

BROADCASTING BUSINESS 1937 YEAR BOOK OF AUSTRALIA

YOUR BUSINESS - PROGRESS! OUR BUSINESS - SERVICE!

Your business is PROGRESS! Our business is SERVICE! Our aim for high quality with reasonable cost has been achieved, and ushers in a new era of economical broadcasting technique.

Penthode Transmitters for all purposes, and our large range of quality studio apparatus and accessories, support our service in the technical field.

In the programme domain the Philips-Miller recording and reproducing units permit of greater co-operation with national sponsors.

Programme materials will be offered for your approval, and we will be in a position to co-operate with recording studio facilities.



SPECIALISING IN

TRANSMISSION

AMPLIFICATION

RECORDING..

RECTIFICATION

ETC. ETC.

PHILIPS

WORLD'S LARGEST RADIO MANUFACTURERS

CONTENTS TABLE

	Page.
Broadcasting in Australia	3
Broadcast Fees and Charges by P.M.G.'s Department	4
Wireless Control in Australia	5
Wireless (Commonwealth) Act	7
Wireless (Commonwealth) Regulations	8
Australian Radio Research Board	12
Fourth Annual Report of the Australian Broadcasting Commission	15
Auditor General's Report on P.M.G.'s Wireless Activities	24
Commonwealth and State Taxes	28
Important Australian Statistics	33
Communication Services of P.M.G.'s Department	35
Technical Progress in Australian Broadcasting	37
Listeners' Licences—in Australia in 1934-5-6	39
—(all classes) in Australia since 1924	39
Long Distance Telephone Service for Broadcasting	40
Listeners' Licences—Growth by States since 1924	41
—Monthly totals by States for 1936	42
—Country-Metropolitan Distribution	44
—in N.Z. for 1936	45
—50 mile quarterly figures	46
Complete list of Broadcasting Stations in Australia	50
Map of Australia showing location of Stations	51
List of existing National Broadcasting Stations	53
List of New Zealand Broadcasting Stations	54
Australian Federation of Broadcasting Stations	55
Institution of Radio Engineers	56
Frequency/Wavelength Conversion Chart	65
Dictionary of Radio Definitions	66
The Decibel System	70
Frequency Spectra of Musical Instruments	71
P.M.G.'s 26th Annual Report	72
Technical Considerations governing location of Transmitters	75
Australian Radio Tariff Schedule	77
Importance of Efficient Aerials	80
"Coverage"—is Higher Power Necessary?	82
Australian Experimental Short Wave Stations	84
Australian Short Wave Transmission Schedules	85
Call Sign Allocations	86
Broadcast Station Separation	88
Modern Disc Recording	89
Transcription Producers and Programme Services	96
Power Analysis of Australian Commercial Stations	99
Prominent Advertisers in Australian Broadcasting	100
Advertising Agencies Handling Radio Accounts	105
Particulars of Commercial Broadcasting Stations	110
Broadcasting Transmission Equipment Manufacturers	137
Important Broadcasting Social Clubs	137
N.Z. National Commercial Broadcasting Service	138
Broadcasting Station Representatives	140
Station Slogans	141
Personnel of Commercial Stations	142
George Edwards Productions	150
Who's Who in Commercial Broadcasting	151
Australian Broadcasting Commission—Members	164
—Executive Officers	165
General Index	166



List and Index of Advertisers

	Page		Page
Airsales Broadcasting Company (2HD) 299 Hunter Street, Newcastle, Waratah 487	125	Hume Broadcasters Ltd. (5DN) 29 Rundle Street, Adelaide, C 8006	131
Amalgamated Wireless (A/sia) Ltd. 47 York Street, Sydney, BW 2211	87	Labour Council of N.S.W., The 428 George Street, Sydney, M 6291	121
Broadcasting Station 2CH 77 York Street, Sydney, MJ 4351	115	Lekmek Radio Laboratories 75 William Street, Sydney, FL 2626	81
Bundaberg Broadcasters Pty. Ltd. (4BU) Bourbong Street, Bundaberg, Tel. 505	145	Melbourne Broadcasters Pty. Ltd. (3AK) 480 Bourke Street, Melbourne, M 5667	123
Catholic Broadcasting Co. Ltd., The, 42 Carrington Street, Sydney, B 7294	141	Newcastle Broadcasting Co. Ltd. (2KO) 72 Hunter Street, Newcastle, Tel. 932	145
Clubb, A. M. & Co. Ltd. 76 Clarence Street, Sydney, B 3908	95	Nilsen's Broadcasting Service Pty. Ltd. (3UZ) 45 Bourke Street, Melbourne, Cen. 572	127
Commercial Broadcasters Pty. Ltd. (7HO) 80 Elizabeth Street, Hobart, Tel. 6008	137	Philips Lamps (A/sia) Ltd. 67 Clarence Street, Sydney, BW 2121	Front Cover
Columbia Graphophone (Aust.) Ltd. 2 Parramatta Road, Homebush, Sydney. UM 6671	Back Cover	Prestophone Pty. Ltd. 296 Pitt Street, Sydney, MA 7325	98
Commonwealth Broadcasting Network 49 Market Street, Sydney, M 6686	111	Radiovision Pty. Ltd. 61 Hunter Street, Sydney, B 5453	139
Country Broadcasting Services Ltd. Hosking House, Hosking Place, Sydney. BW 1428	113	Sound Recording Studios Ltd. 160 Castlereagh Street, Sydney, MA 4035	99
Diamondpoint Services Pty. Ltd. 83 Pitt Street, Sydney, BW 1084	97	Tamworth Radio Development Co. Ltd., 312 Peel Street, Tamworth, Tamworth 211	143
Efftee Broadcasters Pty. Ltd. (3XY) Prince's Theatre Bldg., Spring Street, Mel- bourne, Cen. 6612	119	3KZ Broadcasting Co. Pty. Ltd. 64 Elizabeth Street, Melbourne, Cen. 318 (3 lines)	107
Featuradio Sound Production Pty. Ltd., 32 Market Street, Melbourne, C.1. M 5701-5	93	Trans-Radio-Service, 65 York Street, Sydney, B 5407	96
George Edwards Productions, C/o Station 2UW, Sydney, MA 4158	91	Western Province Radio Pty. Ltd. (3HA) 37 Gray Street, Hamilton, Vic., Hamilton 316	134



. . . The . . .

**BROADCASTING
BUSINESS**

YEAR BOOK
OF AUSTRALIA

SECOND EDITION
1937

Price 10/- per copy, post free in Australia
(Included free in annual subscription of 15/-
to "Broadcasting Business.")
Overseas Price 15/-.

Whilst every care has been exercised in
the compilation of this Annual, the pub-
lishers cannot accept any responsibility
for any errors or omissions.

PUBLISHERS
Australian Radio
Publications Ltd.

O. F. MINGAY, Managing Editor.

Head Office: 30 Carrington Street, Sydney,
N.S.W. B 7188 (3 Lines), G.P.O. Box 3765.

Branch Office: 422 Little Collins Street,
Melbourne, Victoria. M 5438, G.P.O. Box 1774.

Publishers also of:—

"BROADCASTING BUSINESS"—the weekly trade
business paper published every Thursday, covering
the activities of commercial broadcasting stations.
Subscription 15/- p.a., including a free copy of this
Year Book.

"RADIO RETAILER OF AUSTRALIA"—the weekly
trade business paper published every Friday, cover-
ing the manufacturing and distribution activities of
the Radio Industry. Subscription 15/- p.a., including
a free copy of the "Radio Trade Annual."

"RADIO REVIEW"—a technical monthly, of par-
ticular interest to all people engaged professionally
in the technical aspect of radio. Annual subscription
10/-.

"RADIO TRADE ANNUAL OF AUSTRALIA"—pub-
lished every year about May, and includes all the
reference matter required by any person engaged
in radio. Price 10/- (Included free in subscription
to "Radio Retailer.")

Foreword . . .

THE second edition of the "Broadcasting Business Year Book" is presented herewith with a knowledge that it will be of valuable assistance to all those business people who are interested in commercial broadcasting in Australia.

The rapid growth of broadcasting throughout the Commonwealth has been something staggering, even to those who are on the inside of the business. In fact about 35 new stations were opened in five months recently.

The increased advertising revenue enjoyed by commercial stations speaks volumes for the service rendered by those stations, and indicates in a most positive manner that the hard headed business fraternity has found that it pays to advertise over the air.

This second Year Book follows on much the same lines as last year because it has been found that there is not much alteration that could be made, but whatever changes are made will only enhance its value to our readers.

A number of stations have failed to answer our letters asking for data relative to their station, and therefore the Year Book is not quite as complete as we would like. Nevertheless, every care has been taken in the compilation, and some previous details omitted as being too soon out of date and unnecessary.

To those who assisted in making the issue of this "Broadcasting Business Year Book" possible, we offer our sincere thanks, and particularly the P.M.G.'s Department for their very willing co-operation.

OSWALD F. MINGAY,
Managing Editor.



Calendar grid for 1936 (January to June)

Calendar grid for 1936 (July to December)

Calendar grid for 1937 (January to June)

Calendar grid for 1937 (July to December)

Calendar grid for 1938 (January to June)

Calendar grid for 1938 (July to December)

M161114 22 4 87

Broadcasting in Australia

AS this BROADCASTING BUSINESS YEAR BOOK is not issued until August, and while it is intended to primarily serve as a book of record of 1936 happenings, etc., nevertheless it is felt that certain information regarding the first six months of 1937 would prove interesting reading and reference.

This annual publication, along with its weekly companion, BROADCASTING BUSINESS, is mainly concerned with Commercial Broadcasting in Australia, as distinct from the National service. It might be explained that the National stations are owned by the Federal Government, and are operated by the Australian Broadcasting Commission for the Government, to whom all listeners pay an annual license fee to provide National programmes. On the other hand, Commercial stations rely solely on advertising revenue for their income.

The growth of broadcasting in public favour is best indicated by an examination of the listeners' license figures. As is well known, every radio transmitter and receiver must be licensed by the Commonwealth Government. The Commercial transmitters pay an annual fee of £25, while receivers pay £1/1/- per annum. The listeners may take out their license at any Post Office, and it is an offence to use a receiver without a license.

Listeners' License Figures.

DURING the calendar year 1936 (January to December), there were 199,359 new listeners' licenses issued, as compared to 169,621 for the year 1935, which is an increase of 17.4 per cent. After allowing for cancellations, the year 1936 registered a nett gain of 116,863, and the total at the end of December, 1936, was 887,015 listeners' licenses.

At June 30 this year, 1937, the total had reached 940,068, an increase of 53,053 over that six months. At that rate, there will be over 1,000,000 licenses in operation by December 31, 1937.

It is conservatively estimated that at least 180,000 new wireless sets were made and sold in Australia last year, and those figures should be eclipsed this year, while next year, 1938, with the 150th Anniversary Celebrations in Sydney, and the Australian cricketers going to England to play the Test Matches, it is believed that at least 250,000 radio sets will be made and sold.

Broadcasting has undoubtedly caught the public taste, and the Commercial stations certainly entertain 80 per cent. of the listening public. The National Service is not the popular Service, in our opinion, al-

though nearly £1,000,000 will be paid this year in license fees alone. Yet few people complain, and the National Service, as such, does a fairly good job. Probably the "high-brow" tendency of the National Service is a good thing for the Commercial stations, which number over 80, as compared to 20 Nationals.

The details of listeners' license figures will be found commencing on page 39 of this Year Book, and afford very interesting reading for those who are concerned with the business of broadcasting.

On page 41, will be found figures showing the growth of licenses in each State. It will be noticed that at December 31, 1936, South Australia had the highest percentage of radio licenses to population, namely, 15.84, followed closely by Victoria with 15.02, both above the Commonwealth average of 13.09, while New South Wales with 12.76, Western Australia with 12.27, Tasmania with 11.69, and Queensland with 9.40, were all below the average. As against that, the greatest percentage increase during the year was registered by Queensland, with 23 per cent., followed by Tasmania with 20, Western Australia with 19, New South Wales 16, South Australia 15, Commonwealth average of 15, and Victoria well below with only 11 per cent. increase.

It must be remembered that broadcasting in Victoria developed remarkably during 1925 and 1926, due to good programmes and, of course, being a very thickly populated State of relatively small area. During the past few years, other States have gone ahead very well.

Another interesting item is that of 163,006 nett increase in the Commonwealth during 1934, which was the last year that the Australian cricketers went to England, and it is expected that 1938 (they go to England every four years) will see another big nett increase, because the broadcast of the Test Match scores takes place in Australia from about 7.30 p.m. till early morning, a time when most men are at home.

Country—Metropolitan Distribution.

If you turn to page 44, you will see how the listeners' licenses are distributed between the Metropolitan areas and the remainder of the States.

Throughout Australia, 75 per cent. of the homes in the Metropolitan areas were radio equipped, while in the country areas, only 38 per cent. possessed a radio set. That is a reason why there is a bigger scope for expansion by Country broadcasting stations.

(Continued Overleaf.)

Broadcasting in Australia (continued)

In New South Wales, 72 per cent. of Metropolitan homes had radio and 39 per cent. of the country homes. Victoria had 78 per cent. of Metropolitan homes radio equipped and 43 per cent. of country homes. In Queensland, 70 per cent. of Metropolitan homes were fitted with radio, and only 27 per cent. in the country. South Australian Metropolitan homes reached the high figure of 82 per cent. with radio, while 46 per cent. of the homes in the rest of the State enjoyed listening in. Western Australia had 77 per cent. of Metropolitan homes equipped and 29 per cent. of country homes. Tasmanian Metropolitan radio homes reached 70 per cent. and country radio homes 43 per cent.

Further analysis of licenses in districts throughout the Commonwealth will be found on pages 46 to 49, and as those are quarterly figures issued by the P.M.G.'s Dept., they show the growth in the various localities.

In very recent years, there has been a decided growth in country broadcasting stations, both Commercial and National relay. Both types are filling a long-felt want, as they provide a programme service that gives in-

valuable entertainment to the people who need it most. As all of Australia's capital cities are located on the coast, and the conditions of living therein are very good, broadcast entertainment is not of such paramount importance as that required in country areas.

The introduction of more National relay stations, located well out in country areas, rather tends to assist the Commercial stations located nearby. Thus alternative services are provided and both have a definite value to the public.

Network Tendency.

One remarkable tendency of late among Commercial stations, is the linking up in various networks or chains. A number of stations join together under various arrangements, with the object of obtaining greater advertising revenue, or reducing the overhead costs, or because the owners believe it to be a good investment. So far, it appears to work out all right, and only time will show what the results are.

Transcriptions are being used more and more, and so are important relays by landline, all of which proves the tremendous popularity of advertising over the air.

Broadcast Fees and Charges by P.M.G.'s Dept.

It is of paramount interest to broadcasting stations, and advertising agencies to understand the system in vogue in regard to extra charges and ordinary charges made by the P.M.G.'s Department for the use of telephone and trunk lines between the various broadcasting stations and the pick-up points.

The system of re-broadcasting from one station to another or from one station to a chain of stations is growing rapidly and becoming very popular. A considerable amount of equipment is involved in utilising trunk lines for re-broadcasts or relays and a large staff is required to keep this apparatus and lines in order so that broadcasting stations can have their relays carried out with the maximum efficiency.

Primary Charge.

The primary charge on all relays is the same as for trunk line calls, as set out on pages 4 and 5 of the telephone directory, and is made for the actual time the trunk lines are used, except that there is a minimum charge equal to nine minutes' use of the trunk line in question in respect of each race description relayed. There are three periods of the 24 hours, during which different rates are applied. For instance, 9 a.m. to 6 p.m. is the day rate, and this is the highest rate. The next is the period from 6 p.m. to 9 p.m., and from 7 a.m. to 9 a.m. Finally, the 9 p.m. to 7 a.m. is the half-rate period.

Line-up Charges.

In addition to the above charges, there is an added charge called the "Line-up Charge," and this is determined by the time that extra channels are used by the engineers

in order to bring up the actual transmission line into operation. Broadcast line-up charges between two capital cities, where speech is employed, involves an added charge of 18 minutes; for races 9 minutes, and for music, 30 minutes.

Where three or more capital cities are involved, the line-up added charge for each section, i.e., between each capital city, is 18 minutes for speech each section, 9 minutes for races for each section, and 45 minutes for music for each section.

Between a capital city and country town in the same State, the line-up charge for speech is 12 minutes, for races 9 minutes, and music 18 minutes. For a capital city and two or more country towns, 12 minutes for speech, 9 minutes for races and 24 minutes for music.

Splitting Amplifier Charge.

Where there is more than one receiving studio involved in a transmission, a splitting amplifier is necessary either in the originating studio or in a Departmental exchange building.

If the broadcasting organisation concerned desires one trunk line to serve more than one receiving studio it becomes necessary for the Department to provide the splitting amplifier at some intermediate point.

When splitting equipment is provided by the Department a charge of 2/6 for each five minutes, with a minimum of 10/- and a maximum of 20/- for each additional studio is added to the cost of the trunk line facilities.

Full details regarding the Department's facilities for this service are available from the Deputy-Director at the General Post Office of each capital city.

WIRELESS CONTROL IN AUSTRALIA

Wireless activities in Australia, as in all other countries, are under Governmental control. With wireless transmission recognising no national boundaries it is obvious that some form of control is necessary. Consequently the various nations of the world work together under a form of agreement—the International Tele-communication Convention and its Regulations.

In the Commonwealth, the Postmaster-General's Department administers the required control and supervision under the powers of the Wireless Telegraphy Act and Regulations. The Act places the responsibility on the Postmaster-General of conducting wireless services or licensing other people to do so. Therefore, no person is permitted to erect, establish or maintain apparatus capable of transmitting or receiving wireless signals unless he is in possession of a license from the Postmaster-General. The Wireless Telegraphy Regulations published herein set out the detailed conditions under which licenses are obtained.

There are various types of licenses covering the activities of the different classes of services. The licenses issued by the Postmaster-General's Department are:—

Coast Station	Broadcast Listeners'
Ship Station	Portable
Land Station	Experimental Station
Broadcasting Station	Aircraft Station

and

Special Licenses covering such services as the Beam Service and other services for which specific licenses are not provided.

With the exception of Broadcasting Station Licenses and Special Licenses, the applicant meets with scarcely any difficulty, provided that the required conditions are complied with. The name of the license generally indicates the type of service to be covered which, with the exception of Broadcasting Station Licenses, refer mainly to commercial wireless-telegraph or wireless-telephony services.

It is very important, however, for all persons contemplating the installation of wireless apparatus to obtain full particulars from the Senior Radio Inspector in each State.

The issue of Broadcasting Station Licenses is a matter of greater complexity because the number of such licenses is necessarily limited by technical considerations. In accordance with an International agreement only a certain number of broadcasting frequencies or wave-lengths is available for broadcasting services if interference, both national and international, is to be avoided. In the interests of listeners it is essential that the wave-lengths of the different stations have a minimum frequency separation compatible with the performance of average broadcast receivers. Consequently, the obligation rests on the Department, and it is viewed very seriously, to see to it that the stations are properly placed within the spectrum of frequencies comprising the broadcast band. And as the first demands on these frequencies must necessarily come from the national stations, it follows that only a limited number of broadcasting channels or wave-lengths are left for the stations established by private enterprise, known as Commercial Broadcasting Stations. Therefore, the grant of such a license gives to the licensee something of a monopoly and consequently

the Department must select very carefully from the applicants those to whom licenses are to be granted, keeping in view the essential factor that service to listeners must be the paramount consideration.

Inspection of Stations.

When licenses are granted, regular inspections are made by officers of the Department in order to ensure that the conditions of the licence are complied with. Those conditions may be referred to shortly as the stipulated service to be given and adequate precautions to be taken to avoid interference with other services.

Operators' Certificates of Proficiency.

Under the international and local wireless laws, the Department stipulates the conditions pertaining to the issue of Operators' Certificates of Proficiency. These certificates are issued, after appropriate examinations have been passed, to candidates who desire to operate particular types of stations; the examination being conducted with the object of allowing the candidates to demonstrate their possession of the required knowledge of proficiency. Examinations are held periodically for the following certificates:—

First Class Commercial Operator's Certificate of Proficiency in Wireless Telegraphy and Wireless Telephony;

Second Class Commercial Operators' Certificate of Proficiency in Wireless Telegraphy;

*Third Class Commercial Operator's Certificate of Proficiency in Wireless Telegraphy;

*Third Class Commercial Operator's Certificate of Proficiency in Wireless Telephony; Broadcast Station Operator's Certificate of Proficiency;

Amateur Operator's Certificate of Proficiency.

*These Certificates are now issued in lieu of Limited Certificates of Proficiency in Radiotelegraphy and Radiotelephony.

Interested persons should communicate with the nearest Senior Radio Inspector for full details.

Broadcast Listeners' Licenses.

This is the type of licence which in recent years has obviously become the most popular one owing to the progress of the broadcasting services. There are several differences between this type of licence and the others. Broadcast listeners are not required to sign any document as in other cases and the license fee is on a different basis. In all other cases the license fee is a nominal amount, sufficient to defray the administrative costs incurred by the Department.

In the case of Broadcast Listeners' Licenses, however, the fee includes not only the administrative costs but also an amount forming a method of payment for the services which the listener receives, which may be described as a subscription to the service. Only a small portion of the licence fee covers the administrative costs, the far greater part being what might be termed the subscription fee.

WIRELESS CONTROL IN AUSTRALIA—

(Cont.)

The annual fee of 21/- for Broadcast Listeners' Licenses applies to all listeners situated within an area of about 250 miles from a National Broadcasting Station; that area is known as Zone 1. Outside that area, in Zone 2, the annual fee is 15/- per annum.

The licence fee is divided between the Australian Broadcasting Commission, which receives 12/- for the provision of programmes, and the Postmaster-General's Department, which retains the balance for:—

- The provision of the technical services of the National Broadcasting Stations (installation, erection and operation);
- The inter-connecting telephone circuits between the various National Stations;
- Other technical services, including the investigation of radio inductive interference and research; and
- Administrative costs in connection with the issue and recording of licences.

Despite the obligation on listeners to obtain a licence, it is unfortunately necessary for the Department to maintain a permanent staff in each State for the purpose of locating unlicensed listeners. When these listeners are detected they are brought before the Police Magistrates and during the year 1936 there were more than 3,200 convictions for this offence.

Payment of Listeners' License Fees By Postage Stamps.

Provision may be made for the payment of broadcast listeners' license fees by purchasing postage stamps and affixing them to cards which are provided for the purpose. The following notes, printed on the back of the card, state the conditions under which the Department permits license fees to be paid in this manner:—

Postage stamps not otherwise used or defaced, of an individual face value of 6d. or more, when affixed in the spaces provided on this card, will be accepted at any Post Office Licence Issuing Office in partial or full payment for a new listener's licence or for the renewal of any existing licence.

Stamps to the value of more than 21/- should not be affixed to this card.

This card does not take the place of a listener's licence, and, even if it contains stamps to the value of a licence, it is illegal to use a receiving set until the actual licence has been obtained.

If, after certain stamps have been affixed, the owner of this card does not wish to purchase a broadcast listener's licence, the stamps so affixed will be re-purchased at the G.P.O. in any State, but a discount of 10 per cent. (minimum 2d., maximum 2/-) will be charged.

No wireless set may be used until the user is actually in possession of a Broadcast Listener's Licence.

Free Broadcast Listeners' Licenses for the Blind.

Broadcast listeners' licenses are issued free to any blind person over the age of 16 years. These licenses are granted to—

- Blind pensioners;
- Blind soldiers in receipt of a pension;
- Any other person over the age of 16 years on production of a Certificate from a qualified medical practitioner stating that he or she has no useful vision.

Forms of application may be obtained from the Senior Radio Inspector.

Radio Inductive Interference.

INTERFERENCE with broadcast reception caused by electrical appliances has developed in Australia, as in other countries, somewhat seriously. The Department was fully alive to this development, and during the past eight years has undertaken the work of investigation

into the interference. Information concerning listeners' difficulties is invited by the Department, and questionnaire forms for the purpose are provided at Post Offices. All such complaints are investigated and, where necessary, Radio Inspectors visit the localities, carry out investigations with the object of locating the cause of the interference, and demonstrate to the people concerned methods of fitting suppressors whereby the interference may be reduced or eliminated.

A considerable amount of co-operation in this matter is given promptly by Electric Supply Authorities, radio dealers and Listeners' Leagues, with the result that the growth of the interference has been checked.

With the establishment of further stations, thereby ensuring a higher signal strength in the different localities, the menace of radio inductive interference becomes less serious, but, nevertheless, the Department is continuing its work of helping the broadcasters and listeners in this problem.

Radio dealers can be of great assistance in this connection, particularly in country districts where they are familiar with the conditions and have business or other contacts with the listeners and the owners of electrical equipment. By a recognition of a reasonable community spirit, the co-operation could be fostered by the tactful action of radio dealers, whose interests, of course, would be served by listeners generally being more satisfied with their broadcasting services.

The Department is anxious to hear from listeners who are experiencing any trouble in connection with radio inductive interference and invites them to inform the Department of their conditions by filling in a Wireless Reception Questionnaire Form, obtainable from any Post Office, and sending it completed to the Senior Radio Inspector. In every case the Senior Radio Inspector communicates with the complainant and it is pleasing to note that in most cases a satisfactory result has followed.

The technical staff of the Department has been considerably augmented to deal with complaints from listeners, and equipment of the most modern design has been provided to enable the source of the interference to be speedily located.

Many towns in the Commonwealth have been made interference free by the co-operative efforts of machine owners, power supply authorities and in some cases the listeners themselves, in conjunction with the Department's experts, by arranging for offending appliances and devices to be fitted with an appropriate suppressor.

Demonstrations by Radio Dealers.

A broadcast listener's licence obtained by a radio dealer in respect of a particular address does not entitle the dealer to demonstrate or in any other way use a receiver in the home of a prospective buyer. This is a point which many dealers have overlooked. The Department, however, has always endeavoured to assist radio dealers in the conduct of their business, recognising that the radio trade has a very important part to play in the development of broadcasting.

It is recognised that the dealers must give demonstrations away from their shops, and the Department grants the concession of allowing these demonstrations to be conducted without the obligation of obtaining a licence. The conditions under which these special arrangements can be made may be learned by consultation with the Senior Radio Inspector. Generally, it is the practice to permit a demonstration period of three days in the metropolitan area and one week in country districts.

The Department has been reluctantly compelled to take action against several dealers who failed to comply with its conditions covering the demonstration of receivers. In some instances receivers were seized and forfeited to the Commonwealth.

The Commonwealth Wireless Telegraphy Act No. 8 of 1905.

An Act Relating to Wireless Telegraphy. Assented to 18th October, 1905

BE it enacted by the King's Most Excellent Majesty, the Senate, and the House of Representatives of the Commonwealth of Australia, as follows:—

1. This Act may be cited as the **Wireless Telegraphy Act, 1905.**

2. In this Act.—

"Australia" includes the territorial waters of the Commonwealth and any territory of the Commonwealth.

"Wireless Telegraphy" includes all systems of transmitting and receiving telegraphic messages by means of electricity without a continuous metallic connexion between the transmitter and the receiver.

3. This Act shall not apply to ships belonging to the King's Navy.

4. The Postmaster-General shall have the exclusive privilege of establishing, erecting, maintaining, and using stations and appliances for the purpose of—

- transmitting messages by wireless telegraphy within Australia, and receiving messages so transmitted, and
- transmitting messages by wireless telegraphy from Australia to any place or ship outside Australia, and
- receiving in Australia messages transmitted by wireless telegraphy from any place or ship outside Australia.

5. Licenses to establish, erect, maintain, or use stations and appliances for the purpose of transmitting or receiving messages by means of wireless telegraphy may be granted by the Postmaster-General for such terms and on such conditions and on payment of such fees as are prescribed.

6. (1) Except as authorised by or under this Act, no person shall—

- establish, erect, maintain or use any station or appliance for the purpose of transmitting or receiving messages by means of wireless telegraphy, or
- transmit or receive messages by wireless telegraphy.

Penalty: Five hundred pounds, or imprisonment with or without hard labour for a term not exceeding Five years.

(2) Sub-section (1) of this section shall not, except as prescribed extend to appliances maintained on any ship, arriving from any place beyond Australia, for the purpose of enabling messages to be transmitted from or received on that ship by means of wireless telegraphy but all such appliances shall, while the ship is within Australia—

- be subject to the control of the Postmaster-General; and
- only be used by his authority or as authorised by the regulations.

Penalty: Five hundred pounds.

7. All appliances erected, maintained, or used in contravention of this Act or the regulations, for the purpose of transmitting or receiving messages by means of wireless telegraphy, shall be forfeited to the King for the use of the Commonwealth.

8. (1) If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that any appliance is established, erected, maintained, or used in contravention of this Act or the regulations, for the purpose of transmitting or receiving messages by means of wireless telegraphy he may grant a search warrant to any person.

(2) A search warrant under this section shall authorise the person to whom it is addressed to break and enter any place or ship, where the appliance is or is supposed to be, either by day or by night, and to seize all appliances which appear to him to be used or intended to be used for transmitting or receiving messages by means of wireless telegraphy.

9. (1) Proceedings for any offence against this Act may be instituted in any Court of Summary Jurisdiction, and any person proceeded against under this section may be dealt with summarily or may be committed for trial.

(2) The Court in dealing summarily with any accused person under this section may, if he is found guilty of any offence against this Act, punish him by imprisonment with or without hard labour for any period not exceeding six months or by a penalty not exceeding Fifty pounds.

10. The Governor-General may make regulations, not inconsistent with this Act, prescribing all matters which by this Act are required or permitted to be prescribed or which are necessary or convenient to be prescribed for carrying out or giving effect to this Act.

AMENDMENT No. 33 OF 1915.

An Act to amend the Wireless Telegraphy Act, 1905. (Assented to 6th September, 1915.)

BE it enacted by the King's Most Excellent Majesty, the Senate, and the House of Representatives of the Commonwealth of Australia, as follows:—

1. (1) This Act may be cited as the **Wireless Telegraphy Act, 1915.**

(2) The **Wireless Telegraphy Act, 1905**, as amended by this Act, may be cited as the **Wireless Telegraphy Act, 1905-15.**

2. Sections four, five and six of the **Wireless Telegraphy Act, 1905**, are amended by omitting the words "The Postmaster-General" and inserting in their stead the words "the Minister for the time being administering the Act."

AMENDMENT No. 4 OF 1919.

An Act to amend Section Two of the Wireless Telegraphy Act, 1905-1915.

BE it enacted by the King's Most Excellent Majesty, the Senate, and the House of Representatives of the Commonwealth of Australia, as follows:—

1. (1) This Act may be cited as the **Wireless Telegraphy Act, 1919.**

(2) The **Wireless Telegraphy Act, 1905-15** as amended by this Act, may be cited as the **Wireless Telegraphy Act, 1905-1919.**

2. Section two of the **Wireless Telegraphy Act, 1905-1915**, is amended by inserting in the definition of "Wireless telegraphy" after the word "telegraphic," the words, "or telephonic."

Commonwealth Wireless Regulations

Under the Wireless Telegraphy Act 1905-1919.

Statutory Rules No. 101 of 1924 have been amended from time to time by No. 123 of 1925, No. 114 of 1926, Nos. 3-24-63-153 of 1927, Nos. 79-129 of 1928, No. 81 of 1929, No. 113 of 1930 and No. 120 of 1935, and the following are the existing regulations as applicable to Broadcasting in Australia. Details of regulations governing other wireless stations are available from Government Printer, Canberra, F.C.T., or from the Radio Inspector in any capital city.

Part III.—Broadcasting.

Division I.—Broadcasting Stations.

45. (1) The Postmaster-General may grant to any applicant a Broadcasting Station License.

(2) A License shall not be transferred without the approval of the Postmaster-General.

(3) The Postmaster-General shall not recognise any vested interest in the License, and compensation shall not be payable to the Licensee on the termination of the License.

46. An applicant for a Broadcasting Station License shall state in his application the following particulars:—

- (a) Name and address of applicant (in the case of a company; (1) the name of the company and the address of the head office thereof; (2) the name and address of the secretary or other person authorised to act on behalf of the company);
- (b) Technical qualifications of the applicant or of the persons whom it is proposed will operate the licensed installation (where the applicant does not possess the necessary qualifications and proposes to engage an expert to control the station after the issue of the License, this should be stated);
- (c) Location of the proposed station;
- (d) Type of transmitter and character of modulation proposed;
- (e) Proposed normal operating power of transmitter;
- (f) Hours of service; and
- (g) Class of service to be broadcasted and particulars of average programme.

47. (1) A Broadcasting Station License shall be prepared in duplicate, one copy of which shall be retained by the Department and the other shall be issued to the Licensee.

(2) A Licensee shall make his License available for inspection by any authorised officer as and when required.

48. (1) A Broadcasting Station License may be granted for any period not exceeding three years as the Postmaster-General determines.

(2) The Postmaster-General if he deems it desirable may from time to time renew a License for a period not exceeding one year from the date of expiration of the current License.

(3) A Licensee who desires a renewal of his License shall make application for the renewal thereof at least six months before the date of the expiration of his current license, except in cases where a license has been granted or renewed for a period of less than one year, when the application for a renewal shall be made at least one month before the date of expiration of the current license.

(Statutory Rules No. 120 of 1935 repealed, Statutory Rules No. 104 of 1935, 23/10/35 and new regulations 48a reads as follows:—)

48a. (1) Any person making application for the grant or renewal of a Broadcasting Station License shall supply such information as is required by the Postmaster-General, and shall lodge with the application a Statutory Declaration that the grant or renewal of the license will not result in the ownership by any person of more than—

- (a) one metropolitan broadcasting station in any State;
- (b) four metropolitan broadcasting stations in the Commonwealth;
- (c) four broadcasting stations in any one State; or
- (d) eight broadcasting stations in the Commonwealth,

and will not result in any person being in a position to exercise control, either directly or indirectly, of more than that number of stations.

(2) Where the applicant is a company, the Statutory Declaration referred to in the last preceding sub-regulation shall be made by a majority of the directors of the company and the manager or secretary of the company.

(3) Where the applicant is neither an individual or a company, the Statutory Declaration referred to in sub-regulation (1) of this regulation shall be made by such persons as the Postmaster-General determines.

(4) In this regulation—
‘metropolitan broadcasting stations’ means a broadcasting station situated within a radius of 30 miles from the General Post Office in the capital city of the State;
‘person’ includes a firm, body corporate or association.”

49. A Broadcasting Station Licensee shall commence a satisfactory service in accordance with these regulations within three months from the date of the issue of the License or within such further period as the Postmaster-General approves.

50. The licensed installation of a Broadcasting Station shall be equipped, designed and controlled to the satisfaction of the Postmaster-General and shall not be altered without his consent.

51. The power of a Broadcasting Station shall be as approved by the Postmaster-General and shall not be altered without his consent.

52. (1) The frequency (wave length) on which each Broadcasting Station shall operate shall be determined by the Postmaster-General.

(2) The operating frequency shall be maintained to a constancy to the satisfaction of the Postmaster-General.

(3) For the purpose of the last preceding sub-regulation, the transmitting apparatus shall include such equipment for indicating the accuracy of the operating frequency as the Postmaster-General approves.

53. The location of a Broadcasting Station and the periods of operation thereof shall be subject to the approval of the Postmaster-General.

COMMONWEALTH WIRELESS REGULATIONS

(Continued from Page 8.)

54. (1) The Postmaster-General reserves the right, during the currency of a Broadcasting Station License, to vary the conditions upon which the License is granted, especially in regard to the power, location, frequency (wave length) and periods of operation of the licensed installation.

(2) The Licensee shall, at his own expense and to the satisfaction of the Postmaster-General, give effect to any such variation.

55. The licensed installation of any Broadcasting Station shall only be operated by such persons as, in the opinion of the Postmaster-General, are competent to operate the installation.

56. The licensed installation of any Broadcasting Station shall, at all reasonable times, be open to inspection by any authorised officer, and every facility shall be given by the Licensee for ascertaining the conditions of the Station.

57. (1) A Broadcasting Station shall be connected by telephone with the public telephone exchange system of the area in which the Station is located.

(2) The Broadcasting Station Licensee shall enter into the usual telephone subscribers' agreement for the establishment of a service.

58. The Postmaster-General may require the licensee of a Broadcasting Station to include, without charge, such items of general interest or utility as the Postmaster-General, from time to time, determines.

Provided however that the requirements of the Postmaster-General shall not be such as to entail a period of occupation of the Station in excess of thirty minutes in each consecutive period of twelve hours.

59. (1) All matter including advertisements to be broadcasted shall be subject to such censorship as the Postmaster-General determines.

(2) The Broadcasting Station Licensee shall, before broadcasting any such matter which is of a controversial nature or likely to cause offence to any section of the community, direct the attention of the Postmaster-General or an authorised officer, to such matter.

60. (1) A Broadcasting Station Licensee may broadcast advertisements.

(2) A Licensee desiring to broadcast advertisements shall publish a tariff of advertising charges, and shall make his advertising service available without discrimination to any person or firm.

61. The Licensee of any Broadcasting Station may, to such extent as the Postmaster-General approves, by agreement with the Licensees of other Stations, relay or broadcast the programmes broadcast by these stations.

62. A Broadcasting Station Licensee shall:—

- (a) compile and maintain in a recognised business or commercial form, separate accounts in respect of his broadcasting activities;
- (b) make such accounts available for inspection by the Postmaster-General as required;
- (c) supply to the Postmaster-General as required duly audited annual balance sheets in detail for the year ending on the thirtieth day of June in each year or on some other date approved by the Postmaster-General; and
- (d) keep such records relating to the broadcasting service, as the Postmaster-General, from time to time, directs, and supply copies thereof to the Postmaster-General as required.

63. (1) The programme transmitted from a Broadcasting Station shall, both in rendition and transmission, be to the satisfaction of the Postmaster-General.

(2) The general terms of any announcement, whether complete in themselves or referring to items to be transmitted, shall be to the satisfaction of the Postmaster-General.

(3) Every announcer employed by the Licensee shall be of good education, style and personality, and possessed of clear enunciation, as far as possible free from any characteristic dialect.

64. (1) The license fee for a Broadcasting Station License or any renewal thereof shall be £25 per year or part of a year payable in advance.

(2) This regulation shall be deemed to have come into operation on the first day of November, One thousand nine hundred and twenty-nine.

65. A Broadcasting Station Licensee shall at all times keep the Postmaster-General indemnified against any claim for royalties in respect of any equipment operated under his license, or against any claims whatsoever arising out of the Licensee's operations.

66. A Broadcasting Station Licensee shall not—

- (a) transmit any work or part of a work in which copyright subsists except with the consent of the owner of the copyright; or
- (b) send out news or information of any kind published in any newspaper or obtained, collected, collated or co-ordinated by any newspaper, or association of newspapers or any news agency or service except with the full consent in writing, first obtained, of, and upon such payment and conditions as are agreed upon by the licensee and, the newspaper, association of newspapers, news agency or service.

67. (1) A Broadcasting Station Licensee who supplies in advance to the proprietor of any registered newspaper programmes of the items to be broadcasted by his Station shall, on application in writing, supply in advance such programmes on equal terms to the proprietor of any other registered newspaper.

(2) The proprietor of such other newspaper may publish such programmes in any registered newspaper owned by him.

(3) In this regulation “registered newspaper” means a newspaper registered under the Post and Telegraph Act 1901-1923.

68. A person shall not publish any portion of the text of a broadcasted item without the consent of the Broadcasting Station Licensee and the approval of the Postmaster-General.

69. A Broadcasting Station Licensee shall not, without the permission of the Postmaster-General, transmit any message or other communication, the transmission of which would be in contravention of the provisions of the Post and Telegraph Act, 1901-1923 if the licensed installation were a telegraph within the meaning of that Act.

70. Except where any inconsistency exists, nothing in this Part shall affect the generality of the provisions of any other Part of these Regulations.

71. The decision of the Postmaster-General with regard to the interpretation or application of any of the provisions of this Division shall be final.

72. The Postmaster-General may, on such terms and conditions as he thinks fit—

- (a) make contracts for the establishment, erection, maintenance or use of wireless broadcasting stations or appliances on his behalf; and
- (b) for the purpose of using any wireless broadcasting stations or appliances established, erected or maintained by him or on his behalf, make contracts for the provision of programmes by such stations or by such appliances.

73. Any License for a Class B Station in force immediately prior to the commencement of this regulation shall be deemed to have been granted under and subject to the provisions of these Regulations.

74. Notwithstanding anything contained in this Division, any License for a Class A Station granted under the Regulations in force immediately prior to the commencement of this regulation shall not, on and from the commencement of this regulation, be renewed and those Regulations shall be deemed to apply to such License so long as it remains in force.

COMMONWEALTH WIRELESS REGULATIONS

(Continued from Page 9.)

Division II.—Broadcast Listeners' License.

75. A Broadcast Listener's License in accordance with Form 5 in the Schedule to these Regulations may be granted at any Money Order Office on payment of the prescribed fees.

76. (1) For the purpose of the granting of Broadcast Listeners' Licenses and the payment of fees therefor, the Commonwealth and the Territories thereof shall be divided into two zones as follows:—

- (i) Zone 1 shall include all the territory within an approximate radius of 250 miles from such Broadcasting Stations as the Postmaster-General determines; and
- (ii) Zone 2 shall include all the territory of the Commonwealth and the Territories outside Zone 1.

(2) The Postmaster-General may determine the zone within which any Broadcast Listeners' Station is situated.

(3) The Postmaster-General may modify the boundaries of the Zones specified in sub-regulation (1) of this regulation, or establish additional Zones.

77. (1) The fees payable in respect of any Broadcast Listeners' License or any renewal thereof shall be as follows:

- (a) For Zone 1, 21/- per annum; and
- (b) Zone 2, 15/- per annum (from 6/8/34).

(2) License fees shall be paid in advance.

78. Where a Broadcast Listeners' License is being granted in respect of receiving equipment which has been used prior to the grant of the License, the License may be given the date and shall be deemed to have been effective from the date the receiving equipment was first used without a current License.

79. A Broadcast Listeners' License shall not be transferable from one person to another.

80. (1) The user of receiving equipment, capable of being utilised for the reception of broadcast programmes or other wireless signals, shall be in possession of a current Broadcast Listeners' License.

(2) Where a current Broadcast Listeners' License is not held in respect of equipment installed or connected up or capable of being connected up for the purpose of receiving broadcast programmes or other wireless signals in any dwelling house, office, shop, premises or place, the occupier of any such dwelling house, office, shop, premises or place shall be guilty of an offence.

(3) It shall be a defence to a prosecution for an offence against the last preceding sub-regulation, if the occupier proves that he was not aware, or could not with reasonable diligence have become aware, of the existence in the dwelling house, office, shop, premises or place of the receiving equipment in question.

81. (1) Receiving equipment shall not, without the consent of the Postmaster-General, or an authorised officer, be used at a place other than that specified in the Broadcast Listeners' License.

(2) The Licensee shall notify the Department of any permanent change of address within two weeks of the change.

82. A Broadcast Listeners' License shall, at all reasonable times, be available at the address given thereon for inspection by an authorised officer.

83. A Licensee of a Broadcast Listeners' Station shall not divulge, except to an authorised officer or a legal tribunal, the contents of any commercial or defence wireless communications, other than those transmitted by a Broadcasting Station.

84. Any Licensee of a Broadcast Listeners' Station using reaction (back coupling) in such a manner as to cause interference to the reception at any other Station shall be guilty of an offence against these Regulations.

85. A person or firm shall not operate receiving equipment for the purpose of demonstration or test of receivers with the object of promoting the sale of receiving equip-

ment without being in possession of a Broadcast Listeners' License.

Regulation 109 of the Wireless Telegraphy Regulations is repealed as from 2/10/30 and the following regulation inserted in its stead:—

"109. The fee for an Experimental License shall be £1 10s. 0d. per annum."

AMENDING REGULATION.

Free License to Blind.

Statutory Rule 1933, No. 136.

Regulation 12 of the Wireless Telegraphy Regulations is amended by adding at the end of sub-regulation (1) the following proviso:—

1. (1) Provided also that a Broadcast Listeners' License or any renewal thereof may be granted free of charge to any blind person over the age of sixteen years.
- (2) This regulation shall come into operation on the first day of January, 1934.

Amendment of the Wireless Regulations

Approved November 27, 1935.

Regulation 48a of the Wireless Telegraphy Regulations is repealed, and the following regulation inserted in its stead:—

"48a.—(1) Any person making application for the grant or renewal of a Broadcasting Station License shall apply such information as is required by the Postmaster-General, and shall lodge with the application a Statutory Declaration that the grant or renewal of the license will not result in the ownership by any person of more than—

- (a) One metropolitan broadcasting station in any State;
 - (b) four metropolitan broadcasting stations in the Commonwealth;
 - (c) four broadcasting stations in any one State; or
 - (d) eight broadcasting stations in the Commonwealth.
- and will not result in any person being in a position to exercise control, either directly or indirectly, of more than that number of stations.

(2) Where the applicant is a company, the Statutory Declaration referred to in the last preceding sub-regulation shall be made by a majority of the directors of the company and the manager or secretary of the company.

(3) Where the applicant is neither an individual nor a company, the Statutory Declaration referred to in sub-regulation (1) of this regulation shall be made by such persons as the Postmaster-General determines.

(4) In this regulation—
'metropolitan broadcasting station' means a broadcasting station situated within a radius of 30 miles from the General Post Office in the capital city of a State;
'person' includes a firm, body corporate or association."

Amendments of Wireless Regulations, July 1, 1936.

1. Regulation 2 of the Wireless Telegraphy Regulations is amended by omitting the words "Part VI.—Proficiency Certificates for Operators and Watchers," and inserting in their stead the words "Part VI.—Certificates of Proficiency in Wireless Telegraphy."

2. Regulation 3 of the Wireless Telegraphy Regulations is amended—(a) by omitting the definition of "The International Convention for the Safety of Life at Sea," and inserting in its stead the following definitions:—"The Safety Convention" means the International Convention for the Safety of Life at Sea signed in London on the thirty-first day of May, 1929, and includes any Convention amending or superseding that Convention to which the Commonwealth is a party; the Telecommunication Convention' means the International Telecommunication Convention signed in Madrid on the ninth day of December, 1932, and includes any Convention amending or superseding that Convention to which the Commonwealth is a party"; (b) by omitting the definition of "The Secretary"

COMMONWEALTH WIRELESS REGULATIONS

(Continued from Page 10.)

and inserting in its stead the following definition:—"The Director-General" means the Director-General of Posts and Telegraphs"; and (c) by omitting the definitions of "International Telegraph Convention," the "International Telegraph Regulations," "The Radiotelegraph Convention" and "The Radiotelegraph Convention, 1912."

3. Regulation 4 of the Wireless Telegraphy Regulations is amended by omitting from sub-regulation (7) the word "Secretary" (wherever occurring), and inserting in its stead the word "Director-General."

4. Regulation 23 of the Wireless Telegraphy Regulations is amended by omitting the words "Radiotelegraphic Convention and the Service," and inserting in their stead the words "Telecommunication Convention and the."

5. Regulations 25, 27 and 37 of the Wireless Telegraphy Regulations are amended—(a) by omitting the words "International Telegraph Regulations" and "International Telegraphic Regulations" (wherever occurring) and inserting in their stead "Regulations under the Telecommunication Convention"; and (b) by omitting the words and figures "Radiotelegraphic Convention 1912" (wherever occurring) and inserting in their stead "Telecommunication Convention."

New Certificates.

6. Part VI. of the Wireless Telegraphy Regulations is repealed and the following Part inserted in its stead:—"Part VI.—Certificates of Proficiency in Wireless Telegraphy."

"126. A station (other than a Broadcast Listeners' Station) shall not be operated except by a person—(a) who holds such of the certificates referred to in this Part as is determined by the Postmaster-General or an authorised officer to be appropriate for that station; or (b) is qualified, to the satisfaction of the Postmaster-General or an authorised officer, to operate that station.

"127. (1) The Postmaster-General may issue certificates in accordance with Forms 11, 12, 13, 14 and 14a in the Schedule to these Regulations to persons who have reached the age of 18 years (or 15 years in the case of an Amateur Operator's Certificate of Proficiency) and who satisfy him, by examination or otherwise, that they possess the knowledge and qualifications referred to in those certificates respectively:

Provided that a First Class, Second Class or Third Class Commercial Operator's Certificate of Proficiency shall not be issued to a person who is not a British subject unless—(a) the consent in writing of the Minister for Defence has first been obtained; or (b) the Postmaster-General is satisfied that the circumstances justify the issue of a certificate as a matter of urgency, and any certificate issued under paragraph (b) of this proviso shall be in force in respect of one voyage only of a ship or aircraft upon which the holder of the certificate is to be carried.

"(2). In the event of a certificate being lost, the Postmaster-General may issue a duplicate certificate upon payment of the prescribed fee.

"(3). The fees specified in the Table contained in the Second Schedule to these Regulations shall be charged in connexion with—(a) the examination of candidates; (b) the issue of certificates without examination; and (c) the issue of duplicate certificates, under these Regulations.

"128. (1). The Director-General or an authorised officer may from time to time conduct examinations of applicants for certificates.

"(2). The examinations shall be held in such manner and subject to such conditions as the Director-General determines.

"129. The Examination for a First Class Commercial Operator's Certificate of Proficiency shall be such as to show that a successful candidate possesses the knowledge and qualifications specified in this regulation, namely:—
(a) A knowledge of the general principles of electricity,

of the theory of wireless telegraphy and wireless telephony, and of the regulation and practical working of the types of apparatus used in the mobile service. (b) A theoretical and practical knowledge of the working of the accessory apparatus used in the operation and adjustment of the apparatus referred to in paragraph (a) of this regulation. (c) The ability to effect, with the means available on board ship, repairs to damage which may occur to the wireless telegraph or wireless telephone installation during a voyage. (d) The ability to send correctly and to receive correctly, by ear, in Morse code, code groups at a speed of 20 groups per minute, and a message in plain language at a speed of 25 words per minute. (e) The ability to send and receive messages correctly by telephone. (f) A detailed knowledge of—(i) such of the Radiocommunication Regulations annexed to the Telecommunication Convention as relate to the exchange of radiocommunications and assessment of charges in the mobile service; and (ii) that portion of the Safety Convention which relates to radiotelegraphy. (g) A knowledge of the general geography of the world, especially the principal navigation routes and the most important cable, telegraph, wireless telegraphy and wireless telephony routes.

"130. The examination for a Second Class Commercial Operator's Certificate of Proficiency shall be such as to show that a successful candidate possesses the knowledge and qualifications specified in this regulation, namely:—(a) An elementary theoretical knowledge of elementary theoretical and practical knowledge of the adjustment and practical working of the types of wireless telegraph apparatus used in the mobile service. (b) An elementary theoretical and practical knowledge of the working of the accessory apparatus used in the operation and adjustment of the apparatus referred to in paragraph (a) of this regulation. (c) The ability to effect minor repairs to damage occurring to the apparatus referred to in paragraphs (a) and (b) of this regulation. (d) The ability to send correctly, and to receive correctly by ear, in Morse code, code groups at a speed of 16 groups per minute. (e) A detailed knowledge of—(i) such of the Radiocommunication Regulations annexed to the Telecommunication Convention as relate to the exchange of radiocommunications and the assessment of charges in the mobile service; and (ii) that portion of the Safety Convention which relates to radiotelegraphy. (f) A knowledge of the general geography of the world, especially the principal navigation routes and the most important cable, telegraph, wireless telegraphy, and wireless telephony routes.

"131. (1). A Third Class Commercial Operator's Certificate of Proficiency shall be issued in respect of proficiency in wireless telegraphy or wireless telephony.

"(2). The examination for a Third Class Commercial Operator's Certificate of Proficiency shall be such as to show that a successful candidate possesses the knowledge and qualifications specified in this sub-regulation, namely:—(a) In the case of an examination for a Third Class Commercial Operator's Certificate of Proficiency in wireless telegraphy—(i) a practical knowledge of the working and adjustment of such type or types of wireless telegraph installation as is, or are, specified by the Director-General; (ii) ability to send correctly, and to receive correctly by ear, in Morse code, a message in plain language at a speed of 10 words per minute; (iii) a knowledge of the Radiocommunication Regulations annexed to the Telecommunication Convention relating to the exchange of radio-telegraph communications, to interference and to the Distress, Urgency, Alarm, and Safety Signals; and (iv) a knowledge of the precautions necessary for the safety of the installation referred to in sub-paragraph (i) of this paragraph. (b) In the case of an examination for a Third Class Commercial Operator's Certificate of Proficiency in wireless telephony—(i) a practical knowledge of the working and adjustment of such type or types of wireless telephone installation as is, or are, specified by the Director-General; (ii) ability to send

COMMONWEALTH WIRELESS REGULATIONS

(Continued from Page 11.)

and receive correctly messages by telephone; (iii) a knowledge of the Radiocommunication Regulations annexed to the Telecommunication Convention relating to the exchange of radiotelephone communications, to interference and to the Distress, Urgency, Alarm, and Safety Signals. (iv) a knowledge of the precautions necessary for the safety of the installation referred to in sub-paragraph (i) of this paragraph. (c) In the case of an examination for a Third Class Commercial Operator's Certificate of Proficiency in both wireless telegraphy and wireless telephony—the knowledge and qualifications specified in paragraphs (a) and (b) of this sub-regulation.

"132. The examination for a Broadcast Station Operator's Certificate of Proficiency shall be such as to show that a successful candidate possesses the knowledge and qualifications specified in this regulation, namely:—(a) A knowledge of the general principles of electricity and of radio-technology and of all the electrical and wireless telephony equipment used by broadcasting stations. (b) A practical knowledge of the working and adjustment of all apparatus normally used by broadcasting stations. (c) Ability to adjust and carry out repairs to the apparatus referred to in the last preceding paragraph of this regulation. (d) A knowledge of the provisions of Division 1 of Part III. of these regulations.

"133. The examination for an Amateur Operator's Certificate of Proficiency shall be such as to show that a successful candidate possesses the knowledge and qualifications specified in this regulation, namely:—(a) An elementary knowledge of wireless telegraphy and wireless telephony and electrical principles. (b) A knowledge of—(i) such of the Radiocommunication Regulations annexed to the Telecommunication Convention as relate to the operation of experimental stations; (ii) the principal

abbreviations set out in Appendix 9 of those Regulations, and (iii) Part IV. of these Regulations. (c) Ability to send correctly, and to receive correctly by ear, in Morse code, a message in plain language at a speed of 12 words per minute.

"134. The Postmaster-General may cancel or suspend any certificate issued under this Part—(a) if the holder of the certificate is convicted of a criminal offence; or (b) if the Postmaster-General is of the opinion, on account of the incompetence of the holder of the certificate or for any other reason, that it is desirable that the certificate should be cancelled or suspended.

"135. The Postmaster-General may at any time, by notice in writing, require the holder of a certificate issued under this Part to satisfy him, by examination or otherwise, within the time specified in the notice that he possesses the knowledge and qualifications referred to in the certificate. If the holder fails so to satisfy the Postmaster-General, the Postmaster-General may, by notice published in the "Gazette," cancel the certificate.

"Second Schedule," Regulation 127.

TABLE OF FEES AND CLASS OF CERTIFICATE.

	£	s.	d.
For examination for First Class Commercial Operator's Certificate of Proficiency	£1	0	0
For examination for Second Class Commercial Operator's Certificate of Proficiency		15	0
For examination for Third Class Commercial Operator's Certificate of Proficiency		10	0
For examination for Broadcast Station Operator's Certificate of Proficiency		15	0
For examination for Amateur Operator's Certificate of Proficiency		7	6
For the issue of any certificate without examination		2	6
For the issue of a duplicate certificate where original lost		2	6

Australian Radio Research Board

8th Annual Report for the Year Ended 30th June, 1936

THE Radio Research Board of the Council for Scientific and Industrial Research is constituted as follows:—
 Chairman: Professor J. P. V. Madsen (University of Sydney);
 Electrical: Commander F. G. Cresswell (Department of Defence); and Professor T. H. Laby, F.R.S. (University of Melbourne). Its previous annual report was published in this journal (Vol. 8, No. 4, November, 1935).—Ed.

General

During the period under review, the investigations of the Board were concentrated on (i) propagation problems, which in turn involved studies of conditions in the ionosphere, and (ii) atmospheric. The last year's operations constitute the third year's activities of the three-year programme towards the cost of which, as mentioned in the last report, the Postmaster-General's Department and the Council for Scientific and Industrial Research are contributing on a 3:1 basis. Arrangements have been made for a continuation of the work on the same basis.

Still further changes in the staff of the Board have taken place. Dr. A. L. Green resigned in September, 1935, to take up an industrial appointment, and Mr. R. W. Boswell resigned in April, 1936, to join the staff of the Research Section of the Postmaster-General's Department. The vacancy left by Dr. A. L. Green has recently been filled by the appointment of Dr. D. M. Myers, a graduate

of the University of Sydney, who for the last few years has been obtaining further research experience in Great Britain. He will reach Australia in about October, 1937, and will be located at the University of Sydney. Mr. A. F. B. Nickson and Mr. F. G. Nichols have been appointed on a part-time basis to carry out much of the atmospheric work previously undertaken by Mr. Boswell.

Work on Fading and the Ionosphere

Since practically all radio communication on wavelengths below 100 metres is by reflection from one or other of the reflecting layers of the ionosphere, the direct importance of a knowledge of the diurnal and seasonal changes of conditions in these regions is obvious.

