

RADIO

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VOL. I.

NOVEMBER 28, 1923

No. 18



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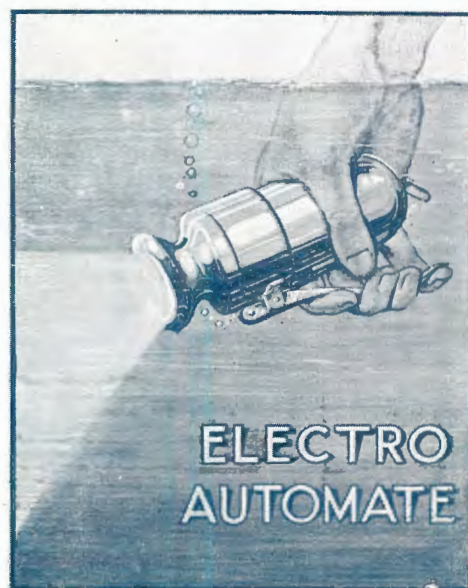
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OFFICIAL JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA.
[New South Wales, South Australia and Queensland Divisions.]

Managing Editor:
S. E. TATHAM.

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Published by
THE WIRELESS PRESS

422-24 Lt. Collins St.,
Melbourne.

97 CLARENCE ST.,
SYDNEY.

Australasia Chambers,
Wellington.

PRICE, 6d. per Copy.

Subscription Rate: 10/- per annum (26 issues) throughout Australia and New Zealand; Foreign Rate, 12/6 (26 issues).

Obtainable from all Booksellers and News Agents, also the
N.S.W. Bookstall Co., Ltd.—all branches.

Wholesale Distributing Agents:

GORDON & GOTCH (AUSTRALASIA), LTD.,

Sydney, Melbourne, Adelaide, Brisbane, Launceston, Perth,
Auckland, Wellington, Christchurch, and Dunedin, N.Z.

Great Britain:

The Wireless Press Ltd.
12-13 Henrietta St.,
London, W.C.2

Canada and U.S.A.:

The Wireless Press Inc.,
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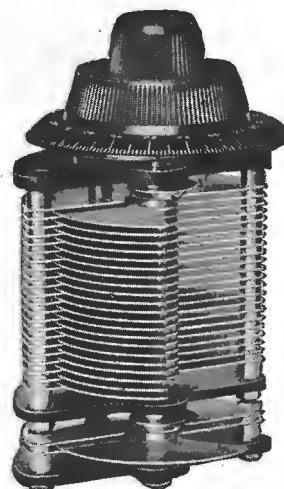
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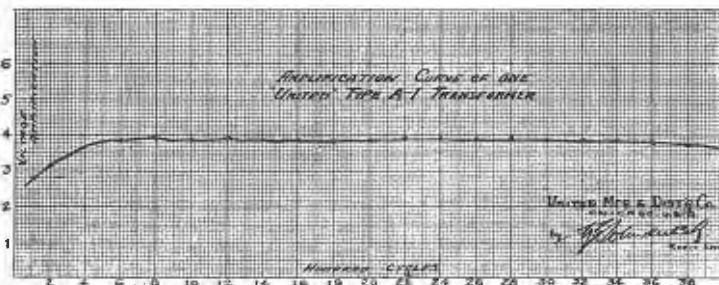
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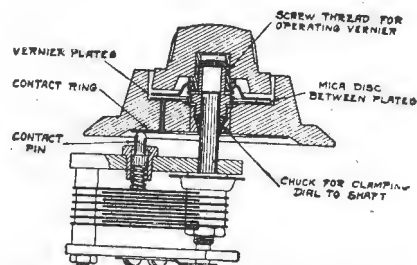
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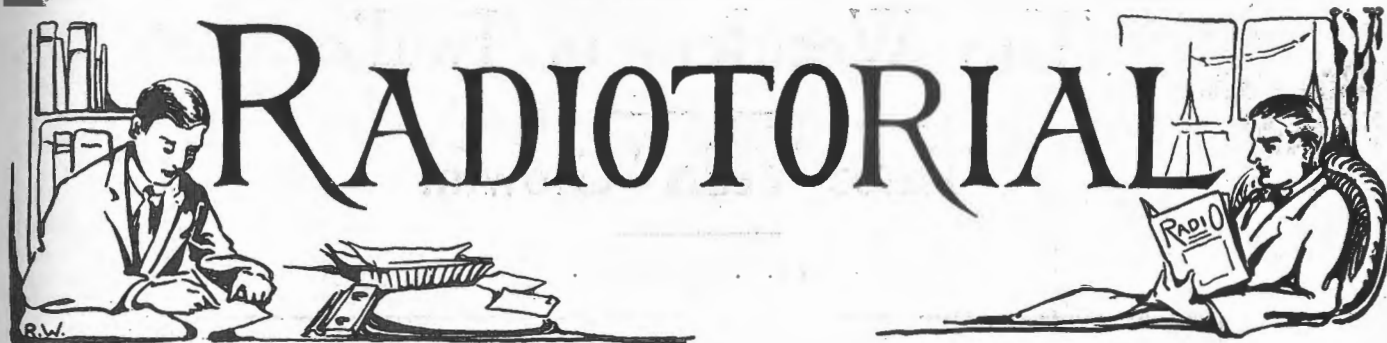
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The Value of the Exhibition.

AN answer to those who contend that Australia is hopelessly backward in wireless and electrical matters will be found in the Exhibition to be staged in the Sydney Town Hall from 3rd to 8th of next month.

THE Wireless Institute of Australia, as the pioneer radio body in the Commonwealth, conceived the idea of holding an exhibition in order that the general public might have an opportunity of learning at first-hand of the tremendous advance made by wireless and electricity generally during the past few years.

It was realised also that such an exhibition would be an excellent advertisement for the skill and enterprise of Australian experimenters and firms interested in one or both of the undertakings, as well as affording the public an opportunity of becoming acquainted with the many and varied ways in which wireless and electricity can minister to their pleasure and comfort.

TO their credit be it said the various business houses approached recognised the wisdom of the Institute's scheme and promised immediate and liberal support.

THE other section concerned—the radio experimenters—have been more modest in their efforts to help the venture along, but it seems assured that when the exhibition opens the section set aside for their display will be, if not fully representative, at least supported by many examples of their skill and initiative.

THERE is little doubt that from an attendance point of view the exhibition will be a success, and it may be taken for granted that the organising body has left

no stone unturned to ensure that those who go there seeking education and enlightenment will not be disappointed.

THE uses to which electricity is put in our modern social and industrial life are as varied as they are important.

IT is no exaggeration to say that it has practically revolutionised homelife for those who are near enough to a source of supply to be able to make full use of it, and what it will do in improving country life when a number of projected hydro-electric schemes are in operation will be equally as great as the part it is now playing in the industrial life of Australia.

WIRELESS, which really consists of an electric current transmitted through the ether bearing intelligible sounds due to the manipulation of instruments at the points of transmission and reception, has a wonderful record in the service of humanity.

IT is the newest discovery in electrical science, and from a life-saving point of view incomparably the greatest.

THEREFORE, there is no question regarding the educational value of an exhibition which aims at laying bare the progress of radio and electricity and their value in modern life.

IN its worthy effort to do this the Wireless Institute deserves the most cordial encouragement and assistance, and *Radio* feels sure that this will be forthcoming to an extent that will practically compel the holding of a similar exhibition each year.

Radio Clubs Need Bucking Up.

ONCE more it becomes necessary to refer to the lack of interest and enthusiasm which prevails amongst a number of radio clubs around Sydney.

ONE would have expected that the approaching advent of broadcasting, coupled with the steady increase in the number of experimenters, would have spelt new life to radio bodies generally, but the reverse has been the case.

THE position is certainly discouraging to those enthusiasts who are prepared to work hard to keep the amateur movement going, simply because they recognise in it the germ of great possibilities in experimental wireless work.

SOME well-wishers contend that radio clubs should have a social as well as a scientific side, while others,

equally well-meaning, declare that it is no function of a technical body to cater for the lighter side of life.

THE principle involved is, after all, not a very important one, and if by following one or other practice a royal road to success could be found it is safe to say that the Clubs would adopt it whole-heartedly.

THE problem of how to keep members interested and enthusiastic is an important one, and will have to be faced sooner or later.

THE future of the experimenter in Australia is destined to be a great and useful one, and it would be a matter for regret if any lack of present day interest contrived to prejudice it.

IT is up to the experimenters themselves to find a way out.

The Wonders of Radio.

Three Years' Growth.

By P. C. KULLMANN.

The following interesting summary, reprinted from a booklet "Radio The Third Year," published by P. C. Kullman & Co., wireless brokers, New York City, graphically illustrates the growth of the radio industry in the comparatively short space of three years. The number of receiving stations in the United States now exceeds two million. —Editor.

WHAT RADIO IS DOING.

The average person has no conception of the bounds and strides radio as a new art has made during the last two years. Hardly a day passes that not something new, something never before heard of, something almost unbelievable is being published as a new achievement of radio, the child of wireless. The only wonder is that it took almost twenty years, after the successful operation of wireless telegraphy, that radio telephony was made practical.

REWARDS NO LONGER OFFERED.

There was a time when a well-known brokerage office on Wall Street, New York, offered a "reward of one dollar" for any substantiated news item or any bona fide newspaper clipping pertaining to wireless telegraphy, and its successful operation. This reward was afterwards reduced to 50 cents, then to 25 cents, then to 10 cents, and finally abolished:—Nowadays, you can hardly pick up any decent-sized newspaper that does not mention wireless or radio in its news columns, ship reports, broadcasting programme or advertising columns.

THE ERA OF RADIO LITERATURE.

The first monthly magazine publication of wireless telegraphy was "Marconigraph," published in London in April, 1911. Then "Marconigraph" (American), published in New York in Oct., 1912, followed. The former is now the "Wireless World and Radio Review," published weekly and the latter is the "Wireless Age," published monthly. Thereupon fol-

lowed in rapid succession scores of others, some monthly, some semi-monthly, and some weekly. Besides these, hundreds and thousands of magazines and large dailies and Sunday papers devote special supplements or full pages to radio telephony and wireless telegraphy. The number of special papers, scientific papers, pamphlets (exclusive of periodicals) and bound books published on wireless and radio would fill a good-sized library.

DO YOU KNOW WHAT RADIO CAN DO?

Depths of Oceans Measured.

Radio has successfully measured the variations of the depths of the water in the Atlantic Ocean and Mediterranean. Radio can accurately measure the depth of any ocean or lake. The Governments of the world will publish in map form the accurate depth of any part of any ocean or lake, where now accurate measurements, by reason of the extreme depths, are impossible. Radio has and will continue to accomplish this and other feats. And who can successfully stand up and say that radio will not accomplish wonders and marvels now unthought of?

MEASURING THE UNIVERSE.

Radio may measure the distances of the stars, the planets and comets, their sizes, dimensions, speed and velocity, density and heat.

RADIO THE SUPER X-RAY.

Radio penetrates everything; the rockiest mountains; the fiercest

storms, the densest clouds; the most compact bodies of water; it communicates with ships; from ship to shore and from shore to ship; from submarines to battleships; from airplanes and dirigibles to land—and ship—and subwater-stations; from the deepest recesses of the mines to the manager's offices above ground.

RADIO LOCATES MINERALS, METALS, ORES AND COAL.

Not only through air and water and earth travel the radio waves at a speed of one hundred and eighty-six thousand miles a second, but likewise through the hardest of stones and the mountains of solid rock, being only deflected when they come into contact with minerals and metals and coal. Here then the radio compass and other scientific calculating instruments are employed to locate and measure the extent and thickness of the deposits of these riches, for which now millions and millions of dollars are annually expended in experimental boring and prospecting.

RADIO THE MIRACLE WORKER.

The United States War Department in the latter part of 1922 sent a radio message to an airplane many thousands of feet aloft, where, upon instantaneous arrival, it typed itself upon the prepared paper tape for the convenience of the pilot, to read it in plain English. Not only this, but the airplane pilot sent his reply message in the same way by radio through the air, where it was recorded and received by the War Department, all printed out on a narrow strip of paper.

RADIO THE INVISIBLE POWER.

Radio fires and guides the irascible and often uncontrollable torpedo, the pilotless airplane or dirigible, the chauffeurless automobile or war tank; the crewless battleship at the will of man. Not only did radio guide in a recent naval manoeuvre and target practice on March 21, 1923, the battleship *Iowa* (Admiral "Bob" Evans' former flagship), in the Gulf of Panama, where there was not a human being on board, but it controlled her every moment from the *Shawmut*, several thousand yards distant, as if her own captain were on the bridge.

RADIO IS BEWILDERING—UNCANNY—UNFATHOMABLE.

Radio started and stopped the engines; steered the ship; started again; made the ship go backwards; then around in a circle; controlled the feeding of the boilers; the oiling of the machinery; blew the whistle and could have fired a broadside of guns with the same ease, and by means of the very radio controlled warcraft with the captain miles away on another warship. Radio in times of war can raise, guide and direct pilotless aircraft and drop tons of explosives over the enemy lines; it can start, guide and control battletanks without crews and send them crashing into the advancing shock troops firing as they go. Radio is uncanny; it is bewildering; it leaves you speechless.

RADIO AT SEA—THE RADIO COMPASS—THE RADIO DIRECTION FINDER.

No longer need the captain of a ship in the hot, broiling tropical sun or in rain, in storm, or on cold and foggy days, leave his cosy warm cabin to ascertain the precise position of the ship. He calls the wireless or radio operator on the interior ship-telephone and simply asks him the question:—"Sparks, what is our position?" (Many operators on board ship are called Mr. Sparks.) Whereupon the operator, by calculating the wave lengths and distances with the aid of his wireless compass and direction finder, and by the simple method of triangulation will inform the captain within three minutes of the precise longitude and latitude and the position of the ship more accurately than old time sea captains

could, when in the habit of ascertaining this by means of the sextant.

RADIO THE LIFE SAVER—THE SILENT FRIEND.

Radio has superseded the sextant, except on sailing vessels, though nearly all old time captains and commanders still have their sextants for cases of emergency and unforeseen eventualities. But the disasters of the sea, according to "Lloyd's Register" and statistics, have greatly diminished and the loss of lives and property at sea materially decreased, since wireless is employed on board of nearly all ocean-going vessels. Wireless warns of approaching storms, of typhoons, hurricanes, of water spouts, of dangerous wrecks and derelicts, shallow waters and dangerous reefs, of ice bergs, and of all the other formerly feared dangers to navigation.

RADIO IN THE JUNGLE.

It exclusively furnishes the outside news in the cities and towns of Manaus, Labrea, Porto Velho and Rio Branco for all the newspapers along the upper reaches of the Amazon River, where neither telephone or cable lines are penetrating the trackless jungles of the Brazilian forest; where ships arrive irregularly and at great intervals; where no railroad goes within a thousand miles, wireless alone supplies the daily news of the world.

RADIO IN THE HOME.

And throughout the United States of America radio furnishes weather bulletins, crop estimates, market reports, time signals; news of approaching storms; disseminates lectures, sermons, church music, concerts, jazz and dance-music, public orations, educational and college courses, bedtime stories for the amusement and the pleasure of the millions of children and the people of all ages, occupations, professions, and stations of life, who are now "listening-in" daily, and who had not seen, and did not know what a radio set was two years ago. It brings the grand opera into your home.

In countless thousands of houses throughout this entire rich country on comparatively inexpensive radio sets, costing less than 100 dollars (\$20), the children of ten years of

age and up to the old grandmother are equally proficient in "tuning in" and connecting with radio broadcasting or amateur stations within range. There is barely a day that the radio in the home is not in actual use for the entertainment of one or more of the members of my family and their invited guests.

RADIO OF THE FUTURE.

The time is not far distant when the architects' and builders' plans of a flat in Harlem, or apartment houses in New York, or elsewhere, are not complete when lacking radio installation. Even now, 299 Clinton Avenue, Newark, N.J., the Ritz Apartment House of 72 apartments, is being equipped with radio installations throughout, according to the "Radio World" of March 31, 1923.

TALKING MOVING PICTURES BY RADIO.

The time is near when every front parlor and sitting room will have its reflector-sheet or white-screen on a roller, precisely as the wall maps are kept in a school room, ready to be pulled down for the reflection of radio talking moving pictures. There will only be a row of dials and knobs in the side of the wall, operated by any child, capable of putting a new disc into the reflector-victrola, to start the music of the concert, or the jazz, for the entertainment, with the accompanying talking and singing and playing moving pictures in your own parlor.

BELLAMY'S "LOOKING BACKWARD" IS OUTDONE.

Imagine your friends assembled in the parlor with shades pulled low in the day time, or lights dimmed in the early evenings and the blank white wall screen pulled down on the ball-bearing electric rollers, and a little ten-year-old girl setting cheerfully a dozen dials or graduated knobs, placed in the wall like electric push buttons, and asking you: "Now, grandma! Friends! What do you wish to see and hear next?"

Imagine the expressions of wonder and expectation on the faces of grandma and grandpa! Imagine the little boy's or the little girl's own importance in producing music and concerts, sermons and speeches, and talking and singing and acting moving pic-

(Continued on page 432.)

The Man Behind the Microphone.

How he will Entertain Australia!

IF Henry Lawson had lived a few years longer the vast outback of Australia, which he knew and loved so well, would have presented a new aspect for him to portray in imperishable verse.

