insofar as interest in wireless betokens intelligence, although the exhibits were perhaps not so attractive or varied as one might expect from so populous a suburb. The impression left was that of a one-man show, the exhibits that dominated all the rest being the product of Mr. Douglas's ingenuity and dexterity, and certainly they were of a high standard. The small-boy exhibit, however, was not in evidence, and after all you want to catch 'em young. The very active Secretary, Mr. Price, to whom the exhibition owed more than the success achieved,

had his receiver on show, with excellent DX work to its credit, notably the reception of G2OD within a fortnight after 3BQ had broken the seals of intercommunication. This club is one of the few that meets twice a week, for lectures and practice, and in spite of its crowded location it does very solid work, and is to be congratulated.

Treasure Trove.

A good story is told in the press about a lucky man who bought a wireless set for 25/- from the Government Department that administers its sales, like a travesty of Justice, blindfolded. On opening the bulky parcel with crowbars and sledge hammers he found therein several tall masts, almost as tall as the story, some Marconi ship sets, accumulators, and other unconsidered trifles. They do say he refused £500 for portion of his bargain, which goes to prove that a fool and other people's money are soon parted. But why government departments should exact the uttermost farthing from outer citizens and be so prodigal of its own inner possessions is a puzzle. It really looks as if the department concerned ought to be charged with larceny as a bailee, or something. Now I suppose another department will step in and prosecute that unlucky purchaser for selling wireless goods without a license. He deserves to pay something back, if only as conscience money.

Amateur Telephony.

The last number of Q.S.T. reveals that the American organisation of amateurs is alive to the fact that there is a large body of amateurs who deserve more than the offensive epithet of B.C.L., and are as genuinely interested in wireless as those who prefer a more brazen keynote. Our local Institute would do well to wake up to the same happy thought, and doubtless will, now that Cousin Jonathan has put 'em wise. The familiar voice of "3BU," heavily underlined, will then be heard by lovers of good phonograph and other music without the fear of having one's membership of the Institute cancelled, and the sister of whoever it is of 3XF will be more than ever welcomed in her announcements over the ether. It is not too much to say that the telephonic transmissions of both these amateur stations come in all round Melbourne with a volume and modulation superior at times to some of the commercial output and it is well worth getting down below 300 metres to hear them. Why haven't the amateurs got a broadcasting station of their own in regular operation?

(Continued on page 34)

SOUTH AUSTRALIA.

RADIO dealers in Adelaide have been looking forward to good busy times this Christmas but bitter disappointment has again been their lot. It was fully expected that the long promised A class license would have been issued, and dealers laid in large stocks of radio goods ready for the rush, but the rush did not take place, and trade has fallen away and seems doomed unless the authorities wake up and issue the license to someone who is ready to carry on immediately. A week or so ago the question was brought up in the House of Assembly when Mr. H. Kneebone asked if the Government would emulate the example of the Queensland Government and apply for the license. The Premier replied that the question was under consideration.

Messrs. W. R. West and J. Chesterfield went to Melbourne last week, as representatives of the Radio Dealers' Association of South Australia, for the purpose of interviewing the Controller of Wireless (Mr. J. Malone) on the matter of the A class license. They desired some definite announcement so that dealers in South Australia might know where they stood. They were sympathetically received, but unfortunately neither the Postmaster General nor Mr. Malone could give any immediate answer to their question, as to the allocation of the license, but they were assured that a definite announcement would be made on December 29th. With goods to the value of £50,000 on their shelves, and little business being transacted, it is small wonder that the local dealers are losing patience with the dilatory methods of those in control of wireless broadcasting in Australia. It is understood that the Adelaide Radio Company Ltd. (5DON N) have applied for the A class license in this State, and that this application has the support of the majority of the Radio Dealers' Association. The issuing of the license to this company would also meet with the approval of the majority of the listeners in.

Central Broadcasters 5CL.

Messrs. Kauper, Williamson, and Austin have been having a busy time doctoring up the transmitter for the Broadcasting Company. A new aerial, a 3 wire flat top, has taken the place of the 6 wire cage that was formerly used. A great improvement was made both in strength and quality of modulation, but alas, 'twas too good to last; as soon as the doctors left, their patient began to sink again and the transmissions from this station were very poor. On Christmas eve carols were transmitted from this station between the hours of 11 to 12 p.m. by means of a gramophone. The music was not inspiring.

Station 5DON N.

An excellent programme of band music was broadcasted from 5DON N last Tuesday evening. Mr. Hume's wireless room is adjacent to a spacious yard fronting on his garage and this was lit up with electricity and about 50 chairs arranged for members of the Adelaide Salvation Army Band, who rendered many enjoyable numbers. The operator was Mr. L. C. Jones, who was assisted by Mr. A. R. Snoswell. The arrangements were in the capable hands of Mr. G. A. Miller Randle, of the Adelaide Radio Company. It was stated by many listeners in, that the quality of the transmission was better than the best interstate programmes 5DON N excelled himself.

On Friday evening another excellent programme was transmitted from this station, this concert being especially arranged for the benefit of patrons of the Star Picture Theatres, in each of which receiving sets had been installed. Besides items rendered by local artists a lecturette was given by Dr. Hargraves. It is understood that it is not Mr. Hume's intention to begin using his recently constructed high powered transmitter until the Federal authorities have definitely announced their policy and decision in regard to broadcasting licenses for South Australia. It is to be hoped that the Federal authorities will hurry up and end the wearisome delay in the issue of these licenses, otherwise broadcasting in this State will be doomed, before it makes its appearance. So many promises have been made and so many times have we been disappointed that no one knows where we stand.

A New Club formed at St. Peters.

Wireless enthusiasts in the eastern suburbs have formed themselves into a radio and social club. They met on Tuesday evening at the Star Theatre, St. Peters, when it was decided that a club should be formed. Mr. R. E. Stephens was elected chairman and treasurer, and Mr. R. F. Crabb was appointed Secretary. It was decided to form a code class, which all who are interested in Radio are invited to join. Meetings will be conducted by experienced amateurs.