In addition, the radio methods developed for ionospheric observation enable many deductions to be made concerning the nature, pressure, temperature, and ionisation of the gases present in the region between 50 and 250 k.m. above the earth—matters which are of great importance to the meteorologist.

The work of the Radio Research Board in this sphere is centred in the University of Sydney, and its progress has been, technically, towards ever-increasing accuracy and comprehensiveness of the information obtained, combined with careful and exhaustive examination of all data as they become available so as to trace out all the implications. Considerable advances have been made both in technique and theory during the last twelve months.

RADIO RESEARCH BOARD — ANNUAL REPORT

(Continued from Page 12.)

The frequency-change method of investigation which has been in use for several years has served a very useful purpose, but it has two main disadvantages. It is prodigal in labour and materials for the amount of information obtained, and the records become very difficult to interpret if multiple echoes are present, as is very frequently the case on wavelengths below 200 metres.

The first disadvantage has been largely obviated by a modified arrangement in which a faster frequency-change is employed and the resultant fringe pattern appears on the screen of a cathode-ray tube. Its appearance and changes can thus be observed directly and photographed when necessary.

For the separation of multiple echoes, however, some form of the pulse method is preferable, and this system has been developed and improved to a very advanced stage. The first type of apparatus makes a continuous record, on motion picture film, of the time delay in arrival of all echoes on any one wavelength. From this record, the heights of the reflecting layers can be deduced. For this work, transmitters have been constructed to send out pulses of very short duration at regular intervals, and special receivers and recording apparatus designed and brought into use. Modifications at the receiver enable the intensities of the echoes also to be measured; some additional information is thus obtained.

The next advance was to enable the transmitter and receiver to be varied rapidly through a large range of frequencies so that the range of frequencies reflected by each layer can be determined at any time. From the frequency which penetrates a layer, the ionisation density can be deduced. In the earlier apparatus, the frequency change was by steps, but in the latest equipment it takes place continuously and automatically. Incidentally, the records obtained give direct information as to the best frequencies for transmission at given times.

A further advance, in this case an original development, is a receiving system which combines most of the merits of the frequency-change and pulse methods. In this system, each echo produces on the cathode-ray tube screen an ellipse which indicates the intensity and state of polarisation, including the sense of rotation. The apparatus now in use is therefore capable of giving very comprehensive data on ionospheric conditions.

The examination of data obtained has already led to important deductions concerning the constitution of, and conditions in, the ionosphere. Further, the information obtained from the radio work has enabled order to be found in what hitherto appeared to be conflicting results from other sources of evidence such as meteor trails, aurorae, and luminous night clouds. The results of these considerations have been embodied in a paper read before the Royal Society in London (see Proc. Roy. Soc. A., 154; 755, 1936). A further paper embracing more recent results is in preparation.

Briefly, the work done to date has led to the following findings:—

The F region of the ionosphere is found to be at temperatures of the order of 1,000 deg. C. These high temperatures exist both in summer and winter, although during winter nights a limited amount of cooling occurs.

The high temperatures thus found are attributed mainly to the absorption of solar ultra-violet light by ozone, which is present in a concentration of about 1 in 10,000. The cooling occurring on a winter night is attributed to radiation by water vapor in a concentration of 1 in 6,000.

The atmosphere is found to be almost completely mixed at the level of the ionosphere, and consists mainly of molecular nitrogen and atomic oxygen.

It is found that the free electrons in the ionosphere disappear by attachment to neutral oxygen particles very quickly, so that none would be present a few minutes after sunset but for the presence of a counterbalancing detaching agent. This agency is found to be the energy of recombining into molecular oxygen. The high energy electrons thus liberated are able to excite the green line spectrum of the night sky. These views are supported by consideration of Lord Rayleigh's measurements of the absolute intensity of the green line, and of its seasonal and diurnal variations, which follow closely the corresponding variations of ionisation in the F region.

Consideration of the temperatures below the 100 kms. level shows a maximum temperature of 175 deg. C. at 60 kms., and a minimum of minus 113 deg. C. at 82 kms. The low temperature at this level, in conjunction with the presence of water vapour, permits the separation of ice crystals, thus giving rise to luminous night clouds.

The ionisation densities in the E and F regions are found to correlate directly, and the height of the F region indirectly, with the barometric pressure at the ground. This correlation is attributed to the temperature changes occasioned by changes in ozone concentration.

In addition to the direct work of the Board's officers, some useful combined work with kindred branches of the University of Sydney has resulted. The assistance of Professor V. A. Bailey, of the Department of Physics, was mentioned in the previous report, particularly in connection with his paper on the influence of electric waves on the ionosphere and the Luxemburg effect.

Mr. Godfrey, in collaboration with Mr. W. L. Price, of the Sydney Technical College, following up a line suggested by Dr. Martyn, has developed some interesting mathematical results concerning temperatures in the upper atmosphere which he has embodied in a paper entitled, "Radiation Equilibrium above 200 kilometres in the upper atmosphere," which he presented to the Conference of Australian physicists which met in Sydney in May, 1936. Following on some work of the Board's officers, Mr. R. N. Morse has developed a new method of investigating transient phenomena in electrical circuits.

A good deal of special auxiliary apparatus has been developed in the course of the year's work, e.g.,

- A temperature-compensated low-frequency oscillator of very good frequency stability.
- A new type of harmonic analyser.
- A new type of calibrator for C.R.O. time scales.
- Thyratron time bases.

Work on Atmospherics

The close connection found between moving sources of atmospheric and cold fronts over the Australian Bight in the summer of 1934-5 suggested a continuation of the work, to determine the value of atmospheric direction-finders for weather forecasting, especially for south-eastern Australia. The Commonwealth Weather Bureau has kindly agreed to co-operate in this work, and the joint programme has been in operation since August, 1935. It is proposed to continue it for one year from that date.

A narrow-sector directional recorder has been installed at Hobart and has been in operation since October, 1935. Further adjustments have been made to the Watheroo and Canberra recorders, so that it is now possible to locate most of the major sources of atmospheric over the Australian Bight, south-eastern Australia, and the

RADIO RESEARCH BOARD — ANNUAL REPORT
(Concluded.)

Tasman Sea over the whole 24 hours. (Cathode-ray direction-finders, at Laverton and Canberra, are still operated in the daytime.) The meteorological analysis is carried out entirely by the Weather Bureau.

In contrast to the previous spring and summer, few sources were observed in the Australian Bight, and few of these persisted more than 24 hours and moved across south-east Australia. It thus appears that during the year under review the majority of cold fronts over the Australian Bight were unaccompanied by (sea) thunderstorms, so that the number of occasions when information of possible use for forecasting was obtained was small. More sources were observed over the Tasman Sea, which suggests that the method may on occasions be of more value for New Zealand weather forecasting.

In assessing the usefulness of the method for forecasting, it is even more important to know what percentage of sea sources are associated with well-marked fronts. An entirely suitable criterion of "association" is lacking, but, judging from proximity (allowing for errors in location), between 50 and 60 per cent. of sea sources appear to be associated with well-marked fronts, mostly cold fronts, for the Australian Bight and Tasman Sea south of 30 deg. S. The analysis of some earlier data has shown that the percentage is considerably lower for more northerly sea areas. Final conclusions have not yet been reached.

Another aspect of this investigation is the possibility of thunderstorm warnings to aircraft, particularly on air routes over sea. On a few occasions, it has been possible to communicate useful information to Essendon (Melbourne) aerodrome regarding the location of thunderstorms near air routes. This information has always been derived from cathode-ray direction-finders, and it would appear that the most promising application of the method is in the use of cathode-ray direction-finders for the combined purpose of locating the position of the aeroplane and of thunderstorms.

An investigation has been commenced with the object of determining the total energy radiated (in the "radio" portion of the spectrum) by the average lightning flash. The necessary apparatus is still under construction and involves the putting together of a special amplifier to give constant amplification over a very wide range of frequencies. In addition to the total energy radiated, it is hoped to obtain some additional information regarding the wave-form of atmospherics, on which subject some discrepancies appear to exist between the results of previous investigations.

Publications

The following publications have been made during the past year as a result of the investigations carried out by the officers of the Board and by independent investigators who have been closely associated with these officers.

(a) Publications of the Council for Scientific and Industrial Research.

- Bulletin 95—"Radio Research Board: Report No. 9." (1) "A Study of the Magneto-Ionic Theory of Wave Propagation by Means of Conformal Representation," by V. A. Bailey, M.A., D.Phil., F.Inst.P. (2) "Dispersion and Absorption Curves for Radio Wave Propagation in the Ionosphere According to the Magneto-Ionic Theory," by D. F. Martyn, Ph.D., A.R.C.Sc., F.Inst.P. (3) "A Temperature-Compensated Dynatron Oscillator of High Frequency Stability," by J. H. Piddington, B.Sc., B.E.

- "The Amplification of Programme Transients in Radio Receivers," by Geoffrey Builder, Ph.D., F.Inst.P. (5) "A Multi-Range, Push-Pull, Thermionic Voltmeter," by Geoffrey Builder, Ph.D., F.Inst.P. (6) "The Graphical Solution of Simple Parallel-Tuned Circuits," by Geoffrey Builder, Ph.D., F.Inst.P. (7) "An Electrical Harmonic Analyser of the Fundamental Suppression Type," by J. H. Piddington, B.Sc., B.E.

- Bulletin 100—"Radio Research Board: Report No. 10." (1) "A Directional Recorder for Atmospherics," by W. J. Wark, M.Sc., R. W. Boswell, M.Sc., and H. C. Webster, Ph.D., F.Inst.P. (2) "Observations of Atmospherics with a Narrow Sector Directional Recorder at Canberra," by G. H. Munro, M.Sc., A.M.I.E.E., W. J. Wark, M.Sc., and A. J. Higgs, B.Sc. (3) "Characteristics and Distribution of Sources of Atmospherics," by G. H. Munro, M.Sc., A.M.I.E.E., W. J. Wark, M.Sc., and A. J. Higgs, B.Sc. (4) "Sources of Atmospherics Over the Tasman Sea," by R. W. Boswell, M.Sc.

(b) Other Publications

- "Interaction of Radio Waves," by V. A. Bailey, M.A., D.Phil., and D. F. Martyn, Ph.D., A.A.C.Sc. Nature, 135, 585, 1935.
- "A Receiver Discriminating between Right- and Left-handed Circularly Polarised Wireless Waves," by O. O. Pulley, Ph.D., B.E. Phys. Soc. 47, 1098, 1935.
- "Modulation Frequency-Change Technique for Ionospheric Measurements," by Geoffrey Builder, Ph.D., F.Inst.P., and A. L. Green, Ph.D. Phys. Soc. (6), 47, 1925.
- "The Delineation of Selectivity Curves," by W. G. Gordon, B.Sc., Rad. Rev., Nov., 1935.
- "Aircraft Radio Communication and Navigation," by H. B. Wood, B.Sc., B.E., Rad. Rev., Sept., 1935.
- "Design of a Simple Linear Time-Base for the Cathode Ray Oscillograph," by O. O. Pulley, Ph.D., B.E., and A. H. Mutton, Rad. Rev., November, 1935.
- "Wireless Direction-Finding and its Application," by G. H. Munro, M.Sc., A.M.I.E.E., Australasian Engineer, August, 1925.
- "The Ionosphere and its Influence upon the Propagation of Radio Waves," by J. P. V. Madsen, B.E., D.Sc., Macrossan Lectures, University of Queensland, 1935.

Acknowledgments.

Once again, acknowledgment is due to a number of organisations and individuals for the valuable co-operation they have furnished.

The help of the Postmaster-General's Department and of the Universities of Melbourne and Sydney has been continued on the previous lines. The Department of Defence, too, has afforded help in several ways, notably by the loan of apparatus and the accommodation of equipment at Laverton (Victoria) and Liverpool (New South Wales). The Commonwealth Solar Observatory at Mt. Stromlo, and the Watheroo Magnetic Observatory of the Carnegie Institution are also co-operating most helpfully in connection with the work on atmospherics. The Commonwealth Meteorological Bureau has also furnished meteorological data at all times, and, at the commencement of the period under review, arranged to co-operate in a thorough test of the possible value of the Board's atmospheric work from a meteorological point of view. This work is still in progress.

Fourth Annual Report of the Australian
Broadcasting Commission
Year Ended 30th June, 1936

To The Honourable,
His Majesty's Postmaster-General to
the Commonwealth of Australia.

Sir:
In accordance with the provisions of Section 32 of the Australian Broadcasting Commission Act, 1932, we, the members of The Australian Broadcasting Commission, have the honour to present to you the Fourth Annual Report and Balance Sheet of the Commission, covering the financial year from 1st July, 1935, to 30th June, 1936. During that period the Commission continued to provide and to render broadcast programmes from the "A" Class Australian National Broadcasting Stations, and to discharge all the other duties assigned to it by the abovementioned Act.

EXTENT OF SERVICE:

The network of National Stations for which programmes were provided was extended during the period under review by the addition of two further Regional Stations, namely 3GI Gippsland Regional and 7NT Northern Tasmania Regional. (Since June, 1936, the Northern Rivers Regional Station 2NR, situated at Grafton, N.S.W.; the North Regional Station 4NQ, situated at Townsville, Queensland; the Goldfields Regional Station 6GF, situated at Kalgoorlie, Western Australia; and the South-west Regional Station 6WA, situated at Minding, Western Australia, have also been put into operation. Regional Station 2NR has been given the same schedule of hours as 2NC Newcastle, whilst the other new regional stations have been allotted the same schedules as their parent stations, 4QG Brisbane and 6WF Perth, respectively.)

STATIONS:

The "A" Class Stations operating during the year were as follow:—

- New South Wales:
2FC . . . Sydney.
2BL . . . "
2NC . . . Newcastle
2CO . . . Corowa.
- Victoria:
3LO . . . Melbourne
3AR . . . "
3GI . . . Gippsland Regional.
- Queensland:
4QG . . . Brisbane
4RK . . . Rockhampton
- South Australia:
5CL . . . Adelaide
5CK . . . Crystal Brook.
- Western Australia:
6WF . . . Perth

- Tasmania:
7ZL . . . Hobart
7NT . . . Northern Tasmania
Regional.

POWER OF STATIONS:

The power of stations previously in existence has remained unaltered, so that any enlargement of the reception-range of the Service has come from the opening of the new Stations referred to above. As, however, the South-west Regional Station 6WA operates on an aerial rating of 10 kilowatts, its transmitter is the most powerful in Australia; 2NR and 4QN are also strong stations, each having an aerial power of 7 kilowatts.

BROADCASTING SCHEDULE:

Few substantial alterations were made in the schedule except in the case of the Short-wave Station 3LR Lyndhurst, the hours of which were considerably extended for reasons stated later in this Report. The full schedule was as follows:—

- 4QG, 4RK, 5CL, 5CK, 6WF, 7ZL, 7NT:
Mondays to Fridays.
7 a.m. to 9 a.m.
10.30 a.m. to 2 p.m.
3 p.m. to 4.30 p.m.
5.30 p.m. to 11.30 p.m.
Saturdays.
7 a.m. to 8.30 a.m.
11 a.m. to 11 p.m.
Sundays.
10 a.m. to 1.30 p.m. (5CL, 5CK, 6WF 10.30 a.m. to 1.30 p.m.)
3 p.m. to 5 p.m. (6WF to 5.20 p.m.)
5.45 p.m. to 10.30 p.m.
- 2FC and 3LO:
Mondays to Fridays.
7 a.m. to 8 a.m.
9.30 a.m. to 11.30 a.m.
12 noon to 2 p.m.
3 p.m. to 4.15 p.m.
5.30 p.m. to 11.30 p.m.
Saturdays.
7 a.m. to 8 a.m.
9.30 a.m. to 11.30 a.m.
12 noon to 5 p.m.
5.30 p.m. to 11.30 p.m.
Sundays.
10 a.m. to 12.15 p.m.
3 p.m. to 4.45 p.m.
6 p.m. to 10.30 p.m.
- 2BL and 3AR:
Mondays to Fridays.
7 a.m. to 9.30 a.m.
11.30 a.m. to 5.30 p.m.
6 p.m. to 10.30 p.m.
Saturdays.
7 a.m. to 9.30 a.m.
11.30 a.m. to 5.30 p.m.
6 p.m. to 12 midnight.

- Sundays.
10.55 a.m. to 3 p.m.
4.30 p.m. to 10 p.m.

- 2CO, 2NC, and 3G1:
Mondays to Fridays.
7 a.m. to 11.30 a.m.
12 noon to 2 p.m.
3 p.m. to 4.15 p.m.
5.30 p.m. to 11.30 p.m.
Saturdays.
7 a.m. to 9 a.m.
10 a.m. to 11.30 a.m.
12 noon to 2 p.m.
5.30 p.m. to 11.30 p.m.
Sundays.
10 a.m. to 12.15 p.m.
1 p.m. to 4.45 p.m.
6 p.m. to 10 p.m.

The Schedule of Broadcasting Hours set down for Stations 2FC, 2BL, 2NC, 2CO, 3LO, 3AR, 3GI, 4QG, 4RK, 7ZL and 7NT is given in terms of Eastern Standard Time, that for 5CL and 5CK in terms of Central Standard Time (30 minutes behind E.S.T.) and that for 6WF in terms of Western Standard Time (two hours behind E.S.T.).

3LR (Short-Wave):
Mondays to Saturdays.
Australasian Zone, 6.30 p.m. to 11.30 p.m.
Sundays.
6 p.m. to 10.30 p.m.
(Australian E.S. Time.)
(This Schedule is expanded when necessary to include outstanding broadcasts.)
Mondays to Saturdays.
English Zone, 1.45 p.m. to 2.45 p.m.
Sundays.
1.45 p.m. to 2.45 p.m.
(Greenwich Mean Time.)
(On Tuesdays and Fridays there is also a special Pacific Zone broadcast of the French News Service at 6.30 p.m. A.E.S.T.)

LICENCES:
(a) Australian Statistics:
During the financial year 1935-36 the number of listeners' licences in Australia increased by 103,248 to a total of 325,136, bringing the percentage of licences to population for the Commonwealth from 10.47% to 12.22%.
The greatest improvement pro rata of population was shown in Western Australia, where the total advanced by 8,824 to 50,081—an increase equivalent to 1.89 per cent. of population. For the remaining States the increases were as follow:—

(Continued on Next Page.)

Australian Broadcasting Commission Annual Report (Continued)

S. Aus.	10,985	(1.83% of population)
Tas.	4,047	(1.4% " ")
Q'land	15,684	(1.54% " ")
Vic.	26,570	(1.41% " ")
N.S.W.	37,174	(1.34% " ")

South Australia maintained its position as the State in which the percentage of licences to population was highest, its ratio advancing from 12.9% to 14.8%. Victoria followed closely, increasing from 12.9% to 14.31%. The remaining percentages at the end of the financial year were:—

New South Wales	11.87%
West Australia	11.18%
Tasmania	10.5%
Queensland	8.56%

(b) World Statistics:

During the year ended 31st December, 1935, licences throughout the world continued to expand rapidly. "Saturation point" does not yet appear to have been reached in any country, although in Great Britain the proportion of licences to population at 31st December, 1935, was as high at 16.08%, while in the United States of America (where there is no licensing system) it was estimated that 17.79 receiving-sets were in operation for every one hundred inhabits.

The table on page 24 shows the number of licences and the ratio of licences to population in the leading "radio" countries, compiled from figures supplied by L'Union Internationale de Radiodiffusion.

It will be seen that in the matter of licences—pro rata—Australia has held its position, sixth place, among all countries, but among the Dominions it has been overtaken by New Zealand, and now ranks second.

TIME "ON THE AIR":

During the year the total number of broadcasting hours from the combined Australian "A" Class (National) Stations was 64,048, as against 53,927 for the previous year. Of that total 29,518 hours were occupied by relays or re-broadcasts from other Stations, so that the nett total of original programme time was 34,530 hours.

PROGRAMME ANALYSIS:

The percentage of time devoted to each of the various types of programme was not radically altered during the year under review. Music absorbed slightly more time than before, the percentage rising from 48.63 to 51.9. Rather more attention than previously was paid to the broadcasting of essential services, especially news and news commentaries, while the proportion of time allotted to dramatic productions, talks, and sporting commentaries was slightly reduced.

PROGRAMME ANALYSIS.		Percentage of Total Broadcasting Hours.	
	Hours.	Hours.	
Musical:			
Classical	4,927	13.94	
Popular	19,185	29.95	
Modern Dance	4,237	6.62	
Old-time Dance	234	.36	
Community Singing	657	1.03	
Group total	33,240	51.9	
Dramatic:			
Grand Opera	871	1.36	
Musical Comedy, Revue	1,331	2.08	
Plays, Dramatised Stories, etc.	1,444	2.25	
Group total	3,646	5.69	
Talks:			
General Talks	5,091	7.95	
Addresses, Technical Talks (Farming), etc.	881	1.38	
Broadcasts to Schools	1,245	1.94	
Descriptive Broadcasts (Non-sporting)	347	.54	
Group total	7,564	11.81	
Sporting:			
Running Descriptions	3,715	5.8	
Results, Commentaries, Notes	2,195	3.43	
Group total	5,910	9.23	
Essential Services:			
News, News Commentaries	3,813	5.95	
Reports (Weather Markets, etc.)	3,625	5.66	
Announcements	1,134	1.77	
Group total	8,572	13.38	
Devotional:			
Church Services	2,024	3.16	
Studio Broadcasts	933	1.46	
Group total	2,957	4.62	
Children's Sessions:			
	2,159	3.37	
Group total	2,159	3.37	
Grand total	64,048	100	

MUSIC:

Every endeavour has been made to present the best available examples of all forms of music under the best possible conditions in the studios at present available, and to blend with works of widely recognised merit a substantial proportion of lesser-known compositions. In doing so the Commission has broadcast performances of a wide range of types of musical combination; has formed and maintained orchestras, bands, choruses and quartets; has engaged, casually or

under long-term contract, soloists (including famous artists from overseas) and independent musical combinations, and has included also in its programmes mechanical recordings of the work of the world's foremost artists.

During the period under review notable overseas visitors who appeared regularly in the Commission's programmes included two Australian pianists who have succeeded abroad, viz.:—Miss Eileen Joyce and Mr. Percy Grainger. Other engagements which may be mentioned were those of Madame Florence Austral and Mr. John Amadio, Miss Thea Phillips, Mr. Ben Williams and Mr. Sidney de Vries. (Since the close of the period covered by this report, the distinguished English conductor, Dr. Malcolm Sargent, has conducted a number of highly successful orchestral performances during a tour which embraced all States, and Madame Elisabeth Rethberg and Signor Ezio Pinza have also given a series of public concerts and studio recitals under the Commission's direction. Further similar engagements have also been made for the future.)

Permanent Employees:

The following table sets out the number of orchestral musicians and choristers employed on regular full-time weekly salary by the Commission, as distinct from those engaged temporarily or casually.

STUDIO ORCHESTRAS:

Players:	
New South Wales	45
Victoria	35
Queensland	17
South Australia	17
Western Australia	17
Tasmania	11
	<hr/> 142
Conductors	6
Orchestrators and arrangers	7
	<hr/> 13
Total Orchestral	155

MILITARY BAND:

Players	32
Conductor	1
Total Military Band	33

DANCE BANDS:

Sydney	17
Melbourne	17
Total Dance Band	34

CHORUSES:

Special Conductor	1
Sydney	16
Melbourne	16
Total Choral	33

GRAND TOTAL 255

Australian Broadcasting Commission Annual Report (Continued.)

Recordings:

Subject to liberal recognition of its obligations to Australian artists, the Commission considers that gramophone recordings must still occupy an important part of its programmes, not only from the point of view of the public entertainment so provided, but also because these recordings keep local artists and listeners in touch with world standards. With, however, a further increase in the number of engagements for Australian artists, the number of recordings broadcast was again reduced, and represented 34.18 per cent. of programme-time for the year, as against 37.54 per cent. during the preceding 12 months.

Orchestras:

During the year the Commission completed its plan of establishing permanent concert orchestras in each capital city. The opportunity of playing together regularly under expert conductors should, when combined with the prospect of more or less permanent employment, greatly stimulate development in this field. The first fruits of this policy are already observable in a gratifying improvement, which should continue. This section of the Commission's activities has involved a large, recurring expenditure, but the Commission is satisfied that it had already been, and will continue to be, a most potent factor in raising the standard of musical performance in all parts of the Commonwealth. Without such regular bodies of competent and highly-trained musicians, the presentation of major symphonic and operatic works has, in the past, often involved an element of risk which should not exist in any country with serious pretensions to musical culture.

The cost of maintaining even reasonably large orchestral combinations is so high, and the response of the public so uncertain, that few organisations have been able to undertake the task. Now that it has been embarked on seriously, Australian music must make great strides, and this progress will no doubt be accompanied by a raising of the standard of appreciation.

Co-operation with Established Orchestras:

As in the past, the Commission made available members of its various studio orchestras to existing orchestral organisations for the purpose of strengthening the latter's performances. Towards the end of the year, however, the Commission, after consultation with representatives of such organisations, accepted in nearly all States the financial responsibility of the public symphony concerts, while still co-operating with local bodies in the matter of engagement of extra players, organisation of subscribers, and so on.

Orchestral Committees:

Towards the close of the financial year a small group of musical enthusiasts in Sydney co-operated with the Commission and formed a Citizens' Orchestral Committee, for the purpose of enlisting subscribers for, and otherwise assisting, the Commission's season of orchestral concerts. As a result of these efforts, over 1,000 subscribers were enrolled within a few weeks for the balance of the 1936 season. The Commission is glad to place on record its appreciation of the valuable assistance, given voluntarily, by this Committee, and in particular by the small group which carried the burden of the organisation.

The Commission—one might well say the music-loving community—has been fortunate in the existence for some years past of such a Committee in Melbourne, whose enthusiastic efforts last year were rewarded with a record list of 1,288 subscribers.

It is hoped that with the co-operation of the Commission, and in view of the increasingly high standard of the orchestral concerts in all States, and with the added attraction of visiting celebrity conductors and associate artists, similar orchestral committees will be organised in other States.

Symphony Hour:

An important change in practice, introduced towards the end of the year as part of the development of National Programmes, was the introduction of "Symphony Hour" periods, broadcast at 9.00 p.m. E.S.T. each Sunday. It has been clearly demonstrated that the regular recurrence of features at the same time on the same day is of great assistance to listeners and the hour fixed is believed to be a suitable one for symphonic programmes.

Notable Performances:

The more notable symphonies produced during the period covered by this report were detailed.

Conductors:

Of the public concerts broadcast by National Stations those presented by the New South Wales State Orchestra were for the most part conducted by Dr. E. L. Bainton, those of the Melbourne Symphony Orchestra by Professor Bernard Heinze, and those of the South Australian Orchestra by Mr. Harold Parsons. Mr. Maurice de Abravanel, who was then visiting Australia, acted as Guest Conductor of public performances arranged by the Commission in several of the capital cities, while Mr. Fritz Hart and Dr. von Keussler also conducted performances for the Commission in Melbourne. The regular conductors of the studio orchestras were Sydney, Mr. E. J. Roberts (who later assisted in the formation and direction of the studio orchestras in both Brisbane and Perth) and Mr. Joseph Post; Mel-

bourne: Mr. Percy Code; Adelaide: Mr. Will Cade; Perth: Mr. Nelson Burton; and Hobart: Mr. E. J. McCann. The formation of the Brisbane Studio Orchestra was only completed at the end of the year, and Mr. Burton was transferred to it from Perth, his place being taken by Mr. Roberts. Subsequently Mr. Clive Douglas, who had figured prominently in the Commission's Composers' Competitions, was appointed to the conductorship of the Hobart Studio Orchestra.

Young People's Concerts:

A popular and valuable feature of previous years was continued and expanded, namely, the series of Young People's Concerts for school boys and school girls. These had previously been known as "Children's Concerts," but in view of the average age of those who attended them, the present title was substituted. The concerts were, as in previous years, conducted by Professor Bernard Heinze, Ormond Professor of Music in the University of Melbourne and Music Adviser to the Commission.

Twelve of the concerts were given in Sydney, nine in Melbourne, three in Perth, and several in Victorian country centres. It is estimated that in all approximately 60,000 boys and girls attended the concerts. This will give some indication of the far-reaching influence of this valuable work.

Numerous questionnaires which were answered by the boys and girls present indicated that the concerts were genuinely and intelligently enjoyed, and that they were doing much to stimulate an interest in, and appreciation of, good music. The Commission hopes eventually to be able to present them regularly in all States. "Hansel and Gretel":

Another musical broadcast specially intended for young people and presented by the Commission from its Studios during the 1935 Christmas Season was the Opera "Hansel and Gretel" (Humperdinck), conducted by Mr. Maurice de Abravanel.

Chamber Music:

The concert tour of the Budapest String Quartet, which began during the previous financial year, continued into the period under review. This quartet, which gave a number of studio recitals and public concerts, all of which were broadcast, was generally considered to be the finest which had ever visited Australia, and its work was much appreciated by an audience embracing many listeners other than the usual chamber-music lover.

The Quartet played almost all the Beethoven Quartets, as well as leading examples of quartet compositions by Schubert, Mendelssohn, Borodin, Mozart, Hindemith, Dohnanyi, Wolf, Brahms, Haydn, Smetana, Bartok, Mitja, Stillman, Dvorak, Grieg, Reger, Franck, Debussy, Sibelius, Tchaikovsky, Dittersdorf, and Prokofieff. One

(Continued on next Page.)

Australian Broadcasting Commission Annual Report (Continued.)

particularly interesting series of programmes, which the quartet presented in Sydney, illustrated the history of Quartet music, in its Classic Romantic, Slavonic, French and Modern phases.

The Spivakovsky-Kurtz Trio also appeared in many programmes under a long-term contract, while performances were given by the Sydney String Quartet, the A.B.C. (Melbourne) String Quartet, the Victorian String Quartet, and Elder Quartet and Trio (both attached to the South Australian Conservatorium of Music), the "Pro-Arte" Trio and other similar combinations. The Spivakovsky-Kurtz Trio, whose work reached a very high standard, performed not only the majority of the better known compositions for violin, cello, and piano, but also a number of sonatas for two of these instruments.

Choirs:

Performances by leading choirs in all States (including the Melbourne Philharmonic Society, the Sydney Philharmonic Society, the Brisbane State and Municipal Choir and the Hobart Orpheus Club) have, as in previous years, been broadcast, while choral-and-orchestral productions by independent organisations have received substantial support from the Commission (whether in the form of direct payment or of the lending of soloists and orchestras) in return for the right of broadcasting their performances. The Viennese Boys' Choir, which visited Australia, also broadcast.

Choral works were transmitted through National Stations during the year, either from the studio or from public concerts.

Soloists:

As in previous years, a large number of solo artists, both instrumental and vocal, appeared in the National Stations' programmes, the engagements numbering over 44,000. Most of these were Australians, resident in Australia; some were visiting artists, mainly Australians who have succeeded abroad.

Choral Works:

Many choral programmes were broadcast during the year. The A.B.C. Radio Choir was maintained in Sydney, and the A.B.C. Wireless Chorus of 16 voices each, which were regularly employed in Sydney and Melbourne respectively, assisted in a large number of broadcasts. These choruses have been useful training-grounds for soloists (though this consideration has necessarily been a secondary one) and have materially strengthened larger choirs when required.

Band Music:

Band music again figured prominently on the Commission's programmes. The National Military Band, conducted by Mr. Stephen Yorke, provided many programmes of excellent quality. Military band music is extremely popular in England,

allowing, as it does, greater flexibility than is allowed bands which do not include woodwind instruments; before, however, the National Military Band was created by the Commission in readiness for the visit of Major (then Captain) H. E. Adkins, Australia was not well supplied with combinations of this type, and the Commission believes that there is a real public demand for programmes of the type conducted by Mr. Yorke. Most of the leading brass bands throughout Australia also broadcast through the "A" Class Stations from time to time.

Dance Bands:

For a substantial part of the year 1935-36 Mr. Jim Davidson's Dance Band remained under contract to the Commission and presented many popular programmes. During the later months a new band was formed in preparation for the arrival of Mr. Howard Jacobs, one of the leading English conductors of the type of music, who, together with Mr. Cecil Norman, the well-known composer, arranger, and dance-band pianist, visited Australia under contract to the Commission and made an extensive tour of the Commonwealth. Apart from Studio broadcasts, this band gave a series of public rhythm-music concerts of a type not previously attempted in this country, which were highly successful.

Composers:

The results of the A.B.C. 1934-35 Competition for Australian Composers were announced during the period under review. The entries submitted were judged in England by a distinguished musical authority, Mr. John Ireland, who commented favourably upon much of the work. The competition drew 269 entries covering a wide range of types of musical compositions—symphonic, choral, brass and military band, chamber music, operetta and vocal and instrumental solos.

The Commission was widely commended for this encouragement to local composers:

DRAMATIC:

Grand Opera:

Commencing in September, 1935, the Commission presented, mainly from its studios, but also a number from the Wilson Hall, Melbourne University, a six months' season of Grand Opera (three months in Sydney and three months in Melbourne) under the conductorship of Mr. Maurice de Abravanel, assisted by the Australian conductors, Mr. Percy Code and Mr. Joseph Post. The principal soloists included Madame Florence Austral, Miss Thea Phillips, Mr. Lionello Cecil, Mr. Ben Williams, Mr. Horace Stevens, Mr. Sydney de Vries and Mr. Raymond Beatty. The Commission's full Concert Orchestras in Sydney and Melbourne respectively, each specially augmented for the purpose, were em-

ployed for this season, and well-trained choruses, the nuclei of which were the A.B.C. (Sydney) Wireless Chorus and the A.B.C. (Melbourne) Wireless Chorus, were engaged.

Recorded Grand Opera:

Full recorded performances of Grand Opera broadcast during the year included "Lucia di Lammermoor," "The Bartered Bride," "The Damnation of Faust" and "Carmen."

Light Opera, Musical Comedy, Vaudeville, etc.:

Adaptation:

Much work was carried out in connection with the difficult task of satisfactorily adapting musical comedy and vaudeville performances for presentation by radio. Except where writers create primarily for the new medium rather than for the stage, adaptation must continue to play an important part in the presentation of programmes. Considerable progress was, it is believed, made in this field. It should be noted that a substantial part of the adaptation necessary consisted of condensation, experience having shown that few dramatic broadcasts are able to hold the attention of listeners for more than one hour. Since it had become apparent that at times drastic re-writing was necessary, the Commission retained, under contract, the services of Mr. Edmund Barclay, who not only wrote original productions of various types, but also assisted in the re-writing of well-known stage successes. Mr. Mark Makeham, another specialist in broadcasting productions, wrote the book, lyrics and music for the musical comedy "Dawn O' Day," and also contributed the "book" for a number of revues (including the humorous "Oh Quate" series), the music for which was written by another of the Commission's officers, Mr. Cecil Fraser. Mr. W. G. James wrote the score for musical versions of John Masefield's "Coming of Christ" and for a locally-written play entitled "Wo-Hie." Another member of the staff, Mr. Horace Keats, wrote the music for Paul Furniss' musical comedy "Maritza," while Mr. Alfred Lawrence wrote the libretto, book, and lyrics of "Babes in the Wood."

The Commission hopes in future to apply even more extensively its policy of encouraging local writers and composers to adapt their work to the particular requirements of radio-drama. As in the preceding year, few musical comedy broadcasts were attempted from theatres during public performances. In general such broadcasts are not satisfactory. "Yes Madam"—a work particularly suited for the purpose—was presented in that manner with, it is thought, a fair measure of success, but, for the most part, it was found more satisfactory to produce light operas, musical come-

(Continued on next Page.)

Australian Broadcasting Commission Annual Report (Continued.)

dies, revues and plays in the studio, specially adapted for broadcasting. Mention was made in the report of the light operas and musical comedies produced during the year.

Gilbert and Sullivan Recordings:

Complete recordings of all the Gilbert and Sullivan Comic Operas were again broadcast from all Stations during the period under review.

Plays:

Much that has been said concerning musical comedy applies with equal force to non-musical plays. In the presentation by radio of all forms of dramatic work, it has been found that the listener's familiarity with characters and general settings has a definite value; on the other hand, it has also been found that the majority of successful stage plays embody characteristics which are not altogether compatible with production for broadcasting purposes.

Accordingly, much re-writing—and in particular condensation—has been found to be necessary. Members of the Commission's staff have been engaged and trained for this purpose, and a general technique has now been evolved. Soon, it is hoped, leading dramatists will commence writing especially for broadcasting. The Commission has made special efforts to induce local playwrights to turn their talents to radio work, but it would appear that for some time to come standard works, suitably adapted, must constitute an important part of the dramatic programme.

Plays and Sketches Competition, 1935:

The results of the Commission's second competition for Radio-plays and Radio-sketches written by Australian authors were announced during the period under review. All prize-winning plays, and a number of other entries that were highly commended by the judges, were broadcast from the National Stations and were commended by the listening public. The entries revealed that a definite advance had been made in the technique of radio-dramatic writing since the first competition was held, and the general standard of writing gave encouraging promise for the future.

Notable Works:

During the year many outstanding examples of all established dramatic schools, including the modern English, American and Russian schools, were broadcast, in addition to lighter and more widely popular plays.

It is of interest to add that a play entitled "The Saga of Minnie Miffin," written in South Africa and obtained from the South African Broadcasting Company, proved particularly popular among listeners in this country.

Federal Department:

Pursuing its policy of federalisation of certain activities, the Commission appointed a Federal Controller of Productions.

This department will co-ordinate and direct the work of the production departments in the various States.

TALKS:

General:

Apart from solo talks, there have been discussions between two or more speakers, in the same city or in different cities, direct debates on controversial points, dramatised arguments in appropriate settings and broadcasts of public speeches. Talks of special merit and having nation-wide appeal were relayed from each of the States to all other parts of the Continent, and a great number of talks, covering a wide range of subject-matters, were broadcast in the ordinary State programmes.

Series of Talks:

Several series of National Talks are worthy of particular mention. One such series was entitled "The Causes of War" and comprised the following four talks:—"Men Like War" (by Dr. W. G. K. Duncan, of Sydney), "The Political Factor" (by Professor G. V. Portus, of Adelaide), "The Profits of War" (by Judge A. W. Foster, of Melbourne), and "War as a Social Institution" (by Mr. W. Macmahon Ball, of Melbourne). "Education on the March" was the general title of another series of five talks, in which the educational systems of Russia, Germany, U.S.A., England and Australia were discussed, from various points of view, by men who had had personal contact with them. A third series, which perhaps served a useful purpose in helping the public at large to understand the difficulties of the man on the land, was the "You Don't Understand My Problems" series. It dealt with the following aspects of the primary producers' life:—"Our Difficulties with Finance" (by The Hon. W. C. Cambridge, M.L.C.); "Soil is Easily Exhausted" (by Mr. M. Pietriche), "Animals and Plants Will Catch Disease" (by Mr. J. F. F. Reid), "Farm Power and Haulage are so Costly" (by Mr. A. H. E. McDonald), "No Respite from Work" (by the Hon. M. P. Dunlop, M.L.C.) and "You Get Our Products Too Cheaply" (by Mr. H. D. Black). Throughout the year, talks concerning the latest developments in international affairs were given regularly by Professor A. H. Charteris (Sydney) and Dr. G. L. Wood (Melbourne).

Two changes in practice introduced during the year were, first, the decreasing number of National Talks given each week from seven to six, and secondly, the decision that the talk on Sunday night should always take the form of a discussion between two or more speakers.

The Commission would again like to record its appreciation of the assistance so willingly given it by honorary talks advisers, who devoted much

time and thought in co-operation with the Commission's staff in the compiling of the talks programmes.

School Broadcasts:

As before, regular talks to boys and girls at school were broadcast on week-days at times decided upon after consultation with educational bodies. When the last annual report was presented to you, this system had been adopted in all States other than Tasmania. Shortly afterwards, the Educational Department in that State also agreed to co-operate with the Commission and since then the practice has been uniform in all parts of the Commonwealth. There can be little doubt that the work has been highly successful.

By bringing to even the most distant schools the benefit of talks by well-known authorities on their specialities, and by indicating to pupils interesting aspects of their work which might not fall entirely within the scope of ordinary lessons, the Commission has been able to help teachers and students alike. In subjects involving the pronunciation of a foreign language, broadcast lectures have, as might be expected, proved especially useful, uniform standards being otherwise difficult to attain.

As before, the subjects dealt with in these lectures in each State followed closely the syllabus prepared for each of the several public examinations. The obligation to do this naturally restricted the use which could be made of national relays, but otherwise little difficulty was met with except in the case of Station 2CO. That station is situated virtually on the border of New South Wales and Victoria, and naturally listeners on each side desired to hear lectures prepared in accordance with the examination syllabus for their own State.

The subjects dealt with in school broadcasts included: English (Syntax, Literature and Speech-Training), History, Geography, French, Elementary Science, Civics, Mathematics, German, Nature Study, Elementary International Affairs, Book-keeping, Elementary Physiology, Health and Physical Training talks, and Music. In the evenings, lectures were also given on Italian and Oriental Studies.

Booklets relating to the various school broadcasts were issued, as before, to all scholars interested in the respective courses. It has been found that some such guide is indispensable to the success of the scheme. When the previous annual report was presented no fewer than 800 schools were listening regularly to this part of the programme. At the close of the year now under review, that number had increased to 1024. These figures give some idea of the rapidity with which the experiment has found favour.

Apart from their service to the pupils of the above-mentioned schools

(Continued on next Page.)

Australian Broadcasting Commission Annual Report (Continued.)

the broadcasts proved to be of incalculable value to scholars living in more remote parts of the continent, and having, in consequence, to depend otherwise for their education upon correspondence courses. It is estimated that upward of 5000 such students listened regularly to the lectures which were broadcast during the year.

Every assistance has been received from the several State Education Departments and from the schools. The Commission desires to pay a tribute to their help and courtesy, and to thank especially those who voluntarily gave their time to act as members of the School Broadcasts Committees.

Readings:

The reading of stories over the air proved once more to be a popular part of the Commission's programmes. Many people who, for one reason or another, lack opportunity for extensive reading have found great interest in the story-readings which have been regularly broadcast. At times, these readings have been dramatised; it is believed that this greatly increases the appeal of many stories, especially where the broadcasts can be enriched by backgrounds of suitable "effects."

Descriptive Broadcasts:

The year was not as rich in opportunity for describing events of a ceremonial character as the previous one, which was marked by many notable functions associated with the Victorian Centenary Celebrations. Descriptions were, however, broadcast whenever occasion arose.

Industrial Broadcasts:

In addition to the more direct educational efforts made in the school broadcasts and the Young People's Concerts, the Commission arranged for expert describers to attend a number of factories and large-scale works and to describe the various operations carried on, for the benefit, especially, of children. The background noises picked up naturally on the microphone lent an air of reality to these descriptions and helped to excite the interest of youthful listeners.

SPORT:

All local sporting events of any importance were described, and the more outstanding descriptions were relayed to all States likely to be interested in them. Short-wave descriptions of notable sporting contests held overseas were also rebroadcast wherever possible, either directly or by means of recordings. The Commission desires to take this opportunity of expressing its appreciation of the assistance given in such matters by the B.B.C.'s Empire Station and by other shortwave organisations.

Particular mention should be made of the description arranged by the National Broadcasting Company In-

corporated of America, of the Louis-Schmelling World's Heavyweight Championship boxing match. The N.B.C.'s admirable account of this interesting match was received with excellent clarity and was much enjoyed by many people in this country.

Other notable re-broadcasts were, as in previous years, the Derby and Grand National horse races, the Oxford-Cambridge boat race, and the English Association football cup final, all of which were received from the R.B.C. Empire Short-Wave Station.

Three interesting broadcasts of overseas sporting events were arranged directly by the Commission—the "synthetic" ball-for-ball description of the five cricket Test matches played by the Australian XI in South Africa; daily commentaries upon the main events of the Berlin Olympiad; and descriptions of the Davis Cup and Wimbledon tennis matches.

As to the first of these, the Commission, in conjunction with certain other Australian broadcasting organisations, sent to South Africa a representative who cabled during the tour the material from which running accounts of the play in all Test matches were reconstructed and broadcast.

The Commission was also represented during the Olympic Games, held in Berlin, by Mr. Harry Hay, a well-known swimmer and athletic authority, who supplied a series of commentaries upon and descriptions of the events which were of most concern to Australia. The Reich-Rundfunk Gesellschaft made admirable facilities available for the service, and the quality of the transmissions was exceptionally good.

During the more important Davis Cup matches and the Wimbledon Men's Singles and Doubles Tennis Championships, a cable service was arranged, which enabled the scores to be announced game by game. This service was supplemented whenever practicable by the B.B.C. short-wave descriptions from the courts.

ESSENTIAL SERVICES:

Reports of various kinds, including market, weather, river-height, stock exchange and wool sale reports, especially designed to be of service to primary producers, and S.O.S. and other similar messages supplied by the Police Department or by other public authorities, were broadcast as in previous years.

DEVOTIONAL:

The Commission continued to broadcast morning and evening Sunday Church Services, representing all denominations, in each State, and also non-denominational studio services on week-days, including a "Daily Broadcast Service," which appeared to attract a large number of regular listeners. A "Sermon for those who

may not like sermons" was also broadcast once each month. In New South Wales, one of the two Sunday morning services was replaced by an alternative programme of serious music.

The Commission also decided to improve the musical quality of the church services broadcast by making available to any church which desired such assistance the services, free of charge, of a well-trained vocal quartette.

SPECIAL SESSIONS:

Special sessions for women and for children were, as previously, broadcast at appropriate hours.

The problem of children's needs, in particular, has been receiving special attention. The tendency is definitely towards the presentation of carefully prepared and adequately rehearsed programmes for children, as well as for other listeners, in preference to relying upon the improvising ability of those—whether staff or professional artists—who contribute to the session. Serials featuring leading broadcast actors and actresses have become a permanent feature.

EMPIRE AND INTERNATIONAL RELATIONS:

Realising the importance of broadcasting—short-wave broadcasting in particular—in the scheme of international relations, and also the necessity for co-operation between broadcasting organisations in all parts of the world, the Commission appointed a special officer to supervise this work.

In order to increase the amount of first-hand information available to it concerning affairs abroad, the Commission has, since the close of the financial year 1935-1936, assisted "The Watchman"—one of its regular News Commentators—to attend a meeting of the League of Nations Council at Geneva, and Miss Constance Duncan—one of its regular speakers—to attend a Pan-Pacific Conference in America and subsequently to visit Japan, China, Manchukuo and Islands in the Pacific. It is hoped that listeners will soon be given the benefit of the additional knowledge so gained.

COMMUNITY SINGING:

Regular community singing concerts were once more arranged. The continued popularity of this form of entertainment has been a notable feature of Australian broadcasts for a number of years.

WOMEN'S SESSIONS:

As in previous years, women's sessions were broadcast at appropriate hours from all stations, and throughout the year under review totalled 973 hours, 33 minutes. They comprised items designed particularly to interest women, and included talks concerning both home and outside activities.

(Continued on next Page.)

Australian Broadcasting Commission Annual Report (Continued.)

B.B.C. RECORDED PROGRAMMES:

By arrangement with the B.B.C., recordings of some of the latter's programmes were broadcast by the Commission.

These recordings have been of excellent mechanical quality and consequently have afforded a more interesting standard of comparison with the work of the B.B.C. than can as yet be obtained from short-wave re-broadcasts.

SHORT-WAVE BROADCASTING:

Reception:

During the year there were frequent rebroadcasts of short-wave programmes. The technical quality of this form of transmission continued to improve substantially. A notable advance was also made by the more liberal use of recording machines in Melbourne and Sydney. Previously, the hours when short-wave transmissions were rebroadcast were often dictated by the most suitable hours for overseas reception. By recording locally, however, it has become possible to choose the time, or times, most likely to suit general programme balance and the convenience of Australian listeners.

As in earlier years, the B.B.C.'s Empire programmes were used freely, and in addition American and Continental stations at times contributed interesting programmes of good technical quality.

Outstanding sporting rebroadcasts have already been mentioned. Particular reference should also be made to the B.B.C. Christmas Broadcast, "The Great Family," in which typical families spoke from widely-separated parts of the Empire, and the "Youth Sings Over the Frontier" broadcast from Zeesen, arranged by l'Union Internationale de Radiodiffusion, to which children of many nationalities contributed their own songs. The Commission was happy to be able to co-operate in the arrangement of both these programmes.

Other notable broadcasts re-transmitted to Australian listeners were Mr. Baldwin's speech concerning the last hours of the late King George V and descriptions of the Funeral and Burial Services of His late Majesty; the Proclamation Ceremony upon the accession of King Edward VIII, and King Edward's speech to the Empire in March, 1936; the special service at Canterbury Cathedral on the occasion of the Bishop Broughton Centenary; and descriptions of the launching by Lord Bledisloe of the S.S. "Awatea"; of the departure of the "Queen Mary" upon its maiden voyage and of its arrival in New York.

On occasion the overseas short-wave transmissions were supplemented by the use of the radio telephone, and interviews with notable personalities in other countries and with distinguished Australians abroad (including members of the Davis Cup

tennis team) were arranged by the Commission for Australian listeners.

TRANSMISSION:

The Commission has continued to supply programmes for the short-wave National Station 3LR Lyndhurst (Victoria). Although working on severely limited power, this station has at times been received with reasonable clarity in England and other parts of Europe, and also in America. Its effective overseas range, however, is restricted principally to New Zealand, the islands in the Pacific, and the Far East of Asia, from which appreciative letters have frequently been received. Possibly, however, the most valuable use to which the station has been put, so far, is the supplying of static-free programmes to the more remote parts of Australia, which cannot be adequately served by the ordinary medium-wave stations at present in existence. Realising the effectiveness of 3LR for this purpose, the Commission has substantially increased the latter's programme output and has recently broadcast from it special news and essential-service bulletins as well as the outstanding features of the ordinary National programmes.

ARTISTS:

Artists' appearances for the year amounted to no fewer than 73,135, of which 44,473 fell within the general category of music, 19,898 within that of talking and 8,764 within that of drama. Microphone appearances over the same period totalled 33,619, the lower number (as against artists' appearances) being explained by the fact that many of the performers appeared in combinations of one kind or another.

ACCOMMODATION:

Although, as this and previous reports indicate, there has been very marked progress both in the development of the Commission's programmes and the raising of standards of performance, the Commission has been under a severe handicap owing to lack of adequate studios and staff accommodation in all States. There was no simple and quick remedy for this. The most difficult technical problems are associated with both the design and location of studios. Large broadcasting organisations in Europe and America have been experimenting on these problems. There were sound reasons for delaying the purchase of land in the major capital cities of Australia, until the conflicting elements of cost and location had been reconciled. Fortunately, the Commission was able to secure suitable sites in the two principal cities, Melbourne and Sydney, last year.

During the year the Commission sent abroad one of its officers (Mr. T. W. Bearup) to investigate broadcasting problems, and in particular problems of studio design. He was accompanied during most of this visit

by the Chief Architect of the Department of the Interior, who was specially released by that Department for this investigation.

The accommodation in the smaller States is of a more or less temporary nature. Studio problems in those States will be reviewed in the light of the reports made by the experts.

Note.—These two officers have since returned, and their reports and recommendations are receiving the attention of the Commission.

FINANCE:

The appended statements show that during the period under review, revenue exceeded expenditure by £91,465, as against £95,078 in the preceding twelve months. Transfers from the surplus bring the Building Reserve to *£235,000, and an unappropriated surplus of £3,867 is carried forward to the next year. The total gross revenue for the year was £470,996 (as against £405,534 for the previous year.) Of this sum, £461,375 was received from the Postmaster-General's Department as the Commission's proportion of Broadcast Listeners' Licence Fees, payable under Section 26 (2) of the Australian Broadcasting Commission Act, 1932. Other revenue (including principally gross proceeds of public concerts and rentals) amounted to £9,621. The total expenditure for the year was £379,531 (as against £310,456 for the previous year), representing 80.58 per cent. of revenue. Programme expenses (included in the above total) increased from 42.23 per cent. of revenue to 49.36 per cent. The percentage of administrative expenses decreased slightly.

The reasons referred to in previous reports for setting aside substantial reserves from revenue may well be repeated. This policy is followed in preference to relying wholly, or even substantially, upon borrowed capital; the Commission's object being to ease the burden of interest charges during future years, when the cost of programmes will grow out of proportion to the increase in revenue. Although the rate of licence-increase has been very satisfactory, and has exceeded all expectations, it must be recognised that saturation-point will one day be reached; but the demand for improved services will not slacken, even though revenue should become stationary. Moreover, although the Commission may borrow on the security of debentures, the amount available to it from this source at a given moment is limited under the Act to £50,000. While this limitation stands, it would appear that capital expenditure beyond this sum must come from revenue. The Commission has already been involved in heavy expenditure in

*Note.—As it will appear from the Accounts, this Reserve is represented as to cash by £100,000 only; the balance being represented by Land and Buildings, £53,260; Furniture, Equipment, etc., £81,740.

(Continued on next Page.)

Australian Broadcasting Commission Annual Report (Continued.)

the purchase of land in the capital cities, particularly in Melbourne and Sydney, and it faces an extensive building programme in order to provide studios and staff accommodation. Reference has already been made to this earlier in the report.

In considering the likely trend of broadcasting expenditure in the future, it must be remembered that the tendency everywhere is to reduce the proportion of gramophone records in favour of live broadcasting, with a consequent increase in cost. The Commission has been making this reduction voluntarily as a matter of national policy, and in response to its obligation under the Act to "give as far as possible . . . encouragement to the development of local talent . . ." The extent and success of its efforts in this direction are evident in the record embodied in this report. The Commission believes however, that the same policy will be forced, by public opinion, upon the commercial stations, which now, in Australia, depend preponderantly upon recordings, and their entry into the field of competition for original programme material and artists is bound to increase the cost. Moreover, already the pinch of insufficient original material, even in the matter of music, is being felt severely. All these difficulties have arisen in an acute degree in Australia, because of our comparatively small population, our immature stage of development, both in respect of composers and artists, and our remoteness from northern centres of civilisation; but the full force of the difficulties has not yet struck us. In the early period of broadcasting the novelty of the art, the freshness of much of the material and of the artists, to some extent delayed or softened criticism. But as the comparatively brief list of local artists—musicians, actors, speakers—becomes exhausted, interest wanes, and is succeeded by boredom and criticism. It is no longer sufficient that an opera, a symphony, a play, a musician, an actor, a speaker be good, or even excellent; the item or the artist must be new or rare.

This prejudice against repetition is imposing a great strain on our resources, which can only be relieved by the expenditure of more money in the encouragement of original composition and of higher standards of performance, and in the leavening of local talent with imported, both in respect of material and artists. Standards can also be raised by improved methods of production, more adequate rehearsal, more expert studio control, and by a greater degree of specialisation in the various branches of broadcasting art. We are pushing on with our work in all these directions, though the rate of progress will be

retarded by the lack of suitable studios, and the impossibility of conjuring experienced staff out of the void.

As fast as staff can be secured and trained, and so soon as new studios are available, the standard of our productions will rise—as also will our expenditure. It is certain that in future we must pay higher fees than in the past for material and artists, both inside and outside Australia; inside, partly because of increasing competition by commercial stations, and partly in order to offer inducement without which sufficient material and talent of a suitable standard will not be created or developed; abroad, partly because of the keen competition for talent by broadcasting organisations with much greater financial resources than ours, and partly because of our distance from the northern capitals, which causes most artists to look askance at the long journey, the time lost in travelling, and the break from the entertainment world of Europe and America.

TECHNICAL:

The Commission desires to express its appreciation of the valuable and courteous co-operation extended to it by the Postmaster-General's Department.

ENCOURAGEMENT TO LOCAL ARTISTS:

The Commission has already done a great deal to encourage Australian artists, and it will progressively increase the opportunities for such artists. A growing proportion of its programme time is now occupied by flesh and blood productions, as against recorded programmes. It has conducted competitions for playwrights and musical composers, and has now set up a Federal Music Department and a Federal Dramatic Productions Department which will, among other things, take special steps to discover and give opportunity to Australian talent. Some of the ways in which the Commission has given, and is continuing to give, employment to Australian artists have been alluded to earlier in this report and may here be briefly summarised.

(i) **Grand Opera Season:** During the past year—lasting three months in each of the larger capitals, Sydney and Melbourne, and employing up to 50 orchestral players with chorus of 32 in each city, together with some 57 Australian soloists in principal and subsidiary roles.

(ii) **Orchestras** have now been set up in every State, giving full-time employment to over 150 musicians, and part-time employment to at least another 150 for public concert performances in each State, varying from 5 to 10 in number.

(iii) **Bands:** A Military Band of thirty-two musicians, and two dance bands of seventeen musicians each, are maintained on full time.

(iv) **Choruses:** Permanent choruses of 16 are maintained in both Melbourne and Sydney, and also part-time choruses in the other States.

(v) **Engagements** are given to outside professional or amateur orchestras, bands, choirs and dramatic societies.

(vi) **In addition** to organised groups such as those referred to above, employment on a very large scale is given to individual singers, instrumentalists, actors, speakers, producers arrangers, writers, composers, and others, in musical comedy, vaudeville, plays, sketches, debates, lectures, talks, story-readings, and so on.

(vii) **Artist appearances** for the year numbered no fewer than 73,000.

STAFF:

Mr. Charles J. A. Moses was appointed General Manager as from the 1st November, 1935.