Lawson painted many fascinating word pictures of Australian life. A first-hand knowledge of its loneliness and isolation, and a close association with people who are born, and live, and die, in the vast bushland of our

look green in the distance" is a truism when applied to the so-called pleasures of life outback.

To one who has tasted of city life with its comforts, conveniences, and, above all, its up-to-dateness, rural existence soon palls. There are no daily newspapers to tell of world doings, no concert halls where one may feast on song and music, and no picture shows to flicker stories for the amusement and education of those who are destined to enjoy but little change from their more or less monotonous existence. And yet Australia could not do without these men and women—they are the backbone of our country. Small wonder if at times they become tired of their cheerless lot, and turn to scenes that contrast pleasantly with those to which they have grown so accustomed.

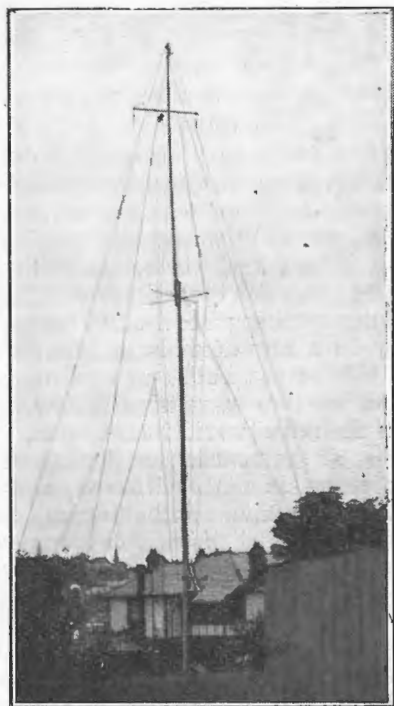
RADIO SOLVES THE PROBLEM.

The people of outback Australia may not yet realise it, but a cure for their solitude and isolation is at hand. Radio broadcasting, which has banished the gloom from millions of homes in America and England, is about to be launched in Australia. That it will establish a link here between the capital cities and the interior, as it has done in other countries is beyond question. No country in the world stands so much in need of a broadcasting service as Australia, and, by the same token, none will welcome it more or make greater use of it.

HOME LIFE TRANSFORMED.

One can imagine what a transformation will be effected when, instead of a group sitting in meditative silence, listening to an oft-told story, or maybe shuffling a well-worn pack of cards, the interest is centred in a radio receiving set which occupies pride of place on the table. In fancy one can see the half-dozen members of the family seated around that table each wearing head 'phones. Their faces beam with expectancy as the hands of the clock point to the hour when, according to schedule, the broadcasting station in the distant

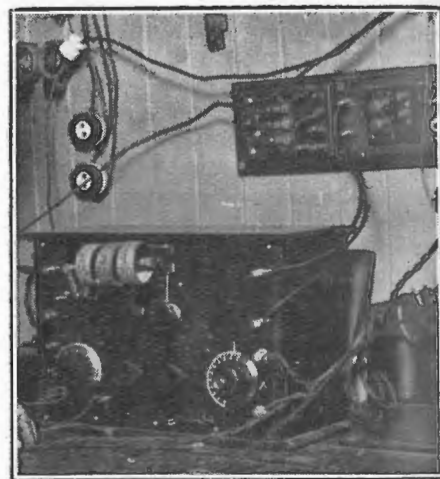
capital city is to commence transmitting. They are not disappointed. Clear and distinct, and in well modulated tones comes a voice which, judging by its quality and volume might be at the end of a landline a few hundred yards away. The first message it delivers is a general report of the State weather conditions, followed by a forecast for the ensuing twenty-four hours. Very frequently that message is of vital importance to rural settlers, and in every case it constitutes one of the items the man



Mr. Spencer Nolan's aerial at his residence, Double Bay, Sydney.

Continent provided him with the material which he used so well. Countless thousands were inspired by what he wrote, and if he did not actually succeed in eliminating the social distinction which separates country and city folk he at least did his share towards it.

There is something strangely fascinating in the contemplation of a peaceful existence "far from the madding crowd," but the mask falls from the eyes when one comes face to face with the stern reality. "Hills



Mr. Spencer Nolan's receiving set.

on the land wants to know. Later it is followed by a summary of the news of the day, which in ordinary circumstances, would take a week to reach many localities. Thanks to radio, however, the man in the Never Never who has subscribed to a broadcasting station will be on practically the same footing as his friend in close proximity to a big city. Not the least important part of the programme is still to come. The vocal and musical items, which act as a tonic to jaded nerves, form the major part of the entertainment. Radio broadcasting will make it a nightly affair, and when the man behind the microphone bids his unseen audience a cheery good-night he will have spread brightness and happiness in homes which deserve well of Australia.

Broadcast Receiving Sets.

Points to be Observed When Selecting.

THE variety of makers of wireless receivers now on the market renders the task of selecting a suitable one easy—and, at the same time, difficult. Where cost is not the all-important factor the selection is a matter for expert judgment, and the purpose of this article is to save the inexperienced purchaser from having to confess that he had to pay dearly for his experience.

Many manufacturers of receiving sets overlook the fact that such sets are destined to be operated by persons who have no technical knowledge of wireless, and that therefore, intelligent instructions are necessary to ensure correct manipulation.

The broadcast receivers to be sold in Australia will respond only to the particular wave-length to which they are tuned, and will, therefore, be much simpler to operate than a set capable of receiving on different wave-lengths. No good purpose would be served by the ordinary person possessing one of the latter sets.

Before a subscription is paid to any broadcasting station the purchaser of a set examines the service offered by the various stations and makes his choice accordingly. He then buys his set.

CRYSTAL SETS.

There are various types of crystal sets on the market and for short distance reception they will give good results. There is little to choose between the various makers and provided one has a good outdoor aerial and lives within about ten miles of the broadcasting station he can be sure of good reception.

VALVE SETS.

When one desires something slightly better than a crystal, a single valve set may give the results required. The

next step is a two-valve set, the majority of which employ high-frequency amplification in which the currents set up in the receiving aerial are amplified by the first valve and rendered audible by the second. It is a simple matter to arrange the second valve so that it will *react*, the current flowing back to the first valve instead of into the aerial.

This power, or low-frequency amplifier may embody one of three amplifying systems: (1) a low-frequency transformer, which is an arrangement producing a high degree of amplification; (2) Reactance Capacity which is designed to reduce distortion, and (3) Resistance Capacity, designed to give purity of tone without undue amplification.



A young American in New Jersey perusing a comic paper while waiting for the next item from the local broadcasting station to start on his radio set. Many young Australians will soon be doing the same!

A two-valve set should be able to tune in any broadcasting station within 250 miles range.

AMPLIFIERS.

To operate a loud speaker a power amplifier should be connected up in place of the telephones. This has the effect of strengthening the signals without bringing in additional sta-

In some receivers one or more of the valves may be so arranged to function simultaneously as both high and low frequency amplifiers. Many difficulties are encountered in the design of such apparatus although in several types of receiver now on the market it has been successfully incorporated.

Wireless Signals Disregarded

Sea Tragedy Results

Seven Ships Wrecked

By ERNEST McGAFFEY
Los Angeles, U.S.A.
(Special to "Radio")

ON the night of September 8, 1923, a fleet of fifteen destroyers belonging to the naval forces of the United States was proceeding south off the shore of Santa Barbara, California. Near them a wireless station at Arlight was in communication with this squadron. A radio message sent to the Commander of the squadron notified him where he was, but the Commander was of the opinion that the radio station had erred in its reckoning.

This, at least, was the evidence of the Commander himself, in the investigation which is now going on with a view to determining the responsibility for this colossal disaster. The evidence given at this hearing was, also, that no effort was made on receipt of the message to check speed on the part of the squadron, and that no soundings were taken to ascertain the depth of water. The Commander asserts that he called the radio station and asked for verification of the message to the effect that they were north of a certain point, when he (the Commander) felt confident that they were

south of this point, but he claimed that he did not receive an answer to this message.

On the other hand, the radio station and its officials declare they received no answer to their original notification that the squadron was north of the point in question. Seven destroyers rushing on at full speed struck hidden reefs and other rocks projecting from the sea. The flagship, *Delphy*, Captain E. H. Watson, Squadron Commander in charge, led the seven big destroyers that foundered. One of the division Commanders said that they were making about twenty knots an hour when the crash came. The ships were following the *Delphy* in single formation, and were about 300 yards apart. There were fifteen ships in the fleet bound from San Francisco to San Diego. Eight of these sheered off in time to escape the fate of the other seven.

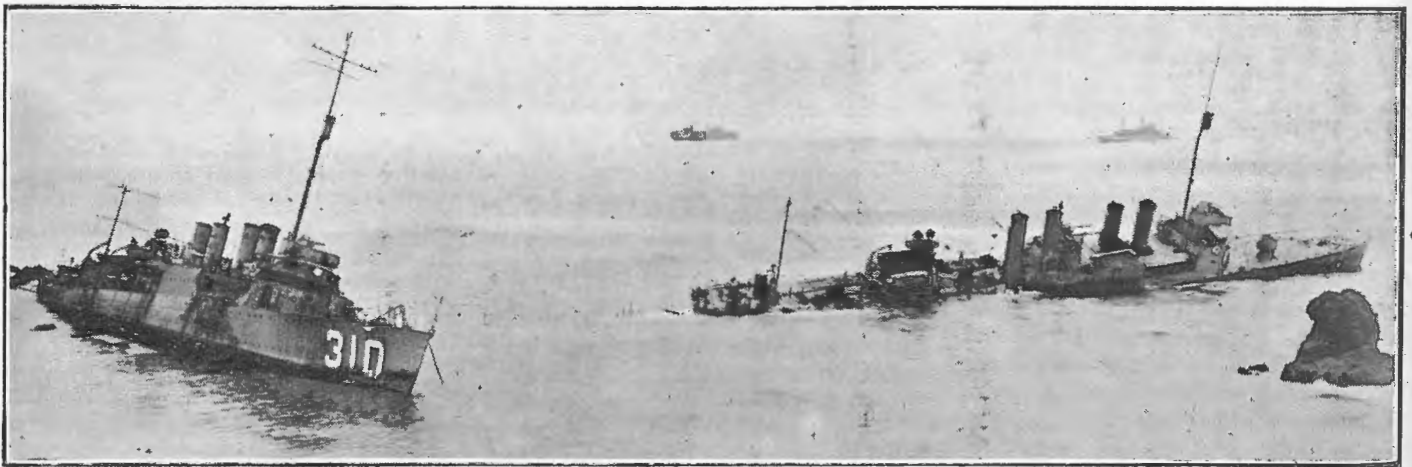
The flagship *Delphy* was the first to strike on the rocks, close into shore, and the *Young* struck on a reef further out. The *Chauncey* came next, coming in between the *Young* and the

Delphy. The *S. P. Lee* was the next vessel to crash onto the rocks and it struck almost on the point of a reef known as Saddle Rock. Further out from the *Lee* the *Nicholas* grounded on a hidden reef. The *Woodberry* and the *Fuller* circled out farther when they received the alarm signal, but struck on the rocks between Saddle Rock and Point Arguello. The instant the vessels struck the fires were banked to prevent an explosion.

The ships were going at such terrific speed that when they struck the reefs they bounded on top of the low ones and tore great holes in their bottoms. Oil poured from the tanks added another peril to the situation as it choked and blinded the sailors whenever the waves dashed over them.

The flagship, the *Delphy*, experienced a great deal of trouble in landing her men and lost several. They only had pocket flashlights to show them the way, and the sailors were compelled to jump at the moment when the ship swayed toward rocks.

(Continued on page 444.)



RADIO WARNINGS UNHEEDED.

This photograph shows two of the wrecked United States Destroyers, which crashed on to the rocks in a thick fog through disregarding radio direction signals. Altogether seven destroyers valued at 1,500,000 dollars, approximately £300,000, were wrecked.

Instruction for the Beginner.

Simple Facts that All May Understand.

UNTIL quite recently, Radio—or Wireless—was to the average man what X-ray is to a school-boy—something he had heard of and knew vaguely to be a fact—but was nevertheless to him a deep and dark mystery. Every now and then he read in the papers of a shipwreck, and of hundreds of lives being saved through wireless, but when he paused to wonder how this was done, he found himself just where he started—no wiser, and with nothing but the firm conviction that wireless was certainly a wonderful thing. To the vast majority wireless is just something behind the veil wrapped in romance. They know that it spans vast distances, and that it is sent by a transmitting station and picked up or received by a receiving station. Many have a hazy idea that it is made up of a number of flashes, much the same as lightning, which jump off an elevated wire called an aerial, and rush through the air until they strike the station for which they are intended.

Those undertaking the study of radio are fortunate if they already possesses a fair electrical knowledge. In that case the many fearsome names used to describe Ra-

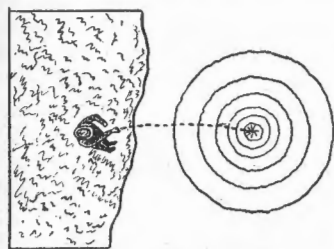


Fig. 1.

dio apparatus are more easily understood. And yet, there is, about wireless itself very little that is difficult to understand when once actual interest is aroused. This is especially so in these days when music and the human voice are flashed across wide spaces, to the education and entertainment of thousands of "listeners in."

We have all heard or read of wireless, or, as they are called, electromagnetic waves, which are really waves in the ether. Before we proceed to look more closely into these

(This is the first of a series of simple articles for the absolute novice in wireless. We believe there are thousands of men, young and middle-aged, who are anxious to make a study of radio, but do not know where to begin. It is for their especial benefit that these articles are being written.)

waves, let us be quite clear as to the meaning of the word *ether*. It is nothing more than an invention of the wise old scientists. A long while ago, when these gentlemen

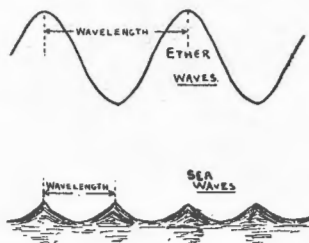


Fig. 2.

worried about the problem of light, they discovered that it did not travel through the air, and as it was not exactly clear what it did travel through, they concluded that there must be some all-pervading intangible something which is neither a gas, liquid nor a solid, and which is invisible, odourless and unweighable. This they termed ether, and by it the whole earth is surrounded and permeated. It is everywhere, and our first step to the understanding of radio is the knowledge that wireless waves travel through the ether. Being quite clear on that point, let us now return to the consideration of these wireless waves and how they travel.

If we stand on the edge of a still pool of water and drop a stone neatly into the middle, small waves spread out in all directions from the source of the disturbance. It is perfectly obvious to us all that the size or length of these waves depends entirely upon the size of the stone that is dropped into the pool. If a larger stone were dropped in, there would result a bigger splash, and the length of the wave would be greater. Now,

the length of a wave means the distance from the peak of one wave to the peak of the next, and while the wave length in a small pool may be only a couple of inches, on the broad ocean it may be anything up to a couple of hundred feet. Small or short waves would pass a given point with much more frequency and in far greater numbers than big or long waves. This, being all boiled down, we find that the length of the waves depends entirely upon their frequency; or, in other words, if twenty short waves pass a given point in one second we say that they have a frequency of twenty a second, and if only one long wave gets past per second then that wave has a frequency of one per second. We must be quite clear that wave length depends absolutely upon frequency, and we can also understand from the foregoing that the more waves that are crowded into a certain space, the shorter those waves will be.

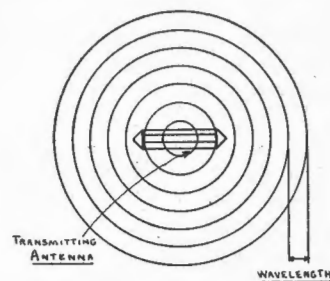


Fig. 3.

Just as waves are caused in water, so are wireless waves caused in the ether. Splashes in the ether result in waves, just as do splashes in the water. Unfortunately, however, waves cannot be caused by throwing a brick into the ether, because the brick has no hold on it. In place of the brick heavy electric discharges are used to produce wireless waves, and these discharges we would compare to an electric brick.

This, then, is the foundation of our study of wireless. In our next issue we shall look closely into the actual means by which these waves are produced, and later, the reasons why different stations radiate waves of various lengths. Why they do so will be fully explained.

(To be continued.)



The Radio King



Published by special arrangement with Universal Films. Adapted from the Universal Chapter Play, "The Radio King."

THE CHARACTERS OF THE STORY.

Marnee—known as the electrical wizard—is seeking to gain world dominance by medium of his extraordinary knowledge of radio telegraphy.

Bradley Lane, a young millionaire who is an ardent student of criminology, and an enthusiastic experimenter in radio. Lane is in love with—

Ruth Leyden, the confidante and right hand assistant of

John Leyden, her father, who has perfected a device for recalling radio messages from the air.

Jimmie, known as the Boy Detective, is an orphan who has been rescued from the clutches of Marnee, by Bradley Lane.

Fatty Ewerts, a radio enthusiast of humble parents, who is endeavouring to construct his own receiving set, under the guidance of Bradley Lane.

Our last instalment finished when we read of Marnee's attempt to seize the Government Broadcasting Station, and the subsequent attempt by Bradley Lane to frustrate the schemes concocted by the twisted mind of the wizard. Lane entered the station and being taken unawares was made prisoner. Soliloquising on his means of escape, his reverie is interrupted by the cry of Jimmie, his self-appointed assistant, from outside the door.

