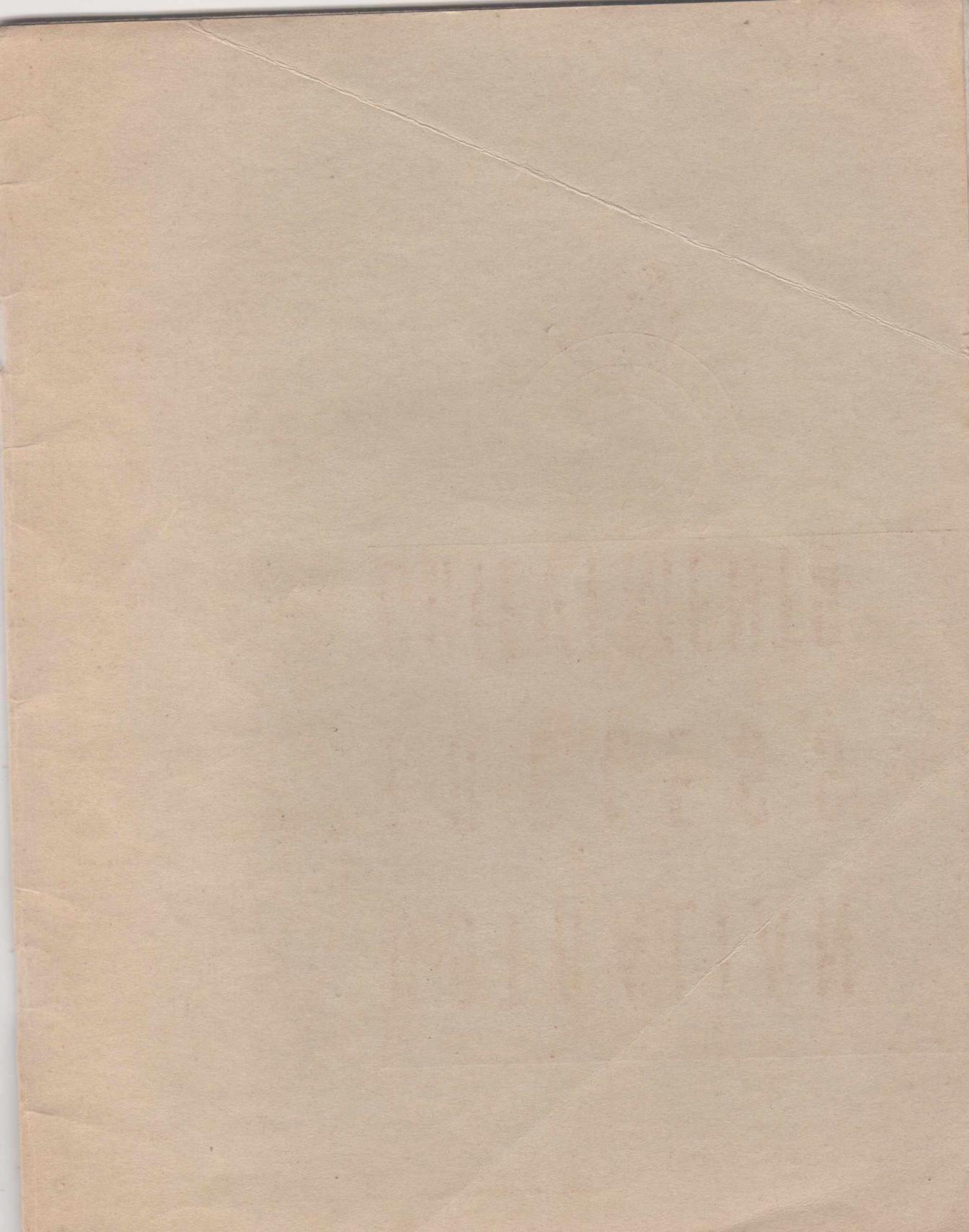


**A
W
A**

**AUSTRALIAN
WIRELESS
ACHIEVEMENTS**





\$ 8.00



A.W.A. ACTIVITIES

•

BEAM WIRELESS SERVICES
BEAM WIRELESS PICTUREGRAM SERVICE
OVERSEAS RADIO TELEPHONE SERVICES
COASTAL RADIO SERVICE
MARINE WIRELESS SERVICE
PACIFIC ISLANDS WIRELESS SERVICE
B R O A D C A S T I N G
RADIO-ELECTRIC WORKS
RADIOLA RECEIVERS
VALVE MANUFACTURE
AERONAUTICAL RADIO

**AUSTRALIAN
WIRELESS
ACHIEVEMENTS**



**AMALGAMATED WIRELESS
(A/SIA) LTD.**

47 York St., Sydney — 167 Queen St., Melbourne
Wellington (N.Z.) and London

THE history of Amalgamated Wireless is more than a recital of technical development and progress. It is the story of a company enlarging the scope and application of wireless science and developing and making available to the Australian public a valuable national service. During the last 26 years the progress of wireless has been truly marvellous—out-distancing all other sciences.

The greater number of the wireless services now in operation and the many wireless achievements to-day regarded as commonplace were, 26 years ago, either unthought of or were regarded as being outside the realm of practicability.

While geographical frontiers have shrunk with the annihilation of distance, the boundaries of wireless science are now wider than ever. Each discovery but opens the gateway to greater attainments. As each ideal set by A.W.A. is realised, another, larger and more expansive, takes its place. The outstanding progress of A.W.A. and its leadership in national wireless is due in a large measure to the foresight, ability and research work of Sir Ernest Fisk, Chairman of A.W.A.

Early in the company's history Sir Ernest laid down the policy of "Good Service to the Public," and the practice of this precept by the company's staff in its manifold activities, together with a forward policy of developing and expanding every phase of wireless in Australia and the Pacific, largely accounts for the goodwill and high prestige the company to-day enjoys, not only in Australia, but throughout the world.

Wireless Development

Commercial wireless in Australia dates back to 1910, when the first overseas ships equipped with wireless arrived in Australia.

At that time but little was known in Australia of the new science. Such wireless work as had been carried out was of a spasmodic and experimental nature only.

In 1913 Amalgamated Wireless (A/sia) Ltd. was incorporated, and thenceforth the commercial development of wireless proceeded apace.

The earlier years of the company were devoted to equipping Australian and New Zealand ships with wireless. With the War came the equipping of wireless on transports, not only in Australia, but on British ships built in Japan, China, and other countries.

Before 1913 all wireless equipment was imported from Britain or Europe. That condition is vastly altered. Representations before the War that, for national insurance, and the emergency service of British countries in the Pacific, Australia ought to be encouraged to make her own supplies, were justified to the hilt during the War years.

Sir Ernest Fisk early foresaw the day when Australia and the Homeland would be linked by a direct wireless service and, backed by an unlimited faith, worked unceasingly for its accomplishment. In 1918, after several years' experiments, he was successful in receiving the first direct wireless messages from England to Australia. Over eight years elapsed, however, before he had the satisfaction of opening such a service to the public.

The Beam Wireless Service between Australia and Great Britain was opened on April 8, 1927, and led the way to a new era in trans-ocean communication.

Three years later the Wireless Telephony Services between Australia and Great Britain, the Continent of Europe, and North and South America, became an accomplished fact, enabling an Australian telephone subscriber to ring up any one of 35,000,000 telephone subscribers in other parts of the world.

A direct wireless telephone service between Australia and United States of America was opened on December 21st, 1938, enabling subscribers in Australia and United States to speak to each other at rates lower than those previously ruling.

Another notable event in wireless expansion was the taking over by A.W.A. in 1922 of the Australian Coastal Radio Stations and the Wireless Services

of Papua and New Guinea, and modernising and operating them in conjunction with the company's other wireless services in order to better serve the telegraphic needs of Australia and the Pacific.

Broadcasting is undoubtedly the most familiar phase of wireless in the public mind to-day. It touches the lives of all of us in a far more intimate manner than any other branch of wireless. It was pioneered in Australia by A.W.A., the first public demonstration being given at the Royal Society of N.S.W. on August 13th, 1919, by Sir Ernest Fisk. On 13th October, 1920, a complete public broadcast concert was arranged by Sir Ernest at the Queen's Hall, Melbourne.

In 1923 A.W.A. supplied the broadcasting equipment for Station 2 FC, and in the following years installed no less than fifty transmitters in most of the principal cities and towns of the Commonwealth and in the principal cities of New Zealand, Papua and Fiji.

In 1927 the first short-wave world-wide broadcasts were commenced by A.W.A. from its stations VK2ME, Sydney, and VK3ME, Melbourne, with the object of making Australia and her resources and attractions better known abroad.

The Beam Wireless Picturegram Service, opened on October 16th, 1934, enables the interchange of pictures, photos, designs and drawings between Australia and Great Britain. In to-day's paper you may see a picture of an important event that took place in London yesterday.

Many of these developments would not have been accomplished had not A.W.A. early undertaken the building up of a self-contained Australian manufacturing industry. The manufacture of wireless equipment has developed with the years, and to-day the company is in the unique position of producing every type of wireless equipment for use at sea, on land, or in the air.

Organised scientific research, with its energy, resource and financial direction, occupies a paramount position in our industrial structure to-day, replacing the lone worker with his often chance findings. A.W.A. recognises that many closely veiled wireless secrets still await the scientist. Conscious of its obligation to develop every phase of wireless, the company maintains a modernly equipped research laboratory staffed with highly qualified scientists; in thus utilising the creative effort of highly trained Australians, the company is opening up further avenues of employment for Australian ability.

Beam Wireless

Some indication of the magnitude of the Beam Wireless Service in relation to the business and social life of the community may be gauged from the fact that over 144,000,000 words have been handled by the service since its opening on 8th April, 1927. The establishment of the Beam made it possible to effect a decrease in the telegraphic rates between Australia and the outside world, effecting a saving of £1,500,000 to the Australian public.

A great deal of experimental work in trans-ocean communications was carried out by Sir Ernest Fisk, Chairman of A.W.A., during the years preceding the opening of a commercial service. On September 22nd, 1918, Sir Ernest, in furthering his advocacy of a direct wireless service, received in Australia the first direct wireless message transmitted from England.

So successful was the Beam Wireless Service between Australia and Great Britain that a year later a similar service between Australia and Canada, serving North and South America, was opened.

The work of establishing the Beam was carried out under the supervision of Sir Ernest, who, for more than a decade, had not only visualised direct trans-ocean wireless communication between Australia and Great Britain, and Australia and the other Dominions, but had consistently advocated and demonstrated the technical means and methods by which it could be carried out. To-day Sir Ernest has the satisfaction of seeing his cherished idea of a direct wireless service operating with brilliant success.

Beam Wireless Stations

The Beam Transmitting centre in Australia is located at Fiskville, close to Ballan, about fifty miles west of Melbourne. There are three sets of transmitters. One is used for messages to London, whence they are distributed throughout the United Kingdom and Europe.

A second transmitting set communicates with Montreal, in Canada. The third transmitter is used for the wireless despatch of pictures to either London or Montreal.

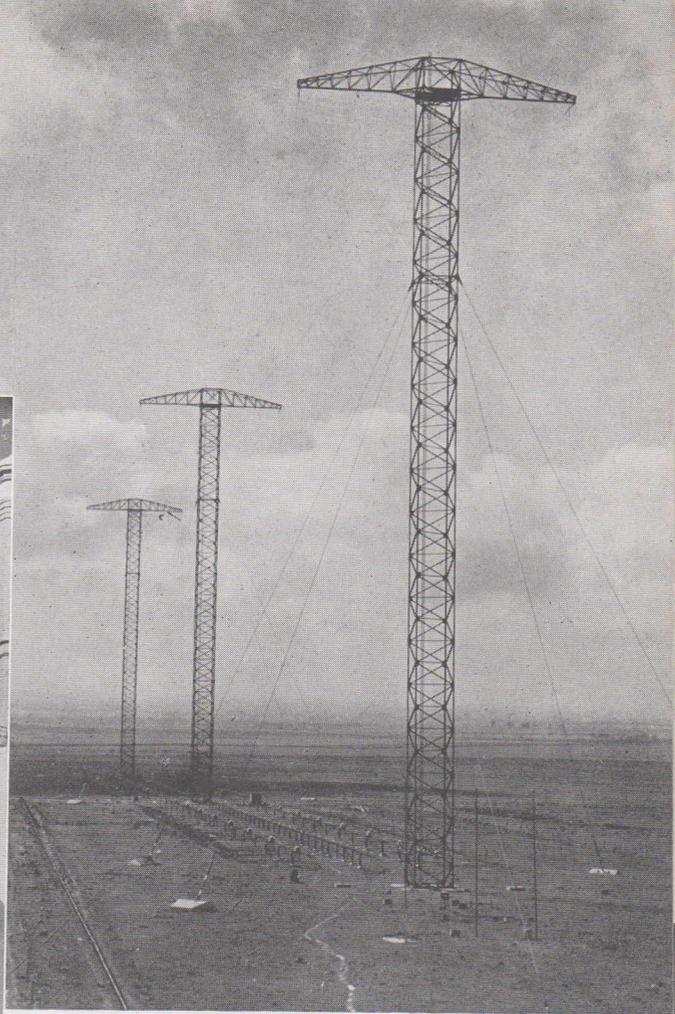
Rockbank, about 18 miles from Melbourne, is the receiving centre for incoming Beam wireless messages. Both the transmitting and receiving stations are connected by special telegraph lines with the Beam Wireless Offices in Melbourne and Sydney.