The Commission desires to take this opportunity of thanking him and all other members of the staff for the loyal and willing service which they have given during the year.

During the year every State of the Commonwealth was visited by one or more members of the Commission, the General Manager and some of the principal executive officers. On these visits close contact has been made, not only with the Commission's own staff, but also with representatives of community life over a wide range of interests and activities—music, drama, education, press, public service and so on. This close personal supervision of the organisation and intimate contact with representative groups of listeners has enabled the Commission to keep in touch with listeners' interests, and equipped it to cater for their diverse tastes and needs.

PERSONNEL OF COMMISSION:

The Commission's personnel has remained unaltered. The original term of office of the Vice-Chairman, Mr. Herbert R. Brookes, terminated during the period under review and he was immediately re-appointed for a further term of one year.

We have the honour to be, Sir,
Your obedient servants,
W. J. Cleary (Chairman),
H. R. Brookes (Vice-Chairman),
R. B. Orchard (Commissioner),
Elizabeth M. R. Couchman
(Commissioner),
J. W. Kitto (Commissioner),
Australian Broadcasting
Commission.

AUSTRALIAN BROADCASTING COMMISSION

BALANCE SHEET AS AT 30th JUNE, 1936.

Previous Year	LIABILITIES.				Previous Year	ASSETS.			
	£	s.	d.	1935-36.		£	s.	d.	1935-36.
13,314 6 8	£	s.	d.	£	s.	d.	£	s.	d.
145,000 0 0	18,146	5	9	235,000	0	0	53,468	18	3
2,401 16 0	2,401	16	0	3,867	2	6	209	1	8
							53,259	16	7
							17,401	14	5
							1,910	16	0
							50,159	8	11
							1,889	12	6
							60,183	5	10
							12,892	4	0
£160,716 2 8	£257,013 8 8			£160,716 2 8			100,958	9	10
							20,763	4	5
							£257,013 8 3		

PROFIT AND LOSS STATEMENT FOR YEAR ENDED 30th JUNE, 1936.

Previous Year	EXPENDITURE.				Previous Year	REVENUE.			
	£	s.	d.	1935-36.		£	s.	d.	1935-36.
171,296 12 7	£	s.	d.	£	s.	d.	£	s.	d.
	232,464	15	5	405,048	19	0	461,374	18	0
				314	10	10	1,656	9	0
				171	2	3	7,965	4	9
40,200 13 9				44,137	10	5			
9,370 5 5				9,679	13	4			
£405,534 12 1	£470,996 11 9			£405,534 12 1			£470,996 11 9		
95,000 0 0				95,078	16	2			
78 16 2									
£95,078 16 2	£91,465 6 6			£95,078 16 2			£91,465 6 6		

World License Distribution as at 31/12/35, mentioned on Page 16, Col. 1.

Country.	Population.	Total.	Licences Per 100 of Population.	Country.	Population.	Total.	Licences Per 100 of Population.
1. U.S. of America	126,425,000	22,500,000†	17.79	15. Argentine	12,200,000	800,000‡	6.56
2. Denmark	3,705,559	609,226	16.44	16. France	41,940,000	2,625,677	6.26
3. Great Britain	46,047,046	7,403,109	16.08	17. Czecho-Slovakia	14,726,158	847,955	5.75
4. Sweden	6,233,090	834,143	13.38	18. Hungary	8,761,000	352,907	4.03
5. New Zealand	1,562,129	183,830	11.77	19. Finland	3,697,505	144,721	3.91
6. Australia	6,734,771	770,152	11.43	20. Chilia	4,500,000	150,000‡	3.33
7. Netherlands	8,351,117	946,844	11.34	21. Irish Free State	3,030,000	78,600	2.59
8. Germany	66,840,000	7,192,952	10.76	22. Japan	97,362,679	2,372,402‡	2.44
9. Switzerland	4,066,400	418,499	10.29	23. U.S.S.R.	168,000,000	2,800,000	1.67
10. Belgium	8,092,004	746,395	9.22	24. Poland	33,584,000	491,823	1.46
11. Canada	10,376,000	862,109*	8.31*	25. Mexico	16,500,000†	220,000	1.33
12. Austria	6,760,000	560,120	8.286	26. Spain	23,677,794	303,983	1.28
13. South Africa	1,730,000†	130,000	7.51	27. Italy	43,450,000	530,000	1.22
14. Norway	2,870,000	191,378	6.67				

†Listeners are not licensed and the totals shown are estimates only of the number of receiving sets in operation.
*As at 31st March, 1936. ‡Excluding natives.

Commonwealth Auditor-General's Annual Report on Wireless Matters of the Postmaster-General's Dept. for Period 1935-36.

The published accounts of the Amalgamated Wireless (Australasia) Limited for the year ended 30th June, 1936, disclose a net profit of £109,701/7/2 from Wireless Services and other sources.

This amount represents a return of 14.73 per cent. on the paid-up capital of £744,283, and is £10,123 less than the net profit for the previous year. Dividends at the rate of 11 per cent. per annum, absorbing £81,871, have been paid for 1935-36, the Commonwealth receiving £38,500, based on its capital holding of £350,000/14/-—500,001 shares paid at 14/-. Dividends received to date by the Commonwealth since the Commonwealth became a shareholder in 1922, total £260,558, including dividend for half-year ended 30th June, 1936, paid on 16th October, 1936.

Under the Wireless Agreement Act 1927, the company received the sum of £33,372/5/1 from the Government, on account of the year 1935-36. This sum, which represents the Commonwealth's net payment towards the maintenance of the Coastal and Island Radio stations, is subject to slight adjustment in respect of the June quarter.

As required by Section 52 (b) of the Audit Act, I append the following opinion of the Attorney-General's Department regarding the right of the Commonwealth to set off the company's revenue contribution against the Government annual subsidy.

Wireless Agreement Act 1927—Schedule, Part III., Clause 12—Constitution, Section 81, 83—Right of Commonwealth To Set Off Company's Revenue Against Commonwealth's Contribution.

OPINION.

The Auditor-General has forwarded the following memorandum to me for advice:—

"Clause 12 (3) of Part III. to the Schedule of the above Act provides—

'As from 28th March, 1927, the Commonwealth shall pay to the company, as a contribution towards the maintenance of the said stations, an annual subsidy of £45,000 per annum, and the company shall pay to the Commonwealth 30 per centum of the revenue earned by the company in the continuance of the services which were carried on by the said stations at the commencement of the Agreement made on the 28th day of March, 1922, between the parties to this agreement.'

2. The practice in the Postmaster-General's Department, since the inception of the Agreement in 1927, has been to deduct 30 per cent. of the revenue collected by the company from the annual subsidy of £45,000. To meet the payment of £45,000, the sum of £37,000 only has been provided (see Estimates 1935-36), Item 127 (f) (1) 'Contributions to Amalgamated Wireless Limited towards the Cost of Wireless Stations', this sum of £37,000 presumably being the net difference between the £45,000 payable by the Department and the 30 per cent. of revenue earned by the company to be paid to the Commonwealth.

3. During the last three years, the following payments and earnings have occurred:—

Financial Year.	Annual Subsidy.	30 per cent. of the Revenue earned by the Company.	Amount Payable to the Company.
1932-33	£ 45,000	£ 8,718 17 1	£ 36,281 2 11
1933-34	45,000	8,869 11 1	36,130 8 11
1934-35	45,000	11,565 2 9	33,434 17 3
Totals	135,000	29,153 10 11	105,846 9 1

4. The Auditor-General will be glad of your advice as to whether the full amount of £45,000, under Clause 12 (3) of the Schedule above-quoted, should be appropriated and paid to the company, and whether the 30 per cent. of the revenue earned by the company should be collected and paid to Commonwealth Revenue.

5. Reference is made to Section 3 of the Wireless Agreement Act 1927, to Treasury Regulation 30 and to Sections 81 and 83 of the Constitution. Section 81 of the Constitution provides that all revenues or moneys raised or received by the Executive Government shall form one Consolidated Revenue Fund.

Clause 12 (3) of the Agreement provides that the Commonwealth shall pay to the Company a subsidy of £45,000 per annum, and the Company shall pay to the Commonwealth 30 per cent. of the revenue earned by the Company in respect of certain services.

Section 3 of the Wireless Agreement Act appropriates the necessary moneys for carrying out the Agreement, but apparently the practice has arisen of setting off the percentage of revenue, due to the Commonwealth against the Commonwealth's contribution, and only appropriating the excess of the contribution over the Commonwealth's share of the revenue.

If the practice is as above-stated, the moneys due by the Company to the Commonwealth are not raised or received within the meaning of section 81 of the Constitution.

Against the amount of subsidy payable by the Commonwealth there is set off the amount of revenue payable by the Company, and I see no reason for appropriating more than the difference or for insisting on the revenue as set off being actually collected and paid to revenue.

(Sgd.) GEO. S. KNOWLES,
Solicitor-General.

5th March, 1936.
The Auditor-General,
Melbourne.

PICTUREGRAM SERVICE.

40. The following figures in regard to this Service are of interest:—

Capital Cost	£12,035
Revenue, 1935-36	636
Working Expenses, 1935-36	815
Interest and Depreciation, 1935-36	1,361
Net loss on the year	1,540

Compared with the figures for the year 1934-35, the Revenue showed a decrease of £319, while Working Expenses were increased by £45. Included in the Work-

AUDITOR GENERAL'S REPORT ON WIRELESS ACCOUNTS (Continued.)

ing Expenses for 1935-36 were amounts of £174 for replacement parts to be used during 1936-37 and £103/10/- representing Exchange. The net loss on the year compared with that of the previous year was increased by £166.

BROADCASTING.

41. Broadcasting Services in Australia are supplied by two classes of stations—the National Stations provided and maintained by the Commonwealth and the licensed Commercial Stations.

There are fifteen National Stations, nine originating stations including the short-wave stations at Lyndhurst, Victoria, and six regional stations. The bulk of the programmes broadcast from regional stations is received over land lines from the metropolitan stations. Seventy-three Commercial stations were broadcasting at the end of the financial year.

Licensed broadcast listeners at 30th June, 1936, numbered 821,765, showing an increase of 102,869 over the number twelve months before.

During the year, 1,364 unlicensed listeners were convicted, fines and costs totalling £2,845.

LISTENERS' LICENCE FEES—RECEIPTS AND EXPENDITURE.

42. The broadcast listeners' licence fee of 21s. is distributed between Consolidated Revenue and the Australian Broadcasting Commission; 9s. is paid to Revenue and 12s. to the Commission. The following Statement shows the broadcasting transactions relating to listeners' fees for the year 1935-36.

INCOME.

	£	s.	d.
Balance of undistributed fees in Trust Account, Wireless Broadcasting Account at 30th June, 1935	211,039	9	0
Licence Fees received from Broadcast Listeners and Experimenters during 1935-36	861,724	14	0
	<u>1,072,764</u>	<u>3</u>	<u>0</u>

EXPENDITURE.

	£	s.	d.
Australian Broadcasting Commission	461,374	18	0
Revenue	367,751	18	0
Balance undistributed fees in Trust Account, Wireless Broadcasting Account*	243,637	7	0
	<u>1,072,764</u>	<u>3</u>	<u>0</u>

Included in the foregoing figures is an amount of £897 in respect of Experimental Licence fees. When the wireless regulations were promulgated in 1924, provision was made for a portion of experimental licence fees to be paid to the "A" class broadcasting companies. The payment was continued up to the date the National Broadcasting Service was established in 1929. The contract with the Australian Broadcasting Company Limited which conducted the first national service provided for a payment of 12/- per annum per listener's licence fee collected. Subsequently, the Australian Broadcasting Commission Act 1932, similarly provided for a payment of 12/- per annum per broadcast listener's licence fee received. Notwithstanding these limitations to listeners' licence fees received, the Department, has since 2nd October, 1930 (when the experimental licence fee was increased to 30s. per annum), paid to the Australian Broadcasting Company Limited and, subsequently, to the Australian Broadcasting Commission, 12/- per annum in respect of each experimental licence issued. These payments to the Company and the Commission in respect of experimental licences have been made without statutory authority and have been illegally charged to the Parliamentary Appropriation "Refunds of Revenue." The Department has indicated that action to legalise the payments will be taken at an early date.

WIRELESS BRANCH ACCOUNTS.

43. The Accounts of the Wireless Branch of the Postmaster-General's Department, which include the receipts and expenditure on account of broadcasting activities and show the Branch Profit and Loss Account for the year, were not complete at the time of preparation of this Report.

*The amount has been reconciled with the Treasury Balance of £282,834/4/-.

The Department administers the Wireless Act generally, and, as required by the Australian Broadcasting Commission Act 1932, provides and maintains broadcasting station and studio technical equipment, and makes available both permanent programme lines to serve the regional stations and lines for relayed programmes mutually agreed upon with the Commission.

The Postmaster-General's Annual Report and Balance-sheet for 1934-35 was issued on 20th May, 1936. The Wireless Branch surplus for 1934-35 was shown as £162,343. Wireless Equipment appears in the Balance-sheet at 30th June, 1935, as £268,779.

AUSTRALIAN BROADCASTING COMMISSION.

44. The accounts of the Australian Broadcasting Commission have been subjected to a continuous audit, the examination being extended to the Branch accounts in each State. The Balance-sheet has been certified by me and a report furnished to the Minister as required by Section 31 of the Australian Broadcasting Commission Act 1932.

The total revenue of £470,996/11/9 was made up of £461,374/18/- from listeners' licence fees, £96/8/- rents from property, £9/9/9 rent from plant, £7,859/7/- proceeds from concerts, and £1,656/9/- interest on fixed deposits. The expenditure totalled £379,531/5/3, leaving a revenue surplus of £91,465/6/6.

For the purpose of comparing the Commission's operations for the past two years, the following table has been prepared:—

TABULATION OF PROFIT AND LOSS ACCOUNTS—Two Years 1934-35 and 1935-36—With Percentages of Revenue.

	1934-35.		1935-36.	
	£	Per cent	£	Per cent
To Artists' Fees and Programme Expenses (Payments to artists, orchestras, lecturers, announcers, accompanists, and production costs)	171,297	42.2	232,465	49.4
Copyright Fees	40,201	9.9	44,137	9.4
Broadcasting Rights	9,370	2.3	9,680	2.0
Rental of Telephone Lines for Broadcasting and Outside Pick-up costs	11,282	2.8	9,962	2.1
Commission's Fees	1,778	.4	1,800	.4
Staff Salaries	34,031	8.4	38,075	8.1
Rent of Offices and Furniture	8,351	2.1	9,482	2.0
Publicity	6,387	1.6	4,060	.9
Depreciation	3,852	.9	5,325	1.1
Preliminary Expenses				
Written Off	1,587	.4	..	..
Other Expenses	22,320	5.5	24,546	5.2
Balance carried down	95,079	23.5	91,465	19.4
	<u>405,535</u>	<u>100.0</u>	<u>470,997</u>	<u>100.0</u>
			<u>1934-35.</u>	<u>1935-36.</u>
			£ Per cent	£ Per cent
By Revenue from Licence Fees	405,049	99.9	461,375	98.0
Interest on Investments	315	.1	1,657	.3
Other Revenue	171		7,965	1.7
	<u>405,535</u>	<u>100.0</u>	<u>470,997</u>	<u>100.0</u>

AUDITOR GENERAL'S REPORT ON WIRELESS ACCOUNTS (Continued.)

Period.	Revenue.	Expenditure.	Surplus.	Reserve for Building.	Accumulated Fund.
Year ended 30th June, 1935	405,535	310,456	95,079	145,000	2,402
Year ended 30th June, 1936	470,997	379,532	91,465	235,000	3,867

Revenue for the year showed an increase of £65,462 on the previous year's figures, of which £56,326 was due to increase in broadcast listeners' licences and £7,778 to proceeds of concerts promoted by the Commission. Expenditure increased by £69,076, the principal items being Artists' fees and Programme expenses, £61,168; Copyright Fees, £3,936; Staff Salaries, £4,044, and other expenses £2,226. Publicity showed a decrease of £2,327.

Copyright Fees paid by the Commission to the Australian Performing Rights Association are subject to an agreement dated 2nd July, 1934. The amount payable to that Association in respect of the year 1935-36 was £39,361.

Briefly, the financial position is explained thus—The assets, Sundry Debtors, Payments in Advance and cash in hand and at bank, amounting to £78,625, are in excess of the liability, Sundry Creditors, to the extent of £60,479. This amount, added to the remaining assets as shown in the balance-sheet, namely, £178,388, offsets the remaining liabilities of £238,867. These liabilities, described as "Reserves for Buildings £235,000 and Accumulated Fund, £3,867," represent the surplus revenue for the four years ended 30th June, 1936. Land and Buildings have increased from £16,279 to £53,260, and Office Furniture, Musical Instruments and Equipment from £17,402 to £21,727. Surplus cash to the extent of £100,000 has been placed on fixed deposit.

A summary of balance-sheet items for two years follows:—

Assets—		30th June 1935	30th June 1936
Land and Buildings—Freehold			
Less Depreciation		16,279	53,260
Office Furniture, Musical Instruments and Equipment Less			
Depreciation		17,402	21,727
Stores and Stationery		1,911	2,443
Sundry Debtors		50,159	55,558
Payments in Advance		1,890	2,304
Fixed Deposits with Accrued Interest		60,183	100,958
Cash in hand and at Bank		12,892	20,763
		160,716	257,013
Liabilities—			
Sundry Creditors		13,314	18,146
Reserve for Building		145,000	235,000
Accumulated Fund		2,402	3,867
		160,716	257,013

Commonwealth Government—Amalgamated Wireless Agreement.

In previous editions of this "Radio Trade Annual" details have been given of the various agreements existing between the Commonwealth of Australia and Amalgamated Wireless A/sia Ltd.

An original agreement dated March 28, 1922, was signed

and completed. An amendment of 1924, Act No. 24 of 1924, was further amended by Act No. 27 of 1927.

Full details of those Acts may be obtained from the Commonwealth Government Printer at Canberra, or from the publishers of this trade annual, Australian Radio Publications Ltd., 30 Carrington Street, Sydney, N.S.W.

Commonwealth Postal Information

WITHIN THE COMMONWEALTH and to Lord Howe Island, Norfolk Island, Papua, The Territory of New Guinea, and the following islands in the Pacific, viz.: Bismarck Archipelago (New Britain, New Ireland, New Hanover, Admiralty Island, etc.), Nauru, Bougainville and Buka (Solomon Islands):—

Letters and Lettercards.—2d. per oz. (Late Fee, 1d.) (Registration Fee, 3d.).

Postcards.—1½d. each.

Second-class Mail Matter, comprising:

- (a) Commercial Papers (maximum weight, 5lbs.), Patterns, Samples and Merchandise (Maximum weight, 1lb.).—1d. per oz.
- (b) Printed Matter: comprising Printed Papers, Circulars and Catalogues (which may contain samples of material) and Books, Periodicals and Newspapers not registered at a General Post Office (Maximum weight, 5lbs.).—1d. per 4 oz.

Third-class Mail Matter, comprising:

Books, Periodicals, and Newspapers registered at a General Post Office for transmission as such. (Maximum weight, 5lbs.).—1d. per 6 oz.

Newspapers published by registered newspaper proprietors to addresses within the Commonwealth or Papua, 20 oz., 1½d.; to New Zealand and Fiji, 16 oz., 2d.

EXPRESS DELIVERY SERVICE.

Prepayment of special fee in addition to the postage secures immediate delivery by special messenger. Minimum fee payable is 4d.

Acknowledgment of Receipt of Registered Letter or Article.—Fee 3d. in addition to Postage and Registration Fee.

POSTAL INFORMATION
(Continued.)

PERMIT MAIL FREE.

Printed Circulars signed by hand or personally addressed, posted in sealed envelopes.—Printed Matter rates, plus ½d. for each article.

AERIAL SERVICE.

Within the Commonwealth.—Articles except Parcels.—3d. per ½ oz. in addition to ordinary postage.

INSURANCE OF PARCELS.

To addresses within the Commonwealth:—

Fee	..	..	£2
3d.	..	..	£5
4d.	..	..	£10
6d.	..	..	£20
9d.	..	..	£30
1/-	..	..	£40
1/3	..	..	£50
1/6	..	..	£50

For loss, damage, or rifling of contents.

CASH ON DELIVERY PARCELS.

Within the Commonwealth.—In addition to the postage, commission on amount to be collected from addressees:—

Not exceeding 10/-	9d.
Over 10/-, and not exceeding 20/-	1/-
" 20/- " " " 30/-	1/3
" 30/- " " " 40/-	1/6
" 40/- " " " 60/-	1/9

For each additional 20/-, or fraction 3d.

BEYOND THE COMMONWEALTH.

Letters and Lettercards.—To places within the British Empire.—2d. per oz.

To all other places.—3d. first oz., 2d. each additional oz. Registration Fee, 3d.

Postcards.—To places within the British Empire.—1½d. each.

To all other places.—2d. each.

Commercial Papers.—To New Zealand and Fiji.—1d. per 2 oz.

To all other places.—1d. per 2 oz., with a minimum of 3d.

Printed Matter.—To places within the British Empire.—1d. per 4 oz.

To all other places.—1d. per 2 oz.

Newspapers.—To New Zealand and Fiji.—1d. per 6 oz.

To the United Kingdom and Irish Free States—Via France or America, 1d. per 4 oz.; via All Sea Route, 1d. per 6 oz.

To places in the British Empire.—1d. per 4 oz.

To all other places.—1d. per 2 oz. Samples.—To places within the British Empire.—1d. per 2 oz.

To all other places.—1d. per 2 oz., with a minimum of 2d.

Merchandise.—To New Zealand and Fiji.—1d. per 2 oz.

Small Packets (transmissible to certain countries only).—2½d. per 2 oz., with a minimum of 6d.

Aerial Service (Australia-Singapore-London)—1/6 per ½ oz. in addition to postage.

PARCELS (Limit of Weight, 11lbs.) To New Zealand.—1lb., 8d.; each additional lb., 6d.

To United Kingdom, by Long Sea Route, 1lb., 1/4; each additional lb., 6d.

To United States of America, via Frisco, 1lb., 1/-; each additional lb., 6d.; via London, 1lb., 3/1; 2lbs., 3/5; 3lbs., 3/9; 4lbs., 6/1; 5lbs., 6/8; 6lbs., 7/-; 7lbs., 7/4; 8lbs., 9/11; 9lbs., 10/3; 10lbs., 10/7; 11lbs., 10/11; via Vancouver, 1lb. 1/1½, each additional lb., 7½d.

Insurance of Parcels.—To addresses in New Zealand: Up to £12, 6d.; £24, 9d.; £36, 1/-; £50, 1/6, in addition to postage.

MONEY ORDERS.

Within the Commonwealth.—6d. for each £5 or part.

New Zealand, Papua, Rabaul (New Guinea), New Caledonia.—3d. for each £1 or part. Minimum, 6d.

Fiji.—3d. for each £1 or part. Minimum, 6d. Exchange, 1.6 pence for each 1/- or 2/8 for each £1.

Gilbert and Ellice Islands, Solomon Islands and Tonga.—4d. for each £1 in first £6, and 3d. for each additional £1 or part. Minimum, 9d. Exchange, 2d. for each 1/- or part.

Philippine Islands.—4d. for each £1 in first £6, and 3d. for each additional £1 or part. Minimum, 9d. Exchange, 2d. for each 1/- or part.

United Kingdom, Canada, Ceylon, China, Dutch East Indies, Egypt, Federated Malay States, Germany, Hong Kong, India, Irish Free State, Italy, Japan, Malta, Mauritius, Norway, North Borneo, Straits Settlements, South Africa, United States of America.—4d. for each £1 in the first £6, and 3d. for each additional £1 or part. Exchange, 3d. for each 1/- or part.

Other Countries in Europe, Asia, Africa, North America, and Islands adjacent to those continents.—4d. for each £1 in the first £6, and 3d. for each additional £1 or part. Minimum, 9d. Exchange, 3d. in 1/-. These must be forwarded via London and are subject to an additional charge of 2d. in each £1 or part. Minimum, 4d.

Until further notice only £100 will be allowed for each remitter per week.

POSTAL NOTES.

Payable throughout the Commonwealth.—1/, 1/6, 2/, 2/6—1d.; 3/, 3/6, 4/, 4/6—1½d.; 5/, 5/6, 6/, 7/6—2d.; 10/, 11/, 15/, 20/—3d.

TELEGRAPHIC RATES.

City and Suburban, or within 15 miles of sending station.—16 words, including address and signature, 9d. Each additional word, 1d.

Country.—16 words, including address and signature, 1/-. Each additional word, 1d.

Interstate.—16 words, including address and signature, 1/4. Each additional word, 1d.

Urgent Telegrams and Sunday, Christmas Day and Good Friday, double the above rates.

To New Zealand, 4½d.; to Suva, 6d.; to United Kingdom, ordinary, 2/-; deferred, 1/-; to New York, ordinary, 2/5, deferred, 1/2½; to Paris, ordinary, 2/7, deferred, 1/3½ per word.

Lettergrams to addresses within the Commonwealth will be forwarded by Telegraph during the night, and delivered as ordinary letters by first delivery.—30 words, 1/3; each additional word, ¾d.

TELEGRAMS TO CATCH MAIL STEAMERS.

On payment of postage in addition to telegraphic rates, telegrams may be sent to any telegraph office in Australia, to be forwarded thence by post to any destination beyond the Commonwealth.

DAILY LETTER TELEGRAMS.

Between Australia and the under-noted places:—

	Minimum	Each
	25 words	add. word
To United Kingdom	16/8	8d.
" Canada (via Pacific) 13/2½		6½d.
" United States (via Eastern)	20/2	9½d.
" Straits Settlements 20/10		10d.
" India — Burma and Ceylon	20/10	10d.

NIGHT LETTER TELEGRAMS.

	Minimum	Each
	25 words	add. word
To New Zealand (Cable) 3/9		2d.
" Suva (Cable)	5/10	3d.

WIRELESS TELEGRAMS.

To and from any ship registered in Australia or New Zealand, 6d. per word.

To British ships, 11d.; Finnish or Latvian, 8½d.; Swedish, 10d.; Spanish, 10d. per word.

To ships of Australian Navy, 4d.; of British Navy, 7d. All other ships, 11d. per word.

To Fiji, Suva, 6d.; Night Letters (25 words), 5/10; Levuka, 8d. per word. Night Letters (25 words), 7/4.

To Friendly Islands, 1/3; Ocean Island, 1/-; Tarawa, 1/6; Lord Howe Island, 1½d., minimum, 2/-; Nauru, 1/3; New Caledonia, 1/2; Apia, 1/3; Solomon Islands, 1/-; Union Island, 1/6; Willis Island, 3d. per word.

Commonwealth & State Taxes

COMMONWEALTH INCOME TAX.

Income of year ended 30-6-'34 (or substituted accounting period).

EXEMPTIONS.

Personal Exertion:—£250, diminishing at the rate of £1 for every £2 by which the income exceeds £250, and disappearing at £750. The deduction is allowed first against property income.

Property:—£200, diminishing at the rate of £1 for every £2 by which the income exceeds £200, and disappearing at £600.

The above exemption is not allowed to absentees or companies.

RATES OF TAX.

First Schedule.

Personal Exertion:—85% of 3d. plus 1/160d. for each £ of taxable income up to £6,900.

Example:—Taxable incomes £240, the rate is therefore—
85(3 + 240) = 3.825d.

100 160
and the tax £240 × 3.825 = £3 16s. 6d.

When the taxable income exceeds £6,900 all in excess of that amount is taxed at a rate of 76.5d. in the £.

Example:—Taxable income, £7,700
85 6900
Tax is £6900 @—(3 + —) = 39.20625 =
100 160 £1127 3 7
£800 @ 76.5d. = 255 0 0

Total £7700 £1382 3 7

SECOND SCHEDULE.

Property:—If taxable income does not exceed £500. 1d.
3d. + —
100

for each £ of taxable income.
Example:—Taxable income, £250.
250d.

Rate = 3d. + $\frac{250}{100} = 5\frac{1}{2}$ d.

If the taxable income exceeds £500, but does not exceed £1,500—
14d. + —
1000

for each £ of taxable income.
Example:—Taxable income £1,000.
Rate = 15d.

If the taxable income exceeds £1,500, but does not exceed £3,700—
23d. + —
2000

for each £ of taxable income.

If the taxable income exceeds £3,700, rate of tax on the first £3,700 is as above, viz:—
3700 × 23
4 $\frac{3}{4}$ d. + —
2000

on each £ in excess of £3,700 the rate is 90d.

For both personal exertion and property the rate is that appropriate to the average taxable income of not more than 5 years.

SPECIAL TAX.

Subject to an exemption of £250 allowed to "Residents," there is a special tax of 6% payable upon the net income derived from:—

- (a) Property.
- (b) Interest, dividends, rents or royalties whether derived from personal exertion or property.

When a company pays such tax upon any income which is subsequently distributed to a shareholder, the shareholder is not liable for special tax in respect thereof.

Example:—

(1) Nil payable upon £250 quoted in first example of Second Schedule.

(2) Net income from property £1,000.

Tax.—Ordinary Property, 1,000 @ 15d. £62 10 0
Special tax, 750 @ 12d. 37 10 0
£100 0 0

THIRD SCHEDULE.

Income partly from Personal Exertion and Property Income.

The rate for each class of taxable income would be the appropriate rate applicable to the total of the two classes of taxable income.

Example:—

Taxable Personal Exertion Income £250
Taxable Property Income 300
£550

The £250 Taxable Personal Exertion income is taxable at the rate appropriate to a Personal Exertion income of £550, similarly the £300 Taxable Property income is taxable at the rate appropriate to a Property income of £550.

FOURTH SCHEDULE.

Rate of Tax Payable by a Trustee.

For every £1 of the taxable income in respect of which a Trustee is liable to be separately assessed, and to pay tax, the rate of tax shall be the rate which would be payable under the First, Second, or Third Schedules, as the case requires if one individual were liable to be separately assessed and to pay tax on that taxable income.

FIFTH SCHEDULE.

Rates of Tax Payable by a Company.

(a) Subject to the Fourth Schedule, for every pound of the taxable income of a Company, the rate of tax shall be 12 pence.

(b) For every pound of interest paid or credited by the Company to any person who is an absentee in respect of debentures of the Company or on money lodged at interest with the Company by such person, the rate of tax shall be 12 pence.

SIXTH SCHEDULE.

Rate of Tax Payable by an Individually Owned Partnership.

Individually owned partnerships other than Trusts which are partnerships.

For every pound of the taxable income of an individually owned partnership, the rate of tax shall be determined as follows:—

(a) From the total amount of tax which would be payable by the member specified under sub-section (2) of section twenty-nine of the Income Tax Assessment Act, 1922-1934, if the taxable income of the partnership were added to his own taxable income, subtract the amount of tax actually payable by him in respect of his own taxable income; and

(b) Divide the amount obtained by the application of the last preceding paragraph by the number of pounds in the taxable income of the partnership.

Trusts which are individually owned partnerships.

For every pound of a taxpayer domiciled in Queensland does not exceed £640, an allowance is made of £60 for each child under 16 years and each invalid child, and £72 for wife. In the case of a widower, £72 for any female relative who may reside with him for the purpose of caring for any child under 16 or invalid child. £60 for mother if she resides in Queensland and is wholly maintained by taxpayer. A further allowance up to £50 for expenses actually incurred in education of each child under 16 years of age where it is proved to the satisfaction of the Commissioner that suitable educational facilities are not provided by the State within reasonable daily travelling distance of the place of residence of the taxpayer. Medical expenses are allowed when net income does not exceed £900, including dividends.

(a) From the amount of tax which would be payable by the person by whom the trust was created if the taxable income of the partnership were added to his own taxable income, subtract the amount of tax actually payable by him in respect of his own taxable income; and

(b) Divide the amount obtained by the application of the last preceding paragraph by the number of pounds in the taxable income of the partnership.

SEVENTH SCHEDULE.

Rate of Tax Payable by a Severally Owned Partnership.

For every pound of the taxable income of a severally owned partnership, the rate of tax shall be determined as follows:—

(a) Compute the total of the amounts of tax that would be payable by the several members specified under sub-section (2) of section twenty-nine of the Income Tax Assessment Act, 1922-1934, if the severally owned partnership were a partnership (other than a severally owned partnership) between those members with equal interests;

COMMONWEALTH INCOME TAX (Continued.)

(b) from the total tax obtained by the application of the last preceding paragraph subtract the total of the amounts of tax actually payable by those several members on their own taxable incomes; and

(c) Divide the difference obtained by the application of the last preceding paragraph by the number of pounds in the taxable income of the partnership.

COMMONWEALTH ESTATE DUTY.

Upon Estates of Deceased persons: Under £1,000, exempt. From £1,001 to £2,000, 1 %.

Over £2,000, 1% with an additional one-fifth % for every £1,000 or part of £1,000 above that amount, maximum duty 15%.

A rebate of six shillings and eight-pence % allowed on the portion of the Estate bequeathed to widow, children, or grand-children of the deceased.

Consolidated and Inscribed Stock (3½ and 4%) are accepted at face value for the payment of these Duties, Interest upon the Bonds or Inscribed Stock is allowed up to the due date of such Duties, or date of payment, which ever is the earlier.

STATE INCOME AND LAND TAXES.

QUEENSLAND.—INCOME TAX.

When net income of a taxpayer domiciled in Queensland does not exceed £640, an allowance is made of £60 for each child under 16 years and each invalid child, and £72 for wife. In the case of a widower, £72 for any female relative who may reside with him for the purpose of caring for any child under 16 or invalid child. £60 for mother if she resides in Queensland and is wholly maintained by taxpayer. A further allowance up to £50 for expenses actually incurred in education of each child under 16 years of age where it is proved to the satisfaction of the Commissioner that suitable educational facilities are not provided by the State within reasonable daily travelling distance of the place of residence of the taxpayer. Medical expenses are allowed when net income does not exceed £900, including dividends.

The amount of £150 (statutory exemption) shall be exempt when income does not exceed £253. When the income is £254 the exemption is £149, and the exemption is reduced by £1 for each four pounds of income in excess of £254, but no exemption is allowed on net incomes of £850 or over.

The allowance for dependents diminishes:—If the net income exceeds £640, the allowance of £60 diminishes by £1 for every six pounds by which the income exceeds £640, and £1 in each five pounds in respect of the £72 for dependents by which his income exceeds £640. The allowance

is further reduced by the amount of any net income whatsoever of which the dependent is in receipt.

Personal Exertion:—For each £ up to £8,000, sixpence plus as many times 6/1000d. as there are pounds in the income. Over £8,000, fifty-four pence for the first £8,000, and sixty pence in £ on remainder.

Income from Property, and all incomes of Absentees:—For each £ up to £3,000, one shilling plus as many times 4/1000d. as there are pounds in the income. From £3,000 to £8,000, sixpence plus as many times 6/1000d. as there are pounds in the income. Over £8,000, fifty-four pence for the first £8,000, and sixty pence in £ on remainder.

Companies, not being public utility or monopoly companies, or foreign companies, as prescribed in the Act:

If profits do not exceed 6 per cent.—
21 pence in £.
6 per cent to 7 per cent.—24 pence in £.
7 per cent. to 8 per cent.—27 pence in £.
8 per cent. to 9 per cent.—30 pence in £.
9 per cent to 10 per cent.—33 pence in £.
Increasing 3d. in £ for each additional 1 per cent. up to 19 per cent., which is 60 pence in £.
Exceeding 19 per cent., which is 60 pence in £.

Public Utility or Monopoly Companies:—

If profits do not exceed 6 per cent.—
21 pence in £.
6 per cent. to 7 per cent.—27 pence in £.
7 per cent. to 8 per cent.—33 pence in the £.
8 per cent. to 9 per cent.—39 pence in £.
9 per cent. to 10 per cent.—45 pence in £.

Increasing sixpence in £ for each additional 1 per cent up to 16 per cent., which is 81 pence in £. Exceeding 16 per cent.—87 pence in £.

Foreign Companies (not being Public Utility Companies or Monopoly Companies) under sections 14, 16 and 17 of the Act, viz., Fire, Accident, Fidelity, Guarantee, or Marine Insurance Co., assessed on 25 per cent. of the Premiums.—39 pence in £. Banking Companies.—48 pence in £.

Mutual Life Assurance Companies, where all profits are divided amongst Policy Holders.—28d. in £ of taxable income. Life Assurance Companies in which both Policy Holders and Shareholders participate in profits.—(a) 28d. in £ on so much of the taxable income as bears the same proportion of the taxable income as the profits divided for the same year among Policy Holders bear to the total profits of the Company; (b) on remainder of taxable income, 39d. in £.

Super Tax.—20 per cent. A person who derives his income from sources

in Queensland during part only of the year whose taxable income does not exceed £250, is not liable to pay any super tax.

Additional Tax (except Absentees and Companies):—

Taxable Income: £780 to £849 15%
" " 850 " 899 16%
" " 900 " 949 18%
" " 950 " 999 20%
" " 1000 and over 27½%

Additional Tax (Absentees): 27½%. Lotteries 5 per cent. of selling price of tickets with a minimum of 3d.

QUEENSLAND UNEMPLOYED RELIEF TAX.

Income from Employment up to £78 p.a., exempt. £78 to £104, 2d. in £; £104 to £208, 5d. in £; £208 to £499, 8d. in £; exceeds £499, 11d. in £. Other income, average rate:—Up to £104, 2½d. in £; £104 to £208, 5½d. in £; £208 to £499, 8½d. in £; exceeds £499, 11½d. in £.

Where total taxable income of any person (not being a company or absentee) does not exceed £78 p.a., exempt.

Super Tax:—On taxable value up to £2,499, nil; £2,500 to £2,999, 1d. in £; £3,000 to £3,999, 1½d. in £; £4,000 and over, 2d. in £.

Mutual Life Assurance Society.—On taxable value up to £2,499, nil; £2,500 and over, 1d. in £.

NEW SOUTH WALES.—INCOME TAX.

For the year ended 30th June, 1935 (or substituted accounting period).

Exemptions:—Resident persons, £250, less £1 for every £8 by which net income exceeds £250.

Non-Resident persons.—£50, less £1 for every £8 by which net income exceeds £50. Minimum tax, 10/-.

COMPANIES.—NIL. FIRST SCHEDULE.

Rates of Tax. Personal Exertion:—Taxable incomes up to £7,000:—

85
100
7 plus $\left(\frac{\text{Taxable income}}{250}\right)$ pence.

Taxable incomes exceeding £7,000:

85
£7,000 @ — × 35 pence.
100
85
Balance @ — × 60 pence.
100

Example:—Taxable income £1,000.
85
Rate —
100

$\left(7 \text{ plus } \frac{1000}{250}\right)$ pence = 9.35 pence.

£1,000 × 9.35 in £ = £38 19 2 amount of tax.

SECOND SCHEDULE.

Property:—Taxable incomes up to £5,500:—

85
100

N.S.W. INCOME TAX (Continued.)

9 plus (Taxable income / 500) pence.

Taxable incomes exceeding £5,500: £5,500 @ 85 / 100 x 42 pence. Balance @ 85 / 100 x 60 pence.

Example:—Taxable income £1,000: Rate 85 / 100

(9 plus (1000 x 3 / 500)) = 12.75 pence.

£1,000 x 12.75 in £ = £53/2/6 amount of tax.

THIRD SCHEDULE.

Incomes derived partly from personal exertion and partly from property.

The two amounts are added together and each portion is charged with the rate payable on the gross amount.

Example:—Taxable income £1,000, consisting of £500 personal exertion and £500 property: £500 @ 9.35 in £ = £19 9 7 £500 @ 12.75 in £ = £26 11 3

Amount of tax . . . £46 0 10

FOURTH SCHEDULE.

Rate of tax payable by a Trustee:—For every £ of taxable income for which a trustee is liable to be separately assessed, the rate shall be that payable under First, Second and Third Schedules, as the case requires if one individual were liable to be separately assessed.

FIFTH SCHEDULE.

(1) On the Taxable income of a company registered in N.S.W., the undernoted rates: Up to £500 1/9 in £ Exceeds £500 up to £1000 . 1/10 " " £1000 " £1500 . 1/11 " " £1500 " £2000 . 2/- " " £2000 " £2500 . 2/1 " " £2500 " £3000 . 2/2 " " £3000 " £3500 . 2/3 " " £3500 " £4000 . 2/4 " " £4000 " £4500 . 2/5 " " 4500 and over 2/6 "

(2) Mutual Life Assurance Company, 1/6 in £.

(3) Life Assurance Company (other than mutual company) upon the profits of life assurance business distributed to shareholders, 1/6 in £. Upon remainder of profits, 2/6 in £.

(4) Company not registered in New South Wales, 2/6 in £ on the whole of taxable income.

(5) In addition to any other Income Tax payable by it, a company

shall also pay 1/6 in £ on interest paid or credited by the company to any non-resident person or foreign company on debentures used in the State or money lodged at interest with the company in the State.

ENTERTAINMENT TAX.

Admission.—1/6½ to 1/11½, 1d.; 2/–, 1d.; 2/0½ to 2/6, 1½d.; and 1d. for each 6d. thereafter.

SPECIAL INCOME AND WAGES TAX.

(As from 1st January, 1936).

On Salaries, Wages, Commission, etc. Employers are required to deduct tax from all employees of £2 or more per week. (Board and Lodgings to be included as £1 per week).

Table with 3 columns: Taxable amount, Rate, and Example. Rows include various brackets like £2 0 0 to £2 10 0, 3 0 1, etc., and corresponding rates in shillings, pence, and farthings.

and one penny extra for each additional 2/- thereafter.

Where employees are paid other than weekly the rate is:—

(a) Fortnightly, £4 to £5, tax 1/-.

(b) Fortnightly, £5/0/1 to £6, tax 1/6 etc.

SPECIAL INCOME TAX.

Resident.—On incomes from all sources other than (1) Income from employment; (2) From Australian Consolidated Loans; (3) From a business outside New South Wales (not shareholders' dividends).

Non-Resident.—On incomes from all sources in New South Wales other than income from employment.

By a Reciprocal Agreement with Victorian Government, residents of Victoria are not assessable upon income derived from N.S.W.

Exemption:—No tax is payable by a person, other than a company, resident in N.S.W., whose total income from all sources is £100 or less. No exemption allowed when total exceeds £100.

Table showing rates for Special Income Tax based on Net Income and Balance Assessable. Columns include Net Income, Balance Assessable, and Rate (e.g., 4½d in £, 8d in £).

VICTORIA.—ORDINARY INCOME TAX.

Individuals.—The minimum income subject to tax is £201. £200 deduction is allowed upon individual incomes between £201 and £500, after which it diminishes at the rate of £4 for every £1 above £500, finally disappearing at £550. No deduction is allowed to companies.

Personal exertion, not exceeding £500, 6d.; property, 12d. in the £. Exceeding £500:—First £500—Personal exertion, 7d.; property, 14d. in the £; second £500—Personal exertion, 8d.; property, 16d. in the £; third £500—Personal exertion, 9d.; property, 18d. in the £; balance over £1,500—Personal exertion, 10d.; property, 20d. The above rates are subject to a Super Tax of 7½ per cent.

Additional Tax.—Where the income exceeds £800, whether from Personal Exertion or from Property, or from Personal Exertion and Property combined:—

Table showing Additional Tax rates: £ 801 to £1,000 .. 10% additional. £1,001 to £1,250 .. 12½% " £1,251 to £2,200 .. 15% " £2,201 to £5,000 .. 20% " £5,001 upwards .. 25% "

Table for Special Income Tax: £101 to £1,000 per £100 .. 6/- 1,001 " 1,250 " .. 7/- 1,251 " 1,750 " .. 8/- 1,751 " 2,000 " .. 9/- 2,001 " 2,500 " .. 11/- Over 2,500 " .. 12/6

Companies.—22.575 pence in every £1 of taxable income. (Mutual Life Assurance Companies, 1/- in £1 on Life Assurance business).

SOUTH AUSTRALIA.—INCOME TAX.

Exemption, £100, diminishing £1 for every £9 by which the net income exceeds £100, plus £30 for wife and £30 for each dependent child or grand-child under 16. The wife and child deductions are not allowable if the net income exceeds £650. Wife who wholly maintains her husband, £30, provided the husband is not in receipt of income of £50 or over. No exemption to companies and absentees.

Widow with one or more dependent children under 16 is allowed exemption of £200.

A widower, whose income is under £650 and has one or more dependent children under 16 years, may claim £30 as if his wife were living.

An unmarried taxpayer, whose income is under £650, and who wholly or mainly supports a parent or brother or sister under 16 years, is allowed deduction of £30 in respect of each dependent.

Personal Exertion.—(Except income of Unmarried Adults) up to £1,000, eighteen pence plus two one-thousandths of a penny for the first £, increasing by two one-thousandths of a penny for each additional £.

From £1,000 to £7,000, twenty pence, plus six one-thousandths of a penny in £ for that portion exceeding £1,000.

S.A. INCOME TAX (Continued.)

Exceeding £7,000, fifty-six pence in £.

Unmarried Adults (other than returned soldiers, army nurses and widowers with children).—Up to £1,000, twenty-seven pence in £. From £1,000 to £7,000, twenty-seven pence, plus six one-thousandths of a penny in £ for that portion in excess of £1,000.

Exceeding £7,000, sixty-three pence in £.

Property Income (except incomes of Unmarried Adults).—Up to £1,000, twenty-seven pence in £. From £1,000 to £7,000, twenty-seven pence plus six one-thousandths of a penny in £ for that portion in excess of £1,000.

Exceeding £7,000, sixty-three pence in £.

Unmarried Adults (other than returned soldiers, army nurses and widowers with children).—Up to £1,000, thirty-two pence in £. From £1,000 to £7,000, thirty-two pence, plus six one-thousandths of a penny for that portion in excess of £1,000. Exceeding £7,000, sixty-eight pence in £.

In the 1934 Act it is provided that where an unmarried adult person (other than a returned soldier, army nurse, or widower with children) resident in the State had a parent, or a brother or sister under sixteen years of age at the commencement of the period for which the income is computed wholly or mainly dependent upon his earnings during the whole of that period, the rates of tax on income derived by him from personal exertion shall in all circumstances be less by sixpence in the pound than the rates fixed for an unmarried adult person. This provision applies to income derived in the year ended 30th June, 1934.

In the 1935 Act it is provided that where an unmarried adult person (other than a returned soldier, army nurse, or widower with children) resident in the State had a parent, or a brother or sister under sixteen years of age at the commencement of the period for which the income is computed, wholly or mainly dependent upon his earnings during the whole of that period, the rates of tax on income derived by him from personal exertion shall be at the same rates as those fixed for a married person.

Composite Incomes (whether derived by an unmarried or married taxpayer).—Where income is derived partly from Personal Exertion and partly from Property, the rates applicable to the total income are applied to the amounts of Personal Exertion and Property Income respectively.

Sixpenny Dividends Tax.—Dividends received by any person ordinarily resident in South Australia from any company, whether registered in South Australia or not, and whether such dividends arise or accrue in or are derived from the State or not, are taxed at the rate of 6d. in £ if received during the years 30th June, 1931, 30th June, 1932, 30th June, 1933, or 30th June, 1934.

Taxation of Dividends.—The 1935 Act provides that in computing the taxable amount of income of a shareholder in a company (whether the company is incorporated in the State or not) there shall, if the shareholder is ordinarily resident in the State, be included dividends paid to him by the company out of profits derived by it from any source. The 1935 Act also provides that a shareholder shall be entitled to a rebate in his assessment of the amount obtained by applying to that part of the dividends which is included in the taxable amount of his income a rate equivalent to:— (a) The rate of tax payable by him on income consisting of the produce of property; or (b) The rate of tax payable by companies, for the year during which the shareholder is liable to be assessed, whichever is the less.

Income Tax on Companies, including Life Assurance Companies.—The Taxation Act, 1935, enacts that the income tax on income derived by a company shall be at the rate of two shillings on each pound of the taxable amount of that income. A company is not allowed the exemption of £100. Minimum tax payable by any taxpayer, £1.

WESTERN AUSTRALIA.—INCOME TAX

The rate is a graduated one. Up to £100 chargeable it is 2d. in £, increasing by .007 of a penny up to a maximum of 4/ in £. Incomes of £6,672 and upwards are 4/- in £, minimum tax, 2/6. These rates are subject to 20 per cent. rebate. Exemptions.—When taxpayer is married or has a dependent, £200 less £2 for every £ by which net income exceeds £200. If single, £100 less £2 for every £ by which net income exceeds £100. Any male person over 65 years, or female over 60 years, whose income does not exceed £250 per year.

Where a single person contributes at least £26 a year towards the support of a dependent, he is allowed the general exemption of £200. If he has more than one dependent he is allowed the actual amount contributed up to £40 (if at least £26 contributed) for each dependent after the first.

A married person contributing at least £26 is also allowed up to £40 for money actually expended towards support of each dependent.

Financial Emergency Tax.—On the same lines as Hospital Tax, but rate varies from 4d. to 9d. in £. Insurance Company (not Life), 6d. for every £3/2/6 of premiums received. TASMANIA.—INCOME TAX. Exemptions.—£200 for any married person (or widower or widow having a child under sixteen years dependent upon him or her). £125 for any unmarried person. Deductions.—Any married person (or widower or widow having a child under sixteen years dependent upon him or her) whose net income did not exceed £500, £1 for every £2 by

A person is a dependent when total annual income, including contribution paid by taxpayer for maintenance is less than £100, and he resides in West Australia.

£62 allowed for each child under 16 years residing with or dependent upon him.

Travelling expenses from place of residence to place where taxpayer earns his income allowed up to £15, also travelling expenses incurred in producing or protecting income.

Medical expenses incurred, if income chargeable does not exceed £350.

Premiums up to £50 on Life Assurance of taxpayer, his wife or children. Premiums up to £50 for fidelity guarantee or bond which taxpayer is required to provide for exercise of his profession, trade, or employment. Rates and Taxes actually paid in W.A. but not State Income Tax.

Gifts to charitable institutions, parks, reserves, university or public school, library, art gallery, museum, or other institutions, for public education, recreation or enjoyment subsidised by the Government provided such payment is applied solely to such charitable or public purposes. Funds for the relief of necessitous persons or for constructing, supporting or maintaining a public hospital in W.A.

Repairs to taxpayer's residence up to £50. Business losses incurred during the three years preceding the year of assessment. Income from mining tenements is only taxable after recoup of expended capital.

Absentees are not allowed any general exemption, insurance premium, medical expenses, travelling expenses or deductions for children or dependents.

W.A. Hospital Tax, 1½d. in £.

DIVIDEND DUTIES

Companies 1/3 in £ on profits earned plus 15 per cent. super tax, except Life Assurance Companies, which are taxed upon incomes from interest and investments, and are not subject to super tax. Insurance companies, other than life, pay 2 per cent. of gross premium income less re-insurance, plus 15 per cent. super tax.

Hospital Tax.—1½d. in £ on all salaries and wages, business profits, property income, earnings and profits of companies. Life Insurance Companies, 1½d. for every £3/2/6 of premiums received.

Financial Emergency Tax.—On the same lines as Hospital Tax, but rate varies from 4d. to 9d. in £. Insurance Company (not Life), 6d. for every £3/2/6 of premiums received.

TASMANIA.—INCOME TAX.

Exemptions.—£200 for any married person (or widower or widow having a child under sixteen years dependent upon him or her). £125 for any unmarried person.

Deductions.—Any married person (or widower or widow having a child under sixteen years dependent upon him or her) whose net income did not exceed £500, £1 for every £2 by

Tasmanian Income Tax (Cont.)

which the net income was less than £500. Any unmarried person whose net income did not exceed £400, £1 for every £6 by which the net income was less than £400.

Child Allowance. — From gross amount of income a deduction of £35 for each child under sixteen wholly maintained by taxpayer.

Where the income of any person (not being a company) is partly from business and partly from property, the deduction shall be made from his income from business, and if his income from business is insufficient to allow him the full benefit of such deduction, then the balance of such deduction shall be made from his income from property (other than dividends upon which income tax has been paid).

No exemption or deduction is allowed in respect of any prize in any lottery authorised by the State of Tasmania.

Rates.—Lotteries: Four shillings and three pence in the £ upon the amount of prize. Companies: One shilling and six pence in the £ upon dividends. All other Incomes.—The rates set forth in Schedule.

Additional tax on profits from manufacture or sale of liquor under a wholesale or importer's licence 1/- in £, but the taxpayer under this section shall be entitled to a rebate equal to the amount of licence aforesaid.

SCHEDULE OF "THE INCOME TAX ACT, 1934." Rate of Tax upon Income from Business

For so much of the taxable amount as does not exceed £7,600, the rate of tax per pound shall be three pence and three eight-hundredths of one penny where the taxable amount is one pound, and shall increase uniformly with each increase of one pound of the taxable amount by three eight-hundredths of one penny.

Exceeding £7,600, the rate shall be sixty pence.

Where the taxable amount does not exceed £7,600, the rate of tax per pound may be calculated from the following formula:—

R = rate of tax in pence per pound. I = taxable income in pounds.

R = (3 + (I - 7600) / 100) pence.

RATE OF TAX UPON INCOME FROM PROPERTY

I.—For incomes of a taxable amount not exceeding £546, the rate of tax shall be calculated from the following formula:—

R = rate of tax in pence per pound. I = taxable income in pounds.

R = (3 + (I - 546) / 100) pence.

Companies are also liable to the Special Tax on the same rates.

Wages Tax is payable on a weekly basis at the same rate as Special Tax, but where payment is made at less than £6 per week, the tax is 1d. for each completed 5/-.

Table with 3 columns: Taxable amount (£), Pence, Pence.

III.—From £2,000 to £6,500 the rate of tax shall increase continually in a curve of the third degree:—

Table with 3 columns: Taxable amount (£), Pence, Pence.

For every pound in excess of £6,500, sixty pence.

Rates of Tax upon Income which is partly Income from Business and partly Income from Property:—

I.—For every pound of the taxable amount of the income from business the rate of tax shall be ascertained by dividing the total amount of the tax that would have been payable under this schedule if the total taxable amount of the taxpayer had been exclusively income from business, by such total taxable amount.

II.—For every pound of the taxable amount of the income from property the rate of tax shall be ascertained by dividing the total amount of the tax that would have been payable under this schedule if the total taxable amount of the taxpayer had been exclusively income from property (other than dividends) by such total taxable amount.

The tax in the case of companies is at the rate of 1/6 in the £.

A special tax on all net incomes of £52 and upwards other than salary or wages is payable as follows:—

(a) Up to £312, 4d. in the £. (b) Exceeding £312 but not exceeding £520, 4d. on £312; 5d. on balance.

(c) Exceeding £520 but not exceeding £1,500. As in (b) up to £520, and 9d. in £ on balance.

(d) Exceeding £1,500. As in (c) up to £1,500, and 1/ in £1 on balance.

Keep Pace With Competition

Executive Retailer Technician Serviceman

NO matter what branch of the radio or broadcasting in which you are interested, "hot" news and modern knowledge are of vital importance to you and will always be found in the:—

"RADIO RETAILER"

The business paper of the industry which brings you each week the last minute news of the trade. You cannot be up-to-date or expect to be efficient without knowing exactly what is happening in the trade, so order the "Radio Retailer," it's the only publication which supplies the trade news.

"BROADCASTING BUSINESS"

The pulse of the Broadcasting field—contains helpful information for Station executives, Sponsors, advertising men, etc., reports on all station activities and other items of vital interest.

"RADIO REVIEW"

A complete digest of all technical developments in the radio world

SUBSCRIPTIONS to Box 3765, G.P.O., SYDNEY

"Radio Retailer" 15/- per annum, post free in Aust. "Broadcasting Business" inc. Trade Annual. "Radio Review" 10/- p.a., post free in Aust.

Important Australian Statistics

POPULATION AND VITAL STATISTICS.

Table with columns: States and Territories, Area Square Miles, Population Estimated 30/9/36 (Males, Females, Persons), Popn. Capital Cities.

ESTIMATED INCREASE OF POPULATION.

Table with columns: States and Territories, 1933, 1934, 1935, 1.1.35 to 1.1.36, 1.1.36 to 1.1.37.

WOOL (as in the Grease) PRODUCED.

Table with columns: States and Territories, Season ended 30th June (1933, 1934, 1935, 1936).

ESTIMATED GROSS VALUE OF ALL PRODUCTION.

Table with columns: Agricultural, Pastoral, Dairy, Poultry and Bee Farming, Forestry and Fisheries, Mining, Manufacturing, 1931-32, 1932-33, 1933-34, 1934-35.

PRINCIPAL CROPS—AUSTRALIA.

Table with columns: Area Under Crops (1932-33, 1933-34, 1934-35) and Total Production (1932-33, 1933-34, 1934-35).

BIRTHS, DEATHS AND MARRIAGES.

Table with columns: States and Territories, Births—Number (1933, 1934, 1935), 1.1.35 to 30.9.35, 30.9.35 to 30.9.36.

Deaths—Number.

Table with columns: States and Territories, 1933, 1934, 1935, 1.1.35 to 1.1.36, 1.1.36 to 1.1.37.

Marriages—Number.

Table with columns: States and Territories, 1933, 1934, 1935, 1.1.35 to 1.1.36, 1.1.36 to 1.1.37.

BASIC WEEKLY WAGE RATES FIXED BY STATE INDUSTRIAL TRIBUNALS.

Table with columns: State, Males, Females, Date of Operation, Family Unit (for Male Rate).