Short Wave Reception by Mr. Bland.

Mr. W. J. Bland, 5AG, of Alberton, S.A., has been carrying out some tests in short wave reception (40 to 100 metres). The tests were made with a special aerial. The following stations were heard on Tuesday, December 9th, and Thursday, December 11th:

New South Wales: 2BB, 2YI, 2IJ, 2AY.
Victoria: 3BQ, 3EM, 3BM, 3JP, 3JX, 3LM.
New Zealand: 4AG, 2TG, 2AC.
Suspected Yanks: 6XKO, 5BA, 6CGO.
Unknown: 2WR, 2GQ, 3AA, 3JS, 6XI.

6XI calls KGI, DE, 6XI, ZLC, at first slow as if sent by hand, then at about 30 to 40 words per minute, which seems to be automatic. This station keeps calling from 10 to 15 minutes at a stretch with a pure D.C. note, on about 90 metres. Mr. Bland would be pleased if any readers could give him any information re this station or any other marked unknown. No doubt the editor will be pleased to publish particulars if readers send them in.

South Australian fans wish the many readers of Wireless Weekly in other States a Happy and Prosperous New Year.

LOW LOSS APPARATUS

By E. Joseph.

AT the present day one hears a great deal about low loss condensers and coils for use in sets for DX work and for extremely short waves.

All sorts of claims, reasonable and otherwise, are made for such apparatus. To deal with condensers first: It is generaly assumed that a variable condenser built without end plates of insulating material has lower losses than one so equipped. This is a fallacy. The energy losses in any air condenser are negligibly small provided its insulation between plates is good. The defects assumed to exist in the condenser with end plates may presumably be due to two causes. First, eddy currents set up in the material of the end plates, an insulator being after all merely a very poor conductor, and secondly, dielectric losses due to the rapidly varying stresses set up by an electro static field. As regards eddy currents, to generate them it is essential that the conductor be cut by a varying magnetic field and the lower the resistance of the conductor, the greater will this loss be. Therefore if we have end plates which are in a magnetic field they are better made of insulating material than of metal. However, in a variable condenser using reasonably small spacing between the plates there exists no magnetic field outside this space. and not very much inside it—so that this argument falls flat. Again, as regards the electro-static field. This is concentrated in the inter-plate space, a very little "fringing" existing at the edges of the plates and on the outer sides of the end or last conducting plates. It is only this latter part which could under any circumstances cause dielectric losses, but the amount of such outside field is so very small that it requires most elaborate apparatus and delicate measurement to even detect it. It does not amount, even in a poor condenser (i.e. one with widely spaced plates) to 1/1000 part of the total so that it can have no appreciable effect on signal strength.

There are, however, certain requirements for condensers which are advantageous for tuning on short wavelengths. The principal of these is effective shielding of at least one set of plates, another is reliable connection to the moving plates. Unless the latter exists, local grating noises may be set up and are very annoying. The shielding problem does not receive the attention it merits. The reason for requiring it is that irregular variations in capacity caused by the occasional proximity of such conducting bodies, usually the hands of the operator, may be avoided.

For this reason the connection nearest to earth potential should always go to the moving plates because the stem projecting into the knob, forms, with the hand, a small condenser to earth. Most condensers have one more fixed plate than they have moving ones. This is incorrect; a reversal of this condition would provide a useful shielding for the fixed plates. It would, however, be effective only when the condenser was being used fairly high up on its scale. The ideal system is to have metal end plates effectively insulated from the fixed plates and connected to the moving ones, such metal end plates being at least as large as the fixed plates so as to completely cover them. Such metal plates must be spaced a considerable distance from the main body of fixed plates because as they form part of the moving plate system they add to the total capacity and so reduce the ratio maximum to minimum capacities. It is as if a fixed condenser was paralleled with the variable one. In some cases, for example, a variable grid condenser, both sets of plates must have effective shielding and the best method of attaining this is to provide extension handles of bakelite rod. It must be pointed out that in all the above remarks there has been no suggestion of a method of reducing energy losses —such losses being practically non-existent.

With regard to coils a totally different set of conditions arises. The space inside a coil is occupied by a magnetic field varying in magnitude and direction with the frequency. At the extremely high frequencies implied by short waves it does not

require a very strong field to induce quite respectable pressures in neighbouring conducting masses. Therefore, the minimum possible quantity of material must be used as inside supports, that is, there should be if possible, no supporting tube or former in which minute eddy currents might be set up. The wire must be large (yet not too large because this may cause eddy currents in the wire itself), to reduce the high frequency resistance. The shortest possible length of wire must be used for the same reason. This implies a coil of circular form as nearly as possible and requires the turns to lie as close as possible to each other. The nearest approach to this is attained by having a few turns per layer and using approximately as many layers as there are turns per layer. The turns must all lie in parallel planes so that each one tends to send its magnetic lines directly through all the other turns. Honeycomb and duo-lateral coils fail in the above respects.

Self capacity may or may not be a disadvantage. It all depends upon the position in the circuit occupied by the coil. If it is used as part of a tuned circuit applying its pressure variations to the grid of a valve then it must have a minimum self capacity because in a resonating circuit the maximum potential difference exists between the functions of the inductance and the capacity. If the coil has appreciable capacity we have in effect a circuit consisting of a coil shunted by two condensers in series (thus dividing between them the P.D.) and we utilise on our grid only the P.D. across one of these condensers. We do not cause energy losses by this but we do waste signal strength. If the coil is used as a loading coil or as the tuned anode coil in a stage of R.F. amplification then self capacity is not a disadvantage. It only has the effect of reducing the range of tuning covered by the other variable condensers, etc., in the circuit.

