his peers or by the law of the land.''

It further enacted that no tax should be levied without the consent of the *Commune Concilium,* besides re-establishing the legal procedure of Henry II. and redressing many crying grievances.

John, as we have said, accepted the Charter, but it soon became evident that he had no serious intention of adhering to its provisions. The acceptance of the Charter was in itself a notable triumph, but it is worthy of note that the famous provision against arbitrary imprisonment did not finally and effectually become law until 1679, when the Statute of *Habœas Corpus* was passed, whilst Kings of England did not definitely forego the right to levy taxes as and when they pleased until a still later date. It is interesting to note that these two problems, which the Charter was intended finally and for ever to solve, proved the nucleus of the quarrel between Charles I. and his parliament more than 400 years later, and that even the defeat and execution of that king did not definitely and satisfactorily settle the question at issue.

John found a ready supporter in the Pope, who proceeded to release him from all liability to adhere to the concessions which had been thus wrested from him. Stephen Langton was at the same time suspended and recalled to Rome.

The archbishop had so far been the leader of the barons who, now that they were compelled by John's duplicity to assert their rights by force of arms, turned for support to the King of France, the offer of the crown to that monarch's eldest son, Louis the Dauphin, procuring them his much-needed assistance. Meanwhile John, at the head of his army of mercenaries, had carried all before him, but once Louis landed in England the situation changed, the French troops in John's employ now resolutely refusing to participate further in the struggle. The tide now turned and, losing a large part of his commissariat in the River Wash, John seemed on the verge of disaster when his death suddenly occurred at Newark, the result, so it is alleged, of a surfeit of peaches.

After the defection of his French troops, even John's indomitable energy and his sterling qualities as a soldier could hardly have enabled him to emerge successful against such vastly superior numbers as he was now called upon to face.

His name has become a byword in English history, but despite his cruelty, his greed and his total lack of principle, he was a man of rare qualities, a fearless soldier, endowed with almost superhuman fortitude and strength of character, and possessed alike of a remarkable genius for organistaion and of a wild, restless, limitless energy.

The tragedy is that his undoubted gifts were not directed into better and worthier channels, for there is no doubt that he was one of the ablest, if not indeed quite the ablest, of our earlier kings. Nor was it merely on land that he demonstrated his great abilities as a fighter, for at sea he proved almost equally successful, and, indeed, his reign marks a distinct epoch in the history of the navy, for he was the first King of England to realise that attack is the surest means of defence by sea.

During the war with France Philip had intended to attempt the invasion of England, and had actually collected a large fleet for this purpose, but before his preparations were complete John, mustering what ships he could thus hurriedly collect, sailed out to meet him and succeeded in inflicting such severe damage on the redoubtable French armada as to render England safe from all fear of invasion for some considerable time to come.

It is worthy of note that, in compelling the King to accept the Great Charter, the barons acted in the interests of the nation as a whole, with the people of England for once solidly at their backs. It was the first instance in our history of the privileged class acting on the nation's behalf and not merely in their own selfish interests. Hitherto the people had consistently sided with the King against the baronage.

Thus begins a new chapter in England's history.

(*To be continued.*)

THE WIRELESS TELEPHONE AT PARLIAMENT HOUSE

SUCCESSFUL DEMONSTRATION BY MR. E. T. FISK

[In our last issue it was announced that Mr. Fisk had consented to furnish us with an exclusive illustrated article describing the wireless telephone demonstration conducted by him on October 13 last, at Federal Parliament House, Melbourne. This announcement was made in all good faith but, unfortunately for our readers, Mr. Fisk was again compelled to return to Melbourne on another, and even more important, demonstration of a somewhat similar nature, and at the time of closing this issue for press it has been impossible to obtain from him the promised article. A representative of this journal who was present at the demonstration, contributes the following report.—*Ed.*]

The Queen's Hall in Federal Parliament House was packed to its utmost capacity with Ministers, Senators, Members of the House of Representatives, and a sprinkling of privileged visitors, when at 7 p.m. on October 13, Mr. E. T. Fisk, M.Inst.R.E. (Managing Director of Amalgamated Wireless, A'asia., Ltd.), opened his practical demonstration of the wireless telephone.

Precisely as the last stroke of seven echoed through the great Hall, the vestibule and corridors of the House reverberated with the orchestral strains of ''Rule Britannia.'' So great a volume of melody could never have emanated from any ordinary phonograph, yet so perfect was the sound reproduction that every characteristic of this instrument could be heard, even the gentle grating of the steel needle against the smooth surface of the record.

As a matter of fact, the music *was* of phonographic origin, being produced by an ordinary cabinet type of instrument such as are sold in Australia by the thousand. This phonograph was installed a dozen miles away, in a room at Middle Brighton, the suburban residence of Mr. L. A. Hooke, Melbourne manager of the above-named Company.