TAXATION—Commonwealth and State per Head.

Table with columns: Year ended 30th June (1933, 1934, 1935, 1936), Taxation by Commonwealth Government, Customs and Excise, Taxation by State Governments.

IMPORTANT AUSTRALIAN STATISTICS. (Continued)

MANUFACTURING INDUSTRIES.

Percentage of each item of outlay on value of Total Output, 1934-35. Table with 6 columns: Particulars, N.S.W., V., Q., S.A., W.A., Tas., Ttl.

AVERAGE AMOUNT OF SALARIES AND WAGES PAID PER EMPLOYEE (a)

Table with 7 columns: Year, N.S.W., Vic., Q'land., South Aust., Western Aust., Tas., Total

AVERAGE NUMBER OF MALES AND FEMALES EMPLOYED, 1934-35.

Table with 6 columns: Sex, N.S.W., Vic., Q'land., South Western Aust., Tas., Total

MANUFACTURING TOTALS.

Table with 3 columns: 1932-33, 1933-34, 1934-35

MOTOR VEHICLES REGISTERED IN AUSTRALIA, 1935-36.

Table with 6 columns: State and Territories, Motor cars, Commercial Vehicles, Motor cycles, Total, Drivers' and Riders' Licences Issued

ALL SAVINGS BANK DEPOSITS

Table with 6 columns: Date, N.S.W., Victoria, Queensland, South Australia, West. Australia, Tasmania, F.C.T., N. Territory, Total

AVERAGE DEPOSIT PER HEAD OF POPULATION.

Table with 6 columns: Date, N.S.W., Victoria, Queensland, South Australia, West. Australia, Tasmania, F.C.T., North Terr., Total

BASIC WEEKLY WAGE RATES FIXED BY COMMONWEALTH COURT OF CONCILIATION AND ARBITRATION FOR EACH CAPITAL CITY (a).

Table with 5 columns: Capital, 1/3/35, 1/12/35, 1/12/36, 1/3/37

Weighted Average—Six Capitals... (a) 'C' Series Index Nos.—Commonwealth Arbitration Court's 'Restoration' wage of the 17th April, 1934.

AUSTRALIAN RADIO PUBLICATIONS LTD.

... the publishers of this Annual who have had over seven years' experience in producing journals for the radio trade, also publish—

RADIO RETAILER:—

The radio trade's national weekly newspaper, containing current news of the trade and articles of value to both dealer and manufacturer alike.

RADIO REVIEW:—

A review of local and overseas technical developments, incorporating detailed and instructional articles designed for the practical technician.

BROADCASTING BUSINESS:—

A weekly newspaper of commercial broadcasting—activities of Australia's commercial stations and latest moves by national advertisers.

Have you a problem? Let us help you. Address all enquiries, subscriptions, etc., to the publishers.

BOX 3765, G.P.O., SYDNEY.

Communication Services of the P.M.G.'s Department

Throughout the world the Postal Service is universally regarded as a public utility which it is fitting to place under direct Government control, its activities being of vital importance to the well-being of the general community in both business and social relations.

Hence, when the Commonwealth of Australia was constituted by the Federation of the six States in 1900, and it became necessary to define the affairs of State which, from their National character, it would be appropriate to transfer from the jurisdiction of the States to the Federal Parliament, the Post Office was naturally included in the functions deputed to the newly constituted governing authority.

The carrying out of the work of the Post Office in Australia at the present time necessitates the employment, either fully or for part time, of over 44,000 persons, through the medium of some 10,000 offices, the transactions at which involve annual financial turnover of approximately £158,000,000.

The internal postal system depends upon scheduled despatches over 27,000 miles of railway, and in addition makes use of 5,000 independent road services to localities which have not railway facilities. These road services are maintained under contract conditions and cover 130,000 miles of route.

Aviation.

To no country in the world has the newest means of transportation — aviation — offered greater benefits from the commercial and social standpoints than to Australia, with its great distances and scattered settlements in isolated territories.

The expansion of the internal air mail system is evidenced by the increase in the route distance of services operating in Australia from 5927 miles in 1931, to 15,801 miles in 1937, and by the increase in the total distance flown in air mail operations from 1,067,000 miles in 1931 to 5,125,950 per annum at the present time.

Expansion During 1936.

The year 1936 has seen a marked expansion of the telephone system, 32,541 telephones having been added as compared with 30,771 during 1935. With the gradual return to pre-depression levels the development of telephone subscribers' services has shown a consistent improvement during recent years and the 1936 figures are the best recorded since 1927.

At the end of December, 1936, there were 579,567 telephones in service throughout the Commonwealth, of which 232,381 were connected to exchanges situated outside the telephone networks of the State capital cities.

With an average of 8.53 telephones per hundred people Australia occupies seventh place in the list of nations showing the greatest telephone density.

Record figures were also reached during the year in regard to the business handled. Approximately 498,000,000 local calls were dealt with as against 455,000,000 in 1935, and about 36,500,000 trunk calls were completed in comparison with 34,300,000 in the preceding year.

The quality of the telephone service rendered is determined by its speed, accuracy and dependability, and setting out to achieve a high standard in these respects the Department has spared no effort to avail itself of the most modern methods or scientific aids.

Australia has not been slow to avail itself of the advantages of the automatic system, and the proportion of dial telephones throughout the Commonwealth is much higher than in many leading countries overseas.

The benefits of the automatic system in provincial and country centres are also recognised, and, whilst the conversion of all exchanges is out of the question because of the prohibitive cost which would be entailed, a gratifying and steady advance has been made in installing in rural areas automatic units which have been developed specially to meet the needs of small communities.

The efficiency and range of the long distance system has also received close attention, with the result that to-day the system penetrates into almost every settled locality in Australia, and a subscriber in one part of the Commonwealth can make a call to any other part of the Continent, including Tasmania, clearly, quickly and at low cost.

With the erection of high quality channels serving important centres and the installation of repeaters at suitable points, enormous distances can now be bridged with almost the same clarity as that of a local call, as, for instance, a call between Wiluna in Western Australia and Cloncurry in Queensland, a distance of 5,500 miles, which is possibly a record in long distance landline telephony.

Carrier Wave.

Another scientific development which has had a pronounced effect on the trunk line service is the carrier wave apparatus. By means of this equipment several channels of communication can be secured from one pair of wires, thus obviating the very heavy expense involved in the erection of new wires.

Communication Services by the P.M.G.'s Department

of the transmission. There are now 75 such systems in use in Australia, and each system on the average saves the erection of nearly 1,500 miles of wire. 40 further systems will be installed in the near future.

The telephone circuits have been equipped to make them suitable for broadcasting transmissions, and any desired grouping of broadcasting stations can thus be arranged for the simultaneous radiation of any particular programme. From the Townsville station in Queensland to the Wagin station in Western Australia the circuit distance is 4,500 miles, and on several occasions programmes have been simultaneously broadcast at these extreme distances with many other intermediate broadcasting stations transmitting the same programme at the same time.

During 1930 a page in telephone history was turned with the establishment of radio telephone services with Great Britain, New Zealand and Java. These services have extended rapidly and there is now a steady stream of traffic to London and to places on the Continent such as Paris and Berlin, as well as to America. It is now possible for a subscriber in Australia to telephone any one of more than 32,000,000 telephones situated in fifty-one countries abroad. Calls may also be made to certain Trans-Atlantic liners whilst they are at sea, including the latest leviathan, the "Queen Mary," and the "Awatea," which trades between Sydney and New Zealand.

During the seven years since the inception of the overseas services, 12,131 calls have been completed, of which 6,999 originated in Australia. Great Britain has shared in 8,571 calls, New Zealand in 2,421, the United States of America in 416, France in 151, Germany in 116 and Ireland in 79, whilst the remainder have been distributed over other countries with which communication is practicable. Altogether calls have been made to 29 different countries in addition to ships at sea. Approximately 52 per cent. of the calls have been of a business character and 48 per cent. of a domestic or social nature.

The telegraph service is conducted from 10,000 offices interconnected by 300,000 channel miles of circuit. It deals with 16 million telegrams per annum. Like the telephone service it has been completely modernised and uses every device which will aid in securing speedy and accurate service with lessened cost. Automatic direct printing telegraph apparatus is used extensively and long distance circuits, such as Perth to Sydney (2,770 miles), are equipped with this system. The typing of a message on a typewriter keyboard in Perth results in an almost simultaneous replica being produced in Sydney.

Carrier circuits which are derived by impressing a continuous train of moderately high frequency electrical oscillation on a metallic circuit have been established extensively for both telephone and telegraph purposes with great benefits from the technical, traffic and economic aspects. The various technical methods of providing for the simultaneous transmission of a number of messages over one metallic circuit have been exploited to the utmost. As a case in point, over one pair of wires between Sydney and Melbourne 36 telegrams are transmitted by machine printing system simultaneously with a telephone conversation. If the traffic offering were sufficient to warrant more carrying capacity the output could be increased to 38 telegrams and one simultaneous telephone conversation. A facsimile of a picture, photograph or any document capable of photographic reproduction may be transmitted over 600 miles of carrier circuit between Melbourne and Sydney, and it is possible for a photograph of, say, a Melbourne Cup to be available in Sydney within about an hour of the running of the race.

Private wire teleprinter services are made available by the Post Office for communication between two points

either in the same area or thousands of miles apart. Transmission is effected by the operation of a keyboard similar to that of a typewriter, a printed record being made simultaneously at both terminals. The apparatus may be operated by any typist of average skill. Teleprinters may also be utilised for the transmission of telegrams between a subscriber's premises and the local telegraph office.

A telephone subscriber may telephone telegrams to a telegraph office for onward transmission, the charges being included in the telephone account. A telegram addressed to a telephone number will be telephoned to the addressee without extra charge, thus ensuring more expeditious delivery of the message.

Broadcasting Services.

Broadcasting services also are of an extensive character. They are divided into two groups. One comprises the national service—Government owned—the programmes being supplied by the Australian Broadcasting Commission and the technical services by the Post Office, the other consisting of licensed stations operated by private enterprise. There are eight National stations in the capital cities and 12 in the country areas. Several additional country stations, or regional stations as they are known, are in course of construction. The network is designed to provide extensive coverage and on completion of the scheme will service effectively about 95 per cent. of the total population.

The privately-owned group consists of 78 broadcasting stations which are distributed in the more densely populated areas of the Commonwealth. Frequently, by mutual arrangements among the managements of a number of these stations, extensive simultaneous broadcasting is effected. In a recent instance there were no less than 66 privately-owned stations simultaneously transmitting by means of the Post Office telephone trunk system.

Activities in connection with Commercial Stations

AS the licensing and controlling authority, the Department is closely associated with the Commercial Stations. Applications for new stations, alterations or replacements to existing transmitters, and all other technical features of the stations call for the approval of the Department. In the interests of listeners these matters are carefully investigated in order to permit the broadcasters to develop the Commercial Service as far as conditions will allow throughout the various States.

The main limiting factor is the shortage of broadcasting channels (wavelengths) which, as already mentioned, are internationally limited to a certain band. In order, however, to provide for additional stations where they are considered justified and where there is a prospect of the stations becoming a financial success for their owners, the Department has introduced a system, adopted in other countries, of sharing the channels between two or more stations. In certain areas where more powerful stations are justified on the basis of population and area to be served, clear channels are provided for those stations, while in other cases, where a comparatively local service is required, stations are allotted channels on the sharing principle.

The maintenance of the operating frequency of the stations is of great importance in the success of the Commercial Stations, particularly those on shared channels, and the Department gratefully records the co-operation which is afforded by the station owners in arranging for the installation of reliable equipment for this purpose. In order to help the stations in this matter, checks of the operating frequency are regularly made and the Department is providing additional equipment for its Radio Inspectors in the different Capital Cities so that the work may be more usefully carried out in the interests of the broadcasters and listeners.

TECHNICAL PROGRESS IN AUSTRALIAN BROADCASTING

An Account of the Activities of the Postmaster-General's Department in the Radio Broadcasting Field in Australia

THE Postmaster-General's Department has important functions in connection with the technical aspect of broadcasting. It provides the technical services for the National Stations, and, as the Department administering the Wireless Telegraphy Regulations it controls the operations of the Commercial Stations.

The Department's activities, insofar as the National Service is concerned, including the following:—

- Provision, maintenance and operation of the technical equipment at the stations and studios;
- Provision of the necessary networks of lines for the simultaneous transmission of programmes through the various stations;
- The investigation of developments in other parts of the world, so that no new features are overlooked which can, with profit, be adapted to Australian conditions.

Stations of the National Broadcasting Service now number 21, including the short-wave transmitter 3LR Lyndhurst, Victoria. Eight stations have been erected since the commencement of the second stage of the National construction programme in 1935.

The new stations and the dates on which they were put into service are as under:—

- 7NT Kelso, Tasmania, 3/8/1935.
- 3GI Longford, near Sale, Victoria, 31/10/1935.
- 2NR Lawrence, near Grafton, N.S.W., 17/7/1936.
- 4QN Clevedon, near Townsville, Q'land, 26/11/1936.
- 6WA Minding, near Wagin, W.A., 7/12/1936.
- 6GF Kalgoorlie, W.A., 10/12/1936.
- 3WV Dooen, near Horsham, Victoria, 25/2/1937.
- 2CR Cummoock, N.S.W., 29/4/1937.

A complete list of the stations of the National Broadcasting Service is given in page 72.

Further extensions and improvements are in hand. Tenders for the replacement of plant in Sydney and Melbourne have already been let. Equipment is on order for stations to provide an alternative service in Brisbane and Adelaide, and plans are well advanced for the provision of additional Regional Stations at Dalby (Qld.) and Canberra (F.C.T.).

Because of the proved importance of short-wave broadcasting to the outback portions of Australia, where medium-wave stations cannot be expected to be reliably heard, further extensions of the department's activities in the short-wave field are contemplated. The existing short-wave station 3LR is to be doubled in power, and a more suitable type of radiating system is to be erected. Plans are well advanced for the installation of a short-wave broadcaster to be run in conjunction with Station 6WF Perth, the intention being that the short-wave plant will provide a West Australian service to the north-west of that State.

The main developments in transmitter design have been in the direction of installing the so-called cabinet type transmitters completely operated from A.C., with practically no rotating machinery. More recent types of transmitters to this design are assembled in such a manner that installation work on the site is reduced to a minimum.

Four stations are now equipped with the type of vertical radiator developed in the Department's Research Laboratories. The heights of these structures vary from 500 to

650 feet. Extensive electrical tests, including measurements made from an aeroplane flying at heights up to 10,000 feet over the radiators have shown that the structures considerably reduce near fading and result in a much greater overall efficiency from the viewpoint of ground field strengths.

To meet the demands of modern broadcast programme production requirements, an extensive overhaul of the existing technical equipment of the National studios is in hand. The first studios to be re-equipped are those in Perth, where advantage has been taken of a removal to provide more up-to-date equipment. Under the new scheme each studio or group of studios will be provided with individual control equipment, thus permitting programme production, rehearsal or addition to be carried out independent of activities existing in other studios within the building. Plans are well advanced for the introduction of this scheme in conjunction with extensive additions that are being made to the studios of the Australian Broadcasting Commission in all capital cities.

The direct recording of programmes within the studios is becoming a more important feature of the Australian Broadcasting Commission's activities. To meet this need, recording equipment is being provided in all capital cities. In Melbourne the steel tape machine, which was installed some time ago, is still giving good service, but experience has shown that its use is limited, particularly from the viewpoint of producing recordings that require transportation around the Commonwealth for reproduction from more than one studio. Extensions to equipment are, therefore, being made on the basis of installation of disc recording equipments, the recordings being made on acetate coated discs. These machines will be capable of producing records at either 78 or 33 1-3 r.p.m.

Constant investigation is in progress to ensure that the latest and most suitable types of microphones and gramophone pick-ups are made available for programme production purposes.

The introduction of high quality microphones, by virtue of their low level output, has necessitated the development of pick-up amplifiers having an overall gain considerably in excess of that previously required. The Department's modern type of amplifiers have a gain of 100 decibels with an output of 100 milliwatts into a 600 ohms line. The amplifiers are arranged for operation either from an A.C. commercial supply or direct from profitable batteries.

The use of ultra high frequency transmitting and receiving units is being gradually extended in connection with outside pick-up work, many pick-ups from remote points to which it is impracticable to provide physical programme lines being made possible by the use of this type of apparatus.

To connect the various stations of the National Broadcasting Service to their respective studios, permanent programme lines totalling some 3,000 circuit miles are now in use. These circuits are made up in the main of physical channels, but the necessity of obtaining the greatest use out of every mile of copper wire erected is tending to force the introduction of a greater number of programme carrier channels, the operating carrier frequency of which is 42.5 kC. The channels connecting Stations 2NR and 2CR with the main studios in Sydney are of this type. The

(Continued Overleaf.)

Technical Progress in Australian Broadcasting

(Continued from Page 37.)

interstate circuits from Brisbane to Adelaide, including Hobart, also operate on this principle, and orders have recently been placed for what amounts to a duplicate channel of this type for operation between Sydney and Brisbane, via the Northern Tablelands. The total inter-capital circuit mileage amounts to 3,900 miles.

The rapid development of commercial broadcasting in Australia, combined with the increase in the number of National transmitters, has necessitated a considerable amount of work being done in the allocation of operating frequencies for the various transmitters. The frequency band that is set aside by the International Telecommunication Convention for local broadcasting is, of course, particularly limited so that, with the large increase in the number of transmitting stations, a certain amount of frequency sharing has been found necessary.

The Department's obligations under the International Telecommunication Convention necessitates a constant check being kept on the frequency of transmitting stations throughout the Commonwealth. The Department's fundamental standard of frequency is operated in conjunction with the Research Laboratories and the Mont Park receiving station. Subsidiary units are now, however, installed at various points throughout the Commonwealth, and by this means adequate steps are taken to ensure that

all transmitters comply with International requirements. The Department's activities in this field are as follows:

- (i) The operation of the National short-wave transmitter 3LR, and
(ii) The reception of overseas programmes for subsequent rebroadcast over the Australian network.

Earlier reference has been made to the National short-wave transmitter. Numerous reports received, not only from within Australia, but also from surrounding territories and other more distant countries, show that this transmitter is performing a very useful function.

The reception of overseas programmes is carried out at the departmental short-wave receiving station at Mont Park. This station is staffed constantly, and by the use of specially designed receivers and efficient directional aerials, many programmes of international note are received, not only from the British Broadcasting Corporation's Daventry transmitter, but also from other international stations. As it is frequently inconvenient to transmit these programmes direct into the National network, the practice of recording programmes for subsequent rebroadcast is, if anything, increasing. Notable services given by this station during the past twelve months were those in relation to the death of King George V and the abdication of his successor.

A Message to Commercial Broadcasting Stations : . .

BROADCASTING BUSINESS

... "the weekly trade newspaper" is published every Thursday and brings the current news of the commercial broadcasting field to the national and local advertisers and to their agents. Through

this medium you, Mr. Broadcasting Station, can sell present and prospective advertisers your claim for their support. Sell them your Station and keep them sold.

BROADCASTING BUSINESS YEAR BOOK

The broadcasting Business Year Book is also a valuable medium which remains in constant use for a full twelve months. As the name conveys, this Year Book within approx. 170 pages, contains complete information on all stations, listeners'

license distribution, etc., and is the reference book of all those interested in commercial broadcasting. Send for full details of advertising space and rates, etc., for both "Broadcasting Business" and the "Broadcasting Business Year Book."

Address all Correspondence to Box 3765, G.P.O., Sydney.

Listeners' Licenses in Australia 1934-5-6.

Table with columns for N.S.W., VIC., Q'LD., S.A., W.A., TAS., C'WEALTH and rows for months from Jan. 1934 to Dec. 1936, detailing Licenses in force and Ratio to 100 of Population.

Growth of Licenses in Commonwealth since 1924

The total number of licenses in operation during the various months since 1924 are given hereunder, together with the ratio to 100 population.

Table showing the total number of licenses and ratio to 100 population for each month from 1924 to 1937, broken down by year.

(Continued Overleaf.)

Technical Progress in Australian Broadcasting

(Continued from Page 37.)

interstate circuits from Brisbane to Adelaide, including Hobart, also operate on this principle, and orders have recently been placed for what amounts to a duplicate channel of this type for operation between Sydney and Brisbane, via the Northern Tablelands. The total inter-capital circuit mileage amounts to 3,900 miles.

The rapid development of commercial broadcasting in Australia, combined with the increase in the number of National transmitters, has necessitated a considerable amount of work being done in the allocation of operating frequencies for the various transmitters. The frequency band that is set aside by the International Telecommunication Convention for local broadcasting is, of course, particularly limited so that, with the large increase in the number of transmitting stations, a certain amount of frequency sharing has been found necessary.

The Department's obligations under the International Telecommunication Convention necessitates a constant check being kept on the frequency of transmitting stations throughout the Commonwealth. The Department's fundamental standard of frequency is operated in conjunction with the Research Laboratories and the Mont Park receiving station. Subsidiary units are now, however, installed at various points throughout the Commonwealth, and by this means adequate steps are taken to ensure that

all transmitters comply with International requirements. The Department's activities in this field are as follows:

- (i) The operation of the National short-wave transmitter 3LR, and
- (ii) The reception of overseas programmes for subsequent rebroadcast over the Australian network.

Earlier reference has been made to the National short-wave transmitter. Numerous reports received, not only from within Australia, but also from surrounding territories and other more distant countries, show that this transmitter is performing a very useful function.

The reception of overseas programmes is carried out at the departmental short-wave receiving station at Mont Park. This station is staffed constantly, and by the use of specially designed receivers and efficient directional aerials, many programmes of international note are received, not only from the British Broadcasting Corporation's Daventry transmitter, but also from other international stations. As it is frequently inconvenient to transmit these programmes direct into the National network, the practice of recording programmes for subsequent rebroadcast is, if anything, increasing. Notable services given by this station during the past twelve months were those in relation to the death of King George V and the abdication of his successor.

Listeners' Licenses in Australia 1934-5-6.

At end of	N.S.W.		VIC.		Q'LD.		S.A.		W.A.		TAS.		C'WEALTH	
	Licenses in force.	Ratio to 100 of Population.	Licenses in force.	Ratio to 100 of Population.	Licenses in force.	Ratio to 100 of Population.	Licenses in force.	Ratio to 100 of Population.	Licenses in force.	Ratio to 100 of Population.	Licenses in force.	Ratio to 100 of Population.	Licenses in force.	Ratio to 100 of Population.
1934														
Jan.	201,654	7.71	186,717	10.25	42,021	4.43	56,539	9.64	25,985	5.91	14,087	6.19	527,003	7.93
Feb.	204,618	7.82	187,918	10.31	44,280	4.66	57,322	9.77	26,457	6.01	14,292	6.28	534,887	8.05
Mar.	218,770	8.34	199,660	10.94	49,258	5.19	61,252	10.15	27,202	6.18	14,554	6.27	543,715	8.17
April	212,903	8.12	194,746	10.67	47,076	4.96	59,548	10.15	28,136	6.39	15,014	6.47	557,423	8.37
May	218,770	8.34	199,660	10.94	49,258	5.19	61,229	10.42	29,540	6.71	15,658	6.75	574,115	8.62
June	227,289	8.66	207,324	11.36	52,185	5.50	64,303	10.94	31,476	7.15	16,582	7.14	599,159	9.00
July	238,625	9.07	211,442	11.57	54,906	5.80	66,938	11.38	33,293	7.55	17,470	7.60	622,674	9.34
Aug.	247,757	9.42	218,442	11.94	57,414	5.99	69,141	11.75	34,639	7.83	18,238	8.00	645,631	9.67
Sept.	251,967	9.57	220,290	12.04	59,074	6.16	69,838	11.87	35,279	7.98	18,400	8.07	654,848	9.81
Oct.	256,117	9.73	223,999	12.24	60,719	6.34	70,863	12.05	36,238	8.20	18,627	8.17	666,563	9.98
Nov.	259,645	9.87	225,670	12.33	61,847	6.45	71,587	12.17	36,899	8.34	18,777	8.23	674,425	10.10
Dec.	262,988	9.97	227,135	12.33	62,721	6.54	72,476	12.31	37,417	8.46	18,897	8.29	681,634	10.19
1935														
Jan.	265,887	10.08	227,760	12.41	63,857	6.65	73,171	12.43	38,004	8.59	19,086	8.38	687,765	10.28
Feb.	269,394	10.22	229,756	12.52	63,703	6.64	73,756	12.53	38,550	8.71	19,320	8.48	694,479	10.38
Mar.	272,342	10.29	232,116	12.63	64,605	6.74	74,408	12.62	39,249	8.87	19,486	8.42	702,206	10.47
April	274,364	10.37	233,913	12.73	65,589	6.83	75,294	12.77	39,968	9.03	19,653	8.53	708,781	10.57
May	277,921	10.50	236,853	12.89	66,931	6.97	76,286	12.94	40,650	9.18	19,957	8.62	718,598	10.71
June	279,166	10.53	237,247	12.90	67,546	7.02	76,515	12.97	41,257	9.29	20,121	8.76	721,852	10.74
July	286,731	10.59	239,694	13.03	69,034	7.17	77,756	13.18	42,249	9.51	20,495	8.92	729,959	10.87
Aug.	282,147	10.64	242,036	13.16	70,002	7.27	78,346	13.28	43,221	9.73	20,848	9.07	736,600	10.97
Sept.	285,641	10.76	244,716	13.31	71,387	7.37	79,142	13.41	44,057	9.88	21,282	9.30	746,225	11.09
Oct.	288,402	10.87	246,587	13.36	72,786	7.52	80,088	13.85	46,219	10.34	22,244	9.73	770,152	11.43
Nov.	291,924	10.99	249,351	13.56	73,785	7.62	81,024	13.56	44,836	10.06	21,615	9.45	754,250	11.22
Dec.	294,232	11.06	250,758	13.63	74,911	7.72	81,788	13.85	45,580	10.22	21,951	9.59	763,598	11.35
1936														
Jan.	297,033	11.17	254,198	13.81	75,712	7.80	82,626	13.99	46,636	10.44	22,446	9.82	778,651	11.56
Feb.	300,282	11.29	255,898	13.91	76,938	7.93	83,598	14.16	47,234	10.57	22,542	9.86	786,492	11.67
Mar.	305,545	11.47	256,493	13.92	78,043	8.03	84,483	14.20	47,653	10.63	22,898	9.95	795,115	11.78
April	308,406	11.58	258,980	14.05	79,849	8.13	85,289	14.42	48,293	10.78	23,204	10.09	803,215	11.90
May	312,137	11.72	263,473	14.07	81,075	8.34	85,873	14.52	48,986	10.93	23,456	10.19	811,000	12.02
June	316,340	11.87	263,817	14.31	83,230	8.56	87,500	14.80	50,081	11.18	24,168	10.50	826,136	12.22
July	323,246	12.09	269,529	14.59	85,402	8.77	88,953	15.02	51,160	11.39	24,648	10.66	842,938	12.45
Aug.	327,848	12.26	270,867	14.66	86,916	8.92	89,651	15.13	52,193	11.62	24,924	10.78	852,399	12.59
Sept.	331,542	12.39	271,388	14.69	88,461	9.02	90,937	15.28	53,344	11.84	25,497	11.10	860,829	12.70
Oct.	336,733	12.58	274,168	14.84	89,686	9.14	91,784	15.48	54,051	12.00	25,860	11.26	872,282	12.87
Nov.	338,762	12.66	275,186	14.90	90,712	9.25	92,586	15.61	54,448	12.09	26,213	11.41	877,847	12.96
Dec.	341,493	12.76	277,344	15.02	92,208	9.40	93,881	15.84	55,246	12.27	26,843	11.69	887,015	13.09

Growth of Licenses in Commonwealth since 1924

The total number of licenses in operation during the various months since 1924 are given hereunder, together with the ratio to 100 population.

Month	Licenses.	Ratio.	Month	Licenses.	Ratio.
1924.			September	77,485	1.31
July	1,206	.02	October	79,271	1.34
August	8,688	.1	November	80,853	1.37
September	16,859	.3	December	85,130	1.44
October	22,087	.4	1926.		
November	31,529	.54	January	90,640	1.5
December	38,336	.66	February	97,219	1.6
1925.			March	103,145	1.7
January	44,274	.76	April	109,500	1.8
February	50,223	.85	May	116,491	1.9
March	54,853	.93	June	128,060	2.14
April	58,133	.99	July	141,392	2.3
May	61,231	1.04	August	154,736	2.5
June	63,874	1.08	September	165,436	2.7
July	66,605	1.1	October	175,298	2.9
August	72,483	1.24	November	183,020	3.02
			December	187,228	3.09

(Continued Overleaf.)

A Message to Commercial Broadcasting Stations:..

BROADCASTING BUSINESS

... "the weekly trade newspaper" is published every Thursday and brings the current news of the commercial broadcasting field to the national and local advertisers and to their agents. Through

this medium you, Mr. Broadcasting Station, can sell present and prospective advertisers your claim for their support. Sell them your Station and keep them sold.

BROADCASTING BUSINESS YEAR BOOK

The broadcasting Business Year Book is also a valuable medium which remains in constant use for a full twelve months. As the name conveys, this Year Book within approx. 170 pages, contains complete information on all stations, listeners'

license distribution, etc., and is the reference book of all those interested in commercial broadcasting.

Send for full details of advertising space and rates, etc., for both "Broadcasting Business" and the "Broadcasting Business Year Book."

Address all Correspondence to Box 3765, G.P.O., Sydney.

GROWTH OF LISTENERS' LICENSES IN AUSTRALIA SINCE 1924—(Continued)

	Licenses.	Ratio.	Licenses.	Ratio.	Licenses.	Ratio.		
April	265,067	4.25	April	329,134	5.08	April	557,423	8.37
May	267,178	4.28	May	328,815	5.09	May	574,115	8.62
June	270,507	4.33	June	331,128	5.12	June	599,159	9.00
July	275,441	4.42	July	330,918	5.10	July	622,674	9.34
August	280,688	4.50	August	326,620	5.03	August	645,631	9.67
September	284,690	4.54	September	326,599	5.02	September	654,848	9.81
October	285,550	4.56	October	330,179	5.08	October	666,563	9.98
November	288,457	4.59	November	333,714	5.13	November	674,425	10.10
December	288,784	4.59	December	337,654	5.19	December	681,634	10.19
1929.			1932.			1935.		
January	289,164	4.60	January	341,394	5.25	January	687,765	10.28
February	291,289	4.61	February	347,555	5.33	February	694,479	10.38
March	293,120	4.64	March	350,661	5.38	March	702,206	10.47
April	296,317	4.69	April	357,433	5.48	April	708,781	10.57
May	298,551	4.73	May	363,772	5.56	May	718,598	10.71
June	301,199	4.75	June	369,936	5.67	June	721,852	10.74
July	303,192	4.78	July	376,759	5.77	July	729,959	10.87
August	303,562	4.79	August	384,787	5.88	August	736,600	10.97
September	304,156	4.78	September	390,552	5.97	September	746,225	11.09
October	309,820	4.86	October	397,490	6.08	October	770,152	11.43
November	310,313	4.87	November	409,264	6.25	November	754,250	11.22
December	309,981	4.86	December	419,180	6.40	December	763,598	11.35
1930.			1933.			1936.		
January	311,074	4.86	January	427,821	6.53	January	778,651	11.56
February	309,001	4.83	February	434,632	6.62	February	786,492	11.67
March	309,572	4.84	March	444,379	6.77	March	795,115	11.78
April	308,711	4.81	April	448,788	6.83	April	803,215	11.90
May	311,322	4.87	May	459,007	7.00	May	811,000	12.01
June	312,192	4.88	June	469,477	7.14	June	825,136	12.22
July	323,004	5.03	July	481,374	7.32	July	842,938	12.45
August	335,037	5.21	August	491,233	7.41	August	852,399	12.59
September	330,169	5.13	September	500,341	7.55	September	860,829	12.70
October	329,627	5.12	October	508,534	6.67	October	872,282	12.87
November	328,307	5.10	November	514,287	7.76	November	877,847	12.96
December	329,465	5.12	December	518,628	7.81	December	887,015	13.09
1931.			1934.			Details in respect to the number of licenses in each particular State for the periods abovementioned will be found in previous copies of this Radio Trade Annual.		
January	326,993	5.08	January	527,003	7.93			
February	326,270	5.06	February	534,887	8.05			
March	327,413	5.07	March	543,715	8.17			

Growth by States of Listeners' Licenses

This summary shows the number of listeners' licenses in force at December 31, each year since 1924 to 1936, also the ratio of licenses to 100 of population and the increase during the year:—

Year ended 31st December	Number in force	Ratio to 100 of Population	Increase during the year Actual	%	Year ended 31st December	Number in force	Ratio to 100 of Population	Increase during the year Actual	%
New South Wales.					Western Australia.				
1924	26,071	1.1	—	—	1924	1,716	.4	—	—
1925	34,911	1.5	8,840	34	1925	4,192	1.15	2,476	144
1926	48,858	2.1	13,947	40	1926	4,114	1.09	- 78	- 2
1927	72,854	3.05	23,996	49	1927	3,872	1.00	- 242	- 6
1928	91,709	3.78	18,855	26	1928	3,814	.95	- 58	- 1
1929	107,503	4.37	15,794	17	1929	4,727	1.15	913	24
1930	119,131	4.79	11,628	11	1930	8,030	1.92	3,303	70
1931	125,409	5.00	6,278	5	1931	10,800	2.57	2,770	35
1932	159,972	6.33	34,563	28	1932	16,127	3.79	5,327	49
1933	197,869	7.56	37,897	24	1933	25,325	5.76	9,198	57
1934	262,988	9.97	65,119	33	1934	37,417	8.46	12,092	48
1935	294,232	11.06	31,244	12	1935	46,219	10.34	8,802	24
1936	341,493	12.76	47,261	16	1936	55,246	12.27	9,027	19
Victoria.					Tasmania.				
1924	8,327	.5	—	—	1924	244	.1	—	—
1925	33,988	2.0	25,661	308	1925	913	.41	669	274
1926	97,744	5.8	63,756	188	1926	1,933	.92	1,020	112
1927	134,825	7.80	37,081	38	1927	3,403	1.63	1,470	76
1928	141,890	8.11	7,065	5	1928	4,117	1.95	714	21
1929	144,141	8.16	2,251	2	1929	5,680	2.67	1,563	34
1930	141,687	7.95	- 2,454	- 2	1930	7,752	3.59	2,072	36
1931	134,173	7.46	- 7,514	- 5	1931	8,667	3.96	915	12
1932	156,307	8.66	22,134	16	1932	11,229	5.08	2,562	30
1933	184,861	10.14	28,554	18	1933	13,893	6.11	2,664	24
1934	227,135	12.33	42,274	23	1934	18,897	8.29	5,004	36
1935	250,758	13.63	23,623	10	1935	22,244	9.73	3,347	18
1936	277,344	15.02	26,586	11	1936	26,843	11.69	4,599	20
Queensland.					South Australia.				
1924	633	.07	—	—	1924	1,345	.25	—	—
1925	4,141	.49	3,508	554	1925	6,985	1.29	5,640	419
1926	19,414	2.2	15,273	369	1926	15,165	2.7	8,180	117
1927	24,433	2.73	5,019	26	1927	18,792	3.29	3,627	24
1928	25,224	2.77	791	3	1928	22,120	3.81	3,328	18
1929	22,449	2.42	- 2,775	- 11	1929	25,481	4.38	3,361	15
1930	24,418	2.59	1,969	9	1930	28,447	4.90	2,966	12
1931	26,449	2.76	2,031	8	1931	32,160	5.51	3,713	13
1932	32,183	3.31	5,734	22	1932	43,362	7.40	11,202	35
1933	40,918	4.31	8,735	27	1933	55,762	9.51	12,400	29
1934	62,721	6.54	21,803	53	1934	72,476	12.31	16,714	30
1935	74,911	7.72	12,190	19	1935	81,788	13.85	9,312	13
1936	92,208	9.40	17,297	23	1936	93,881	15.84	12,093	15
Commonwealth Totals.					Commonwealth Totals.				
1924	38,336	.66	—	—	1924	38,336	.66	—	—
1925	85,130	1.44	46,794	122	1925	85,130	1.44	46,794	122
1926	187,228	3.09	102,098	120	1926	187,228	3.09	102,098	120
1927	258,179	4.19	70,951	38	1927	258,179	4.19	70,951	38
1928	288,874	4.59	30,695	12	1928	288,874	4.59	30,695	12
1929	309,981	4.86	21,107	7	1929	309,981	4.86	21,107	7
1930	329,465	5.12	19,484	6	1930	329,465	5.12	19,484	6
1931	337,658	5.19	8,193	2	1931	337,658	5.19	8,193	2
1932	419,180	6.40	81,522	24	1932	419,180	6.40	81,522	24
1933	518,628	7.81	99,448	24	1933	518,628	7.81	99,448	24
1934	681,634	10.19	163,006	31	1934	681,634	10.19	163,006	31
1935	770,152	11.43	88,518	13	1935	770,152	11.43	88,518	13
1936	887,015	13.09	116,863	15	1936	887,015	13.09	116,863	15

Use of Long Distance Telephone Service for Broadcasting Purposes

THE Australian Broadcasting Commission and Commercial Broadcasting organisations continue to make extensive use of the long distance telephone system to link up stations for the simultaneous radiation of programmes of special interest, and during 1936 telephone channels were used for relay purposes on 12,497 occasions. Since 1932 the number of transmissions over trunk lines for broadcasting purposes in any one year has increased by 490 per cent. The progressive growth in the past five years is shown by the following figures:—

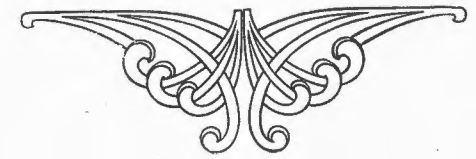
Year	Number of Transmissions Over Trunk Lines.
1932	2,118
1933	3,478
1934	7,679
1935	9,997
1936	12,497

Of the total relays which took place in 1936, 2,324 extended to two States, 1,348 to three States, 749 to four States, 1,163 to five States, and 488 to six States. The remaining 6,425 relays concerned only stations in the State of origin. These figures exceed all previous records for the Commonwealth, involving as they do the occupation of channels for 21,444 hours. The total mileage for trunk lines used in connection with these broadcasts was in the region of 20,000,000 miles.

Some idea of the variety of the items which are relayed over the trunk lines for broadcasting can be gained from the following details which relate to National service programmes transmitted over interstate channels during last year, viz.:—

Item	Number of Relays
Race descriptions	1219
Talks and speeches	783
News sessions	721
Musical programmes	709
Stock Exchange, market and corn reports . .	650
Cricket descriptions	285
Programmes from overseas stations	125
Operas, plays, musical comedies and revues	98
Other sporting events	60
Concerts	23
Miscellaneous items	57
	4,730

(Continued on Page 60.)



Country—Metropolitan License Distribution In Various States and the Commonwealth During 1936

THE following figures show the quarterly license figures in the various metropolitan and country areas for each State for 1936.

It must be specially noted that the generally accepted boundaries for the metropolitan areas are not exactly in accordance with that as defined by the Commonwealth Statistician, and to assist the radio industry throughout Australia in a proper determination of the various figures, it will be noted that the names of the various municipalities are given here under each State:—

Table with columns for State, Licenses, Population, Ratio: Licenses to 100 Popn., Dwellings, and % of State. Rows are categorized by New South Wales, Queensland, Victoria, South Australia, and the Commonwealth. Includes detailed lists of municipalities for each metropolitan area.

Country—Metropolitan License Distribution

Table with columns for State, Licenses, Population, Ratio: Licenses to 100 Popn., Dwellings, and % of State. Rows are categorized by Western Australia, Tasmania, and the Commonwealth. Includes detailed lists of municipalities for each metropolitan area.

N.Z. Radio Licenses in Force at 31st December, 1936

Table showing CLASS OF LICENSE (Receivers, Dealers, Experimental, Multiple, Special, Free, Broadcasting) and DISTRICTS (Auckland, Canterbury, Otago, Wellington, Total).

Free licenses are issued to blind persons, to institutions, homes, and asylums for blind persons, and to schools, hospitals, and charitable institutions.

It is an offence against the Regulations for any receiving set to be in an oscillating condition, to the detriment of reception by other licensees.

The N.Z. Radio Regulations cover over 65 pages of printed matter.

The radio dealers' licenses are divided into five classes, Class 1, 2, 3, and 5 are issued to persons to respect of a fixed place of business.

Extracts from N.Z. Radio Regulations.

Radio receiving licenses cost £1/5/- per annum. Temporary licenses can be obtained for 10/- per week of 7 days or fraction thereof.

All licenses expire on March 31 of each year, and any licenses renewed within 3 months of March 31 have to pay the additional 12 months' license at 2/1 per calendar month.

Class 5 license may be issued to a person engaged in the repair and servicing of radio apparatus, and will entitle him to sell or offer for sale apparatus to be used in the repair and servicing of radio sets, such repairs and servicing to be carried out by the license holder.

Radio dealers' license for Class 1 costs £15 per annum, Class 2 £7/10/- p.a., Class 3 £2 p.a., Class 4 £15 p.a., Class 5 £5/5/- p.a.

Listeners' License Figures in Force in Areas Within 50 Miles of Principal Cities and Towns

QUARTER ENDING MARCH, 31, 1936.

Table of license figures for N.S.W. and F.C.T., Queensland, South Australia, Western Australia, Tasmania, and Victoria, including columns for Locality, Licenses, Population, Popn. Homes, and Ratio of Licenses to 100 of Homes.

Listeners' License Figures in force in areas within 50 miles of Principal Cities and Towns.

Quarter Ending June 30, 1936.

Table of license figures for N.S.W. and F.C.T., Queensland, South Australia, Western Australia, Tasmania, and Victoria, including columns for Locality, Licenses, Population, Popn. Homes, and Ratio of Licenses to 100 of Homes.

Listeners' License Figures in force in areas within 50 miles of Principal Cities and Towns

Quarter ending September 30th, 1936.

Table with columns: Locality, Licences, Population, Ratio of Licenses to 100 of (Popn., Homes). Includes sections for N.S.W. and F.C.T., Queensland, South Australia, Western Australia, and Tasmania.

Listeners' License Figures in force in areas within 50 miles of Principal Cities and Towns

Quarter ending December 30th, 1936.

Table with columns: Locality, Licences, Population, Ratio of Licenses to 100 of (Popn., Homes). Includes sections for N.S.W. AND F.C.T., QUEENSLAND, SOUTH AUSTRALIA, WESTERN AUSTRALIA, and TASMANIA.

COMPLETE LIST OF BROADCASTING STATIONS IN AUSTRALIA

INCLUDING GOVERNMENT STATIONS OPERATED BY THE NATIONAL BROADCASTING SERVICE AND COMMERCIAL STATIONS PRIVATELY OWNED AND OPERATED.

†Denotes Not Yet in Operation.

- 2AD 278 metres, 1080 kC, 100 watts. New England Broadcasters, Armidale.
 - 2AY 203 metres, 1480 kC, 100 watts. Amalgamated Wireless (A/sia) Ltd., Studio, Temple Court, Dean Street, Albury.
 - †2BE Bega.
 - 2BH 283 metres, 1060 kC, 100 watts. Radio Silver City Ltd. Studio, Cnr. Cummins and Zebina Streets, Broken Hill.
 - 2BL 405 metres, 740 kC, 3,000 watts. National Broadcasting Service. Studio, 96-98 Market Street, Sydney.
 - 2BS 200 metres, 1500 kC, 100 watts. Bathurst Broadcasters Ltd. Studio, 51a Keppell Street, Bathurst.
 - 2CA 286 metres, 1050 kC, 500 watts. A. J. Ryan Broadcasters Ltd., Symondston, Canberra, F.C.T.
 - 2CH 252 metres, 1190 kC, 1,000 watts. N.S.W. Council of Churches' Service. Studio, Grace Building, York and King Street, Sydney. Station at Dundas.
 - 2CO 448 metres, 670 kC, 7,500 watts. National Broadcasting Service (Relays 3AR and 3LO). Station at Corowa.
 - 2CR 545 metres, 550 kc, 10,000 watts. National Broadcasting Service. Station at Cumnock.
 - 2DU 455 metres, 660 kC, 100 watts. Central Western Radio Services Ltd. Tamworth Street, Dubbo.
 - 2FC 492 metres, 610 kC, 3,500 watts. National Broadcasting Service. Studio, 96-98 Market Street, Sydney.
 - 2GB 345 metres, 870 kC, 1,000 watts. Theosophical Broadcasting Station Ltd., 29 Bligh Street, Sydney. Station at Mosman.
 - 2GF 248 metres, 1210 kC, 100 watts. Grafton Broadcasting Co. Ltd. Station at Turf Street, Grafton.
 - 2GN 216 metres, 1390 kC, 200 watts. Goulburn Broadcasting Co. Ltd., Auburn Street, Goulburn.
 - 2GZ 303 metres, 990 kC, 2,000 watts. Country Broadcasting Services Ltd., Orange.
 - 2HD 263 metres, 1140 kC, 500 watts. Airsales Broadcasting Co., P.O. Box 123, Newcastle.
 - †2HR Singleton.
 - 2KA 259 metres, 1160 kC, 100 watts. Radio Katoomba Ltd., Katoomba Street, Katoomba.
 - †2KM Kempsey.
 - 2KO 213 metres, 1410 kC, 500 watts. Newcastle Broadcasting Co. Ltd., 70-74 Hunter Street, Newcastle.
 - 2KY 294 metres, 1020 kC, 1,000 watts. The Labour Council of N.S.W. Studio, 424 George Street, Sydney.
 - †2LF Young.
 - 2LM 333 metres, 900 kC, 500 watts. Richmond River Broadcasters Ltd., Molesworth Street, Lismore.
 - 2MO 219 metres, 1370 kC, 100 watts. 2MO Gunnedah Ltd., Marquis Street, Gunnedah.
 - †2MW Murwillumbah.
 - 2NC 244 metres, 1230 kC, 2,000 watts. National Broadcasting Service (Relays 2FC and 2BL). Station at Newcastle.
 - 2NR 429 metres, 700 kC, 7,000 watts. National Broadcasting Service. (Relays 2FC and 2BL.) Station at Lawrence, near Grafton.
 - 2NZ 256 metres, 1170 kC, 2,000 watts. Northern Broadcasters Ltd., Otho Street, Inverell. Station at Little Plain.
 - 2QN 208 metres, 1440 kC, 100 watts. Deniliquin Broadcasting Co. Ltd., End Street, Deniliquin.
 - 2RG 204 metres, 1470 kC, 50 watts. Irrigation Area Newspapers Ltd., P.O. Box 388, Griffith.
 - 2SM 236 metres, 1270 kC, 1,000 watts. Catholic Broadcasting Co., Australia House Wynyard Square, Sydney.
 - 2TM 231 metres, 1300 kC, 2,000 watts. Tamworth Radio Development Co., Peel Street, Tamworth.
 - 2UE 316 metres, 950 kC, 1,000 watts. Radio 2UE Sydney Ltd., 29 Bligh Street, Sydney.
 - 2UW 270 metres, 1110 kC, 750 watts. Commonwealth Broadcasting Corporation Ltd., 49 Market Street, Sydney.
 - 2WG 261 metres, 1150 kC, 1,000 watts. Riverina Radio Broadcasting Co. Ltd., 16 Fitzmaurice Street, Wagga.
 - 2WL 210 metres, 1430 kC, 300 watts. Wollongong Broadcasting Pty. Ltd., Cnr. Church and Edward Street, Wollongong.
 - †2XL Cooma.
- VICTORIA.**
- 3AK 200 metres, 1500 kC, 200 watts. Melbourne Broadcasters Pty. Ltd., 480 Bourke Street, Melbourne, C.1.
 - 3AR 476 metres, 630 kC, 4,500 watts. National Broadcasting Service. Studio, 120a Russell Street, Melbourne, C.1.
 - 3AW 234 metres, 1280 kC, 600 watts. 3AW Broadcasting Co. Pty. Ltd., 382 Latrobe Street, Melbourne, C.1.



Complete List of Australian Broadcasting Stations (Continued)

- 3BA 227 metres, 1320 kC, 500 watts. Ballarat Broadcasters Pty. Ltd., 56 Lydiard Street, Ballarat.
- 3BO 309 metres, 970 kC, 400 watts. Amalgamated Wireless (A/sia) Ltd. Studio, Pall Mall, Bendigo.
- 3DB 291 metres, 1030 kC, 600 watts. 3DB Broadcasting Co. Pty. Ltd., 36 Flinders Street, Melbourne, C.1.
- 3GI 361 metres, 830 kC, 7,000 watts. National Broadcasting Service (Relays 3AR and 3LO). Station at Longford, near Sale.
- 3GL 222 metres, 1350 kC, 100 watts. Geelong Broadcasters Pty. Ltd., National Mutual Buildings, Moorabool Street, Geelong.
- 3HA 297 metres, 1010 kC, 750 watts. Western Province Radio Pty. Ltd., 37 Gray Street, Hamilton.
- 3KZ 254 metres, 1180 kC, 600 watts. Industrial Printing and Pubilcity Co., 24 Victoria Street, Carlton, N.3.
- 3LK 275 metres, 1090 kC, 2,000 watts. 3DB Broadcasting Co. Pty. Ltd. Station at Lubeck.
- 3LO 390 metres, 770 kC, 3,500 watts. National Broadcasting Service. Studio, 120a Russell Street, Melbourne, C.1.
- 3LR 31,315 metres, 9580 kC, 1,000 watts. National Broadcasting Service. Station at Lyndhurst.
- 3MA 221 metres, 1360 kC, 100 watts. Sunraysia Broadcasters Pty. Ltd., 22 Deakin Avenue, Mildura.
- 3MB 201 metres, 1490 kC, 100 watts. Mallee Broadcasters Pty. Ltd., Cumming Avenue, Birchip.
- 3SH 226 metres, 1330 kC, 100 watts. Swan Hill Broadcasting Co., Campbell Street, Swan Hill.
- 3SR 238 metres, 1260 kC, 2,000 watts. "The Argus" Broadcasting Services Pty. Ltd., 365 Elizabeth Street, Melbourne. Station at Shepparton.
- 3TR 242 metres, 1240 kC, 1,000 watts. Gippsland Publicity Pty. Ltd., Raymond Street, Sale.
- †3UL Warragul.
- 3UZ 323 metres, 930 kC, 600 watts. Nilsen's Broadcasting Service Pty. Ltd., 45 Bourke Street, Melbourne, C.1.
- 3UW 517 metres, 580 kC, 10,000 watts. National Broadcasting Service. (Relays 3AR and 3LO.) Station at Dooen, near Horsham.
- 3XY 211 metres, 1420 kC, 600 watts. Station 3XY Pty. Ltd., 4 Bank Place, Melbourne, C.1.
- 3YB 248 metres, 1210 kC, 100 watts. "The Argus" Broadcasting Services Pty. Ltd., 365 Elizabeth Street, Melbourne. Station at Warrnambool. Queensland.
- 4AK 246 metres, 1220 kC, 2,000 watts. Brisbane Broadcasting Pty. Ltd., King House, King Street, Brisbane.
- 4AY 349 metres, 860 kC, 500 watts. Ayr Broadcasters Pty. Ltd., Airdmillan Road, Ayr.
- 4BC 268 metres, 1120 kC, 1,000 watts. Commonwealth Broadcasting Corporation (Qld.), Pty. Ltd. Studio, 43 Adelaide Street, Brisbane.
- 4BH 217 metres, 1380 kC, 1,000 watts. Broadcasters (Aust.), Ltd., Parbury House, Eagle Street, Brisbane.
- 4BK 233 metres, 1290 kC, 500 watts. Brisbane Broadcasting Pty. Ltd., 47 Charlotte Street, Brisbane.
- 4BU 203 metres, 1480 kC, 100 watts. Bundaberg Broadcasters Pty. Ltd., 117 Bourbong Street, Bundaberg.
- 4CA 216 metres, 1390 kC, 100 watts. Amalgamated Wireless (A/sia) Ltd. Station at Cairns.
- 4GR 300 metres, 1000 kC, 500 watts. Gold Radio Service Pty. Ltd., 43 Adelaide Street, Brisbane.
- 4IP 208 metres, 1440 kC, 100 watts. Ipswich Broadcasting Co. Pty. Ltd., Brisbane Street, Ipswich.
- 4LG 273 metres, 1100 kC, 300 watts. Central Western Broadcasting Co. Pty. Ltd., Longreach.
- 4MB 283 metres, 1060 kC, 100 watts. Maryborough Broadcasting Co. Ltd., 43 Adelaide Street, Brisbane. Station, Kent Street, Maryborough.
- 4MK 278 metres, 1080 kC, 100 watts. Mackay Broadcasting Service, 64 Nelson Street, Mackay.
- 4PM 221 metres, 1360 kC, 100 watts. Amalgamated Wireless (A/sia) Ltd. Studio, Musgrave Street, Port Moresby, Papua.
- 4QG 375 metres, 800 kC, 2,500 watts. National Broadcasting Service. Studio, State Insurance Building, Brisbane.
- 4QN 500 metres, 600 kC, 7,000 watts. National Broadcasting Service. Station at Clevedon, North Queensland.
- 4RK 330 metres, 910 kC, 2,000 watts. National Broadcasting Service. Station at Rockhampton.
- 4RO 226 metres, 1330 kC, 50 watts. Rockhampton Broadcasting Co. Pty. Ltd., 43 Adelaide Street, Brisbane. Station at Rockhampton.
- †4SB Kingaroy.
- 4TO 259 metres, 1160 kC, 200 watts. Amalgamated Wireless (A/sia) Ltd. Station at Townsville.
- 4VL 210 metres, 1430 kC, 50 watts. Charleville Broadcasting Service Pty. Ltd., Burke Street, Charleville.
- 4WK 224 metres, 1340 kC, 100 watts. Warwick Broadcasting Co. Pty. Ltd., Cnr. King and Albion Streets, Warwick.
- †4ZR Roma.

SOUTH AUSTRALIA.

- 5AD 229 metres, 1310 kC, 500 watts. Advertiser Newspapers Ltd., Waymouth Street, Adelaide.
- 5DN 313 metres, 960 kC, 500 watts. Hume Broadcasters Ltd., 29 Rundle Street, Adelaide.
- 5CK 469 metres, 640 kC, 7,500 watts. National Broadcasting Service Station at Crystal Brook.

Complete List of Australian Broadcasting Stations (Continued)

- 5CL 411 metres, 730 kC, 2,000 watts. National Broadcasting Service. Studio, Hindmarsh Square, Adelaide.
 - 5KA 250 metres, 1200 kC, 500 watts. Sport Radio Broadcasting Co. Ltd., Richards Building, Currie Street, Adelaide.
 - 5MU 207 metres, 1450 kC, 100 watts. Murray Bridge Broadcasting Co. Ltd. Station at Murray Bridge.
 - 5PI 288 metres, 1040 kC, 2,000 watts. Midlands Broadcasting Services Ltd. Station at Crystal Brook.
 - 5RM 353 metres, 850 kC, 1,000 watts. River Murray Broadcasters Ltd. Station at Renmark.
 - †5SE Mt. Gambier.
- WESTERN AUSTRALIA.
- 6AM 306 metres, 980 kC, 2,000 watts. 6AM Broadcasters Ltd. Station at Northam.
 - †6— Geraldton.
 - 6GF 417 metres, 720 kC, 2,000 watts. National Broadcasting Service. Station at Kalgoorlie.
 - 6IX 242 metres, 1240 kC, 500 watts. West Australian Newspapers Ltd., St. George's Terrace, Perth.
 - 6KG 248 metres, 1210 kC, 500 watts. Goldfields Broadcasters (1933) Ltd., 209 Hannan Street, Kalgoorlie.
 - 6ML 265 metres, 1130 kC, 500 watts. W.A. Broadcasters Ltd., Lyric House, Murray Street, Perth.
 - †6NA Narrogin.
 - †6PM 216 metres, 1390 kC, 100 watts. 6PM Broadcasters Ltd., St. George's House, St. George's Terrace, Perth. Station at Fremantle.
 - 6PR 341 metres, 880 kC, 500 watts. Nicholson's Ltd., 86-90 Barrack Street, Perth.
 - 6WA 536 metres, 560 kC, 10,000 watts. National Broadcasting Service. Station at Minding, near Wagin.
 - 6WB 280 metres, 1070 kC, 2,000 watts. W.A. Broadcasters Ltd. Station at Katanning.
 - 6WF 435 metres, 690 kC, 3,500 watts. National Broadcasting Service. Studio, Stirling Institute, Perth.
- TASMANIA.
- 7BU 455 metres, 660 kC, 100 watts. Findlay's Pty. Ltd., Wilson Street, Burnie.
 - 7HO 349 metres, 860 kC, 100 watts. Commercial Broadcasters Pty. Ltd., 82 Elizabeth Street, Hobart.
 - 7HT 278 metres, 1080 kC, 300 watts. Metropolitan Broadcasters Pty. Ltd., 44 Elizabeth Street, Hobart.
 - 7LA 273 metres, 110 kC, 300 watts. Findlay and Wills Broadcasters Pty. Ltd., 67 Brisbane Street, Launceston.
 - †7— Longford.
 - 7NT 423 metres, 710 kC, 7,000 watts. National Broadcasting Service. Station at Kelso.
 - †7QT Queenstown.
 - 7UV 205 metres, 1460 kC, 300 watts. Northern Tasmania Broadcasters Pty. Ltd., Reibey Street, Ulverstone.
 - 7ZL 484 metres, 620 kC, 1,000 watts. National Broadcasting Service. Studio, Elizabeth Street, Hobart.