BEAM WIRELESS
RECEIVING STATION,
ROCKBANK, VICTORIA.

The picturesque entrance to the station.



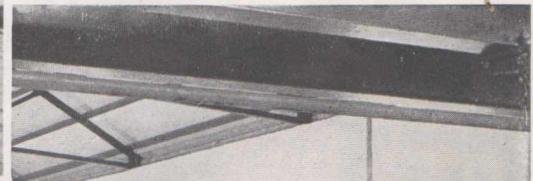
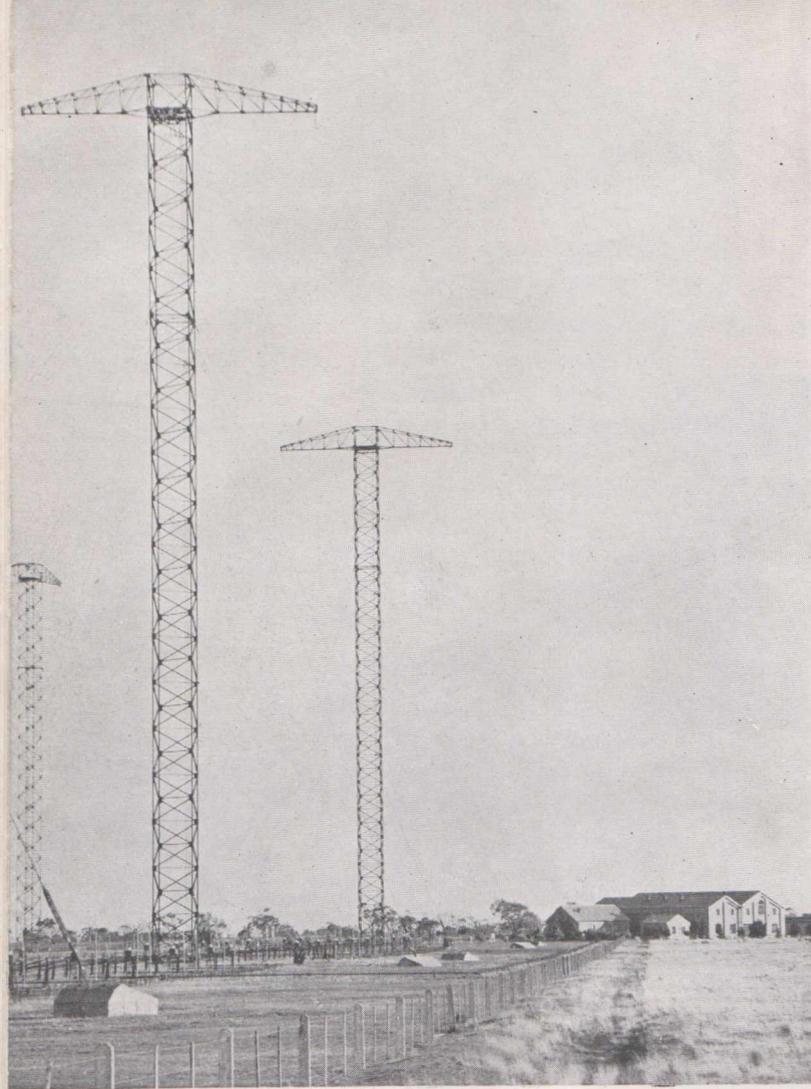
Rack of Beam wireless receivers.



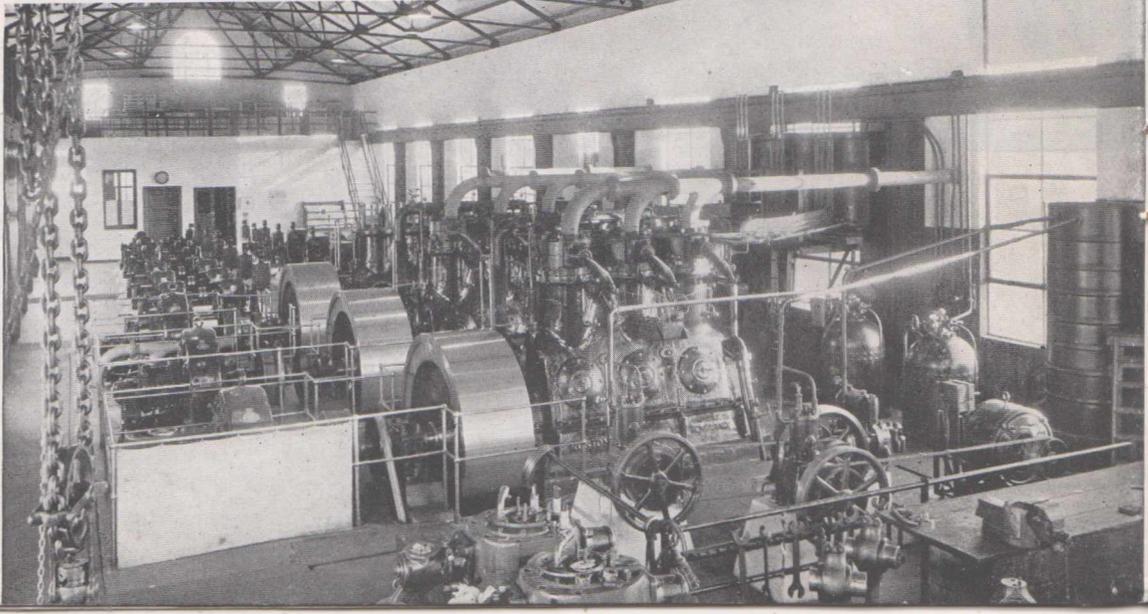
Aerial system for reception of B messages.

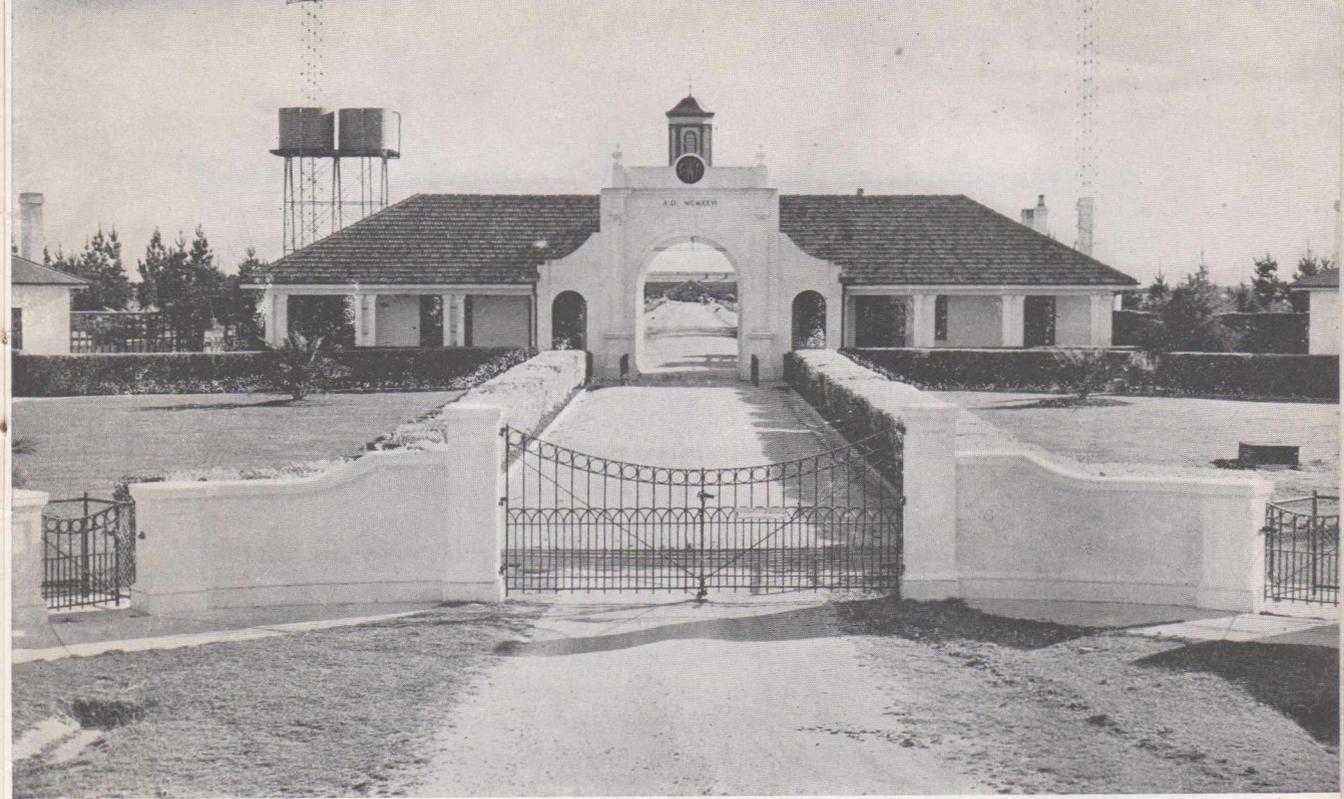
BEAM WIRELESS
TRANSMITTING STATION,
FISKVILLE, V.

Three of the six 250 feet Masts.



Power plant at
Fiskville.





Beam Wireless Station entrance, on each side of which are the modern staff bungalows.

Section of Beam Transmitters.



Messages from Sydney and Melbourne city areas intended for transmission abroad are usually lodged at the Beam Offices of Amalgamated Wireless in Sydney or Melbourne, or they are collected in the city by Beam messengers if the sender advises the Beam Office.

Beam messages from other parts of Australia are lodged at any telegraph office, whence they are despatched over the telegraph lines and delivered to the Beam Office in either Sydney or Melbourne. The constantly incoming stream of messages is handed over to expert telegraphists, who sit before machines resembling typewriters and quickly translate the words into Morse code perforations on paper tape. The tape is then fed through a small instrument which causes the word impulses to be conveyed by means of the special telegraph lines to the transmitters at Fiskville. The time of travel between Australia and England is a mere fraction (about 1/18th) of a second, the words being received in Great Britain as rapidly as they are passed through the Fiskville transmitters. From the British receiving station at Skegness they pass automatically over special lines to the overseas receiving centre of Cable and Wireless Ltd., in the heart of London, where they are reproduced in Morse code characters on a tape from which they are transcribed by a telegraphist upon a typewriter. Thus the message is ready for delivery.

It will be seen that in the whole operation only two men are directly concerned, one being the telegraphist, who prepares the tape for the transmitter, and the other the telegraphist, who reads the Morse tape record at the receiving end. All other phases in the transmission and reception of Beam wireless messages are entirely automatic.

Beam to Canada

The service between Australia and Canada is practically identical with that between Australia and Great Britain.

The rate at which messages are transmitted is limited only by the mechanical restrictions of the automatic instruments used. A speed of about 180 or 200 words a minute may be maintained, although 250 or more words can be achieved when necessary. Thus with Sydney and Melbourne both working, up to 500 words a minute may be leaving Australia. Or, to put it another way, the transmission methods used on the Beam may represent approximately the simultaneous work of seven expert telegraphists at Sydney and seven at Melbourne at a good average manual rate of operating.

Amalgamated Wireless should be proud of the fact that the whole of the staff necessary to inaugurate and maintain the highly technical and intricate Beam Wireless Stations and high speed telegraph controlling offices were recruited in Australia, and the faith of those in charge of the great enterprise has been justified by its success.

Beam Wireless Picturegram Service

By the establishment of the Beam Wireless Picturegram Service, on October 16th, 1934, A.W.A. pioneered still another modern wireless service. Pictures, photos, drawings, fashion plates, cheques, finger-prints and documents of any character can now be transmitted and received by wireless between Australia and Great Britain, and Australia and North America. The service has proved particularly useful to newspaper proprietors, enabling the pictorial reproduction of events on the other side of the world to be published in Australia almost simultaneously with their publication in London and New York. It is also being extensively utilised by commercial and financial houses and private individuals.

Trans-Ocean Wireless Telephone Service

The A.W.A. Trans-Ocean Wireless Telephone Service between Australia and England is the world's longest telephone service. It was pioneered by A.W.A. on April 30th, 1930, and represents the first wireless telephone between Great Britain and a Dominion.

On December 21st, 1938, a direct wireless telephone service was inaugurated between Australia and United States of America, thus giving the Australian public telephone facilities at rates lower than previously ruling when the service was operated to America via London.

To-day, from the telephone in a subscriber's home or office he can speak to a telephone subscriber in Great Britain, the Continent of Europe, North and South America, Java, Rabaul, New Zealand, and many other parts of the world. By means of this service an Australian telephone subscriber can speak to any one of 35,000,000 telephone subscribers in other parts of the world.