To avoid or reduce self capacity it is unfortunately necessary to so modify the coil as to reduce its inductance. The turns must be spaced apart so causing magnetic leakage and thus requiring a greater number of turns, more wire, higher resistance, for a given inductance. The low capacity low loss coil must therefore be wound to the following specification. It must be as nearly as possible self supporting, must have flat circular turns lying in parallel planes, must have approximately as many layers as there are turns per layer, must have turns spaced apart, the interspaces being as nearly as possible of air only; the conductor must be of reasonable size, lightly insulated to avoid introducing solid dielectric into the inter turn spaces and finally whilst it must be rigid and damp proof, care must be taken not to fill the interspaces with wax or varnish. The range of tuning, selectivity and general excellence of a coil embodying the above requirements in its construction, are a revelation. With a variable condenser having a ratio of maximum to minimum capacities of 10 to 1, the theoretical range of wave length is 3.16 to 1. The author has wound coils giving over 3 to 1 by close attention to the specifications. From the energy utilisation point of view then, all variable condensers are "low loss" ones and coils may by careful construction also have low losses. There is a drain of energy which is usually overlooked. A condenser fixed or variable, must have a dielectric between its plates. All solid and liquid dielectrics cause losses, air does not (to any appreciable extent). A grid condenser usually has mica dielectric. The substitution of a small air condenser of similar capacity gives a remarkable increase in signal strength. Such a condenser is of necessity somewhat larger than the mica condenser but with careful construction it need not be too large to be effectively built into a set.

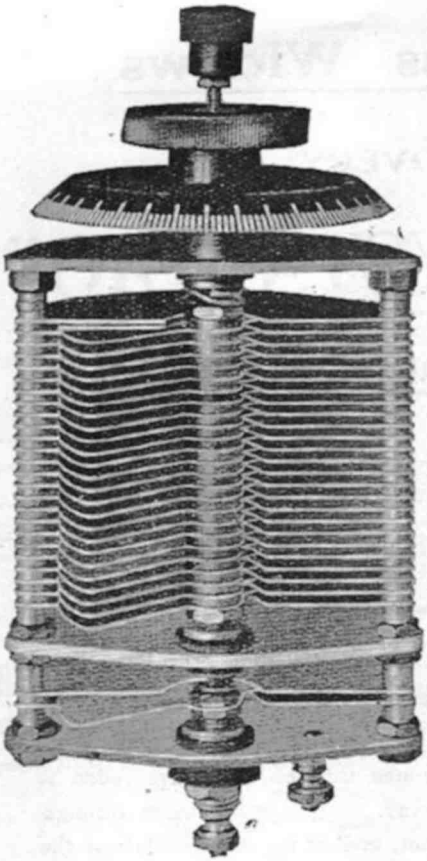
CATALOGUES RECEIVED.

Among other things featured in some highly interesting literature we have received from Precise Manufacturing Corporation (Pacific Coast Office, 821 Market St., San Francisco) are power amplifying transformers for the popular "push pull" audio circuits, and precise transformers which are used by Cockaday in his experiments. With this latter is shown a novel chart illustrating the curve of musical notes in place of the usual frequency. A super-multiformer which, it is claimed, does away with all the trouble in building super-heterodyne receivers looks very efficient, since it ensures short connections from the instruments to the various valve sockets. Several illustrations show this multiformer incorporated in various types of commercially built receivers.

A.R.R.L. ON THE AIR.

There is a new amateur station on the air, 1MK, American Radio Relay League Headquarters. The station was installed by F. H. Schnell, traffic manager of the A.R.R.L., following the urgent request of amateurs in varous parts of the country. 1MK is equipped with four 5 watt tubes. The farthest two-way communication so far was with an amateur in Texas.

Don't, if you expect to get best results, charge your A battery at the same time you are listening in.



A Condenser is the Nerve Centre in Your Radio Set

All other units of your apparatus may be high grade and conducive to the best results, and so the condensers—the very nerve or brain centre of the entire set—should be most carefully chosen. You want distance, volume, and quality, and you get them when you use

"ORMOND"

English Variable Condensers

Built to a high degree of accuracy, they are proving the best by their ever-increasing popularity the world over. They are complete with knob, dial and pointer, and are sold under money-back guarantee of absolute satisfaction.

These are the prices of "Ormond" from all dealers.

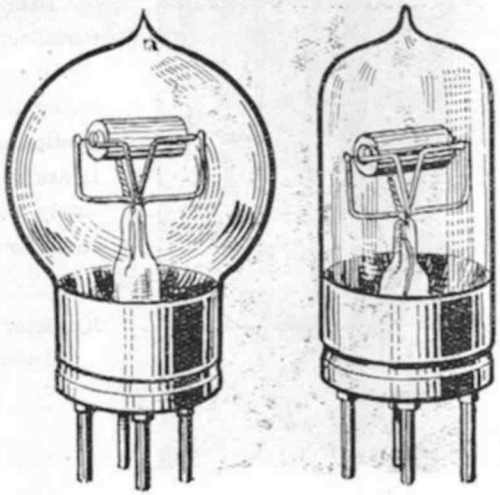
Without Vernier.		With Vernier.	
.0002	9/6	.00025	13/-
.0003	10/6	.0003	14/-
.0005	11/6	.0005	16/-
.00075	13/6	.001	18/6
.001	14/-	Duo Anode (Twin)	25/-

Have you tried these new

DUTCH VALVES ?

These New Dutch Valves are obtainable everywhere—either detector or amplifier type—at 12/6 each. This value is amazing, because these valves are considerably below the price of competitive lines, yet are more than equal in results and service. Use Dutch Valves for Radio satisfaction.

Obtainable Everywhere at **PRICE 12/6 EACH**



Details of Dutch Valves.