EXISTING AUSTRALIAN NATIONAL BROADCASTING STATIONS

Station	Location	Frequency kC	Wave length (m.)	Power Watts	Ultimate Power
2BL Sydney	Coogee, 4½ miles S.E. of G.P.O.	740	405	3,000	
2CO Corowa	3½ miles N.N.E. of P.O., Corowa	448	670	7,500	
2CR Cumnock	Cumnock, N.S.W.	550	545	10,000	60,000
2FC Sydney	Pennant Hills, 11¼ miles N.W. of G.P.O.	610	492	3,500	
2NC Newcastle	Beresfield, 11½ miles W.N.W. P.O. Newcastle	1,230	244	2,000	
2NR Lawrence	Near Grafton, N.S.W.	700	429	7,000	30,000
3AR Melbourne	North Essendon, 8 miles N.W. Elizabeth Street P.O.	630	476	4,500	
3GL Longford	Near Sale, Vic.	830	361	7,000	30,000
3LO Melbourne	Braybrook, 5½ miles W. Elizabeth St. P.O.	770	390	3,500	
3LR Lyndhurst	5 miles S. by E. of Dandenong	9,580	31.31	1,000	
3WV Doen	Near Horsham, Vic.	580	517	10,000	60,000
4QG Brisbane	25 chains S.W. of G.P.O.	800	375	2,500	
4QN Clevedon	Near Townsville, Qld.	600	500	7,000	30,000
4RK Rockhampton	6 miles S.W. of P.O.	910	330	2,000	
5CK Crystal Brook	2½ miles N.E. of P.O.	640	469	7,500	
5CL Adelaide	Brooklyn Park, 3¼ miles W. of G.P.O.	730	411	2,000	
6GF Kalgoorlie	4 miles S.W. of Kalgoorlie P.O., W.A.	720	417	2,000	
6WA Minding	Near Wagin, W.A.	560	536	10,000	60,000
6WF Perth	8 miles N. of G.P.O.	690	435	3,500	
7NT Kelso	29 miles N.W. of Launceston, Tas	710	423	7,000	30,000
7ZL Hobart	Radio Hill, 1¼ miles S.W. of G.P.O.	620	484	1,000	

New Zealand Broadcasting Stations

As at February, 1937.

- 1YA:** National Broadcasting Service, Shortland Street, Auckland. 10 k.w. 650 kc., 461.3 m. Transmission hours:—Monday, to Saturday, 7—9 a.m., 10 a.m.—11 p.m.; Sundays, 9 a.m. to noon, 1—4.30 p.m., 6—10 p.m.
- 1YX:** National Broadcasting Service, Shortland Street, Auckland. 75 watts, 880 k.c. 340.7 m. Transmission hours: 5—6 p.m., 7—10 p.m. (daily except Sunday); Sunday, 6—10 p.m.
- 1ZB:** National Commercial Broadcasting Service, Queen's Arcade, Auckland. 350 watts, 1090 k.c., 275.2 m. Transmission hours:—Monday to Friday, 7 a.m.—10.30 a.m., 5—11 p.m.; Saturday, 7 a.m.—10.30 a.m., 5—midnight; Sunday, 7 a.m.—noon, 5—10.30 p.m.
- 1ZM:** W. W. Rodgers Ltd., Massey Road, Manurewa, 200 watts, 1260 k.c., 238 m. Transmission hours: Monday, Tuesday, Wednesday, Thursday, Friday, 5—10 p.m.; Saturday, 1—4 p.m.; 5 p.m.—midnight; Sunday, 10 a.m. to 6 p.m., 7—10 p.m.; Holidays, 8 p.m. to midnight.
- 1ZJ:** Johns Ltd., Chancery Street, Auckland, 100 watts, 1310 k.c., 228.9 m. Transmission hours: Monday, Tuesday, Thursday, noon to 2 p.m., 7.30—9.30 p.m.
- 2YA:** National Broadcasting Service, Featherston Street, Wellington. 60 k.w., 570 k.c., 526 m. Transmission hours:—Monday to Saturday, 7—9 a.m., 10 a.m.—11 p.m.; Sunday, 9 a.m. to noon, 1—4.30 p.m., 6—10 p.m.
- 2YB:** The North Taranaki Radio Society, Empire Building, King Street, New Plymouth. 100 watts, 760 k.c., 395 m. Transmission hours:—Monday, 7—10 p.m.; Wednesday, 6.30—10 p.m.; Saturday, 1 p.m.—5.15, 6.30—10.30 p.m.; Sunday, 6—10 p.m.
- 2ZH:** C. B. Hansen, Dalton Street, Napier. 90 watts, 820 k.c., 365.6 m. Transmission hours:—Monday, Tuesday, Friday, noon to 2 p.m., 7—10.30 p.m.; Wednesday, noon to 2 p.m., 6.30—10.30 p.m.; Thursday, noon to 2 p.m.; Saturday, 10 a.m. to 5 p.m., 7—11 p.m.; Sunday, noon to 3 p.m., 6.30—10 p.m.
- 2YC:** National Broadcasting Service, Featherston Street, Wellington. 200 watts, 840 k.c., 356.9 m. Transmission hours:—5—6 p.m.; 7—10 p.m. (daily except Sunday); Sunday, 6—10 p.m.
- 2ZP:** E. A. Perry, 128 Queen Street, Wairoa. 210 watts, 900 k.c., 333.3 m. Transmission hours: Tuesday, 7—9 a.m., 6—10.30 p.m.; Wednesday, Thursday, Friday, 7—9 a.m.; Sunday, 7.30—9.30 a.m.
- 2ZF:** The Manawatu Radio Club, King Street, Palmerston North. 250 watts, 960 k.c., 312.3 m. Transmission hours: Monday, Thursday, Saturday, 8—10 p.m.; Wednesday, 6.15—10 p.m.; Friday, 7—9.30 p.m.; Sunday, 7—9.30 p.m.
- 2ZJ:** C.T.C. Hands, 229 Gladstone Road, Gisborne. 300 watts, 980 k.c., 303.9 m. Transmission hours: Monday, Friday, Saturday, 7—10 p.m.; Tuesday, Wednesday, noon to 1.30 p.m., 7—10 p.m.; Thursday, 7—8 p.m.
- 2ZM:** Atwater Kent Radio Service Ltd., 258 Gladstone Road, Gisborne. 30 watts, 1150 k.c., 260.9 m. Transmission hours: Monday, 9.15—10 a.m., 8—10.30 p.m.; Tuesday, Wednesday, Friday, 9.15—10 a.m.; Thursday, 9.15—10 a.m., 8—11 p.m.; Saturday, 9.15—10 a.m., 8—10.30 p.m.; Sunday, noon to 1 p.m., 7—11 p.m.
- 2ZD:**—W. D. Ansell, 7 Rimu Street, Masterton. 12 watts, 1170 k.c., 256.3 m. Transmission hours: Monday to Sunday, 8—10 p.m.
- 2ZL:** John Holden, 609 Park Road, Hastings. 50 watts, 1240 k.c., 241.8 m. Thursday, 6.30—11 p.m.; Sunday, 9.30 a.m. to noon.
- 2ZR:** 2ZR Radio Club, Trafalgar Street, Nelson. 60 watts, 920 k.c., 326.1 m. Transmission hours: Monday, Wednesday, 5—10 p.m.; Tuesday, Thursday, Friday, 6—10 p.m.; Saturday, 2.30—4.30 p.m., 6—10 p.m.; Sunday, 10.45 a.m. to 1 p.m., 6.15—9.30 p.m.
- 2ZO:** J. V. Kyle, 50 Waldegrave Street, Palmerston North. 200 watts, 1400 k.c., 214.2 m. Transmission hours: Tuesday, 6.30—10 p.m.; Thursday, 7.30—10 p.m.
- 3YA:** National Broadcasting Service, Gloucester Street, Christchurch. 10 k.w., 720 k.c., 416.4 m. Transmission hours: Monday to Saturday, 7—9 a.m., 10 a.m. to 11 p.m.; Sunday, 9 to noon, 1—4.30 p.m., 5.30—10 p.m.
- 3ZR:** West Coast Radio Society, Bright Street, Cobden, Greymouth. 250 watts, 940 k.c., 319 m. Transmission hours: Monday to Friday, 7.30—8.30 a.m., 3—5 p.m., 6—7 p.m., 7.30—10 p.m.; Saturday, 7.30—8.30 a.m., 1.30—5 p.m., 6—11 p.m.; Sunday, noon to 1.30 p.m., 5.30—6.30 p.m., 7—9 p.m.
- 3YL:** National Broadcasting Service, Gloucester Street, Christchurch. 250 watts, 1200 k.c., 250 m. Transmission hours: Week-days, 5—6 p.m., 7—10 a.m.; Sunday, 6—10 p.m.
- 3ZM:** W. J. Green and J. Younger, 253 Brougham Street, Christchurch. 100 watts, 1470 k.c., 204.1 m. Transmission hours: Monday, Tuesday, Thursday, 7.30—10 a.m., 5—6 p.m., 7—10 p.m.; Wednesday, 7.30—10 a.m., 5—6 p.m., 7—10.15 p.m.; Friday, 7.30—10 a.m.; Saturday, 7.30 a.m. to 2 p.m., 8 p.m. to midnight; Sunday, 11 a.m.—2 p.m., 5—6 p.m., 7—10 p.m.
- 4ZP:** R. T. Parsons, 155 Layard Street North, Invercargill. 450 watts, 620 k.c., 483.6 m. Transmission hours: Monday to Friday, 12.30—1.30 p.m., 7—10 p.m.; Saturday, 7—10 p.m.; Sunday, 11 a.m. to noon, 6.30—10 p.m.
- 4YA:** National Broadcasting Service, Stuart Street, Dunedin. 10 k.w., 790 k.c., 379.5 m. Transmission hours: Monday to Saturday, 7—9 a.m., 10 a.m. to 11 p.m.; Sunday, 9 to noon, 1—4.30 p.m., 5.30—10 p.m.
- 4ZB:** Otago Radio Association, 180 Rattray Street, Dunedin. 78 watts, 1010 k.c., 297 m. Transmission hours: Wednesday, 6.30—11 p.m.; Thursday, 6—11 p.m.; Sunday, 10 a.m. to noon.
- 4ZM:** McCracken and Walls, 17 George Street, Dunedin. 100 watts, 1010 k.c., 297 m. Transmission hours: Monday, Wednesday, Thursday, Friday, 9—11.45 a.m., 1—2 p.m.; Tuesday, 9—11.45 a.m., 1—2 p.m., 6—11 p.m.; Saturday, 9 a.m. to noon, 5—10 p.m.; Sunday, 2—10 p.m.
- 4ZO:** Barnett's Radio Supplies, The Octagon, Dunedin. 25 watts, 1010 k.c., 297 m. Transmission hours: Monday to Friday, noon to 1 p.m., 2—3 p.m., 5—6 p.m.; Monday, 8—11 p.m.; Friday, 7—11 p.m.; Saturday, noon to 1 p.m.
- 4YO:** National Broadcasting Service, Stuart Street, Dunedin. 200 watts, 1140 k.c., 263.2 m. Transmission hours: Week days, 5—6 p.m., 7—10 p.m.; Sunday, 6—10 p.m.
- 4ZL:** Radio Service Ltd., 243 Macandrew Road, Dunedin. 100 watts, 1220 k.c., 245.9 m. Transmission hours: Monday and Thursday, 7—9 a.m., 7.30—11 p.m.; Tuesday, Wednesday and Friday, 7—9 a.m.; Saturday, 7—9 a.m., 7—11 p.m.; Sundays, 8—10 a.m.
- 4ZC:** John I. Bilton, Lowburn Ferry, Cromwell, Otago. 45 watts, 1280 k.c., 234.2 m. Transmission hours: 7—9 p.m. daily.
- 4ZR:** Renton and Clark, Inchclutha, Balclutha. 10 watts, 1340 k.c., 224 m. Transmission hours: Tuesday, 7.30—10 p.m.; Thursday, 7—10 p.m.; Sunday, 10 a.m. to noon, 7.30—9.30 p.m.

Australian Federation of Broadcasting Stations

HEAD OFFICE: 371 Collins Street, Melbourne. Phone M5532.

SYDNEY OFFICE: Commonwealth Bank Building, Martin Place. Phone BW7310.

OFFICER BEARERS FOR 1936-37.

President: J. B. Chandler, Esq.

Vice-Presidents: D. W. Worrall, Esq. ((3DB), Senior; C. F. Marden, Esq. (C.B.N.); G. H. Anderson (2GZ), Country V.P.

Secretary General: M. B. Duffy, Esq.

Administrative Secretary: R. Dooley, Esq.

Federal Council comprises representatives of City Commercial Station; and two Country Commercial Station representatives in Victoria and New South Wales.

Executive Council comprises representatives of Melbourne and Sydney Stations and two Country Station representatives in Victoria and New South Wales.

History.

The Federation started from small beginnings about 1928, when three of the Sydney stations then operating decided that common action was necessary on certain matters, such as copyright. Since the first interstate Convention was held in 1930, the Federation has continued to grow in strength and in membership until now it has 70 Commercial Stations as members. Side by side with the expansion of the organisation so has the scope of its operations and interests increased also. To-day the Federation is a substantial stabilising influence upon almost every phase of broadcasting development in the Commercial sphere, and a close watch is maintained on all governmental matters affecting broadcasting. In 1935 important agreements were entered into with the Associated Record Manufacturers for the use of gramophone records, and with the Australian Performing Rights Association Ltd. for the use of copyright music. This latter agreement remains in force until 1938, but the former will be revised (and possibly renewed) during the present year.

Activities.

The following is an extract from the annual report of the Secretary-General, Mr. M. B. Duffy, delivered at the Sixth Annual Convention of the Federation in November, 1936:—

"Last Convention was very much concerned with the issue of regulations by the Government eliminating ownership of broadcasting stations, and in addition, placing restrictions upon co-operative efforts in regard to programme and technical services. The Convention, in consequence, set up a Defence Fund to organise and protect the interests of a number of Federation members. . . . A breaking down of the terms of the Regulations was accomplished. While complete repeal could not be obtained the efforts of the Federation have earned for it a greater respect for its power.

"The decision of last Convention was to aim at an independent board to control broadcasting and to have it separate from the P.M.G.'s Department, the main objects being—(a) To obtain some security of tenure for commercial broadcasting, and (b) Transfer issue and cancellation of Licenses to be placed upon a semi-judicial basis. . . .

"In following this request for legislative security, a questionnaire was issued to the various stations in order that statistics might be available to justify the maintenance of an industry that has reached fair proportions. From the replies received the following information was obtained:—

"(1) Capital invested in Commercial Broadcasting is approximately £500,000.

"(2) The direct employees of Commercial Broadcasting in Australia approximately 2,000.

"(3) The amount paid in talent fees, apart from regular members of the staffs amounted to £25,000 per annum.

"(4) Total salaries and wages paid £500,000 per annum.

All these facts, together with reasons why security of tenure was necessary, were set out and placed before the Government.

Since the last Convention the all-important question of accreditation of Service Agencies has been given close attention and sets of rules governing this phase of the business have been prepared.

Since the beginning of the year also, an agreement was entered into with the owners of mechanical copyright for the importation of recorded music for broadcast purposes. The Agreement was for a very short term only and evidence of its working has induced the broadcasting stations to seek a number of amendments particularly in relation to library items, short introductory and closing theme music and medley records.

The Federation views the year just past as a very successful one for Commercial Broadcasters. There has been quite a development of chain establishing, these chains hoping by their strength in combining to be able to produce much more expensive programmes, and it is considered quite possible during the coming year that outstanding artists from overseas will be heard over the Chain routes.

Code of Ethics.

1. RECOGNISING THAT THE RADIO AUDIENCE INCLUDES persons of all ages and all types of political, social and religious belief, each member station will endeavour to prevent the broadcasting of any matter which would commonly be regarded as offensive.

2. WHEN THE FACILITIES OF A MEMBER STATION are used by others than the owner, the member shall ascertain the financial responsibility and character of such client, that no dishonest, fraudulent or dangerous person, firm or corporation may gain access to the radio audience.

3. MATTER WHICH IS BARRED FROM THE MAILS as fraudulent, deceptive or obscene shall not be broadcast by a member station.

4. EACH MEMBER STATION SHOULD REFUSE TO accept any business on a cost per inquiry, contingent or percentage basis, or to accord free time for commercial use.

5. NO MEMBER STATION SHOULD PERMIT THE broadcasting of advertising statements or claims which he knows or believes to be false, deceptive or grossly exaggerated.

6. NO MEMBER STATION SHALL DEFAME OR DISPARAGE a competitor, directly or indirectly, by word or acts which call in question such competitor's business integrity, ability to perform contracts, credit standing or quality of service.

7. NO MEMBER STATION SHOULD KNOWINGLY broadcast ambiguous statements which may be misleading to the listening audience.

8. MEMBER STATIONS SHOULD NOT BROADCAST anonymous advertising testimonials.

9. AS FAR AS POSSIBLE MEMBER STATIONS SHALL not allow more than 300 words of direct advertising in a 15 minute sponsored session or 450 words in a 30 minute session.

LIST OF MEMBERS OF I.R.E. AUSTRALIA

- Hosking, A. P., C/o A.W.A., 47 York Street, Sydney, N.S.W.
 Hill, R., C/o Western Electric Co., 49a King Street, Sydney, N.S.W.
 Hull, A. G., C/o "Wireless Weekly," 60 Elizabeth Street, Sydney, N.S.W.
 Hayes, N. W. V., 9 Ocean Street, Hampton, V.
 Henderson, F. J., South Lodge, Brighton Beach, V.
 Hopton, A. T.
 Hale, J. P., C/o Newton McLaren Ltd., Box 1339, G.P.O., Adelaide, S.A.
 Harrington, H. W., Senior Radio Inspector, Post Office Place, Adelaide S.A.
 Honnor, W. W., C/o S.A. School of Mines, Adelaide, S.A.
 Israel, M. S., C/o Station 3GL, Little Malop Street, Geelong, V.
 Johnson, J. M., 632 Glenhantly Road, Caulfield, V.
 Kennell, R. J. W., C/o Philco Radio and Television Corp., 276 Castle-reagh Street, Sydney, N.S.W.
 Kendall, Major R., General Staff Signals, A.M.F., Melbourne, V.
 Kauper, H. A., 227 Lennox Street, Richmond, V.
 Kappe, Capt. C. H., C/o Staff College, Quetta, India.
 Kerr Grant, Prof., Professor of Physics, Adelaide University, Adelaide, S.A.
 Lovett, H. F., 14 Summerhill Road, West Hobart, Tas.
 Lindberg, E. R., C/o National Radio Corporation, 96 Pirie Street, Adelaide, S.A.
 Leslie, J. R., Research Labs., P.M.G.'s Dept., 59 Lt. Collins Street, Melbourne, V.
 Manley, P. J. C/o Amplion Ltd., 70 Clarence Street, Sydney, N.S.W.
 Mingay, O. F., 30 Carrington Street, Sydney, N.S.W.
 Murray, L. C., 19 Milner Crescent, Wollstonecraft, N.S.W.
 Marshall, H. A., 94 Francis Street, Bondi, N.S.W.
 Mulholland, J. L., C/o A.W.A., 47 York Street, Sydney, N.S.W.
 Martin, L. T., 6 Alton Avenue, Concord, N.S.W.
 Moore, E. J. T., Room 65, 14 O'Connell Street, Sydney, N.S.W.
 McDonald, A. S., C/o A.W.A., 47 York Street, Sydney, N.S.W.
 McPhee, S., C/o Standard Telephones and Cables Ltd., 258 Botany Road, Alexandria, N.S.W.
 MacNee, D. H., C/o The Gramophone Co., 2 Parramatta Road, Homebush, N.S.W.
 Mackay, R. R., C/o Melbourne Technical College, Latrobe Street, Melbourne, V.
 McKay, R. V., Engineers' Central Office, Treasury Gardens, Melbourne, V.
 Malone, J., Chief Wireless Inspector, Treasury Gardens, Melbourne, V.
 Mathews, S. A., C/o 108 Francis Street, Perth, W.A.,
- Norville, C. H., C/o Breville Radio, 30 Cottenhan Avenue, Kensington, N.S.W.
 Newman, S. M., 11 Kissing Point Road, Turramurra, N.S.W.
 Otty, W., Toronto, N.S.W.
 Olle, J. D., 17 Eccles Avenue, Ashfield, N.S.W.
 Parker, P. S., Works Manager, Airzone (1931) Ltd., 16 Australia Street, Camperdown, N.S.W.
 Phillips, W. H. C., C/o A.W.A., 47 York Street, Sydney, N.S.W.
 Pringle, A. Y., C/o A.W.A., Queen Street, Melbourne, V.
 Rowland, W. J., 22 Belmont Road, Mosman, N.S.W.
 Ryan, A. J., C/o Station 2CA, Kingston, Canberra, F.C.T.
 Ryan, J. W., C/o Station 3AW, Latrobe Street, Melbourne, V.
 Risely, E. J., C/o Western Electric Co., Paringa Bldgs., Hindley Street, Adelaide, S.A.
 Scott, A. W., C/o Stromberg-Carlson A/sia Ltd., Box 3971 V, G.P.O., Sydney, N.S.W.
 Southey, R. V., C/o Columbia Graphophone Co. Ltd., 2 Parramatta Road, Homebush, N.S.W.
 Spinks, W. C., 6 Doyer Road, Rose Bay, N.S.W.
 Schultz, L. N., Engineer-in-Charge, Station 2GB, Clifton Gardens, N.S.W.
 Salmon, W. E., "La Paloma," Frederick Street, North Bondi, N.S.W.
 Stevenson, M. H., C/o Station 2UE, 29 Blich Street, Sydney, N.S.W.
 Skene-Smith, A., 9 Wilfield Avenue, Vaucluse, N.S.W.
 Seccombe, L. M., 4 Hayburn Avenue, Rockdale, N.S.W.
 Smith, F. Langford, C/o A. W. Valve Co. Ltd., 47 York Street, Sydney, N.S.W.
 Stevens, F. H., Radio Engineer, Station 3LO, Melbourne, V.
 Toombs, Capt. S., C/o A.W.A., 47 York Street, Sydney, N.S.W.
 Trenam, H. C., C/o Standard Telephones and Cables Ltd., 258 Botany Road, Alexandria, N.S.W.
 Tyler, M., Rosedale Road, Gordon, N.S.W.
 Thom, F. W. P., C/o Thom and Smith Ltd., Box 2596, G.P.O., Sydney, N.S.W.
 Thorrington, L., C/o Stromberg-Carlson Ltd., Box 3971 V, G.P.O., Sydney, N.S.W.
 Turner, O. C., 122 Newington Road, Petersham, N.S.W.
 Tyrell, C. W., C/o Philips Lamps A/sia Ltd., 69 Clarence Street, Sydney, N.S.W.
 Traynor, P. B., Asst. Radio Inspector, Wireless Branch, C'wealth Offices, Post Office Place, Adelaide, S.A.
 Whitaker, J. R., C/o The Gramophone Co., 2 Parramatta Road, Homebush, N.S.W.
 Wilson, J. F., C/o Amalgamated Wireless A/sia Ltd., 47 York Street, Sydney, N.S.W.
 Wyles, D. G., C/o Philips Lamps A/sia Ltd., 67 Clarence Street, Sydney, N.S.W.

- Wedgner, N. T., 353 Penshurst Street, Willoughby Junction, N.S.W.
 Wood, H. B., 225 Old South Head Road, Bondi, N.S.W.
 Wiggins, C. S., R.A.A.F. Headquarters, Victoria Barracks, Melbourne, V.
 Williams, G. F., Radio Eng., Eclipse Radio, 111 Queensbridge Street, Melbourne, V.
 Witt, S. H., P.M.G.'s Research Labs., 59 Lt. Collins Street, Melbourne, V.
 Wilson, Warne A., C/o Station 3BA, Sturt Street, Ballarat, V.
 Wellington, S. H., 2 Arthur Avenue, Brighton, Melbourne, S.5, V.
 Walters, G., C/o A.W.A., Radio Station, Thursday Island, Q'land.

ASSOCIATE MEMBERS.

- Arms, A., 15 Mile P.O., Newnes Junction, N.S.W.
 Ash, B., Box 81, P.O., Quirindi, N.S.W.
 Allison, C. M., 33 Arnold Street, Carlton North, N.4, V.
 Allen, G. U., 126 Riversdale Road, Camberwell, E.6, V.
 Baker, R. C., 10 Captain Pipers Road, Vaucluse, N.S.W.
 Boothman, R. C., "Alberta," Walsham Parade, North Bondi, N.S.W.
 Butterworth, C., 19 Thomas Street, Wallsend, Newcastle, N.S.W.
 Bell, R. A., 29 Woodland Street, Marri-ckville, N.S.W.
 Bodkin, H. B., 290 Unwin's Bridge Road, St. Peters, N.S.W.
 Barkley, D. A., 1 Constitution Road, Dulwich Hill, N.S.W.
 Boxall, H., H.M.A.S. "Stuart," C/o G.P.O., Sydney, N.S.W.
 Betts, E. G., 24 Kerferd Street, North Essendon, W.6, V.
 Busch, R. T., "Stratford," 20 Wordsworth Street, Moonee Ponds, V.
 Binnion, R. R., 29 Tooronga Road, Hawthorn, E.3, V.
 Batt, C. H., "Woodlands," Melton Mowbray, Tasmania.
 Burmester, O. C., Stanley Terrace, East Brisbane, Q'land.
 Butterfield, G. W., C/o Station 6IX, Lyric House, Murray Street, Perth, W.A.
 Cameron, R. M., C/o Station 2UE, 29 Blich Street, Sydney, N.S.W.
 Crouch, E. C., C/o Station 2GZ, Hosking Bldgs., Hosking Place, Sydney, N.S.W.
 Chilton, R. R., Chilton Avenue, Warra-wee, N.S.W.
 Crowley, C., C/o Electricity Dept., Parkes, N.S.W.
 Chittock, K. H., C/o Airzone (1931) Ltd., 16 Australia Street, Camperdown, N.S.W.
 Choules, G. H., C/o The Gramophone Co., 2 Parramatta Road, Homebush, N.S.W.
 Crow, R. K., 14 Parker Setreet, Ormond, S.E.9, V.
 Clarke Cottrell, L. L., C/o Station 3AR, 120a Russell Street, Melbourne, V.
 Coate, E. F., C/o Metropolitan Elec. Supply, Green Street, Richmond, V.
 Cox, H. E., Manager, Station 4TO, Townsville, Q'land.
 Collins, C. H. J., C/o Supt. Engineer's Branch, P.M.G.'s Dept., Adelaide, S.A.

- Coate, E. F. C/o Metropolitan Elec. Supply, Green Street, Richmond, V.
 Cox, H. E., Manager, Station 4TO, Townsville, Q'land.
 Collins, C. H. J., C/o Supt. Engineer's Branch, P.M.G.'s Dept., Adelaide, S.A.
 Dennis, L. C., 22 Tessa Street, Chatswood, N.S.W.
 De Courcy Brown, A. W., 32 Palmer Street, Rose Bay North, N.S.W.
 Della Pietra, J., 198 Glenhantly Road, Elsternwick, S.4, V.
 Dunstan, C. B. C/o J. B. Chandler, 43 Adelaide Street, Brisbane, Q'land.
 Edgerton, C. L., 50 Dolphin Street, Coogee, N.S.W.
 Ebrall, H. N., C/o Station 2HD, Box 123, P.O., Newcastle, N.S.W.
 Edwards, H. S., 110 Lyons Road, Drummoyn, N.S.W.
 Everitt, A. R., C/o Borthwick Everitt and Co., 33 Mountain St., Sydney, N.S.W.
 Edwards, J. R., C/o Australian Radio Publications Ltd., 30 Carrington Street, Sydney, N.S.W.
 Enticknap, L. E., 117 Coward Street, Mascot, N.S.W.
 Errey, R. A., 48 Macgregor Street, East Malvern, V.
 Fidden, K. F. E., C/o R.C.A. Photophone Ltd., 221 Elizabeth Street, Sydney, N.S.W.
 Fraser, J. H., 8 Deakin Avenue, Haberfield, N.S.W.
 Fitzpatrick, W. P., 205 Coppen Street, Richmond, E.1, V.
 Fox, A. E. R., C/o Marine Dept., A.W.A., 167 Queen Street, Melbourne, V.
 Ferrar, L. H., C/o Newton McLaren Ltd., Leigh Street, Adelaide, S.A.
 Gee, C. W., Llewellyn Street, Oatley, N.S.W.
 Goddard, N. M., 350 George Street, Sydney, N.S.W.
 Greenhalgh, K. N., C/o Station 2KO, 8 Bond Street, Newcastle, N.S.W.
 Gilchrist, J. D., "Amesbury," 78 Alt Street, Ashfield, N.S.W.
 Garth, A. H., Box 52, G.P.O., Perth, W.A.
 Hatton, H. C., 18 Irene Street, Abbotsford, N.S.W.
 Henricks, F. L., "Alwood," Mount Street, Hunter's Hill, N.S.W.
 Hodder, G. H., 5 Barwon Street, Forbes, N.S.W.
 Hooker, B. W., 183 Burwood Road, Burwood, N.S.W.
 Halley, D. S., 26 Knox Street, Randwick, N.S.W.
 Hibbert, C. T., 20 Cowles Road, Mosman, N.S.W.
 Huey, R. M., 7 Arthur Street, Cronulla, N.S.W.
 Hoare, P. M., 17 Cathcart Street, Lismore, N.S.W.
 Hannam, H. W., 34 Seymour Street, South Hurstville, N.S.W.
 Hall, B. M., 6 Billong Avenue, Vaucluse, N.S.W.
 Hall, G. G., C/o A.W.A. Radio-Electric Works, Parramatta Road, Ashfield, N.S.W.
 Harradence, J. W., C/o Metropolitan Elec. Supply, Green Street, Richmond, V.
 Hehir, W. J., 14 Raven Street, Kew, E.4, V.
 Hogg, W. D., 7 Willowbank Road, North Fitzroy, V.

- Hooper, S. M., 223 Auburn Road, Auburn, E.3, V.
 Hoe, F., Jr., C/o Edgar V. Hudson Pty. Ltd., Box 522H, G.P.O., Brisbane, Q'land.
 Hepple, W. B., C/o The Electric Shop Ltd., 57 Russell Street, Toowoomba, Q'land.
 Hope, R. S., Engineer, Station 7HO, Hobart, Tasmania.
 Jordan, J., C/o Broadcasting Station 4BU, Bundaberg, Q'land.
 Kelso, A. J. B., C/o Mrs. Willis, 25 Walker Avenue, Haberfield, N.S.W.
 Kerr, A. D., C/o Station 3BA, 56 Lydiard Street, Nth., Ballarat, V.
 Lackey, R., 3 Meryla Street, Burwood, N.S.W.
 Lindsay, D. G., Burgoyne Street, Gordon, N.S.W.
 Mason, V. O., 34 Palmer Street, Rose Bay North, N.S.W.
 Mitchell, J. A. J., 169 Morgan Street, Wagga Wagga, N.S.W.
 Moore, B., 5 Ryan's Road, Willoughby, N.S.W.
 Moyle, J. M., C/o "Wireless Weekly," 60 Elizabeth Street, Sydney, N.S.W.
 McKeown, R. H., No. 8 King's Lynn, Kirribilli, N.S.W.
 McLean, A., C/o I.C.S., 140 Elizabeth Street, Sydney, N.S.W.
 Mackenzie, C. A., 11 Cradley Avenue, Kew, E.4, V.
 Maddicks, H., Victoria Street, Daylesford, V.
 Missen, J. A., 22 Denmark Street, Kew, V.
 Molan, A., 79 Gipps Street, East Melbourne, V.
 Morrison, G. M., C/o A.W.A., 167 Queen Street, Melbourne, V.
 Minchin, W. A., Radio Engineer, 63 William St., Rockhampton, Q'land.
 Moule, C. E., 146 Young Street, Parkside, Adelaide, S.A.
 North, W., Robertson Crescent, Marri-ckville, N.S.W.
 Nottingham, H. A. J., "Eden Park," Lane Cove Road, North Ryde, N.S.W.
 Nannelli-Dawson, S. A. R., "New Cottage," Cnr. Macarthur and Victoria Roads, Parramatta, N.S.W.
 Nolte, G. E., C/o Station 3AW, 382 Latrobe Street, Melbourne, V.
 Nicholson, R. M., C/o Station 4LG, Box 107, P.O., Longreach, Q'land.
 Nicholas, W. R., C/o Station 7HO, 82 Elizabeth Street, Hobart, Tas.
 Oakley, R. A., C/o Station 5KA, Currie Street, Adelaide, S.A.
 Oppenheim, O. G., 33 Saturn Street, Caulfield, V.
 Parr, A. K., Radio Trader, Collaroy Beach, N.S.W.
 Parker, M. J., 180 Nelson Bay Road, Bronte, N.S.W.
 Persson, A. H., C/o Ducon Condenser Pty. Ltd., 73 Bourke Street, Waterloo, N.S.W.
 Pickerill, J. P., Main Road, Ravensbourne, Dunedin, New Zealand.
 Paget, J. R., No. 1 Squadron, R.A.A.F., Laverton, V.
 Phillips, A. J., 122a North Road, Brighton, V.
 Plummer, D. K., 16 Orford Street, Moonee Ponds, W.4, V.
 Parasiars, R., 102 Flinders Street, Adelaide, S.A.

- Parker, N. A., Sea View Terrace, Kal-amunda, W.A.
 Phipps, W. R., 56 Coode Street, South Perth, W.A.
 Ratcliffe, S. T., 94 Evans Street, Rozelle, N.S.W.
 Robinson, W. H. R., Asst. Engineer, Station 2UE, 29 Blich Street, Sydney, N.S.W.
 Read, E. W. H., Maloney's Road, E. Camberwell, E.6, V.
 Scarlett, H. J., C/o Broadcasting Station 2GZ, Orange, N.S.W.
 Selman, N. H. G., 165 Ramsay Road, Haberfield, N.S.W.
 Sherwood, S. R. D., 117 Milson Road, Cremorne, N.S.W.
 Symons, C. J., Capel Street, Young, N.S.W.
 Schmidt, R. F., C/o Station 3TR, Raymond Street, Sale, V.
 Smith, E. J., La Motte, Bright, V.
 Smith, C. W.,
 Shortell, R. C., C/o Station 3WR, Congre-pna Road, P.O., via Shepparton, Vic.
 Stevens, J. P., 23 Riddell Parade, Elsternwick, S.4, V.
 Sleep, M. L., 10 Waverley Street, Essendon, W.5, V.
 Sydow, J. F., C/o P. and L. Wireless Pty. Ltd., 11 Hardware Street, Melbourne, V.
 Searle, A. B., C/o Station 4BC, 45 Adelaide Street, Brisbane, Q'land.
 Simon, L. K., 11 Cudmore Street, Somerton, Adelaide, S.A.
 Simons, N. W., C/o Station 6KG, Kalgoorlie, W.A.
 Taylor, T. G., Box 38, P.O., Cessnock, N.S.W.
 Thomas, H. K. R., C/o Station 2GB, 29 Blich Street, Sydney, N.S.W.
 Tree, E. E., 128 Willoughby Road, Crow's Nest, N.S.W.
 Torr, N., 49 Rowe Street, Eastwood, N.S.W.
 Thompson, H. A., Chief Telegraphist, H.M.A.S. "Sydney," C/o G.P.O., Sydney, N.S.W.
 Tiller, G. G., 152 Dandenong Road, Frankston, V.
 Turner, R. R., 102 Flinder Street, Adelaide, S.A.
 Tapper, J. R., C/o Station 6ML, Lyric House, Murray Street, Perth, W.A.
 Taylor, H. A., Engineer-in-Charge, 6KG Transmitting Station, Parkes-town, W.A.
 Waters, R. T. A., Surf Road, Cronulla, N.S.W.
 Watson, T. W., 70 Calero Street, Lithgow, N.S.W.
 Wilson, G. H., C/o E. F. Wilks and Co., 52 Shepherd Street, Chippendale, N.S.W.
 Wearne, T. S. P., 36 Mitford Street, Elwood, S.3, V.
 Walthor, E. L., C/o R.C.A. Photophone, Box 536H, G.P.O., Brisbane, Q'land.
 Weddell, J. A., 26 Kandahar Crescent, Reade Park, Adelaide, S.A.
 White, G. J., Galway Avenue, Broadview, Adelaide, S.A.
 Wilson, H. B., Maintenance Engineer, Station 5AD, Weymouth Street, Adelaide, S.A.
 Walch, C. A., 100 Elizabeth Street, Hobart, Tasmania.
 Wolff, H. A., 107 St. John Street, Launceston, Tasmania.

ASSOCIATES.

Allan, A. J., 12 Torrens Road, Ovingham, S.A.
 Bennett, A. N. Mc., 7 Silva Street, Bondi, N.S.W.
 Brown, A. J., 12 Gretchen Avenue, Earlwood, N.S.W.
 Colebrook, W. A. E., 30 Macpherson Street, Waverley, N.S.W.
 Collins, A. K., Elizabeth Street, Albany, W.A.
 Conlon, S. M., 26 Kippax Street, Sydney, N.S.W.
 Dare, E., C/o Mullard Radio, 26 Clarence Street, Sydney, N.S.W.
 Gibson, L., Box 39, P.O., Alstonville, N.S.W.
 Griffith, R. M., 156 Edwin Street, Croydon, N.S.W.
 Hume, G. V., No. 6 Flat, "Corinthia," Mosman Street, Mosman, N.S.W.
 Lambert, C. C., 49a Grenfell Street, Adelaide, S.A.
 Lorenzen, L. P., Emerald, Q'land.
 Maidment, V. F., 32 Haig Street, Bexley, N.S.W.
 Merryfull, A. E., C/o Russell Radio, Goulburn, N.S.W.
 Menzel, W. E. B., Box 196, P.O., Hamilton, V.
 Morgan, A. S., 212 Bay Street, Brighton, V.
 Murphy, W. T., C/o Pike Bros. Ltd., Townsville, Q'land.
 Olfe, P. D., 17 Eccles Avenue, Ashfield, N.S.W.

Paton, J. W. A., 260 Pacific Highway, Artarmon, N.S.W.
 Prout, J. L., Box 154, P.O., Grafton, N.S.W.
 Reed, J. G., 26 Kennilworth Street, Croydon, N.S.W.
 Webb, R. H., Watson Street, Cunnamulla, Q'land.
 Whatmuff, C. W., 26 George Street, Parramatta, N.S.W.
 Wood, E. T. G., 5 Judge Street, Randwick, N.S.W.

JUNIORS.

Askins, F. D., C/o National Radio Corp., 96 Pirie Street, Adelaide, S.A.
 Beaumont, J. F., 18 Riley St., Kogarah, N.S.W.
 Boud, W. E., 515 Kooyong Road, Garden Vale, S.4, V.
 Boylan, C., 93 Fuller's Road, Chatswood, N.S.W.
 Chamberlain, W. R., 43 Beaconsfield Parade, Croxton, N.16, V.
 Christopher, J. T., 108 Greville Street, Chatswood, N.S.W.
 Croke, C. M., Koorawatha, N.S.W.
 Dalziel, K. E., C/o Royal Ausn. Air Force, Richmond, N.S.W.
 Daly, T. J., 209 Bridport Street, Albert Park, V.
 Dorsett, R. J., 15 Bath Street, Glenelg, S.A.
 Fisher, A. W., 152 Osborne Street, Williamstown, W.16, V.

Gray, J. T., 16 Canberra Street, Moreland, N.10, V.
 Hannam, E. H., 19 Dickson Street, Waverley, N.S.W.
 Hood, I. A. F., C/o Mrs. McCall, 15 Glenville Ave., Giffnock, Glasgow, Scotland.
 Lamont, J. M., 48 Princess Street, Kew, E.4, V.
 McManus, F. A., C/o Huckell Radio, 285 Military Road, Cremorne, N.S.W.
 Moeser, E. H., 176 Croydon Road, Croydon, N.S.W.
 Mackenzie, G. H., 109 Cochrane Street, Elsternwick, V.
 Pearce, C. A., 385 High Street, Glen Iris, S.E.6, V.
 Potter, J. S. R., 132 Drummoyne Street, Wentworthville, N.S.W.
 Perrott, R. W., C/o A.W.A. Radio-Electric Works, Parramatta Road, Ashfield, N.S.W.
 Simpson, J., 3 St. George's Crescent, Drummoyne, N.S.W.
 Smith, J. F., 280 Old Canterbury Road, Summer Hill, N.S.W.
 Stender, L. F.
 Stone, R. N., 16 Queensville Street, West, Footscray, W.12, V.
 Thompson, M. M., C/o Station 3AW, 382 Latrobe Street, Melbourne, V.
 Thomson, D. C., 23 Charlbury Road, Medindie Gardens, S.A.
 Tremlett, R. W., 25 Robert Street, Ashfield, N.S.W.

Telephone Service Used In Broadcasting

(Continued from Page 40.)

All previous records for a simultaneous broadcast were broken on one occasion during the year when 87 separate broadcasting stations in the Commonwealth were linked together. This necessitated the use of 18,000 miles of telephone trunk lines which had to be withdrawn temporarily from their normal functions wherein transmission in both directions is essential, and specially prepared to give high quality transmission from the originating station out to the remaining 86 stations. This highly complex network of line equipment was set up by the technical staff of the Post Office, no less than 150 officers having to be employed for this occasion.

Broadcasting authorities have found that chain broadcasts enhance the value of their programmes and are keen to supplement their purely local programmes by descriptions of important events occurring outside their own localities or of performances of exceptional interest or merit arranged by other stations. It is in providing the means of transmitting these items to any number of stations that the telephone trunk line system plays such an important part in broadcast entertainment in this country.

The provision of channels suitable for programme transmission between broadcasting stations is now a feature demanding constant consideration in the planning of the long distance telephone system. In addition to the millions of miles of telephone channels which are diverted temporarily for broadcasting purposes, 5,700 miles of special high quality channels are used exclusively in this way. The association of certain country and metropolitan broadcasting stations for the purpose of programme economy and a wider advertising field has also resulted in the permanent leasing of channels between the stations concerned.

RIF CLUB OF SYDNEY

(Radio Industry Functions Club)

Formed February, 1937.

Chairman: J. L. Mulholland.
 Deputy-Chairman: A. L. Freedman.
 Treasurer: G. Davidson.
 Hon. Secretary: O. F. Mingay.
 Committee: C. F. Marden, W. Godley, A. R. Allen, E. Dare, C. Gittoes, A. P. Hosking, R. Jennings, G. Anderson.

POLICY AND OBJECTS:

The Club is composed of members engaged in radio and broadcasting in all its phases, and is formed for the purpose of carrying out social functions in the entire radio field, in so doing, any residue of funds to be used for such charitable and other purposes as the Board, at its discretion, deems advisable.

Luncheons are held fortnightly in Sydney.

The RIF Club of Sydney conducts the Radio Ball and the Xmas Radio Golf Outing.

Membership is open to all persons of good standing directly engaged in radio and broadcasting.

Subscription is 5/- p.a., and the financial year commences January 1 of each year.

Hon. Secretary's address is 30 Carrington Street, Sydney, 'phone B7188.

1937 Annual Report of the Institution of Radio Engineers (Australia)

Presented at the Annual General Meeting held at Science House, Gloucester and Essex Streets, Sydney, Wednesday, April 21, 1937

THE past financial year of the Institution of Radio Engineers (Australia), beginning April 1, 1936, and ending March 31, 1937, has been one of the most eventful years in the brief history of this Institution. During that period the Adelaide Division of the Institution was formed, and is now functioning very successfully.

The Institution was responsible for the establishing of Radio Foundation Day on December 12, in honour of the radio pioneers. That particular day was chosen because it was the day on which Marconi first successfully transmitted wireless signals across the Atlantic, in 1901.

The Institution also began organising in respect to the holding of a World Radio Convention during April, 1938, coinciding with Australia's 150th Anniversary Celebrations.

Another important development was the centralising at head office in Sydney, of all membership rolls and arrangements for the collection of all fees direct from head office. It was found necessary in that direction to arrange for the services of a full-time stenographer to help in carrying on the work.

Boards and Committees.

The respective boards and committees appointed to carry out various phases of work during the year performed excellent service.

QUALIFICATIONS BOARD.

(Chairman, Mr. A. S. McDonald.)
 The Qualifications Board, consisting of Messrs. A. S. McDonald (chairman), D. G. Wyles, W. T. S. Crawford and F. W. P. Thom, attended many meetings, and carried out the functions of their office in accordance with the Rules of the Institution.

During the year, in respect to the qualifications of applicants, Council decided to inaugurate a new membership grade, that of Associate, interspersing it between the Junior and Associate membership grades. This now makes the grades as follows:—Fellow, Full Member, Associate Member, Associate and Junior.

The Qualifications Board found that due to the increased wide-spread knowledge of the I.R.E. activities in all parts of Australia, it was necessary to admit into its ranks many people engaged in radio who wished to be associated with engineers. In this direction it was found that it was rather difficult for the Radio Society to function as such, and it was there-

fore decided to discontinue the Radio Society and to transfer all members thereof to the grade of Associate of the Institution.

Quite a number of applications for admission to the Institution were requested to sit for examination, which is held on the first Saturday in November of each year.

EXAMINATION BOARD
(Chairman, Mr. J. N. Briton.)

The annual examination of the Institution was held in November, 1936, when eight candidates sat for the grade of Associate membership. There were no Junior applicants. Seven of the eight applicants gained passes.

The chairman of the Examination Board particularly records the excellent co-operation he received from his colleagues on the Board during the year.

LECTURES AND PAPERS BOARD.
(Chairman, Mr. C. W. Tyrrell.)

The chairman of the Lectures and Papers Board reports that the Institution was favoured with a number of interesting lectures and papers during the period under review. There were 12 lectures and 3 outside functions, viz., a visit to the Radio-Electric Works, Ashfield, by courtesy of A.W.A., a demonstration of new sound developments by Raycophone Theatre, by courtesy of the Directors of Raycophone, and the Radio Foundation Day Dinner. The list of lectures is as follows:—

General meeting, 7/4/'36—Discussion: "Who Sets the Standard—the Valve Engineer or the Set Designer?"

General meeting, 1/5/'36—Illustrated Lecture by Dr. A. L. Green (Radio Research Board): "Non-Fading, Noise-free Broadcasting Services."

General meeting, 30/6/'36—Address to members on the introduction of radio to the Army by Major T. J. Farrow, Australian Instructional Corps: "The Development of Signals."

General meeting, 20/7/'36—Illustrated lecture by Mr. F. Langford Smith: "Tone Compensation in Broadcast Receivers."

General meeting, 12/8/'36—Illustrated lecture by Mr. V. H. Dudman, Manager Transmitting Department, Philips Lamps, on "Some Observations on Transmitter Design" (Part 1).

General meeting, 9/9/'36—Illustrated lecture by Mr. R. R. Mackay, Supervisor, Melbourne Technical College, on "The Theory and Design of Audio Beat-Note Oscillators."

September 12th, 1936—Visit to Radio-Electric Works of Amalgamated

Wireless A/sia Ltd., Ashfield, to inspect the new 60 k.w. broadcast transmitter for New Zealand.

General meeting, 21/9/'36—Illustrated Lecture by Mr. J. G. Reed, radio engineer, Amalgamated Wireless A/sia Ltd., on "Modern High Powered Broadcasting Transmitter Development."

General meeting, 14/10/'36—Illustrated lecture by Mr. V. H. Dudman, manager Transmitting Department, Philips Lamps, on "Some Observations on Transmitter Design" (Part 2.)

General meeting, 29/10/'36—Illustrated lecture by Dr. G. Builder, Research Laboratories, A.W.A., on "Noise Interference in Radio Receivers."

General meeting, 18/11/'36—Illustrated lecture by Mr. E. G. Beard, Director, Ace Amplifiers Ltd., on "Advanced Receiver Design."

General meeting, 1/12/'36—Illustrated lecture by Mr. F. Langford Smith, Development Engineer, A.W. Valve Co. Ltd., on "A Discussion on Sound Output Systems."

Annual dinner, 12/12/'36—Annual Dinner and Radio Foundation Day Function in honour of Marconi and Wireless Pioneers.

General meeting, 24/2/'37—Lecture by Mr. E. G. Beard on "Distance Measuring by Electrical Means."

March 17, 1937—Visit to Raycophone Theatre—General technical outline of the new Raycophone Panophonic Sound System given by Mr. Ray Allsop, Chief Engineer and Director of Raycophone Ltd.

ANNUAL AWARD.

The annual award by way of plaques for the various grades has not been determined for the period under review, but the new Council will have this matter in hand immediately. This is an annual award of a plaque for each grade of membership.

INTERSTATE DIVISIONS.

During the year the Council arranged with the Hon. General Secretary to visit Adelaide and form the Adelaide Branch. This was duly attended to.

In respect to Brisbane and Perth, time has not permitted finalisation of the foundation of these Divisions, but it is hoped this will be arranged before the end of 1937.

Victorian Division: Considerable progress has been made by the Victorian Division, under the Chairmanship of Mr. J. Malone.

I must place on record the excellent work done by the Hon. Secretary of the Melbourne Branch, Mr. R. R. Mackay, and the Hon. Secretary of the Adelaide Branch, Mr. A. H. Garth, both of whom have been a tower of strength in handling matters in their respective States.

I.R.E. (Aust.) Annual Report (Continued)

WORK OF COUNCIL.

On behalf of the President, Mr. E. T. Fisk, the various officers and Council are duly commended for their assistance and co-operation during the past year: Vice-Presidents, Messrs. Bean and Gilmour; Hon. Treasurer, C. H. Norville; Hon. Assistant Treasurer, S. V. Colville; Hon. Assistant Secretary, K. H. M. Denny, and Councilors Allsop, Briton, Court, Crawford, Hooke, Kennell, McDonald, Parker, Schultz, Thom, Tree, Tyrrell and Wyles.

RADIO FOUNDATION DAY.

Most members of the Institution are now well aware of the success of the inauguration of the Radio Foundation Day function on December 12. On that occasion, a dinner was held at the Hotel Australia, Sydney. A combined function was also held in Melbourne, the Adelaide branch held a dinner in Adelaide, and the Brisbane radio trade also organised a dinner in honour of the occasion.

Council of the Institution is extremely grateful to the various people who assisted in making these functions so successful.

Messages were exchanged from overseas, particularly from the I.R.E. in America and from Colonel Angwyn on behalf of the Wireless Section of the Institution of Electrical Engineers, England. Messages from Marconi and other well-known figures were also received.

The Institution intends to organise this function as an annual affair throughout the world, and it is hoped that in a very short time practically every country will be celebrating the pioneers of wireless on December 12 of each year.

I must record my appreciation of the assistance rendered by Mr. Hooke, Chairman of the Social Committee, in respect to this Radio Foundation Day function.

HON. LIFE MEMBER.

During the year under review the first Honorary Life Member of the Institution was appointed by a general meeting of members under recommendation of Council. Mr. W. Phil. Renshaw was duly elected an Honorary Life Member of the Institution in recognition of the valuable assistance rendered by him to the Institution and to radio in Australia, in the past.

GROWTH OF MEMBERSHIP.

At the beginning of the period under review, viz., April 1, 1936, there were 256 members of all grades, but this number increased to 314 during the 12 months, representing an increase of 22.6 per cent. N.S.W. membership increased by 17 from 164 to 181; Victoria by 9 from 64 to 73; Queensland by 8 from 10 to 18; South Australia by 16 from 9 to 25; Western Australia by 8 from 3 to 11, whilst Tasmania remained at 6.

In the various grades Full Members increased by 18 from 101 to 119, As-

sociate Members increased by 32 from 104 to 136 and Junior by 3 from 24 to 27. There are also other grades as follows: Fellow 1; Hon. Life Member 1; Associates 9 and Radio Society 21. This latter grade will be merged into the Associate Grade as from April 1 this year.

I.R.E. PROCEEDINGS.

The Council of this Institution has made new arrangements in regard to the publication of the proceedings of the I.R.E. It has now been arranged for the papers to be printed separately to be posted, and to be available only to members of the Institution. In this way members will have an advantage over non-members.

LENDING TECHNICAL LIBRARY.

Council has been giving consideration to the inauguration of some form of lending library for technical books, etc. This matter is receiving careful investigation with a view to bringing in some practical scheme.

TECHNICAL APPARATUS.

Council has arranged to hand back to the Wireless Institute of Australia (N.S.W. Division), certain technical instruments which were taken over in the transfer of the Wireless Institute to the I.R.E. a few years ago, and also has arranged for the amateur body in N.S.W. to officially take over the name and the old registration certificate of the Wireless Institute. This will then permit the recognised amateur body in N.S.W. to function under the name of the Wireless Institute of Australia (N.S.W. Division) and remain as an amateur body.

WORLD RADIO CONVENTION.

As previously reported, arrangements are well in hand for the holding of a World Radio Convention in Sydney on April 4th to April 14th, 1938. The Committee appointed by Council to carry out the arrangements for the Convention, has been meeting during the past year, successfully obtained the support of the N.S.W. Government and the sympathetic consideration of the Commonwealth Government. Invitations have been extended, to be official guests during April of next year, to the Marchese Marconi, Sir John Reith, Dr. A. F. Philips (Eindhoven), Baron Togo (Japan), and Mr. David Sarnoff (America).

Members will be pleased to hear that the Marchese Marconi has accepted, on behalf of himself and his wife, and also Mr. David Sarnoff has accepted on behalf of himself and his wife. Dr. Philips has requested time to give the matter attention to see whether he can definitely accept the invitation, and be away from Holland during that time. Sir John Reith regrets he cannot accept the invitation to be in Australia at that time, but as our President, Mr. Fisk, will be in England during the next few weeks, the matter will be discussed with Sir John on that occasion. Advice from Baron Togo of Japan has yet to come to hand.

The fact that the Marchese Marconi and other gentlemen have accepted the invitation will undoubtedly ensure the complete success of this very important event next year.

In connection with this World Radio Convention, intensive organisation is in hand to spread propaganda throughout the world, both per medium of broadcasting stations and the press. The aid of the amateurs and of the Wireless Institute of Australia has also been obtained, with the idea of spreading further propaganda to all parts of the world. Arrangements are in hand for bringing delegates from each State on behalf of the I.R.E. to attend in Sydney, and also in co-operation with the Wireless Institute for the holding of their Convention in Sydney at that time.

It is confidently anticipated that April, 1938, will be a very memorable period in the history of wireless in Australia.

SYDNEY DIVISION.

Council has made the necessary arrangements for the inauguration in the coming period of a Sydney Division, to operate similar to the Melbourne and Adelaide Divisions. In this way the Sydney operations will be more or less divorced from the main Council, and a committee will be appointed to carry on the Sydney activities. This will then relieve Council, and make it a Commonwealth body.

FINANCE.

The growth of the Institution is very readily reflected in the financial report, and now that the financial reports of all Divisions are in future to be incorporated in the Institution's main balance sheet, the question of accounting, auditing and collection of subscriptions, etc., will be much simpler. The Treasurer will deal with the financial statement in his report.

GENERAL PROGRESS.

As Hon. Secretary of the Institution since its inception, it is very gratifying for me to record the continued progress of same. The amount of secretarial work has increased to such an extent, as noted above, that Council found it necessary to appoint a full time stenographer.

Members from many parts of Australia have been assisted in many ways with information, and I want to assure all members, irrespective of their location, that if I, as Hon. Secretary, or the Institution generally, can be of any assistance to them, they have only to communicate with me or any member of Council, and we will do our best to help them in every direction.

It has been a very pleasing period, and a very satisfactory amount of work has been concluded, with every indication that the forthcoming year will be a most memorable one.

(Signed) O. F. MINGAY,
Hon. General Secretary.

Victorian Division Annual Report 1936-37

THE Honorary Secretary reports that during the year ending March 31, 1937, steady progress has been made by the Victorian Division in providing suitable lectures on subjects of interest to members and in maintaining a high standard of membership.

The total membership of the Victorian Division is ninety (90) members of all grades, and is made up of 34 Full members, 44 Associate members, 10 Juniors, and 2 members of the Radio Society. There have been two resignations, one being an Associate member and one a member of the Radio Society.

It is also worth noting the number of our members who have been transferred to the Sydney roll, they having changed their business affiliations and now permanently residing there. These changes now total 14. One member has transferred to Adelaide and three are in England temporarily.

GOVERNMENT OF THE INSTITUTION.

Because of the constant changes in location of members and the subsequent difficulties encountered in keeping membership records, it has been decided by the Council that all fees, irrespective of a member's location, shall be paid direct to the Hon. General Secretary at the headquarters of the Institution in Sydney. Future applications for membership together with application fees will also be dealt with as mentioned above. The applications will then be sent to the Victorian Qualifications Board for their attention and recommendations.

QUALIFICATIONS BOARD ACTIVITIES.

The Qualifications Board has met on numerous occasions during the year and has spent a considerable amount of time in examining the qualifications of the applicants who have applied for membership in the various grades. Six persons have been recommended for the grade of Member, twelve for the grade of Associate member, and six for Junior grade. Four applications are still being dealt with.

