LONG-DISTANCE SPEECH BY WIRELESS

BY

"SIGNALS"

One of the most prominent characteristics of scientific development and discovery is the great benefit which sometimes follows from the application to commercial purposes of what at first appears to be an advance in purely academic knowledge.

A striking instance of this nature is furnished by the development in recent years of what is known as the Thermionic Valve, or the Audion. The applications of the principles underlying the audion are the subject of a steadily increasing number of patents, and the theory of its action in fulfilling the different purposes for which it is used is discussed in innumerable lectures and papers in the various scientific societies and journals.

The pioneers in the discovery of this invention were Professor J. A. Fleming and Dr. Lee de Forest, and they and many other notable scientists have contributed to its development during the last twelve years.

In one of its simplest forms the thermionic valve has the appearance of an electric incandescent filament lamp of the ordinary size, with the addition of a "grid" of fine wires of small mesh and a small cylindrical metal plate arranged concentrically around the filament. The filament, which is of tantalum, is similar to that used for a lamp, but is of smaller size and more compactly arranged. It is surrounded by the grid, which in turn is encased by the cylindrical plate, both grid and plate being of nickel.

Briefly stated, the action of the valve depends on the emission from an incandescent filament, glowing in a vacuum, of negatively charged electrons, and their power of producing a conducting medium for electric currents in the space between the grid and the plate. To increase the effect, the plate is maintained at a potential of from thirty to forty volts by means of a battery of small dry cells.

The peculiarity of the valve under these conditions is that if the grid or mesh is now connected to an electric circuit on which minute oscillations or variations of potential are occurring, these variations will cause large increases and decreases in the current flowing from the battery between the filament and the plate.

The effect produced is a true magnification, without distortion, within certain limits, and in conjunction with a telephone very feeble currents, such as those produced by long-distance wireless signals or telephone speech, can be magnified to any desired effect, and thus give rise to audible sounds.

So far, the chief application for commercial purposes to which the thermionic valve or audion has been put is for the reception of wireless signals. Wireless waves which are too feeble to be observed by the detectors previously in use may be magnified as many times as required by the use of one or more of the valves, so that the oscillations may be easily recorded.

The facility with which faint signals may be detected and magnified by this means has enabled small reception aerials to be used which, by being carefully sited towards the sending-station and tuned to the frequency of the waves of electrical disturbance it is desired to "pick up," cut out all extraneous disturbances, permitting the required signals to be read without interference from other sources. This applies to both wireless telegraphy and telephony, and the distances over which wireless telephony is now practicable have been largely increased.

Another important application of this system of magnifying feeble currents is to be found in the "relaying" of telephone speech currents. The limit of distance over which it was possible to speak by the use of wires, without a prohibitive expenditure of copper in the conductors, appeared to have been reached before the introduction of the thermionic valve furnished a practical means of producing a telephone "relay."

With the employment of an audion as a "relaying" instrument, there is now no reasonable limit to the distance over which speech can be transmitted by the use of wires of moderate gauge, and the possibility has been opened up of direct speech

along an Atlantic cable suitably designed for this purpose.

The great development of wireless telephony and telegraphy for naval and military purposes, and particularly in the direction of communication with aeroplanes, has largely centred around this discovery. The simplicity and portability of the valve, and its suitability for both transmitting and receiving purposes, have opened up means of communication which were not contemplated at the commencement of the war; and it is gratifying to know that the Germans admitted in the published intelligence summaries of their General Staff that in the struggle for supremacy in the use and improvement of wireless telegraphy we held a lead which they were unable to overtake.

With the devotion of time and pains to the investigation of the possible applications of this discovery, further methods of employing it for the benefit of mankind will doubtless be revealed. One simple application suggests itself which does not appear to have been tried as yet. When a speaker is addressing a vast public meeting, the difficulty of making himself clearly heard throughout a large hall could be overcome by the use of the thermionic valve, which might be employed to amplify the sound of the voice, and, if necessary, to reproduce it simultaneously at several points of the building; for the valve enables the vibrations produced by the human voice to be magnified without distortion, and without losing any of the characteristics of the original sound.

"WIRELESS" MUSIC. [*Wireless Press Photograph.*]

Members of an American Radio Club who danced to music received by wireless telephone.

[*Wireless Press Photograph.*]

Dame Melba giving her concert by wireless telephone in the Marconi Company's Works at Chelmsford.