Facing the instrument was a microphone transmitter of the same type as (though slightly larger than) those in general use in private or commercial telephone sets. This transmitter was connected with a wireless telephone equipment of the most modern type, which, in turn, was connected with a few aerial wires suspended from a mast in Mr. Hooke's garden.

With these aerial wires as a starting point, so to speak, of their flight, the silent, invisible ether waves—carrying the sound waves on their crests and troughs—precipitated themselves into space at a velocity of 669,600,000 miles an hour (sound, as most of our readers know, travels at a speed of 186,000 miles per second). Instantaneously they were caught by a similar set of aerials erected above Parliament House, and connected with a highly sensitive and accurate, yet robust and simple, apparatus in the Queen's Hall.

The Parliament House apparatus automatically separated the sound waves from the ether waves, reproducing and magnifying the former so that the music was distinctly audible in every part of the building. To have produced such an effect locally, at least a dozen similar phonographs would have been required.

Following a few instrumental selections of the above variety, the astonished audience was now entertained with an actual reproduction of the human voice, the singer being Miss L. Walker, recent winner of the Melba Scholarship. To her fell the distinction of being the first in Australia to perform to an invisible audience by the medium of wireless telephony, thus following the precedent recently established by her illustrious benefactress, Dame Melba, who, as has already been reported in this journal, sang, a few months ago, ''before'' an audience who, throughout the United Kingdom and in many European centres, were enabled simultaneously to listen to the Diva's incomparable performance.

Miss Walker's song was preceded by a piano prelude and accompaniment which reached the Queen's Hall with perfect distinctness. Next a truly wonderful soprano voice was heard in our famous national song, ''Advance Australia!'' which was enthusiastically encored.

At the conclusion of the musical entertainment Mr. Fisk, who had personally arranged and supervised the demonstration, delivered the following address:—

''I feel it is a great privilege to be able to give this demonstration in this historic

building and before such a distinguished gathering.

"For this privilege I am indebted to a suggestion from the Prime Minister who immediately recognised the immense advantages offered to Australia by Wireless communication as well as its great importance to the Naval, Military and Air Forces. I am equally indebted to the President of the Senate and the Speaker of the House of Representatives, both of whom appreciate the benefits of this great scientific conquest to a country like Australia. While appreciating this privilege in full degree I also feel that the subject of wireless communication is worthy of the privilege. (*Applause.*)

"No greater benefit has ever been offered to Australia by science than wireless, which annihilates both space and time in human intercourse and destroys isolation from people inland and from those overseas.

"The object of this demonstration is to show wireless telephony in actual operation before the Honourable Members of these Houses, and to demonstrate that it is something 'real'—something ready and available to perform the work so badly needed in destroying the internal and external isolation of Australia and thus to play an important part in the future development of this wonderful country.

"This thing is ready to be taken up by the country towns and by the man on the land, and, given freedom for development, will soon be as great an asset and a necessity as the motor car has proved to be. With his own wireless equipment, which is quite as simple to use and maintain as a motor car or machine shearing apparatus, the man who produces our primary wealth will have a ready means of communicating with his neighbours and with his nearest town. He will be able to transact his business, improve his social life, call for medical assistance and do many other things which to-day are impracticable. He will also be able to receive daily news of the world from the capital cities, and even musical entertainments, as this demonstration has shown.

"Wireless, also, is the only means of carrying the human voice between countries separated by sea. A wireless telephone service between Tasmania and the mainland, and between Australia and New Zealand, is quite a practicable proposition to-day, and I place my experience and reputation behind the statement that *within a very few years we shall listen to the human voice carried by wireless waves from the United Kingdom.* From that point it will be a mere step to general conversation between friends on opposite sides of the earth, and to the possibility of standing in this Hall and listening to the Grand Opera in London or Paris or to some momentous speech at Westminster or the Guildhall.

"The wireless telegraph has already arrived at the stage where direct communication between Australia and any part of the world is merely a matter of practical engineering. No better proof of this could be given than the fact that at my experimental station at Wahroonga I have received messages daily from high-power stations in England, France, America, Japan and other countries for two years past, and only last week we actually received a message in this building direct from Lyons, in France—every dot and dash clear and distinct. We have also received messages here from a station just outside New York.

"A few weeks ago I enjoyed the honour of permitting one of your honourable Senators to listen from his bedroom in a Melbourne hotel to a message from France. That gentleman, who is quite a layman in relation to this subject, was astonished at the loudness and clearness of the Morse signals. These are no freaks of darkness—these things can be done here in broad daylight and at any hour. I propose suggesting to the Prime Minister that he ask for messages to be sent from the Prime Minister of the United Kingdom, the President of France and the President of the United States. We will receive these messages in Melbourne without delay.