A WARNING cry from Lane and Jimmie ceased shouting through the door, only to appear a few seconds later at the window, immediately over Lane. By his direction the boy took from his pocket a knife and, after skilful manoeuvring, succeeded in slipping back the catch of the window. It took but a few seconds to throw open the window, slip through into the operating room, and again close the window. But the next job that confronted Jimmie was not quite so easy, he must free Lane before anything further could be done. As in most things

which Marnee did he had secured Bradley Lane with ropes and cords in such a way as to make his escape, without assistance, an impossibility. To untie the knots was beyond thought, and even with the use of the knife it took many valuable moments to release Lane. The next thing to be done was to glean the whereabouts of the gang, and to find some means or other of outwitting them. Instructing Jimmie to wait near the transmitting instruments, Lane set off to explore the station, and, if possible, learn the further plans of the conspirators. His wanderings took him from one room to the other, and ultimately to the outside of the building again. A piercing shriek rent the stillness of the night. That was Jimmie's voice, he could not mistake it, and that one shriek conveyed a whole heap of information. Jimmie was in peril. Marnee must have returned to the operating room, found Jimmie there, and was now perhaps venting his vile spite on the boy. Apparently the movements of the sleuth had been watched by Marnee and his confederates, for no sooner had Lane left the building, than the doors were bolted against him. He must gain admission. The doors withstood his violent attacks—there was only one thing left—the window.

A smashing blow, a crash of falling glass, a hurried leap, and Lane was again inside the building. Only a few moments had elapsed since he had left Jimmie, but those few moments had been sufficient to allow Marnee to seize Jimmie, and make his escape, together with the rest of the conspirators. Lane was almost

panic stricken. He had the highest regard and affection for Jimmie, and felt that he was personally responsible for anything that might befall the boy. Rushing from room to room he called to his youthful assistant, but receiving no response he gained the front door, only just in time to see the tail light of a car disappearing in the distance. There could be only one solution of the matter—Marnee had gone, and had taken Jimmie with him as a prisoner. Pursuit through the night, through the sleeping village of Snifton, Marnee out-speeding Lane, then Lane gaining on him, ultimately the chase brought the two cars to the waterfront, where a high-speed launch awaited Marnee and his prisoner. Now appeared another difficulty, racing along the foreshore Lane's attempt to find a boat in which to effect further pursuit was futile. The chase had gone so far that to give up now, on the verge of the capture, would have been unbearable. Surmising that the lights of the ship in the bay were the objective of the launch, Lane plunged into the sea without hesitation, but the current proved too strong for him, and finally he found himself miles from the ship. He must get Jimmie, that fact was certain, but to upset such carefully arranged plans as those of Marnee required more consideration than a few moments. As was his wont when confronted by difficult problems, he went to the nearest 'phone to confer with Ruth, who thinking that, without her, Lane might unduly jeopardise his life, advised him to wait, saying that she would join him within half an hour. To a man in such a state of

mind as Lane, inactivity was intolerable. He must find something to occupy his mind. He must think. His aimless wanderings took him down many back lanes and side streets, until a flash of light in a field attracted his attention. Curiosity prompted him to investigate. Close inspection proved the hitherto dark shadow to be the hangar of an outpost branch of the Military Air Service. Lane's previous experience in handling International Criminals during the war period, put him in touch with many of the Military Chiefs, and his surprise may be imagined when he found that the Commander of this arm of the the Air Service was Major Williams, an officer of the Investigation Branch, with whom Lane had handled many intricate problems in the past. The millionaire detective related his story to the Major, and received the greatest encouragement. He placed a sea-plane at the disposal of Lane, there being absolutely no restrictions as to how the plane was used, or when it was to be returned. The harsh croak of a motor horn heralded the approach of Ruth, who immediately joined in the consultation, with enthusiasm so characteristic of her nature. All the protests of Lane and the Major against Ruth taking up the pursuit in the aeroplane, with her lover were of no avail. The two pursuers, together with the pilot set out to overtake the ship carrying Jimmie and the confederates, but smooth running was not destined to be their lot. The aeroplane, a two-passenger machine, was sorely overloaded by the additional third person, and despite the efforts of the pilot it pitched and tossed dangerously, until with the ship almost beneath them the machine started a dizzy nose dive into the sea.

and with a resounding crash it struck the water but a few yards from the fleeing steamer. Not prompted by any humane thought, but with the idea that perhaps he may draw more unfortunates within his net, Marnee ordered a boat to be launched, and the crestfallen pursuers were brought aboard the steamer. The chagrin of Lane can be better imagined than described, at finding himself

the cabin weakened them, and a sharp twist of the wrists freed his hands—now for his desperate plan. Taking the two wires from the electric light sockets he carefully frayed the insulating silk until it formed a fringe about the ends of the wire, then with a sharp touch together of the two bare ends, a blinding flash of light, and the insulation burst into flames. The wax coated covering of the wire



The unfortunate pursuers again found themselves in the hands of the arch enemy.

and his sweetheart again in the clutches of his arch-enemy. Needless to relate the captives were again bound and gagged, and thrown into a cabin, the door being securely locked. All hope of escape seemed to be gone until the electric light offered a solution, but Lane's hands were bound. Continual chafing of the cords on an upright stanchion of

afforded easy fuel and in a few seconds the ceiling of the cabin was on fire, and volumes of smoke pouring down the corridor. "Fire! Fire! Fire!" a shout from the officer on watch, a rush of feet—

(Another thrilling instalment of this Chapter Play will appear in the next issue of "Radio.")

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In a Broadcasting Studio

An Artist's Impressions

Florence Olsen Tells the Story

A ROOM no bigger than an ordinary drawing-room; carpeted, with a winter-fire blazing on the hearth; the four walls lined with folds of muslin, suspended to leave a slight space between walls and fabric; the ceiling similarly treated, with, hanging from between the muslin folds, four dangling transmitters. One transmitter is over the grand piano, two hang where the orchestra is accommodated, and one a little apart from the rest is for the vocalists. The transmitters look for all the world like the enlarged earpieces of a telephone, and they can be drawn up or down to suit the requirements or stature of the user. Such is the Room of Mystery, the modern Wizard's Tower—a little spot whence originate those items of delight and instruction for which probably tens of thousands of pairs of ears in the town and hamlets of—not one, but several—countries listen nightly.

The orchestra has just concluded a dance number, and the voice of the Master of Ceremonies—or whatever the popular gentleman's designation may come to be—is heard.

"Hallo—hallo—hallo-o-o . . . This is Blankchester No. 10 speaking. That was 'Colonel Bogey,' played by the 'Merry Mannikins.' The next item will be a song," etc., etc.

We sit round the fire in the waiting room while the number is being sung, silent, speculative. Every sound from the concert-room comes to us through the thin partition. None of the party has "broadcasted" before, and though semi-professionals of considerable platform experience, all are a little apprehensive of the new experiment. While the items are in progress the busy branch manager

has a few helpful things to say to the waiting performers. Vocalists must remember to keep perfectly still and stand at a distance of perhaps 12in. from the transmitter. For loud high notes, it is advisable to lean back a little from the transmitter. Clearness rather than loudness is the essential point. Many people make the mistake of thinking that it will be necessary to make as much noise as possible in order to be successfully "broadcasted"; but the transmitters are marvelously sensitive—even the drawing of the breath has been heard!—and the clear, penetrating quality possessed by some voices gets through on the softest notes, better than the thick rough quality of other voices, no matter how forcibly produced. Too great loudness often has a "blasting" effect on the ears of the listeners. The same remarks apply to the elocutionist, with this addition. Choose your items well—you have only your voice with which to tell the story. There is no support from gesture or facial expression. You may find that half your repertoire would be useless when the test is applied. You will probably feel as though you are addressing a political meeting at first—they all do. But you will get used to it. Articulation will be your greatest help. And—an important point—get as near as you can to the transmitter, much nearer than the vocalists, for instance. You probably know yourself the difference between speaking and singing which renders this necessary for successful transmission.

As to the instruments, the violin, because of its penetrating quality, should always do well. The flute also is generally successful, as are also the orchestral items when clear and well conducted.

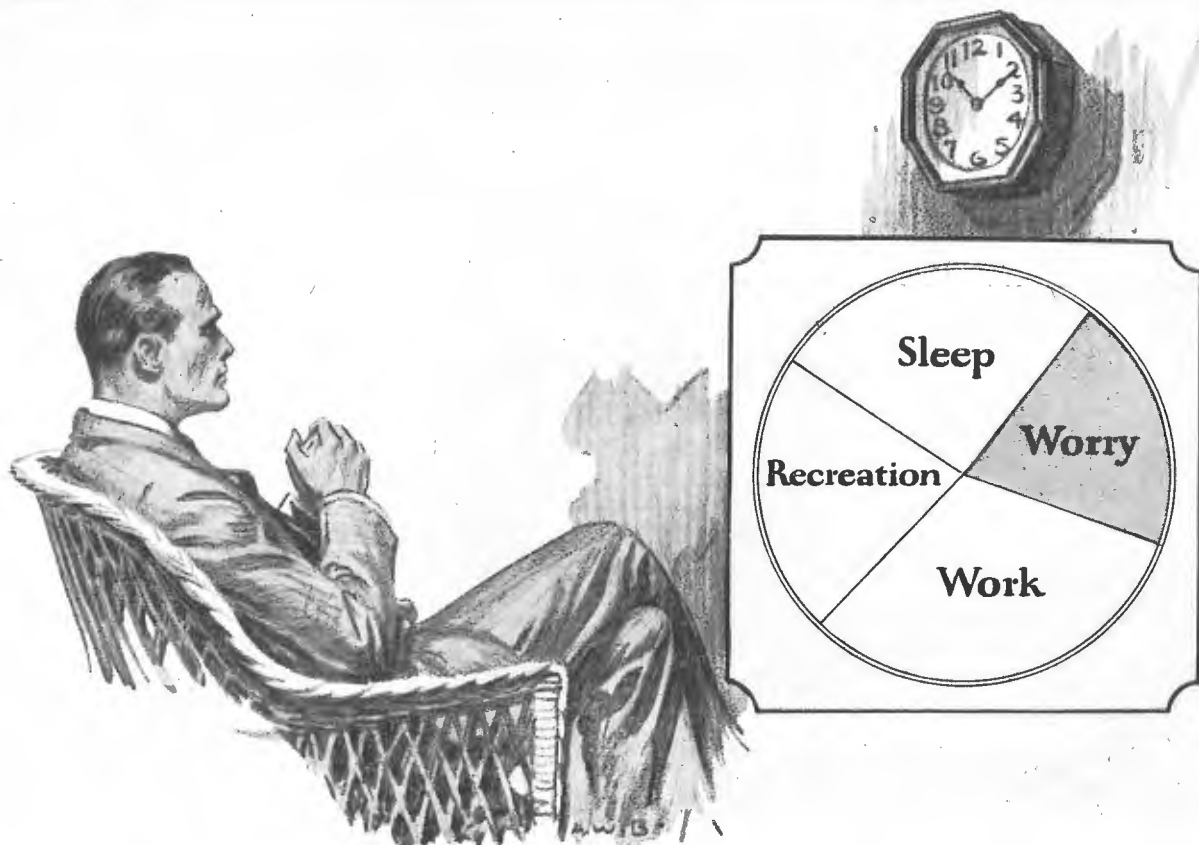
As the performers return one by one from their trial auditions impressions are eagerly sought, and given. "I like to see the audience—it is such a help." "Yes,—and don't you miss the applause?" "—and the laughter," put in the humorous entertainer. "What a difference it makes, not knowing whether you 'got home' or not." "There's one thing—it doesn't matter what you wear!"

As the programme draws to an end, sundry contributors are beckoned aside. The reward of a successful trial is to be a professional engagement. The general shyness towards the new experiment is already giving place to a warmth that will end in enthusiasm. As the unseen entertainers of a vast and scattered audience leave the building, the erstwhile strangers talk with the loquacity of intimate friends. Regular concert-party engagements are fixed up, where audience and artist will meet vis-a-vis and "what one wears" is not an important item. But the parting thoughts are for the infant wonder they have just left behind. "I wonder how big our audience really was to-night?—or if anybody listened at all?"

"It is a rare stunt. Think of it—Norway, France, Scotland, Ireland, as well as every English subscriber on our wave-length—what an audience. Out at sea, even as far as Gibraltar—all kinds of people, young and old, all listening, listening . . . and every note, every word, mattered. People whom we shall never see have heard our instruments and voices to-night. It's thrilling. We felt strange and nervous to-night because it was our first experience, that is all."

"Radio" is the only paper dealing effectively with Australian wireless activities. It is bright, up to date and, above all, authentic.

An annual subscription at 10/- will bring it regularly to your home each fortnight. Send that Sub. to-day.



How much of your day is worry?

EVERY DAY has twenty-four hours. The richest man has no more time, the poorest has no less. And all men must divide their days into three main divisions—Work, Recreation, Sleep.

But there is a *fourth* division. In proportion as you get rid of it, you add to your income, your standing and your peace of mind. In proportion as you give way to it, you find it spreading like a cancer over the three main divisions of your time.

Its name is Worry.

Effective work cannot be done by men whose minds are wandering in futile concern about their bills, their business positions, their futures. No man can benefit from his round of golf or his evening at home with a book if he is really far away—fearing a pressing creditor, or tomorrow's work.

And if worry follows you to bed at night—then indeed you have little chance for happiness or even physical health.

There is a way out. There is an outside influence ready to help you reduce the hours or minutes that worry steals away from you. There is an outside influence that has made the lives of 200,000 other men happier as well as more prosperous.

Its name is the Alexander Hamilton Institute.

You have read about it as a training for ambitious men. Think of it now in another way—think of it as an agency that will banish the needless worry out of your days.

If it is more income you need—the Alexander Hamilton Institute has helped *every* conscientious subscriber to earn more money. Many have doubled and tripled their salaries in one year. If you need a better, more dignified, more permanent position—trust the business judgment of the 27,000 Managing Directors who have enrolled.

Here is a curious fact to which 200,000 Institute men can testify. The very moment you tear off the coupon at the foot of this page you will feel the satisfaction that comes from having taken a step forward—a step that may be a decisive one in your life.

Tear it off now, and hold it in your hand for a moment. Say to yourself:

"If I mail this coupon, *something* is going to happen; an outside influence is going to work in my behalf. I am going to find out whether it can do for me what it has done for so many others. I am going to mail this coupon to-day—and receive the Definite Plan of Business Progress which it promises."

Do that one thing *now*.

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Mention "Radio" when communicating with advertisers.

Radio Sets in Motor Cars.

Truly amazing popularity has suddenly come to that scientific apparatus which a few years ago was considered an impractical dream of electrical theorists.

outside sounds when the set is in operation.

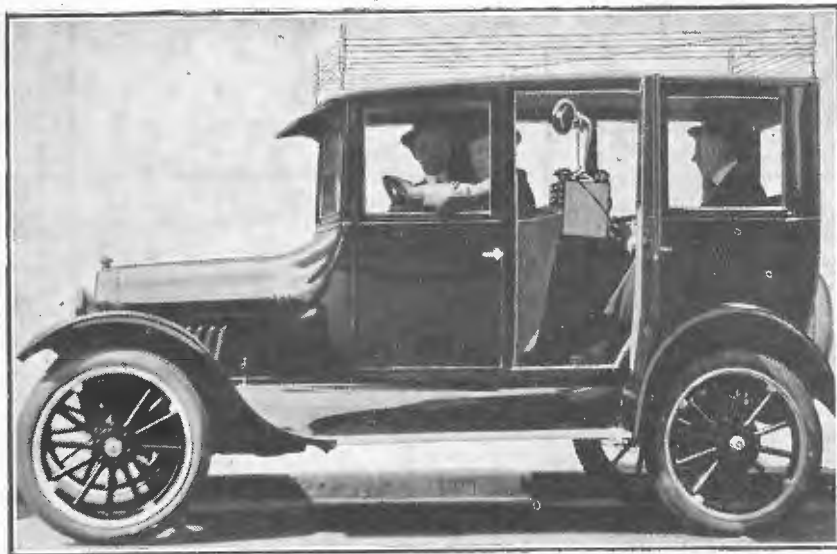
While owners are driving in their radio-equipped sedans, it is possible for them to listen to music, speeches,

educational entertainments and other interesting and instructive features during the trip.

One ingenious car owner, by utilizing the power of the generator on his car, not only receives radio messages, but transmits them as well. It has been foreseen that this feature will make possible the use of motor cars as scouts or as reporters of crop, weather or news messages from any part of the country.

The news reporter no longer need be obliged to beat his rival to the wire. With a car equipped to talk instantly and directly with the radio office of his paper, he is free from competition as regards speedy transmission of his news message.

Unquestionably, this fostering of radio equipment for motor cars will result in widening still further the utility and pleasure-giving value of automotive passenger transportation. It is yet another of those progressive steps forward that have always characterized this youngest and greatest of industries.



A Chevrolet Sedan fitted with wireless receiving equipment. Note the aerial on top.

Wireless telephony—one of the greatest marvels of the present day—is linking concert hall and farmhouse, lecturer's platform and country hamlet.