Detector
Filament 3.8 v. to 4 v. 0.5 amps.
Plate 20 volts to 60 volts

Amplifier
Filament. 3.8 v. to 4 v. 0.5 amps.
Plate 30 volts to 80 volts

Wholesale from the agents

Corbett, Derham & Co. Pty. Ltd.,

39 Dixon Street, SYDNEY.

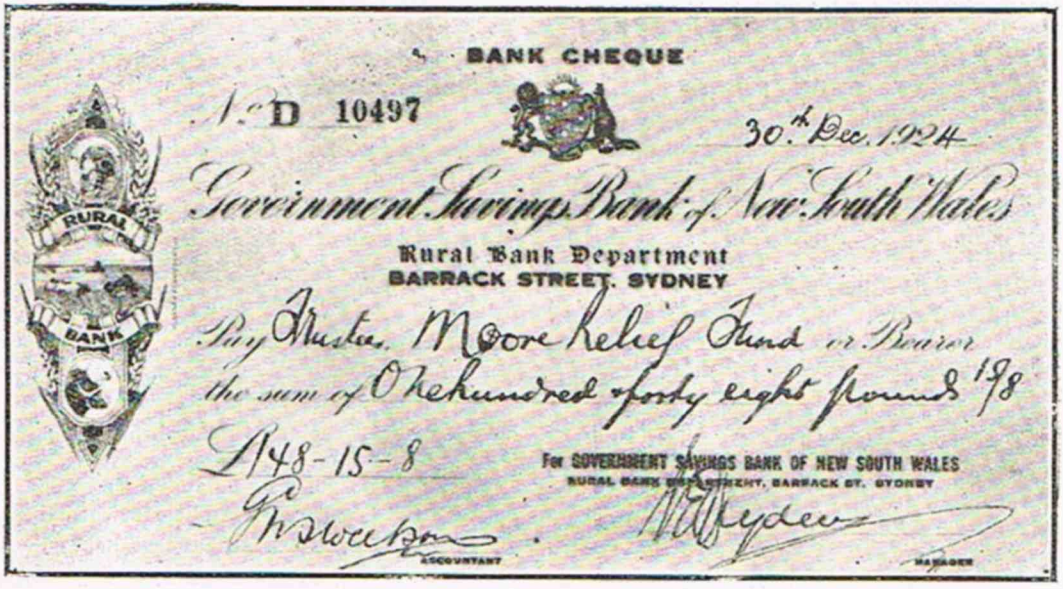
Melbourne, Sydney, Adelaide, London, New York, Chicago
Managing Agents for N.S.W.—CHAS R. GABB & Co.

The Moore Fund.

THE trustees have paid over to Mrs. F. L. Moore, widow of the late F. L. Moore, Esq., on 31st December, 1924, a cheque for the sum of £148/15/8, being the amount collected by public subscription from various radio interests and individuals.

The amount subscribed was £145/7/5 and bank interest to 31/12/'24 amounted to £3/8/3, making a total of £148/15/8. Below is a complete list of subscribers:

R. C. Marsden	£1	1	0
Robt. H. Doyle	1	1	0
R. W. Faulks	0	2	6
D. T. Hinchen	5	0	0
A. Usher	0	5	0
Concord Radio Club	0	10	6
W.I.A., N.S.W. Division	5	5	0
V. J. M. Darby	0	12	6
Mr. Herker	0	5	0
—. Sanders	0	1	0
Australian Radio Relay League	1	1	0
Campsie and District Radio Club	0	15	0
A. E. Henry	0	5	0
Goulburn and District Radio Club	4	0	0
Charles Tripp	0	5	0
Wireless Branch, P.M.G., Melbourne	1	8	0
Illawarra Radio Club	0	10	0
T. E. Dickenson	0	5	0
J. W. Robinson	1	1	0
F. T. S. O'Donnell and Griffen	0	10	6



The Cheque presented to Mrs. Moore.

A. Price	0	10	6
R. E. McIntosh	0	10	6
Phil Renshaw	3	3	0
Otto Sandel	1	1	0
Miss Day	0	10	0
A. Dare	0	10	6
F. Basil Cooke	1	1	0
Keith Davis	0	5	0
J. G. Pritchard	1	0	0
C. Leaver	0	5	0
R. Seach	0	2	6
J. A. Taylor	1	1	0
W. Harry Wiles	1	1	0
Farmer and Company Ltd.	5	5	0
Edison Swan Electric Company	1	1	0
A. Dixon	1	1	0
J. Lendlaw	1	1	0
C. Storm	0	15	0
H. Carter	0	5	0
A. Larkin	1	0	0
E. Mason	0	5	0
N. Ambrose	0	3	0
Chas. D. Maclurcan	2	2	0
Q.S.A. Crystals (Neutral Bay)	2	2	0

Leichhardt and District Radio Society	1	1	0
Western Electric Co. (Aus.) Ltd.	2	2	0
S. Hoffnung & Co. Ltd.	2	2	0
John Danks & Son Pty. Ltd.	1	1	0
L. P. R. Bean & Co. Ltd.	2	2	0
N. P. Olsen	1	1	0
Newcastle Radio Club	1	10	0
Bacon & Company Ltd.	2	2	0
Radio Magazine	5	5	0
Amalgamated Wireless (Aus.) Ltd.	10	10	0
Marconi School of Wireless	5	5	0
E. T. Fisk	3	3	0
Hyde, Gluck & Co.	0	10	0
Western Suburbs Radio Club	1	1	0
G. R. Challenger	0	10	6
Northern Suburbs Radio Society	3	3	0
W. E. Wilson	1	1	0
Burgin Electric Co.	2	2	0
Harringtons Ltd.	1	1	0
N. L. McKenzie	0	5	0
New System Telephones Pty. Ltd.	5	5	0
W. H. Newman	1	1	0
O. H. O'Brien & Nicholl	1	1	0
R. J. Fagan	3	3	0
Gordon and Gotch	1	1	0
Katoomba School of Arts Radio Club	1	13	0
Harry Reid	0	5	0
F. Miller	0	5	0
N. O. Glasson	1	0	0
H. Hooke	2	2	0
T. W. Smithson	0	5	0
Scots' College Radjo Club	0	9	0
Waverley Radio Club	2	10	0
Northbridge Radio Club	1	1	0
Wireless Institute S. A. Division	2	2	0
Anonymous	0	10	0
W. J. Lewis	0	2	6
Frances Markell	2	2	0
Frank Leverrier, K.C.	10	10	0
V. S. Liardet	0	1	0
Anonymous	0	8	0
Anonymous	0	11	0
Wireless Weekly	5	0	0
American Radio Relay League	5	17	5
	£145	7	5
Bank interest to date	3	8	3
	£148	15	8

The Trustees again record their appreciation of the generous manner in which those who subscribed came forward. There are still a few promises to materialise, so when this takes place the additional collection, if received, will be forwarded to Mrs. Moore.