Coastal Radio Services

Around the coast of Australia there is a chain of 19 Coastal Radio Stations, nine of which operate continuously day and night throughout the year for communication with ships at sea.

These stations are owned and operated by A.W.A., and form the only telegraphic route to many important points in the Pacific, including Papua and the Mandated Territory of New Guinea.

The stations handle approximately two and a half million words per annum with ships at sea.

The Coastal Radio Stations are also extensively used for broadcasting official time signals, meteorological bulletins, weather reports, storm warnings and warnings of any wreckage or other navigational dangers to ships at sea.

The Company's Coastal Radio Stations are located at every capital city in Australia, and at Broome, Cooktown, Darwin, Flinders Island, Lord Howe Island, Esperance, Geraldton, King Island, Rockhampton, Thursday Island, Townsville, Willis Island and Wyndham.

Pacific Islands Wireless Services

An extensive wireless communication service is operated in the Pacific, affording direct communication services between Australia and Fiji, Papua and New Guinea. About a million words a year are handled by this service, by means of which it is possible to reach the most outlying parts of these islands.

There are many stations at smaller island centres, and these communicate with the nearest of the above-mentioned centres, which, in turn, communicate with Sydney.

Thus communication can be effected from any of the Pacific Island centres to Sydney for Australia and New Zealand, and any town in Great Britain, the Continent of Europe, and North and South America, by means of the Australian Beam Wireless Service.

The chief radio station in the Territory of New Guinea is at Rabaul, on the island of New Britain. Rabaul is in direct communication with Sydney, as well as with stations at Port Moresby, Misima, and Samarai in Papua, and Wewak, Madang, Bulolo, Wau, Salamaua, Manus, Kavieng and Kieta in New Guinea, and Truk in the Caroline Islands. It also communicates with the Gilbert and Ellice Islands through the station on Ocean Island, with Tulagi in the Solomon Islands, with Vanikoro in the Santa Cruz Islands, and with the island of Nauru.

Sydney Radio is in daily communication by wireless with Suva and Noumea. Suva station collects and distributes wireless traffic to and from almost all the Pacific Islands provided with radio. Among these are Tutuila and Apia in Samoa, Noumea in New Caledonia, Vila in New Hebrides, Nukualofa in the Friendly Islands, Ocean Island and Wallis Island (Fatuna Islands).

The radio station at Willis Island, about 300 miles east of Townsville, is maintained for the sole purpose of supplying information to the Weather Bureaux at Sydney, Melbourne and Brisbane. Warnings of tropical disturbances sent from Willis Island have often been of great value to ships in the areas affected and to coastal residents.

Settlers, missionaries, explorers, traders, prospectors and others in remote parts of the Pacific Islands use A.W.A. teleradios to keep in touch with the world.

The teleradio is a small portable radio equipment suitable for either telephony or telegraphy. About 180 of these are in use, and their owners send and receive messages both within the islands and the outside world through the "mother" stations in such centres as Port Moresby, Rabaul and Suva.

The teleradio keeps island residents informed of the progress of world events.

Marine Wireless Communication

The first application of wireless in Australia was for communication between shore and ships at sea. This phase was steadily developed until to-day practically every ship of the Australasian Mercantile Marine is equipped with wireless, not only for the safety of passengers and crew, but also for the interchange of business and private telegrams.

Every wireless equipped ship is a floating telegraph office and forms part of the world's telegraphic system. Wireless messages can be handed in on board for delivery to an addressee in any part of the world. Likewise a message can be handed in to the A.W.A. Central Radio Offices in Sydney or Melbourne, or to any telegraph office in Australia for transmission to a ship at sea.

During recent years extensive developments in Marine wireless equipment have greatly extended its utility. Many ships in the Australasian Mercantile Marine are equipped with all of the new wireless appliances.

In addition to long and short-wave valve transmitters and receivers for the interchange of traffic, there are the auto alarm apparatus for service when the operator is not in his office, echometers for determining the depth of water under the ship's keel, wireless telephony transmitting and receiving apparatus enabling the captain to speak to Coast Stations, and also wireless equipment in lifeboats, so that, should passengers and crew be adrift on the ocean, they can make their position known to people on land or in other ships.

The first maritime wireless beacon—a product of Amalgamated Wireless (A/sia) Limited—has been established by the Commonwealth Lighthouse Department at Cape Otway. Its utility has been affirmed by various shipmasters who use it to fix their position at sea when sun and stars are obscured.

The automatic distress transmitter, designed particularly for use in small coastal vessels, is started by the mere pressing of a switch, and (having been previously set with the call-sign of the ship and its position) sends out the alarm signal, the S.O.S. signal and the call-sign and position of the vessel calling, even if there is no one on board who is able to use the Morse code.

The auto alarm apparatus is designed to pick up the alarm signal only, which always precedes the S.O.S. signal, and immediately causes a bell to ring, thus summoning the operator to take up watch for further signals.

For the entertainment of passengers, gigantaforte loud speaker equipment is installed in many ships. By means of this apparatus the distribution of broadcast programmes, recorded music, concert items and announcements are made simultaneously to different parts of the ship. Talkie picture equipment with twin projectors is also installed in passenger ships.

One of the ships of the Australian Mercantile Marine has the unique distinction of being the first ship in the world equipped with a broadcasting station, while a trans-Tasman liner carries a wireless telephone installation for communication with shore.

Press news is transmitted nightly from Sydney Radio to ships at sea for publication in the "Ocean News" newspaper, printed on board. Navigation and weather reports, also, are transmitted nightly.

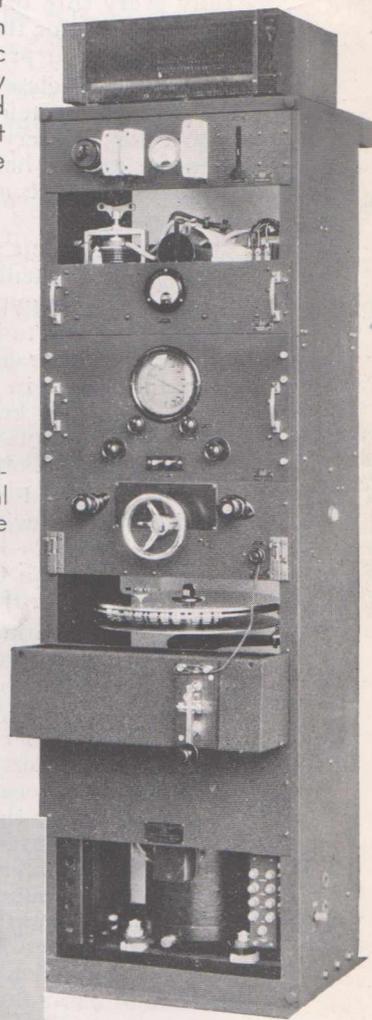
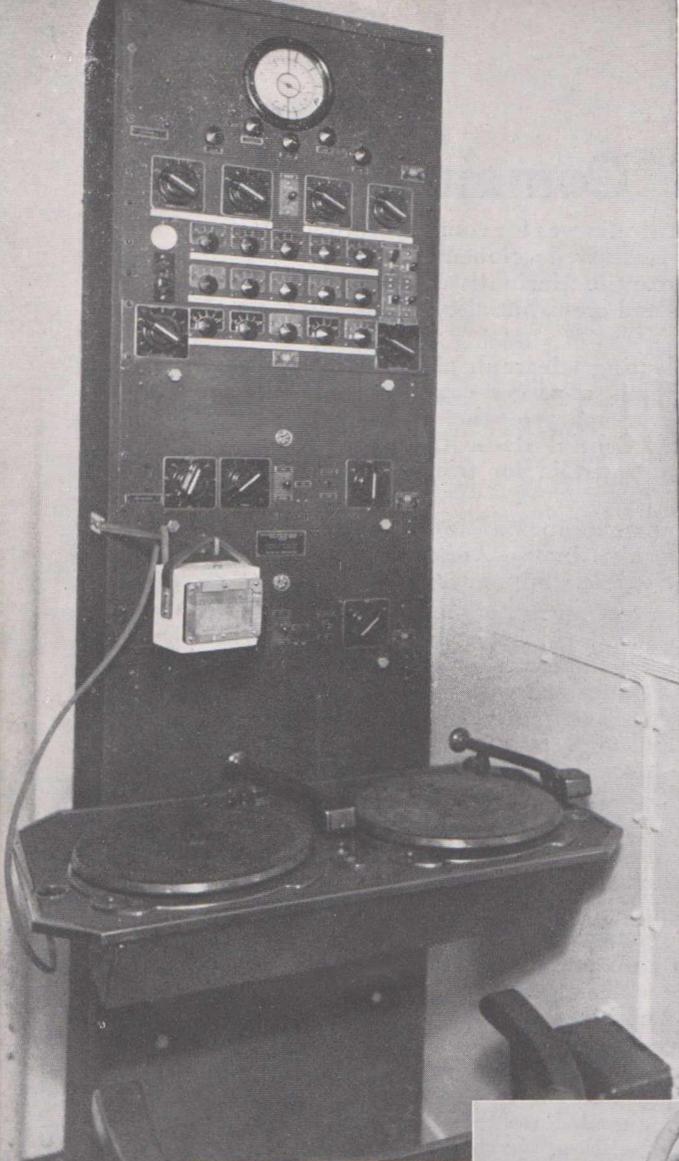
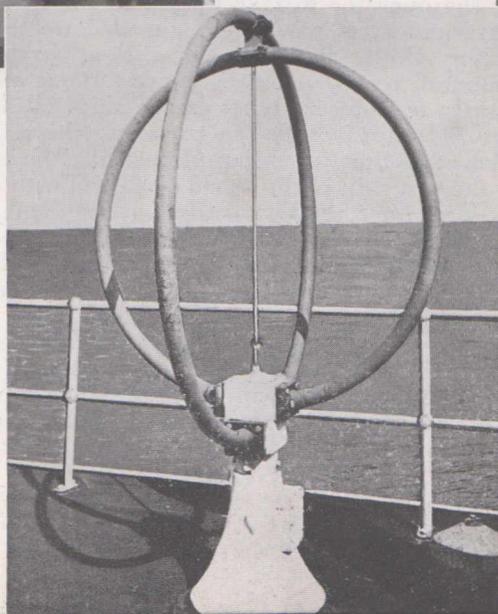
By means of the short-wave station at A.W.A. Receiving Centre, Sydney, communication is maintained with ships equipped with short-wave apparatus in the Pacific and Indian Oceans, with liners crossing the Atlantic Ocean, with whalers in the Antarctic, and with short-wave stations in other countries.

MARINE WIRELESS

(At left) Amplifier for the reproduction of speech and music throughout a ship by means of loud speakers installed at various parts of the vessel.

(At right) Automatic distress signal transmitter for use on small vessels.

Shielded Loop Aerial of Direction Finder.

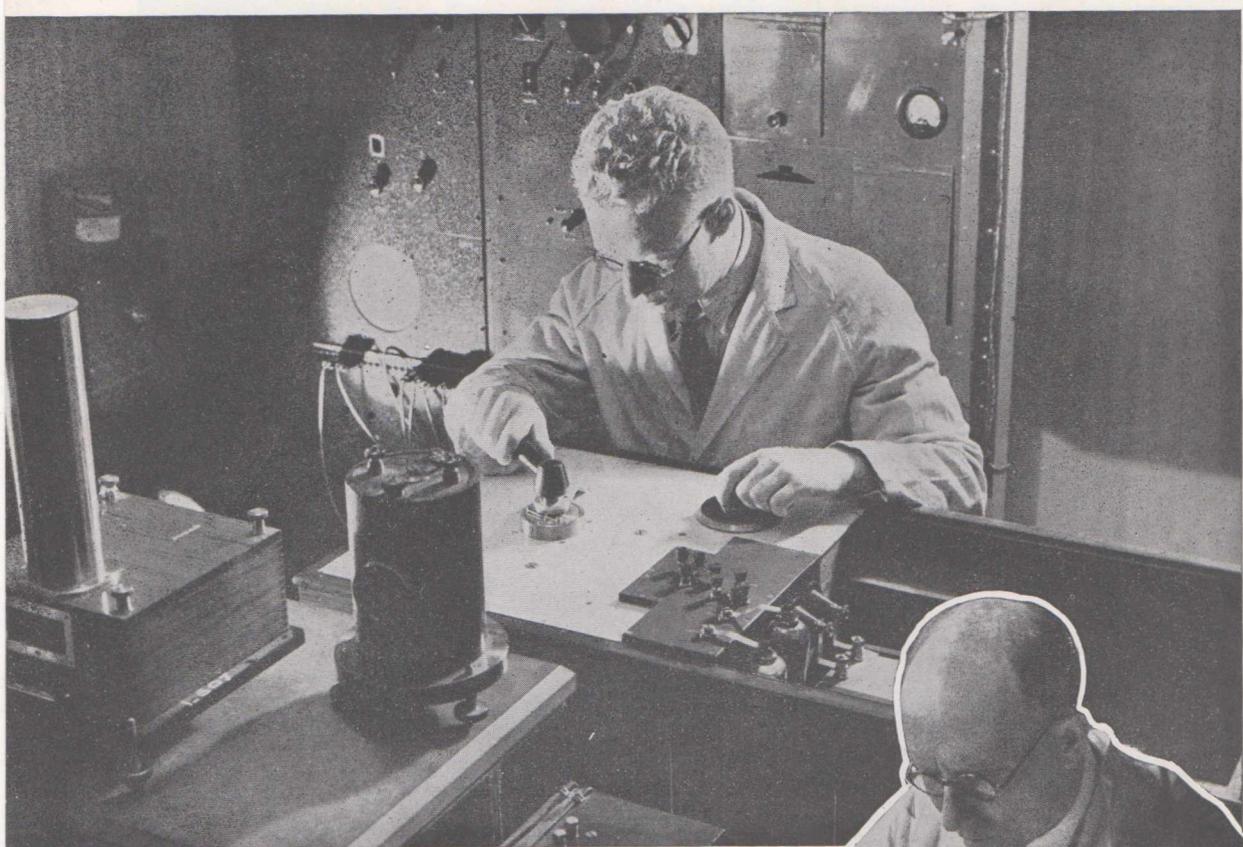




Modern wireless station
on Trans-Tasman liner.