It has been decided by Council that the standard of entry for the various grades shall be raised considerably, and since this would have the effect of unduly restricting an applicant for membership to the Radio Society section, it has been decided to create a new grade. The grade will be known as Associate and will rank in seniority as follows: Fellow, Full member, Associate member, Associate and Junior. The new grade will be open to all persons engaged in the radio profession.

With the extension of the Institution's activities in forming a division in South Australia, and possibly in Queensland and Western Australia in the very near future, the method of government of the Institution has become a matter of importance.

As in the case of other professional institutions, it appears necessary to have some form of Federal controlling body to which will be responsible the divisions in each State. The committee of the Melbourne division has already reported to Council along these lines, and it is expected that in a very short time the necessary changes will be introduced. Under the new arrangement, the New South Wales members will be governed directly by a Divisional Committee in the same way as in Melbourne. The Council will then deal with matters of general policy affecting members as a whole.

The Council has also arranged that the proceedings of the Institution will be published separately and sent to members only, instead of being printed in the "Radio Review" as previously. This new arrangement will enable members to obtain details of discussions of the various divisions and should prove a definite aid to those members (like our Tasmanian members) who, because of their location, are unable to attend meetings.

LECTURES AND PAPERS SUB-COMMITTEE REPORT.

The Lectures and Papers sub-committee have endeavoured to provide a series of lectures covering widely diverging sections of the profession and their success can best be judged by the large attendance which was present at each. The following lectures took place during the year under review:—

May 7th, 1936.—"Technical Description of Gippsland Regional Station 3GI." S. H. Witt, P.M.G.'s Department.

June 16th, 1936.—"Factors Influencing Design of Loud Speakers." A. C. Webb, Rola Coy.

July 7th, 1936.—"Demonstration of Sound Waves and Films." Archibald, Ampro Films.

August 11th, 1936.—"Electrical Interference with Radio Reception." W. H. Conry, P.M.G.'s Department.

September 8th, 1936.—"Aids to Marine Navigation." H. M. Lamb, A.W.A.

October 13th, 1936.—"Technical Aspects of Inspection of Wireless Installations on Ships as Conducted by P.M.G.'s Department." E. Greig, P.M.G.'s Department.

November 23rd, 1936.—"Special Film of State Electricity Scheme."

The Committee has drawn up a programme of lectures for the ensuing six months, and the titles are listed as follows:—

"Receiving Aerial Design in Theory and Practice."

"The Application of Radio to Police Work."

"Modern Valve Design and Production."

"Research into the Upper Ionosphere."

"General Principles of Television."

"Design of Army Wireless Equipment."

"Modern Direction Finding Equipment for Aircraft."

"Technique of Broadcast Studio Design."

The Committee hopes that by arranging dates as far as possible to fall on the second Tuesday of each month, members will be able to keep the dates free.

In September last, members were notified that the Committee was arranging for Junior and Associate members to compete for a prize of £3 for each grade. The prizes were to be awarded for the best paper or thesis submitted as the original work of the member concerned on any subject of use in Radio Engineering. No papers were received, however, and the Lectures and Papers Sub-committee feels that the failure of Juniors and Associates to submit papers for consideration was due mainly to the fact that no lead was given as to suitable subjects. It is therefore suggested that similar awards again be offered for a paper submitted on either of the two subjects:—

(a) "Thermionic Valves and their general or any special application in Radio Engineering."

(b) "Condensers and their general or any special application in Radio Engineering."

Further details will be sent by circular letter as soon as the Council has agreed to the new proposals.

Two social functions were arranged during the year; the first was the special dinner held at Menzies Hotel in conjunction with the Victorian Radio Traders' Association. The dinner was held in honour of the Founders of Radio, and during the dinner speeches were received from overseas extending greetings to the institution. It has been suggested that such a dinner as well as the Annual Smoke Night, which is purely an informal evening for members, should be repeated this year.

Although it cannot be regarded as purely a social event, mention should

ANNUAL REPORT VICTORIAN DIVISION I.R.E.

—(Continued)

be made of the World Radio Convention which is to be held in Sydney next year as part of the Sesqui Centennial Celebrations in New South Wales.

on special sections of their work, and it is hoped that the Victorian members will be able to join in the activities if possible.

The Treasurer has provided a Statement of Receipts and Expenditure in place of the usual Balance Sheet. This change has been caused by the new arrangement whereby all subscriptions are paid to the central fund, hence one balance sheet will be

issued for the Institution as a whole, and not one for each Division as previously.

The following nominations have been received for the Committee and Office-bearers. As there are no excess of nominations over vacancies, no election is required and it is only necessary for this meeting of members to formally approve of the nominations,

Adelaide Division Annual Report

Presented by Chairman, Professor Kerr Grant

A preliminary meeting of members of the Institution of Radio Engineers resident in South Australia, held on May 27, 1936, at the Hotel Richmond, Mr. D. F. Mingay, Honorary General Secretary of the Institution, gave an address outlining the present situation of the I.R.E. in Australia, and describing its aims and objects.

January 18, 1937—Lecture by Mr. F. P. O'Grady, Transmission Engineer, P.M.G.'s Dept., "Adelaide on Developments in Australian Broadcasting."

March 10, 1937—Lecture by Mr. W. W. Honnor on "Wireless Abroad."

On December 12, 1936, the Division held a dinner at the Oriental Hotel to commemorate as Radio Foundation Day, the first trans-Atlantic communication by wireless, when Marchese Marconi was successful in receiving in Newfoundland a message sent out from Poldhu in Cornwall.

Chairman, Professor Kerr Grant; Vice-Chairman, Mr. H. W. Harrington; Secretary and Treasurer, Mr. A. H. Garth; Committee, Messrs. S. F. Ackland, D. M. Gooding, W. W. Honnor, C. E. Moule, R. Oakley, R. Parasiens, E. J. Risely, H. B. Wilson.

The first meeting of the Adelaide Division was held on June 1, 1936, at the Hotel Richmond, when 72 persons interested in radio, either from a technical or commercial aspect, were present.

Professor Kerr Grant was in the chair. Mr. Mingay addressed the meeting, explaining again the aims and objects of the I.R.E., and the advantages of membership.

A recorded address by Mr. E. T. Fisk, President of the Institution, specially composed for this occasion, in which Mr. Fisk congratulated South Australian members on the formation of a local Division, was reproduced.

A congratulatory message was also received from Mr. J. Malone, Chairman of the Melbourne Division.

MEETINGS.

Four subsequent general meetings have been held as under:—

September 14, 1936—Address by Professor Kerr Grant on "Secondary Electron Multipliers."

November 16, 1936—General discussion on present-day radio receivers.

MEMBERSHIP.

The number of members now enrolled stands at 25, which includes 10 Full Members, 10 Associate Members, 2 Associates and 3 Juniors.

SUB-COMMITTEES.

The following sub-committees have been appointed:—

Programme and Papers Committee—Messrs. H. W. Harrington, W. W. Honnor, D. M. Gooding and E. J. Risley.

Qualifications Committee—Messrs. H. W. Harrington, W. W. Honnor, D. M. Gooding.

Publicity Officer—Mr. H. B. Wilson has been appointed.

The Council of the Adelaide Division is considering the possibility of establishing a technical library for radio in Adelaide for the use of S.A. members.

The Council has appointed a delegate, the Vice-President Mr. H. W. Harrington, and a vice-delegate, Mr. D. M. Gooding, to the Council of the S.A. Division of the Australian Aerial Medical Service.

Applications for Membership to I.R.E. (Aust.)

Persons professionally engaged in radio are invited to submit applications for membership of the Institution of Radio Engineers of Australia.

Full particulars and application forms are available from

Hon. General Secretary, I.R.E. Aust., Box 3120 G.P.O., SYDNEY :: N.S.W.

READING THE FREQUENCY/WAVELENGTH CONVERSION CHART ON NEXT PAGE.

The chart on the following page shows the equivalent frequencies, in kilocycles per second, of the band of wavelengths between 10 and 100 metres. As will be seen, wavelengths are to be found in the column marked "M" and the equivalent frequency is shown in the adjacent right hand column marked "KC."

As the relationship of wavelength and frequency always remains constant, conversion for any wavelength or frequency outside the range of the chart may be effected by the use of a multiplying factor on one column and a divisor of the same value on the other. A factor of 10 will prove to be the most useful as the procedure is then simplified to a matter of shifting the decimal point.

Example: The equivalent frequency of 1,000 metres is required. 1,000 metres is ten times 100 (the highest wavelength on the chart.) The equivalent frequency is therefore (2,998 kc/sec. divided by 10) 299.8 kc/sec.

The reverse operation is quite as simple, and to illustrate this we will find the equivalent wavelength of 60 megacycles (60,000 kc/sec.). The nearest sub-multiple of this figure on the chart is 5,996 kc/sec., the frequency equivalent for 50 metres. 60,000 kc/sec. is very nearly ten times 5,996 kc/sec., so that it will be necessary to divide the wavelength equivalent of 5,996 kc/sec. by ten. This will give 5 metres (approximately) as the wavelength equivalent to 60 megacycles.

FREQUENCY/WAVELENGTH CONVERSION CHART

Table with 18 columns (M, KC, M, KC, M, KC, M, KC, M, KC, M, KC, M, KC, M, KC, M, KC) and 20 rows of frequency/wavelength conversion data.

A DICTIONARY OF RADIO DEFINITIONS

Abac. An alignment chart by which formulae can be enumerated and results read off by the simple expedient of placing a ruler between appropriate columns and noting the points of intersection with other columns.

Acoustical Labyrinth. An absorbent conduit attached to the rear of a loud speaker to prevent sound pressure waves radiated by the back of the cone from interfering with the sound pressure waves radiated from the front. Actually, any properly proportioned chamber lined with sound absorbent material will do this, but in order to reduce space requirements, the acoustic labyrinth is arranged so that the conduits are folded upon themselves.

Active Current. The "in-phase" component of an alternating current flowing in a circuit. The product of this and the voltage gives the true power.

Admittance. Denoted by the letter "Y," is the reciprocal of the impedance of an alternating current circuit.

Antenna Resistance. Given by the power supplied to the entire antenna circuit divided by the square of the antenna current (measured at the point where the power is supplied to the antenna).

Amplification Factor. A change in grid-cathode or input voltage of a tube will produce a corresponding change in plate-cathode or output voltage. The amplification factor is defined as the ratio between these voltages.

Amplifier, Class "A." A class "A" amplifier is one in which the bias and exciting grid voltages are such that plate current through the valve flows at all times. The ideal class "A" amplifier is one in which the alternating component of the plate current is an exact reproduction of the form of the alternating grid voltage, and the plate current flows 360 electrical degrees. The characteristics of a class "A" amplifier are low efficiency and output.

Amplifier, Class "B." A class "B" amplifier is one in which the grid bias is approximately equal to the cut-off value so that the plate current is virtually zero when no exciting grid voltage is applied, and so that the plate current in each tube flows during approximately one-half to each cycle when an exciting grid voltage is present. The ideal class "B" amplifier is one in which the alternating component of plate current is an exact replica of the alternating grid voltage half-cycle when the grid is positive with respect to bias voltage, and the plate current flows 180 electrical degrees. The characteristics of a class "B" amplifier are a medium efficiency and output.

Amplifier, Class "C." A class "C" amplifier is one in which the grid bias is appreciably beyond the cut-off so that the plate current in each valve is zero when no exciting grid voltage is present, and so that the plate current flows in each valve for appreciably less than one-half of each cycle when an exciting grid voltage is present. Class "C" amplifiers find application where high plate circuit efficiency is the paramount requirement and where departures from linearity between input and output are permissible. The characteristics of a class "C" amplifier are high plate circuit efficiency and high power output.

Angular Frequency. If the frequency of an A.C. wave is "f" c.p.s., the rotating vector by which it can be represented makes "f" revolutions per second, and, therefore,

rotates through an angle of $2\pi f$ radians per second. This is known as the angular frequency and is usually denoted by a small Greek "omega," or a small Greek "rho". (See "Radio Symbols" section, also table of Greek symbols in "Resistance Calculation" section.)

Apparent Inductance. The effective inductance of a coil. This is the inductance of the winding plus the extra inductance which is brought about by self-capacity in the winding.

Atmospherics. Strays produced by atmospheric conditions. The term static has come to be used quite generally as a synonym for atmospherics.

Attenuation. The reduction in magnitude of a wave with increasing distance from its source or from a specified point of reference.

Autodyne Reception. A system of heterodyne reception through the use of a device which is both an oscillator and a detector.

Automatic Volume Control. A system whereby the output of a receiver is held virtually constant over wide variations of signal input.

B/H Curve. A graph showing the relation between the magnetising force (H) and the resultant magnetic flux density (B) produced (usually in iron). The ratio B/H is known as the permeability of a material.

Beating. A phenomenon in which two or more periodic quantities of different frequencies react to produce a result having pulsations of amplitude. The resultant complete cycle of pulsations is known as a "beat."

Bias. A term used to denote the potential difference, usually negative, existing between cathode and control grid of a tube.

Biotron. A combination of two tubes connected so as to produce a particularly steep characteristic curve.

Bridge. A balanced measuring device in which two parallel paths, one of which contains an unknown quantity (of resistance, inductance or capacity), are provided for the flow of current. Balance of the two paths indicates that the unknown section of one path is equal in value to a known section in the other path. The bridge method of measurement was first introduced by Wheatstone as a resistance measuring device, but has since been adapted for the measurement and comparison of inductance or capacity.

Cathode Rays. Streams of electrons emitted by the cathode or negative electrode of a thermionic valve. See also under "Oscillograph."

Centimetre Units (of inductance and capacity). The C.G.S. (metric) units of inductance and capacity. One microhenry is equivalent to 1,000 centimetres of inductance, and one centimetre of capacity is equal to 1.1 microfarads.

Coercive Force. The magnetising force which must be applied in the reverse direction to a magnetised body in order to remove its magnetism.

Codan. Initials of "Carrier operated device, antinoise." A muting system arranged to suppress noise during breaks in carrier. Specially developed for communications services.

RADIO DICTIONARY

(Continued.)

Conversion Transconductance. The ratio of the intermediate frequency current in the primary of the I.F. transformer to the applied radio frequency voltage producing it. Used to determine performance of a frequency changer valve.

Coupling Co-efficient. The ratio of the mutual or common impedance component of two circuits to the square roots of the product of the total impedance components of the same kind in the two circuits. The impedance components may be inductive, capacitive, or resistive.

Cross Modulation. Due to modulation of the carrier of a desired signal by an undesired signal.

Decibel. The decibel is the practical transmission unit in which gains or levels are expressed. The gain of an amplifier in decibels is numerically equal to ten times the common or "base 10" logarithm of the ratio of the output power to the input power. (See section "The Decibel System" for further details.)

Decrement of a train of waves is the ratio of one peak value to that immediately succeeding it in the same direction.

Detection. Any process of operation on a modulated signal wave to obtain the signal imparted to it in the modulation process.

De-modulation. A term applied to the process of modulation carried out in such a manner as to recover the original signal. In radio reception the term "detection" is commonly used for this process.

Dielectric. Insulating material used between the plates of a condenser.

Differential Resistance. The ratio of a change of applied voltage to the resultant change of current in any electrical device where the two are not related as in Ohm's Law. This applies in particular to the plate resistance of a valve.

Diode. A type of thermionic valve containing two electrodes and which passes current wholly or predominantly in one direction.

Direction Finder. A radio receiving device which permits determination of the line of travel of radio waves as received.

Distortion. A change in wave form occurring in a transducer or transmission medium. The principal sources are (a) non-linear relations between input and output at a given frequency; (b) non-uniform transmission at different frequencies, and (c) phase shift not proportional to frequency.

Doublet Antenna. One consisting of two elevated conductors substantially in the same straight line and of approximately equal lengths with the power delivered at the centre.

Dynatron. A valve operated with a low plate voltage and a high grid or screen voltage so that the plate impedance is virtually negative due to secondary emission. Oscillation will occur if the plate circuit is tuned, no feed back to the grid circuit being necessary.

Eddy Currents are those induced in a solid conductor due to a varying magnetic field, as, for example, in the core of a power transformer.

Electron. This is the fundamental particle of electricity, negative in sign.

Electron Multiplier. A special valve-like device which utilises secondary emission principles.

Facsimile Transmission. The electrical transmission of a graphic record having a limited number of shade values.

Farad. The unit of capacity. The normal unit used in radio is the "microfarad" (one millionth of a farad).

Fidelity. The degree to which a system, or any portion of a system, accurately reproduces at its output the form of the signal which is impressed upon its input.

Field Intensity. The effective (root-mean-square) value of the electric or magnetic field intensity at a point due to the passage of radio waves of a specified frequency. It is usually expressed in terms of electric field intensity in microvolts or millivolts per metre. When the direction in which the field intensity is measured is not stated, it is assumed to be measured in the direction of maximum field intensity.

Filter, Band-Pass. A combination of inductances and condensers designed to pass a pre-determined band of frequencies with a sharp cut-off at each end of the band.

Filter, High-Pass. A filter circuit arranged to permit only frequencies above a certain value to pass.

Filter, Low-Pass. A filter circuit arranged to permit only frequencies below a certain value to pass.

Flux Density. The number of lines of magnetic force per unit area of cross section of a magnetic circuit. Usually expressed as "lines per square (inch or centimetre)." Symbol is "B."

Forced Oscillations. Those maintained in a tuned circuit by an outside source of energy, always at the frequency of the supply.

Free Oscillations. Those which occur in a tuned circuit at the natural or resonant frequency of the circuit.

Fundamental Frequency. The lowest component frequency of a periodic wave or quantity.

Gauss or "Maxwell." The unit of field strength or magnetic flux density used for comparative purposes or for calibration. Is a flux density of one line per square centimetre. Thus a flux density of 10,000 lines per sq. cm. would be expressed at 10,000 Gauss.

Gilbert. The unit of magnetomotive force.

Grid Rectification. The use of a valve for de-modulating high frequency transmission by utilising the one-way conductivity of the grid filament circuit. During the impact of a train of waves, the resultant flow of current through the grid leak depresses the mean voltage of the grid, and so reduces the value of the plate current at an audible frequency corresponding to modulated components in the original wave.

Harmonic. A component of a periodic wave or quantity having a frequency which is a multiple of the fundamental frequency. For example, a component whose frequency is twice the fundamental frequency is called the second harmonic.

Henry. The unit of inductance.

Heterodyne Reception. The process of receiving radio waves by combining in a detector a received voltage with a locally generated alternating voltage. The frequency of the locally generated voltage is usually different from that of the received voltage. This system is sometimes known as beat reception.

Heaviside Layer. A stratum or layer of ionised particles in the upper regions of the atmosphere. This layer serves to reflect and/or refract electro-magnetic sky waves which would otherwise escape into space.

RADIO DICTIONARY

(Continued.)

Homing Device. A direction-finder system for aircraft use, comprising a fixed loop and a trailing aerial. Manipulation of a switch indicates whether the aircraft is on or off the course, determined by a radio beacon.

Hysteresis. The tendency of magnetisation to lag behind the magnetising force, as, for example, in the case of an iron-cored transformer. This produces the transformer iron loss which is directly proportional to the area of the hysteresis loop for the particular sample of iron in use.

Image Ratio. A term used in the assessment of superheterodyne receiver selectivity. Is the ratio of the signal strength increase required to produce the same output, when the receiver is detuned twice the I.F. from resonance with the signal, as when the receiver is tuned to resonance.

Impedance. The opposition offered by a circuit to the passage of alternating current due to the combined effects of inductance, resistance, and capacity.

Inductance. The property of a circuit by virtue of which it opposes any alteration in the value of the current, and hence offers opposition to alternating current.

Inverse Feed-Back. Also termed "negative" or "reversed" feed-back. A system whereby portion of the output from a valve amplifier is fed back to the input in reverse phase, thus setting up degeneration. Useful for the reduction of distortion and resonance effects.

Inverse Voltage, Peak. The highest voltage that a rectifier valve can safely stand in the direction opposite to that in which it is designed to pass current.

Ionisation. The process of splitting up molecules into their component ions carrying positive or negative charges. The ions so produced thus act as carriers of electricity through the liquid or gas.

Kilocycle Per Second. A unit of frequency equal to 1000 cycles per second. The frequency corresponding to any wave-length may be found by dividing the wavelength in metres into the constant 300,000. Conversely, to obtain the wave-length in metres, divide the constant 300,000 by the frequency in kilocycles per second.

Linear Detection. That form of detection in which the output voltage under consideration is substantially proportional to the carrier voltage throughout the useful range of the detecting device.

Litzendraht (Litz). A stranded conductor in which each strand is insulated from every other strand. Radio frequency resistance is reduced by this means.

Magnetron. A diode valve having a straight filament surrounded by a cylindrical anode, a powerful magnetic field being applied coaxially with the filament. Used as a generator of ultra-high frequencies.

Magnetising Force. The magnetic field strength in lines per sq. cm. at a point where no iron or other magnetic material is present. Symbol is "H."

Megacycle Per Second. A unit of frequency equal to one million cycles per second.

Mho. The unit of admittance (A.C.) and also of conductance (D.C.).

Modulation. The process whereby the frequency or amplitude of a wave is varied in accordance with a signal wave.

Modulation Capability. The maximum percentage of modulation that is possible without objectionable distortion.

Mutual Conductance. The ratio of change in plate current of a valve to the change in the control grid voltage producing it, under the condition that all other voltages remain unchanged. The unit may be expressed in milliamperes per volt, or micromhos.

Neper. A transmission unit somewhat similar to the decibel, but is calculated on the Napierian or base "e" scale of logarithms.

Octode. A dual-purpose valve containing 6 grids in addition to a heater, cathode and anode. Usually employed as a frequency changer in superheterodyne circuits; similar to the pentagrid.

Oscillator. A non-rotating device for producing alternating current, the output frequency of which is determined by the characteristics of the device.

Oscillograph. An instrument for showing visually, or recording photographically, the wave-form of alternating or other periodically changing currents and voltages. In the electro-magnetic type, a mirror is attached to a small coil suspended in a magnetic field. In the cathode-ray type, a stream of electrons is controlled by electro-static and/or electro-magnetic fields. (See measuring instrument section for full definition of all terms used in cathode-ray oscillograph operation.)

Pentagrid. A dual purpose valve containing 5 grids in addition to a heater, cathode and anode. Usually employed as a frequency changer in superheterodyne circuits, where electronic modulation provides the coupling between the oscillator and amplifier portions of the valve.

Pentode. A 5 electrode valve incorporating between screen and plate a suppressor grid which is usually connected to the cathode. By this means the effect of secondary emission in the vicinity of the plate is avoided.

Percentage of Modulation. This is 100 times the ratio of half the difference between the maximum and minimum amplitudes of a modulated wave to the average amplitude.

Permeability. The ratio of the magnetic flux produced in any substance to the applied magnetising force, which is itself equal to the magnetic flux in air. The measure of magnetic conductivity.

Picture Transmission. The electrical transmission of a picture having a gradation of shade value.

Piezo-electric Effect. A phenomenon exhibited by certain natural crystals (such as Rochelle Salt, quartz or tourmaline) as a result of which physical stresses in the crystal are set up by the application of an electrical potential. The reverse also applies.

Power Detection. That in which the power output of the detecting device is used to supply a substantial amount of power, directly to a device such as a loudspeaker or recorder.

Power Factor. The ratio of the true power (watts) in an alternating current circuit to apparent power (volt-amperes). It is always less than unity, since the voltage and current are not in phase.

Preselector. A selective tuned circuit preceding the radio frequency amplifier in a receiver, in order to avoid cross modulation troubles and lack of selectivity. Sometimes referred to as a band-pass filter.

Proximity Effect. One of the factors which tend to increase the R.F. resistance of a conductor wound into a coil. Is set up by interference between the magnetic fields of adjacent turns.

Quartz Crystal Oscillator. One utilising the piezo-electric effect of a quartz crystal plate. The mechanical oscillations of the quartz plate are maintained by means of a thermionic valve, a high degree of frequency stability being obtained.

Radiation Efficiency. The ratio of the power radiated to the total power supplied to an antenna.

Radiation Resistance. This is obtained by dividing the power radiated from an antenna by the square of the antenna current, measured at the point where the power is supplied to the antenna.

Radio Beacon. A transmitting station in a fixed geographic location which emits a distinctive or characteristic signal for enabling mobile stations to determine bearings or courses.

Radio Compass. A direction-finder used for navigational purposes.

RADIO DICTIONARY

(Continued.)

Reflex Circuit. One in which the signal is amplified both before and after detection, in the same amplifier valve or valves.

Regeneration. Sometimes called reaction or feedback. A process by which a part of the power in the output circuit of an amplifying device reacts upon the input circuit in such a manner as to reinforce the initial power, thereby increasing the amplification. The feed-back in such a system is "in-phase," as distinct from "negative feed-back."

Regulation. A measure of the change in voltage at the output of an electrical device under varying conditions of load.

Renode. A thermionic valve which has no grid in the accepted sense of the term. Control is provided by focusing the electrons emitted by the cathode into a beam and using various electrodes for the purpose of focussing or acceleration. Greater sensitivity and linearity of response is obtained and also greater efficiency. The new "beam power" valves, such as the 6L6, operate on a similar principle to this. First introduced by A. S. Jensen, a Danish engineer.

Screen Grid Valve. (See also Tetrode.) A four-electrode valve in which an extra grid carrying a high positive potential is interposed between the plate and the control grid, electro-statically screening these elements and preventing capacity feed back. At the same time the flow of electrons is not impeded.

Secondary Emission. Electrons liberated from the plate of a valve by the violent impact of the normal electron stream from the cathode.

Sideband. A band of frequencies on either side of the carrier frequency produced by the process of modulation.

Skin Effect. The tendency for high frequency currents to travel along the outside of a conductor. The radio frequency resistance of a solid wire is thus somewhat higher than its D.C. resistance.

Space Charge. A cloud of electrons which hovers between the cathode and the plate. This charge tends to repel electrons leaving the cathode, with a resultant increase in internal impedance of the valve.

Specific Inductive Capacity, or Dielectric Constant. The ratio between the capacities of two condensers, one with the material under consideration as the dielectric, the other with an air dielectric. Abbreviated, S.I.C. The usual symbol is "K."

Static. See atmospherics.

Strays. Electric-magnetic disturbances in radio reception, other than those produced by radio transmitting systems.

Superheterodyne Reception. The method of reception in which the received voltage is combined with the voltage from a local oscillator and converted into voltage of an intermediate frequency which is amplified and then detected to reproduce the original signal wave. Sometimes called "double detection" or "supersonic" reception.

Super Re-generation. A circuit in which a reactive detector is maintained, by means of a local quenching valve, at the threshold of oscillation, where it operates with increased efficiency.

Television. The electrical transmission of a succession of images and their reception in such a way as to give a substantially continuous and simultaneous reproduction of the object or scene before the eye of a distant observer.

Tetrode. A type of thermionic valve containing a plate, cathode, and two additional electrodes ordinarily in the nature of grids.

Thyratron. A special form of gas-filled rectifier in which the plate current is controllable by a grid. The term "Thyratron" is a registered trade name and the term "grid-controlled rectifier" is usually used.

Transconductance. The ratio of the change in the circuit of an electrode to the change in the voltage on another electrode, under the condition that all other voltages remain unchanged.

Triode. A type of thermionic valve containing an anode, cathode, and a third electrode, in which the current flowing between the anode and cathode may be controlled by the voltage between the third electrode and the cathode.

Variable-mu Valve. A thermionic valve which has a long sloping characteristic, thus enabling a continuous change of amplification factor to be effected by a change of grid bias.

Vector. A quantity which is represented by both the magnitude and direction of a straight line. Vector methods are largely used in alternating current work.

Video. Vision. A term used to distinguish between the sound and vision channels in television transmission and reception.

Vodas. The initials of "voice operated device, anti-singing." A device developed by Australian and New Zealand engineers for use on the Trans-Tasman telephone service for reduction of feed-back effects encountered during operation.

Wattage, Dissipation, Anode. The difference between input and output wattages in the plate circuit of a valve, the maximum permissible figure usually being stated by the manufacturer.

Wave Form. The shape of a curve representing an alternating current.

Wave-length. The distance between two successive peaks in any periodic wave-train.

TELL THE ADVERTISERS ABOUT YOUR STATION

Tell the national and local advertisers and advertising agencies, the value of your station
your successful advertisers . . . your listener response . . . station features, etc. Keep
the merits of your station before the advertisers . . . SELL THEM by advertising in—

BROADCASTING BUSINESS

THE DECIBEL SYSTEM

The decibel (or "transmission unit") has been adopted as the practical unit by which the loudness of sounds may be compared. The computation of the unit is based on the Briggsian (base 10) logarithmic tables, and it has many other applications than that of loudness comparison. The chart shown below and the accompanying explanation will give a useful insight into the working and application of the system.

Energy.	Voltage	Number of Decibels	Energy.	Voltage
"Up"			"Down"	
1.26	1.12	1	0.794	0.891
1.59	1.26	2	.631	.794
2.00	1.41	3	.501	.708
2.51	1.59	4	.398	.631
3.16	1.79	5	.316	.562
3.98	2.00	6	0.251	0.501
5.01	2.24	7	.1999	.447
6.31	2.51	8	.158	.398
7.94	2.82	9	.126	.355
10.00	3.16	10	.100	.316
12.59	3.55	11	.079	0.282
15.85	3.98	12	.063	.261
19.96	4.47	13	.050	.224
25.12	5.01	14	.040	.200
31.62	5.62	15	.032	.178
39.81	6.31	16	.025	0.158
50.12	7.08	17	.020	.141
63.10	7.94	18	.016	.126
79.43	8.91	19	.013	.112
100.00	10.00	20	.010	.100
125.9	11.22	21	.0079	.089
158.5	12.59	22	.0063	.079
199.6	14.13	23	.0050	.071
251.2	15.85	24	.0040	.063
316.2	17.78	25	.0032	.056
398.1	19.96	26	.0020	.050
501.2	22.39	27	.0016	.047
631.0	25.12	28	.0013	.040
794.3	28.18	29	.0010	.035
1,000.0	31.62	30	.0010	.032
1,259	35.48	31	.0008	.028
1,585	39.81	32	.0006	.025
1,996	44.67	33	.0005	.022
2,512	50.12	34	.0004	.020
3,162	56.23	35	.00032	.018
3,981	63.10	36	.00020	.016
5,012	70.80	37	.00016	.014
6,310	79.43	38	.00013	.013
7,943	89.13	39	.00010	.011
10,000	100.00	40	.00010	.010
12,590	112.2	41	.00008	.0089
15,850	125.9	42	.00006	.0079
19,960	141.3	43	.00005	.0071
25,120	158.5	44	.00004	.0063
31,620	177.8	45	.000032	.0056
39,810	199.6	46	.000025	.0050
50,120	223.9	47	.000020	.0047
63,100	251.2	48	.000016	.0040
79,430	282.0	49	.000013	.0036
100,000	316.0	50	.000010	.0032
1,000,000	1,000	60	.000001	.001
10,000,000	3,162	70	.0000001	.0003
100,000,000	10,000	80	.00000001	.0001
1,000,000,000	31,620	90	.000000001	.00003
10,000,000,000	100,000	100	.0000000001	.000003

The number of decibels Ndb corresponding to the ratio between two amounts of power P₁ and P₂ is

$$N \text{ db} = 10 \log_{10} \frac{P_1}{P_2}$$

When two voltages E₁ and E₂ or two currents I₁ and I₂ operate in the same or equal impedances,

$$N \text{ db} = 20 \log_{10} \frac{E_1}{E_2}$$

and

$$N \text{ db} = 20 \log_{10} \frac{I_1}{I_2}$$

If E₁ and E₂ or I₁ and I₂ operate in unequal impedances,

$$N \text{ db} = 20 \log_{10} \frac{E_1}{E_2} + 10 \log_{10} \frac{Z_2}{Z_1} + 10 \log_{10} \frac{k_2}{k_1}$$

and

$$N \text{ db} = 20 \log_{10} \frac{I_1}{I_2} + 10 \log_{10} \frac{Z_1}{Z_2} + 10 \log_{10} \frac{k_1}{k_2}$$

where Z₁ and Z₂ are the absolute magnitudes of the corresponding impedances and k₁ and k₂ are the values of power factor for the impedances.

The accompanying table will enable the number of decibels corresponding to various energy and voltage ratios to be ascertained without calculation. Current ratios may be substituted for the voltage ratios given if desired.

Care should be taken not to confuse "Gain in db" with "Level in db." Each is commonly expressed in decibels although, strictly speaking, a level should be referred to as "db above zero level." Thus while the output level of a given amplifier is, say, 30 db, its gain may be only 20 db.

The threshold of audibility is much too low a level to be used as a reference intensity for relatively loud sounds such as those coming from a loud speaker, therefore "zero level" of 0 db = 6 milliwatts has been adopted from telephone transmission practice.

An idea of the intensity of sound at "zero level" may be had if it is remembered that speech from a telephone receiver held tightly against the ear is about zero level when it is just too loud to be comfortable. This represents a level roughly 50 db above the threshold of audibility.

The great advantage of the decibel system is that overall figures may be obtained by adding the decibels gain or loss of the various stages. For example, consider the overall gain of an amplifier whose first stage has a voltage amplification factor of 15, followed by a 10 db attenuator, another stage whose amplification factor is 15, and a final stage whose factor is 5. Referring to the table, we have the following approximate figures:

$$\text{Overall gain} = 23 - 10 + 23 + 14 = 50 \text{ db.}$$

It should be noted that the decibel equivalents on left for voltage ratios "up" or "down" are only correct when the input and output impedances are the same. For dissimilar impedances, a calculation along the lines indicated in the text will be necessary.

Decibel System (Continued.)

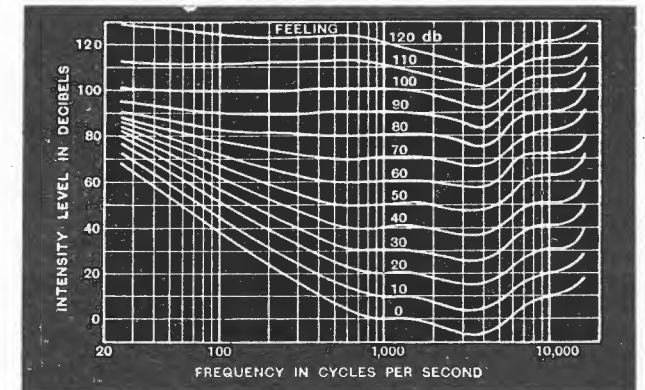
This is a much simpler and less unwieldy procedure than the older method of multiplying the gain factors together.

It will be observed that 10 times power indicates a level of 10 db, 100 times indicates 20 db, 1,000 times indicates 30 db, etc. A handy rule for finding the level when the ratio of the powers involved is a power of 10, is to remember that the number of decibels is ten times the power index. In the examples above, 10 = 10¹, 100 = 10², and 1,000 = 10³, hence the levels are (10 × 1), (10 × 2), and (10 × 3) decibels respectively. This should be of assistance to those unfamiliar with the use of logarithms.

SENSITIVITY OF THE EAR

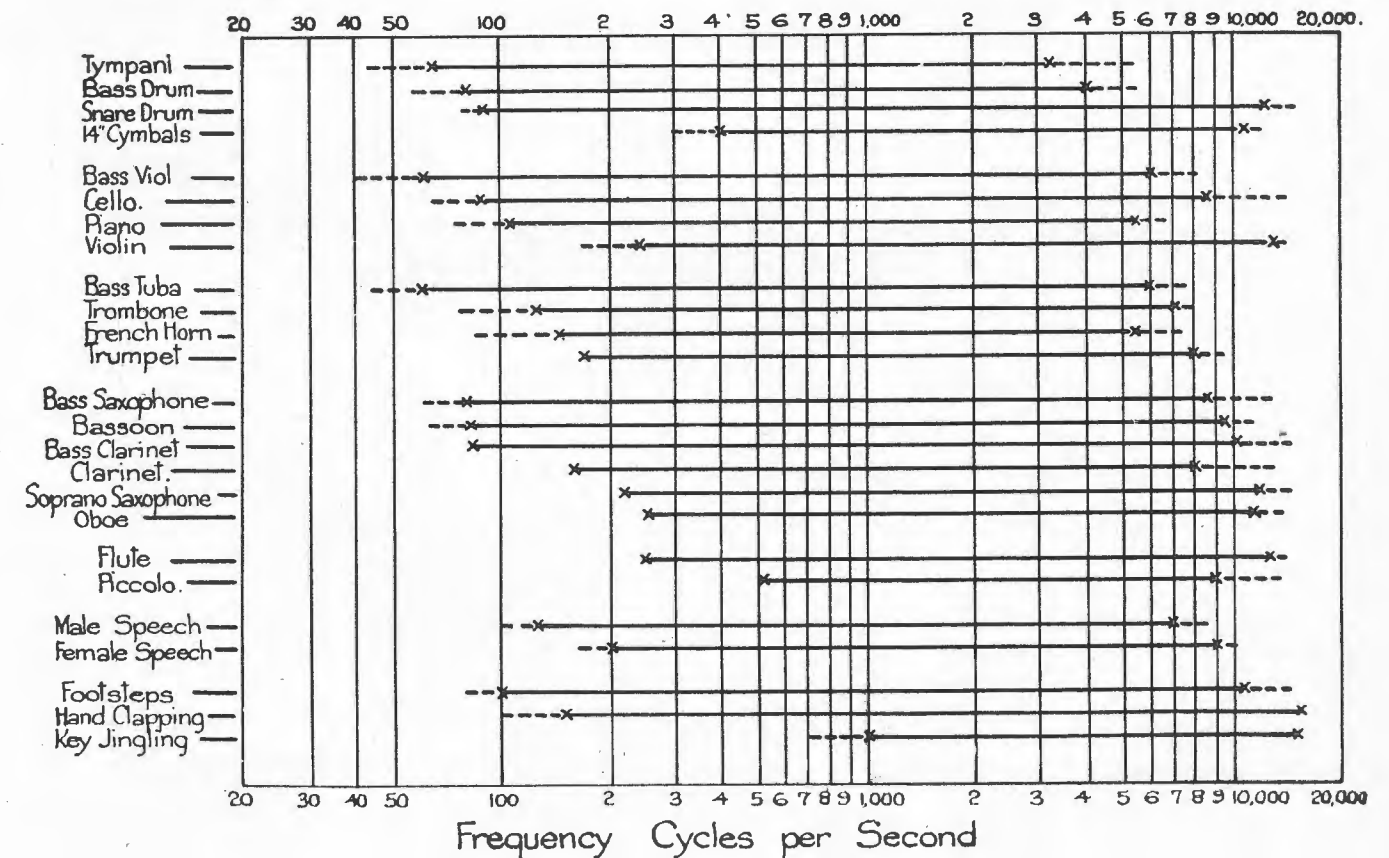
While the human ear is an extremely sensitive acoustic device it is also an extremely erratic one. No two ears are exactly the same when judged by "sensitivity" or frequency response curves. Each one is full of small peaks at differing frequencies. In addition the sensitivity of the ear will vary from day to day and considerably over a period of years. In general as age creeps on the ear becomes less sensitive to the higher frequencies in comparison to the lower.

A further factor to be considered is that the sensitivity of the ear varies considerably with the intensity of the sound being heard. The accompanying illustration gives an excellent indication of the manner in which the sensitivity of the "average" human ear varies over the audio frequency spectrum and also over a range of levels from "threshold" up to the point where a sound is "felt" instead of being "heard." This illustration, together with that showing the frequency spectra of various musical instruments, should be of value to all acoustic engineers.



The relationship between sound intensity (to the ear) and level at various frequencies.

Frequency Spectra of Musical Instruments



P.M.G.'s 26th Annual Report

For Period July 1, 1935—June 30, 1936

BROADCASTING SERVICE.

FURTHER progress has been made with the extension of the National Broadcasting System. Two new stations were opened during the year, i.e., 3GI (Longford), Victoria, in October, 1935, and 7NT (Kelso), Tasmania, in August, 1935. Six other stations are in course of construction and will be brought into service in the near future.

Particulars of the National Stations are given in Appendix Z (b).

New Radiator.

Theoretical investigations conducted in the Department's Research Laboratories resulted in the discovery of a means for improving the radiation from aerials used for radio broadcasting purposes, and the invention was developed and engineered into a full scale structure. The first such structure was built for the National Broadcasting Regional Station 2NR, which was under construction near Grafton, New South Wales. The object of the proposal was to reduce high angle radiation and to augment the horizontal and low angle radiation, thus extending the effective non-fading area of the station. In the case of Station 2NR, the service area has been approximately doubled.

Programme Carrier Systems.

The facilities provided by the telephone service for the transmission of broadcast programmes between stations were augmented by the provision of a carrier programme system between Melbourne and Adelaide. This will ultimately feed 3WV Regional Station (Victoria).

A system was also installed between Sydney, Grafton and Brisbane which feeds 2NR Regional Station as well as providing the interstate relay channel.

A similar channel has also been provided with the Tasmanian cable project, relaying between Melbourne, Launceston and Hobart.

A channel between Rockhampton and Townsville is being installed.

Commercial Broadcasting Stations.

There are now 73 Commercial Broadcasting Stations in operation, sixteen additional stations having commenced service during the year. Twenty-two stations are located in the capital cities and 51 in the country areas. The aggregate weekly programme hours are 4,868.

Use of Trunk Lines for Broadcasting Purposes.

The Australian Broadcasting Commission and Licensed Broadcasting organisations continue to make extensive use of the long distance telephone system to link up stations for the simultaneous radiation of programmes of special interest, and during the year telephone channels were used for relay purposes on 5,641 occasions by the Commission, and in 5,329 instances by licensed stations. The utilisation of these networks occupied the trunk channels for 17,351 hours.

Interstate channels were utilised exclusively by the Australian Broadcasting Commission on 3,773 occasions, whilst the licensed stations made use of them 996 times. Of the total relays which took place, 88 included broadcasting stations in six States, 665 extended to five States, 768 to four States, 1,276 to three States, and 1,972 to two States.

Some idea of the variety of items which are transmitted over the trunk lines for broadcasting can be gained from the following details which relate to national service programmes transmitted over interstate channels last year, viz:—

Item.	No. of Relays
Race descriptions	1,237
News sessions	675
Talks and speeches	640
Musical programmes	456
Cricket descriptions	241
Stock exchange, market and corn reports	228
Overseas programmes	106
Operas, plays, etc.	94
Sporting descriptions	43
Miscellaneous items	37
Concerts	16
	<u>3,773</u>

All previous records for a simultaneous broadcast were broken on one occasion during the year, when 87 separate broadcasting stations in the Commonwealth were linked together. This necessitated the use of 18,000 miles of telephone trunk lines which had to be withdrawn temporarily from normal service and specially prepared by the technical staffs of the Post Office to give high quality transmission from the originating station out to the remaining 86 stations.

The provision of channels suitable for programme transmissions between broadcasting stations is now a feature demanding constant consideration in the planning of the long distance telephone system. In addition to the thousands of miles of telephone channels which are diverted temporarily for broadcasting purposes, 5,700 miles of special high quality channels are used exclusively in this way. The association of certain country and metropolitan broadcasting stations for purposes of programme economy and a wider advertising field have also resulted in the permanent leasing of channels between the stations concerned.

The value of the Post Office trunk system to the broadcasting services of the Commonwealth is well nigh incalculable, making it possible for listeners throughout the vast area of Australia to receive programmes of high merit and of special interest, which would otherwise be denied them.

Broadcast Listeners' Licences.

Licences authorising the reception of broadcast programmes increased during the year by 103,284 or 14 per cent., compared with 122,693 or 21 per cent. during the previous year; the total for the Commonwealth at 30th June, 1936, was 825,136. This number represents 52 per cent. of the total dwellings. The greatest percentage increase was recorded in Queensland, where the number of licences increased by 15,684 or 23 per cent.

The greatest density exists in South Australia (including Northern Territory), where 87,500 homes or 61 per cent. of the total dwellings are equipped with licensed receivers.

The corresponding licence totals and percentages in brackets for the other States, in order of density of radio dwellings, are:—

Victoria	263,817 (59)
New South Wales (inc. Federal Capital)	316,340 (51)
Western Australia	50,081 (46)
Tasmania	24,168 (45)
Queensland	83,230 (37)

Of the total licences in the Commonwealth (825,136), 66 per cent. are in the metropolitan areas.

(Continued on Page 73.)

P.M.G.'s Report (Continued)

On pages 85, 86 and 87 of the report are graphs showing—

- (a) the annual development of listeners' licences in the various States;
- (b) the number and percentage of licences in the metropolitan areas;
- (c) the density of listeners' licences in Australia and other countries.

During the year, 33,184 persons availed themselves of the plan whereby the payment of licence fees may be made by affixing postage stamps to a special form supplied for the purpose.

Unlicensed Listeners.

Prosecutions during the year, in connexion with the use of unlicensed broadcast receivers, numbered 1,364; the total amount of fines and costs inflicted totalled £2,845. Up to 30th June, 1936, 11,540 persons were convicted for this offence, the fines and costs aggregating £27,301. The number of investigations by Licence Inspectors during the year exceeded 101,000.

Radio Inductive Interference.

During 1935-36 the investigations into cases of interference to broadcast reception were vigorously pursued. Approximately 7,700 cases were

dealt with and in 6,800 instances the interference was eliminated as a result of the Departmental efforts. The remaining 900 are awaiting further attention.

In the course of their investigations, the officers engaged on the work travelled more than 95,000 miles and made 15,000 inspections.

Proficiency Certificates.

During the year, 813 candidates were examined for Operators' Certificates of Proficiency. The number of certificates issued was—

Commercial—First Class	45
Second Class	26
Limited—Radiotelegraphy	0
Radiotelephony	47
Amateur	187
Total	<u>305</u>

Other Radio Services.

The total number of radio-communication stations (other than Broadcasting Stations and Experimental Stations) in operation in the Commonwealth, including Papua, at 30th June, 1936, was 421, compared with 280 at the end of the previous year. The comparative figures for the various classes are—

	No. at 30/6/35	No. at 30/6/36
Coast Stations	21	21
Ship Stations	105	195
Aircraft Stations	12	14
Land Stations	67	102
Portable Stations	28	29
Special Stations	47	60
	<u>280</u>	<u>421</u>

The increase in the number of ship stations is almost wholly accounted for by the introduction of Commonwealth legislation compelling the fitting of wireless telegraphy apparatus in all ships engaged in interstate trade and by the adoption of similar legislation by the States of New South Wales, Victoria and Queensland in regard to vessels trading within the confines of these States. Previously, the installation of wireless telegraphy apparatus was compulsory only in ships engaged in interstate trade which carried more than twelve passengers or which were of not less than 1,600 tons gross.

The additional land stations consist mostly of low-powered pedal transmitters established in remote areas of the Commonwealth.

Stations in the Mandated Territory of New Guinea at 30th June, 1936, numbered 26.

Experimental stations increased during the year from 1,319 to 1,523.

(Continued on foot of Page 74.)

DETAILS OF FIXED ASSETS—WIRELESS PLANT.

Description	Value on 1st July, 1935	Expenditure, 1935-36	Gross Value on 30th June, 1936	Dismantled Assets Depreciation written off, and Assets transferred, 1935-36		Net Value on 30th June, 1936
Other Broadcasting and Wireless Assets	10,609	21,542	235,590	235	235,355	
National Studio Equipment	42,393	10,826	53,219	1,147	52,072	
National Station Equipment	214,048					
		1,117	11,726	129	11,597	
Total Wireless Plant	267,050	33,485	300,535	1,511	299,024	

The results of working the Wireless Branch are as follow:—

State	1935-36		1934-1935	
	Surplus	Deficit	Surplus	Deficit
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
New South Wales	51,697 1 9	..	66,407 14 11	..
Victoria	39,942 7 5	..	74,556 14 9	..
Queensland . . . . .	..	1,740 6 2	5,983 18 3	..
South Australia	7,084 19 7	..	12,755 6 1	..
Western Australia	983 10 9	..	3,064 19 10	..
Tasmania . . . . .	..	11,783 19 2	..	425 10 7
	99,707 19 6	13,524 5 4	162,768 13 10	425 10 7

Total Net Surplus, 1935-36 £86,183 14s. 2d.
Total Net Surplus, 1934-35 £162,343 3s. 3d.

SUMMARY OF FINANCIAL RESULTS—WIRELESS BRANCH.

	1934-5						Total 1934-5	Total C'wealth, 1935-36
	N.S.W.	Vic.	Qld.	S.A.	W.A.	Tas.		
	£	£	£	£	£	£	£	
Earnings	133,516	110,476	32,369	37,060	20,445	10,170	371,604	344,036
Working Expenses (exclusive of Interest)	77,799	68,023	31,845	28,365	17,572	20,600	193,507	244,204
Earnings compared with Working Expenses	55,717	42,453	524	8,695	2,873	..	178,097	99,832
Interest on Capital including Exchange thereon	4,020	2,511	2,264	1,610	1,889	1,354	15,754	13,648
Result, after providing for Working Expenses and Interest	51,697	39,942	..	7,085	984	..	162,343	86,184
Percentage of Working Expenses to Earnings	58.27	61.57	98.38	76.54	85.95	202.56	52.07	70.98

Technical Considerations Governing the Location of Broadcasting Transmitters

THE following data were prepared by the Federal Communications Commission of U.S.A. as a guide to owners of broadcasting stations in that country. The information is extremely sound and will apply as well in Australia as in the country of its origin. Many of our readers will no doubt have read this matter previously, as it has been extensively reprinted in American journals, in which case there is obviously no need to read it again. We are quite sure, however, that there are an equal number who have not read it, and it is for their benefit, as well as for record purposes, that we pass the information along.

THE Federal Communications Commission has no rules or regulations concerning the location of transmitters of broadcast stations. The Communications Act of 1934 requires that the Commission pass upon sites, and pursuant thereto applicants desiring to obtain approval of sites for broadcast transmitters are required to supply the Commission with extensive technical data concerning the proposed site. These data are reviewed by the Engineering Department while the application is in regular routing through the Commission.

The Engineering Department makes a complete report to the Commission for its consideration in passing upon the application. In making the report the Engineering Department is guided by the data supplied by the applicant and what it considers good engineering practice. In some cases Field Division supplies supplement data, and the applicants may be required to supply additional data if the case could not be properly reported from the data supplied in the application.

To insure uniformity several empirical standards on the location of transmitters of broadcast stations have been adopted, based on the extensive experience of the Engineering Department and all data available along this line. Heretofore there has been little published data on sites, and this paper is offered as a guide and for the information of those who desire to know the Engineering Department's standards.

Importance of Sites.

It is only recently that the importance of selecting the proper site for broadcast transmitters has been fully realised. The coverage success of a broadcast station is dependent in a large measure upon selecting the proper site which may directly determine the efficiency of the radiating system and the field intensity throughout any desired centre of population. Recent engineering surveys of transmitters reveal that the efficiency of radiating systems vary from approximately 5.7 per cent. to 57 per cent., the location of the transmitter and the antenna being in a large measure responsible for this wide variation. A 1,000-watt station with a 57 per cent.

efficient antenna would be equivalent to a 10,000-watt transmitter with 5.7 per cent. antenna efficiency, other conditions being the same.

It has been found that certain low-power stations are much more successful in covering centres of population than high-powered stations, due to the efficiency of the radiating system and the location of the transmitter. It data were available on the primary coverage of all broadcast stations and tabulated according to power, it would undoubtedly reveal that power alone is of minor importance in determining the coverage and that there are other factors which are more influential.

As a matter of fact, the percentage of modulation is more important than power, and the effectiveness of the site and antenna efficiency of the radiating system are more important than either.

The operating power of a station and the minimum percentage of modulation are fixed by the Commission, and every licensee of a broadcast station should select a site from which a maximum city and rural service may be had and the minimum amount of interference produced with other stations.

By the Commission's plan of allocation, power is allocated by steps which increase by approximately twice the

next lower step. A study of the transmitter locations and radiating systems indicates that these two factors may have a materially greater effect than these small power steps. A station assigned 500 watts may by the mere expediency of selecting a suitable location and efficient radiating system increase the effective coverage much more than by increasing the power by twice or even more as given in the above example.

Primary Objectives.

The three primary objectives to be attained in the selection of a site for the transmitter of a broadcast station are as follows:

1. To serve adequately the centre of population in which the studio is located and give maximum coverage to adjacent areas.

2. To produce minimum crosstalk interference to the receptions of other stations assigned to adjacent channels.

3. Pass requirements of Federal Communications Commission.

If a site is engineeringly correct, presumably it will pass the requirements of the Federal Communications Commission.

The table herewith is offered as a general guide to be used in determining the approximate site of broadcast transmitters. That is, from this table it may be determined whether or not

P.M.G.'s Report

(Continued from Page 73.)

Profit and Loss.

Expenditure—Wireless, £244,204/4/- (1.62%); Surplus—Wireless, £99,831/14/2 (0.66%); Interest and Exchange—Wireless, £13,648 (0.09%); Surplus after charging interest, £86,183/14/2 (0.57%).

Revenue.

Wireless, £344,035/18/2 (2.28%).

Summary of Depreciation in Profit and Loss.

Depreciation of Stores in Stock and Miscellaneous Plant £7
Depreciation Reserve £30,342

Depreciation Reserve.

Equipment: N.S.W., £8,922; Vic., £5,246; Qld., £5,215; S.A., £4,534;

W.A., £3,168; Tas., £2,801; Total, £29,886.

Radio Inspector's Addresses.

Sydney: Mr. W. T. S. Crawford, Haymarket Post Office Chambers, 635 George Street. 'Phone B040.

Melbourne: Mr. J. M. Martin, Treasury Gardens, C.2. 'Phone Central 5551.

Brisbane: Mr. T. Armstrong, General Post Office. 'Phone BY8371.

Adelaide: Mr. H. W. Harrington, Commonwealth Offices, Post Office Place, Adelaide. 'Phone Central 6100.

Perth: Mr. G. A. Scott, General Post Office. 'Phone B6023.

Hobart: Mr. E. J. G. Bowden, Telephone Buildings, Harrington Street. 'Phone (prefix not used in Hobart) 5081.

Full particulars relating to Departmental Wireless Matters can always be obtained from any of the Senior Radio Inspectors listed above.

Location of Transmitters (Continued)

the station should be located in the centre of the city or at some distance from the city.

In case the power and the population of the city are such that it should be located at some distance from the centre of the city, the approximate distance is given as well as the population of the so-called "blanket area." The "blanket area" of a broadcast station is defined as that area in which the average broadcast receiver would not receive satisfactorily, without cross-talk, other stations operating on a frequency separated by 50 kilocycles or more. If the city under consideration is of irregular shape, the table may not apply, but the general principles set out will still hold.

Another factor to be considered is the relation of the site to airports and airways. There are no regulations or laws with respect to distance from airports and airways, but a distance of three miles from each is used as a guide. In case a suitable location is found at less distance than this, it may be satisfactory if the towers are suitably painted and lighted in conformity with local aeronautical requirements or if the towers are not higher than the surrounding objects. The latter is poor radio engineering. In selecting a site, the local aeronautical authorities should always be consulted if there is any question concerning erecting a hazard to aviation, and in case of towers over 200 feet high this should always be done.

Sites Within Cities.

In selecting a site in the centre of a city, it is usually necessary to place the radiating system on the top of a building. This building should be large enough to permit the necessary spacing and height of towers. Great care must be taken to avoid selecting a building surrounded by taller buildings or any building higher than the antenna and in the direction which it is desired to serve. Such a build-

ing will tend to cast shadows in the field intensity, which may materially reduce the coverage of the station in that direction.

If from Table A it is determined that a site should be selected removed from the city, then there are several general conditions to be followed in determining the exact site. The table gives the approximate distance from the centre of the city. Three maps should be given consideration if available:

1. Map of the density of population and number of people by sections in the area.

2. Geographical contour map with contour intervals of 20 to 50 feet.

3. Map showing the type, nature and depth of the soil in the area, with special reference to the condition of the moisture throughout the year.

From these maps a site should be selected that is approximately the required distance from the city with a minimum population in the "blanket area" and with a minimum number of intervening hills between it and the centre of the city. In general, because of ground conditions, it is better to select a site in a low area rather than on top of a hill, and the only condition under which a site on top of a hill should be selected is that it is only possible by this means to avoid a substantial number of hills between the site and the centre of a city with consequent field shadows.

If a compromise must be made between probable field shadows from intervening hills and locating the transmitter on top of a hill, it is generally better to compromise in favour of the lower area where an efficient radiating system may be erected and take the losses due to shadows being caused by the hills if not too numerous or too high. Several transmitters have been located on top of hills, but so far as is known not a single installation has given the average efficiency of propagation and coverage.

Ideal Broadcast Locations.

The ideal location of a broadcast transmitter is in a low area of marshy or "crawfishy" soil or area which is damp the maximum percentage of time and from which a straight line view over the entire centre of population may be had, and the tall buildings in the business section of the city would cast a shadow across the minimum residential area.

The type and condition of the soil or earth immediately around a site is very important. Important, but to a less extent, is the soil or earth between the site and the principle area to be served. Sandy soil is considered the worst type, with glacial deposits and mineral ore areas next. Alluvial, marshy areas and salt water bogs have been found to have the least absorption of the signal. One is fortunate to have available such an area, and, if not available, the next best condition must be selected.

If a site is to be selected to serve a city which is on a general sloping area, it is generally better to select a site below the city than above the city.

Careful consideration must be given to selecting a site, so that the number of people in the "blanket area" is a minimum. The last column of Table A gives the percentage of the total population of the city or metropolitan area that may be permitted in the "blanket area." In general, broadcast transmitters operating with approximately the same power can be grouped in the same approximate area and thereby reduce the crosstalk interference between them.