"At a later date I hope to explain in simple language and demonstrate how this wireless communication is worked. Now I wish to tender my thanks to those honourable gentlemen to whom I am indebted for the privilege of this demonstration, also to my assistants, Mr. Apperley, Mr. Hooke and Mr. Vipan, who have worked very hard and skilfully in preparing the equipment in very difficult circumstances.

"I will now invite Honourable Members to exchange greetings by wireless telephone with the Mayor of Brighton, who is waiting at the other end of the ether waves."

MODERN AIDS TO NAVIGATION

BY

JOHN ARNOLD

During the last decade there has been a gradual removal of the human control in almost every branch of engineering. A particularly striking example is the automatic equipment of lighthouses throughout the world.

Aids to navigation are divisible into two main classes: Those appealing to the eye, and those which appeal to the ear.

In Australia, owing to the extremely clear atmosphere and almost entire absence of fogs, "sound warnings" are very little used. Our best example of a modern sound warning is the A.G.A. siren at Gellibrand, Port Phillip, Victoria.

It consists of a 9 h.p. engine which drives an air compressor; the air is compressed to 30 lbs. per square inch in an air receiver. On obtaining this pressure, an outlet valve automatically opens, and permits the air to drive a siren wheel which creates the loud, deep blast emitted by Gellibrand. When the air-pressure in the receiver has dropped to 10 lbs. per sq. in. the outlet valve automatically shuts. The air compressor once again starts to raise the pressure in the receiver; on obtaining 30 lbs. per sq. in. the outlet valve reopens, thus giving an automatic train of intermittent warnings.

The warning of Gellibrand can be heard about 5 miles up the South and West Channels of Port Phillip.

Lights.

Let us now consider the other type of warning, namely, lights. In this field, Australia is one of the most advanced countries in the world. All the automatic unattended lights burn dissolved acetylene. This is acetylene compressed and dissolved in acetone absorbed in a porous mass.

Acetylene contains the highest percentage of carbon of any hydro-carbon in use, and as the illuminative power of any gas, when burned in an open flame, is dependent on the amount of carbon it contains, it will readily be understood why acetylene is used. But, acetylene, owing to its explosive properties under pressure, cannot be compressed in the manner of other combustible gases. It is necessary to adopt certain precautionary means, based on the principle of absorbing and confining the heat which would be liberated during disintegration of the acetylene.

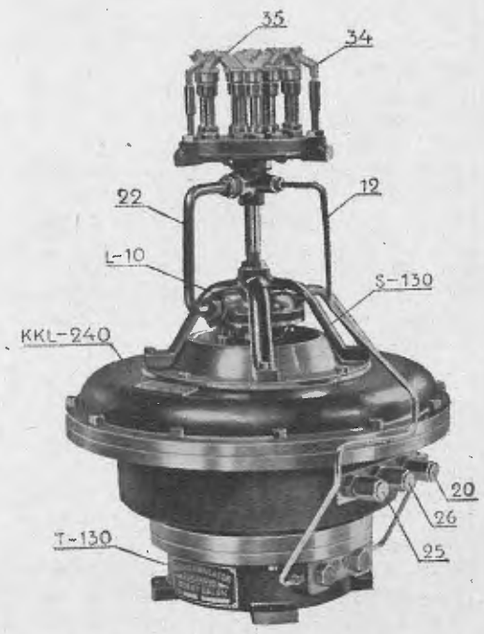
This is done by filling a cylinder with a porous mass of 80 per cent. porosity, saturating the latter with acetone, and dissolving the acetylene in the acetone at the maximum pressure of 16 atmospheres.

The cylinders vary in capacity from 75 to 60,000 *litres*.

The coast lights are replenished with gas once every twelve months; the harbour lights more frequently.

The gas is given off from the cylinder at a pressure varying from 1 to 16 atmospheres, according to the quantity of gas contained.

From the cylinder, the gas passes to a governor which delivers it at a constant pressure of about 12 in. of water, to an ingenious piece of apparatus called the flasher, illustrated below.



The A.G.A. Complex Group Flasher.

FOR THE WIRELESS EXPERIMENTER

RECEPTION WITH THE "ELECTRONIC VALVE"

BY

RAYMOND EVANS

PART III.

(Continued from October issue.)

In this, the third article of the series, is offered some timely information upon the subject of radio amplification, together with suitable values, data, etc., for the successful operation of the various systems, involving the use of the "Expanse," "Marconi V24" and "Q" valves.

Before going deeply into the above subject it might be opportune, perhaps, to make a few comparisons regarding what are known as "soft" and "hard" valves.