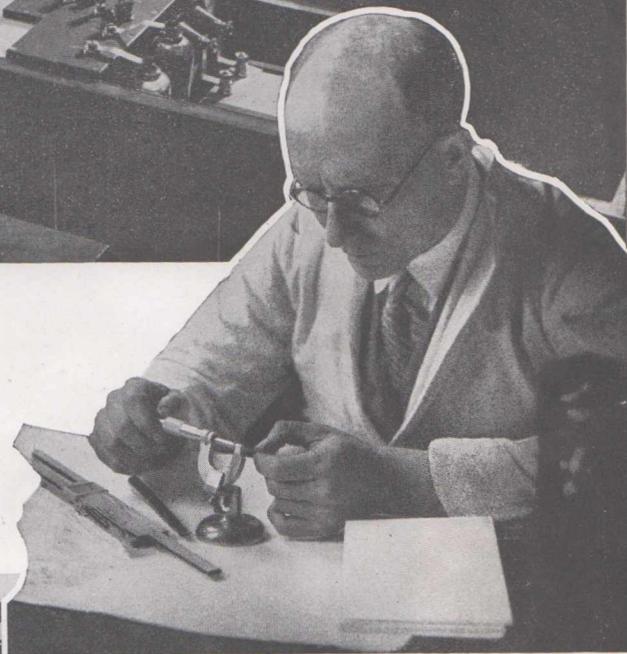


Operator taking
bearings on latest
type of Direction
Finding Equipment.



The work of the A.W.A. Research Laboratory at Ashfield is having a marked effect on the development of wireless communications, broadcasting and other phases of wireless, and its results will be even more potent in the coming years.

A.W.A. RESEARCH LABORATORY



Sub-standards
Laboratory.



Sydney Transmitting Centre

The largest and most up-to-date Transmitting Centre in Australia is the A.W.A. Station at Pennant Hills, near Sydney.

Fourteen wireless services are operated from Sydney Radio Centre, amongst the most important being:—

Trans-Ocean Telephone:

Overseas Wireless Telephone Services to Great Britain and the Continent, North and South America, and parts of South Africa.

Wireless Telephone Services to New Zealand, Java and Rabaul.

Marine Services:

Communication services with ships in Australian and New Zealand waters.

Long-distance service to ships in the Pacific, Indian and Atlantic Oceans.

Trawler Services.

Transmission of news for publication in daily papers printed on board vessels at sea.

Transmission of time signals and weather forecasts.

Pacific Island Services:

Pacific Islands Communication Services to Rabaul, Port Moresby, Suva, Noumea and Nauru.

Broadcasting:

A.W.A. world-wide short-wave station VK2ME.

Broadcasting station 2SM.

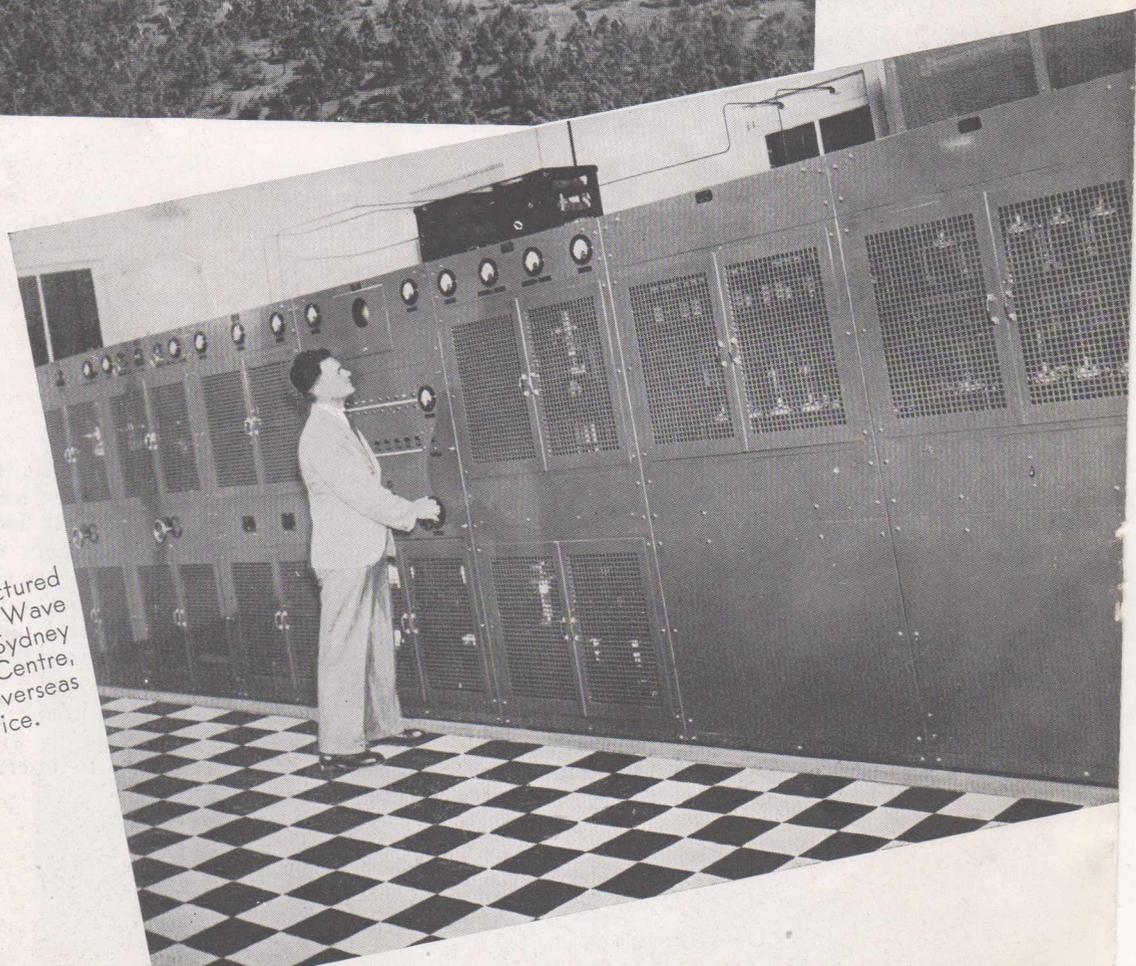
Of the transmitters, three are normally used on wireless telephone circuits, two as broadcast transmitters, and nine comprise telegraph transmitters. These transmitters operate on wave-lengths as low as 13 metres and as high as 2400 metres. Over 40 transmitting valves are in operation, working on voltages up to 10,000 volts. One hundred and thirty indicating meters are required for the smooth functioning of the equipment. Some idea of the engineering ingenuity of the Radio Centre may be gained from the fact that from the control table in the centre of the room a technician can control and operate any transmitter.

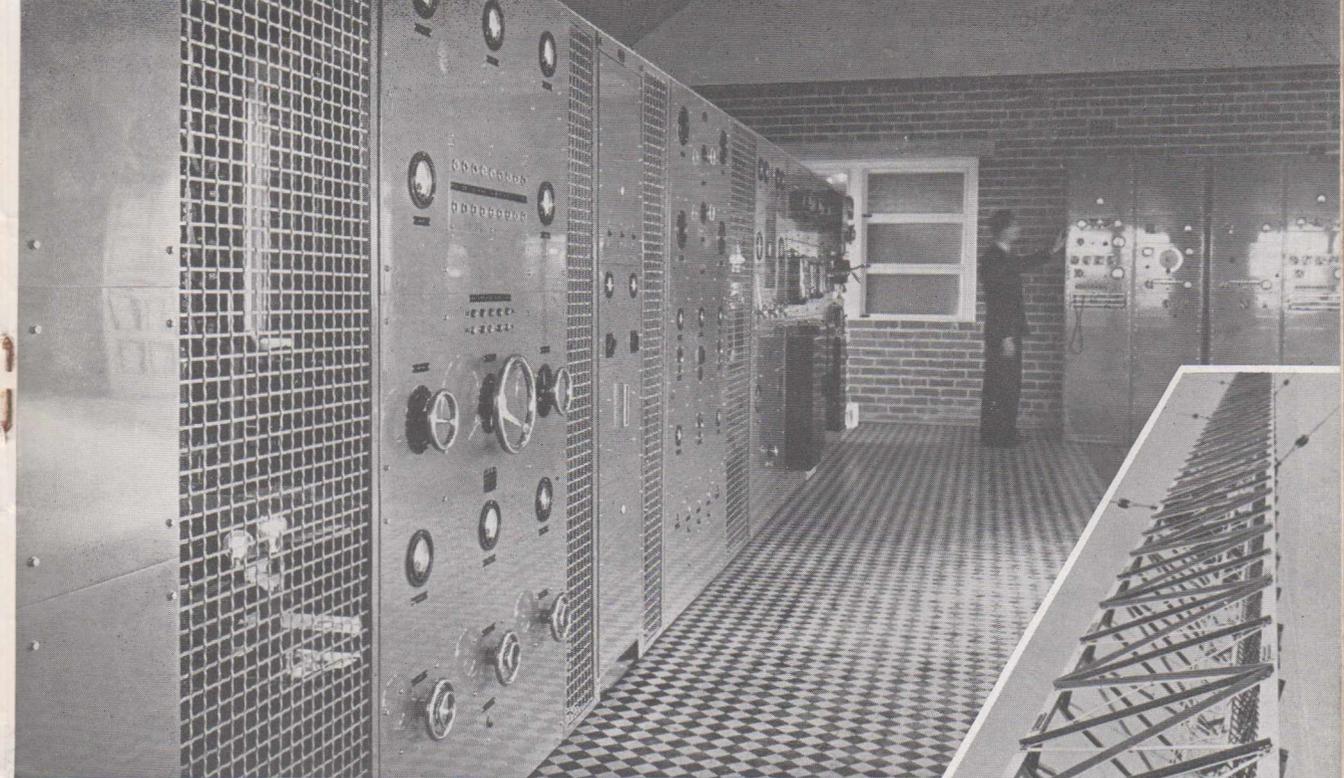
One of the most powerful transmitters is the 20 kilowatt wireless telephone transmitter, occupying a floor space of 600 feet, and the largest of its kind in the Southern Pacific. Actually over 60 kilowatts are required to operate this transmitter, and 22 large oil and air-cooled valves are utilised.



Sydney Transmitting
Centre of A.W.A. at
Pennant Hills.

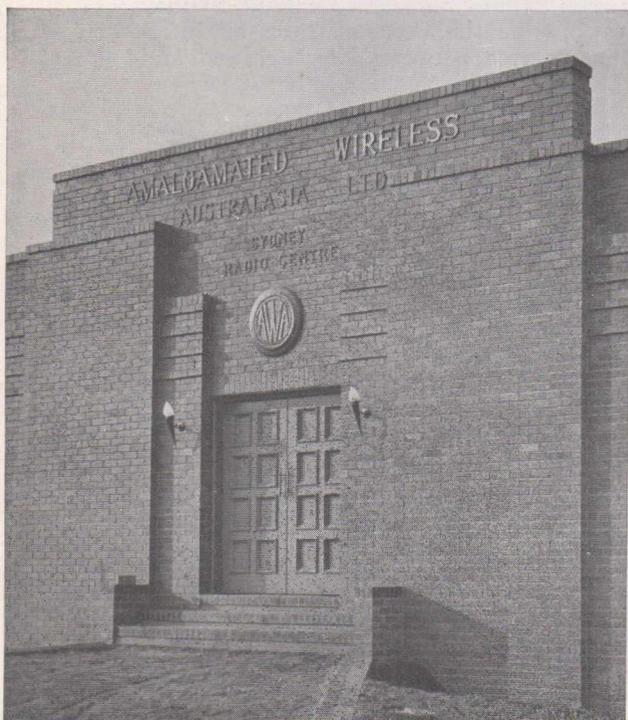
A.W.A. - manufactured
20 K.W. Short Wave
Transmitter at Sydney
Transmitting Centre,
for use in Overseas
Telephony Service.