Up to a few months ago, only one field of activity remained in which wireless telephony—or radio, as it is commonly termed—had not come into active use. This was the motor car. Doubts had been expressed as to whether a radio set would operate satisfactorily in the absence of a ground connection, impossible in the case of a motor car on account of the rubber tyres which are non-conductors.

By operating successfully wireless telephone sets in several of its motor cars in the United States, the Chevrolet Motor Company has recently demonstrated the practicability of radio for automobile use. It has been shown that even without the customary ground connection, the wireless telephone set will receive messages clearly and audibly.

In particular, it has found that radio equipment is suitable for use in sedans, since the tightly-built enclosed body eliminates interference from



The receiving equipment installed in the car.

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Radio Station 2DS.

Jack Davis, of Vacluse, Sydney.

A Youth With a Bright Future.

IN a tower at his parents' home at Vacluse, Jack Davis has a compact wireless room in which all his apparatus is arranged and work carried out. One aerial mast is erected directly over this tower, the actual height being 60 ft., the other pole being 35 ft. high.

The aerial is of the inverted L type, and consists of two 3/20 gauge wires 100 ft. long, with a lead-in of 12 ft. to the tower. The counterpoise is of the fan type, of 3/20 gauge wire about 12 ft. above the ground.

The earth consists of three separate leads of 3/20 gauge wire to water pipes, earth plates and wires buried underneath the aerial.

As the diagram shows, he uses a three-coil circuit in his transmitter with grid modulation. One valve only is used, a UV202 Five Watt Radiotron with an input of 10 watts to the plate circuit which gives a radiation of 1200 milliamps.

The windings on the three coils are as follows:—

Aerial circuit coil, 25 turns No. 14 D.C.C.

Grid coil, 40 turns No. 18 D.C.C.

Plate coil, 45 turns No. 20 D.C.C.

The plate coil is shunted with a .000335 variable condenser.

Kenetron Rectification delivering about 300 volts to the plate.

A variometer is used for tuning the counterpoise.



Aerial at 2DS. The tower on which the aerial mast is erected houses the radio equipment.

(See diagrams page 428.)

The grid condenser is a .001 variable. The High Tension supply is secured by a step up transformer and

The receiving apparatus employs a three-coil circuit with a UV200 Radiotron as detector and a French "R" Valve as an amplifier with a Federal Type audio-frequency transformer.

Some very remarkable work has been accomplished by this station.

Two-way communication has been established with:—

New Zealand 2AD, 4AA and 3AA.

Melbourne 3BY, 3BG and 3DX.

Adelaide 5AH.

The owner and operator of 2DS has received reports that his signals, speech and music have been received strongly in various parts of N.S.W., Victoria, Queensland, Tasmania, South Australia and New Zealand.

He has intercepted signals and messages from the following American amateur stations: 6JD, 6KA, 6ZAD, 6CGW, 6BBC, 6PL, 6CFZ and several stations in the 5th, 7th, 8th and 9th districts.

On long wave he can easily read POZ, LY, YN, KGI, JAA, WQK and WGG.



Jack Davis (2DS) in his radio room at his home at Vacluse, Sydney.
(See diagrams page 428.)

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TRIMM "PROFESSIONAL" HEADSET 3000 Ohms. 45/- per set

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Copper—Beldenamel DCC SCC DSC, for general purposes and panel wiring.
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OBTAINABLE IN SYDNEY FROM:—

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Wireless and Electrical Exhibition

Big Success Assured

Final Appeal to Experimenters

THE opening date of the biggest wireless and electrical exhibition yet held in Australia is now close at hand, and there is every evidence that it is going to be a tremendous success in every way.

The Council of the N.S.W. Division of the Wireless Institute of Australia has done everything possible to make the exhibition worthy of wireless and electricity generally with the object of focussing public attention on these two innovations of our modern social, industrial and business life.

The organising secretary, Mr. F. H. Daniell, has worked hard and successfully to enlist the co-operation of the wireless and electrical supply houses of Sydney, and when the exhibition opens on December 3 the public will have an opportunity of judging the wide scope and high standard of radio and electrical work in Australia.

A special effort has been made to induce wireless experimenters in N.S.W. to exhibit samples of home-made apparatus, either as an individual or club exhibits, and a liberal amount of prize money has been allotted for this particular branch of the exhibition, in addition to which no expense is being spared in making the stands attractive.

As a further inducement to experimenters to exhibit their sets the committee will make all arrangements for collecting the apparatus and returning it after the exhibition, effecting insurance, etc., at its own expense.

The only cost to the exhibitor will be the entrance fee.

It is essential that all entries should be forwarded at the earliest possible moment, and in order to assist those who have no entry forms at hand, one is printed herewith. The committee will be glad if intending exhibitors will make use of it if their entry is not already in. In all cases it must be accompanied by the entrance fee.

SPECIAL CONDITIONS.

Exhibitors will be allotted numbers till after the judging, when exhibitor's name may be displayed on their respective exhibits, if desired.

Prizes in their respective class will be awarded in accordance with the judge's finding.

Exhibitors non-transferable passes will be issued, permitting entry at all times to the Exhibition.

The committee reserves to itself the

right to refuse any exhibit it deems unsuitable.

No exhibit may be removed during the progress of the Exhibition.

In the event of any dispute arising, the decision of the committee to be final and binding on all parties.

Every exhibit upon delivery, must have the exhibitor's name and address securely attached by means of an address tag.

Exhibits will be received not later than Saturday, December 1, 1923.

TO OFFICIAL ORGANISERS OF WIRELESS AND ELECTRICAL EXHIBITION.

Please enter the following for exhibition, under the respective classes set out, for which I enclose fees amounting to and in respect of which entries, I agree to be bound by the conditions attached and by the general Rules and Regulations, of which Rules, etc., I am aware.

A. (Crystal Sets).....	per exhibit	2/-
B. (Single Valve Sets)	" "	3/6
C. (Multi Valve Sets).....	" "	5/-
D. (Transmitters)	" "	7/6
E. (Parts and auxiliary apparatus)	" "	2/-

(Strike out items not intended to be exhibited under.)

I request that you collect and return my exhibits to the undermentioned address.

Signed

Address

Long Wave Stations

Those experimenters who have facilities for tuning to long wave stations will no doubt find the following list useful, the first column showing the length, the second call letters, the third the name of the station, and the fourth column the method of transmission.

Wave Length.	Call.	Name of Station.	Method of Transmission.
2,000	V L A	Awanui (N.Z.)	Spark
2,300	P K C	Sitoebondo	Spark
2,300	P K D	Koepang	Spark
2,300	P K E	Amboina	Spark
2,500	P K X	Malabang	Continuous Wave
3,375	P K F	Ballkapan	Spark
3,375	P K G	Tarakan	Spark
4,800	N P G	San Francisco	Continuous Wave
5,000	J J C	Funabashi (Japan)	Spark
5,000	N P O	Cavite (Manila)	Continuous Wave
8,800	P K X	Malabang	Continuous Wave
9,400	P O Z	Nauen (Germany)	Continuous Wave
9,800	N P L	San Diego	Continuous Wave
11,200	N P M	Pearl Harbour (Honolulu)	Continuous Wave
12,600	P O Z	Nauen	Continuous Wave
14,200	M U U	Carnarvon (Wales)	Continuous Wave
15,200	Y N	Lyons (France)	Continuous Wave
17,750	P C G	Kootwijk-Sambeek (D.I.E.)	Continuous Wave
17,000	N S S	Annapolis (U.S.A.)	Continuous Wave
18,000	P K X	Malabang (D.E. Indies) ..	Continuous Wave
23,400	L Y	Bordeaux (France)	Continuous Wave



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"THE WIRELESS AGE"—America's foremost Radiophone Review, is the most popular American wireless magazine published. Monthly. Price, 2/- Annual Sub., 24/-.

"THE WIRELESS WORLD"—England's pioneer wireless journal. Liked by all experimenters. Weekly. Price, 6d. Annual Sub., 26/-.

"Wireless Press Publications" are the very best on the market. They are authoritative, reliable, and written so that you can understand them!

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SEND FOR OUR FREE CATALOGUE.

Useful Hints and Notes.

CAUSE OF ATMOSPHERICS.

Every wireless experimenter knows of the trouble caused by atmospherics even if he is not aware of their origin.

Under the various names of "atmospherics," "static," "X's," "strays," etc., the trouble is due to electric upheavals in the atmosphere.

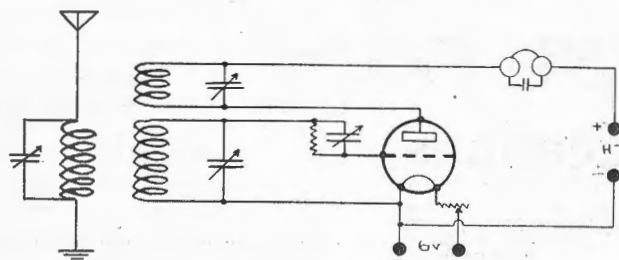


Diagram of Jack Davis's receiving circuit. (See page 424.)

Charges of electricity accumulate in different regions of the atmosphere and on reaching a certain magnitude, discharge. Lightning is caused in the same manner as that in which a spark is caused between the two knobs (or electrodes) of a spark gap. In other words, two cloud layers may become charged up to such a voltage that resistance of the air between them is overcome and a current of electricity "sparks" from one to the other.

In the same way as the spark of a wireless transmitter agitates the surrounding air and produces a certain amount of noise, atmospheric sparks also produce noise in the shape of thunder. Therefore thunder and lightning are due to the one cause, viz., an electric discharge in the atmosphere. Due to the fact that light waves travel much faster than sound waves lightning is always seen before thunder is heard during electric storms. When these atmospheric disturbances occur they set up ether waves, which, like those emanating from a wireless transmitter radiate in all directions and produce vibrations in any receiving aerial within range. These waves are highly "damped" and, as is the case with such waves, are not amenable to tuning. Hence the great difficulty experienced by operators of receiving sets in reading signals when atmospherics are bad.

MEASURING INSULATOR RESISTANCE.

The question is often asked by beginners in wireless work why the resistance of an insulator is sometimes measured in volts when an ohm is the unit of resistance.

One frequently finds references to ohms and volts in connection with

wireless receivers, but the two words are usually employed to denote quite different things. For instance, the battery which lights the valve filament has so many volts, and the high-tension battery also exerts a pressure of so many volts on the plates of the valves. In each case the term is used in reference to an electric

broken down until the knobs have been charged up to a certain voltage. When this is done the resistance of the air is overcome, and a current of electricity flows across the gap in the form of a bright spark. In this way it is possible to indicate the resistance of a thin sheet of air (or ebonite or mica) by stating the number of thousands of volts required to overcome it.

WHEN DOUBLE-WIRE AERIALS ARE UNSATISFACTORY.

If the wires are placed too close together in a twin-wire aerial the results are bound to be unsatisfactory. This is because the wires act to some extent as a condenser. An elementary explanation of why this is so is provided by the working of a simple type of condenser, such as that used in combination with a high resistance to form a "grid leak." This condenser consists of two conductors separated from each other by some insulating material or dielectric.

The capacity of the condenser can be varied by altering the distance between the conductors, which, when brought close together act strongly

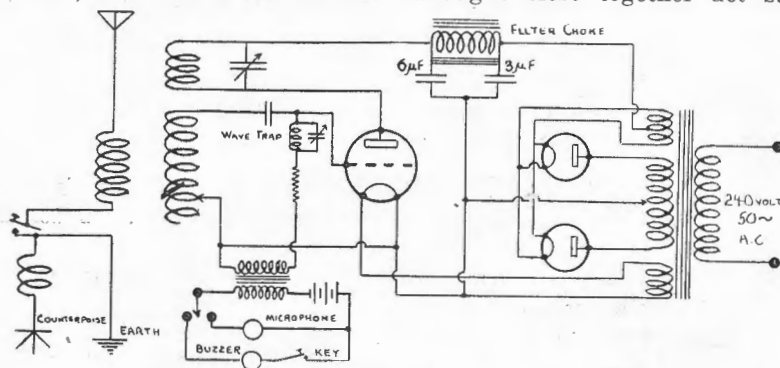


Diagram of transmitting circuit used by 2DS.

battery of some kind or other, whether low or high tension.

The word "ohms" is commonly used to denote a special quality of some instrument other than a battery, viz., its *resistance*.

The high resistance of a grid leak is one of so many thousands of ohms, and the wire in a filament rheostat also has a resistance of so many ohms. The resistance of an insulator can also be expressed by stating the pressure (or voltage) that is necessary to overcome it. The air between the two sides of a spark gap has a very high resistance which cannot be

upon one another and thus increase the capacity of the condenser. Similarly, if separated widely, the condenser capacity is decreased. This self-same effect is experienced in connection with aerial wires. The capacity of an aerial is dependent upon the distance between the wires and, as the capacity is one of the factors which determine the wave length to which an aerial can be tuned most effectively, it follows that the "layout" of the wires is an important point. The greatest efficiency is secured when the wires of a twin aerial are spaced about 5ft.

A Lead for Australia.

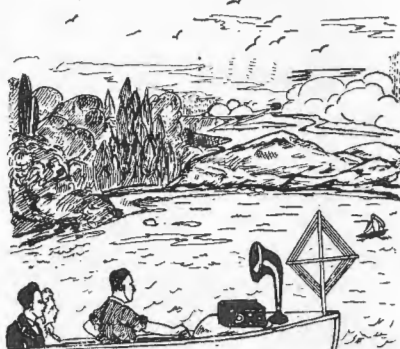
How America Does Things.

Brisbane Man's Impressions.

Mr. John S. Just, manager of the Brisbane City Electric Light Company, returned to Queensland recently from an extended tour of America and the Continent full of enthusiasm regarding the value and application of radio broadcasting in the countries he visited.

After commenting on the desire to remain in constant touch with world happenings which one acquires after an experience of wireless communication at sea Mr. Just remarked:—

"In the matter of broadcasting in general, the progress which has been made in other parts of the world is remarkable. In America daily programmes are broadcasted. These comprise musical items, talks to housewives on domestic economy,



speeches by public men on highly diversified topics, bed-time stories, and reproductions of plays from the theatres, including the applause or disapproval of the audience.

"In addition, broadcasting is utilised in the sending out twice daily of international news items, weather reports, and market quotations.

"When the latter item is inaugurated in this country it will prove a tremendous boon to the primary producer, who will be able to ascertain at first hand the state of the market, and regulate the shipment of his produce accordingly.

"The prices of the sets range from £5 to £50, and in consequence the number of 'listeners-in' is legion."

(Mr. Just will be pleased to learn that the progress which he found so marked in America will be equalled, if not excelled in Australia within the next few months.—Ed. *Radio*.)



£2/5/- each.

WE BEG TO PRESENT TO THE AUSTRALIAN PUBLIC THE

AUDIOLA

BROADCAST RECEIVING SET,

a high-class product, combining first-class design and technical skill, with cabinet work of elegant artistry. — *Made in Australia.*

WITH AUDIOLAS ARE SUPPLIED No. 2-A

STROMBERG CARLSON HEADPHONES.

Durable, Comfortable, Accurately Reproduces Voice and Music.

See Stand No. 11 at the Wireless and Electrical Exhibition — or write us.

L. P. R. BEAN & CO., LTD.
229 Castlereagh Street, SYDNEY.

Experimental Station "4CM"

Dr. Val. McDowall, Brisbane

THERE are, perhaps, few better-known radio amateurs in Australia than Dr. Val McDowall (4CM), Preston House, Brisbane. His broadcast programmes have for a long time provided the main bill of fare for "listeners-in" throughout Queensland and northern New South Wales, and the following particulars of his station, should prove of interest to amateurs throughout the Commonwealth.

Mr. T. M. B. Elliott is the "man behind the gun" at Preston House. The mechanical side of the station—essentially the major portion of the work—has fallen on his shoulders and he has acquitted himself admirably.

The aerial consists of two navy type cages, designed for a wave-length of 900 metres, the fundamental wave-length being 610 metres. Although it has proved highly efficient for transmission, its success as a receiving medium has not been so marked, and in consequence a two-wire ship aerial has been installed, having a fundamental wave-length of

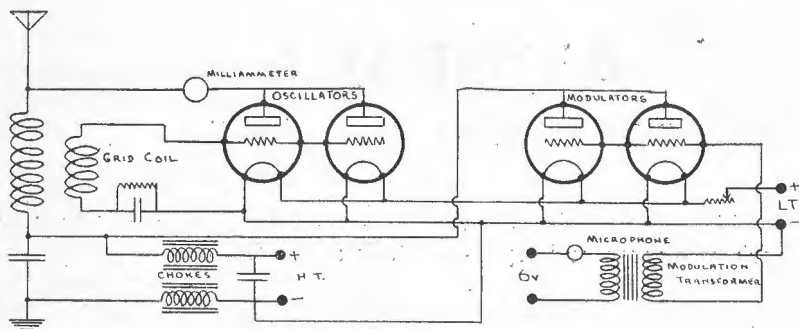


Mr. T. M. B. Elliott, operator 4CM, "tuning in."

The earth used connects all the ironwork in the building, and no counterpoise is necessary owing to the construction of the aerial.

The circuit is of simple design, and has proved very effective in picking up weak signals. Honeycomb coils are used. The switchboard below the receiver panel controls the accumulator battery, and has the necessary meters, switches, and fuses attached. The accumulator battery consists of two sets of Cox's accumulators—one set (12 volts) connecting with the light filament tubes, and the other (16 volts) with the local modulating circuit. The batteries are placed in the bottom of the cabinet.