A small receiver in front of the speaker, and reproduction transmitters suitably placed in proximity to various portions of the audience, would enable the orator's words to be heard clearly beyond the limits to which an ordinary voice would penetrate. The strain on the speaker would by this means be very much reduced, and the effort of making the voice carry to the most remote portions of a large audience would be no greater than that involved in speaking to a small gathering. There would, of course, be no time interval between the sounds as spoken and as heard from the reproducing instrument, while the gestures accompanying the speech would sychronise with the sounds as reproduced.

Extensions of this principle would enable a speech or a declaration to be made to many audiences at one and the same time. By the use of the ordinary telephone system, as many halls as required could be connected to the place at which the speech was being delivered. At each of the connected halls the sounds as spoken into the receiver at the place where they originated would be suitably magnified and transmitted with no distortion, but with sufficient volume to be clearly heard.

Many other possibilities present themselves, such as its association with the "electrophone" and the gramophone for reproducing loud records, and as the properties of the valve become more widely and precisely known, its adaptation for other commercial purposes may be confidently predicted.

THE WIRELESS INSTITUTE OF AUSTRALIA

South Australian Division.

The Annual General Meeting of the South Australian Division of the Wireless Institute of Australia was held in Adelaide on September 8, Mr. Hambly Clark presiding.

The following officers for the ensuing year were elected:—President, Mr. Hambly Clark; Vice-Presidents, Mr. J. M. Honner and Mr. H. Hawke; Hon. Treasurer, Mr. R. M. Dunstone; Hon. Secretary, Mr. C. E. Ames; Council, Mr. A. A. Cotton and Mr. H. L. Austin. Messrs. W. J. Bland and J. M. Honner were elected "Operating Examiners" to examine members requiring endorsement of licences for the use of Valves.

The Chairman presented the Secretary with a letter signed by all members present, together with a cheque as a token of appreciation of services rendered during the year.

With the opening of a new financial year the Secretary requests members of the Institute to renew their subscriptions as soon as possible.

OPERATING SUGGESTIONS FOR THE RADIO AMATEUR

BY

J. H. TOLLEY

[The following article was awarded the cash prize recently offered by our American contemporary, *The Wireless Age,* for the best suggestions for the guidance of wireless amateurs.—*Ed.*]

A great percentage of the amateurs operating stations either have given the "interference" problem little thought or are indifferent to the interference and inconvenience they may be causing to brother amateurs or professionals by unprofessional methods of operating.

Before attempting to do any telegraphing the student should know the code thoroughly, the practice work should be done on a buzzer set and continued until there is no hesitation in making any character desired. The spacing between letters and between words is very important. If the student will bear in mind that he is in fact *writing* when he telegraphs and strives to space his characters exactly as they would appear in writing or in print, it will result in fewer twenty-eight letter words at the receiving station. The study of the proper spacing is as important to the beginner in telegraphy as is the study of *tempo* to the beginner in music. Until the student is able to take a newspaper and send a hundred or two hundred words without hesitation or stumbling and with uniform spacing between words he should not attempt to turn loose his skill upon the much abused ether.

Even after learning the code it is an excellent plan to do but little sending and much listening. This is the best way, too, in which to attain efficiency in receiving. Pick out some station which operates in a short, business-like way and avoids saying or repeating the same thing over and over. Study his style of handling messages or conversation and note how he gets over the ground in comparison with the operator who insults your ability to receive by repeating numerous times.

Telegraphing is the same thing as carrying on a converstaion by word of mouth, providing always that the static (or interference) is not breaking it up and numerous repetitions or lengthy explanations are as unnecessary there as in conversation by word of mouth. The international abbreviations used in handling traffic should be committed to memory, at least those in most common use, so that the meaning of each will be recognised immediately upon hearing it. A copy of this list should be posted in a convenient place also, so that a glance will be sufficient to read any abbreviation heard and not recognised. If this plan is followed out, it will be but a short time before the entire list is committed to memory.

Nor is it necessary that you do some transmitting every time you sit down to the apparatus. Make it a practice to listen for at least five minutes after sitting-in before you do any sending. This will give you an idea of what the conditions are like, and if the air is already crowded there is little use in getting in yourself and adding to the confusion. Just what idea underlies the practice of some stations calling others frantically and insistently only to say "Good evening, how do you get me?" when they receive an answer, I am unable to say, but note that it is common practice. It would seem that if there is nothing more important to transmit it would not justify the interference and hard feeling caused. If the need of practice is felt, why not do it upon the buzzer set instead of turning it loose upon the heads of those engaged in trying to get through legitimate information?