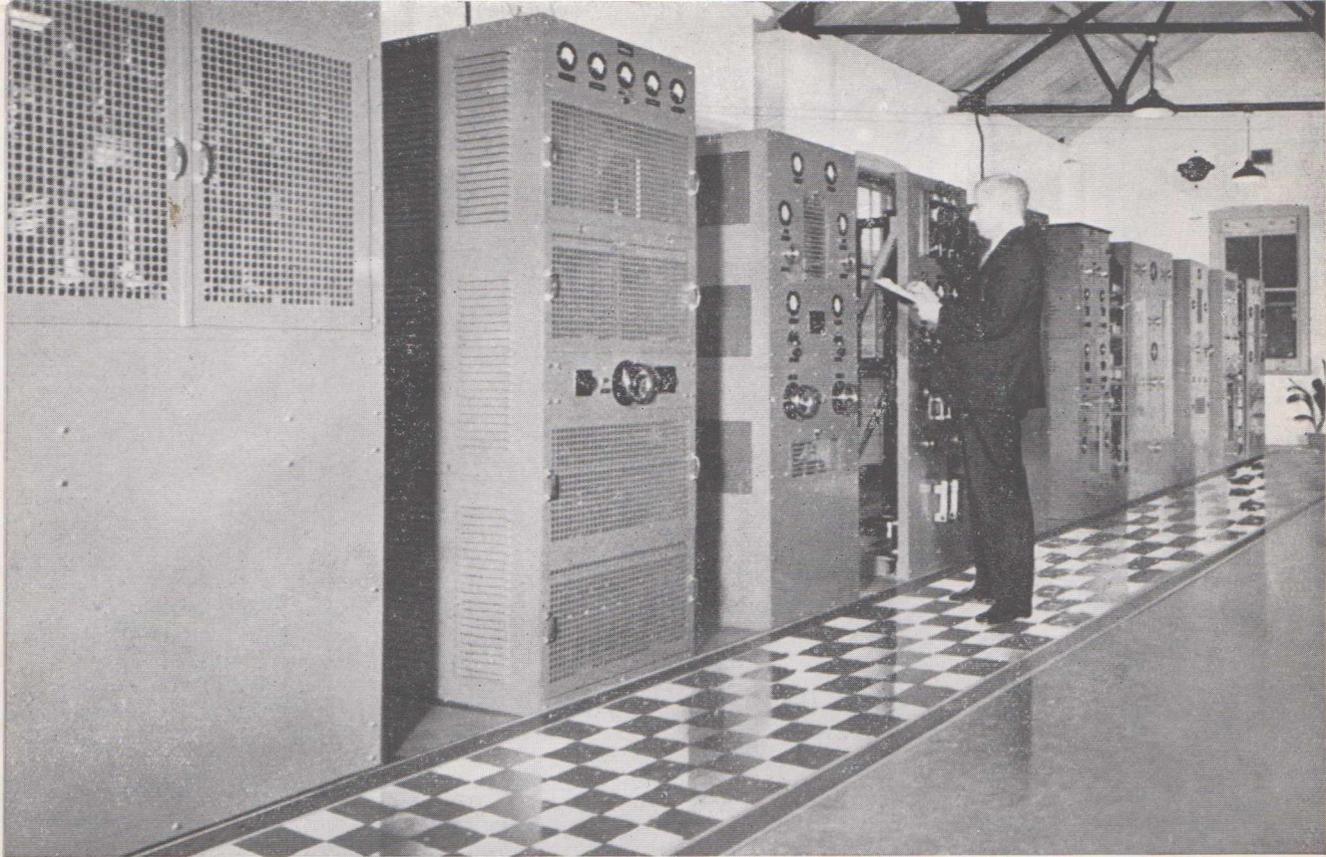




High-fidelity broadcast transmitter of Station 2SM, designed and manufactured by A.W.A.

2SM's radiating mast at Pennant Hills, Sydney, 450 feet high and 400 feet above sea-level.





A.W.A. Transmitting Centre

It carries the human voice direct to Great Britain in connection with the Australian Oversea Telephone Service. Other important telephone services operated from this Centre are those between Sydney and New Zealand, Sydney and San Francisco, and Sydney and Java; while the Centre acts as an inter-connecting link in the wireless telephone service between New Zealand and Great Britain.

A public wireless telephone service is in operation between Rabaul and Sydney, connecting up with the Australian telephone network.

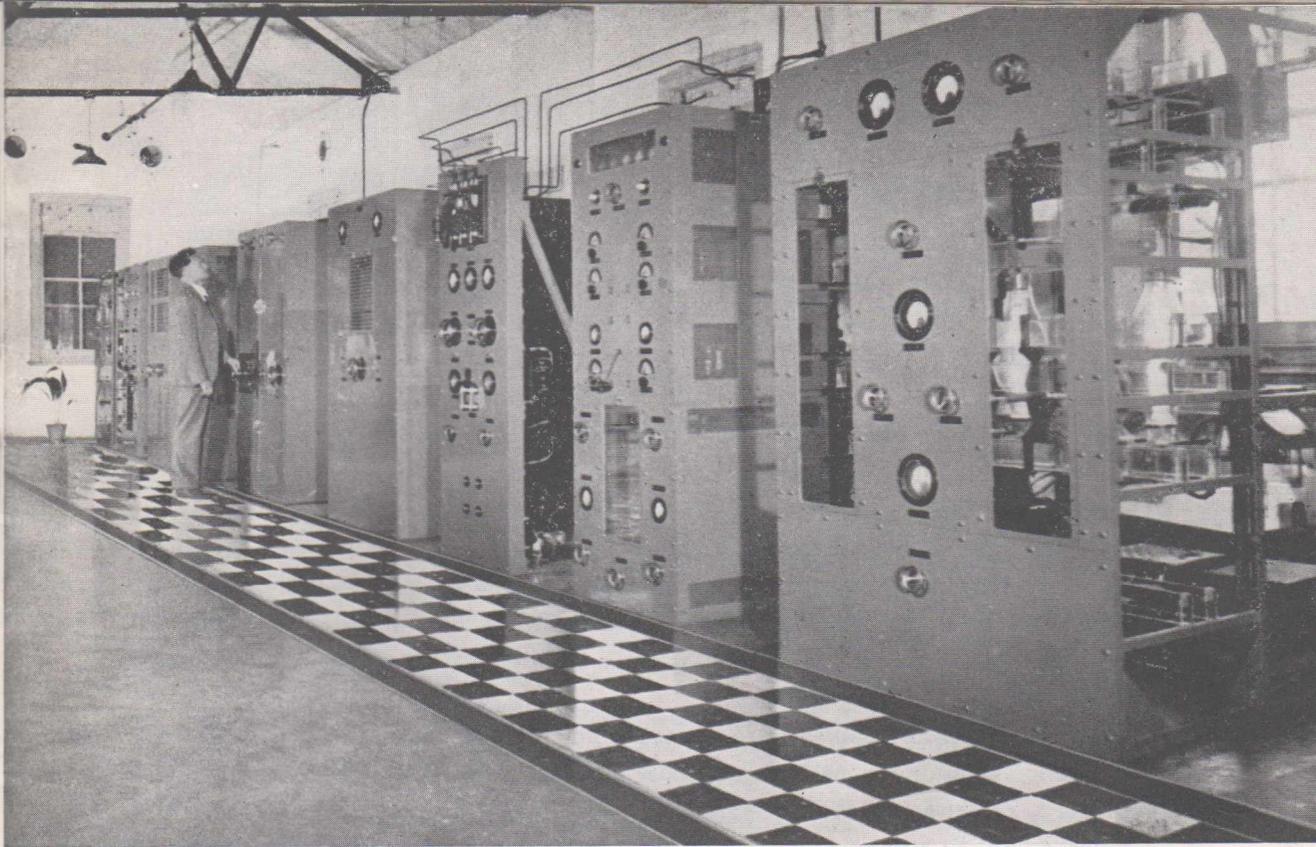
The regular weekly world-wide short-wave broadcast programmes of Station VK2ME are also transmitted from this Centre.

The Coastal Radio Service transmitters, communicating on both short and long waves with ships at sea, are located here.

In addition to the transmission of passenger and ships' traffic a regular press news service is sent out nightly to ships at sea, while navigation and weather warnings and information are broadcast to ships of all nationalities.

A service is maintained for communicating by means of either telephony or telegraphy with the trawlers operating off the N.S.W. coast.

Wireless telegraph services are in operation between Sydney and Rabaul, Port Moresby, Suva and Noumea, forming the only direct telegraphic routes to New Guinea, Papua and Noumea.



Pennant Hills, Sydney.

At A.W.A. Radio Centre is located the transmitter of Broadcasting Station 2SM, the services of which station are operated from the control room at the studios in the city of Sydney. The A.W.A. Broadcasting Station 2CH is situated at Dundas, a mile away from Pennant Hills Centre.

A particular feature of the telegraph and telephone services at Radio Centre is that the whole of these, with the exception of the Overseas Wireless Telephone Service—which is operated from the Central Telephone Exchange—are operated from either the A.W.A. Receiving Station at La Perouse or from A.W.A. Central Radio Office in Sydney, at will.

As a result of this modern system of operation the company's staff at Pennant Hills deals exclusively with the maintenance of the transmitters, the operating staffs being located at La Perouse Receiving Centre or at the A.W.A. Headquarters. Thus an operator located at the Receiving Station can carry on two-way working with ships, for when he is in contact with a ship's station and receives a message, he can, by tapping a keyboard, actuate the required transmitter at Pennant Hills, which sends out the message to the particular ship he is working. The same applies to practically all the other telegraph and telephone services enumerated above.

The whole of the modern equipment at this great Centre was designed and manufactured at the A.W.A. Radio-Electric Works.

Sydney Receiving Centre

In a veritable forest of steel masts on the crest of the northern headland of Botany Bay stands a solitary building. It is the radio ear of Australia.

Nearly fourteen years ago Sir Ernest Fisk, Chairman of Amalgamated Wireless (A/sia) Limited, evolved a scheme of centralising the Company's radio telegraph activities into three groups, viz., a Transmitting Centre, a Receiving Centre, and Central Radio Office. The Receiving Centre was established at La Perouse and is now the main receiving station in Australia. Apart from the economy of both the equipment and personnel, the operating efficiency of all the services has been vastly improved by this system. But how many people realise what a tremendous national service the Receiving Centre is performing?

Through this Receiving Centre comes the news of the world; all the wireless telephonic communications from any part of the globe intended for Australia and New Zealand; wireless telegraphic communications from Papua, New Guinea and Fiji; overseas short-wave broadcast programmes intended for re-broadcast in Australia. Wireless telegraphic messages from ships at sea are also received here.

There is hardly any limit, indeed, to the functions of this station as a Receiving Centre.

What a store of knowledge this ear of Australia has built up in listening to tens of millions of words and signals, and separating them into their proper channels in the service of the people of Australia! One may stand in the receiving room at this station and listen on twenty or more receivers to the business of the world—ships requiring information, New York disseminating commercial intelligence, London broadcasting news, trawlers communicating with their headquarters at Sydney, a passenger on an Atlantic liner conversing with an agent in Sydney, and a wide variety of other matters.

Inside the station the messages are separated into their proper channels, and the twenty receivers are constantly employed for twenty-four hours of the day in carrying on the radio business of the community.

Sydney Radio Centre is also the terminal of the Overseas Telephone Services. Telephone conversations from all parts of the world pass through here on their way to the connected telephone subscriber in Australia.

Another very important service is the reception of time signals which are received daily from Nauen (Germany), Malabar (Java), Washington (U.S.A.), and Paris. These are re-broadcast by the A.W.A. Transmitting Centre (Station VKO, Pennant Hills) on 197.4 metres and are received by Sydney and other Observatories, and by anyone tuning in to them. And the clocks set by these signals can be said to be perfectly accurate. Indeed, reception from Nauen and Paris is guaranteed to one-two-hundredth part of a second.

One of the most important functions performed by Sydney Receiving Centre is the operation of the Marine Wireless Service. Reception is effected up to a range of 5,000 miles with ships at sea on their normal wave-length of 600-800 metres. There is no limit, however, to the range of reception from ships equipped with short-wave apparatus. The Marine Service is world-wide. Communication has actually been established with trawlers off the coast of Greenland and with Antarctic expeditions.

The wireless-equipped trawling fleets operating off the east coast of Australia are in constant touch with Sydney Receiving Centre. This trawler service includes both wireless telegraphy and telephony.

In the pre-wireless days the trawlers made their catch and returned to port. There the skippers might find the public clamouring for fish or they might discover a glutted market. Now the comings and goings of the fleet are regulated by their owners. If the demand is strong a trawler might be ordered into port with a part cargo or the master might be instructed to continue fishing because the market is already well supplied. Wireless has had the effect of distributing the supply more evenly.

