MERCANTILE MARINE WAR SERVICE ASSOCIATION OF AUSTRALASIA

Under the above title an Association has been formed in Sydney, its aims and objects being summarised as follow:—

(a) To promote and protect status and interest of members of the Mercantile Marine generally, and particularly all members of the Mercantile Marine who have performed War Service or been engaged in service in the war zone, and to perpetuate in the Mercantile Marine all those traditional principles for which the Empire fought.

(b) To print and publish any newspaper, books, periodicals or leaflets as the Association may think fit for the promotion of its objects.

(c) To provide and grant gratuitous relief by means of pecuniary or other assistance to persons who are, or have been, eligible as members of the Association, their widows or children when in necessitous or distressed circumstances.

(d) To establish, conduct and carry on at any place within the State, or elsewhere, employment bureaux, emigration bureaux and agencies for the purpose of obtaining employment for members of the Mercantile Marine, and to promote the welfare of members of the Mercantile Marine and the relief of their distress by social and other agencies and means.

(e) For the comfort or use of members of the Mercantile Marine to carry on the business of proprietors of a club, reading rooms, billiard and other recreation rooms and refreshment rooms, and to afford accommodation for meetings and other gatherings of all descriptions, whether social, commercial or otherwise.

(f) Subject to Section 53 of the Companies Act, 1899, to purchase, take on lease, or exchange, hire or otherwise secure any real or personal estate which may be deemed necessary or convenient for the purposes of the Association.

(g) To construct, maintain and alter any houses, buildings, or works necessary or convenient for the purpose of the Association.

(h) Subject to the provisions of Section 53 of the Companies Act of 1899, to take any gift of property, whether subject to any special trust or not for any one or more of the objects of the Association.

(i) To take such steps by personal or written appeals, public meetings, or otherwise as may from time to time be deemed expedient for the purpose of securing contributions to the funds of the Association, or for any other purpose in the shape of donations, annual subscriptions, or otherwise.

(j) To sell, manage, lease, mortgage, dispose, or otherwise deal with, all or any part of the property of the Association.

(k) For the purposes of the Association to undertake or transact all kinds of agency or business which an ordinary individual may legally undertake.

(l) To borrow, or raise, or secure payment of money in such manner as the Association may think fit, and to purchase redeem, or pay off any such obligations.

(m) To amalgamate or federate with any other League or Association having objects similar to those of this Association.

(n) To establish branches or agencies in any part of the world.

(o) To insure any servants of the Association against any risk or accident in the course of their employment by the Association, and to effect insurances for the purpose of indemnifying the Association in respect of any risk or accident, and to pay the premiums on any such insurance.

(p) To enter into any arrangement with any Government or authority that may seem conducive to the objects of the Association, or any of them, and to obtain from any such Government or authority any rights, privileges or concessions conducive to such objects, and to carry out, exercise, and comply with the conditions of any such rights privileges and concessions.

(q) To do all such things as in the opinion of the Association are incidental or conducive to the attainment of the above objects or any of them.

The following Committee and Office Bearers have been appointed:—

Patron: Commodore Dumaresq, C.B., Commanding H.M. Australian Fleet. Vice-Patrons: The Dean of Sydney (Rev. A. E. Talbot, M.A.), Captain T. Langley Webb, Dr. R. Arthur, M.L.A., Messrs. E. D. Gray, H. P. Harriott and J. Kelso. President: Captain Moodie-Heddle. Vice-Presidents: Captain P. N. Day, Captain A. Hayward, Lieutenant-Commander Ruddell, D.S.C. and Mr. R. T. Kearney. Committee: Messrs. L. J. Broome, J. A. Davis, W. Lund, J. McLeod, C. A. Parrett and W. Vernon. Hon. General Secretary: Captain A. Hayward. Hon. Assistant Secretary: Mr. V. Gardiner.

The Association's headquarters are at Phœnix Wharf, 27 Sussex Street, Sydney, and all communications should be addressed to the Hon. General Secretary.