When sending messages, use the regulation form. This will help the operator on the receiving end, as he is probably expecting that you will do this, and the use of Bohemian methods will probably decide him that he will see less of you until you learn something about the game. The old-timers especially dislike to work with revolutionary newcomers and if you wish to stand in with them and become one of

the gang with a standing, copy their style and graduate from the ranks.

Avoid the long call. A half-dozen times is as good as a million if the other fellow is not getting you, and if he is getting you, one is sufficient. In signing your own station-call the same advice applies. If he is getting you, once or twice is enough. If he is not getting you a million repetitions do no good. Above all do not be one of the expert *alibi* artists. If you fail to get what is sent you ask for repetition and stop there. An explanation comprising two hundred words of why you did not get the twenty-five words sent you is uncalled for and of no interest to the operator at the other end. The only thing of interest to him is the fact that you wish him to repeat. This last applies not only to amateurs but to a great many operators earning their livelihood as such. They waste their own time and others' by going into lengthy explanations as to why they are asking for repetition, sending seventy or eighty words of this useless stuff when the message missed is possibly of only twelve or fifteen words and could be sent over a half-dozen times while they are establishing an *alibi*.

If you know that your speed in receiving is limited to about fifteen words per minute, you invite trouble by sending to another station at a rate of twenty-five words per minute for the reason that in all probability he will answer you at the same rate of speed and you will then be called upon to exercise your ingenuity in establishing an *alibi*, which an incredulous and contemptuous operator at the other end clearly sees through. Try always to make good copy, and follow the professional form of writing messages; that is, place the message number, operator's sign, check, date, address, etc., on the sheet in the same manner as is done in professional work. It is bad practice also to write too close behind the sender for the reason that if a mistake is made in sending, it is written down and must then be erased. Writing a word or two behind the sender will result in better looking copy.

Avoid joining the ranks of the "QRA'S." They are already overcrowded. I refer to the operator who whenever he hears a strange call must open up and inquire "QRA O M." He is probably not O M to you anyway, being a stranger. Up-to-date call lists are to be had at a very low cost and reference to one of these is to be preferred to the QRA method.

Don't copy the style of the operator who affects a swing in his sending. It is odd, of course, and attracts attention, but so do the guests at Matteawan, and many other things which most people are shy of. *The best method of finding out what to avoid is to take note of what causes you to froth at the mouth when you are trying to get through something and are prevented by other stations interfering. Take careful note of what might have been eliminated by them and avoid just that yourself in the future.*

A word of warning in conclusion. The United States Government regulations are not strict and interference is bad. If conditions continue to grow worse, it is an unavoidable conclusion that the Government will take steps to improve matters and whatever form such legislation may take, it will surely place further restrictions upon amateur transmission. So, in justice to yourself and the many amateur station owners who strive to improve matters, get behind offending stations when you locate them, and if you cannot induce them to mend their ways by argument, apply a little pressure. Exclude them from your clubs and meetings; refuse to work with them, and if necessary explain matters to the Government inspector and ask him to get behind the unmanageable one. In doing this, you will be doing it as much for yourself as anyone else. If you do nothing about it but let the newcomers play as they will, you also will be partly to blame, when stricter laws take from you some of the privileges now allowed.

WIRELESS AND THE PRESS

THE "DAILY MAIL'S" WIRELESS STATION

On May 11, 1920, *The Daily Mail* achieved the record of being the first London newspaper to instal a permanent wireless receiving station on its premises, and, after a short period devoted to experiments, accomplished on May 28 a further record, that of being the first British newspaper to receive by wireless telephony news messages for publication. These messages were transmitted by the Chelmsford high power wireless telephony plant belonging to Marconi's Wireless Telegraph Co., Ltd., and received on *The Daily Mail* station in London, the work being done by the paper's own reporters.

The Daily Mail installation—as described in a recent issue of our British contemporary, *The Wireless World*—consists chiefly of a six-foot frame aerial of the solenoid type, wound with 48 turns of wire, used in conjunction with Marconi 7-valve high frequency amplifiers and detectors, Types 55A and 55D.

Type 55 is one of the most sensitive receivers in existence and is particularly suitable for use with a loop aerial. The tuning arrangements permit of reception on wavelengths of from 600 *metres* to 18,000 *metres*. Damped and undamped waves and wireless speech can be equally well received on this apparatus, which is no amateur set but an instrument which has been thoroughly proved both in war and commerce, and is capable of detecting signals from any high-power station within a radius of 3,000 miles.