The Rabaul-Sydney commercial service is a particularly busy one. Rabaul is the main clearing station for traffic between New Guinea stations. La Perouse is also in constant touch with all Radio Stations in the Pacific.

There are no fewer than nineteen coastal radio stations around the seaboard of Australia, and La Perouse is in daily touch with them.

Most of the receivers at Sydney Receiving Centre are connected by land-lines with A.W.A. Central Radio Office in York Street, from where they are "remotely controlled" by an operator. By merely pressing a key this operator can tune a receiver at La Perouse on the desired wave-length, which is denoted on a meter in front of him. As the receiver dial moves at La Perouse, corresponding movements are made in the meter at the Central Radio Office. Similarly all of the telegraph transmitters at the A.W.A. Transmitting Centre at Pennant Hills are actuated from the A.W.A. Central Radio Office at Sydney.

It is a gigantic service that this wireless ear of A.W.A. at La Perouse is performing. But as busy as it is, it is kept constantly abreast of the latest scientific developments. And it never ceases to listen.

Melbourne Transmitting Centre

The Melbourne transmitting centre of A.W.A. is situated at Braybrook, six miles out of the city. Many services of importance are operated from this centre.

The marine wireless equipment for transmitting radiograms to ships at sea is here located, and is operated by remote control from the Central Radio Office of A.W.A. in Melbourne. The Braybrook transmitting centre accommodates the equipment used in the wireless telephone service maintained especially for trawlers which communicate with their principals ashore by the spoken word in preference to the Morse code.

A.W.A. world-wide short-wave broadcasting station VK3ME is located at Braybrook. This station transmits a regular broadcast programme (daily, except Sunday) for reception abroad, and appreciatory letters of the company's programmes and the quality of reception have been received from all parts of the world.

World-wide Broadcasting Service

The "Voice of Australia"

Australia was the first British Dominion to establish a regular overseas broadcasting service to the world. This service is operated by Amalgamated Wireless and its purpose is to keep overseas countries informed of the resources and tourist attractions of the Commonwealth.

The musical programmes are of high quality, and these are interspersed with talks on holiday resorts and on Australian industries—wool, wheat, meat, minerals—life on farms and stations and similar subjects.

The Company's world-wide short-wave broadcasting services are operated from Stations VK2ME, Sydney, and VK3ME, Melbourne. During the past two years no fewer than 15,103 letters of appreciation have been received from listeners in Great Britain, the Continent of Europe, U.S.A., and many other countries.

Australians are becoming more and more interested in international affairs, a fact accounted for partly by reason of Australia being a member of the League of Nations, and partly on account of the large number of movements in Europe having a reaction upon Australia's financial and economical position. Just as we can listen in Australia to transmissions in English from many foreign countries, A.W.A. has made it possible for people in non-English-speaking countries to follow the Australian stations by making announcements over Station VK2ME in English, French, Dutch, Spanish, Italian and German.

Aeronautical Radio

In this development the application of radio to aviation within the past two or three years stands out conspicuously.

Two years ago the world of aviation was discussing eagerly the reports of new ultra-high frequency beacons that send out a guiding ray or path along which a pilot flies to his destination. Amalgamated Wireless has now supplied seven such beacons to the Civil Aviation Department, the last three of which have been produced in the Company's Radio-Electric Works at Ashfield, and thus A.W.A. has pioneered the manufacture in Australia of this highly technical equipment.

The principle of the radio beacon is simple, though the technique involved is advanced. A pilot can see by the instruments in front of him when he is flying straight for the beacon. Immediately he veers to one side, the error is revealed and he turns to left or right until he sees he is on his course again.

A.W.A. has also the credit of being the organisation in Australia which has manufactured the new marker beacons of which the Company has made seven to the Civil Aviation Department. The marker beacon operates in conjunction with the course beacon. It emits a radio ray straight up into the air over the flying field, and the pilot is informed by his instruments immediately he has arrived overhead. Thus he knows he has reached the aerodrome, even though the ground is enveloped in fog.

These activities of Amalgamated Wireless have been of great assistance in the programme of enlarging the scope of aerial travel in Australia. Part of the Government's policy has been to have wireless facilities carried by every plane flying with passengers or mails to enable the pilot to send and receive messages to and from the ground. Amalgamated Wireless is the organisation in Australia to manufacture transmitters and receivers for aircraft, and the Company has installed such equipment in no fewer than 35 commercial planes. Also at many airports in Australia the Civil Aviation Department has established aeradio stations which are equipped, maintained, and operated by Amalgamated Wireless. These stations number 20, and the equipment, manufactured at the A.W.A. Radio-Electric Works, provides for the exchange of both speech and telegraphy between the ground and aircraft in flight.

A.W.A. also produces in Australia the famous Bellini-Tosi direction-finding apparatus, of which 19 sets have been supplied and installed. This appliance is a specialised radio receiver which detects the direction from which radio signals are coming.

A pilot who wishes to check his position therefore simply asks the aeradio station to give him a direction. He transmits the letter V a few times, and the officer at the land station trains the direction-finder upon him, and in less than a minute he tells him the angle of direction at which he is flying. By securing a bearing on the same machine from another station the aeradio officer can advise the pilot also of his exact position.

A.W.A. has introduced also the combined radio compass and "homing-device." This is fitted in an aeroplane, and can be employed by the pilot either as a compass to take bearings upon a wireless station or to set a course direct for a wireless station.

Thus the progress of aviation in Australia is being assisted by radio, upon which, indeed, flying is depending more and more. This is revealed in the fact that, during 1938, wireless equipment to the value of nearly £250,000 was completed for use upon Australian airways routes. The money thus expended will go a long way towards making Australia's facilities as good as those in the most advanced flying countries of the world.

Wireless Transport Services

Under the wireless system established for the Sydney Ambulance Service by A.W.A., no fewer than 19 ambulance cars serving the metropolitan area are in constant touch with their headquarters, and may be sent here and there at a moment's notice, assembled at any place as required, or recalled to their base.

The Sydney County Council operates a central wireless station and has 46 cars equipped with A.W.A. wireless engaged in the maintenance and breakdown service of the electricity supply.

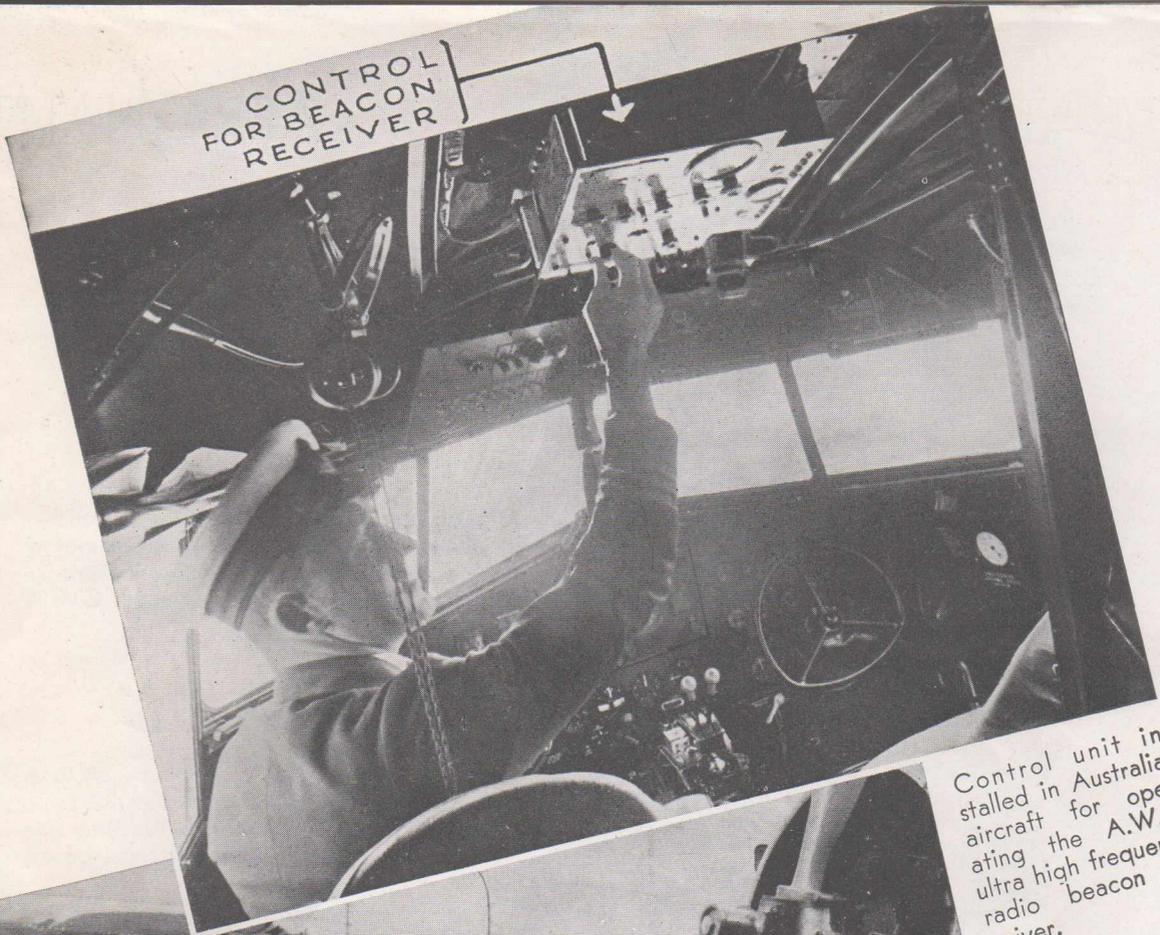
Radio services were provided some time ago for the Police Department of Sydney, Melbourne and Perth, by means of which the wireless-equipped police cars are in constant communication with police headquarters station.

The hydro-electric district served from the great Burrinjuck Dam is patrolled by a fleet of A.W.A.-equipped breakdown cars which rely upon wireless for instructions from central stations at Yass, Bogalara, Cootamundra, Gundagai and Murrumburrah. News of any fault in the electrical system is conveyed to the breakdown gangs as they travel along the roads, thus effecting great saving in time and repair work.

The Queensland Forestry Department has been equipped by A.W.A. with portable wireless plant which enables its forest rangers to maintain contact with their headquarters and with each other. This equipment is intended particularly as a means of giving early warning of bush fires.

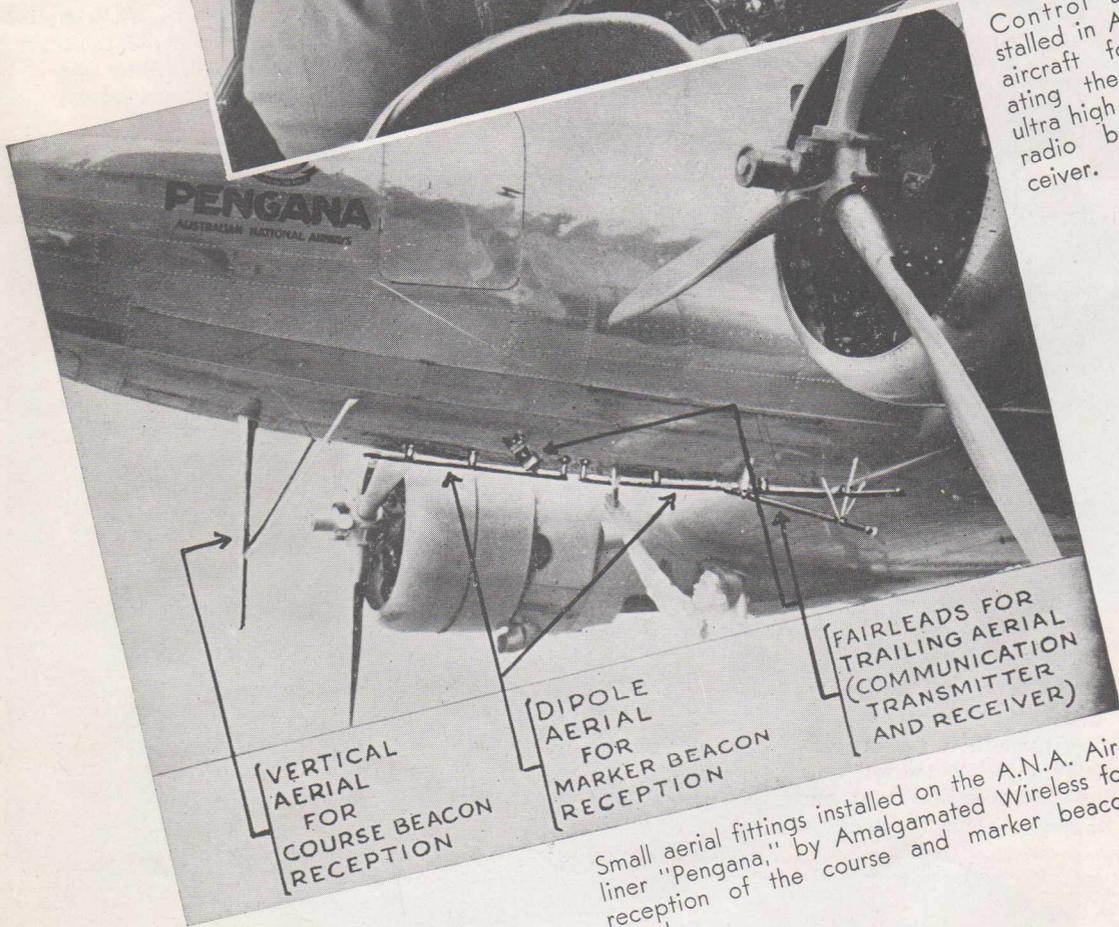
Lithgow, New South Wales, is the centre of an electrical area served by the Railways Department, and service men in repair trucks travel this district, each vehicle being fitted with radio equipment to enable them to communicate with headquarters, which are A.W.A. equipped.