The first valves designed for use in wireless reception were all of the "soft" variety, so that they contained a considerable number of gas molecules (due to their imperfect exhaustion), and their characteristics were much influenced by ionic phenomena. These valves have been used extensively in the past, but the tendency at present seems to be in the direction of the "hard" valve, as it is admittedly more stable in operation and has advantages which will be considered later.

Generally speaking, the hardness or softness of the valve depends upon its degree of exhaustion, the composition of its elements, and their spacing. Under conclusive research it has been proved that the presence of even a trace of gas in the valve is unnecessary, and that though the strength of an electron flow was very erratic in a valve containing it, yet in one containing a hard vacuum, conditions were far more stable and regular. It is not intended to say, however, that the soft valve is entirely superseded, but, on the contrary, soft valves can be placed to most interesting use with indeed wonderful results—provided, of course, that the degree of softness is not too great.

The action of a "soft" valve is very complex. Normally, there is a certain amount of ionisation due to the continuation of electrons from the filament to the plate. When the grid is positive, the velocity and number of electrons passing through it is increased, and more are produced in the gas. This increase of ionisation reduces the space charge and a larger flow of electrons from the grid to the plate takes place, so that it is possible that the pure relaying action may be greater than if no gas were present.

Referring to the "blue glow" (mentioned in Parts I. and II.), which is apt to make its appearance in certain valves, this is most prevalent in "soft" valves, but will also be apparent if too large a "B" battery potential is impressed upon the plate.

"Expanse A" valves generally allow of at least 30 volts "B" potential before the "blue glow" appears, though in some samples this point is reached at lower and higher values. It can be said, however, that, taking into account the fact of it being of the soft type, its utility and sensitiveness as a detector and amplifier, are remarkable.

The "Marconi V24" and "Q" valves are of the harder type and particularly suited for cascade amplification. By progressive amplification, that is, the connecting of the plate circuit of one valve to the grid circuit of another and so on, signals otherwise inaudible are rendered surprisingly clear. Valves connected in this manner are said to be "in cascade," the connection being generally made through the medium of a step-up transformer, impedance or resistance. Either the radio-frequency oscillations or the low-frequency current variations in the telephone circuit can be amplified by means of properly designed intervalve transformers, impedance coils or resistance. For audio-frequency amplification, the transformer (or impedance) has an iron core, but for radio-frequency amplification this is omitted.

In the amplification of weak signals by means of the cascade method two systems may be employed, namely: radio-frequency (high-frequency) amplification and audio-frequency (low-frequency) amplification, the former of which is coming more into general use for reasons which will be understood later.

Audio-frequency amplification has many disadvantages, chiefly satisfactory amplification is obtained by this method only when the signals are of such a strength that the most sensitive detector will rectify them. If the signals are so weak as to not affect the detector, they cannot be amplified by the low-frequency method, irrespective of the number of stages of amplification used. As a matter of fact, using this method, more than two stages are rarely made use of, chiefly on account of the resultant increase of foreign noises compared with the signal strength. These noises are of audio-frequency and may have an electrical or mechanical origin.

The more common sources of mechanical noise are those caused by ordinary vibration of the valve, apparatus, or the table, etc., and may be demonstrated by gently tapping the first valve of an amplifier with the finger. Electrical noises are mostly caused by loose contacts, particularly if traced to the "B" battery. Then again are produced what are commonly known as "howling," "singing" or "whistling" of the valve. These are due to the low frequency regener-

LETTER TO THE EDITOR.

A Satisfied Advertiser.

The Editor,

Sea, Land and Air,

Dear Sir,—We feel we must express our appreciation of your splendid magazine, both from the viewpoint of reader and advertiser, and must compliment you on the improvement each issue shows on its predecessor.

We realise that our advertisement in *Sea, Land and Air* is bringing us more business than all the others put together, and therefore think it is our duty to thank you.

Wishing the magazine every success,

We are, yours faithfully,

RAYMOND McINTOSH & CO.

Sydney, November 9, 1920.

ative action, and are a great drawback to the use of many stages of low-frequency amplification.

In the case of high-frequency amplification, "howling" is far less troublesome, mainly because of the fact that if regenerative action takes place, it does so at a radio-frequency and, of course, as already explained, being above audibility is not perceptible in the telephones. For the same reason ordinary mechanical and electrical noises, though apparent, are certainly not amplified.

From these considerations it can be readily seen that many stages of amplification can be made use of with beneficial results. Moreover, it is possible to connect an audio- or low-frequency amplifier after the detector, thereby obtaining the advantages of low-frequency amplification without its disadvantages.

Due to the differences in frequencies, regenerative action between the two circuits is eliminated. This method also adds to the selectivity and gives greater control over the ill-effects of atmospheric interference, etc.