F. Basil Cooke, J. W. Robinson, Phil Renshaw,
Trustees.

Allocation of Wavelengths

THE third National Radio Conference, held at Washington, from October 3rd to October 10th, made some very important changes in wavelengths for various classes of stations. The 600 metre marine wavelength formerly used entirely for commercial working will be from now on used only for calling and distress signals, and traffic will be conducted on 660, 730, and 875 metres. The amateurs were represented by H. P. Maxim, C. H. Stewart and K. B. Warner, respectively president, vice-president, and secretary of the A.R.R.L., and among the other delegates were men such as Dr. A. N. Goldsmith, representing commercial interests. The allotting of short waves to the amateurs caused a certain amount of disapproval among the commercial representatives because it was stated that the big wireless companies are experimenting in trans-ocean transmission on short waves in the hope that before long commercial working will be carried out on the band now occupied by amateurs.

Six Canadian commercial stations are now under construction for operation between 85 and 104 metres.

The table below shows the allocation of the various wavelengths for the coming year.

0.0	to	4.7	meters—Beam transmission.
4.7	to	5.3	meters—Amateur
5.3	to	16.7	meters—Beam transmission.
16.7	to	18.7	meters—Public service and mobile.
18.7	to	21.2	meters—Amateur.
21.2	to	25.8	meters—Public service.
25.8	to	27.3	meters—Relay broadcasting, excl.
27.3	to	30.0	meters—Public service.
30.0	to	33.3	meters—Relay broadcasting excl.
33.3	to	37.5	meters—Public service and mobile.
37.5	to	42.8	meters—Amateur and army mobile.
42.8	to	51.7	meters—Public service.
51.7	to	54.5	meters—Relay broadcasting excl.
54.5	to	60.0	meters—Public service.
60.0	to	66.7	meters—Relay broadcasting, excl.
66.7	to	75.0	meters—Public service and mobile.
75.0	to	85.6	meters—Amateur and army mobile.
85.6	to	103.3	meters—Public service.
103.3	to	109.2	meters—Relay broadcasting, excl.
109.2	to	120	meters—Mobile.
120	to	137	meters—Aircraft, exclusive.
137	to	150	meters—Point-to-point non-excl.
150	to	200	meters—Amateur.
200	to	545	meters—Phone broadcasting excl.

Blind Spots and Dead Spots

By E. H. Chapman

IN various portions of Australia exist particular locations in which wireless signals are apparently undetectable even with sensitive apparatus, and since this is a branch to which very little attention seems to have been devoted locally, it will be of interest to readers to chronicle briefly the investigations which have been noted in other parts of the world.

By the term "blind spot" is meant an area, generally small, which is consistently shielded from the incoming waves of one or more transmitting stations. The lack of signal strength is always apparent and does not appear to vary with changes in atmospheric conditions. Although the words "blind spot" and its American equivalent "dead spot" are convenient terms, they do not convey a very adequate idea of what is really meant. A better idea would be conveyed by the term "shaded area" "Shadow" and "shade" are words of every day use with us. Then, again, the word shadow is frequently used in scientific work which is not connected in any way with the study of light. For example, in the extreme south of South America the Andes cause the rain-shadow of Patagonia. That is to say, the Andes shield that part of the Argentine from the effects of the rainy westerly winds and so cause the rainfall to be only one-eighth of what it is on the other side of the mountains. From this illustration of the word shadow it will be seen that attention is of necessity drawn to the cause of the shadow. In wireless work a mere knowledge of the existence of "blind spots" will help us a little. What we want to know most of all is what causes those "blind spots," or, to to put it rather more scientifically, what we desire to know is what is it that throws a radio shadow, and why.

Another point to be noted with regard to the use of the term "blind spot" is that it gives the idea of complete blindness, whereas the term is a purely relative one. It is doubtful if any area can be called a "blind spot" in the strict sense of the term. There may be partial absorption of the electro-magnetic waves radiated from a certain transmitting station, but that is by no means the same thing as being total absorption. Then again, a certain area may be well in the "radio shade" for transmissions from one broadcasting station, yet be quite "in the open" for transmissions from all the other broadcasting stations.

Because of the lack of authentic information on this subject of "blind spots" a good many stories have gained credence which would otherwise have received no attention at all. A well-known American writer recently related how there used to be mysterious yarns told by ocean travellers of a place in mid-Atlantic where no wireless signals had ever been heard, either from ships or from shore stations. There was a similar story of another place in the Atlantic where signals from all over the world were easily picked up day or night. Since the establishment of the broadcasting stations in England, there have been many cases of what are undoubtedly radio shadows. For example, in some of the deep valleys of South Wales it is very difficult to receive the Cardiff broadcasting. Here we have a distinct suggestion of the possibility of mountains casting radio shadows. The effect of hilly or mountainous country on the range of a wireless station is well known for its absorbing properties. A very noticeable feature is that mountains and hills have greater impeding effect on the shorter wave length. This is in accordance with what has been observed in connection with the travel of sound waves. Often enough hills have thrown a distinct sound shadow when houses and buildings in the direct line of the sound waves have thrown no such shadow.

Another important thing is that increase of power with the shorter wave lengths does not appear to have much effect when the transmission is over mountainous or hilly country. In connection with the effect of a land mass on wireless signalling, it is interesting to recall an example frequently quoted by American writers. Ships to the north of Long Island often find difficulty in getting into wireless communication with ships to the south of the island, although the island is only some forty miles wide. Long Island also appears to throw a radio shadow in the direction with New York ships out at sea cannot easily get into touch with New York. One is struck with the possibility that wireless waves from a ship out at sea, tending to take the line of least resist-

ance, may travel along the water of Long Island sound rather than over the land of the island. If so, wireless waves would only be showing the same protensity for travelling over water as thunderstorms do.