In a vision of the future one sees the inside of a newspaper office, where reporters are busy receiving "copy" from their colleagues in distant towns, whilst automatic receivers click out tape records of news messages sent at 100 words a minute from the world's high-power news-distributing stations. From this to direct type-setting by wireless is, maybe, not so far a cry as from Marconi's early experiments to his first great achievement, trans-Atlantic wireless telegraphy!

If, in addition, this future newspaper draws its electrical power from some huge Wireless Power Station, why then—then we shall have really begun in earnest to use that incomparable, universal medium, the æther.

A visit to Carmelite House and a conversation with *Daily Mail* officials revealed that the latter intend to lose no time in assisting wireless and journalism to join hands. They look forward to the time when a reporter shall start for the scene of his "story" in an aeroplane—"and arrive," one of them humorously interpolated—and deliver his "copy" to headquarters by a system of linked wired and wireless telephony, the message being received at the paper's own wireless station. They intend to make as much use of wireless as possible and entertain no doubt but that present day apparatus can fulfil all the demands likely to be laid upon it by Fleet Street in general. The idea of an "exclusive" message being flung out on an indiscriminating, generous æther, and intercepted by rival papers, created a disturbing ripple in the flow of conversation. Knowing that a similar objection has been levelled at wireless telegraphy for twenty years we do not view this question in quite such a serious light. There is this point, too, which must be taken into account—directive wireless is probably not far distant.

WIRELESS HOUSE BALL

The Wireless House Ball at the Paddington Town Hall, Sydney, on September 22, proved one of the most successful events of the season, and was attended by some 250 couples, whose twinkling feet chased the flying hours until 2 a.m., when special trains and trams conveyed them to their homes.

Among the novel features of the programme were the following numbers rendered with considerable gusto and the usual weird mechanical effects by Derriman's Jazz Orchestra:—

"Wireless Waltz, Radio Two-Step, Rotary One-Step, Undamped Fox-Trot, Continuous-Wave Schottische, Quenched One-step, Marconi Lancers, High-Tension Waltz, Filament Fox-Trot, Triode One-Step, 600-*Metre* Waltz, Long Wave Two-Step, S.O.S. One-Step, Australectric Waltz, *Sea, Land and Air* Fox Trot."

WIRELESS RECEPTION WITH THE ELECTRONIC VALVE

BY

RAYMOND EVANS

PART 2

The reader, having familiarised himself with the elementary portion of "Valve" operation, as described in the August issue of this journal, let us now consider the use of the "Expanse" Valve in the reception of damped and undamped waves.

The circuit shown in *Figure 1* is an example of what is commonly known as a regenerative amplifyer. This circuit is one of great flexibility and particularly valuable when used in conjunction with a single "Expanse" Valve, as it can be used for detecting and amplifying both damped and undamped signals.

In this circuit, *S* represents the secondary coil of the tuner, C^1 the secondary tuning condenser, C^2 the grid condenser, C^3 the bridging condenser, and *T* the tickler, or regenerative coil. In operation, the circuit SC^1 is adjusted to the wavelength of the incoming signal, the filament battery (*A*) and the plate battery (*B*) adjusted to maximum strength of signal. The most sensitive position of the *A* battery rheostat for the reception of spark signals will be indicated in the telephones at a point just below the peculiar frying or hissing sound. This value must not be exceeded, as the Valve filament is likely to suffer in consequence. Some modern receivers are fitted with panel *ammeters* which, on account of the convenience they afford in enabling a careful watch being kept upon the filament current, are certainly an advantage, as the life of the "Valve" is preserved in consequence.

The inductive value of the tickler coil depends largely upon the wavelength to be received. A coil for use as a tickler for wavelengths between 600 and 1,000 *metres* need have 50 turns of No. 22-gauge "C" cord copper wire wound on a former 3 inches in diameter, while one for use on the longer, undamped waves would require to be from 10 to 60 *millihenries*, and could be built similar to the one described in the July issue.

The Valve values of the grid condenser, C^2, and the bridging condenser, C^3, depend mostly upon the type of Valve used, the "Expanse" requiring an approximate grid capacity of .0001 *microfarads*, and a bridging capacity about three times greater.

On account of the possibilities of various makes of "Valves," being used, these condensers are generally made variable, within values slightly above and below those given, in order that the experimenter can find for himself the most satisfactory values for the best signal response.