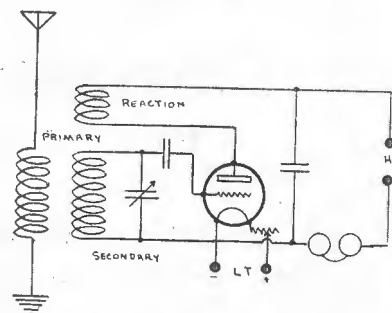
(Continued on page 447.)



Circuit of 4CM's Transmitter.

540 metres. The feed wires on the main cage aerial are of single 10-gauge copper wire, as compared with the four single 12-gauge wires in the aerial itself. The construction was planned in this manner in order to reduce the capacity of the aerial, which is in close proximity to some iron pipes which are earthed, and which are also adjacent to the feed wire all the way down the wall.

The photograph shows the set with Mr. Elliott at the controls. The receiver which can be seen in the top right-hand corner of the photograph consists of one radiotron valve as a detector. It was found by experiment that amplification was unnecessary, owing to local interference, and in consequence only one valve is used. Most of the condensers are shunted by verniers, to enable very fine adjustments to be made,



Receiving Circuit at 4CM.

Wireless in the West

(By Our Special Correspondent.)

THE Western Australian Division of the Wireless Institute of Australia held its usual monthly meeting at the Central Fire Station, Murray Street, on October 25 last, when Mr. Holt, President of the Institute, gave a very interesting lecture and demonstration on "Electrical Hazards from a Life Standpoint."

At the fortnightly meeting of the Subiaco Radio Society, Mr. A. E. Stevens (Hon. Technical Adviser) delivered a lecture on "Wavemeters, Design, Calibration and Use" to a large attendance of members.

A sad bereavement has befallen Mr. W. E. Coxon, one of the pioneers of Wireless in West Australia, whose only son, aged 17 months, passed away on October 5, after a short illness. Amateurs throughout W.A. join in offering Mr. and Mrs. Coxon their heartfelt sympathy.

In connection with the broadcasting station to be erected by the Westralian Farmers Ltd., it was originally planned to instal a 2-3 kilowatt transmitter, capable of being heard through average receivers up to 300 miles. As a result of overtures by pastoralists that plan has been abandoned and a 5-6 kilowatt transmitter with a range of 600 miles is being installed.

The sixth general meeting of the Mount Lawley Radio Club took place in Wallish's Hall, Mount Lawley, on November 2. Messrs. McCallum Smith, M.L.A., C. P. Knapton, W. E. Coxon, and T. Muir accepted the office of patrons of the Club.

Three new members were elected. Messrs. Herbert Fitzgerald, John Kay Hall, and Alfred Stevens.

Successful Students.

The following students of the Marconi School of Wireless were successful in gaining a first-class certificate of proficiency in wireless telegraphy at an examination held in Sydney on October 30, 1923:—Messrs. E. Reithmuller, H. J. Edwards, H. E. Oates and L. W. Moore.

Radio Broadcasting

How to get what you want—
when you want it



IT at home in your easy chair and hear the news and songs and music of the large cities on a "Col-Mo" Broadcast Receiver. Select from the air the music to meet your mood—Grand Opera or Jazz, Chorus or Orchestra, Recitals or Church Services.

Recitals or Church Services.

Listen to Lectures, Speeches, Weather Reports; Crop, Market and Stock Reports; to Theatre, and the Bedtime Stories for the Kiddies. WITH A "COL-MO" Receiver you get clear music, with perfect articulation, absolutely free from distortion, from the Station you tune in on.

Until you have listened in on a "Col-Mo" set you cannot guess the real pleasure and fascination of Radio.

Be satisfied with nothing less than the ultimate attainment of the Radio science.

APPARATUS AND PRICES TO SUIT ALL.

The Colville-Moore Wireless Supplies

10 Rowe Street,
SYDNEY.

The Wonders of Radio

(Continued from Page 413)

tures on the screen of your own parlor. Imagine the little girl's matter-of-fact importance as opera director. Does she not hold in her hand the official "parlor radio programme" for the evening?

Truly! The year in the title of the world-famous book, "Looking Backward," by Edward Bellamy, should be changed from "2000-1887" to "1923-1887."

A well-known American radio magazine, published monthly, in a recent issue brings under the proper headings:—

"THE WHIRLING GLASS RINGS THAT PERFORM THE WONDER."

"These two glass discs (one of which revolves 100 times as fast as the other) literally "pick a picture to pieces." The "pieces" consist of horizontal lines of light and shadow that are traced from the film and are flicked across the screen at the rate of 16 complete pictures a second. The inventor, C. Francis Jenkins, is shown operating the device."

Another item illustrated:—

"THE BELIN APPARATUS RECEIVES A PICTURE BY RADIO."

"The sliding arm, seen in the picture with the two wires attached, slips across the rotating drum and records the picture that is being transmitted. It is the invention of a French professor, Edouard Belin."

Here is a third illustrated item of wireless news in the same magazine:—

"THE MAN WHO SENDS A PICTURE BY RADIO ACROSS THE OCEAN."

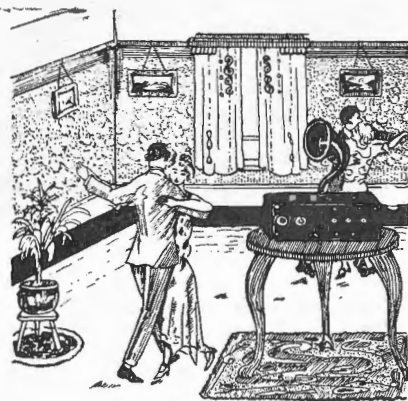
"Dr. Korn, the inventor, transmitted a photograph on June 7, 1922, from Sanpaolo, Italy, to Bar Harbor, Maine. The apparatus translates the picture into a series of code letters, which are decoded at the receiving stations, and printed on a typing machine that makes dots and dashes of varying intensity."

\$30,000 IS THE COST OF ONE AMATEUR RADIO STATION.

All this, together with an illustration of the "Finest amateur station in the world," having three call letters, 8BSS, 8AQO, and 8XH, located in Cazenovia, New York, and costing 30,000 dollars (approximately £6000), was also illustrated and described.

ONE MILLION READERS.

The magazine referred to is only one of the numerous radio publications, which have in the aggregate more than one million readers. One of them has a circulation of a quarter of a million per month, and weighs one pound. And there were only two wireless journals ten years ago.



WHAT IS NEXT IN RADIO?

The number of firms and corporations in the New York telephone book, having telephone connections, not directly connected with radio, are nearly 100.

There are:—Radio Button Co., Radio Cloak and Suit Co., Radio Clothing Co., Radio Costume Co., Radio Dress Co., Radio Drug Co., Radio Embroidery Co., Radio Fur Co., Radio Garage, Radio Garment Co., Radio Hat Co., Radio Knitting Co., Radio Laundry, Radio Leather Goods Co., Radio Meat Market, Radio Real Estate Corp., and many other too numerous to mention.

599 RADIO BROADCASTING STATIONS NOW WHERE THERE WAS NOT ONE TWO YEARS AGO.

The number of radio broadcasting stations in the United States and Colonies is 599—where there was only one as little while ago as September, 1921. The number of radio broadcasting stations in Canada and British Columbia is 59, where there was not even one a year ago.

The total number of radio broadcasting stations outside of the United States and Canada, in operation, under construction and projected is estimated to be many thousands, while the number of radio stations and radio sets in the United States and Canada is more than 1,000,000. The amount of capital invested in wireless and radio is more than one thousand million dollars (approximately £200,000,000).

At a meeting of the subscribers to Babson's Statistical Bureau (Mr. Babson lecturing), held in Cooper Union Hall, on November 10, one of the audience of 6,000 got up and asked this question: "What do you think of the future of radio, Mr. Babson? Whereupon Mr. Babson threw up his hands and stated: "If I had my entire fortune tied up in the gramophone industry, at a very high price (selling at about 1,000 dollars a share), dividend-paying and handing out bonuses, I would sell every share of it and place it in the foremost wireless and the foremost radio companies."

This is a significant expression, looking as it does to the future of the wireless and radio, coming as it does from one of the foremost analysts, statisticians and market-and-investment forecasters in the United States to-day.

DON'T FORGET—the Wireless and Electrical Exhibition in the Sydney Town Hall from December 3 to 8.

Brisbane Notes.

(By Our Special Correspondent.)

Mr. T. W. Bridger, who, in addition to being Radio Inspector, is President of the Queensland Institute of Radio Engineers, has in course of construction what should prove to be one of the finest amateur sets in Australia. He plans to fit into a writing desk a three-valve receiving set, two transmitting panels, and a 12-valve receiving set for long distance messages. He has just dismantled his 10-valve combination, with which he achieved wonderful results, and the new set should be switched into operation early in the New Year. It will certainly be something of outstanding interest to amateurs who are limited to two-valve and three-valve combinations.

During the past few weeks amateurs in Brisbane have heard 4CM repeatedly calling Pearl Harbour (Honolulu), and inquiry elicited that Mr. T. M. B. Elliott, Dr. McDowall's energetic mechanic, was endeavouring to establish communication with that station but at time of writing his efforts had not met with success.

Westralian Farmers Ltd. to Broadcast.

The honour of being the pioneers of broadcasting in W.A. looks like being annexed by Westralian Farmers Ltd.

Details have been almost completed, and the information so far available discloses that the Company is sparing no expense in an effort to achieve good results.

One of the most up-to-date broadcasting sets available will be installed, and the whole of the arrangements will be supervised by Mr. W. E. Coxon, who will act as technical adviser to the Company.

The programmes will consist mainly of matter of direct value to farmers, pastoralists and country residents generally. It will embrace news, market reports, musical and other entertainments, church services, speeches by visitors and prominent citizens and any other items required by residents outback.

The station is expected to be in full working order within three months.



Quality Radio

We are importers, manufacturers and suppliers of all
Wireless and Electrical Apparatus.

Complete sets for all wave lengths.
All parts for amateur constructions.

Allow us to furnish you with quotation for a complete
Wireless or Electrical Installation.

*Authorised to issue Licenses (both Government and Broadcasting)
for Farmer & Co. and Broadcasters (Sydney) Ltd.*

Daily Demonstrations at our Showrooms.

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Everything Electrical

60-62 Goulburn Street (one door from Pitt Street),

Sydney

ESTABLISHED 1904

Experimental Call Signs

NEW SOUTH WALES.

2AJ Short, W., Queenscliff Road, Manly.
 2AL Cooper, A. E. C., "Edale," Cecul Street, Ashfield.
 2AR Hudson, W. H., 1 Terrace Road, Dulwich Hill.
 2AS Grigg, H. E., 370 Military Road, Mosman.
 2AY Curston, J. C., "Maruna," Burwood Road, Burwood.
 2BB Crocker E B., 14 Roseby Street, Marrickville.
 2BF Forsythe, L. E., Sailor Bay Road, Northbridge.
 2BM Vears, E. T., "Pipitea," Cross Street, Leura.
 2BV Waverley Am. Radio Club, 42 Evans Street, Waverley.
 2BY Arnold, E. C., Carthage Street, Tamworth.
 2CA Bonwill, E. W., Cowra.
 2CI Charlesworth, E. H., 173 Parramatta Road, Haberfield.
 2CJ Sewell, P. L. H., 12 Dillon Street, Paddington.
 2CL Caletti, G., c/o. P. L. Stonewall, 83 King Street, Newtown.
 2CM MacLurcan, C. D., "Namanula," Agnes Street, Strathfield.
 2CR Todd, L. V. G., Dennison Street, West Tamworth.
 2CS Swain, L. T., 49 Everton Street, Hamilton.
 2CZ Exton, C. W., Lismore.
 2DE Renshaw, R. P., "Waimea," Lord Street Roseville.
 2DH Mawson, E. R., "Daisydale," Wonga Street, Campsie.
 2DK Whitburn, R. P., 7 Hatheon Street, Leichhardt.
 2DN Blanchard, G. E. H., 60 Bligh Street, Newtown.
 2DS Davis, R. R., Fisher Avenue, Vaucluse.
 2EC Gorman, C. A., 31 Segenhee Street, Arncliffe.
 2ED Gregory, H. R., "Gerrobbar," Walton Crescent, Abbotsford.
 2FA Colville, S. V., 10 Rowe Street, Sydney.
 2FF Western Suburbs Radio Assn., 77 Park Road, Auburn.
 2GQ Barlow, E., Faulkner Street, Armidale.
 2GR Marks, J. S., Ritz Flats, Salisbury Road, Rose Bay.
 2GU Dunn, R., 324 Anzac Parade, South Kensington.
 2GY North Sydney Radio Club (G. McClure), cnr. High and Alfred Streets, North Sydney.
 2HH Wireless Institute (N.S.W. Div.), Queen's Chambers, Dalley Street, Sydney.
 2HP W. J. Maclardy, 46 Murdoch Street, Cremorne.
 2HY Bongers, G. S., "Marmora," Lawson Street, Rockdale.
 2IJ Gray, A. H., Florence Street, Killara.
 2IN Payne, J., 143 Avoca Street, Randwick.
 2IX Burwood Radio Club, 203 Burwood Road, Burwood.
 2JH Spencer-Nolan, J., Bellevue Road, Double Bay.

2JM Marsden, R. C., Victoria Road, Edgecliffe.
 2JN Wireless Electric Co., Aquarium Buildings, Coogee.
 2JT Luckman, C., 14 Queen Street, Croydon.
 2KC Fry, R. H. Brighton Street, Croydon.
 2LI Cooke, F. B., 23 Lang St., Sydney.
 2LO Schultz, L. N., "Waraba," Burns Bay Road, Lane Cove.
 2MA Amalgamated Wireless, Ltd., 97 Clarence Street, Sydney.
 2MB Amalgamated Wireless, Ltd., 97 Clarence Street, Sydney.
 2MC Amalgamated Wireless, Ltd., 97 Clarence Street, Sydney.
 2MD Amalgamated Wireless, Ltd., 97 Clarence Street, Sydney.
 2MJ Newman, W. H., Cooney Road, Artarmon.
 2MR Stewart, J. E., Garrick Street, Mayfield, Newcastle.
 2MU Nangle, J., Tupper St., Marrickville.
 2OI Whitaker, A. T., 31 Railway Crescent, Banksia.
 2SO Newcastle Radio Club, 25 Winship Street, Hamilton.
 2SP Evans, R., "Garth Craig," 6 Flood Street, Clovelly.
 2ST Tatham, S. E., "Stonehenge Flats," Kurraba Road, Neutral Bay.
 2SX Slade, H. C., "Rockleigh," Lang Street, Croydon.
 2UI Illawarra Radio Club, 75 Montgomerie Street, Kogarah.
 2UR Creamer, A. H., 10 Hereford Street, Glebe Point.
 2UU Roberts, R. G. C., 9 Church Street, Ashfield.
 2UW Sandel, O., Mooramie Avenue, Kensington.
 2VX McIntyre, D. G., Livingstone Avenue, Pymble.
 2WU Morley, W. H., Rangers Avenue, Watersleigh.
 2WV Burgin Electric Co., Kent Street, Sydney.
 2YD Donne, C. W., "Lansdowne," Manns Avenue, Neutral Bay.
 2YP Bergen, M. W., "Keera," West Maitland.
 2ZA Keogh, W. G., 11 Victoria Square, Summer Hill.
 2ZB Balmain District Radio Club, 29a Ballast Point Road, Balmain.
 2ZC Lavington, E. M. E., 7 Blandford Avenue, Waverley.
 2ZD Brain, S. F., 85 Bland St., Ashfield.
 2ZE Laker, F. J. F., Harfleur Street, Deniliquin.
 2ZF Newtown District Radio Club, 83 King Street, Newtown.
 2ZG McIntosh, R. E., Burns Bay Road, Lane Cove.
 2ZH New System Telephones Co., 280 Castlereagh Street, Sydney.
 2ZI Dixon, R. H., c/o. C.S.R. Co., Condong, Tweed River.
 2ZJ Simpson, A. W., Duri.
 2ZL Otty, W., Killingworth.
 2ZK Marsh, S., Carrington Street, West Wallsend.
 2ZM Deane, P. M., Clarence St., Burwood.
 2ZN Cottrell, J. W. M., 23 Dolphin Street, Randwick.

2ZR Perdiau, W. J. S., 47 East Esplanade, Manly.
 2ZT Bean, L. P. R., 86 Muston Street, Mosman.
 2ZU Gilmour, N. G., 156 Kurraba Road, Neutral Bay.
 2ZV Universal Electric Co. (A. L. Dixon), 244 Pitt Street, Sydney.

VICTORIA.