FOR THE WIRELESS EXPERIMENTER

RADIO RECEPTION WITH COILS OF FIXED VALUE

BY
RAYMOND EVANS.

The reception of undamped signals at long wavelengths calls for the maximum efficiency of design in the instruments because of certain losses, which are of small moment on the shorter waves, but become a matter of extreme importance when working on long wavelengths. The losses which require the most careful consideration are: (a) those from distributed capacity effects, and (b) others due to the high frequency resistance of the windings. The former can be minimised by spacing all inductance windings and by eliminating dead ends, etc., and the latter, by using a heavy gauge or special wire. In the accomplishment of this, the receiver becomes a most cumbersome apparatus and, with the object of providing an efficient, neat and compact tuner, the following are instructions for the building of an instrument which will meet all requirements.

The capacity of this tuner depends largely upon the values of the aerial and the instruments used in conjunction. However, using average values, it should respond to wavelengths lying between 8,000 and 16,000 *mètres*.

The writer advocates the use of a separate tuner for shorter waves with the necessary "change over" devices, for greater efficiency, or preferably, a series of separate coils could be made up to cover a full range of wavelengths and provided with the necessary clips or plugs to allow of a quick change.

On an examination of the drawings it will be seen that the tuner consists of three separate coils or inductances, namely, the primary, P, secondary, S, and the regenerative or tickler coil, R. The three are mounted on a small pillar of wood or ebonite, D, the secondary being fixed and the primary and regenerative coil capable of movement. No variation of the windings is made, as is usually the case. It has been found that tuning is more readily accomplished by means of condensers, loading coils and couplings.

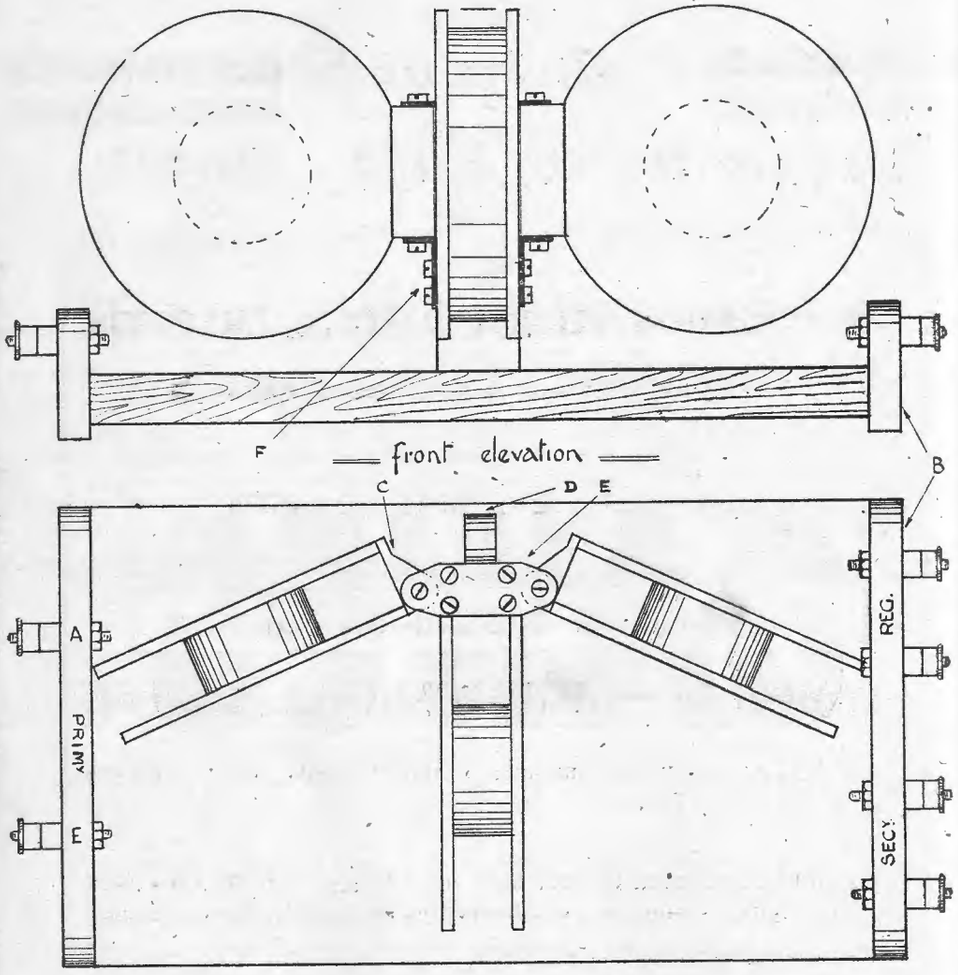
The inductances are wound with stranded wire for preference, on account of its low resistance at radio frequencies, but should the cost of this be beyond the experimenter, good results can be obtained with ordinary solid, cotton-covered or enamel wire.