By the Commission policy, stations serving the same area must have a frequency separation of 50 kilocycles, and this practice is observed in practically all cases. It is presumed that owners of any radio receiving sets would have no difficulty in separating signals separated in frequency by 50 or more kilocycles when the receiver is located not in the "blanket area" of either station. This is not strictly

(Continued on Page 76.)

GUIDE IN DETERMINING STATION SITES

TABLE A

Power of Station	Population of City or Metropolitan Area	Radius of "Blanket Area" 100 to 125 MV/M	Site Distance from Centre of City (Business or Geographical)	Maximum Percentage of Total Population in "Blanket Area"
50-100 w.	5,000-50,000	0.3 to 0.4 mile	1/2 to 2 miles or centre of business section	0.50
50-100 w.	75,000 and up	0.3 to 0.4 mile		0.75
250-500 w.	5,000-150,000	0.6 to 0.9 mile	1 to 3 miles or centre of business section	0.75
250-500 w.	200,000 and up	0.6 to 0.9 mile		0.75
1,000 w.	5,000-200,000	1.25 miles	2 to 5 miles or centre of business section	1.0
1,000 w.	250,000 and up	1.25 miles		1.0
5-10 kw.	All	2.7 to 3.75 miles	7.5 to 10 miles	1.0
25-50 kw.	All	4.5 to 6.0 miles		12.0 to 20 miles	1.0

Location of Transmitters (Continued)

true, however, of some old receiving sets and any set in a poor state of repair and alignment, as they may not have the capability of separating stations operating on frequencies 50 or more kilocycles separated. This is especially true when the transmitters of the stations are so located that in certain areas there are large differences in the field intensities from the stations and on the higher frequencies. If this condition could be alleviated without impairing the coverage of the stations and at the same time protect all receivers, this would be desirable.

In cases of several stations serving large cities, the principle of grouping transmitters could not be advantageously applied to all stations located in the area because generally any station has some field shadow and accordingly may not well serve certain parts of the city. Another station with the transmitter across the city would serve this area well, so that between the two they would serve all the areas well.

The ideal arrangement would be to group the transmitters of the stations operating nearest in frequency and between which there may be some possibility of crosstalk interference.

If the city is of irregular shape, it is often possible to take advantage of this in selecting a suitable location that will give a maximum coverage and at the same time maintain a minimum of people within the "blanket area." The maps giving the density of population will be a key to this. The map giving the elevation by contours will be a key to the obstructing hills between the site and city. The map of the soil conditions will assist in determining the efficiency of the radiating system that may be erected

and the absorption of the signal encountered in the surrounding area.

Efficiency of Radiators.

In finally selecting the site consideration must be given to the required space for erecting an efficient radiating system. It is the general practice to use direct grounds consisting of a radial buried wire system. If the area is such that it is not possible to get such a ground system in soil that remains moist throughout the year, it probably will be found better to erect a counterpoise. A counterpoise properly erected may be as efficient as the best possible ground, and, if it is not possible to secure an excellent ground the counterpoise should always be given consideration. It, like the antenna itself, must of course be designed properly for the operating frequency and other local conditions.

It is always highly desirable, and whenever possible, a field intensity survey should be made to determine that the site selected will come up to the expectations and meet the requirements. Often two or more sites may be selected that appear to be of equal promise. It is only by means of field intensity surveys taken with a transmitter at the different sites that it can be determined which is more desirable. There are many considerations of inefficiency that cannot be determined by any other method. An engineer with experience in selecting a site can generally do a good job by inspection, but he can never be certain without the survey. The field survey should prove the following things:

1. A minimum field intensity of 10 to 25 millivolts per meter will be obtained over the business area of the city.

2. A minimum field intensity of at least 2 to 5 millivolts per meter will be obtained over the residential section.

3. The absorption of the signal is the minimum of any obtainable sites in the area. As a guide in this respect the absorption of the signals from other stations in that area should be followed as well as the results of tests on other sites.

4. The field intensity at the outer limit of the blanket radius does not exceed 100 to 125 millivolts per meter.

In the absence of field surveys, the average conditions are presumed to prevail. If a compromise must be made between sandy soil, high elevations, and intervening territory, a field intensity survey should be made from several sites.

In conclusion let it be said that there are now many stations licensed to operate with specific powers which could undoubtedly gain a better coverage of their primary areas by selecting more suitable sites and erecting efficient radiating systems than could be obtained by a one or two step increase in power. As commercial surveys become more popular this fact will become evident throughout the industry.

In making the final determination of a site, it cannot be stressed too much the need for a field intensity survey to establish the exact conditions and the consideration of the results with the field intensities considered in comparison not only with other sites in the same area but with other existing stations in the same and other areas. The selection of a proper site for a broadcast station is an important engineering problem and can only be done properly by experienced radio engineers.

**RADIO
REVIEW**

Price - 1/- post free
MONTHLY TECHNICAL REVIEW

Presents in practical and theoretical form technical information on the developments in radio to-day, and has proved of practical assistance to radio technicians throughout Australia.

SEND TO AUSTRALIAN RADIO PUBLICATIONS LTD., BOX 3765, G.P.O., SYDNEY.

Australian Radio Tariff Schedule

In Accordance with the Customs Tariff, 1933-1936

In the following schedules the first duty is British Preference Tariff, the second Intermediate Tariff, and the third, General Tariff. The Intermediate Tariff rates shown are at present inoperative.

Readers will observe that the majority of the articles mentioned in this section of tariff items are used also in the manufacture, maintenance or conduct, of transcription recording and transmission equipment.

In addition to the rates of import duty shown hereunder, primage duty is payable on goods covered by certain items as follows:—

Item No.	Tariff Items.	Primage Duty.	
		B.P.T.	General
179 (D) (4) (a)	...	Free	4%
" 180 (E)	...	5%	10%
" 180 (G)	...	5%	10%
" 180 (I)	...	5%	10%
" 181 (A) (2)	...	10%	10%
" 404	...	Free	4%
" 415A	...	Free	4%

The import duty on goods admissible at the British Preferential Tariff rate under Tariff Items 180 (E) (9), 180 (E) (10), 180 (E) (11), 180 (E) (12) 180 (E) (13), 180 (E) (15), 180 (E) (16), and 180 (G), is subject to a deduction in accordance with the Customs Tariff (Exchange Adjustment) Act, 1933-1936, and in this connection Section 5 of that Act reads as follows:—

"5. The duties of Customs (other than primage duty and duty imposed by the Customs Tariff (Industries Preservation) Act 1921-1936 (or any Act amending or in substitution for that Act) which would, but for the provision of this Act, be payable on goods to which protective duties apply and which are admissible under the British Preferential Tariff and which are entered for home consumption on or after the fifth day of October, one thousand nine hundred and thirty-three, shall be varied in accordance with the following provisions:—

(a) Whenever at the date of exportation of any such goods Australian currency is depreciated to the extent of not less than sixteen and two-thirds per centum in relation to the currency of the British country from which those goods are imported, a deduction from the amount of duty payable on those goods in accordance with any law of the Commonwealth for the time being in force imposing Duties of Customs (other than primage duty and duty imposed by the Customs Tariff (Industries Preservation) Act, 1921-1936, or any Act amending or in substitution for that Act) or in accordance with Customs Tariff proposals shall be made of—

(i) one-fourth of that amount of duty; or
(ii) twelve and one-half per centum of the value for duty, whichever is the less; and

(b) Whenever at the date of exportation of any such goods Australian currency is depreciated to the extent of not less than eleven and one-ninth per centum and less than sixteen and two-thirds per centum in relation to the currency of the British country from which those goods are imported, a deduction from the amount of duty payable on those goods in accordance with any law of the Commonwealth for the time being in force imposing Duties of Custom (other than primage duty and duty imposed by the Customs Tariff (Industries Preservation) Act, 1921-1936, or any Act amending or in substitution for that Act), or in accordance with Customs Tariff proposals shall be made of—

(i) one-eighth of that amount of duty; or
(ii) six and one-quarter per centum of the value for duty whichever is the less."

179. ELECTRICAL MACHINES AND APPLIANCES.—

(D) (4) (a) Elements for electric current rectifier assemblies, other than rectifying valves covered by item 181 (A) (2) ad val. British Preferential Free, Intermediate Tariff 15%, General Tariff 15%.

180. (E) WIRELESS RECEIVERS, PARTS THEREOF, and ACCESSORIES THEREFOR, viz:—

1. Chargers, Battery exceeding 1 ampere and up to and including 5 amperes—each 15/ (British); 24/- (Intermediate); 26/6 (General). †

And in respect of paragraph (1)—For each £1 by which the equivalent in Australian currency of £100 sterling is less than £125 at the date of exportation—an additional duty of each 2/4. †

2. Condensers, fixed mica, each 3d., 4d., 4½d. †

And in respect of paragraph (2)—For each £1 by which the equivalent in Australian currency of £100 sterling is less than £125 at the date of exportation—an additional duty of each .02d. †

3. Articles for tuning devices, viz:—

(a) Dials, complete, per unit 2/, 2/6, 2/8. †

And in respect of sub-paragraph (a)—for each £1 by which the equivalent in Australian currency of £100 sterling is less than £125 at the date of exportation—an additional duty of, per unit, .16d. †

(b) Dial or Scale Assembly, per unit, 6d., 9d., 9½d. †

And in respect of sub-paragraph (b)—for each £1 by which the equivalent in Australian currency of £100 sterling is less than £125 at the date of exportation—an additional duty of, per unit, .04d.

(c) Drives, ratio reducing, per unit 1/6, 1/9, 1/10½d. †

And in respect of sub-paragraph (c)—for each £1 by which the equivalent in Australian currency of £100 sterling is less than £125 at the date of exportation—an additional duty of per unit, .12d. †

4. Resistances, fixed, having a resistance value of 2 megohms and over—each 2½d., 4d., 4½d. †

And in respect of paragraph (4)—for each £1 by which the equivalent in Australian currency of £100 sterling is less than £125 at the date of exportation—an additional duty of each, .02d. †

5. Rheostats, potentiometers and variable resistances other than carbon type variable resistances, each 6d., 8d., 8½d. †

And in respect of paragraph (5)—for each £1 by which the equivalent in Australian currency of £100 sterling is less than £125 at the date of exportation—an additional duty of each, .06d. †

6. Sockets, valve, each 2d., 3½d., 4d. †

And in respect of paragraph (6)—for each £1 by which the equivalent in Australian currency of £100 sterling is less than £125 at the date of exportation—an additional duty of each, .04d. †

7. Transformers, audio and radio—each 1/6, 2/6, 2/9. †

And in respect of paragraph (7)—for each £1 by which the equivalent in Australian currency of £100 sterling is less than £125 at the date of exportation—an additional duty of each ½d. †

8. Combined power transformers and chokes or any device for eliminating "AB," "BC" or "ABC" batteries, such as power packs and similar devices, whether imported separately or incorporated in a wireless receiving set each 15/-, 25/-, 26/6. †

And in respect of paragraph (8)—for each £1 by which the equivalent in Australian currency of £100 sterling is less than £125 at the date of exportation—an additional duty of each ½d. †

(Continued Overleaf.)

CUSTOMS TARIFF SCHEDULE

(Continued from Page 77.)

less than £125 at the date of exportation—an additional duty of each 1½d. †

or, as to all the goods covered by paragraphs (1) to (8) of sub-item (E) the following rates if same return a higher duty, viz.:—ad val 30 per cent., 50 per cent., 57½ per cent.

And for each £1 by which the equivalent in Australian currency of £100 sterling is less than £125 at the date of exportation—an additional duty of, ad val. .6 per cent.

† See provision after paragraph (2) of this sub-item for alternative ad valorem rates.

9. Choke coils suitable for use in connection with battery eliminating devices, each 5/., 10/-. ‡

10. Condensers, variable, of capacities exceeding .0001 microfarad, but not exceeding .001 microfarad—with gang or drum control—per each condenser contained therein, 1/6, 3/-. ‡

Without gang or drum control, each 1/6, 3/-. ‡

11. Condensers, variable, midget, of .0001 microfarad capacity or less, each 1/., 1/6. ‡

12. Loudspeakers and Parts thereof:

(a) Loudspeakers including transformers, each 10/., 12/6. ‡

(b) Parts of loudspeakers imported other than in complete loudspeakers, viz.:—

(1) Field coils, each 2/., 3/-. ‡

(2) Field Coil Cores, each 9d., 1/3. ‡

(3) Field Coil Housings, each 1/., 1/6. ‡

(4) Cones with or without voice coils, each 1/3, 1/9. ‡

(5) Cone Housings, each 1/9, 2/3. ‡

(6) N.E.I. other than transformers, ad val. 35 per cent.—55 per cent.

Provided, however, that in the case of combinations of any of the abovementioned parts duty shall be payable on such combinations as though the parts were imported separately.

13. Transformers, power, each 10/., 15/-. ‡

or as to all the goods covered by paragraphs (9) to (13) of sub-item (E) with the exception of the goods covered by clause (6) of sub-paragraph (b) of paragraph (12) the following rates if same return a higher duty, viz.: ad val. 35 per cent.—55 per cent. ‡

14. Headphones; Parts n.e.i. of wireless receivers, other than cabinets—ad val. 30 per cent., 50 per cent., 57½ per cent.

And in respect of paragraph (14)—for each £1 by which the equivalent in Australian currency of £100 sterling is less than £125 at the date of exportation—an additional duty of ad val. 6 per cent.

15. Wireless Receiving Sets wholly assembled, partly assembled, or unassembled, excluding cabinets, valves, loudspeakers, headphones, batteries or any device for eliminating batteries—

Per valve socket excluding sockets for valves forming part of any battery eliminating device—12/6, 25/., or ad val. 35 per cent., 55 per cent.

whichever rate returns the higher duty.

Provided—(1) In the absence of valve sockets the sets shall be charged duty at the above rates on the basis of the number of valves for which they are constructed or designed.

‡ See provision after paragraph (13) of this sub-item (on this page) for alternative ad valorem rates.

(2) In the instance of sets constructed or adapted for use with multiple purpose valves, the sets shall be charged duty equal to that payable on sets having an equal number of unit stages using unit function valves.

16. Wireless Receiving Sets and Gramophones combined, excluding cabinets, valves, loudspeakers, headphones, batteries or any device for eliminating batteries, each 20/., 25/-. ‡

And in addition per valve socket excluding sockets for valves forming part of any battery eliminating device—12/6, 25/-. ‡

Or as an alternative to the cumulative fixed rates provided above ad val. 35 per cent.—55 per cent.

whichever rate returns the higher duty.

Provided—(1) In the absence of valve sockets the combined sets shall be charged duty at the above rates on the basis of the number of valves for which they are constructed or designed. (2) In the instance of combined sets constructed or adapted for use with multiple purpose valves, the combined sets shall be charged duty equal to that payable on combined sets having an equal number of unit stages using unit function valves.

180 (G) STORAGE BATTERIES AND PARTS THEREOF, Viz.:—

1. Storage Batteries for wireless receiving sets, whether imported separately or incorporated in or forming part of a wireless receiving set, ad val. 50 per cent.—70 per cent.

2. Storage Batteries suitable for use in motor vehicles (other than motor cycles) otherwise than for propulsion purposes, whether imported separately or incorporated in or forming parts of any goods covered by sub-item (D) of item 359—ad. val. 50 per cent.—70 per cent.

3. Composition parts, including containers for storage batteries for wireless receiving sets and for storage batteries suitable for use in motor vehicles (other than motor cycles) otherwise than for propulsion purposes—per lb. 2d., 2½d., and ad val. 40 per cent.—60 per cent.

DRY BATTERIES.

1. Dry Batteries and Dry Cells of all descriptions, whether imported separately or incorporated in any article or appliance, per lb. 2d., 5d., 5½d., or ad val. 25 per cent., 42½ per cent., 48½ per cent.

whichever rate returns the higher duty.

And in respect of sub-item (1)—for each £1 by which the equivalent in Australian currency of £100 sterling is less than £125 at the date of exportation—an additional duty of, per lb., .02d., or ad val. .4 per cent., .5 per cent. whichever is applicable.

VALVES.

181 (a). 2. Valves for wireless telegraphy and telephony, including rectifying valves, each, 2/3, 3/6, or ad val. 20 per cent.—40 per cent.

whichever rate returns the higher duty.

Under the excise tariff for the year 1921-1936, Item 19 provides for valves for wireless telegraphy and telephony, including rectifying valves, but not including metal type valves, 2/- each.

And on and after July 1, 1937, valves for wireless telegraphy and telephony, including rectifying valves, 2/- each.

This means that after July 1, 1937 (subject to any possible alteration that may occur later than March, 1937), all valves made in Australia are subject to a local excise duty of 2/- each.

RECORDING APPARATUS.

There are two rulings covering the import of recording apparatus equipment, the first of which deals with recording heads only, which are to be used in conjunction with Australian-built equipment, such as amplifiers. On this basis it is possible to bring in recording heads under a "guarantee" classification, and the duty payable is only 15 per cent. This means that the apparatus must not be re-sold without the Department being notified, and must always be used in conjunction with other Australian-built apparatus.

Should it be desired to import a complete recording installation, i.e., a recording head and associate amplifier, together with the necessary motor and turn-table, a duty of 65 per cent. must be paid and 10 per cent. primage. These figures are for American equipment, as at present very little work has been done in this direction by English manufacturers. The figures relating to British apparatus are 45 per cent. duty and 5 per cent. primage.

(Continued on Next Page.)

CUSTOMS TARIFF SCHEDULE

(Continued)

RECORDING MATERIALS: If complete discs are brought in it is necessary to pay a duty of, British 1/- each, and Foreign 1/6 each, for discs over six inches diameter and, British 6d., Foreign 10d. for discs six inches and under. But if record material only is imported it comes under a weight classification at 4d. a pound, with 10 per cent. primage for imports from Foreign countries, and 3d. a pound with 5 per cent. primage, from British countries.

MASTER MATRICES imported for local pressing are subject to a duty of 45 per cent. less a quarter, and 5 per cent. primage, British; and 65 per cent. and 10 per cent. primage, Foreign.

RECORDING AND TRANSMISSION ITEMS.

	British Duty	prim- age	Foreign Duty	prim- age
Loudspeakers	10/- each less ½	5%	12/6 each	5%
Pickups	27½% less ½	5%	47½%	10%
Gramophone motors (174Y)	Free	Free	15%	4%
Microphones (174Y)	Free	10%	20%	10%
Test Gear	Free	Free	15%	4%
Meters	Free	Free	15%	4%
Playback (including fibre) Needles	25%	10%	42½%	10%
Cutting (high grade steel) Needles	Free	Free	15%	4%

Item 404, Miscellaneous.

Materials and Minor Articles of a class or kind not commercially produced or manufactured in Australia, for use in the manufacture of goods within the Commonwealth, as prescribed by Departmental By-Laws are subject to an ad val. duty of—British free, Foreign 15 per cent.

FOR USE IN THE MANUFACTURE OF ALL KINDS OF ELECTRICAL APPARATUS AND APPLIANCES, resistance alloys in the form of wire, bars, rods, sheets, or strips; jet insulating beads; porcelain insulating beads of sizes less than ¼ inch diameter by ¾ inch long over all measurements; cotton covered copper wire finer than 30 gauge (I.S.W.G.); insulating tubes, except:—Tubular cotton braiding or sleeving, bakelised paper, porcelain, hard rubber.

Speaker units under security for the manufacture of magnetic type loud speakers.

Permanent magnets under security for the manufacture of loud speakers.

FOR THE MANUFACTURE OF WIRELESS RECEIVING SETS, battery cables (not including terminals), consisting of several flexible cords contained in one braided cover; woven antenna, i.e., aerial tape without terminals, under security; cotton-covered loop antenna wire for inside aerials, under security.

Record changing devices imported unassembled, excluding pick-ups 12 inch turntables and motors, for use in the manufacture of combined radio gramophone sets.

Bright cold rolled steel strips 3½ ins. wide x 3/16 ins. thick under security for manufacture of Field Coil Housings for Loud speakers.

The undermentioned items may be added to the list of articles admissible under tariff item 404:—

FOR USE IN THE MANUFACTURE OF RADIO "B" BATTERIES, ALKALINE TYPE, TO BE FITTED INTO CABINETS, COMPLETE WITH CHARGING APPARATUS OF AUSTRALIAN MANUFACTURE, connectors, under security, elements, under security, separators, under security.

FOR USE IN THE MANUFACTURE OF CONDENSERS, metal foil, under security, tissue paper, used as a dielectric, under security.

FOR ALL PURPOSES, aluminium sheets, plain, satin finished, and/or polished.

FOR USE IN THE MANUFACTURE OF LEADS OR CABLES, BRAIDED, FOR WIRELESS RECEIVING SETS, cotton yarns or threads, polished, single or 2-ply, dyed or otherwise, under security.

FOR USE IN THE MANUFACTURE OF POTENTIOMETERS AND VARIABLE RESISTANCES, carbon rings, under security.

FOR USE IN THE MANUFACTURE OF WIRELESS VALVES, bakelite valve bases, with metal pins attached; glass, soda or lime bulbs; barium magnesium pellets; pure iron sheets; of gauges Nos. 18 to 46 (S.W.G.), both gauges inclusive; magnesium strips; metal strips, having a nickel content greater than 20 per cent., under security; nickel chromium strips, in rolls, of gauges Nos. 18 to 46 (S.W.G.), both gauges inclusive; fabricated valve parts, of metal or mica, viz.: Caps, eyelets, filament clips and supports, getter cups and tabs, grid collars, grids, heaters and cathodes, mica spacers, plates, top shields, screens, welds and spuds; wire mesh, less than 120 holes per lineal inch, viz.: monel metal, nickel, pure iron; magnesium wire; pure iron wire of gauges Nos. 18 to 46 (S.W.G.) both gauges inclusive.

FOR USE IN THE MANUFACTURE OF WIRELESS RECEIVING SETS, cords with or without terminals affixed thereto whether imported with loud speakers or separately.

415a (2) Manufactures for use in the development of an Australian industry of a class or kind not commercially manufactured in Australia—ad val., Free—15 per cent.

FOR USE IN ELECTRICAL APPARATUS AND APPLIANCES, copper braid made of wire of gauges finer than No. 30 (I.S.W.G.); copper cable, stranded, made of wire gauges finer than No. 30 (I.S.W.G.)

Cotton covered flat laid cords with terminals affixed thereto for use with radio head sets.

Being instruments for testing radio equipment, standard signal generators; beat frequency and low frequency oscillators.

Carbon being amorphous carbon or consisting principally of amorphous carbon which has been subjected to no other process of manufacture than the formation into plain blocks or plain rods.

Carbon being synthetic graphite or consisting principally of synthetic graphite which has been subjected to no other process of manufacture than the formation into plain blocks or plain rods.

The UNDERMENTIONED ITEMS MAY BE ADDED TO THE LIST OF ARTICLES ADMISSIBLE UNDER TARIFF ITEM 415A (2):—

Insulating boards of a quality of kind which the Minister is satisfied is not being made in Australia, for use in electrical apparatus and appliances (security is required for boards of paper other than Elephantide, Fibreboard, Leatheroid and Presspahn).

The importation of the undermentioned goods from all non-British countries is prohibited unless the consent of the Minister has first been obtained, viz.:—

Wireless receivers, parts thereof and accessories thereof.

Valves for wireless telegraphy and telephony, including rectifying valves.

Carbon manufactures of all kinds, including carbon blocks.

Application for permits to import should be made prior to importation to the Collector in the State into which the goods are to be imported.

Efficient Aerials Important

Good Radiating System Ensures Better Coverage

IN addition to the questions of station location and modulation efficiency dealt with elsewhere in the technical section of this "Year Book," there remains to be considered the efficiency of the radiating system employed by a broadcasting station.

It is, of course, obvious that the best broadcast transmitter ever made is useless without some means of radiating its signals, and it follows from this that the more efficient the radiating system, so will the station's signals be radiated more effectively. Australian broadcast station engineers have a lively appreciation of this fact, and some first-class examples of efficient aerial design are to be seen. As a matter of interest, however, we present below the rule of the Federal Communications Commission of the United States regarding broadcast station aerials. The Commission's explanatory notes are appended, together with a height/frequency graph which will prove valuable for reference purposes.

F.C.C. (U.S.A.) Rule Governing Aerial Systems

Rule 131. (a) All applicants for new additional, or different broadcast facilities and all licensees requesting authority to move the location of the station shall specify a radiating system the efficiency of which complies with the requirements of good engineering practice for the class and power of the station.

(b) The Commission will publish from time to time specifications deemed necessary to meet the requirements of good engineering practice.

(c) No broadcast station licensee shall change the physical height of the transmitting antenna, or supporting structures, or make any changes in the radiating system which will measurably alter the radiation patterns except upon written application to and authority from the Commission.

(d) The antenna and/or supporting structure shall be painted and illuminated in accordance with the specifications supplied by the Commission pursuant to Section 303 (q) of the Communications Act of 1934.

MINIMUM ANTENNA HEIGHTS REQUIRED FOR BROADCAST STATIONS PURSUANT TO RULE 131.

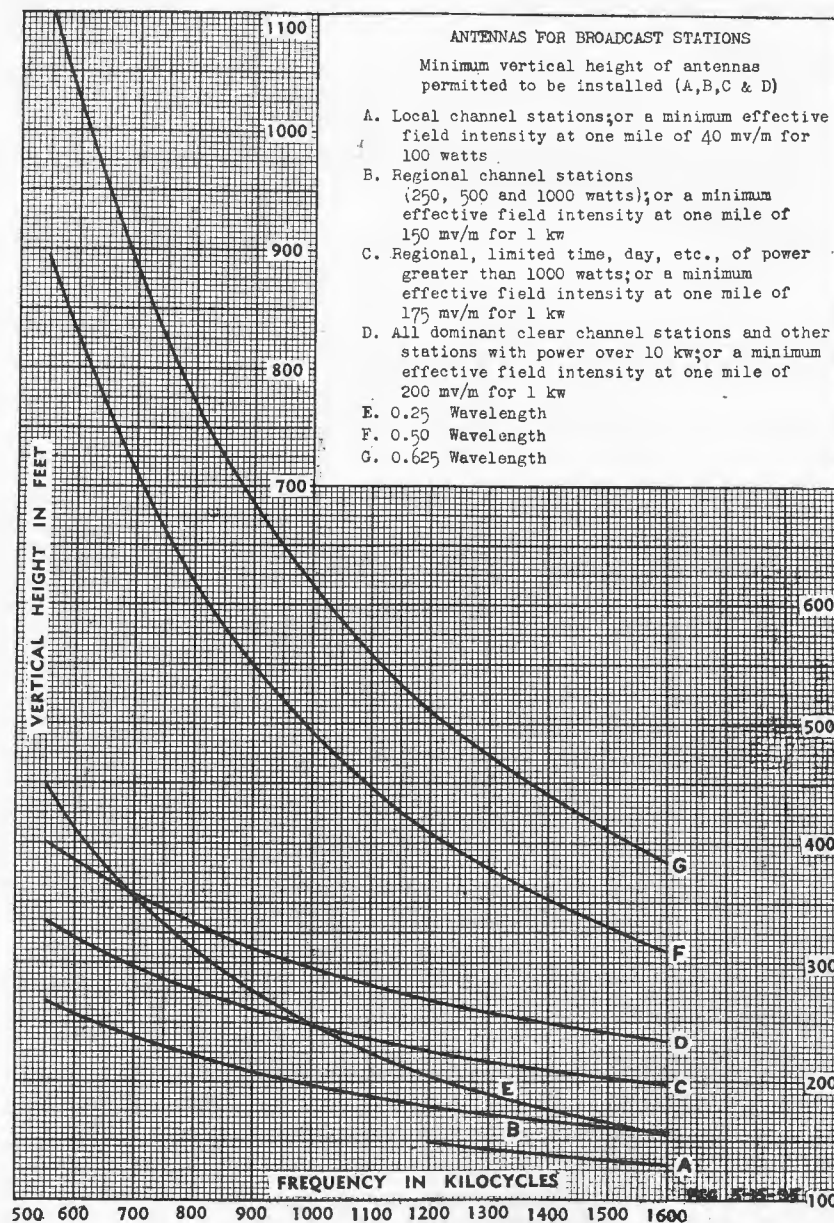
A review of the antenna systems employed by broadcast stations reveals that there are now many antennas in use that the radiating efficiency does not comply with the requirements of good engineering practice. In many cases a material improvement in the coverage of the sta-

tion could be accomplished by erecting an efficient radiating system. This increase in coverage may be more than could be accomplished by doubling the power.

It is the obligation of the licensee of every station to make efficient usage of the assignment granted by the Commission. It is not the intention of the Commission at this time to

require all stations with questionable radiating systems to install antennas having the required efficiency, but it is the intention not to grant additional facilities to licensees of broadcast stations unless they are making efficient usage of the assignment already granted. That is, the licensee of a broadcast station requesting more power, change in time of operation, different frequency, or move of the transmitter, must have an antenna for the assignment requested that meets with the minimum requirements before favourable consideration will be given.

(Continued on Page 82.)



Graph showing F.C.C. (U.S.A.) requirements for broadcast station aerial systems. Curves A, B, C, and D are fully covered in the text. Curves E, F, and G show the actual height of vertical radiators for the wave-length ratios indicated over the broadcast band, and are included for reference and comparison purposes only.

Lekmek STUDIO EQUIPMENT



LEKMEK RADIO LABORATORIES have designed and engineered the most complex of Broadcast Station Equipment to the full satisfaction of leading "A" and "B" Class Station Engineers, the Postmaster-General's Department, Universities, etc. Lekmek Equipment is designed to give uninterrupted service for years, and is proving its efficiency and durability in all parts of Australia, New Zealand and the Islands.

LEKMEK is furnishing to Broadcast Engineers and others, individual parts fully tested for expansion of their existing Equipment, and is always pleased to co-operate with circuit and layout suggestions.

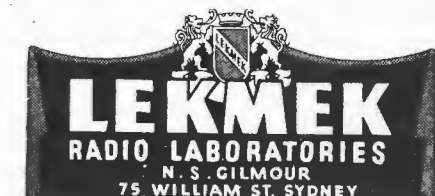


Audio Transformers, Power Transformers, Chokes, Faders (all types), Potentiometers etc.

LEKMEK will furnish complete Equipment where required. Illustration at left shows complete STUDIO EQUIPMENT FOR 2MW MURWILLUMBAH, designed and manufactured by Lekmek. The final tests on this Equipment show flat response (within 1.5 db 30 to 10,000 cycles) from Microphone input minus 90db to Programme Line plus 6db.

Enquiries invited.

Phone: FL 2626 (3 lines)



Telegrams: "Lekmek," Sydney.

Efficient Aerials (Continued)

The attached graph shows the minimum physical height of antenna proper or minimum effective field intensity that stations must have before additional facilities will be granted.

These minimum actual physical vertical heights of antennas permitted to be installed are shown by curves A, B, C and D of the graph as follows:

A—Local Channel Stations, 100 watts night and day or 100 watts night and 250 watts day; or a minimum effective field intensity at one mile of 40 mv/m for 100 watts.

B—Regional Channel, limited time, day, etc., Stations 250 watts to 1000 watts night and day; or a minimum effective field intensity at one mile of 150 mv/m for 1 kilowatt.

C—All stations other than Dominant Clear Channel Stations having an operating power night or day greater than one kilowatt and less than 25 kilowatts; or a minimum effective field intensity at one mile of 175 mv/m for one kilowatt.

D—All Dominant Clear Channel Stations and all other stations having a

maximum operating power night or day of over 10 kilowatts; or a minimum effective field intensity at one mile of 200 mv/m for one kilowatt.

The heights given on the graph for the antenna apply regardless of whether the antenna is located on the ground or on a building. Except for the reduction of shadows locating the antenna on a building does not necessarily increase the efficiency. In applying these curves the maximum operating power shall determine which curve is applicable.

In case it is contended that the required antenna efficiency can be obtained without antennas of the height specified, a complete field intensity survey must be supplied to the Commission showing that the field intensity at a mile without attenuation fulfills at least the minimum requirements. This field survey must be made by a qualified engineer using equipment of acceptable accuracy.

To obtain the maximum efficiency of which any antenna is capable, a good ground or counterpoise system must be employed.

At the present state of the art, it appears that where a vertical radiator is employed the ground system should consist of radial wires at least $\frac{1}{4}$ wave length long. There should be as many of these radials as practicable and in no event less than 70. These wires should be buried only deep enough to provide mechanical protection (not greater than 12 inches). However, they should not be permitted to rest on the surface.

In many cases a counterpoise or combination counterpoise and ground system may be superior to a ground, especially where a good ground cannot be obtained.

It should be borne in mind that the above specifications are the minimum and where possible better antenna and ground systems should be installed.

Before any change is made in the antenna, details should be submitted to the Commission for approval in order that it may be definitely determined that the installation will meet the requirements of Rule 131 and that it does not constitute an objectionable hazard to air commerce. These data may be submitted by letter setting out full details.

Efficient operation of the station would have the same effect on coverage as a power rating increase of over five times would have if the transmitter were to be run along the same lines as at present.

The question of using the maximum power rating of a station is largely a matter of obtaining maximum modulation efficiency, although, of course, the efficiency of the aerial or radiating system employed is also of great importance. The latter is, however, governed by the facilities available when the station is installed and is rarely under the direct control of the station personnel.

Interesting sidelights on the American viewpoints concerning radiator efficiency and also the important question of the actual site upon which a broadcast transmitter is located are given in articles appearing elsewhere in the technical section of this "Year Book."

Modulation efficiency is a matter which is directly under the control of the station personnel and is, moreover, a factor which is susceptible to immediate adjustment at any time.

Without going into a wealth of technicalities, it is a matter of fairly common knowledge that the maximum modulation capability of any station is reached when the carrier power is fully modulated. If this is exceeded, excessive distortion is introduced and, in addition, the station becomes a nuisance to other stations on adjacent wavelengths, due to the fact that its carrier wave breaks up and creates spurious frequencies.

Efficient Operation Essential.

It is fairly obvious that in a case such as this (which is by no means as uncommon as it might seem) effi-

This "Coverage" Business Is Higher Power Necessary?

WHEN a station salesman comes in with a long grouse about lack of effective coverage, "low power" usually gets the blame and everybody starts to talk about the "near-sighted" policy of a Department which only allows "commercials" a few hundred watts of aerial power.

There is much to be said for both sides in discussions of this nature, but often, after listening to many of the commercial stations now on the air, one is inclined to agree with the man who is credited with saying that "the commercial stations would be better off if they used the power they have, instead of continually talking about power increases."

There is a lot of truth in this remark, even though it may be damaging to the ego of a lot of station operators. Very few, if any, of the Australian commercial stations are making full use of the power they are licensed to use, and even if they are radiating their rated amount of power, they are not using it to anywhere near the best advantage. This is not intended as a condemnation of Australian commercial stations; far from it, in fact. The writer believes that the average station executive is conscientiously endeavouring to give his radio audience, and his advertisers, "full value" in every sense of the term, and that any deficiencies which exist are unintentional. That is why these notes are written.

Australian stations are not the only ones suffering from engineering deficiencies of this nature; a recent

N.A.B. Conference in U.S.A. revealed that many American stations are similarly affected, and one speaker said that fifty per cent. of the stations in U.S.A. could improve their coverage without increasing their power. (It is not suggested that this state of affairs exists in Australia; the remarks are cited as an indication of the condition which can arise through inefficient station operation. In any case, they provide abundant food for thought.) He further went on to say that he knew of one station, rated at 1000 watts, that radiated a signal equivalent to less than 200 watts, simply because of engineering deficiencies in the design and handling of the transmitter.

This Coverage Business (Continued)

The station engineer usually does his best to prevent this condition arising, but, unfortunately, usually succeeds in "undermodulating" the carrier. The effect of this, while it does not worry other stations (or rather, the listeners to other stations) is to reduce the efficiency of the station enormously.

Signal/Noise Ratio Lowered.

The efficiency of the station is reduced in two ways; firstly, by the reduction in its effective power, with resultant lower signal strength to listeners and, secondly, by the fact that the effective external interference level, heard by the listener when tuned to the station, increases proportionately to the reduction in effective power. The effect of these two factors is, of course, cumulative, and it can be shown that a ten per cent. reduction in average modulation level can have the same effect as a power reduction of almost twenty-five per cent.

This alone would be serious enough, but there is another point to be considered. Every station has a certain percentage of inherent "noise" which is radiated along with the signal. The "entertainment value" of any station's transmission is largely controlled by the difference in volume between this noise and the music or speech being transmitted. The inherent noise level of a station is very nearly a fixed quantity, being dependent on the design of the equipment, and, therefore, any reduction in the average modulation level will result in a corresponding reduction in the signal/noise ratio.

The amount of effective signal radiated is therefore still further reduced and, when one considers this together with the previously mentioned factors, it is quite easy to appreciate how a condition such as that detailed at the N.A.B. Conference can arise.

Apart from the undeniable loss in listener coverage caused by undermodulation, it must also be remembered that the running cost of a station operating at 50 or 75 per cent. of its optimum efficiency is quite as high as that of a station operating at peak efficiency, so that nothing is gained, and coverage, the most important factor of all, is lost.

A deficiency of this nature can almost always be ascribed to the use of inefficient modulation monitoring equipment. Unskilled station personnel can sometimes be blamed; but very rarely, and even the best operator cannot do a good job with antiquated equipment.

So, Mr. Station Executive, next time your salesmen come into your office

with a grouse about "poor coverage" don't blame your "inadequate power." Find out if you are USING the power you already have.

The American Attitude.

In the United States, the question of efficient station operation is regarded seriously, and legislation has been provided to ensure that stations, once licensed, are operated at somewhere near maximum efficiency. As a matter of record, Rule 139 of the Federal Communications Commission of U.S.A. is appended, together with explanatory notes and technical specifications.

F.C.C. (U.S.A.) Rule Covering Modulation Efficiency of Broadcasting Stations

Rule 139. (a) A licensee of a broadcast station will not be authorized to operate a transmitter unless it is capable of delivering satisfactorily the authorized power with a modulation of at least 85 per cent. When the transmitter is operated with 85 per cent. modulation, not over 10 per cent. combined audio frequency harmonics shall be generated by the transmitter.

(b) All broadcast stations shall, on and after November 1, 1936, have in operation a modulation monitor approved by the Commission.

(c) The operating percentage of modulation of all stations shall be maintained as high as possible consistent with good quality of transmission and good broadcast practice and in no case less than 85 per cent. on peaks of frequent recurrence during any selection which normally is transmitted at the highest level of the programme under consideration.

(d) The Commission will, from time to time, publish the specifications, requirements for approval, and a list of approved modulation monitors.

Amendment to Rule 139.

Rule 139, as amended, section (b), requires all broadcast stations to have in operation on and after November 1, 1936, a modulation monitor approved by the Commission. The modulation monitors will be approved by type after tests at the Bureau of Standards in the same manner that frequency monitors, as required by Rule 145, are approved. Any manufacturer desiring to submit a monitor for approval should supply the Commission with full details and if the specifications appear to meet the requirements, the Commission will request the Bureau of Standards to issue shipping instructions. Below are given the specifications that the modulation monitor must meet to be tested at the Bureau of Standards before it will be ap-

proved by the Commission. Approval will be given based on the test data taken at the Bureau, but the Bureau of Standards does not approve or disapprove the monitor as this is entirely in the hands of the Commission.

Specifications for Rule 139.

The specifications pursuant to Rule 139, section (d), are as follows:—

1. A DC meter for setting the average rectified carrier at a specific value and to indicate changes in carrier intensity during modulation.
2. A peak indicating light or similar device that can be set at any predetermined value from 50 to 120 per cent. modulation to indicate on positive peaks, and/or from 50 to 100 per cent. negative modulation.
3. A semi-peak indicator with a meter having the characteristics given below shall be used with a circuit such that peaks of modulation of duration between 40 and 90 milliseconds are indicated to 90 per cent. of full value and the discharge rate adjusted so that the pointer returns from full reading to 10 per cent. of zero within 500 to 800 milliseconds. A switch shall be provided so that this meter will read either positive or negative modulation and, if desired, in the centre position it may read both in a full-wave circuit.

The characteristics of the indicating meter are as follows:—Speed—The time for one complete oscillation of the pointer shall be 290 to 350 milliseconds. The damping factor shall be between 16 and 200. The useful scale length shall be at least 2.3 inches. The meter shall be calibrated for modulation from 0 to 110 per cent. and in decibels below 100 per cent. with 100 per cent. being 0 DB.

The accuracy of the reading on percentage of modulation shall be ± 2 per cent. for 100 per cent. modulation, and ± 4 per cent. of full scale reading at any other percentage of modulation.

4. The frequency characteristics curve shall not depart from a straight line more than $\pm \frac{1}{2}$ DB from 30 to 10,000 cycles. The amplitude distortion or generation of audio harmonics shall be kept to a minimum.

5. The modulation meter shall be equipped with appropriate terminals so that an external peak counter can be readily connected.

6. Modulation will be tested at 115 volts ± 5 per cent. and 60 cycles, and the above accuracies shall be applicable under these conditions.

7. All specifications not already covered above, and the general design, construction, and operation of these units must be in accordance with good engineering practice.

Experimental World-Wide Short Wave Broadcasting Station, VK2ME, Sydney

THE most powerful broadcasting station operating in Australia is VK2ME, the short wave long distance station of Amalgamated Wireless, located at Pennant Hills, fourteen miles from Sydney.

VK2ME is known as "The Voice of Australia," and has been heard in every country of the world where radio is known.

The studio is situated in Sydney, and the programmes cover the whole range of music, with the exception of jazz, interspersed with talks dealing mainly with the characteristic industries and life of Australia.

The transmissions of VK2ME are divided into four sections. The first covers Australia, the western portions of North and South America, and England. The second is intended for the southern and eastern portions of Australia, Tasmania, New Zealand, Papua, New Guinea, Fiji, New Caledonia, the New Hebrides, and other Pacific Islands. The third provides for Western Australia, China, Japan, the Philippine Islands, the Straits Settlements, U.S.A., and most of India, South Africa, and Rhodesia. The fourth transmission is received best in Great Britain, Western Europe, and India.

Perhaps the feature of VK2ME, which has made it best known in overseas listening circles, is the laugh of Australia's national bird, the kookaburra, or laughing jackass, with which each programme starts and ends.

Considerable interest has been created in outside countries by talks on the Australian merino wool industry, agriculture, wheat, meat, dairying, and timber enterprises and, particularly, by talks on Australia's tourist resorts. Tasmania has become more popular on the part of overseas visitors partly, it is known, through talks from VK2ME. Jenolan Caves, Mount Kosciusko and the surf beaches, for which Australia is famous, have become

A.W.A. Experimental World-Wide Short Wave Broadcasting Station, VK3ME, Melbourne

VK3ME is the Victorian short wave overseas experimental station of Amalgamated Wireless (A/sia) Ltd. The transmitter is housed at the A.W.A. Transmitting Centre, Braybrook, six miles west of Melbourne on the Ballarat Road.

VK3ME commenced experimental world-wide broadcasts in 1927. The services have been gradually extended and the station now operates from Monday to Saturday, from 7 to 10 p.m., Eastern Australian Standard time (0900 to 1200 G.M.T.).

Every overseas mail contains appreciatory letters of the reception of the station's programmes. The items broadcast comprise entertainment interspersed with interesting and informative lectures and talks on Australian affairs.

The studio is located at the offices of Amalgamated Wireless (A/sia) Ltd., "Wireless House," 167 Queen Street, Melbourne, and is equipped for A.C. working throughout with the usual facilities for relaying and for duplex telephony.

The transmitter was designed and manufactured at the Radio-Electric Works of Amalgamated Wireless. It operates on 9510 kilocycles and has an aerial power of 1.5 k.w. It consists of four units and two high tension double wave three phase rectifiers. The high power method of modulation is used.

The aerial is of the half-wave vertical type arranged for low angle uniform radiation, and is remotely fed by a conventional high frequency feeder line about 250 feet long.

known abroad in a way that is very gratifying in official circles.

Amalgamated Wireless (A/sia) Ltd. is carrying out a National service in bringing before residents of overseas countries the advantages of Australia as a tourist resort, and keeping them informed of our resources and National development.

Some idea of the publicity value to Australia of a high-powered long-distance broadcasting station may be gathered from the fact that during two and a half years Amalgamated Wireless received 15,103 letters reporting on reception of VK2ME. The number of letters received averaged 116 a week.

The transmitter of VK2ME was designed and manufactured by Amalgamated Wireless. It has a power of 20 kilowatts in the aerial and operates on a carrier frequency of 9590 kilocycles (31.28 metres), which is generated by a high precision valve oscillator and amplified through a series of valve magnifiers. The transmitter utilises 22 oil and air-cooled valves mounted in seven separate units.

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 Germany and Holland, A.W.A. has made it possible for European residents to hear broadcast announcements from VK2ME in French, German, Dutch, Spanish, and Italian as well as English. It is believed that this will still further enhance the station's popularity and usefulness abroad, especially in European countries.

VK6ME, Perth.

On March 22, 1937, Amalgamated Wireless (A/sia) Ltd. inaugurated a short wave experimental broadcasting service of world range at Perth, Western Australia.

The station, known as VK6ME, operates on a frequency of 9590 kilocycles with a power of 200 watts unmodulated in the aerial.

Reports on the reception of VK6ME have been received by A.W.A. from all parts of the world.

VPD2, Suva, Fiji.

Amalgamated Wireless (A/sia) Ltd., also operates the short wave broadcasting station VPD2 at Suva, Fiji. This station has a frequency of 9540 kilocycles, with a power of 500 watts.

VPD2 is the only commercial short-wave station in the Southern Hemisphere. Confirmatory letters of the station's reception have been received from all parts of the world.



Australian Short Wave Experimental Transmission Schedules

VK2ME (SYDNEY). Sundays only, 31.28 Metres, 9590 K/Cs.

Month of Session	Sydney Time	G.M.T.	E.S.T. (America)
1937			
July	1st	3.0 p.m.—5.0 p.m.	0500 — 0700
	2nd & 3rd	7.30 p.m.—11.30 p.m.	0930 — 1330
	4th	2.30 a.m.—4.30 a.m.	1630 — 1830
August	1st	3.0 p.m.—5.0 p.m.	0500 — 0700
	2nd & 3rd	7.30 p.m.—11.30 p.m.	0930 — 1330
	4th	1.30 a.m.—3.30 a.m.	1530 — 1730
September	1st	3.30 p.m.—5.30 p.m.	0530 — 0730
	2nd & 3rd	7.30 p.m.—11.30 p.m.	0930 — 1330
	4th	12.30 a.m.—2.30 a.m.	1430 — 1630
October	1st	3.30 p.m.—5.30 p.m.	0530 — 0730
	2nd & 3rd	7.30 p.m.—11.30 p.m.	0930 — 1330
	4th	12.30 a.m.—2.30 a.m.	1430 — 1630
November	1st	4.0 p.m.—6.0 p.m.	0600 — 0800
	2nd & 3rd	7.30 p.m.—11.30 p.m.	0930 — 1330
	4th	Mdt. — 2.0 a.m.	1400 — 1600
December	1st	4.0 p.m.—6.0 p.m.	0600 — 0800
	2nd & 3rd	8.0 p.m.—Mdt.	1000 — 1400
	4th	Mdt. — 2.0 a.m.	1400 — 1600
1938			
January	1st	4.0 p.m.—6.0 p.m.	0600 — 0800
	2nd & 3rd	8.0 p.m.—Mdt.	1000 — 1400
	4th	Mdt. — 2.0 a.m.	1400 — 1600
February	1st	4.0 p.m.—6.0 p.m.	0600 — 0800
	2nd & 3rd	8.0 p.m.—Mdt.	1000 — 1400
	4th	Mdt. — 2.0 a.m.	1400 — 1600
March	1st	4.0 p.m.—6.0 p.m.	0600 — 0800
	2nd & 3rd	8.0 p.m.—Mdt.	1000 — 1400
	4th	12.30 a.m.—2.30 a.m.	1430 — 1630
April	1st	4.0 p.m.—6.0 p.m.	0600 — 0800
	2nd & 3rd	8.0 p.m.—Mdt.	1000 — 1400
	4th	12.30 a.m.—2.30 a.m.	1430 — 1630
May	1st	4.0 p.m.—6.0 p.m.	0600 — 0800
	2nd & 3rd	8.0 p.m.—Mdt.	1000 — 1400
	4th	1.30 a.m.—3.30 a.m.	1530 — 1730
June	1st	3.0 p.m.—5.0 p.m.	0500 — 0700
	2nd & 3rd	8.0 p.m.—Mdt.	1000 — 1400
	4th	2.30 a.m.—4.30 a.m.	1630 — 1830

VK3ME (MELBOURNE). 31.5 Metres (9510 K/Cs.)

Melbourne Time	G.M.T.	E.S.T. (America)
Nightly Monday to Saturday (inclusive)	7.0 p.m.—10.0 p.m.	0900 — 1200

VK6ME (PERTH). 31.28 Metres (9590 K/Cs.)

Perth Time	G.M.T.	E.S.T. (America)
Nightly Monday to Saturday (inclusive)	7.0 p.m.—9.0 p.m.	1100 — 1300

VPD2 (SUVA). (9540 K/Cs.)

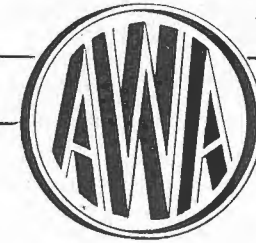
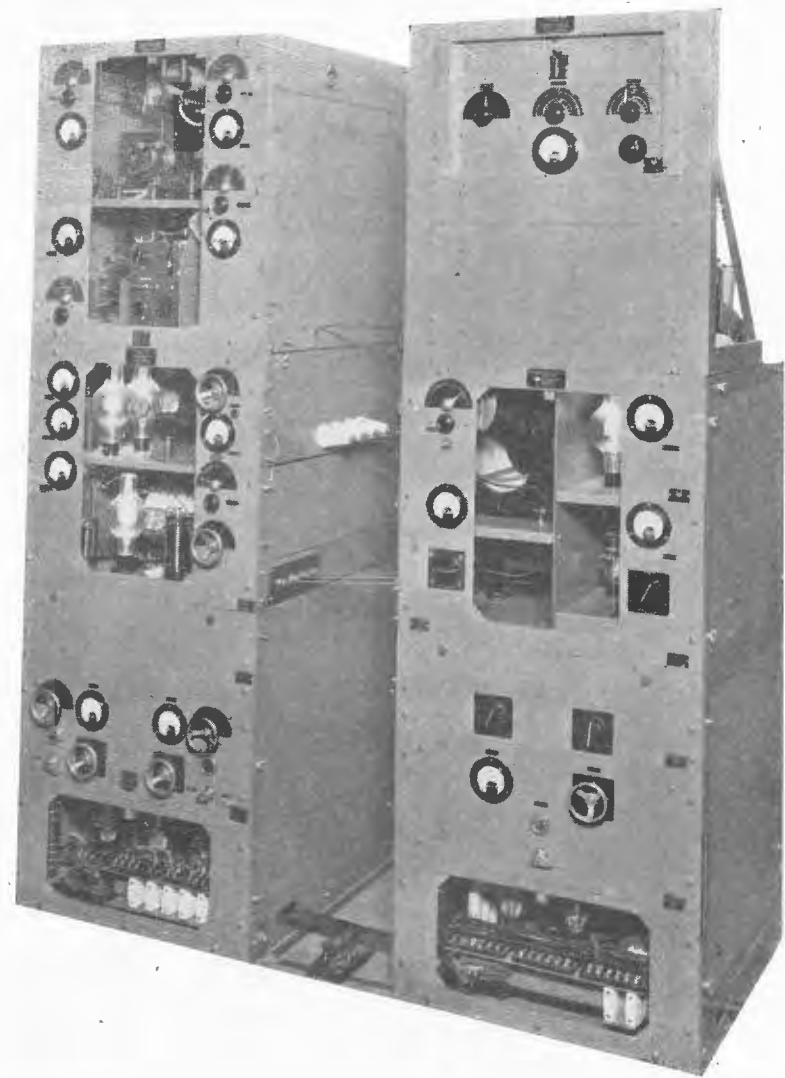
Suva Time	G.M.T.	E.S.T. (America)
Nightly Monday to Saturday (inclusive)	10.30 p.m.—Midt.	1030 — 1200

Call-Sign Allocations

WHEN reading an overseas periodical (or even listening-in on short waves) an unfamiliar station call-sign is often encountered. The following table will help materially in this direction, as it gives the range of letters allocated to each country by the World Telecommunications Conference, held at Madrid in 1932.

Country	Call Signal
Chile	CAA-CEZ
Canada	CFA-CKZ
Cuba	CLA-CMZ
Morocco	CNA-CMZ
Cuba	COA-COZ
Bolivia	CPA-CPZ
Portuguese Colonies	CQA-CRZ
Portugal	CSA-CUZ
Uruguay	CVA-CXZ
Canada	CYZ-CZZ
Germany	D
Spain	EAA-EHZ
Irish Free State	EIA-EIZ
Republic of Liberia	ELA-ELZ
Persia	EPA-EQZ
Estonia	ESA-ESZ
Ethiopia	ETA-ETZ
Sarre Territory	EZA-EZZ
France and Colonies and Protectorates	F
Great Britain	G
Hungary	HAA-HAZ
Swiss Confederation	HBA-HBZ
Ecuador	HCA-HCZ
Republic of Haiti	HHA-HHZ
Dominican Republic	HIA-HIZ
Republic of Colombia	HJA-HKZ
Republic of Panama	HPA-HPZ
Republic of Honduras	HRA-HRZ
Siam	HSA-HSZ
Vatican City State	HVA-HVZ
Hedjaz	HZA-HZZ
Italy and Colonies	I
Japan	J
United States of America	K
Norway	LAA-LNZ
Republic of Argentina	LOA-LWZ
Luxembourg	LXA-LXZ
Lithuania	LYA-LYZ
Bulgaria	LZA-LZZ
Great Britain	M
United States of America	N
Peru	OAA-OCZ
Austria	OEA-OEZ
Finland	OFA-OHZ
Czechoslovakia	OKA-OKZ
Belgium and Colonies	ONA-OTZ
Denmark	OUA-OZZ
Netherlands	PAA-PIZ
Curacao	PJA-PJZ
Dutch East Indies	PKA-POZ
Brazil	PPA-PYZ
Surinam	PZA-PZZ
(Abbreviations)	Q
Union of Socialist Soviet Republics	R
Sweden	SAA-SMZ
Poland	SOA-SRZ
Egypt	STA-SUZ
Greece	SVA-SZZ
Turkey	TAA-TCZ
Iceland	TFA-TFZ
Guatemala	TGA-TGZ
Costa Rica	TIA-TIZ
Canada	VXA-VYZ
United States of America	W
Mexico	XAA-XFZ
China	XGA-XUZ
British India	XYA-XZZ
Afghanistan	YAA-YAZ
Dutch East Indies	YBA-YHZ
Iraq	YIA-YIZ
New Hebrides	YJA-YJZ
Latvia	YLA-YLZ
Free City of Danzig	YMA-YMZ
Nicaragua	YNA-YNZ
Rumania	YOA-YRZ
Republic of El Salvador	YSA-YSZ
Yugoslavia	YTA-YUZ
Venezuela	YVA-YWZ
Albania	ZAA-ZAZ
British Colonies and Protectorates	ZBA-ZJZ
New Zealand	ZKA-ZMZ
Paraguay	ZPA-ZPZ
Union of South Africa	ZSA-ZUZ
France and Colonies and Protectorates	TKA-TZZ
Union of Socialist Soviet Republics	U
Canada	VAA-VGZ
Australian Commonwealth	VHA-VMZ
Newfoundland	VOA-VOZ
British Colonies and Protectorates	VPA-VSZ
British India	VTA-VWZ

VK6ME—9590 Kilocycles



MANUFACTURERS AND SUPPLIERS

OF EVERY TYPE OF

Broadcasting Equipment

COMPLETE TRANSMITTERS—

50 watts to 60,000 watts equipments . . .
Cathode Ray Oscillographs . . . Modulation Indicators . . . Crystals, to comply with modern standards.

STUDIO EQUIPMENTS—

Single, Double and Triple Channel Studio facilities. All requirements from Microphone to Line, including: Pick-ups, Turntables and Motors, Beat Frequency Oscillators, Level Indicators.

VALVES—

5 watt to water-cooled types.

A.W.A. are manufacturers of all types of Radio Communication Apparatus.

AMALGAMATED WIRELESS (A/SIA) LTD.

47 YORK STREET, SYDNEY — 167/9 QUEEN STREET, MELBOURNE

Broadcast Station Separation

American F.C.C. Tables Provide Useful Indication

IN Australia complaints are often heard concerning the allocation of adjacent or nearly adjacent channels to broadcast stations which are relatively closely located geographically. It is safe to say that the majority of these complaints are based on reports from listeners who are not usually in a position to pass a reliable opinion. Nevertheless, the complaints still persist, and it is of interest to examine portions of the Australian medium-wave broadcasting spectrum in the light of accepted engineering recommendations and practice.

The United States of America are fortunate in possessing a Federal control body for the purpose of dealing with radio station power and frequency allocations. This body is known as the Federal Communications Commission, and an important part of its constitution consists of a very highly qualified Board of Radio Engineers. Furthermore, this Board works in close collaboration with the engineers of commercial organisations and is therefore in a position to express a reliable opinion on matters related to the technical side of broadcasting.