Notwithstanding the fact that high-frequency amplification possesses all the above advantages, on very short wavelengths—namely, those below 600 *mètres*—other difficulties are encountered which, although liable to cause much trouble, can be partially overcome with a fair amount of patient experiment. It must be said here, however, that the use of any of these methods will *not* produce satisfactory results on wavelengths of 250 *mètres* and below; in fact it is doubtful if a radio-amplifier on these wavelengths would be as efficient as a single "Expanse A" valve used simply as a detector.

A method has come recently into use which consists of lowering the frequency to some constant given value before passing on to a radio-frequency amplifier and finally feeding into a detector valve in the usual manner. A circuit illustrating this method is shown in *Figure 1*. Here, the incoming oscillatons are transferred from the aerial circuit to the secondary circuit, *LC*, which in turn is coupled to a source of local oscillations, LC^2, by means of which the incoming oscillations are heterodyned, producing beats in *LC* which are then rectified in the valve *D*.

Now, when a valve of heterodyning is reached (by adjustments to C^2) when the strongest signal is heard in the 'phones, then the "beat" wave is in resonance with the amplifier, which finally transfers its energy to D^2, the detecting valve. This scheme is considered to be of great value for use on short-wave signals, and has the added advantage of reproducing the exact characteristics of the spark note, that is, there is no distortion or "mushiness."

Some amplifier circuits for use on long waves are shown in *Figures 2* and *3*.

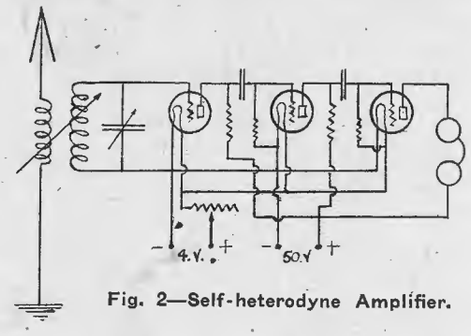


Fig. 2—Self-heterodyne Amplifier.

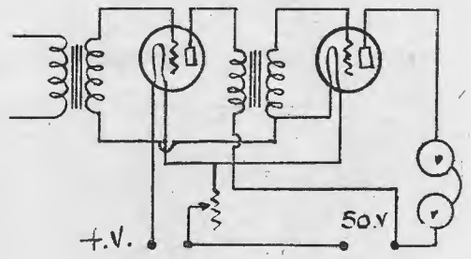


Fig. 3—Low-frequency Amplifier.

Much experiment will be necessary when trying out the various arrangements herein described, before satisfactory results can be ex-

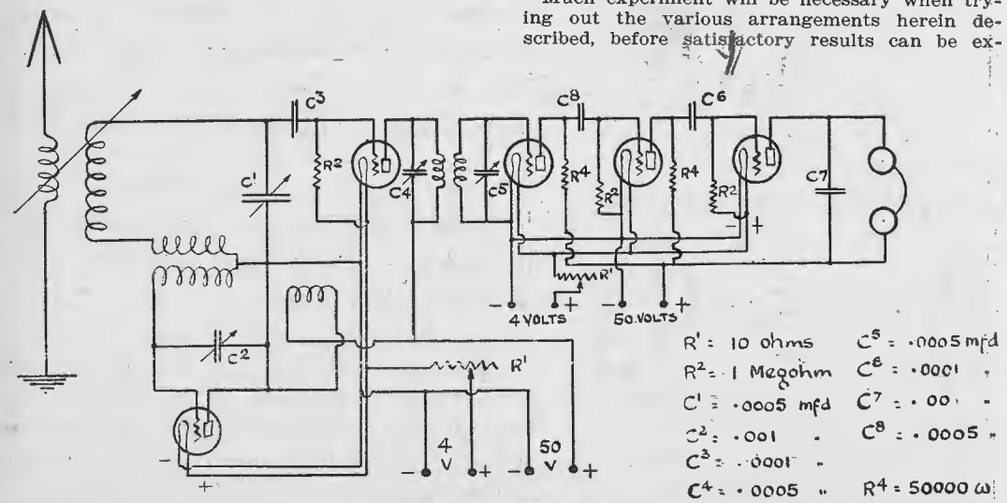


Fig. 1—Resistance-coupled Amplifier with Separate Heterodyne.

pected, but the reader must be largely guided by his experience in single-valve operation which it is presumed he has gone into before embarking upon cascade amplification.

Inter-Valve Transformers.

The following data on intervalve transformers is here given as a guide to the experimenter who desires to go deeply into the above subject.