3AM Dohrmann, G. S., 2 Hopetown Avenue, Canterbury.
 3AP Morris, R. D., 6 Bealiba Road, Caulfield.
 3AY Jenvy, W. W., 12 Lord Street, East Caulfield.
 3BD Cox, E. H., 5 Gibson Street, Elsternwick.
 3BG Osborne, L., Terang.
 3BH Whitelaw, C. R. Mooroolbark.
 3BL Fitchett, J. C., Salisbury Street, Balwyn.
 3BM Love, H. K., "Lindum," Ferncroft Avenue, East Malvern.
 3BP Hood, J. H., 6 Alexandra St., East St. Kilda.
 3BQ Howden, W., Hill Street, Box Hill.
 3BU Connolly, D. A., "Larnokk," Balclava Road, East St. Kilda.
 3BY Holst, H., 27 Bambra Rd., Caulfield.
 3CC University of Melbourne, Melbourne.
 3DB Hobart-Duff, 27 Westgarth Street, East Malvern.
 3DD Osborne, L. F. G., "Louisville," Darling Road, East Malvern.
 3DL Fells, L. C. North Road, Caulfield.
 3DV Beattie, H. S., 1 Bishop Street, Box Hill.
 3DX Van Cooth, J. R., Wattletree Road, East Malvern.
 3EC Y.M.C.A., Am. Wireless Society, cr. Short and High Streets, Bendigo.
 3EM Doudney, H. W., Holy Trinity Vicarage, 7 Dickens St., Balclava.
 3EP Gwens, J., 19 Logan Street, Canterbury.
 3FH Hall, R. F., Glindabourn Avenue, Toorak.
 3FM Decrespy, R. C., 20 Black Street, Middle Brighton.
 3HH Maughan, F. H., 15 Staniland Avenue, Malvern.
 3HQ Good, E. J., "Rock Grove," Private Mail, Glenrowan.
 3JP Mitchell, H., Kean Street, Caulfield.
 3JR Dunstan, W. J., 7 Cameron Street, Ballarat East.
 3JU Hull, R. A., 38 Charnwood Road, St. Kilda.
 3JZ Whalley, R. P., "Enmore," Bridge Street, Sandringham.
 3LQ Downey, W. E., Hopkins House, Hopkins River, Warnambool.
 3LS Busch, R. T., 30 Wordsworth Street, Moonee Ponds.
 3LW Heam, C., 222 Carlisle Street, St. Kilda.
 3MA Amalgamated Wireless, Ltd., 422 Little Collins Street, Melbourne.
 3MB Amalgamated Wireless, Ltd., Koo-wee-rup.
 3MC Amalgamated Wireless, Ltd., Canterbury.
 3MD Amalgamated Wireless, Ltd., in the vicinity of Melbourne.

- 3ME Amalgamated Wireless, Ltd., in the vicinity of Melbourne.
 3MF Amalgamated Wireless, Ltd., in the vicinity of Melbourne.
 3MP Hosken, S. V., 42 Melville Street, Hawthorn.
 3OK Conry, W. H., 32 Irving Avenue, Armadale.
 3PO Roberts, A. H., 103 Bent Street, Northcote.
 3QW Muir, J. A., 10 Young St., Brighton.
 3RF Cordingley, C. H., 77 Bank Street, E. Ascot Vale.
 3RG Humbert, S. G., Waverley Road, East Malvern.
 3SM Gay, A. H., Warragul.
 3SX Steane, G. W., Earle Street, Mont Albert.
 3UI Dalton, R. M., San Mateo Avenue, Mildura.
 3VR Abbot, R. N., "Fleu-de-Lis," St. Elmo Avenue, Alphington.
 3VS Philpott, O. J., 26 Lumeah Road, Caulfield.
 3XF Chaffer, M., 41 Norwood Crescent, Moonee Ponds.
 3XN Leaney, W. G., 12 Henry Street, Northcote.
 3ZA Bardin, W. F., 226 Station Street, North Carlton.
 3ZB Dixon, R. H., 1 Hopetoun Avenue, Canterbury.
 3ZC Brock, H. E. E., 8 Ngarveno Street, Moonee Ponds.
 3ZD Taylor, C. F., 133 High Street, Kew.
 3ZE McGregor, K. W. A., 23 Molesworth Street, Armadale.
 3ZI Barbour, K. H., 1 Irving Avenue, Armadale.
 3ZJ Lempriere, C. L., Terrara Road, Vermont.
 3ZK Bradley, F. R., Beach Crescent, Sandringham.
 3ZN Israel, M. S., 53 Blessington Street, St. Kilda.
 3ZM Owen, C., 22 Kendall Street, South St. Kilda.
 3ZO Johnson, E. H., 105 Moorabool St., Geelong.
 3ZP George, H. A., 195 Ballarat Road, Footscray.
 3ZQ Ballarat Radio Club (J. Matthews), Y.M.C.A., Ballarat.
 3ZR Snaith, S. L., 1 Byron Street, Footscray.

QUEENSLAND.

- 4AC Waters, L., Rankin Street, Innisfail.
 4AE Wireless Institute (Qld. Div.), Edward Street, Brisbane.
 4AK Milner, J., Kelvin Grove, Brisbane.
 4AN Gibson, E. McL., Greenslopes, Brisbane.
 4AU Finney, W., Arthur Terrace, Red Hill, Brisbane.
 4BI Junction Park Radio Club, St. Leonards, Yeonga, Brisbane.
 4BW Cooper, A., Byrne Street, Mareeba.
 4CC Isles, C. W., Charlton Street, Ascot, Brisbane.
 4CG Stephens, A. N., Railway Parade, Clayfield, Brisbane.

- 4CH Dillon, A. E., Brown Street, New Farm.
 4CK Norris, E. L., Hume Street, Too-womba.
 4CM McDowall, V., Preston House, Queen Street, Brisbane.
 4CS Geraghty, J. A., Christian Bros. College, Townsville.
 4CV Husband, N. E., Aland Street, Charters Towers.
 4EH Miller, H., "Broadway," Kitcheners Road, Ascot.
 4EI State Engineer, G.P.O., Brisbane.
 4EZ Institute Radio Engineers, Bowen Terrace, Brisbane.
 4FA Bright, W. H. H., Hume Street, North Toowoomba.
 4FE Y.M.C.A., Edward Street, Brisbane.
 4FJ Price, J. C., Bardon Estate, Paddington Heights.
 4FK Mathews, F. T., 57 Anne Street, New Farm.
 4GC Maryborough Wireless Club, Richmond Street, Maryborough.
 4GE Fortescue, C., Arthur Street, Toowoomba.

SOUTH AUSTRALIA.

- 5AC Cook, V. R. P., 37 Johns Road, Prospect.
 5AD Snoswell, A. R., Harris Street, Exeter.
 5AE Honnor, J. H., Alpha Rd., Prospect.
 5AH Williamson, F. L., 25 Dequetville Terrace, Kent Town.
 5AI Lloyd, H. H., 16 Trinity Street, College Town.
 5AV Wireless Institute (S.A. Div.), 20 Grange Road, Hindmarsh.
 5AW University of Adelaide, Adelaide.
 5BD Earle, F. E., 321 Fifth Avenue, St. Peters.
 5BF Miller, F. G., Murray Bridge.
 5BG Kauper, H. A., 20 Gurney Street, Dulwich.
 5BI S.A. School of Mines and Industries, North Terrace, Adelaide.
 5BN Austin, H. L., 8 Parade, Norwood.
 5BP Caldwell, W. A., 53 Hughes Street, Unley North.
 5BQ Jones, L. C., Carlisle Road, Westbourne Park.
 5DN Jones, L. C., 146 Rundle Street, Adelaide.
 5DO St. Peter's College Radio Club (F. B. Oldfield), St. Peter's College, Adelaide.
 5FT Fitzmaurice, J. S., St. Andrews Street, North Walkerville.

WESTERN AUSTRALIA.

- 6AB Cecil, C., 75 Duggan Street, Kalgoorlie.
 6AC Spark, J., 23 Mount Street, Perth.
 6AF Sibly, A., 38 Park St., North Perth.
 6AK University of West Australia, Perth.
 6AM Kennedy, P., 210 Wolcott Street, Mt. Lawley.
 6AQ Mathews, V. J., Beechboro Road, Bayswater.

- 6BG Technical School, Perth.
 6BH Burrows, F. H., 9 John Street, Claremont.
 6BP Stott's Business College, St. Georges Terrace, Perth.
 6BR Wireless Institute (W.A. Div.), St. George's Terrace, Perth.
 6BT McNail, N., Perth Boys' School, Perth.
 6BU McNail, N., Perth Boys' School, Perth.
 6CJ Darley, E. J., Darley Street, South Perth.
 6CZ Saar, A., Grey Street, Northam.
 6DA Law, F. W., cr. Bedford and Bunbury Roads, Annandale.
 6DD Bishop, C. E., Grey Street, Albany.

TASMANIA.

- 7AA Watkins, W. T., 146 Warwick Street, Hobart.
 7AK Deegan, S. C., St. Virgil's College, Hobart.
 7AQ McCabe, W. B., Clarence Point, West Tamar.
 7BK Preston, T. A. C., Railway Row, Queenstown.

NEW ZEALAND.

- 1AA Edwards, N., 42 Collins Street, Auckland, 5 watts.
 1AB Penney, —, Auckland, 5 watts.
 1AC Spackman, L., Herne Bay, Auckland, 5 watts.
 1AH —Hartle & Gray, Auckland, 50 watts.
 2AB D. Wilkinson, Motueka, Nelson, 5 watts.
 2AC O'Meara, —, Gisborne, 50 watts.
 2AD Stevens, C., Gisborne, 5 watts.
 2AE Patty, —, Gisborne, 5 watts.
 2AF Sinclair, —, Gisborne, 50 watts.
 2AG Ewen, —, Wanganui, 5 watts.
 2AH Radio Club, Wanganui, 50 watts.
 2AI Harrison, —, Wellington, 5 watts.
 2AJ Branagrove, Stratford, 5 watts.
 2AK Rawson, —, Hawera, 5 watts.
 2XA Shrimpton, —, Chief Telegraph Engineer, Wellington, 50 watts.
 3AA Orbell, R. J., 154 Heaton, Merivale, Christchurch, 50 watts.
 3AB Vincent, —, Christchurch, 20 watts.
 3AC Radio Society, Christchurch, 15 watts.
 3AD Blake, —, Greymouth, 5 watts.
 3AF Ball, —, Christchurch, 5 watts.
 4AA Bell, —, Palmerston South, 50 watts.
 4AB Otago Radio Association, Dunedin, 50 watts.
 4AC Robinson, —, Dunedin, 50 watts.
 4AD Jordan, —, Invercargill, 50 watts.

N.Z. BROADCASTING STATIONS.

- 1YA Auckland Broadcast Station, 300 metres, 250 watts.
 4YA British Electric Co., Moray Place, Dunedin, 500 watts.
 4YO Dunedin Broadcast Station, uses four 250 watt tubes, two as oscillators, two as modulators.

THE WIRELESS & ELECTRICAL EXHIBITION
 at the TOWN HALL, SYDNEY, from DECEMBER 3rd to 8th.
BE SURE AND SEE IT!

The Experimenters Come

Tell all your friends about the Wireless and Electrical Exhibition to be held in the Sydney Town Hall, from December 3 to 8 inclusive. It will prove an eye-opener to all.

Hints on Soldering.

Cleanliness is the great point to observe in soldering. Failure is impossible if care is taken to see that the wires are free from dirt of any description, and the soldering iron has a clean, tinned surface. It is well

is not made of spirits may be employed. Spirits is excellent for most outdoor work, but if used for soldering instruments, the residue, no matter how small, will, in time, corrode the wires.

WHY "LISTENERS IN" SHOULD BUY "RADIO."

In every home where a broadcast receiving set is installed "Radio" magazine will become a necessity:—

- (1) Because it will feature useful and necessary information regarding the operation of broadcast receivers.
- (2) It will tell you how to get the utmost pleasure and benefit out of broadcasting.
- (3) It will contain an up-to-date and authentic record of what is doing in broadcasting circles throughout Australia.
- (4) It will support at all times the principle of high-class services, such as will give "listeners in" throughout Australia the full benefits of this latest and greatest method of communication—radio telephony.

"Radio" will cost you 10/- per annum, but to the home where a receiving set is installed it is worth ten times that amount. Place your order to-day!

to procure an iron of reasonable size, and before tinning it file a groove across one of its sides. When this groove is well tinned it will greatly facilitate the soldering of large wires, as the wire can rest in the groove and the solder be applied more effectively.

If the iron is properly tinned the surface will last for quite a long time provided it is not overheated.

A gas ring makes an ideal flame at which to heat the iron. It provides an even heat without too great an intensity.

As already mentioned the wires must be cleaned thoroughly, preferably with a blunt knife, as it leaves no dirt behind like cloth or emery paper.

The best solder to use for wireless work is one containing a large proportion of tin. To test whether this is present in any stick you are about to buy is a simple matter. If the stick is placed close against the ear and bent the presence of tin will be denoted by a good crackling sound. If this crackling sound is not heard or is very faint the solder is composed mostly of lead.

Resin is probably the best flux to use, but any well-known flux which

If the soldering job consists of attaching a number of tappings from an inductance to a number of studs the best plan is to first of all clean and tin the tapping, and then treat the studs similarly. If the tappings are then taken singly and placed one each against a stud and a warm iron applied, the joint will be effected immediately. If all work is done in this way loose connections are impossible.

A MARCONI STORY.

Signor Marconi tells an amusing story concerning an applicant for a job at an electric power station whose knowledge was small, to put it mildly.

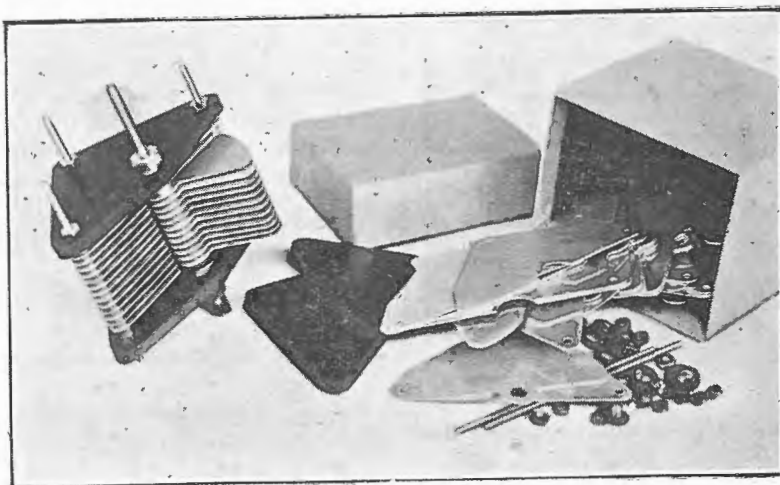
The busy foreman of works, wishing to learn what were his qualifications for the post, led off by asking him what was ordinarily used as a conductor of electricity.

Applicant (all at sea): "Why—er—"

Foreman: "Wire. Correct! Now tell me what is the unit of electric power?"

Applicant: "The what, sir?"

Foreman: "Exactly, the watt. Very good; that will do. You may sign on for the job."



TUNE IN THE BROADCASTERS

with a variable condenser. Make your own with a set of parts.

PRICES:

Size.	No. of Plates.	Set of Parts.	Same Assembled.
.0002	5	7/6	8/6
.0003	9	8/6	10/-
.0005	17	11/-	12/6
.0008	25	13/6	15/6
.001	35	16/-	18/6

Vernier Adjustment, 7/6 extra.



RADIO HOUSE,

619 George Street,
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Telephone: City 1487.

A Cheap Crystal Receiver.

RCEPTION by means of a crystal receiver is generally the first experiment carried out by the beginner in radio principally owing to the simplicity and low cost of the apparatus. The receiver described below was constructed at a cost very little in excess of that of the telephone receivers, and by following the description given herewith a duplicate in appearance and performance will result.

The cabinet consists of a cigar box large enough to accommodate 100 of these fragrant weeds. This can be obtained from a tobacconist for a small sum. It must be sandpapered smooth to remove all the trademarks, etc., and then stained with some good grade of wood dye such as Johnson's Mahogany Stain, which gives a pleasing colour. Remove the bottom of the box carefully, and cut a piece of wood for the sliding baseboard of a length to slide smoothly inside. To this baseboard will be screwed the ebonite panel carrying the switches and crystal detector as shown in Figures A and B. The panel consists of a piece of ebonite one-eighth of an inch thick and of sufficient size



FIG. A.

Rear view of Panel and Containing Box.

to make a complete cover for the open end of the box. Before screwing it to the baseboard, mark out the positions for the various contact studs, switches, terminals and detector. To make absolutely sure of the position of each hole, prepare a full size drawing on some stout paper and use it for a template by tacking it lightly to the panel with a few touches of Le Pages glue.

Next for consideration comes the tuning element. This is provided by

two single layer inductances wound with No. 30 gauge double silk covered wire. The coil behind the two ten point switches is wound with 100 turns of wire so connected that the top switch controls one turn at a time, and the bottom one in steps of ten. This allows of close control over the entire range of the coil. The former is constructed from a piece of three-inch cardboard tubing which



FIG. B.

Top view of Panel, showing coils and switches.

has been dipped in paraffin wax to make it moisture proof. If tubing of this size is unobtainable from any of the experimental supply houses, an empty container used for "Snow Glow" or "Old Dutch Cleanser" will make a good substitute. When winding the coil make a six-inch loop at each point where a tap is taken off. This when threaded through a piece of bicycle valve or No. 3 surgical rubber tubing provides the connecting lead to the multi-point switch. The other coil is used to load the first inductance when it is desired to tune

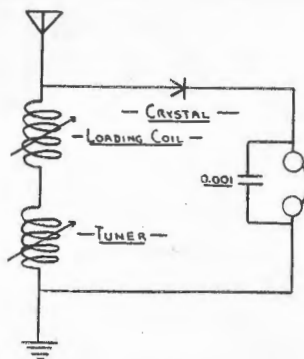


FIG. C.