For the base, select a piece of well seasoned oak, maple or mahogany 12in. by 7in. by ¾in. This must be planed and sand-papered to a perfect smoothness and given a thorough polish with shellac varnish, which, besides adding to the appearance of the instrument, also increases its insulating qualities.

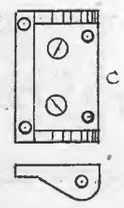
The forms or bobbins, of which three are required, can either be turned in a lathe or built up in three pieces, screwed or glued together and varnished in a similar manner to that of the base. Two pieces of ¼-inch sheet "bakelite," or ebonite, are next to be cut and shaped, as in B; though primarily intended as terminal blocks, they also act as feet for the tuner, thus raising the base by ¼-inch and leaving space for wiring beneath. The bakelite hinge-pieces, *C*, which are required for the primary and regenerative coils, can readily be cut and filed from sheet material and accurately drilled and tapped to suit the pivot-screws, as shown. Two other screws may be seen on the drawing of the hinge-piece, these act as anchorages for the ends of the winding, before being taken to the terminals. The hinge-pieces are screwed to the flat portion of the formers with small countersunk brass screws. The pillar, *D*, is preferably made from bakelite or ebonite and is secured to the base from underneath by means of screws. The flattened portion of the secondary former is screwed to the front of the pillar from behind to hold it firmly in the centre of the base. The brass top-plate, *E*, and the pair of brackets, *F*, are cut from ⅛in. sheet brass and shaped as shown in the drawing. It is provided with two countersunk holes for screwing down to top of pillar, one on each side, as shown. Six terminal posts are required; plain brass ones will suffice, though insulated tops are the most suitable.

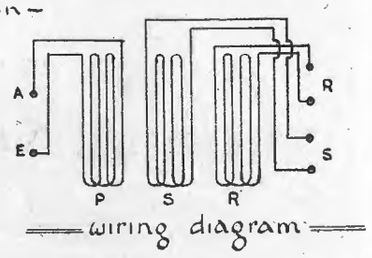
With regard to the windings, great care should be shown for best results. The use of stranded wire is recommended, though the experimenter would, probably, require to strand it himself, as every strand should be insulated. A suitable wire for the primary winding can be made by twisting up seven strands of 36-gauge enamel wire by means of a hand-drill or lathe. The secondary and regenerative coils can be wound with either five strands of 36-gauge or seven strands of 38-gauge wire. In the event of the above being too troublesome or costly, the primary can be wound with 22-gauge and the others with 24-gauge D.C.C. wire.

Do not wind in the usual manner, but space your layers by placing small strips of ⅛in. fibre evenly around the winding, as shown at *G*. The position of these strips must be staggered in order to give the winding the characteristic spacing, which reduces the capacity effects between the layers of the coils. Wind the primary with 650 turns, the secondary with 1,200 turns and the regenerative coil with 2,000 turns, as described; this should give an approximate inductance of 3,000, 12,000 and 2,000 *microhenries* respectively. Shellac each layer as completed and after the required amount of wire has been wound on, secure the ends to the two anchor screws, which are provided at the back of each of the formers. Before assembling, lacquer all terminals, screws, the brass plates, *E*, and the brackets, *F*. In assembling be sure to have the coils fitted into position from left to right in their correct order, namely, primary, secondary and regenerative coil. Drill small holes in the wood base immediately beneath the nuts at the



top elevation.
—windings not shown—





A MODERN TUNER
UTILISING NON-TAPPED COILS

back of terminals and at the back of each of the formers, but large enough to allow a rather heavy "flex" wire to pass through.