Amplifying transformers for low-frequency amplification must be constructed with cores of the softest and best transformer iron or wire, which cores must be either of the enclosed or open type, the former being considered the most efficient magnetically, and its field is likely to have a less harmful effect upon the adjoining circuits.

The ratio of turns in these transformers varies in many types of receivers as does also the resistances. Generally speaking, the first transformer—that conveying the rectified current to the amplifier—should be made with a variable primary and of a resistance of from 700 to 900 *ohms*, though of course no set figures can be actually taken, as much depends upon the general design of the receiver, amplifier, and valve used. A secondary resistance of 10,000 *ohms* is considered suitable for use with a primary of 900 *ohms*. The inter-valve transformers generally have a resistance of from 1,500 to 2,000 *ohms* in the primary, and from 10,000 to 12,000 *ohms* in the secondary.

The ratio of transformation cannot be judged by the resistances of the primary and secondary, since they may be wound with wires of a different gauge; a ratio of 1 to 5, however, is found to give satisfactory results. As regards the gauge of wire used, this varies in different sets, but generally lies between 40- and 46-gauge, which allows of a large number of turns in a limited amount of space.

Chiefly on account of the high voltage "B" battery used, it is the custom of later months to use a telephone transformer which is really an audio-frequency transformer, with its primary connected across the telephone terminals of the amplifier and its secondary to the telephones themselves.

As regards the advantages of using telephone transformers it must be remembered that a steady value of plate-current flows continuously when signals are not arriving, and if the telephones are connected directly in the plate circuit this current will flow through them. Such an arrangement entails three obvious disadvantages. First, since the receivers must be of high-resistance, the insulation of its coils will be very light, and the comparatively high potentials employed in the plate-circuit are liable to break down this insulation, especially when the receivers are damp. Dampness usually occurs from condensation when the receivers are worn for any length of time. Secondly, since the coils of telephone receivers are wound on the poles of permanent magnets they must obviously have a distinct polarity, therefore, if attention is not paid to this polarity when connecting the receivers, the steady current flowing through the plate-circuit may be demagnetising the receivers the whole time they are connected up. This very undesirable state of affairs cannot take place if the receivers are connected to the secondary of a telephone transformer, since a steady current in the primary gives no induction and a current will flow in the secondary circuit only when pulses of primary current occur, or in other words, only when signals arrive. Lastly, if the receivers are connected directly in the plate-circuit it is evident that if a metal headband is used this will be earthed through the body of the operator; when the insulation is weak through dampness, etc., this may seriously interfere with the potential difference between the plate and the filament. It is usual to take advantage of the use of a telephone transformer so as to have a step-down ratio from primary to secondary, enabling us to use 60 *ohm* or low-resistance telephone receivers instead of 2,000 to 4,000 *ohms*. An article, giving detailed information for the construction of both telephone and amplifying transformers will be published in this journal at an early date.

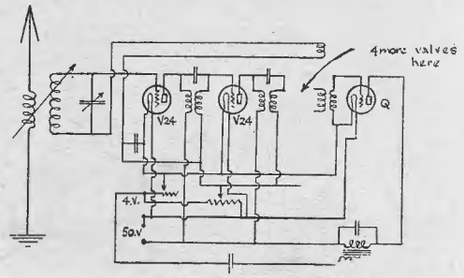


Fig. 4—Marconi 7-valve Amplifier, Type 55A.

The amplifier circuit shown in *Figure 4* is a modification of that used in Marconi Amplifier, type "55A," which is specially designed to be efficient on wavelengths between 500 and 5,000 *mètres*. This circuit is similar to that of the type "55A," except that seven valves are used in the original instrument, namely, six Marconi "V24" valves for ultra-magnification, and one "Q" valve for rectification purposes.

In order to simplify the diagram, the writer has omitted four of the seven valves by making use of two "V24" and one "Q" valve. The experimenter could, of course, add extra valves as more experience in the operation of the circuit is obtained.

In this circuit the treating of the filaments is regulated by a rheostat, *R*, of approximately 3 *ohms*, and the grid potential of the "V24" valves by the potentiometer, *P*, of 300 *ohms*.

The inter-valve transformers are wound with a special wire of extremely high-resistance and very fine gauge on ebonite cores.

The approximate resistance of each winding is 3,000 *ohms*.

The amplifier contains a small feed-back, or tickler, coil, which slides across the end of the last inter-valve transformer, a weak coupling in most cases increasing the amplification on long-wave spark signals by bringing the valves to a position just on the point of oscillation, and a closer coupling for complete oscillation of the valves for the reception of undamped signals wth marked amplification.

The writer would like to mention in conclusion that this is the receiver used by the London *Daily Mail* in their new station, particulars of which were published in the October issue of this journal.

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

Revised to November 10, 1920.