Circuit of Receiver.

to longer wave-lengths than that capable with the latter. A winding of 180 turns is placed on this coil and it is divided into three sections of 60 turns each. These sections are wired

to the four point switch on the right of the ten point switches.

For the crystal detector any of the units sold by experimental houses may be used, but if the experimenter already has a small one available its parts can be mounted on the panel where shown in the illustration. Across the terminals provided for the telephones is connected a fixed condenser of 0.001 microfarads capacity to act as a reservoir for the rectified radio frequency impulses passed by the detector.

When wiring up the switches do not solder the leads to the contact studs or trouble will be experienced owing to the ebonite panel shrinking and allowing them to come loose. It is far preferable to use two nuts and a washer for this purpose. The coils are screwed to the baseboard by means of two wooden discs fitted into each end.

A cheap and simple switch arm is made by using a piece of spring brass bent to shape and held in a terminal with a hard rubber top. This type of terminal costs about sixpence each, and the contact arm can be cut to shape with a pair of tin snips.

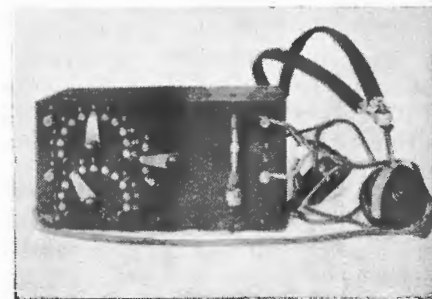


FIG. D.

Complete Receiver.

The lettering on the panel of the receiver described above was done by means of steel letter stamps and Windsor and Newton's Chinese white water colour paint applied with an ordinary steel pen. The letter stamps should be heated in a clean gas flame until they just hiss when touched with a wet finger. This makes a more definite impression with only a light tap from the hammer. If struck too hard the ebonite panel is liable to crack, especially near the edges.

(Continued on page 447.)

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Successful Transmis- sion from 2GR.

MR. J. S. MARKS, owner and operator of experimental station 2GR, situated at Rose Bay, Sydney, while testing with the Neutral Bay Radio Club on Tuesday, November 13, was overheard by Mr. A. C. Conolly at Darlington Point, near Hay, N.S.W., 400 miles from Sydney. In a letter to Mr. Marks dated November 14 he reports hearing the transmission from 2GR quite clearly and quoted various remarks Mr. Marks made "over the air" which were also overheard by the Editor of *Radio* simultaneously. Mr. Conolly stated that the transmission from 2GR was loud and clear, the speech being perfect. It is interesting to know that Mr. Conolly was only using two dry cell valves (Radiotron WD 11's).

Mr. Marks also received a splendid report from Mr. Jerrard at Gayndah in Queensland, over 700 miles in a direct line from Sydney. This remarkable reception was achieved by Mr. Jerrard using one Expanse "B" valve without any amplification.

Simultaneously with receiving Mr. Conolly's letter Mr. Marks received a letter from Hotaki, West Coast, of New Zealand, 1200 miles in a direct line from Sydney, stating that his transmissions had been clearly received over there quite as strong and clear as the local broadcasting transmitting station in New Zealand which uses a much higher power than 2GR. This amateur in New Zealand used a detector and two stages of amplification and could hear the signals from 2GR 300 yards away from the loud speaker.

On the evening of the same day (November 14) Mr. Marks acknowledged receipt of the letter by Radiophone from his station at Rose Bay, and immediately on reaching his office the next morning at 8.30 a.m. he found a cable awaiting him acknowledging receipt of his reply by Radiophone eight hours previously!

This alone for experimental work constitutes a record, especially as Mr. Marks was only using a maximum power of 14 watts.

Any experimenters who may write to Mr. Marks can always depend upon receiving an answer by Radiophone.

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it can be mastered and
operated by all.

BROADCASTING

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Phone: B 4153.

Radio Helps in Melbourne Riots

Experimenters Perform Good Work.

The value of wireless as a means of rapid communication under the most critical conditions was well demonstrated in the recent Melbourne riots.

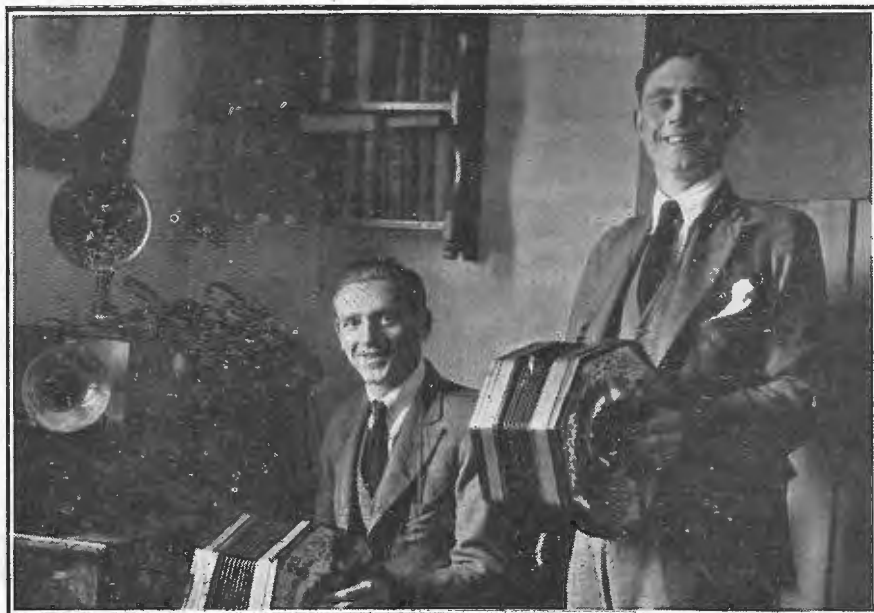
No sooner had the disturbance broken out than efforts were made to re-

the service worked without a hitch.

Amongst the experimenters who figured prominently in the work were Messrs. H. W. Maddick (3EF), K. Barbour (3ZI) and J. C. Fitchett (3BL).

disturbance was transmitted and a party of "specials" despatched was largely responsible for breaking the trouble. As might be expected, those operating the wireless stations were kept working at high pressure and sleep during the night was out of the question.

The call signal of headquarters was TH, and "listeners in" heard it on countless occasions during that eventful Saturday night.



The well-known "Campbell Boys" at 2FA, Mr. S. V. Colville's experimental station at Drummoyne, who rendered several selections during a recent test. The transmissions proved to be highly successful and the items were greatly appreciated by those experimenters who received the tests.

cruit wireless operators to assist the special constabulary.

Within an hour the service was in operation, and thanks to the skill of those who were called upon to assist,

The central station was located at the Town Hall. Suburban guards were in almost continuous wireless communication with headquarters, and the speed with which news of a

Radio Church Services

Any doubt regarding the value of radio as an aid to the spreading of Church Services will be dispelled after reading the glowing eulogy bestowed upon it by the Rev. Warren Rogers, Dean of St. Paul's Episcopal Cathedral, Detroit, U.S.A.

The Rev. Rogers' sermons have been broadcasted during the past year, and here is his opinion in a nutshell:—

"I am convinced," he said, "that radio has unquestionably proved a most valuable adjunct to the work of the Church. It has enabled us here in the Cathedral to embark upon a great missionary enterprise in the broadcasting of the Gospel on a scale that would have astonished the old-time Apostles.

"By it we have been able to reach and help many thousands of non-churchgoers, and it has, therefore, opened the way for the greatest missionary achievements since the time of the Creator."

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high, 1¾in. gauge.

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VALVE SETS—SINGLE:			VALVE SETS—THREE:		
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Complete with Aerial Wire, 'Phones, Batteries, and All Accessories.

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J. S. MARKS (Radio 2GR), General Manager.

We are the accredited Agents for all Broadcasting Companies. Service fees on application.

Wireless in New Zealand

(By Our Special Correspondent.)

MENTION has been made previously that members of the Hamilton Amateur Radio Club have upon several occasions received music from Sydney, but this achievement was overshadowed recently by two amateurs belonging to the same club picking up music from California. Wireless music from the Key West Radio Station in California was received clearly in Hamilton by the experimenters mentioned on a De Forest reflex set. It was first heard about half-past six in the evening and continued for some time.

Mr. E. S. Ralls, of Auckland, informs me that he often gets in touch with the station owned and operated by Mr. Marks, of Rose Bay, Sydney, whose call sign is 2GR. This station has been heard many times in the Dominion on one valve, and Mr. Ralls states that he receives it regularly on an aerial 10 feet high and 35 feet long, using a detector and one low frequency.

Quite a feature of Auckland Boys' Week was the exhibition of wireless and other hobbies in the Town Hall concert chamber. Some unique devices were introduced, and some remarkably cheap sets as well as expensive ones were exhibited.

The New Zealand Shipping Company's fine steamer *Remuera* is the first vessel to visit Auckland thoroughly equipped with an up-to-date direction finding plant. Quite a number of operators have inspected the apparatus. This particular installation is supplied and controlled by the Marconi Company, which is also installing one on the *Ruapehu*, the next vessel to visit Auckland equipped with this device for ensuring safety at sea. A large number of ships are now fitted with wireless direction finders, and according to an official of the Marconi Company about 70 vessels have them actually in use, whilst a score more are in course of being fitted. The daily meteorologi-

cal reports by wireless from the Pacific Islands to New Zealand, collected from the various islands by the Apia wireless station, afford valuable information to shipping and serve to give warning of approaching storms.

Leading business firms in Auckland and Wellington have announced their intention of installing broadcasting sets and giving out information after the manner of Farmer & Company, Ltd., of Sydney. The great increase in the number of persons, both young and old, who have taken up the hobby throughout New Zealand fully justifies the action of the firms in question.

The announcement in *Radio* that wireless was wrongly blamed for the American warship disaster and the subsequent vindication of the direction finding apparatus will do much to dispel the opposition to the installation of direction finding apparatus on the Three Kings. It is pretty certain that with the new authorised light, a wireless direction finding station will be established.

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"The Wireless Age"

contains the very latest Broadcasting and experimental views and ideas from America. :: ::

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Every type of wireless apparatus from the smallest receiving set to the high power Radio Station, depicted in an interesting way.

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Abbreviations

The following list of abbreviations has been prepared for the use of British ships and coast stations licensed by the Postmaster-General in accordance with the list annexed to Article 22 of the Service Regulations to the International Radiotelegraph Convention of 1912.

In the use of these abbreviations, the signal employed should be repeated three times.

The addition of the mark of interrogation indicates that the sentence is being put as a question.

Station.	Examples.
A QRA?	What is the name of your station?
B QRA Campania	This is the Campania.
A QRG?	To what Company or line of navigation do you belong?
B QRG Cunard QRZ	I belong to the Cunard line. Your signals are weak.

Station A then increases the power of its transmitter and sends:—

Station.	
A QRK?	How are you receiving?
B QRK	I am receiving well.
QRB 80	The distance between our stations is 80 nautical miles.
QRC 62	My true bearings are 62 degrees, etc.

AB-BREVIATION.	QUESTION.	ANSWER OR ADVICE.
PRB	Do you wish to communicate with my station by means of the International Signal Code?	I wish to communicate with your station by means of the International Signal Code.
QRA	What is the name of your Station?	This station is.....
QRB	How far are you from my Station?	The distance between our stations is nautical miles.
QRC	What are your true bearings?	My true bearings are degrees.
QRD	Where are you bound?	I am bound for.....
QRF	Where are you coming from?	I am coming from.....
QRG	To what company or line of navigation do you belong?	I belong to.....
QRH	What is your wave-length?	My wave-length is..... metres.
QRJ	How many words have you to transmit?	I have words to transmit.
QRK	How are you receiving?	I am receiving well.
QRL	Are you receiving badly? Shall I transmit 20 times for you to adjust your apparatus?	I am receiving badly. Transmit 20 times for me to adjust my apparatus.
QRM	Are you being interfered with?	I am being interfered with.
QRN	Are the atmospherics very strong?	The atmospherics are very strong.
QRO	Shall I increase my power?	Increase your power.
QRP	Shall I decrease my power?	Decrease your power.
QRQ	Shall I transmit faster?	Transmit faster.
QRS	Shall I transmit slower?	Transmit slower.
QRT	Shall I stop transmitting?	Stop transmitting.
QRU	—	I have nothing to communicate. I have nothing for you.
QRV	Are you ready?	I am ready. All is in order.
QRW	Are you busy?	I am busy with another station (or with). Please do not interrupt.



CLEAR AND TRUE *Western Electric* LOUD SPEAKERS

When used with a correctly designed and adjusted radio receiving set, Western Electric Loud Speakers give a clear and true reproduction of speech and music over the entire musical range, including the low bass notes of a pipe organ and the high tremolo notes of a violin.

Western Electric Radio Equipment can be obtained direct and also from Radio dealers in town & country. We are at all times pleased to give expert advice and help regarding Radio installations and equipment.

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QRX Shall I stand by?	Stand by. I will call you at o'clock (or: when required).
QRY What is my turn?	Your turn is No.....
QRZ Are my signals weak?	Your signals are weak.
QSA Are my signals strong?	Your signals are strong.
QSB Is my tone bad?	{ The tone is bad.
Is my spark bad?	{ The spark is bad.
QSC Is my spacing bad?	Your spacing is bad.
QSD Let us compare watches.	The time is
My time is..... What is your time?	
QSF Are the radiotelegrams to be transmitted alternately or in series?	The radiotelegrams are to be transmitted alternately.
QSG ———	The transmission will be in series of five radiotelegrams.
QSH ———	The transmission will be in series of ten radiotelegrams.
QSJ What is the rate per word to.....?	The rate per word is
QSK Is the last radiotelegram cancelled?	The last radiotelegram is cancelled.
QSL Have you got the receipt?	Please give a receipt.
QSM What is your true course?	My true course is..... degrees.
QSN Are you communicating with land?	I am not communicating with land.
QSO Are you in communication with another station (or: with.....?)	I am in communication with (through the medium of).
QSP Shall I signal to..... that you are calling him?	Inform that I am calling him.
QSQ Am I being called by.....?	You are being called by
QSR Will you despatch the radiotelegram?	I will forward the radiotelegram.
QST Have you received a general call?	I have received a general call for all stations.
QSU Please call me when you have finished (or: at o'clock.	I will call you when I have finished.
QSV Is public correspondence engaged?	Public correspondence is engaged. Please do not interrupt.
QSW Must I increase the frequency of my spark?	Increase the frequency of your spark.
QSX Must I diminish the frequency of my spark?	Diminish the frequency of your spark.
QSY Shall I transmit with a wave-length of metres?	Let us transfer to the wave-length of metre.
QSZ ———	Transmit each word twice. I have difficulty in receiving your signals.
QTA ———	Transmit each radiotelegram twice. I have difficulty in receiving your signals; or Repeat the radiotelegram you have just sent. Reception doubtful.
QTB ———	Number of words not agreed; I will repeat first letter of each word and first figure of each group.
QTC Have you { something anything to communicate?	I have something to communicate. I have messages for
QTE What is my true bearing from you (or from.....)?	Your true bearing from me or from was degrees.
QTG Shall I transmit call sign of this station for one minute in order that a bearing may be obtained?	Please transmit your station's call sign for one minute in order that a bearing may be obtained.

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Are you getting the best results from your apparatus?

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We have a few experimental receivers Crystal, 1, 2, or 3 valve, which we wish to clear at cost to make way for our Broadcast receivers.

RADIO frequency transformers we are selling for 3/6, and our other parts are just as low priced.

RADIO CO., LIMITED.

17 Loftus Street, Circular Quay,
SYDNEY.

Wireless Signals Disregarded.

(Continued from Page 416)

The cliffs and rocks were slippery and several men were carried in and submerged in attempting to gain a landing.

When the *Young* struck it rolled over and turned completely upside down in less than two minutes, according to some of the men on the ship.

Twenty-three men were drowned, altogether, the greater number of them from the *Young*.

The seven vessels will be almost a total loss, for it is out of the question to float any of them. Some of the equipment has been brought ashore and there will be some salvage from them, but it will be comparatively small. These vessels were built in 1918 and were considered among the best equipped destroyers afloat. They were sister ships, 315 feet 4 inches in length and with four propellers, giving them a speed of 35 knots per hour. The cost of the vessels and their equipment was 1,500,000 dollars each (approximately £300,000), and the total loss was over 10,000,00 dollars (approximately £2,000,000). Each destroyer carried four 4-inch 50 calibre guns, one 3-inch anti-aircraft gun, and was equipped with four 21-inch triple torpedo tubes.

The catastrophe, in the opinion of a number of naval experts, could have been avoided if due heed had been given to the original message sent out by the radio station at Arlight.

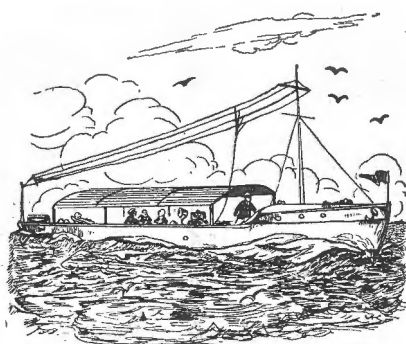
If, on receiving this message, the squadron had immediately stopped speed and drifted, at the same time taking soundings, it would have acquainted the squadron with the fact that they were in shallow water, and immediate full speed astern would have resulted. Even if there had been no time to take soundings, if the speed had been entirely retarded, the ships might have gone aground, but they would not have been dashed headlong on to the rocks and reefs along this rocky and terribly dangerous shore.