In wiring up the tuner, use a heavy gauge lighting "flex"; one with vulcanised rubber insulation is to be preferred, as the silk covering can be removed more readily. Cleat the wire up beneath the wooden base and pass the ends through the holes to the coils and terminals, as shown in the wiring diagram.

In operation, the tuner is simplicity itself, as all adjustments of wavelengths are made on the loading coils and condensers, and besides this, extremely interesting results can be obtained with this novel method of varying the coupling between the coils. The approximate maximum aerial-inductance value (with an average sized aerial) to be used in conjunction with the tuner, should be between 6 and 7 *millihenries*, though this can be reduced considerably if the primary condenser be connected in parallel, as shown. A similar value can be used for the secondary loading coil which, of course, must be arranged with the necessary tappings and dead end switches. Using a tuner of this type with a single standard three element valve, signals from Europe and U.S.A. have been heard.

OUR QUESTION BOX.

Cadet (Dunedin, N.Z.).—The nautical day begins at noon and is divided into "watches" of four hours each, time being indicated by bells striking every half-hour.

A.M.	A.M.	A.M.		P.M.	P.M.	P.M.
12.30	4.30	8.30	1 Bell	12.30	4.30	8.30
1.00	5.00	9.00	2 Bells	1.00	5.00	9.00
1.30	5.30	9.30	3 Bells	1.30	5.30	9.30
2.00	6.00	10.00	4 Bells	2.00	6.00	10.00
2.30	6.30	10.30	5 Bells	2.30	6.30	10.30
3.00	7.00	11.00	6 Bells	3.00	7.00	11.00
3.30	7.30	11.30	7 Bells	3.30	7.30	11.30
4.00	8.00	Noon	8 Bells	4.00	8.00	Midnight

R.M.T.—To be able to step into a salaried position after six or eight months' study is asking rather much, assuming you have only a superficial knowledge of Engineering, Wireless and Aeronautics. Our advice to you is to enter the Marconi School of Wireless, where, after about eight months' tuition, you would be available for a position as junior operator. Your career need not stop here, as you seem to fear, you keep on studying and become a senior operator, then fit yourself to become a wireless engineer and, in the event of the Marconi Company's proposal, which was fully set out in the May issue of this Journal, being accepted, a wide field will be open to wireless men.

J. Lough (Timaru, N.Z.).—Unfortunately the original diagrams illustrating the article on the construction of a "cabinet receiver" have been sold out. The same author has an article, in our December issue, on "A Tuning Transformer for Long Waves."

Beachcomber (Cooktown).—The ionic valve used in conjunction with oscillatory circuits is an excellent means of obtaining a high frequency, undamped and almost sinusoidal current. It is of service in experimental work and in radio-transmission from aircraft where small power is needed. The valve is also used as a detector and amplifier in wireless and other work. One application of the ionic valve may be mentioned—it is used as an amplifier in signalling from submarines to aircraft or *vice versa*.

E. Anderson (Portland).—Yes. A wireless message can be received at the same time by as many different stations within range as are tuned to the same wave-length as the message sent. The range depends on the power of the sending station and the type of receiver used.

THE WIRELESS INSTITUTE OF AUSTRALIA.

SOUTH AUSTRALIAN DIVISION.

The Tenth General Meeting of the Division was held in Adelaide on June 2, Mr. Hambley Clark presiding.