In the reception of spark signals in the ordinary way with this circuit, little use is made of the regenerative effects, which are of wonderful value for amplification purposes, but if certain adjustments of C^3 are made, also the coupling between the "tickler' coil and the secondary carefully adjusted, part of the telephone current can be "fed back" to the "grid" circuit per medium of the tickler coil, where it reinforces the "grid" oscillations and which, in turn, react upon the telephone circuit *viâ* the "plate," thus increasing the amplitude of the current therein on account of the still greater variation of the local current which it produces.

If the "Valve" is brought to an oscillatory condition, that is, caused to generate oscillations of its own by means of the critical adjustment of C^1—C^3 tickler coil, and both *A* and *B* batteries, "beats" will be produced, which, though giving remarkable amplification, will have the detrimental effect of causing a distortion of most spark signals. The method of producing "beats" and detecting and amplifying with the one "Valve" is called the "self heterodyne," or more commonly, the "Autodyne." The system, however, is of far greater value when utilised for the reception of undamped signals, as, on account of the sustained nature of these waves wonderfully amplified signals can be obtained and the pitch of the signals altered at the will of the operator, thus permitting of a far greater degree of selectivity than could otherwise be obtained.

A simplified explanation of this action is as follows:—Take the case of the common spark or undamped wave. This is readily audible in the telephones of the elementary receiver, for the reason that, although the oscillation frequency of the wave is considerably above audibility, the actual tone of the note is dependent upon the frequency of the wave train, or, in other words, the number of wave groups per second as in *Figure 2*, which, in this case, are within the bounds of human audibility.

Figure 3 will give a graphic illustration of the form of the undamped or continuous wave, where it will be easily seen that on account of the sustained nature of the oscillations, which are of a frequency exceeding 10,000 per second, and are therefore above audibility. Supposing two separate oscillatory currents of frequencies of 100,000 and 100,500 (both of which are above audibility) respectively, are caused to act together in the one circuit, the "beats" or rise and fall in amplitude occur at a rate equal to the difference in frequencies of the two oscillations. In other words, should we wish to tune in an undamped or "Arc" wave of a frequency of 100,000, and we were to impress upon the circuit another current at a frequency of 100,500, the result will be a current of a frequency of 500 which, of course, would be audible in the telephones.