A similar service to the above has been provided by A.W.A. for the Public Works Department of New Zealand to connect the generating stations at Mangahao and Waikaremoana, between which the country is very rough.



CONTROL
FOR BEACON
RECEIVER

Control unit in-
stalled in Australian
aircraft for oper-
ating the A.W.A.
ultra high frequency
radio beacon re-
ceiver.



PENGANA
AUSTRALIAN NATIONAL AIRWAYS

VERTICAL
AERIAL
FOR
COURSE BEACON
RECEPTION

DIPOLE
AERIAL
FOR
MARKER BEACON
RECEPTION

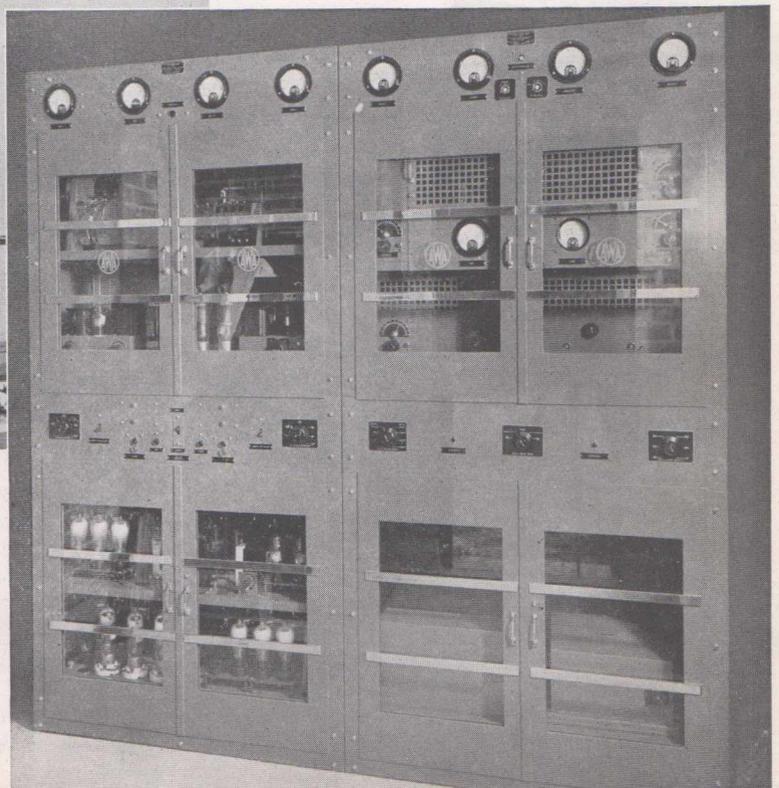
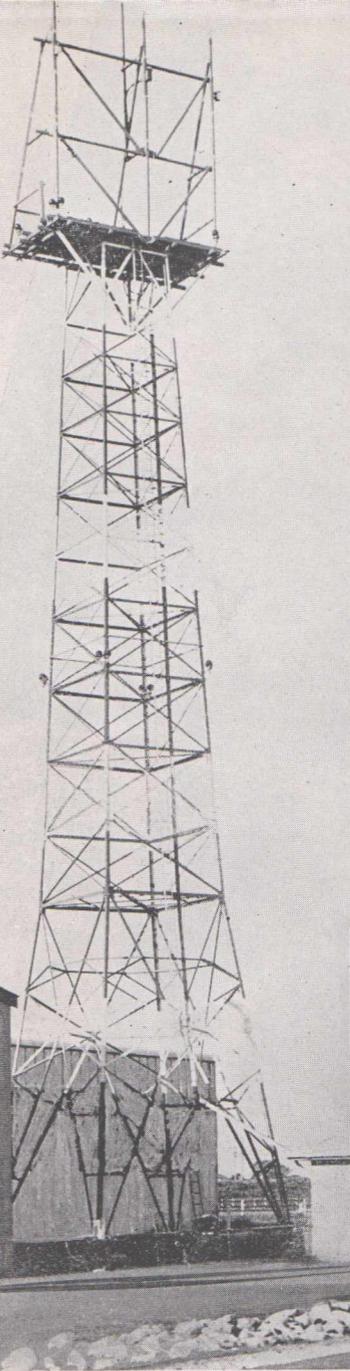
FAIRLEADS FOR
TRAILING AERIAL
(COMMUNICATION
TRANSMITTER
AND RECEIVER)

Small aerial fittings installed on the A.N.A. Air-
liner "Pengana," by Amalgamated Wireless for
reception of the course and marker beacon
signals.

AERONAUTI

A.W.A. ULTRA - HIGH FREQUENCY BEACON.

90 ft. steel tower carrying aerial and reflectors for the ultra-high frequency radio beacon at Kingsford Smith Aerodrome, erected by A.W.A. for the Civil Aviation Dept.



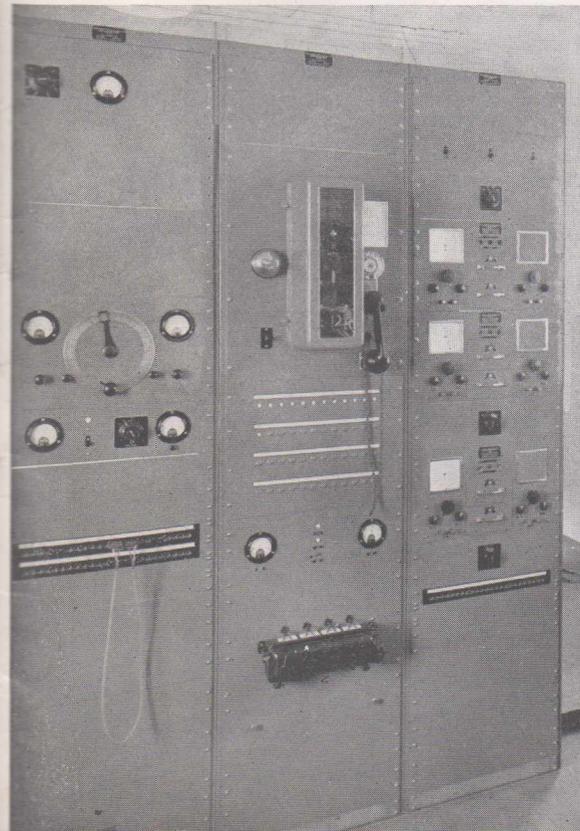
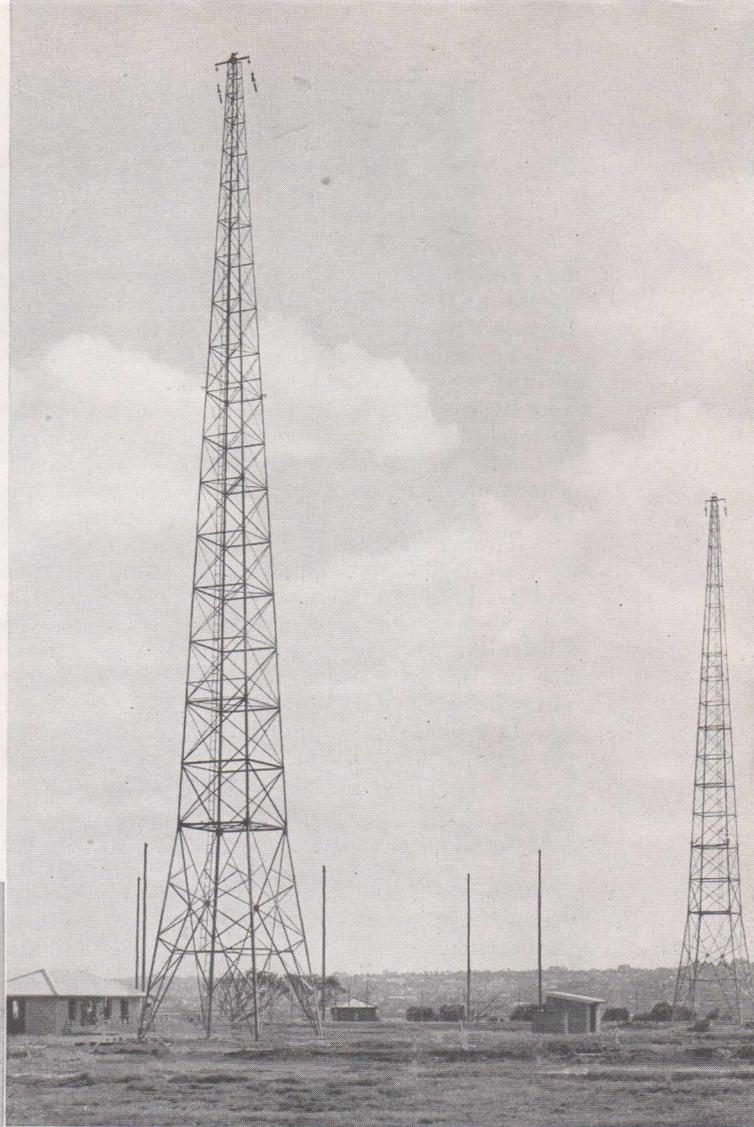
Transmitter of A.W.A. ultra-high frequency beacon manufactured in Australia by Amalgamated Wireless (A'sia) Limited for the Civil Aviation Dept. and installed at Kingsford Smith Aerodrome, Sydney.

CAL RADIO

AERONAUTICAL COMMUNICATION STATION.

150 ft. transmitting towers at Kingsford Smith Aerodrome, Sydney, for aeronautical communication, erected by A.W.A. for the Civil Aviation Dept.

A.W.A. designed and manufactured aeronautical communication receivers and control equipment, Kingsford Smith Aerodrome, Sydney.



Wireless Manufacture

On the incorporation of A.W.A. in 1913 the policy of manufacturing wireless equipment in Australia was laid down and important but unpretentious works established. The extensive and consistent progress in wireless manufacture since then has resulted in the acquisition of new and modern works.

To-day the Company's Radio-Electric Works at Ashfield, Sydney, comprise 231,000 square feet of floor space and stand in magnificently laid-out grounds. The beauty of the surroundings is such that the A.W.A. Works have been aptly termed "An Australian Factory in an Australian Garden." The plant is of the most modern type and was designed for large scale precision manufacture. The buildings also house the Company's modern testing and research laboratories, stores and distributing departments.

The leading position now held in the wireless industry by the A.W.A. Radio-Electric Works is the outcome of twenty-six years' steady progress in the design and production in Australia of all classes of wireless apparatus. The Works staff comprises the largest aggregation of wireless engineers and trained mechanics in Australia, while every type of transmitting equipment is manufactured for use on coast stations, ship stations, broadcasting stations, aerodromes, and aircraft, while the Radiola broadcast receiver is manufactured in thousands.