A request was received from the Honorary Secretary of the Victorian Division that all Divisions agree to the appointment of proxies from the Victorian Council to represent them on a Federal Council with a view to approaching the authorities in regard to the issue of licences and the due recognition of The Federal Wireless Institute of Australia. (*Carried unanimously.*)

Mr. R. M. Dunstone was elected to fill the office of Vice-President vacated by Mr. Heagney, who has resigned.

Mr. J. N. Bald and Mr. H. Hawke were elected Council Members.

Mr. H. C. Coles and Mr. J. M. Honner were elected to form an Examination Committee for the purpose of examining members requiring licences.

It was also decided to open a "Question Box" for the assistance of members desiring information.

LAWRENCE HARGRAVE MEMORIAL FUND.

The following donations are acknowledged with many thanks by the Trustees:—

FIFTH LIST.

	£	s.	d.
Amount Previously Acknowledged ..	391	12	0
Royal Aero Club	21	0	0
Total	£412	12	0

Donations should be addressed to the Trustees, Lawrence Hargrave Memorial Fund, 99 Clarence Street, Sydney, and will be acknowledged in the issue of *Sea, Land and Air* immediately following receipt of same.

WIRELESS OFFICERS ATTACHED TO VESSELS OF THE AUSTRALASIAN MERCANTILE MARINE.

Revised to June 10, 1920.

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Australbrook	J. F. McGinley
Australcrag	V. E. Stanley
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Kaiapoi	A. E. Sheppherd
Kaitangata	R. W. Barnes
Kaituna	G. Illingworth
Kaiwarra	L. H. Jones
Kanowna	———
Karori	S. G. Jones
Karoola	R. R. Pilmore
Katoa	B. Boni
Katoomba	T. A. Jones
Kauri	H. G. Reilly
Koromiko	R. Stephen
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Kurow	F. N. Davidson
Levuka	D. N. Quinn
Loongana	N. W. G. Scott
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Waihora	V. M. Brooker
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Wyandra	H. Tuson
Wyreema	———
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Morialta	E. F. Hayes
Rupara	G. Cook
Zealandic	J. Elmore

On Home Port Leave.

C. H. A. Kidman — S. A. Ludlow

THE LIGHTHOUSES OF NEW ZEALAND

BY

P. MALTHUS, Principal Keeper of Stephen's Island Lighthouse.

THE first lighthouse mentioned in history was the celebrated tower of the isle of Pharos, before the Egyptian port of Alexandria. It was of white marble, erected by the order of Ptolemy Soter, ruler of Egypt, about 284 B.C., at a cost equal to £330,000, and was considered one of the seven wonders of the world. A bright fire was kept constantly burning on the top, and was visible at a distance of one hundred miles.

New Zealand lighthouses of the present day vary somewhat in form, but the standard type of the more recently erected is a cylindrical iron tower, composed of heavy iron plates fitting closely together, the bottom plates firmly bolted into a solid concrete foundation. Painted a snowy white, and tapering symmetrically, this tower presents a handsome appearance and situated, as it usually is, on a rock island, high bluff or headland, it stands out grim and lonely like a colossal monument.

In modern lighthouses the old style of wick burner has been superseded by incandescent light. On the floor below the lightroom are two steel cylinders, one holding compressed air, the other kerosene. Pressure in the air cylinder is pumped in at intervals during the keepers' night watch. When valves are turned, compressed air forces the kerosene up through a thin copper tube to the burner in the lightroom. To start the light, a spirit lamp is placed below the burner for ten minutes, thus heating the vaporising tubes; the oil valve is then slowly turned and the kerosene, passing through the heated tubes, is converted into vapour gas. The whole is a large-scale application of the principle of a Primus stove. Beneath the vaporising tubes a single perforated tube, called the "Bunsen," draws a supply of gas from near the top of the burner, and burns with a flame sufficient to keep the tubes hot. The vapour gas, issuing from a nipple, is carried up through a tube to the top of the burner; it then passes through a wire gauze cap and is burned in a large mantle,

Nugget Point Lighthouse. Midway Between Dunedin and The Bluff.