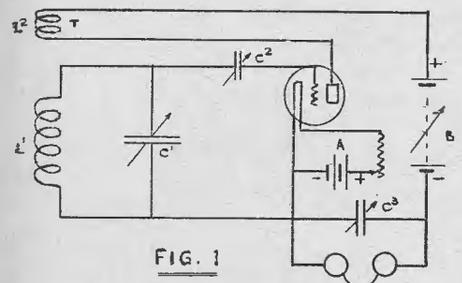

FIG. 1

Regenerative circuit employing tickler coil

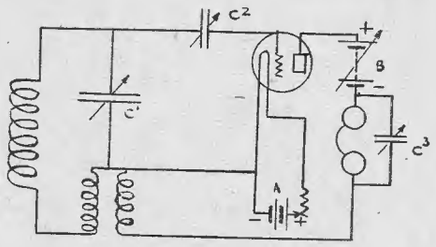

FIG. 4

employment of regenerative coupler

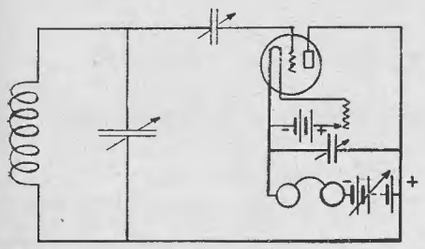

FIG. 5

ultra audion circuit

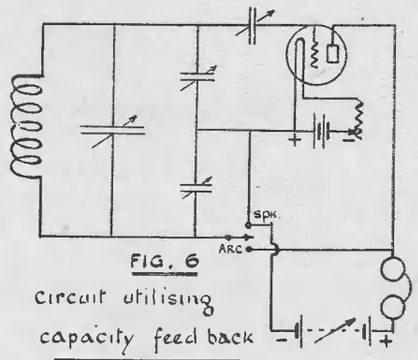

FIG. 6

circuit utilising capacity feed back

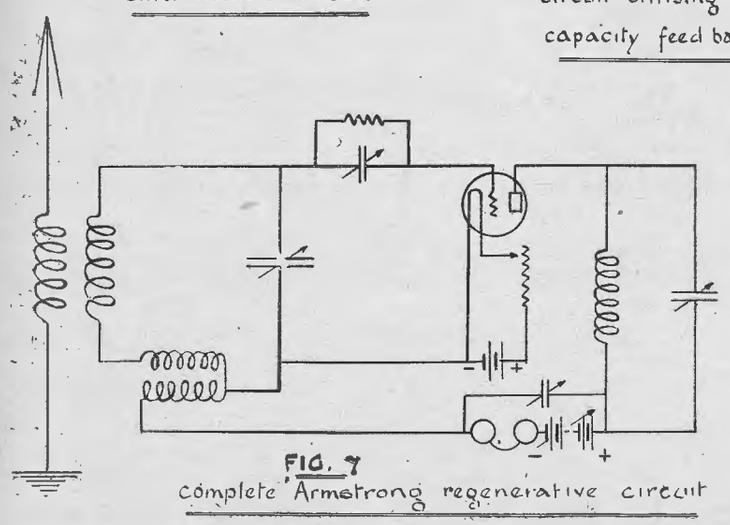

FIG. 7

complete Armstrong regenerative circuit

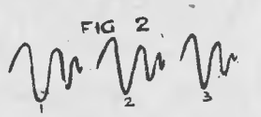

FIG 2

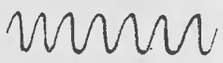

FIG 3

Therefore, if our local (or interfering) oscillations are capable of variation as is the case when using the "Expanse," the pitch of the received signals can be altered to suit the operator's own liking. When the same "Valve" is used to generate these local oscillations as is used to rectify and detect the signals, the arrangement is said to be "self-heterodyning." This is a very convenient and inexpensive method for the use of the experimenter, as it removes the necessity of using a separate "Valve" for heterodyning.

In tuning for long sustained waves, it is first necessary to set your secondary coil, secondary loading coil and secondary condenser to the wavelength it is desired to receive, using as small a value of capacity as necessary; then set the valve into oscillation by means of adjustments to the filament and plate currents, the bridging condenser and, last, but not least, the coupling between the tickler coil and the secondary of the tuner. This latter will be found very critical and some practice will be required in order that the circuit can be kept in a stable condition.

A simple method to ascertain if the valve is generating oscillations, is to tap any part of the oscillating circuit with the moistened finger, when a clear, loud click will be heard in the 'phones. Next, adjust the wavelength of the aerial circuit to that of the secondary circuit, an indication of resonance being obtained by tapping the aerial terminal of the primary with the finger (as with the secondary), when the familiar click will again be heard in the 'phones. Now alter the value of the secondary tuning condenser over the full range of its scale; a distinct click will be heard each time the pointer passes one certain point on the scale. This is known as the resonance click, and is an indication that both aerial and secondary circuits are in tune. Next move the secondary tuning condenser pointer to a value slightly above or below the resonance point, when a peculiar "drummy" sound will be heard, not unlike that heard when a large seashell is moved to and from the ear. This action, namely, the throwing of the incoming and local oscillations out of resonance, causes the so-called "beat" currents which result in the received continuous waves being made audible, and, as the degree of detuning is controlled by the operator a range of beautiful flutelike signals will result.

In operating these regenerative amplifiers, great care should be exercised in arranging the various units of the receivers, also the wiring, as many undesirable effects will be obtained if these inter-capacity troubles are not taken care of.

Most common of these are those caused by the extra capacity placed in the circuit when the hand is placed near certain parts of the apparatus when tuning, resulting in the throwing of the circuit out of balance and therefore the loss of signals.

In some modern instruments this effect is partially eliminated by the use of long insulated operating handles, and by means of an earthed shielding around the units of the oscillating circuit.

Another effect most common in experimental amplifiers is that known as "howling" of the valve and to a large extent is also due to these extra capacities in the circuit such as the telephone cords, for instance. In this connection it must be noted that when the valve assumes this "howling" condition it is in reality producing its oscillations at an audible frequency.

Thus it is obvious that this condition should be avoided for more reasons than one.

Earlier in this article reference was made to the amplification of damped or spark signals, and to the fact that the same degree of amplification could not be obtained as with undamped signals due, mainly, to the distortion of signals, etc. However, remarkable results can be obtained with the modern "Cascade" amplifiers, which will form the subject of the next article of this series.