SHIP.	OPERATOR.
Apolda	J. W. McKay
Arahura	W. C. Brown
Araluen	H. H. Black.
Aramac	C. Williamson
Arawatta	D. W. Higgins
Atua	A. S. Smith
Australbrook	F. G. Forrest
Australcrag	V. E. Stanley
Australford	T. W. Bearup
Australglen	W. H. Richardson
Australmead	S. V. Blight
Australmount	A. R. Catford
Australpeak	H. P. Weedke
Australplain	A. Stuart
Australpool	E. J. Glaisher
Australport	J. H. Pullan
Australrange	V. P. Nevins
Bakara	C. W. Donne
Baldina	———
Barambah	M. L. Robertson
Bellata	G. Soilleux
Berringa	———
Bingera	J. H. Hawkins
Birriwa	F. G. Lewis
Bombala	A. H. Jeremy
Boonah	F. A. Cook
Booral	R. Jordan
Boorara	T. Alexander
Bulla	A. W. Watt
Bundarra	H. G. Reilly
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	———
Dilga	T. V. Tressler
Dimboola	S. L. Filer
Dinoga	R. R. Robinson
Dongarra	H. J. Byrne
Dromana	F. Stevens
Dumosa	H. Beckett
Dundula	J. A. Cooper
Eastern	C. H. A. Kidman
Emita	———
Eurelia	———
Eudunda	———
Gilgai	D. H. George
Hwah Ping	H. F. Hartley
Kaiapoi	E. A. Miller
Kaitangata	A. Cuthill
Kaituna	F. E. Duggan
Kaiwarra	L. H. Jones
Kanna	K. McSwann
Kanowna	W. J. Washbourne
Karoola	R. R. Pilmore
Katoomba	T. A. Jones
Karori	W. C. Lucas
Katoa	K. L. Freeman
Kauri	H. S. Chown
Koromiko	A. E. Lawrence
Kowarra	H. Fullerton
Kurow	F. N. Davidson
Levuka	———
Loongana	H. A. de Dassel
Macedon	H. E. Young
Mackarra	A. G. Ross
Macumba	F. L. Dawes
Maheno	N. H. Brown
Makambo	V. M. Brooker
Makura	E. A. Hunter (s) / M. Webb Watts (j)
Malayan	H. F. Giles
Manuka	J. A. Heavey
Maori	P. C. Gillon
Mapourika	J. O. Taylor
Marama	J. H. Bennett (s) / F. Ouvrier (j)
Mararoa	R. W. Barnes
Marella	———
Marsina	J. R. Gilligan
Mataram	J. F. Hutton
Maunganui	———
Melusia	S. F. Stafford
Minderoo	M. A. Prudence
Mindini	E. F. Hayes
Moana	R. S. Taylor
Moeraki	———
Mokoia	T. H. McWilliams
Monowai	———
Montoro	S. R. Dixon
Morinda	F. C. Davies
Navua	G. M. Gormlie
Ngakuta	H. Bargrove
Niagara	W. H. Harris (s) / F. A. Hunter (j)
Ooma	A. E. Sheppherd
Oonah	R. M. Firminger
Paloona	R. P. Ginders
Parattah	K. L. Simpson
Pateena	———
Rakanoa	W. A. Hawkins
Riverina	G. Illingworth
Rotomahana	J. B. Ponsonby
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. H. Cooper
Tofua	L. R. Dickson (s) / E. N. Williams (j)
Toromeo	M. Sedgers
Ulimaroa	H. Tuson
Victoria	H. M. Lamb
Wahine	C. F. G. Taylor
Waihora	H. Bashford
Waihemo	G. Maxwell
Waikawa	N. Leeder

(*Continued on page 622.*)

(*Continued from page* 620.)

Waimarino	A. S. Dening
Waipori	G. Donnelly
Wairuna	R. T. Stephens
Waitemata	G. Poole
Waitomo	S. J. McVeigh
Wanaka	J. Elmore
Wandilla	D. N. Quinn
Westralia	M. A. Ryan
Whangape	A. O. Sutherland
Wodonga	G. M. Whiteside
Wyreema	T. Chalmers
Wyandra	J. Doggett
Zealandia	J. G. C. Higgins

A.W. (A'sia.) Ltd. Operators Temporarily Employed on M.I.M.C.C. and Other Ships.

Rupara	G. Cook
Durham	H. Heather
Wattle	L. N. Callagham

WIRELESS CALL LETTERS.

The following additions and cancellations are notified:—

Additions.

	Ship.
CGG	*Eudunda.*
CGI	*Bellata*
CGW	*Birriwa*
VHC	*Wattle* (Oil launch).
VHG	*Emita*

Cancellations.