The radio system at Arlight was in perfect working order it is claimed, and that the original message informed the fleet commander and the squadron of their real position, is not denied.

The appalling disaster, in the judgment of experts, was due to the fact

that the radio signal was not given due consideration at the time it was received and immediate action taken.

Radio has demonstrated on so many occasions its wonderful value in preventing catastrophes at sea that its life-saving and property-saving qualities do not need to be argued about. The investigation of the causes of the disaster, just where the blame lies, and just what degree of responsibility is to be divided among the different commanders, remains to be seen. But no more tremendous object lesson has ever been afforded the United States in regard to the uses of radio, than was manifested on this night. It is undeniable that the warning message was sent out and received. It is undeniable, also, that the advice was not acted upon. It is, in addition, a fact which cannot be



controverted, that the loss of life, infinitely more precious than the loss of the vessels, could have been averted had immediate precautions been taken, following the message sent and received.

It is not too much to say that the manifold uses of radio have only just begun. What its effect will be in war or peace remains, to some considerable extent, a field which has only been scatteringly reaped.

Perhaps more than any other single factor, wireless is the prime force which is now being used on the high seas for the preservation of that most sacred thing we know of—human life.

The lives of these twenty-three men will not have been given in vain if this casualty will result in more rigid rules of inter-communication between vessels proceeding along shore and radio stations in communication with

them. Had the sea been unusually rough on the night in question, it is more than likely that hundreds of lives would have been lost instead of the twenty-three who went to their watery graves.

The discipline displayed by the crews of these destroyers, and individual instances of splendid heroism by sailors who swam through the waves and oil to carry lines to the shore, was in accordance with the highest traditions of the American Navy. But the blotting out of the lives of twenty-three brave young fellows, and the grief and sorrow engendered by their untimely taking off, is a solemn reflection which will have its weight in determining the actions of future Commanders when confronted by radio messages indicating the possibility of danger.

The people of neighbouring cities and towns flocked to the shore and rendered all assistance possible in their power. The offices of the Automobile Club of Southern California at Santa Barbara and at Lompoc were crowded with people seeking directions to the scene of the wreck, and the roads to the scene of the catastrophe were almost immediately jammed with automobiles hurrying to render aid to the unfortunate sailors.

This great and almost mysterious power which has been harnessed by the genius of inventive man has a commanding part to play in the future, and its efficacy has been so often so severely tested, and has been so almost universally successful, that it has earned a place in the category of inventions which entitles it to the highest consideration and respect.

An argument arose on board ship as to whether the musical strains of a flute were more mellow to listen to by wireless than if heard otherwise. Said Kingston, the ship's operator, "We shall test the matter to-night; there is a musical concert being broadcasted at 8 p.m." Tuning Pkx to his third harmonic, Scotty, the ship's musical third mate, was requested to give the decision. Somewhat to our chagrin Scotty declared, "It's noo a flute, but a piccolo."

SPECIAL NOTICE.

With issue No. 216, dated October 3, 1923, the retail price of

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was Reduced to 6d. per copy throughout Australia and New Zealand.

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Club Reports**WIRELESS INSTITUTE OF AUSTRALIA.****SOUTH AUSTRALIAN DIVISION.**

A letter was received from the Controller of Wireless at the November 7 meeting of the above Division pointing out that considerable interference has been caused to Adelaide Radio Station by amateur transmitters in the vicinity.

After discussion it was decided to call a special meeting of all holders of transmitting licenses to consider the position.

Two applicants for membership were received and approved.

The treasurer submitted a copy of the annual balance sheet which was accepted.

After further business had been disposed of Mr. Jones displayed a reflex receiver, power amplifier and magnavox, and gave a clear and interesting description of the apparatus.

Later, he tuned in 5AH (Mr. F. L. Williamson of Kent Town) and members were able to enjoy a very fine concert.

Mr. Jones expressed his indebtedness to Professor Kerr Grant for the loan of several batteries used in operating the set.

NEUTRAL BAY RADIO CLUB.

With the co-operation of Mr. J. S. Marks (2GR) the members were afforded a splendid demonstration of radio telephony at the last meeting on Tuesday, November 13. Some excellent musical items were transmitted by Mr. Marks, which, together with the speech signals, were received perfectly. So loud and clear was 2GR that it almost seemed as if he were in the same room.

The next meetings of the club will be held on November 27 and December 11 at "Bellevue," 180 Kurraba Road, Neutral Bay.

MOSMAN RADIO CLUB.

At the October 29 meeting of the above club the President (Mr. R. Young) delivered an interesting and encouraging address on the future of the club.

He stressed the wide field for experiment which lies ahead, and appealed for the co-operation of members in pushing the club forward.

Mr. Young also referred to the construction of the club's apparatus and mentioned that each member would share in the task of building it.

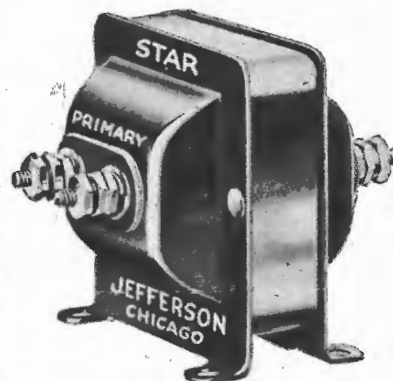
At the conclusion of the address a number of visitors enrolled as members. The subscription was fixed at 10/- per annum with an entrance fee of 2/6.

All interested in the club are invited to write to the secretary, Mr. M. Nunn, at Medusa Street, Mosman.

MANLY RADIO CLUB.

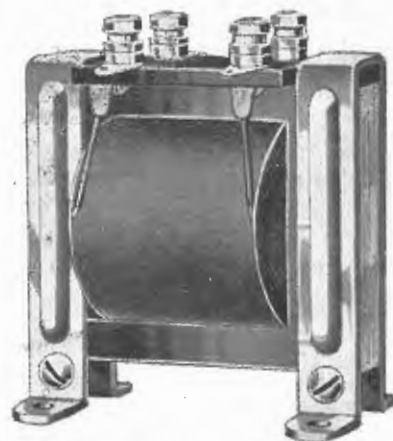
A general discussion on the future of the club's work was followed by an interesting lecture on "Receiving Circuits" by Mr. Keogh on the November 12 meeting of the above club.

It is probable that within the next few weeks the club will transfer its headquarters from the Literary Institute to a more convenient location.

Jefferson TRANSFORMERS

JEFFERSON "Star" Transformer.

Electrical Characteristics:—1. Ratio of secondary to primary turns, 3.50 to 1. 2. Useful tone frequency range, 60/5000 cycles. 3. Allowable current on each winding, 10 milli-amperes. 4. Test voltage between primary and secondary, between primary, secondary and ground, 300 volts. 5. Terminal voltage tests on open circuit, 500 volts. 6. D.C. resistance of windings: Primary 800 ohms (approx.); Secondary, 3500 ohms (approx.). 7. Primary and secondary wound with No. 40 enamel-covered copper wire.



JEFFERSON No. 41 Transformer.

Electrical Characteristics:—1. Ratio of secondary to primary turns, 3.75 to 1. 2. Useful tone frequency range, 60/5000 cycles. 3. Allowable current on each winding, 10 milli-amperes. 4. Test voltage between primary and secondary, between primary, secondary and ground, 300 volts. 5. Terminal voltage tests on open circuit, 500 volts. 6. D.C. resistance of windings: Primary, 1000 ohms (approx.); Secondary, 5000 ohms (approx.). 7. Primary and secondary wound with No. 40 enamel-covered copper wire.

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Personalities

Mr. Eric J. T. Moore has been appointed to the Sales Department of Farmer's Broadcasting Service. Mr. Moore is well known to almost every experimenter in Sydney and in addition to being a most enthusiastic experimenter himself is the Honorary Secretary of the Neutral Bay Radio Club and a very active Secretary, too!

Mr. Raymond MacIntosh, recently Works Manager at Electricity House, Sydney, is now in David Jones' Radio Department.

Mr. J. Gunderson resigned from the Radio Co., Sydney, and joined the Radio Service Company, Sydney.

Mr. Leslie Holland, the well-known actor, a very keen wireless experimenter and Vice-President of the Wentworth Radio Club, has returned to Sydney after an absence of some months.

Coastal Radio Service

STAFF CHANGES

Mr. J. Green, Radio Mechanic, Perth, has been transferred to Darwin Radio.

Mr. R. C. Austin, Radio Mechanic, Darwin, has been transferred to Perth Radio, on completion of his term of Tropical Service.

Mr. A. S. Hart, Radiotelegraphist, Thursday Island, is being transferred to Sydney.

Mr. C. F. Dale, Radiotelegraphist, to be transferred from Sydney Radio to Thursday Island Radio.

The Relief Staff for Willis Island left Sydney, per s.s. *Melusia*, on November 7. The party consisted of Mr. A. G. Kempling (Radiotelegraphist in Charge), Mr. N. Stockton (Assistant

Radiotelegraphist), and Mr. J. Hogan (Meteorological Observer).

It is interesting to note that both Messrs. Kempling and Hogan were stationed at Willis Island during the last cyclone season, and again volunteered for service during the present season.

Movements of Wireless Officers

Mr. G. Flynn signed off s.s. *Arafura*, at Sydney, on October 29, and relieved Mr. D. N. Quinn on s.s. *Nairana*, at Sydney, on the same date.

Mr. W. C. Smith signed off s.s. *Arafura* as 2nd Operator, at Sydney, on October 29, and signed on s.s. *Australport*, at Sydney, on the same date.

Mr. D. N. Quinn signed on s.s. *Riviera*, at Sydney, on October 30.

Mr. V. P. Nevins signed off s.s. *Melusia*, at Sydney, on October 30 and signed on s.s. *Carina* as Senior Operator, at Sydney, on October 31.

Mr. A. W. Hooper signed off s.s. *Niagara*, as 2nd Operator, at Sydney, on October 31, and relieved Mr. R. Jordan on s.s. *Manuka*, at Sydney, on November 1.

Mr. W. C. Brown, who was relieved by Mr. A. Laurie on s.s. *Katoa*, at Wellington, on October 13, signed on s.s. *Maori*, at Wellington, on October 19.

Mr. O. A. Sutherland signed off s.s. *Waipori*, at Wellington, on October 23 and proceeded on Home Port leave.

Mr. P. C. Gillon signed on s.s. *Century*, at Melbourne, on November 1.

Mr. J. E. Cleary, who was relieved by Mr. H. K. Wadsworth on s.s.

Goulburn, at Melbourne on November 1 proceeded on Home Port leave.

Mr. E. Meissner signed off s.s. *Hauraki* as 3rd Operator, at Melbourne, on November 5, returned to Sydney and signed on s.s. *Eurelia* on November 7.

Mr. A. Cuthill signed off s.s. *Morinda*, at Sydney, on November 6 and signed on s.s. *Melusia* on the same date.

Mr. T. Bannister signed off s.s. *Dimboola*, at Sydney, on November 6 and relieved Mr. G. Hugman on s.s. *Bombala* on the same date. Mr. Hugman proceeded on Home Port leave.

Mr. V. Rippingale signed off s.s. *Port Hunter*, as 3rd Operator, at London, on September 25 and signed on s.s. *Calulu* as 3rd Operator, at Middlesborough, on September 27.

Mr. G. B. Fullwood signed on s.s. *Niagara* as 2nd Operator, at Sydney, on November 7.

Mr. G. R. Hore signed off s.s. *Loon-gana*, at Melbourne, on November 3.

Mr. A. B. Monks signed off s.s. *Suva*, at Sydney, on November 8 and signed on s.s. *Dimboola* on the same date.

Messrs. H. B. Tyler and J. S. McTavish signed on s.s. *Carina* as 3rd Operators, at Melbourne, on November 7.

Mr. C. F. Griffiths relieved Mr. H. Johnston as Senior Operator on s.s. *Moreton Bay*, at Sydney, on November 9.

Mr. H. Johnston relieved Mr. C. F. Griffiths on s.s. *Kanowna*, at Sydney, November 9.

Mr. M. H. Stuart signed on s.s. *Marawah*, at Melbourne, on November 2.

Mr. G. Hugman signed on s.s. *Suva*, at Sydney, on November 10.

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Experimental Station 4CM

(Continued).

To the left of the main transmitting panel is the high tension switch-board, showing the high voltage meter, fuses, high and low reading milliamp metres and grid meters, with controlling switches. Behind this board are the condensers, chokes, and leaks. One of the chokes is shown. The reaction coils are not shown, as they are in position behind the main transmitting panel, with the transmitting condensers, etc. Above the panel is the helix, which controls the wave-length. The starting switch and field regulator can be seen in the left-hand corner of the main panel, where the distributing wires are connected. The motor belonging to the motor generator set can be seen in the left-hand corner of the picture.

In the middle of the picture is the main transmitting panel, in the centre of which the radiating meter, with its controlling switch, can be plainly seen above the rheostat handles on either side of the meter control and oscillating and modulating tubes. The tubes used are not shown, as they are accommodated behind the panel. The two switches below the meter control the high and low tension circuits.

To the left of the operator's hand is situated the meter which shows the modulated current through the microphone. The voice impression on the microphone is recorded on this meter. The three meters below the switches show the voltage across the tubes, and the current consumed.

The motor generator is of the shunt type, generating 500 volts D.C. When the load is on, the voltage drop is 420 volts. The commutator has 60 segments. The generator is driven from a half horsepower motor, and both are secured to a hardwood base, which is protected from vibration by rubber bumpers. The generator is driven at a speed of 1500 R.P.M.

A Cheap Crystal Receiver

(Continued).

It is not essential that these stamps be used, for by means of a sharp steel scriber and a little skill it is possible to engrave fairly neat letters and figures. If not already experienced

in this art do a little preliminary practice upon a piece of scrap ebonite sheet,

Actual tests with this receiver in Sydney and Melbourne on an aerial about 20 ft. high and 100 ft. long bring in commercial spark stations at Awanui, Adelaide, Hobart, Brisbane, and others within about a 1000 mile radius, as well as experimental low-power telephones up to 15 miles distant. The wave range with the abovementioned aerial is between 220 and 1900 metres.

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Queries Answered



L. G. L. (Pittsworth): Referring to article on "Super-regeneration," published in Radio No. 10, asks: (1) Will a D.E.R. Valve with 40-volt plate current act efficiently with this circuit? (2) Will the values shown in the circuit be the same for the D.E.R.? (3) Are the two "leaks" shown variable or fixed?

Answer: (1 and 2) A D.E.R. Valve is not suitable for efficient super-regeneration, owing to its limited electron emission. (3) The grid "leaks" must be variable.

T. W. (Lindfield): It is possible to operate your 'phones or Loud Speaker at a distance from the receiver by using a 1 : 1 ratio transformer in place of the 'phones and connecting the latter through the lead wires across the secondary. Use No. 20 gauge twin bell wire for the connecting leads.

H. R. B. (Yanac, Vic.): asks: (1) Would a "T" aerial 150 ft. span, 50 ft. high, twin wires spaced 6 ft. apart, be suitable for both transmitting and receiving on amateur wave-lengths? (2) Would this proposed "T" aerial be as efficient for receiving the longer wave-lengths as present "L" aerial?

(3) Would better results be obtained in transmitting if four wires in the form of a cage were used instead of two? (4) Would placing aerial east and west be most suitable for all-round reception? (5) Using a 5-watt "Radiotron" and a 1in. coil as spark coil-valve transmitter, what would be approximate power.

Answer: (1) and (2): You will find the "T" aerial much better for short wave reception and transmission. There will be no appreciable difference on the longer wave-lengths. The action of the centre tap is to reduce the aerial's natural inductance. (3) A cage aerial if spaced on at least 2 ft. hoops will have a lower resistance than the usual type. (4) The effect of direction will be hardly noticeable with so small an aerial. (5) The power will not be much in excess of 10 watts with the arrangement you suggest.

W. G. T. (East Coburg) asks: (1) Particulars for making and using transformer and filter system for stepping down A.C. current for use on valve filaments, with tapings for four and six volts. (2) Approximate range of variometer (particulars submitted).

Answer: (1) A suitable step down transformer should have a core 1in. x 1in. cross section, outside dimensions 4in. x 4in. and internal 2in. x 2in. Primary winding 2,200 turns of No. 26 D.S.C., secondary 60 turns for the six-volt and 40 turns for the four-volt winding. A filter is not used when employing A.C. on the filaments, but instead a potentiometer across the low tension A.C. leads. A very efficient circuit was published on page 110, issue Radio No. 5. (2) The approximate wave range of your variometer will be from about 250 to 800 metres. Much, however, depends upon the distributed capacity of the circuit in which it is used.

Thanks for complimentary remarks re Radio.—Ed.

J. S. B. (Lithgow) submits diagram of receiver and asks: (1) Would this circuit be suitable for broadcasting wave-lengths, using Expanse "B" valve. (2) Is it possible to use an Expanse valve as an amplifier.

Answer: (1) The circuit you propose to use is at present prohibited on any wave-length. (2) It is possible to use a soft valve as an amplifier, but the adjustments are too critical. Use a "V 24," "R" or "QX."

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