LIST OF WIRELESS OFFICERS ATTACHED TO VESSELS OF THE AUSTRALASIAN MERCANTILE MARINE

Revised to September 21, 1920.

Ship.	Operator.
Apolda	J. W. McKay
Arahura	W. C. Brown
Araluen	H. H. Black
Aramac	N. H. Brown
Arawatta	N. W. G. Scott
Atua	G. Poole
Australbrook	J. F. McGinley
Australcrag	V. E. Stanley
Australford	T. W. Bearup
Australglen	W. H. Richardson
Australmead	G. Pow
Australmount	A. R. Catford
Australpeak	R. H. Alexander
Australplain	A. Stuart
Australpool	E. J. Glaisher
Australport	J. H. Pullan
Australrange	V. P. Nevins
Bakara	C. W. Donne
Baldina	———
Barambah	M. L. Robertson
Bingera	J. H. Hawkins
Bombala	I. B. Gibson
Boonah	F. A. Cook
Booral	R. Jordan
Boorara	T. Alexander
Bulla	A. W. Watt
Bundarra	J. B. Ponsonby
Calulu	F. Exon
Canberra	T. Bannister
Carina	W. Hall
Changsha	B. Boni
Charon	J. E. Cleary
Cooee	P. D. Hodges
Cooma	J. A. Guy
Delungra	F. G. Lewis
Dilga	T. V. Tressler
Dimboola	———
Dinoga	R. R. Robinson
Dongarra	H. J. Byrne
Dromana	F. Stevens
Dumosa	H. Beckett
Dundula	J. A. Cooper
Eastern	C. H. A. Kidman
Eurelia	———
Eudunda	———
Gilgai	D. H. George
Hwah Ping	F. A. Hunter
Kaiapoi	E. A. Miller
Kaitangata	R. W. Barnes
Kaituna	F. E. Duggan
Kaiwarra	L. H. Jones
Kanowna	W. J. Washbourne
Karoola	R. R. Pilmore
Katoomba	T. A. Jones
Karori	S. G. Jones
Katoa	K. L. Freeman
Kauri	S. V. Blight
Koromiko	H. E. Young
Kowarra	H. Fullerton
Kurow	F. N. Davidson
Levuka	S. L. Fuller
Loongana	R. M. Firminger
Macedon	N. W. Marshall
Makarra	A. D. R. Davis
Macumba	F. L. Dawes
Maheno	G. Hugman
Makambo	V. M. Brooker
Makura	E. A. Hunter (s), M. Webb-Watts (j)
Malayan	H. F. Giles
Manuka	J. A. Heavey
Maori	J. Elmore
Marama	J. H. Bennett (s), F. Ouvrier (j)
Mararoa	———
Marsina	E. A. Burbury
Matarâm	C. Williamson
Maunganui	———
Melusia	S. F. Stafford
Minderoo	M. A. Prudence
Mindini	R. S. Taylor
Moana	J. F. Hutton
Moeraki	A. Cuthill
Mokoia	T. H. McWilliams
Monowai	G. Donnelly
Montoro	S. R. Dixon
Morinda	F. C. Davies
Navua	D. C. Lane
Ngakuta	H. Bargrove
Niagara	H. A. de Dassel (s), D. W. Higgins
Ooma	A. E. Sheppherd
Oonah	F. G. Forrest
Paloona	R. P. Ginders
Parattah	K. L. Simpson
Pateena	C. F. S. Taylor
Rakanoa	V. M. S. Simpson
Riverina	G. Illingworth
Rotomahana	A. S. Smith
Shandon	G. Vincent
South Africa	E. J. Giles
St. Albans	H. W. Barnfield
St. George	A. J. Sawyer
Suva	L. S. Lane
Tahiti	E. M. Bain (s), W. S. Ringrose (j)
Taiyuan	F. A. Woodall
Talawa	D. Hairs
Talune	H. F. Harman
Tarawera	A. W. Hooper
Tofua	L. R. Dickson (s), E. N. Williams (j)
Toromeo	M. Sedgers
Ulimaroa	H. Tuson
Victoria	C. H. Griffiths
Wahine	W. A. Hawkins
Waihora	H. Bashford
Waihemo	G. Maxwell
Waikawa	N. Leeder
Waimarino	A. S. Dening
Waipori	J. G. Champion
Wairuna	R. T. Stephen
Waitemata	H. F. Hartley
Waitomo	S. J. McVeigh

(Continued on page 486.)