CGJ	*Kanna*
VHP	*Indarra*
VXS	*Mawatta*
VZC	*Paringa*
VZD	*Pateena*

WIRELESS INSTITUTE OF AUSTRALIA.

South Australian Division.

The usual monthly General Meeting was held in Adelaide on November 3, Mr. Hambly Clark presiding over an attendance of this Division, which continues to grow, adverse circumstances notwithstanding.

The vacancy on the Council caused by the resignation of Mr. Cotton, was filled by Mr. Bland.

To enable the formation of the library mentioned in our last report, the annual membership fee has been increased to 15s. Rules for the control of this library have been drawn up and adopted.

Members of the South Australian Division are notified that a buzzer-practice class is held at the Secretary's residence every Friday evening.

The next General Meeting will be held on Wednesday, December 1, and all wireless amateurs are invited to attend. A special feature of this meeting will be a lecture on the Direction-Finder, delivered by the Secretary, Mr. Clement E. Ames.

THE NEW SOUTH WALES AERIAL DERBY

PUBLIC CONFIDENCE IN AVIATION RESTORED

WHEN the Defence Department employed short-range aeroplanes to assist in the Second Peace Loan appeal, the wrong type of machine for cross-country and interstate flights was used; moreover, there was a failure to provide suitable landing grounds—with the inevitable result that practically every machine came to grief, and public confidence in the safety of aviation was badly shaken.

It was with the primary object of restoring this confidence that the New South Wales Section of the Australian Aero Club recently decided to hold its first big flying carnival. In this it has succeeded beyond all possible exaggeration.

Under the patronage of His Excellency the Governor of New South Wales, the Aerial Derby, contested on November 27, attracted to Mascot some ten thousand spectators, and has given Australian aviation a much-needed boost.

The keynote of the exhibition was reliability; reliability of pilots, as demonstrated in the taking-off and landing of the nine competing aircraft; reliability of the machines in that although completing a course of 64 miles against a headwind varying in force from 30 to 40 miles an hour, not a single wire was strained; reliability of the handicappers in that although a period of thirty-five minutes separated the start of the first and last machines, the whole nine returned in a bunch, the last appearing above the horizon just as the landing wheels of the first home had touched the ground of the Mascot aerodrome. Of engine reliability no better proof could be offered than in the remarkable display of aerobatics which characterised the New South Wales "Stunting" Championship, and the ease with which competitors manoeuvred their machines into, and out of, the most extraordinary evolutions yet attempted in Australia

Of the actual meeting, there remains little or nothing to add what has already been printed in every newspaper in the Commonwealth. From the airman's point of view, the occasion marked a reunion of Service comrades from all States, and nearly everyone who is anyone at all in the flying world managed to make his way to Mascot.

The outstanding features were the elaborate precautions taken by the Aero Club officials to restrain the crowd from swarming on to the aerodrome, the keen enthusiasm of the crowd itself, the military precision with which the machines, manned by ex-Service pilots, were manipulated, and the up-to-date methods employed in reporting progress of the flight between the two aerodromes, wireless stations being installed and staffed by Amalgamated Wireless (Australasia) Limited, both at the home aerodrome and the turning point at Richmond.

The star item of the day was, naturally, the Aerial Derby, the course being a 64-mile loop from Mascot to Richmond and back.

Ten machines were entered for this event but owing to some trifling engine defect one was withdrawn; this was an *Avro* (130 h.p. *Clerget*), entered by the Australian Aircraft & Engineering Co., Ltd., with Captain E. W. Cornish, M.C., as pilot. The nine competitors who faced the starter (Captain C. B. C. Williams), took off and landed in the order shown on page 624.

The second item on the programme was the speed-judging competition. Spectators were invited to estimate the varying speeds of an *Avro* in four flights across the aerodrome, the prize of a free flight over Sydney Harbour in one of the A.A. & E. Co.'s machines going to each of the four spectators whose estimates were nearest to the officially measured speeds. The winners were:—Mr. T. M. S. Hall, St. Andrew's College, Newtown; Mr. R. Paton, Beaufort Court, Darlinghurst; Mr. P. A. Kennedy, Aurora Hotel, Elizabeth Street, Sydney; and Mr. John McKenzie, 12 Sea View Street, Dulwich Hill.

This event was followed by a short handicap race, consisting of a double triangular circuit from the aerodrome to Nestlé's Factory at Rosebery, thence to Sir Joseph Bank's Hotel at Botany, and back to Mascot. Six machines competed, with the following result:—

Dove (Captain G. C. Wilson), 3¼ min.	1
Avro (Lieutenant Nigel Love), 3 min.	2
Gnu (Captain Roy King), scr.	3
Avro (Captain E. W. Percival), 4¾ min.	4