The whole question of radio shadows is an extremely interesting one, and if a proper investigation inspired by the local authorities is carried out by a sufficiently large number of experimenters, a great deal should be added to our present rather small stock of knowledge of the way wireless waves travel through the ether.

Stations Heard

LAWRENCE E. DEANE, Havilah Road, Lindfield, N.S.W. sends us one of the most complete lists we have yet published. His receiver is a single tube low loss, the circuit being a modified form of the "Reinartz All Wave Receiver" as described in "Wireless Weekly." A single wire 3/20 copper aerial, 130 feet long and 35 feet high, completes the installation. And, by the way, Mr. Deane would be glad if some reader could advise him the QRA of G2NM.

N.S.W.: 2CR, 2GQ, 2HM, 2RJ, 2SO, 2YA, 2WS, 2JS.

Victoria: 3AP, 3BD, 3BH, 3BK, 3BL, 3BM, 3BP, 3BQ, 3BU, 3CB, 3OB, 3EF, 3EM, 3EN, 3GB, 3HL, 3JH, 3JP, 3JU, 3LM, 3LS, 3OT, 3RY, 3TM, 3XF, 3XO, 3XX.

Queensland: 4AN, 4AP, 4AZ, 4CM.

S.A.: 5AD, 5BF, 5BG, 5CD, 5DA, 5DO, 5LO, 5WJ.

Tasmania: 7AA, 7AB, 7BK.

N.Z.: 1AA, 1AK, 1AO, 1FF, 2AF, 2AC, 2AF, 2AQ, 2AO, 2AP, 2AR, 2AW, 2BA, 2BC, 2BL, 2BM, 2BU, 2XA, 3AA, 3AD, 3AF, 3AL, 3CG, 4AA, 4AD, 4AG, 4AK, 4AP.

U.S.A.: 1ABF, 1BUX, 1JS, 1KC, 1OW, 1PL, 1XB, 1XZ, 1XAM, 1XAV, 2BFB, 2BGI, 2BRB, 2CQZ, 2RK, 2XQ, 3AB, 3ADB, 3HG, 3AU, 3AUV, 3WB, 4KL, 4KU, 4OA, 4SB, 4UK, 4XE, 4YE, 4IN, 5QY, 5ZAI, 5ZAV, 6AHP, 6AK, 6AKW, 6ALO, 6AO, 6APW, 6ARB, 6AWT, 6BUW, 6CGO, 6CN, 6CNL, 6CTO, 6EB, 6ETC, 6EW, 6UC, 6VC, 6XI, 6ASE, 6BOT, 6BIP, 6CCT, 6CRX, 8BA,. 8CBP, 8PL, 9BCJ, 9CJC, 9EFZ, 9EKY, 9XI, 9ZT, 9ZY, 9AQD, 9BDW, KGO.

Mexico: BX.

England: 2OD, 2NM.

The following stations have been logged using no aerial at all:—

Australia: 2GQ, 2HM, 3BQ, 3BD, 3JH, 3EM, 3TM, 3LM, 3JU, 3JP, 2CR, 2CB.

N.Z.: 1AA, 1AO, 2AC, 2AP, 2XA, 4AA, 4AG, 4AK.

U.S.A.: 6AWT.

Always remove the valves from a set whenever repairs are to be made. This will prevent burn-out from high voltage current of the "B" battery getting across the filament of the valves. An additional reason is that the tips of the vacuum tubes are very delicate, and a slight bump with a tool is often sufficient to break the tip and allow air to enter the inside of the valve and end its usefulness.

The tips of these valves are often broken off by handling while taking them out of the set. A drop of melted sealing wax placed on the tube tip will strengthen it and protect it from damage. Whenever a radio set is to be moved, or it is not to be used for some time, it is best to take out the valves altogether and place them either in the original cartons or else in a small pasteboard box well protected with cloth or paper to keep the delicate filament from shocks and jars which they may be subjected.

Olive or pickle bottles with a flange at each end make cheap and efficient aerial insulators. Bridles of insulated wire are fastened to each end. These insulators will stand quite a strain and at the same time furnish adequate insulation.

Do Regenerative Sets Interfere ?

Editors Note—So much has been written and said lately concerning the tangled subjects of "fading" and "re-radiation" that the following extracts taken from a paper read before the Institute of Radio Engineers by Professor Pickard prove very interesting.

SCIENCE, ever probing and analysing, tireless and persistent, is about to untangle and explain another of nature's great mysteries. In Radio science, two important phenomena, "static" and "fading" have so far withstood every effort to solve their cause and source. That the objectionable "fading" or as it is sometimes called "swinging" and "soaring", will soon no longer be a mystery but understood and probably controlled, was the unanimous opinion of the leading radio engineers who attended the last meeting of the Institute of Radio Engineers.

At the meeting which was attended by such renowned scientists as Dr. Louis Cohen, Dr. E. E. Mayer, General Russell, Professor Morecroft, Dr. DeForest, General Squier and Dr. Alfred Goldsmith, a paper on fading was read by Professor Greenleaf W. Pickard, which outlined his experiments, tests and observations over a period of fifteen years. Professor Pickard is consulting engineer to one of America's leading manufacturers of precision equipment and is well known for his discovery of the crystal detector, and countless other inventions.

Lantern Slides used to Illustrate.

Listening to his address which was illustrated with scores of lantern slides, one must have been impressed by the untiring patience and devotion to science of a man who could take the records day after day of scores of stations, carefully noting every infinestimal variation in signal strength hour after hour, as well as every factor—such as operation of other sets near by and of spark stations—that might well affect his observations. Well known stations such as KDKA, WNAC, WGY, WDAP, WCAP, WBAP, and WOC were chosen by the professor as the most fitting for study, as understanding of their fading would benefit the greatest number of listeners. After describing to his assembled colleagues the apparatus used and leaving no doubt in anyone's mind as to the accuracy of the data gathered through it, the famous scientist went on to show some of the records made.

Two Important Facts.