(*Continued from page 484.*)

Ship.	Operator.
Wanaka	P. C. Gillon
Wandilla	D. N. Quinn
Westralia	M. A. H. Ryan
Whanrgape	A. O. Sutherland
Wodonga	G. M. Whiteside
Wyandra	T. Chalmers
Wyreema	——
Zealandia	M. A. Prudence

Amalgamated Wireless Operators Temporarily Employed on M.I.M.C. Coy's Ships.

Durham	H. Heather
Havre	A. E. Lawrence
Rupara	G. Cook

WIRELESS CALL LETTERS.

The following additions are notified:—

Additions.

Call Signal.	Ship.
CGC	*St. George*
CGF	*Eurella*

To the Editor,
Sea, Land and Air,

Dear Sir,—It has been suggested that an association of ex-members of the Royal Naval Air Service be formed in Australia, and I would be glad to hear from any such members at any time, with any suggestions as to when and how a meeting could take place to discuss the possibilities of such an association, and the arranging of an annual dinner.

A similar meeting took place a couple of months or so ago in Melbourne, presided over by Wing-Commander S. J. Goble, O.B.E., D.S.O., D.S.C., and it was an entirely successful gathering.

I think that many members of the R.N.A.S. would welcome such an Association in order to renew old acquaintances.

Thanking you for the space you are allowing us in the columns of your valuable and popular magazine.

Yours faithfully,
P. ROACH-PIERSON,
Captain (Ex-R.N.A.S.).

Sydney,
September 10, 1920.

Sullivan Telephones for Sale.

Mr. W. V. Neill, of "Ormond," Surat (Q.), offers for sale a pair of Sullivan's Telephones—price 35s.

THE ISLE OF ADVENTURE

LORD HOWE ISLAND

BY

FRANK REID

LORD HOWE ISLAND, distant and inaccessible at it may at first appear, is not really altogether out of the world, for it is situated about three hundred miles from Sydney. Its length is between six and seven miles. "as the crow flies" (only there are no crows there), but is considerably longer if the curve of the land is followed. The average width is a mile, but is a great deal more in places.

The discovery of the island was made by Lieutenant Henry Ledgbird on February 17, 1788, during his passage from Sydney to Norfolk Island. Mr. Ball remained several days at the island; he gave it the title we know it by—after the celebrated admiral—and also named the principal peaks, points, and ports around and upon it. He made a survey of the shore line and of the adjacent isles, took soundings, and gave sailing directions for future guidance. Most of the names bestowed by Lieutenant Ball have been retained—namely: Mount Ledgbird, Mount Gower, Point Phillip and Point King—after the first Governor and Lieutenant-Governor of New South Wales.

The appearance of the island as it is approached is remarkable. Two round-looking knobs are first seen, at a distance of from forty to fifty miles, like separate isles rising from the water. As one comes nearer, these appear to be joined together, and to have a long, flat stretch of ground attached to them, terminating in a lower mound. The general effect now is that of a camel crouching to receive its load. The two first-sighted prominences form the hind-quarters of the animal, and the small hill at the farther end of the island may be described as the camel's head, whilst a line of low rocks stretching across the bay seems to be the cord or string attaching the head to the hump; a slight rise about the middle of the island seems to be the saddle ready for loading.

Closer approach reveals a singularly beautiful outline. The two rises which were first seen turn out to be a couple of bold headlines at the south end—known as Mount Ledgbird and Mount Gower—rising in great, inaccessible cliffs nearly three thousand feet sheer from the sea. The head of the camel proves to be North Ridge, and the centre rise Mount Lookout.

There are some three thousand acres of land in the whole island, two-thirds of which would be capable of cultivation; but as a matter of fact, only a few hundred acres are in tilth. The principal crops are onions—the finest south of the Line—bananas, sweet-potatoes, and maize. It is indeed from the export of onions to Sydney that the inhabitants of the island chiefly obtain their living; but there are abundant opportunities of increasing their means of subsistence, for there is hardly a fruit, vegetable, or flower grown throughout the temperate or semi-tropical regions of the world which does not flourish upon it.

The island was only occasionally visited from its discovery until 1834. Now and then a party of whalers would land and refresh themselves with the easily-caught wild hens and indigenous fruits, or obtain from the lagoon boat-loads of the swarming fish; and sometimes would leave parts of their crews there while they made short runs elsewhere. Some of these rambling visitors, indeed, performed acts which have left their marks on the island. They turned loose pigs and goats, and also, unfortun-