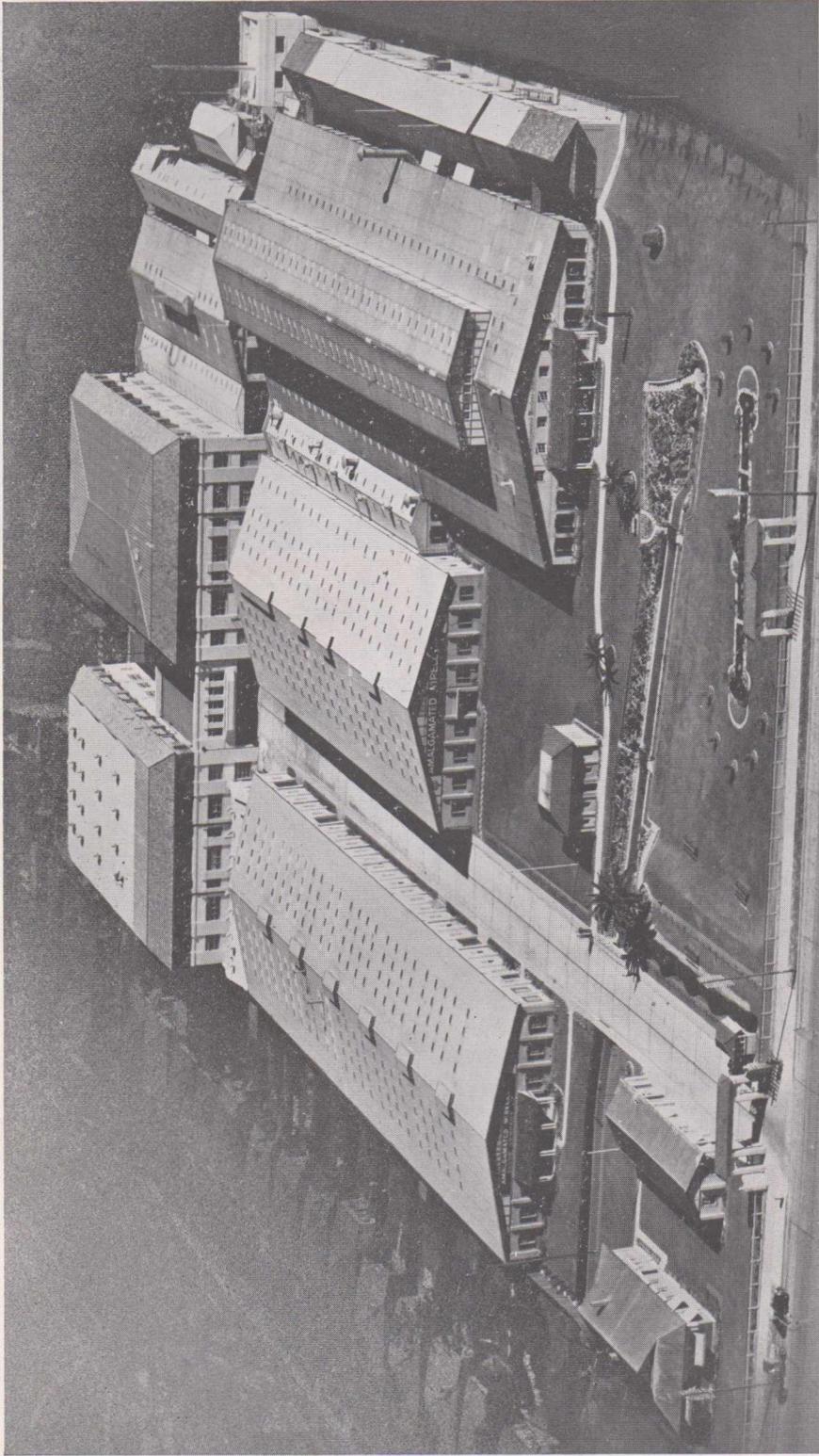
It is noteworthy that in the building up of the wireless industry in Australia the Company has not imported one expert from overseas.

Broadcast Transmitter Manufacture

Since the inception of broadcasting A.W.A. has designed and manufactured over fifty broadcast transmitters. The first installation was that for Station 2FC in 1923, followed by stations for 3LO, Melbourne; 4QG, Brisbane; 5CL, Adelaide, and 6WF, Perth. In addition, A.W.A. broadcast transmitters have been manufactured and installed in a large number of the principal provincial cities and towns in the Commonwealth.

Stations equipped during recent years by A.W.A. include 2UW, 2SM and 2CH, Sydney; 2GZ, Orange; 2LM, Lismore; 2CK, Cessnock; 2GN, Goulburn; 3XY, Melbourne; 3DB, Melbourne; 3TR, Sale; 3SR, Shepparton; 3LK, Lubeck; 4WK, Warwick; 4CA, Cairns; 4RK, Rockhampton; 4SB, Kingaroy; 4MK, Mackay; 4AT, Atherton; 4BK, 4BC, Brisbane, Q.; 4PM, Port Moresby; ZJV, Suva; 2KA, Katoomba; 5AU, Port Augusta; 6PR, Perth; 6GE, Geraldton; 7LA, Launceston.

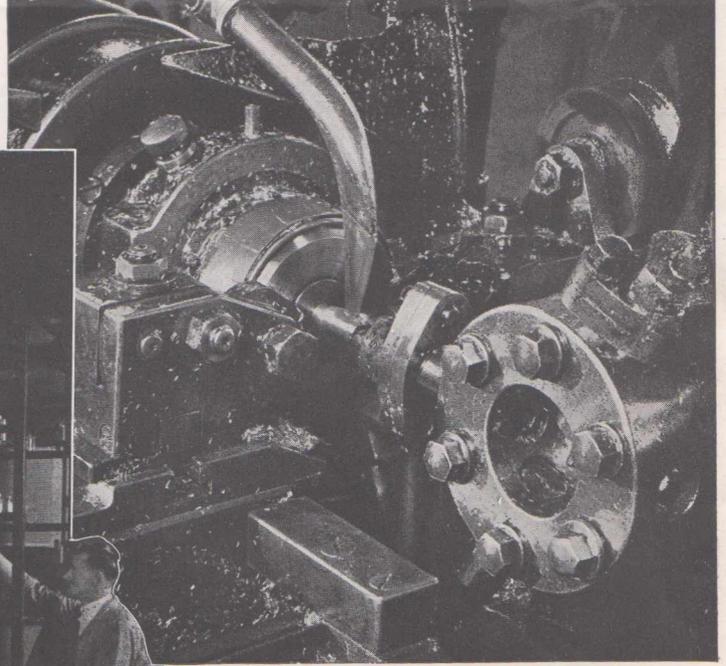
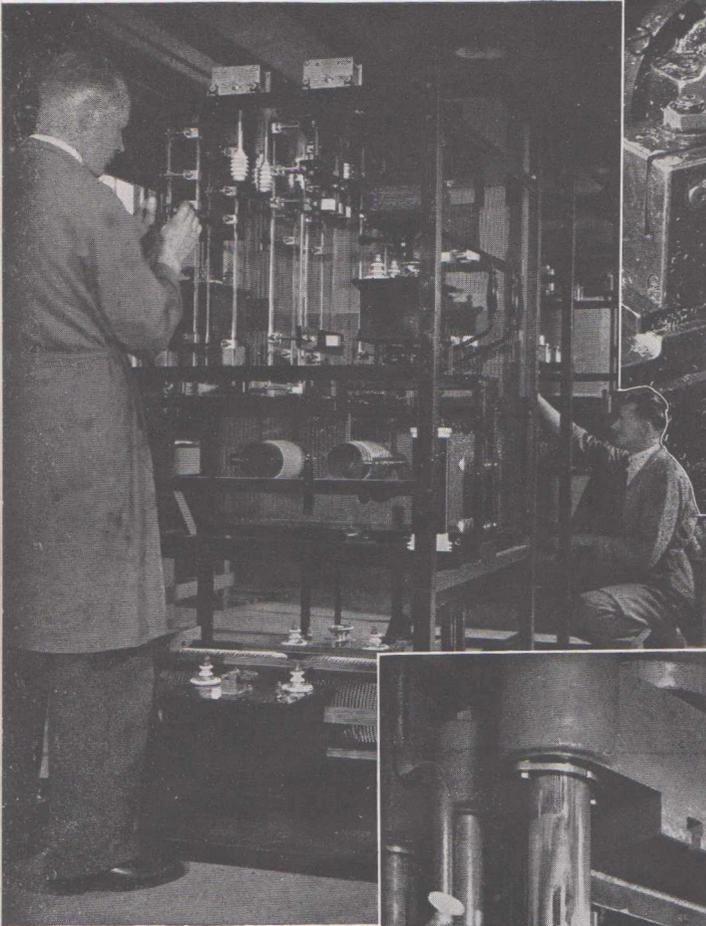
Not only are the most powerful and modern type of broadcast transmitters designed and manufactured in Australia, but they are being exported overseas. Following on the re-organisation of broadcasting in New Zealand, the New Zealand Broadcasting Board placed orders with A.W.A. for the installation of several modern transmitters. Of these, one has been installed at Auckland, another at Christchurch, and a third at Dunedin. All are of 10,000 watts power. Others at Hawkes Bay and Southland have a power of 5,000 watts each. Further, a 60,000 watts transmitter specially designed and manufactured for the New Zealand National Broadcasting Service was installed at Wellington. This is one of the most powerful medium wave broadcasting transmitters in the British Empire.



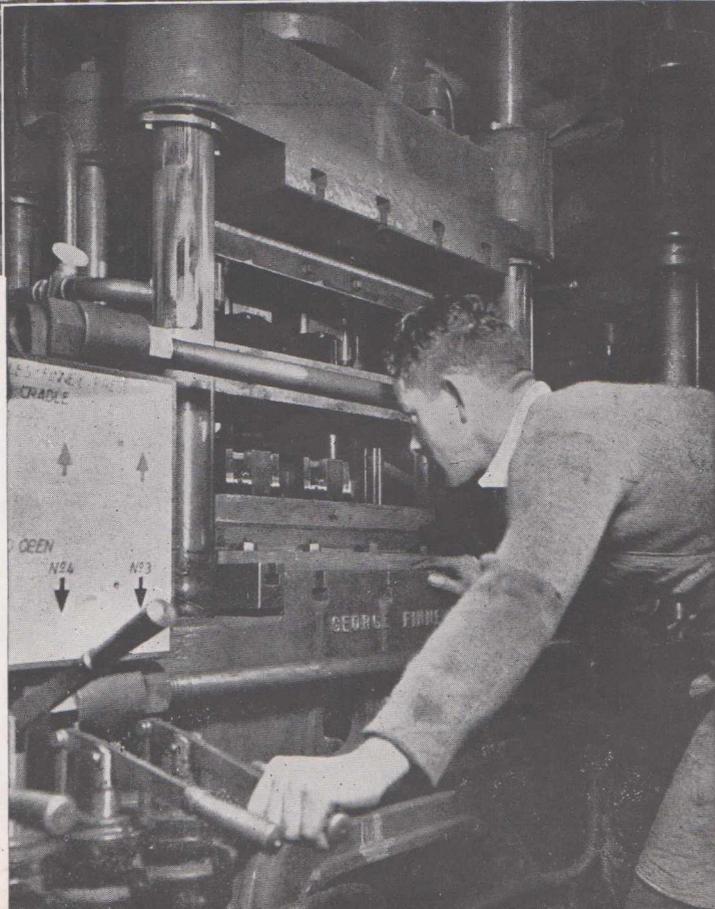
A.W.A. Radio Electric Works, Ashfield, Sydney

AN AUSTRALIAN FACTORY IN AN AUSTRALIAN GARDEN

Manufacture of 10,000 watt Broadcasting
Transmitter.



Once set up this machine completely
manufactures thousands of small parts
without human aid.



100 tons pressure is exerted
by this hydraulic moulding
press in making synthetic
moulding.

A.W.A.
RADIO-ELECTRIC
WORKS

Valve Manufacture in Australia

With the formation of the Amalgamated Wireless Valve Company, and the installation of a valve plant of the most modern type at Ashfield, Sydney, the output of Radiotron valves in Australia is approximately a million per annum, and the quality equal to the best valves manufactured overseas. The production of valves in Australia is an entirely new industry, and its establishment was wholly carried out by Australians. Instead of importing trained men from abroad, the Company sent some of its own technicians overseas to gain experience in valve processes. On their return they were instrumental in helping to establish the new industry and in training Australians in the intricate processes of valve production.

Research Laboratory

Recognising the value of research work in the development of wireless, the Company, some years ago, established a well-equipped research laboratory to develop new means and methods in the application of wireless science. In accordance with its established policy, A.W.A. has engaged Australian scientists to carry on its research activities. The work has grown with the expansion of wireless activities and to-day many highly qualified men constitute the laboratory staff. The Company is confident that its developmental and research laboratory will prove an important factor in furthering Australian wireless.

Employment of Australians

The placing of Australian youth in industry is a difficult problem and one which many social organisations are endeavouring to solve. A.W.A. is keenly interested in the solution of the problem, and in the extension of its activities has provided profitable channels of training for a great many young men, and for continuity of employment within its own organisation.

Products Manufactured by A.W.A.

Broadcast Transmitting Stations and Studio Apparatus.

Wireless Telegraph Stations.

„ Telephone „

Aeronautical Radio Equipment.

Navigation Beacons.

Marker Beacons.

Aeradio Communication Systems.

Aircraft „ „

Marine Apparatus.

Wireless Telegraph Transmitters.

„ „ Receivers.

Wireless Telephone Transmitters.

„ „ Receivers.

Direction Finders.

Music Amplifying Equipment.

Auto Alarm Equipment.

Automatic S.O.S. Transmitters.

Wireless Beacons.

Echometers.

“Fisk” Radiolas.

“Fisk” Sound-proof Windows.

„ „ Partitions.

„ „ Ventilators.

Radio Telephone Terminal Apparatus.

Public Address Apparatus.

Loudspeaker Call System for Hotels.

Centralised Radio for Flats, Guest Houses, etc.

Public Address and Loudspeaker Systems for Hospitals.

Sound Amplifying Systems for Churches, Halls, etc.

Electromatic Traffic Signals.

Special Electrical and Radio Apparatus.

AMALGAMATED WIRELESS (A/SIA) LTD.

AUSTRALIA'S NATIONAL WIRELESS ORGANISATION