It is by careful study and analysis of charts or graphs, gathered over a long period of time, and hundreds of hours of patient listening, that deductions and theories are formed which lead to the truth. Two important facts have been settled, the first being, to quote from his address: "If we continue our attention to frequencies between 500 and 1,500 kilocycles, that is, to the band now principally filled with radiophone broadcasting, and to overland transmission at distances between 100 and 1,000 kilometres (62 to 620 miles), we find that the average mid-winter intensity (signal strength) is about five times greater than in mid-summer." There you learn why, in summer, you cannot hear that distant station that rolled in so wonderfully in winter."

A second portion of his address tells us that "The principal change from day to night is an increase in field intensity (Signal strength); the upper limit of the night time field ... may be ten, a hundred or even, on occasions, thousands of times greater than the daytime intensity, depending upon the distance and the character of night." Which explains why frequently Mrs. Listener cannot hear that afternoon lecture on baking or care of the complexion from that distant station which her husband brings in so clearly when he comes home in the evening.

Receiver is Exonerated.

These two calculations, while not pertaining closely to the phenomena of fading were apparent during the tests and final analysis. The regenerative receiver is exonerated from one of the many crimes ascribed to it by another portion of Professor Pickard's talk when he states: "A very odd explanation of these variations (changes in signal strength) has been gaining much vogue in the popular scientific press, to the effect that they are due to other receivers in the neighbourhood, particularly if these happen to be of the much maligned single circuit regenerative variety. I have many records of transmission, principally made by audibility meter measurement, which run back over fifteen years,

when there were far less receivers than at present. These records show exactly the same short period variations (decreases in strength for three to fifty seconds) that now exist, so that this explanation does not seem very plausible. However, I have recently made a number of records of reception from distant stations under conditions of severe exposure to nearby regenerative receivers and although my receiver was situated in the same house as a single circuit receiver which was used with full regeneration, and brought almost to the point of oscillation, absolutely no effect was noticed.''

Neighbor's Receiver Interferes.

There you have it. If your neighbour permits his set to oscillate and causes the rising falling whistle in your headphones, tell him what you think of him, but he is not responsible for the sudden falling off of signal strength in some programme to which you may be listening.

The deductions formed by Professor Pickard as the cause of fading are most interesting and, while not as yet proven facts, remain as a theory to be proved or disproved by his own future work and that of his contemporaries. Just so much energy is radiated by a broadcasting station, and, if part of that energy is absorbed or weakened by a condition of nature, less energy reaches your receiver. Assuming that it absorption, what is that absorbs? To again quote from his masterful presentation of the tests: "Absorption can only be explained as due to ionization (too many positively charged particles) and ...one difficulty in the past has perhaps been our tendency to attribute too much of the ionization to the effect of direct sunlight, and too little to the effect of alpha particles shot out by the sun, which continually fall in drifting clouds into our atmosphere. These charged particles may arrive intermittently and at short intervals, perhaps in groups of small cloudlike masses, and before the outer limit of our atmosphere is reached, the earth's magnetic field begins to deflect and combs them out along its own direction.

This (combing) process continues, perhaps down to an elevation of some 150 kilometers (94 miles) or less, eventually drawing these clouds out into long streamers in a south to north direction. Then perhaps, these streamers are captured by the high level air currents, which cover the United States at heights of between 100 and 20 kilometers (63 and 13 miles), drift slowly from west to east, and, finally, they become subject to the stronger and varying low level winds.''

Reflecting Waves Back to Earth.

The result of this hypothesis is that the streamers of alpha particles from the sun could act, now as

(Continued from Page 48.)

a gigantic mirror which reflects Radio waves back to earth causing interference and weakening, and then again like a huge grating which would permit the radio waves to enter and would absorb them. This upper stratum, would be constantly varying, at one moment absorbing, at another reflecting, and thus cause the constant changes in signal strength apparent in the graphic records. During the day, the sun's rays, adding to the ionization, would tend to make this grating uniformly absorptive, while at night, when they are not present, the grating is more refractive (capable of reflecting) and signals would be jumpy though generally stronger than in the daytime.

It must be understood that this hypothesis is not accepted as fact; to once more quote Professor Pickard: "I am sure you will agree with me as to the utility of hypothesis; it is at least something concrete, and if it stands the attack of new facts, and the further analysis and correlation of our present knowledge, it may be the stepping stone to the truth." It is such years of investigation that are the heart of science, and what materially advance civilization, Professor Pickard cannot be too highly congratulated on his contribution to Radio knowledge.

DANISH AMATEUR COMMUNICATES WITH AMERICA,

WHILE broadcast listeners have been busily engaged in listening for European stations, the original DX men—amateur radio telegraph operators—have been just as intent in their efforts to communicate with foreign amateurs. Having been first to show an interest in international radio, they continue to make and break records with unfailing enthusiasm.

Uulike the listening enthusiasts who turn their dials in the hope of getting a fragment now and then from a far away musical program, the amateurs go out for what they think is bigger game—personal communication through the medium of the International Morse Code. There is no test period for them as there are now so many foreign operators that they can be picked up every night. The American Radio Relay League is receiving reports of this nature constantly.

For example, quite recently D.C.S. Comstock, an amateur radio operator of East Hartford, was tuning in on his set and he heard a strange call which he identified as a Danish station, the first to communicate with this country. Comstock received a message for the A.R.R.L. as follows: "Greetings from the first Danish amateur across." Hiram Percy Maxim, President of the A.R.R.L. replied through Mr. Comstock with this message: "Sincere congratulations. Hope that we communicate often."

With the addition of Denmark, there are eleven foreign countries whcse amateurs have communicated with operators in North America. In many of those countries the development of amateur radio has been inspired by the work of U.S. and Canadian amateurs. The list is as follows: England, France, Italy, Holland, Scotland, Denmark, Australia, New Zealand, Mexico, Argentine and Chile.

Do not allow your telephone cords to touch the top of your storage battery, because the strong fumes of the electrolyte will destroy the telephone cords and thus short-circuit the phones.

Good use can be made of a closed single circuit jack mounted on a panel. It can be employed as an "A" battery switch. Mount it on the "A" battery circuit between the battery and the tubes.

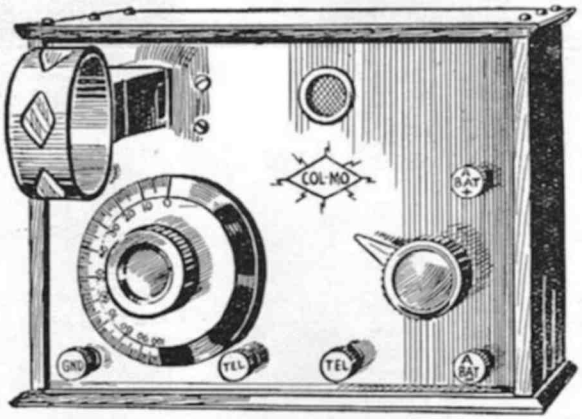
Year Offering!

BUY Your Radio Supplies NOW and avoid disappointment

VALVE SETS AND ACCESSORIES

THE LITTLE GIANT —— COL-MO SINGLE VALVE SET

Complete with coils to tune to both Broadcasters and Farmers **£4-10**



ACCESSORIES

Phones	1	5	0
Radiotron Valve	1	10	0
B. Battery	0	9	6
A. Battery	0	3	0
	£3	7	6

Before you decide upon your Xmas presents SEE OUR LITTLE GIANT. This set is manufactured with first-class material, in highly polished maple cabinet, and assembled up to the usual standard of Col-Mo craftsmanship. Call or write for further particulars.
We have an unusually large selection of the best phones and valves from which the experimenter may choose with the knowledge that he is receiving the best value for his money.

Mello Phones, 4000 ohms	25/-
Pico Phones, 2000 ohms	25/-
Murdoch Phones, 2000 ohms	27/6
Western Electric, 4000 ohms	37/6
Colmo Phones, 4000 ohms	32/6
Trimm Dependable and Trimm Professional, 2000 and 2400 ohms	32/6, 45/-
Brandes Phones 4000 ohms	35/-
Sterling Phones, 4000 ohms	44/-
Baldwin's Phones, C.	75/-
Brown's 2000 ohms adj.	110/-
Brown's Adj. 4000 ohms	115/-
Brown's Adj., 8000 ohms	115/-

Mullard Ora Det.	17/6
Mullard Ora Amp. Radio Frequency . .	17/6
Mullard Ora Amp. Audio Frequency . .	17/6
Philips D1. Detector	18/6
Philips D2. Amp.	18/6
Philips D4 Detector, standard American Socket	18/6
Phillips E. Amp.	18/6
Philips B6 Double Grid Dull Emitter	£2/5/-
D.6 Double Grid	1/7/6
B2 Dull Emitter	1/7/6
Cossor Valves	£1
D.V.3 Dull Emitter	1/10/-
201A	1/10/-

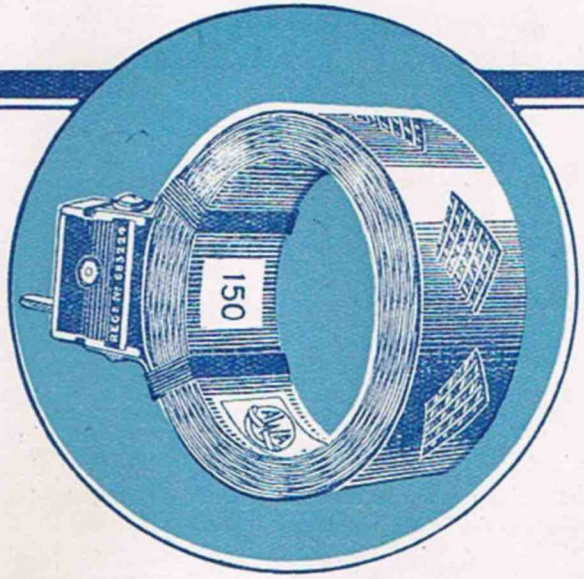
All other Radiotron, De Forest and Marconi valves in stock at usual city prices.

COLVILLE-MOORE

TUNE IN

WIRELESS SUPPLIES, LIMITED.

10 ROWE STREET (NEXT HOTEL AUSTRALIA) SYDNEY



Tuning In

In thousands of homes people are tuning in on their radio sets.

Scarcely a sound; a slight turn, a faint noise; another adjustment, and then clearer and clearer comes music from the air.

Is your nightly "tuning-in" as simple as this?

If you want simple, quick and more selective tuning use,

A.W.A. Honeycomb Coils

No. of Turns.	Wavelength with .001 Condenser.	Price, Mounted.	Price, Unmounted.
20	50–260	6/9	2/–
25	100–375	7/–	2/2
35	150–525	7/6	2/2
50	190–675	7/9	2/4
75	240–925	8/–	2/6
100	340–1340	8/3	2/9
150	500–1960	8/6	3/–
200	650–2675	9/–	3/6
250	725–3575	9/9	3/9
300	1050–4200	10/6	4/3
400	1600–6000	11/8	5/–
500	2000–7500	13/6	7/–
600	3000–9000	15/6	9/–
750	4000–11000	16/9	12/–
1000	4500–16000	1/–/–	14/–
1250	6310–18240	1/4/–	16/–
1500	7635–22210	1/8/–	18/–

At all Radio Stores

A.W.A. Honeycomb Coils are mounted on Igranic Honeycomb coil plugs with a black celluloid diamond strip, and then the shoulders are specially bound with black waxed thread, which holds the coil rigidly in position.

A.W.A. Coils offer very low radio-frequency resistance and self capacity is at a minimum. They may be used as tuning, loading, coupling, or wavemeter inductances, ensuring the highest degree of efficiency for your Set. Made in sizes to suit your requirements, each A.W.A. Honeycomb Coil is attractively boxed, and the wavelength table printed on the carton. Also supplied unmounted.

Amalgamated Wireless (Australasia) Ltd.

97 Clarence Street
SYDNEY

Collins Street
MELBOURNE

AWA

Published by A. W. Watt, "Keira," Alfred Street, North Sydney, for the proprietors and printers, Publicity Press Ltd., 12-16 Regent Street, Sydney.