Some few years ago, the American ether was in a chaotic state and the F.C.C. was faced with the job of straightening matters out. One of the first steps in this procedure was the making of a wide survey and the preparation of a set of "average station separation" tables which could be used as a guide for future frequency and power allocations. These tables take into account night and day transmission and provide a valuable indication of the distances by which stations of given power and frequency separation should be separated geographically if objectionable interference is to be avoided.

A portion of the American F.C.C. "average night separation" table is shown in the accompanying chart. This takes into account stations varying in power between 50 watts and 10,000 watts and operating on frequencies ranging up to 40 k.c. (four channels) apart. It is assumed that the frequency control equipment of the stations is capable of maintaining their carrier frequencies constant within plus or minus 50 cycles.

Inspection of the chart will show that the chart is divided into seven main sections, vertically and horizontally; these correspond to the powers of the stations. The horizontal sections are further subdivided into five groups, corresponding to frequency separations of zero, 10, 20, 30 and 40 kilocycles. The remaining figures are the distances in miles by which stations of given power and frequency difference should be separated to

avoid objectionable interference when both are operating at night. The "day" tables are similar to this, the major point of difference being that the permissible geographical separations are smaller, due to less effective transmission during daylight hours.

As an example of the application of the chart, we will take two stations, each of 100 watts, separated in frequency by 10 k.c.

Looking down from the top in the second "power" column until we come to the horizontal line commenced by the "10" inside the "100 w." bracket. At this point we see the number "53" and this is the minimum geographical separation in miles of these two stations which can be tolerated from an interference point of view. Going further down the same column, we see that if the stations are separated in frequency by 20 k.c., their geographical separation may be reduced to 21 miles without risk of interference.

It should be remembered that these tables are only intended as "averages"; modifying factors such as the local topography and the actual location of the stations in the medium-wave band also enter into the problem, and must be considered.

However, the figures tabulated are the result of much serious research on

(Turn to Col. 3, Page 95.)

Class & Power	Freq. Diff. Kc.	Local		Regional			High Power Regional	
		50	100	250	500	1 kw	5 kw	10 kw
Local 50 w	0	130	185	...	...	...	...	...
	10	40	50	82	90	107	180	220
	20	15	18	41	49	57	85	100
	30	9	12	30	38	46	74	89
	40	8	11	28	36	44	72	87
100 w	0	185	185	...	...	...	...	...
	10	50	53	98	106	114	183	225
	20	18	21	46	54	62	90	105
	30	12	13	32	40	48	76	91
	40	11	11	28	36	44	72	87
Regional 250 w	0	...	...	640	800	1000	...	...
	10	82	98	126	153	185	290	345
	20	41	46	55	65	78	110	145
	30	30	32	35	43	51	79	94
	40	28	28	29	37	45	73	88
500 w	0	...	...	800	800	1000	...	...
	10	90	106	153	160	190	300	355
	20	49	54	65	74	85	127	150
	30	38	40	43	46	54	82	97
	40	36	36	37	39	47	75	90
1 kw	0	...	...	1000	1000	1000	...	...
	10	107	114	185	190	200	305	360
	20	57	62	78	85	94	135	160
	30	46	48	51	54	58	86	100
	40	44	44	45	47	48	76	91
High Power Regional 5 kw	0	...	...	...	...	...	1600	2000
	10	180	183	290	300	305	335	390
	20	85	90	110	127	135	163	187
	30	74	76	79	82	86	102	117
	40	72	72	73	75	76	83	98
10 kw	0	...	...	...	...	...	2000	2000
	10	220	225	345	355	360	390	405
	20	100	105	145	150	160	187	203
	30	89	91	94	97	100	117	128
	40	87	87	88	90	91	98	102

Minimum station separation mileages as listed by F.C.C. (U.S.A.). The "Local," etc., classifications are those used in U.S.A.

Modern Disc Recording

A Discussion on Modern Recording Systems and a Comparison of their Merits

By the Technical Editor of "Broadcasting Business"

A VERY large proportion of the modern broadcasting station's "time on the air" is made up of recorded programme matter in one form or another, yet, in spite of this, there are few subjects that the average station manager knows less about than the technique of disc recording.

The usual answer to this is that there is no necessity for the executive to know anything about it—in other words, he pays an engineer to attend to such matters. This may have been true a few years—even one year—ago, but the advent of new recording systems and improved methods of reproduction has changed the position considerably.

Certain of the newer systems require an appreciable capital investment on the part of the broadcasting station before they can be utilised. At first glance, the advantages accruing may appear to justify this investment, but, without first-hand knowledge of the subject the station executive is largely at the mercy of those endeavouring to sell the proposition to him.

It is the aim of this article to set out the pros and cons of the various systems in a logical, unbiased manner so that those with no basic knowledge of the subject of disc recording can assess for themselves the relative merits of the recording systems available.

General Considerations.

ALTHOUGH the ultimate aim of any recording system is to establish complete overall fidelity—in other words, the sound output from the loudspeaker used for reproduction should be indistinguishable from the original recorded sounds—this ideal is seldom realised. This is because there are so many transformations which the original sound must undergo before and after actual recording, and during the recording process itself.

A brief summarisation of these various "transformations" should serve to provide a mental picture of the entire recording system and thus "clear the air" for that which follows.

Fundamentally, a modern recording and reproducing system consists of seven links:—A microphone to convert the sound waves from the original programme material into equivalent electrical impulses; an amplifier to increase the intensity of those electrical impulses; means for making a record of the impulses; the record itself; means for transcribing the record into electrical impulses again; an amplifier to restore the power lost in recording; and a loudspeaker for converting the output of this amplifier into sound waves. As we are dealing with disc recording, the third, fourth

*This article is a slightly amended reprint of the matter which appeared under the same title in the February 13 issue of "Broadcasting Business."

and fifth of these comprise a mechanical engraver or cutting stylus, a disc of suitable material which can be engraved, and a pick-up or reproducer which serves to reconvert the engraving on the disc to electrical impulses in the order indicated.

For broadcasting purposes, several other links in the chain are interposed between the pick-up amplifier and the loudspeaker. These links are the broadcast transmitter itself with its associated modulation and radiation processes, and the broadcast receiver. From this it can be seen that for the final reproduction to be even reasonably like the original a very high standard of quality must be attained in each of the links in the system.

The least troublesome links in the chain are the purely electrical components such as the microphone, amplifiers and loudspeakers. It is the electro-mechanical and purely mechanical links in the chain which are most prone to introduce faults. Leaving aside the purely electrical components for the time being we will now discuss the actual recording and reproducing processes themselves.

These processes are considerably more complicated than the above resume of the fundamental requirements of a recording system would lead one to believe. As they are basically mechanical in nature it can be seen that the controlling factors are the mounting, damping and resonances of the engraving stylus, the characteristics of the record material,

the fidelity of the duplicating process employed when more than one record is required, the constancy of speed of the recording and reproducing turntables, the hardness and shape of the reproducing needle, and the overall characteristics of the pick-up used for reproduction. We will deal with record materials first.

Record Materials.

Perhaps the most important improvement in recording technique during the last few years is the use of new materials and compositions from which the discs are made.

For making the original engraving, soft wax (metallic soap) is still acknowledged as being the best available material and is used for the highest grade work. Wax requires the most painstaking control of working conditions, however, and the original engraving cannot be played back, except by a very light-weight pick-up, and only with the chance of ruining the recording.

For producing original engravings which can be played back at once, the most popular material is "acetate" (actually nitro-cellulose) which is sprayed or flowed on to metal discs. These coated discs are at present widely used for immediate play-back purposes, and also for the actual presentation of programme matter where only a relatively few playings are required. Properly handled, recordings of this type are capable of giving astonishingly good results.

(Continued Overleaf.)

MODERN DISC RECORDING—(Continued).

The nitro-cellulose used for the coating is a lacquer very similar to the "Duco" finish used on motor cars; the commonly used term "acetate" is a misnomer, as cellulose acetate compounds have a tendency to "tear" when engraved, although they are quite suitable for making duplicate records by thermoplastic pressing. The shavings which result when nitro-cellulose records are engraved are highly inflammable and must be carefully disposed of. The record itself is no inflammable because of the high heat conductivity of the metal base. The lacquer coating tends to become hard when old, but can be softened prior to using by enclosing the disc in an air-tight can with a small amount of organic solvent whose vapour penetrates the cellulose material. After engraving and drying the material regains its former hardness.

Aluminium is also used for the original in some instances, and can be played-back with a fibre needle, but only with a quality which is less than that actually present in the recording. It is reported that one American organisation has developed a process for producing acetate duplicates from aluminium originals. Steel needles may be used on such duplicates and as a result the full quality of the original recording may be reproduced.

The newest material, which is considered by many technicians to hold great promise for future improvements in the art, is the "Vinyl" class of compounds.

These compounds are thermoplastic and extremely homogenous in nature, and in addition, are extremely ductile. This latter property permits the use of an embossing process (as distinct from engraving), although the engraving process may be used if desired. The difference between embossing and engraving is important and may prove to be of considerable significance.

In engraving, part of the material is cut away from the record and removed by the stylus in the form of a thread or shaving. This cutting process puts a great burden on the cutting stylus as the edge must be perfectly sharp in order to give a clean cut. In addition, since part of the material is actually removed from the record there is an irreducible minimum of roughness in the groove which is the present absolute limitation to the reduction of surface noise. For embossing the stylus may be rounded in shape and polished, as no cutting is necessary. Because of the small area of the stylus, the pressure at its point is many tons per square inch, and the material under it, if sufficiently ductile, will flow under the pressure and leave an indentation on the surface which follows the path of the

stylus. The groove thus produced is said to be "embossed" and takes the polish of the stylus itself. The result is extremely low noise level.

All of the materials used in both original records and duplicates nowadays have been chosen with the noise problem in mind. It has been found that the presence of even so fine a material as lamp-black, used for colouring nitro-cellulose discs, adds appreciably to the noise level. Cleanliness, particularly freedom from dust, is another important factor.

The best achievements in recording so far have produced a noise level from 50 to 60DB. below the maximum amplitude of the recorded signal; the average record, however, has only a 35 to 40DB. spread between noise and maximum signal. However, this compares very favourably with the average maximum noise/signal range attainable over the broadcast station—receiver link so that little, if any, "volume range" is lost by the use of good recordings.

Although, in a number of cases only a few playings are required from a particular record, duplicates are required where the same programme matter is to be supplied to a number of stations and also where records are to be supplied to the general public. These duplicates are made by a thermoplastic pressing process from a variety of materials.

Ordinary phonograph records are made from a high grade of shellac, with a percentage of abrasive filler. The abrasive adds considerably to the noise level but is necessary to keep the needle from cutting into the shellac. Actually the abrasive grinds the needle point to the shape of the groove, thereby distributing the weight of the pick-up over the widest available area and reducing the pressure to a point where no injury, other than normal wear, is done to the record. Commercial records of this kind, while greatly improved over the original electrical recordings, are not suitable for high quality work unless "scratch-filters" are used to remove portion, at least, of the needle hiss and surface noise.

Duplicates for high quality use, such as programme transcriptions, are usually made from cellulose acetate or one of the "Vinyl" compounds. These materials are free from abrasives and are as homogeneous as it is possible to produce them; to a degree, in fact, where the residual foreign matter is so small in quantity that it does not contribute to the noise level. All of these materials are thermoplastic; that is, they flow under proper conditions of heat and pressure and enable every detail of the original recording to be reproduced.

Record Duplication.

The duplication process is one of the most outstanding examples of plastic technology.

In the wax process, the original engraving on the soft wax disc is first given a microscopically thin coating of metal, either by dusting with a metallic powder or by the finer processes of silver nitrate or sputtering of pure gold on to the surface. The wax disc is then placed in an electroplating bath, where the metallic coating acts as one electrode. A film of copper from 1/32 to 1/16 of an inch in thickness is then deposited on the surface. The copper and wax are then separated and the copper plate becomes what is known as the "Master Matrix."

If the copper-coating process has been carried out carefully the surface which was adjacent to the wax will be an exact negative of the original engraving. The procedure from this point on depends entirely on the number of duplicates which are required.

If only a few are necessary, this "Master Matrix" is backed up by heavier metal and used for actually stamping duplicates of the wax on discs of suitable materials, chosen according to the type of programme material originally recorded on the wax, or the service for which the duplicates are required. Normally, however, the "Master Matrix" is used for the preparation of "stamping matrices" which are actually used for the pressing of the final records. These "stamping matrices" are made of copper, the same as the "Master Matrix," but are nickel-plated and polished before use.

In general, it may be said that the duplicating process reproduces everything on the original wax engraving to such a fine degree that the only observable difference is in the material; one wax, and the other a harder, more durable plastic. Actual experience shows that lines only 0.00002 inch in width can be reproduced by the electroplating processes, and that the transfer from the electroplated stamper to the final duplicate is nearly as good.

The actual pressing process is rather interesting and demonstrates the necessity for the use of thermoplastic materials in the duplicate records. The stamping matrix is mounted on the top plate of the press, while the bottom half is a plain polished plate in the case of a single-sided record. For a double-sided record another stamping matrix is mounted in place of this plain polished plate. A disc of record material is placed between the two surfaces thus provided and the whole assembly heated by steam at a pres-

(Continued on Page 92.)

GEORGE EDWARDS

GEORGE EDWARDS PRODUCTIONS
RECORDED BY COLUMBIA
 The Premier Radio Presentations of Australasia
 "David and Dawn" in Fairyland
 "Darby and Joan" at the Breakfast Table.
 "Famous British Trials" "Lady Jane Grey"
 "New "Inspector Scott" "Madame Curie"
 "Cleopatra" "Florence Nightingale"
 "Empress Josephine". "Christina of Sweden"
 "Pocahontas" "Marie Antionette"
 "Knights of the Round Table."

Now Available
GEORGE EDWARDS PRODUCTIONS, 2UW SYDNEY.
 SESSIONS TO SUIT ALL SPONSORS. 'PHONE: MA4158

MODERN DISC RECORDING—(Continued).

sure of 100lb per square inch. Simultaneously with this, hydraulic pressure is applied to the top stamping matrix (attached to the plunger of the press) at 3,000lb per square inch.

The combined effect of heat and pressure causes the thermoplastic material of the record blank to "flow" and thus fill up the thousands of minute undulations which go to make up the engraved spiral sound track on the stamping matrix. On cooling and the removal of pressure, the disc which emerges is no longer a blank but a perfect replica of the original wax engraving.

Following this, it only remains for the pressing to be tested and finished by "edging." It is usually only necessary to check the first pressing of any batch of duplicates as it is quite obvious that if one is satisfactory all of those which follow will be also, unless, of course, a faulty batch of record material is encountered. Faults in the material are, however, readily detected by a visual inspection. We believe that there are factories who are not content to let their records go through with only a visual inspection, but insist on a complete auditory check of each pressing before passing it into stock or permitting it to be released.

The Cutting Head.

The cutting head, or engraving head, which actuates the stylus used for engraving or embossing the spiral sound track on the surface of the original record is, next to the record material itself, perhaps the most important section of the whole system.

No matter how perfect the microphone and amplifier system may be all of this is wasted unless the cutting head is capable of responding faithfully to every impulse supplied to it by the amplifier.

The design of a cutting head is a mechanico-electrical problem of the highest order. It must have a natural resonance somewhere, since it has weight and stiffness; and if this resonance is in the desired frequency range, a really faithful response can be achieved only by the use of heavy damping, which loads the system in the same way as resistance does in a normal electrical circuit. Damping moreover, uses a great deal of energy and therefore more power must be fed to the cutter in order to maintain the recording level. Furthermore, it is usually found that in addition to flattening out the unwanted resonance, the damping lowers the response of the cutter at the higher frequencies. Consequently, damping is to be avoided as much as possible and the problem of resonances attacked by reducing the weight of the cutter and employing special means of suspension,

If this is done, it is possible to raise the resonant frequency of the cutting system to a point where damping can be applied without having an appreciable effect on the response in the audio-frequency range. Unfortunately, refinements in design such as this result in an extremely delicate instrument and the use and servicing of this is a matter for a highly skilled technician.

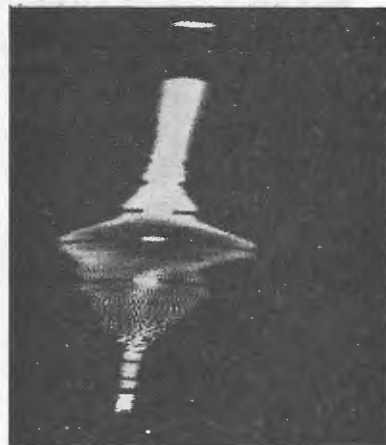
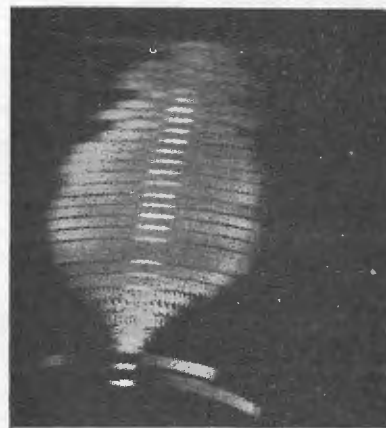
Until recently, the only cutters which could be operated satisfactorily at frequencies in excess of about 6,500 cycles were those of the vertical-cut "hill and dale" type. These cutters used a driving movement of the moving coil type, somewhat similar to that used in a dynamic microphone, and it was possible to obtain reasonably flat response up to about 9,000 cycles per second.

Recently, however, advice has been received that the moving coil principle has been applied to lateral-type cutters and, as a result, cutting efficiency is maintained up to about 8,500 cycles. We understand that lateral-type cutters operating on a similar principle to this have been installed by Columbia in Australia.

Another recent development in this field has been introduced by the engineers of the Brush Development Co. of U.S.A., and makes use of the "piezo-electric" principle of operation already familiar in broadcast studios where "crystal" microphones and pick-ups are in use. In this new cutter a rochelle salts crystal is used as the motor element and operates entirely without damping. A cutter of this type should be extremely efficient in operation and the arrival of further information from overseas is eagerly awaited by Australian recording technicians.

A point concerning the operation of a cutting head which must be borne in mind, is that a "flat" characteristic below 300 cycles is not altogether desirable. This is on account of the fact that for a given voltage input from the recording amplifier the amplitude of the stylus movement increases as the frequency of operation decreases. It has been found that below 300 cycles the amplitude becomes so excessive that the cutter tends to cut into the adjacent groove, producing "overcutting" or the equally disagreeable "echo effect" which comes from distortion of the adjacent groove. This problem can be overcome by using widely spaced grooves, but such a procedure means a sacrifice of recording time per disc. By limiting the response of the cutter so that it has a gradually falling characteristic below 300 cycles the groove spacing can be made 100 to 150 lines per inch of the radius of the recording space without over-cutting and without reducing the level of the voltage fed to the cutter.

An alternative method is, of course, to design the cutter so that its response is flat, and to provide the necessary falling characteristic by means of a low frequency attenuation network either in the amplifier itself or between the amplifier and the cutter. Normal practice, however, generally favours limitation of the cutter response in order to obtain the desired effect.



Illustrations of "Christmas Tree" reflections from the surface of frequency-run records. Top, aluminium disc produced by Fairchild-Proctor, showing flat response to about 6000 cycles. Middle, experimental acetate cut showing pronounced peak at 2000 cps. Bottom, same, made with adjustments to throw peak up to 6000.

MODERN DISC RECORDING—(Continued).

Determining the frequency response of a cutting head alone (without making a record) is a job seldom attempted, although one experimenter has done so by fastening a tiny mirror to the engraving stylus and reflecting light into a photocell. Usually the frequency responses of two elements, the cutting head and the disc material, are measured at the same time by means of a very simple expedient. In order to do this the cutting head and record material are set up as for making a normal recording and the output of a beat-frequency oscillator coupled to the terminals of the cutting head. The beat frequency oscillator output is then held at a constant voltage and its frequency is varied over the desired range, starting at a low frequency and gradually increasing until the top limit is reached.

When the record is complete, it is removed from the turntable and held under a strong concentrated source of light, such as a single coiled-filament 100 watt electric light bulb. The reflection of the light as seen in the grooves will produce a peculiarly shaped pattern which has been given the descriptive name "Christmas Tree." This pattern is symmetrical about a radius of the disc and is actually a graphic representation of

the frequency responses of the cutter and record material taken together. The radius of the disc is the axis of frequency, the end of the pattern nearest the centre corresponding to the lowest frequencies in 33 1/3 r.p.m. recording (which is done from the inside out). The opposite applies for 78 r.p.m. recording. The width of the pattern measured at right angles to the radius is proportional to the amplitude of the engraving, and this, in lateral recording, corresponds exactly to the depth of modulation. This peculiar optical phenomenon is the result of the fact that the light is reflected over a band proportional to the ratio of modulated groove width to groove depth.

Since the overall response of the reproducing equipment is fairly amenable to control and can therefore be compensated to suit any particular conditions without very great difficulty, it is usually sufficient to adjust the cutter head so that the "Christmas Tree" pattern produced by a frequency run has straight sides between about 300 and 6,000 or 7,000 cycles. If pronounced peaks are present in the pattern the cutting head may need adjustment or, as is more usual, electrical filters may be inserted in the recording amplifier in order to level them off.

A really flat characteristic between the limits of 300 to 6,000 cycles, or higher, is not possible unless great care is devoted to the adjustment of the various recording elements, and even then such an adjustment rarely lasts for long as the engraving stylus grows dull with use and must be replaced, or the quality of the disc material changes because of atmospheric conditions. Under proper conditions of control both of these factors can be reduced to fairly low levels by means of such devices as high-grade jewel cutters and air-conditioning in the recording room.

It follows from the above that as falling characteristics may be expected below 300 cycles and above 6,000 to 7,000 cycles, some form of compensation must be introduced in the reproducing network for correction of the response characteristic at these frequencies. The necessary bass compensation is frequently introduced into the design of the pick-up, or by means of an equalising network between the pick-up and its associated amplifier. High-note compensation is a matter for amplifier design, if flat response above the high frequency limits mentioned is desired. However, as will be shown presently, high frequency compensation is rarely essential because of several other limiting factors which must be considered.

(Continued Overleaf.)

12 MONTHS OF PROGRESS

Crashed in the Jungle	The Shell Co.	The Radio Theatre Guild
Swiss Family Robinson	Victoria Palace.	Directed by Lee Murray
Victoria of England	Bryant and May.	A Training School
New Guinea Patrol	Alba Motor Spirit.	For Announcers
Mo. Roy Rene	Nugget Shoe Polish	And Fitting
7.30 Victoria	The Vacuum Oil Company	Pupils for
Features	The Ford Company of Australia	A Radio
By	Purina Grains Foods Pty. Limited	Career
	The Catholic Association of Australia	
	A Few Satisfied Users of Crystal Cut Recordings	

FEATURADIO SOUND PRODUCTIONS PTY. LTD.

32 MARKET STREET, MELBOURNE

MODERN DISC RECORDING—(Continued).

Turntables and Drives.

The third purely mechanical factor which enters into a recording system is that supplied by the rotating turntable necessary for both recording and reproduction.

The performance of the entire system is dependent on these items to a larger extent than most people realise, as not only must their speed be constant in order to ensure that the recorded programme matter stays "on pitch," but the average speed must also be under strict control to ensure that the playing time of the recording remains at its prescribed length.

Mechanical engineers are the first to admit that obtaining a constant steady drive under recording and reproducing conditions, with the load varying both haphazardly (because of the varying depths of modulation) and regularly (as the cutting head, or the pick-up, travels from the outside of the disc in, or vice versa) is one of the most difficult problems they have. The speed regulation, for results acceptable to a trained ear, must be better than 0.3 per cent. Actually, regulation better than 0.2 per cent. is rarely achieved, so that the limits within which turntable designers must work are fairly close.

Average speeds are measured and adjusted by means of stroboscopic lines or patterns in conjunction with a fluctuating light source such as a 50 cycle electric lamp. By adopting a fixed standard of measurement, which is common to both the recording and reproducing turntables, it is therefore possible to ensure that average playing speed, and therefore the record playing time, is duplicated without much difficulty.

Speed regulation, that is, ensuring that the record speed remains constant throughout its playing time, is not nearly so simple. One means of accomplishing this is known as the "brute force" method and makes use of an extremely heavy turntable, which will maintain its speed by virtue of its high moment of inertia. This method usually accomplishes the desired purpose, and turntables weighing up to 110 lbs. have been used at the recording end. The only disadvantage of this system, which is not particularly serious, is that the turntable is not self-starting, but must be given a preliminary spin by hand. The use of synchronous motors as prime movers is also of great assistance in this direction, as this type of motor automatically adjusts the amount of power available to the instantaneous load requirements.

Even this method is not altogether perfect, as synchronous motors have torque variations within the cycle of the power frequency. These torque variations must be filtered out in some way and it is necessary to provide a mechanical filter which contains both mass and stiffness. A

massive universal joint with spring couplers is usually used. By this means it has been possible to obtain constant speed, at varying power requirements, within the prescribed limits of regulation.

Another method, which is normally employed in the larger gramophone record factories, is the use of "gravity" type motors. These motors consist of a deep pit in which is suspended a heavy weight at the end of a cable. The top of this cable is wound round a drum which turns on release of the weight. Extremely constant power is available from the spindle of the drum, and is, moreover, completely independent of power fluctuations or other extraneous factors.

Coupling from the filter (in the case of the mechanical drive system) or the cable drum (in the case of the gravity drive) to the turntable is accomplished by carefully machined gears; by direct drive, by rim drive (a small rubber wheel running against the inside of the rim of the turntable); or by belts. The relative advantages of these different systems have been widely argued in the industry, but, in general, it is accepted that the heavier the drive and the more precision workmanship put into it the better it is. Portable recording machines, which are becoming increasingly popular, impose very severe restrictions on the turntable drive, but most of the units available are, nevertheless, surprisingly efficient.

Although it is not generally necessary to go to quite so much trouble in the design and construction of a reproducing turntable as in a recording turntable, the above factors must all be considered, especially if high quality reproduction is desired. As a result of this, we find that special transcription-type turntables have been developed by several of the "wide range" recording licensees for use by stations using their productions. These turntables may seem unnecessarily elaborate to the average station engineer (or manager for that matter) but a little thought will soon indicate that their use can have no other than a beneficial effect on the quality of the reproduction obtained.

It is, in fact, quite possible that a large percentage of the superiority claimed for some of the "wide range" systems is largely due to the care which has been taken by their sponsors to ensure that reproduction is effected under conditions which are at least comparable with recording conditions. Furthermore, it is quite possible that if as much time and attention had been devoted to the reproduction of more or less "standard" recordings as has been devoted to "wide range," much of the justification for the introduction of so-called "high fidelity" recordings would never have existed.

The two standard turntable speeds, 33 1/3 and 78 r.p.m., are now divided

rather sharply, the former for transcription type records and the latter for the recording of brief announcements and general purpose records sold to the public. The "wavering" quality noticeable in the first 33 1/3 r.p.m. recording have been fully overcome nowadays, so that when properly designed equipment is used there is little choice between the two speeds, although it is generally claimed that it is easier to record the higher frequencies at higher groove speeds.

Reproducing Equipment.

The question of turntable speed and the necessity for bass boosting in connection with reproducing equipment has already been mentioned, and need not be elaborated on further. A few words about pick-ups should be of interest, however, as a wide variety of choice as to the particular type of pick-up to be used exists.

Broadly speaking, there are two general classifications of pick-ups; those that operate along magnetic principles and those that utilise the piezo-electric principle. Until recently, magnetic pick-ups were severely limited in frequency response and reasonable output above 5,000 cycles was rarely obtained. However, a considerable amount of attention has been paid to the design of pick-ups recently and units are at present available which are capable of extremely flat response up to as high as 10,000 cycles.

On the other hand, piezo-electric (crystal) type reproducers have been available for some considerable time which will provide satisfactory response up to over 8,000 cycles. Outstanding examples of this type of unit are to be found among the range of Brush-licensed products.

Vertical type pick-ups (those used for the reproduction of "hill and dale" records) are designed to operate on the moving-coil principle similar to that used in the moving-coil cutting heads previously described.

Recent advice from overseas indicates that the moving-coil principle has now been applied to "lateral" reproducers and some really surprising characteristics are claimed. Another example of the newer trend in magnetic pick-up design for "lateral" records is found in the "relayed-frequency" pick-up in which the previously heavy (comparatively speaking) armature is replaced by a small "exciter" which varies the magnetic flux between a stationary armature and field magnet.

A major problem with all types of reproducers has been that of the needle. This inevitably wears after playing a few recordings, at the very outside, and must be replaced. Constant replacement imposes a heavy strain on the moving armature or exciter and its mounting; consequently more massive construction is necessary than would be the case if a non-wearing needle could be used. The effect of this extra mass is most seri-

MODERN DISC RECORDING—(Continued).

ous at the high frequencies and many devices have been introduced at various times in an endeavour to overcome the difficulty.

The first really logical step in the right direction was made when the first modern verticle-cut recordings were introduced. The pick-ups designed for operation with these records were equipped with a sapphire "needle" which only needed replacement at very long intervals. As a result, the armature mechanism (which in this case is a moving coil) can be made very light in construction and free to respond to the slightest undulation in the engraved sound track.

News of the first application of a jewel point to lateral type reproducers was received only recently. The pick-up using this jewel point is a German product (Telefunken) and the effect of the change is amply demonstrated by the published response curves, which show a surprisingly flat characteristic up to about 10,000 cycles.

Broadcast Limitations.

So far this discussion has dealt purely with recording and reproduction as such and not in connection with a broadcast system. In order to obtain a complete picture of the circumstances which govern the use of any recording system, it is necessary to consider the broadcast system factor as well as the problems directly associated with recording and reproduction.

The first point is that of volume range. Although we hear reports from overseas about "high fidelity" broadcasting stations which are capable of modulating a volume range in excess of 60 decibels and doing justice to a frequency range of from 30 cycles to over 7,500 cycles, such stations are extremely rare and it must be admitted that very few, if any, are to be found in Australia. There are several factors which contribute to this, chief among which are the frequency allocations (which make the radiation of any frequency much in excess of 5,000 cycles rather useless); the relatively low powers used; and the high prevailing noise level. These factors, together with the dictum which rules that commercial programmes shall be modulated at the highest possible average level, conspire to keep the average station's volume range somewhere around the 40 to 45 DB mark and to limit the upper modulation frequency to somewhere very close to 6,000 cycles.

Even should a station actually be radiating a full 60 decibels of volume range and a frequency range of over 7,000 cycles there is still the receiver to consider. Recent papers delivered before the Institution of Radio Engineers (Australia) and elsewhere have shown that the response of the average receiver (which means the majority of them) is negligible at frequencies over 4,000 to 5,000 cycles. In addition, the average output valve used in a radio receiver limits the reproducible volume range to somewhere in the neighbourhood of 40 decibels even at the very best, so that little is gained, at the present time, by the station expending much time and trouble on extended range programmes.

From the above it can be seen that there is not much to choose between the various systems on purely technical grounds, and the choice devolves largely on the relative merits of the programme matter available.

Vertical v. Lateral Records.

A great deal of matter has recently appeared concerning the superiority of records made by "vertical" or "hill and dale" engraving processes.

Although the details presented in the preceding sections of this discussion indicate that there is, at the present state of development, a reasonable doubt as to whether this superiority is as great as claimed, it must be admitted that the vertical-cut recordings, when heard direct from the reproducing equipment, sound better than lateral-cut recordings of similar musical numbers. As to whether they sound better when heard "over the air" on an average receiver is a debatable point; and an opinion would be out of place in this discussion.

The "auditory superiority" of vertical-cut records mentioned above cannot be wholly explained by inherent technical improvements. Rather, it seems likely that the improvement is due largely to the establishment of a system of which all parts are under close engineering control, and to the expenditure of much energy on refinement of the engravers and reproducers (to a point, incidentally, where they can be maintained only by specially trained experts). The vertical type cutters are a marvel of workmanship; they cut a groove as well at 9,000 cycles as they do at 300 cycles.

The wax original and the plastic duplicates used are of the best materials available; while the reproducers use a special sapphire stylus

which is designed to match the groove with precision, but which cannot be replaced or even adjusted except by an expert. The noise level, reduced by care in engraving and by the use of proper materials, is claimed to be a full 60 decibels below the level of the maximum allowable signal.

On the other hand the very latest lateral-cut recordings from overseas indicate that a volume range in the neighbourhood of 50 decibels has been accommodated on a disc. As pointed out previously, lateral cutters are available commercially which will engrave efficiently up to over 8,000 cycles, and the same materials are available for use with both systems. It would appear that the weakest link at the moment is in the reproduction, in spite of the fact that response up to nearly 10,000 cycles is claimed for some of the pick-ups at present available on the Australian market. Bearing in mind the factors mentioned in the "Turntable" section of this discussion, it is doubtful if lateral recordings at their best have ever been heard in Australia. However, there is still hope, as samples of the "high fidelity" lateral-type pick-ups previously mentioned should be available shortly.

So we can conclude this discussion by saying that even if there does appear to be an appreciable difference between the two systems at the present time (disregarding the limitations imposed by the broadcast system itself) so much more attention is being paid to the development of the lateral system nowadays that the gap between the two is rapidly closing. Which will eventually prove the best is at least an open question.

BROADCAST STATION SEPARATION.

(Continued from Page 88.)

the part of a responsible body of engineers and, as such, may be taken as a reliable guide.

Therefore, next time a controversy regarding the frequency allocation of a station, with relation to another "nearby" transmitter, crops up, take time off to examine the case on its engineering merits, and judge how much of the complaint can be discounted. Don't forget that there are still such items as overmodulation, carrier instability and unselective radio receivers to take into account—each of which alone can give rise to more complaints of interference than the fact that another station on a nearby frequency seems to be a few miles closer than it should be.

PRESTO
RECORDING CORPORATION

REMEMBER . . . whether you want a complete recording installation or just a needle, rely on PRESTO: Makers of the famous Green Seal Disc . . . Sole agents—

A. M. CLUBB & CO. LTD.,
76 Clarence Street, Sydney.



MICROPHONES
PICK-UP DEVICES
RECORD CUTTERS
RECORDING
EQUIPMENTS
SOUND PROJECTORS
VALVES

Transcription Producers and Programme Services

(See also Advertising Service Agents placing Radio Accounts)

AERIAL PUBLICITY COMPANY LTD., Wingello House, Angel Place, Sydney. B 3397. Directors, H. T. Hungerford, A. Gibb, C. H. Gilham. Manager, A. Gibb. Secretary, C. H. Gilham.

Bankers: Commonwealth Bank. Auditors: Croft. Interstate representative: Una Radcliffe, 470 Lonsdale Street, Melbourne, Victoria.

Radio accounts handled: Bear and Co., Sydney Cash Orders, Moran and Cato, Wisemans' Tailors, Globe Trust, etc.

Business placed during past 13 months with: All Sydney stations and 2HD, 2KA, 2GZ, 2WO, 2CA, 3KZ, 3XY, 4BH.

AMALGAMATED WIRELESS (A/SIA) LTD., "Wireless House," 47 York Street, Sydney. Telephone: BW2211.

Manager, Broadcasting Department: V. M. Brooker. Recording Equipment: High fidelity processed and instantaneous playback types.

BLANKS, CHAS. E. LTD., "Kelvin House," 15 Castle-reagh Street, Sydney, N.S.W. B 6748-9. Managing Director, Chas. Edward Blanks; Recording Manager, Charles Calvert King.

Equipment: Four Stage P.P. Recording Amplifiers on standard racks with associated mixers and faders. Presto Commercial Recorders. Important recordings during the past 12 months made for the following clients:—Commonwealth and Rural Banks, Messrs. Snyder & Dean, Stations 2GZ, 2BH, General Theatre Corporation Ltd., Burwood Cinemas Ltd., King's Theatres Ltd., N.S.W. Theatres Ltd., Northern Theatres Co., Manly Theatre Co. Also a large number of other theatre companies and commercial undertakings.

BROADCAST SERVICES: Q.N. Bank Building, Chr. George and Turbot Streets, B.12, Brisbane. B 9659. Manager and Director, John Christopher; Chief Sound Engineer, W. Clarkson.

Equipment: Presto Portable Recorder, recording at 78 and 33 $\frac{1}{2}$ on 10 to 16 inch discs, with interchangeable cutting heads for all surfaces.

Important recordings during the past 12 months made for the following clients: Champion Autos, Studebaker Cars, Australian Broadcasting Commission, Station 4QG, Vealls Agencies Pty. Ltd., Hi-Mark Shoe Polish, Coronation Band Contest Committee, speeches by Sir Leslie Wilson, Cairns Combined Schools Boys' Band, special band records. With various advertising agencies, musical travelogue presentations, complete revues, various sketches, etc. Organisation can supply actors and script and production for any type of straight credit or feature recording.

B.S.A. PLAYERS: 29 Bligh Street, Sydney.

CHANDLER, J. B. & CO., Australia House, Carrington Street, Sydney. B 6401.

COLUMBIA GRAPHOPHONE (AUST.) LTD., 2 Parramatta Road, Homebush, N.S.W. Phone UM 6671. Managing Director, W. A. Donner; Secretary, J. M. Burnett; Sales Manager, C. F. Tyler; Recording Manager, R. V. Southey.

EQUIPMENT: The Columbia Company, specialists in recording for over 25 years, use equipment designed and perfected in their own Research Department. Both fully processed wax recordings and direct playback acetate discs are produced.

IMPORTANT RECORDINGS during the past 12 months made for the following clients: Bonds Industries Ltd., Bushells Ltd., Kraft Walker Cheese Co., Wrigleys (A/sia) Ltd., Taubmans Ltd., British Australian Lead Manufacturers Ltd., Lambert Pharmacal Co. (Listerine), Kellogg (Aust.) Pty. Ltd., Fostars Shoes Ltd., Atlantic Union Oil Co., Nestles and Anglo Swiss Condensed Milk Co., Colman-Keen (Aust.) Ltd. (Keens Mustard), Heans Essence Pty. Ltd., Eno's Fruit Salts, Berlei Ltd., Tea Market Expansion Bureau, W. D. and H. O. Wills (Temple Bar Tobacco), W. E. Woods Ltd. (Peppermint Cure).

The Columbia Graphophone Company is one of the oldest and largest recording and record manufacturing organisations, with interests that spread all over the globe. The well-known "Magic Notes" trademark has been carried to every part of the world on records made by this Company of some of the world's most famous artists. To-day, the Australian branch of this same organisation offers its unique recording facilities to all people who are interested

TRANS-RADIO SERVICE

Covers TALENT BUREAU . . . SCRIPT SUPPLIES . . . INTERSTATE SERVICE . . . COVERAGE
STATISTICS . . . RECORDED COMMERCIALS . . . COPY WRITING . . . MERCHANDISING
. . . DISTRIBUTION . . . PROGRAM PLANNING, TRANSCRIPTIONS, MUSICAL AND
DRAMATIC PRODUCTION. Postal Address . . . Box 1193
Studios, Asbestos House, G.P.O., Sydney . . . Tel. B5407
65 York St., Sydney.

TRANSCRIPTION PRODUCERS AND PROGRAMME SERVICES—(Cont.)

in the recording of messages or entertainment for use over broadcasting stations. Only recently it was found necessary to increase the studio space available at their Homebush factory, and additional equipment has also been installed to cope with the demands made on them. Quite apart from the technical equipment available, one of the secrets of modern high-class recording is the availability of experienced engineers. Under the direction of Mr. R. V. Southey, the technical staff associated with the Columbia Studios have had a training and experience available to few.

The Columbia Company extends an invitation to all interested persons who may wish to inspect their recording studios and processing plant, which is claimed to be the most complete of its kind in the Southern Hemisphere.

COUNTRY BROADCASTING SERVICES (2GZ), Hosking Place, Sydney.

COMMONWEALTH BROADCASTING CORP. LTD. (2UW), 49 Market Street, Sydney.

DIAMONDPOINT SERVICES PROPRIETARY LTD., Victoria House, 83 Pitt Street, Sydney. BW 7490.

Managing Director and Secretary: Jacob H. Barker, Jun. Director: Miss M. E. Sommerville.

Importer and licensor of transcriptions.

Clients during the past 12 months include Stations 4BK, Brisbane; 2UW, Sydney; 3DB, Melbourne; 5AD, Adelaide; 6IX, Perth.

FEATURADIO SOUND PRODUCTIONS PTY. LTD., Featuradio House, 32 Market Street, Melbourne, C.1. Telephone: M 5701-2. Managing Director, George Sutton. Director, J. M. Sayer.

Recording equipment: Playback—Audisk—complete galvanic and processing outfit.

Recordings made during past 12 months for Shell Co. of Australia, Bryant and May Ltd., Vacuum Co., Prestige, Suttons Ltd., Ford Motor Co., Schumanns Salts, Bedggood and Co. Pty. Ltd., Kellogg (Aust.) Pty. Ltd., Alba Petroleum, Henry Buck, Robur Tea, C.O.R., Pelaco, Nuggett, Godfrey Phillips, W. D. and H. O. Wills, Victoria Palace, Catholic Association, etc.

FEATURADIO SOUND PRODUCTIONS (N.S.W.) PTY. LTD., Pacific House, 296-300 Pitt Street, Sydney, N.S.W. M 3652. Managing Director: Charles Henry Gendle, Sales Promotion Manager, James Joyce.

Equipment designed and evolved by Featuradio. Modern Galvanic and Pressing Department, the facilities of which are available to those recording studios not equipped for this work. Details on application.

Important recordings made during the past twelve months for the following clients: Whiteloid Products ("Nu-Nap," "Shu-Milk," "Lusteroid"), Pennsylvania Oils (A/sia) Ltd. ("Kendall Oil"), Schumann's Salts, Philips Lamps (A/sia) Ltd. (Philips Radio Valves), Ford Co. of N.Z. (Automobiles), Sydney Milling Co. (Sydney Flour), N.R.M.A. (announcements), Shell Co. of Australia (Shell Products), Rural Bank (Pastoral interests), United Aus-

tralian and United Country Parties (Election Addresses), Bonds Industries Ltd. (Hosiery), Kellogg (Aust.) Pty. Ltd. ("All-Bran," "Rice Bubbles"), Kraft Walker Cheese Co. Pty. Ltd. ("Kraft Cheese"), Du Maurier Institute, The Investors' Bureau (stocks and shares), Slazengers (Aust.), Cinesound Productions, Bushells Ltd. (tea and coffee), Brennan's Theatres Ltd (screen slide announcements), Chas. E. Blanks Ltd. (screen slide announcements), Fox Films, Burns Philps & Co. Ltd. (travel), Dangar Gedy & Malloch Ltd. (various—featuring "Leave it to Leslie"), "Unitair" Air Conditioning Systems, W. D. & H. O. Wills, Pick-Me-Up Condiment Co., Prudence Investment Trust (Golden Casket Lottery), Tea Marketing Board, Safety First Council, Continental Drug Co. (Outdoor Girl Cosmetics), E. F. Wilks & Co. Ltd. (Washing Machines).

FIDEL-A-TONE SOUND PRODUCTIONS, 407-409 Swanston Street, Melbourne, Vic. Phone F 1735. Managing Director, Mr. John Murray.

Recording Equipment: Presto and Western Electric, R.C.A. Accessories.

Recordings during past 12 months: Holborn Tailors, Voice of the People Rebroadcast, Mignon Hosiery Ltd., Radi Record Ads., Guest's, Moran and Cato, Wardrop Tailors, Clarrie Gange and Band, Smoky Dawson and Colorado Boys, Harmony Kings, etc.

Mr. Murray was sound recording engineer at Efftee Film Productions from 1931-1936, and film recording for 3XY. In conjunction with Mr. Gaston Mervale, producer for Radi Records Ads., Fidel-a-tone Sound Productions have formed the Melbourne Academy of Broadcasting.

Doodlesack or dulcimer

. . . contrafagotto, bagpipe, xanorpha, rebec, orphicleide, viola de gamba—no matter how unusual the instrumentation, Diamondpoint reproduces them all with unparalleled fidelity. Even better known instruments such as the violin require recording methods of almost unbelievable sensitivity at a frequency of 10,000 cycles per second. Only in Diamondpoint's wide range hill-and-dale sound system is the record a clear and unblemished replica of the ORIGINAL tone. This superlative tone quality accounts in part for Diamondpoint's increasing use by important sponsors.



Diamondpoint Services Pty. Ltd., 83 Pitt Street, Sydney

TRANSCRIPTION PRODUCERS AND PROGRAMME SERVICES—(Cont.)

GEORGE EDWARDS PRODUCTIONS, State Shopping Block, Market Street, Sydney. Telephone MA 4158. Programme producers. Programmes recorded during the past 12 months for British Australian Lead Manufacturers, Wrigleys (Aust.) Ltd., New Zealand Government, 3KZ casters Ltd., Adelaide. (See further particulars on page 150).

LEGIONNAIRE RADIO PRODUCTIONS PTY. LTD., 68-70 King Street, Melbourne, Vic. Telephone MU 2757. New company registered 1937.

Directors: L. L. Wathen (Chairman); K. L. Corr (Managing); Sales Manager, Harold Brown; Technician, John Marks; Production Manager, E. Conway.

Recording Equipment: Presto Heavy Duty Cutters. High Fidelity Amplification.

Sole Victorian Representative Presto Equipment and Green Seal Discs.

MAURICE & MOORE PTY. LTD., City Mutual Building, Cnr. Bligh and Hunter Streets, Sydney, N.S.W. BV 4111 (3 lines).

Two studios and general offices at above address. One Audition Room. One Control Room.

Equipment: S.T.C. Equipment and Recording Plant.

PRESTOPHONE PTY. LTD. (formerly Radio Associated Services), Pacific House, 296 Pitt Street, Sydney, N.S.W. MA 7325. Managing Director: Rex Shaw. Directors: Gordon Bennett, A. J. Daniels. Secretary and Registered Office: L. J. Moore (Moore & Moore), Watson House, Bligh Street, Sydney. Sales Representative: C. Honeyfield. Producers: Arthur Hemsley and Frederick Ward. Announcer: John C. Cover.

EQUIPMENT: Presto Universal Recorders. Crystal Microphones.

Important recordings during the past 12 months made for the following clients: The Trocadero, Palladium, Woman's Musical Society, Bebarfalds Ltd., Trans-Radio News and Sales Service, Women's Magazine of the Air, Purr Pull Motor Spirit, Crispies and Vita Brits, Kathner and Tolhurst Films, Teddie Garrett School of Music, Radio-division Pty. Ltd.

"Prestophone" has been registered as trade mark for both instantaneous and processed discs. Application has

been made to change name of firm to "Prestophone Pty. Ltd."

New studio and equipment built and installed May, 1937.

RADCLIFFE, Una, 470 Lonsdale Street, Melbourne. Representing Aerial Publicity Ltd., Sydney.

RADIOPHONIC RECORDING (Mr. Ernest Long), C/o Station 4BK, Brisbane.

RECAUDIO PRODUCTIONS, 8 A.M.P. Chambers, William Street, Perth, W.A. Phone B 9919. Proprietor, W. E. Coxon.

Recording equipment: Telefunken.

Recordings during past 12 months: Woolworths (W.A.) Ltd., Vacuum Oil Co. Ltd., Colonial Mutual Life Assurance Society, 6PM Broadcasters, 6AM Broadcasters Ltd., W.A. Broadcasters Ltd., Malloch Bros., Robur Tea Co., Fashion House, Elder Smith and Co. Ltd., Arrow Cycles Ltd., Filmads (W.A.) Ltd., Bairds Co. Ltd., Perth Literary Institute, Airzone (W.A.) Ltd., Harris, Scarfe and Sandovers Ltd., Michelides Ltd., Lipton's Tea.

STATION 4BC, 43 Adelaide Street, Brisbane.

STATION 3DB, Broadcasting Co. Pty. Ltd., 36 Flinders Street, Melbourne.

SHEARMAN, T. H. Sound Recording Studio, Underwood House, 16 Hunter Street, Sydney, N.S.W. B 5525.

Equipment: "Presto." Commercial and private recordings.

SOUND RECORDING STUDIOS LIMITED, 160 Castlereagh Street, Sydney, N.S.W. MA 4035. Directors: A. R. Fox (Chairman), C. M. Guiney, B. E. Salter and S. E. Tatham. Manager, S. E. Tatham. Secretary, C. Godfrey Hill. Engineers, J. Brassil, A. Cornell and I. Fraser.

STUDIOS: Three studios completely furnished and with equipment installed at above address.

RECORDING EQUIPMENT: Dual Universal Professional Recording Machines and Portable Recorders. Dual amplifying systems, together with associate mixers and faders. Separate recording and audition systems. Present equipment permits three separate recordings to be made simultaneously and broadcast out over the Company's private land-line to any station or network of stations desired. Talking picture reproducing equipment also available.

Recording, Audition, Broadcasting Studios

Instantaneous & Pressed Records

Landlines for any Radio Network



SOUND RECORDING STUDIOS LIMITED.

Programmes Planned, Produced, Recorded

160 CASTLEREAGH ST. SYDNEY.

Most Modern Recording Equipment in Australia

S.R.S. Specialise, Ensuring Record Satisfaction!

TRANSCRIPTION PRODUCERS AND PROGRAMME SERVICES—(Cont.)

PROCESSING EQUIPMENT: Complete equipment for processing records either from instantaneous acetate cuts, or from wax. The Company employs the very latest methods in all branches of its products from the recording end right through the processing and pressing departments, where the finished records are delivered. The equipment permits almost any size record to be processed and pressed, ranging from small six inch discs up to ten, twelve and sixteen inch transcription size. The actual pressed record can be supplied in the form of the ordinary record stock or special material as used by American transcription manufacturers known as "Vinylite."

Important recordings during the past 12 months made for the following clients: The Australian Broadcasting Commission, the Commonwealth Government, the Commonwealth Broadcasting Corporation, Station 2UW; Commonwealth Broadcasting Network, numerous other "B" class stations in New South Wales, and many commercial recordings and scatters for both local and National sponsors.

FACILITIES: Complete broadcasting and recording studios and talking picture theatre. Broadcasting direct

from studio to any outside point; receiving remote broadcasts from any outside point into studio for audition or recording. Services include continuity writing and complete programme planning department.

THURSTON, HARRY, 29 Bligh Street, Sydney.

TRANS-RADIO NEWS AND SALES SERVICE, 8th Floor, Asbestos House, 67 York Street, Sydney, N.S.W. B 5407. Director, S. A. Maxwell; Programme Manager, Ward Leopold; Talent Sales Manager, D. M. Fegan; Publicity Officer and Assistant Programme Manager, M. Dye; Margo Russell, Editress of Woman's Magazine of the Air.

All requirements for recording and programme building are supplied, operating in conjunction with any recording house. Important recordings during the past 12 months made for the following clients: W. H. Lober & Co. Ltd., Cereal Foods Ltd., Purina Grain Foods Ltd., etc. Talent supplied to J. Walter-Thompson Pty. Ltd., Columbia, Featuradio.

Productions include "The Woman's Magazine of the Air."

3KZ BROADCASTING CO. PTY. LTD., 64 Elizabeth Street, Melbourne.

Power Analysis of Commercial Broadcasting Stations in Australia

NOTE: Some stations have a licence for the use of higher power than that which is indicated here and may be using such before this Year Book is circulated. However, as changes of power are recorded in "Broadcasting Business" from time to time, the information can be extracted from the weekly publication and added to this analysis to keep it up-to-date all the year around.

2000 WATTS	750 WATTS	600 WATTS	500 WATTS	400 WATTS	300 WATTS	200 WATTS	100 WATTS	50 WATTS
2GZ Orange, N.S.W.	2UW Sydney, N.S.W.	3AW Melbourne, Vic.	2CA Canberra, F.C.T.	3BO Bendigo, Vic.	2WL Wollongong, N.S.W.	2GN Goulburn, N.S.W.	2AD Armidale, N.S.W.	2RG Griffiths, N.S.W.
2NZ Inverell, N.S.W.	3HA Hamilton, Vic.	3DB "	2HD Newcastle, N.S.W.	3BQ "	4LG Longreach, Q'ld.	3AK Melbourne, Vic.	2AY Albury, N.S.W.	4RO Rockhampton, Q'ld.
2TM Tamworth, N.S.W.	3AW "	3KZ Carlton, Vic.	3KO "	3BU "	7HT Hobart, Tas.	3UL Warragul, Vic.		4VL Charleville, Q'ld.
2WG Wagga, N.S.W.	3DB "	3UZ Melbourne, Vic.	3LM Lismore, N.S.W.	4BU Bundaberg, Q'ld.	7LA Launceston, Tas.	4TO Townsville, Q'ld.		
3LK Lubeck, Vic.	3KZ "	3XY "	3BA Ballarat, Vic.	4CA Cairns, Q'ld.	7LU Ulverstone, Tas.	5SE Mt. Gambier, S.A.		
3SR Shepparton, Vic.	3UZ "		4AY Ayr, Q'ld.	4IP Ipswich, Q'ld.				
4AK Brisbane, Q'ld.	3XY "		4BK Brisbane, Q'ld.	4MB Maryborough, Q'ld.				
5P1 Crystal Brook, S.A.			4GR "	4MK Mackay, Q'ld.				
6AM Northam, W.A.			5AD Adelaide, S.A.	4PM Port Moresby (Papua).				
6WB Katanning, W.A.			5DN "	4WK Warwick, Q'ld.				
			5KA "	4ZR Roma, Q'ld.				
1000 WATTS				5MU Murray Bridge, S.A.				
2CH Sydney, N.S.W.				6PM Fremantle, W.A.				
2GB "				7BU Burnie, Tas.				
2KY "				7QT Queenstown, Tas.				
2SM "				7HO Hobart, Tas.				
2UE "								
3TR Sale, Vic.								
4BC Brisbane, Q'ld.								
4BH "								

Faithful Reproduction of Speech, Music, and effects.

SUPREME QUALITY

PRESTOPHONE

New Studios — plus experienced operation guarantee satisfaction

COMMERCIAL RECORDINGS

Prestophone Pty. Ltd.
296 Pitt Street, Sydney
Tel., MA 7325

Trade quotations for instantaneous and processed discs.

PROMINENT ADVERTISERS IN AUSTRALIAN BROADCASTING

Analysed By Products Advertised

The particulars in this section provide a comprehensive survey of Broadcast Advertising on Australian Commercial Stations during the past 12 months.

The information from which the following lists were compiled was supplied by many Commercial Stations in the Commonwealth, as well as from data, used for checking purposes, obtained from Advertising Service Agencies handling radio accounts.

The purpose of the section is to indicate at a glance from what industries and from what sections of commerce broadcast advertising business flows. The station call-signs after each listed advertiser show what stations have been used.

Obviously, every advertiser is not listed. The accounts listed are in the main National Accounts, but where possible Metropolitan Advertisers making substantial broadcasting contracts have been included.

The publishers of "Broadcasting Business" Year Book for 1937 accept no responsibility for omissions in this section, but all care has been taken to provide as efficient a guide as circumstances will permit. Out of 61 stations throughout the Commonwealth who replied, in part or fully, to questionnaires sent out, 24 stations supplied lists of National Advertisers over the past 12 months and a lesser number of stations supplied additional information concerning local accounts handled.

Automobiles, Accessories, Etc.

Advans Tyres: 2SM.
Aust. Auto Distributors Parts Assn.: 2GZ.
Bennett and Wood Ltd.: 2WL.
Brico Piston Rings: 2GZ.
Dunlop-Perdriau Tyres: 2UW, 2KO, 2HD, 2GZ, 3KZ, 3HA, 3TR, 4BC, 5DN, 5RM, 6IX-WB, 7HO.
Eager and Sons (Gen.-Motors, Cars): 4BK.
Ford Co.: 2KO, 6IX, 6ML.
Garratts Ltd.—Overland, Sydney: 2CH.
General Motors-Holdens Ltd.: 5DN.
Gurton Tyre Co.: 2UW.
Havilands Service Station: 2KO.
Hillman Cars: 6IX, 6WB.
Karpol: 6ML.
Newcastle Auto. Exchange: 2KO.
Reo Motors: 2SM.
Southern Motors Pty. Ltd.: 3KZ.

BICYCLES.

Bruce Small Pty. (Malvern Star): 2KY, 2GZ, 3AW, 3HA, 4BH, 4BC, 4MB, 6IX, 6WB, 2ML.

Batteries.

Clyde: 4RO, 4MK, 4TO, 4LG, 4BU, 4CA, 4MB.
Ever Ready: 2GZ, 2WG, 2BH, 2TM, 2GN, 2LM, 2NZ, 3HA, 3MA, 3TR, 3SH, 3SR, 3MB, 3BO, 4CA, 4AY, 4VL, 4LG, 4MB, 4BU, 4GR, 4RO, 4MK, 5AD, 6IX, 6WB, 6KG, 6AM.
Exide: 2KO, 2LM, 2NZ, 3SR, 3YB, 3UL.
Diamond: 6IX, 6WB, 6ML.
Masse: 4RO, 6IX, 6ML.
Implex: 3HA, 3TR.
Vesta: 2GZ.
Widdis Dry Cell: 2GZ, 2TM, 2WL, 3TR, 3HA, 5DN, 7HO.

Cleaners and Dyers.

Brown's Dry Cleaning: 3KZ.
Mark Mayne: 2UW.
Roger Bros.: 2SM.

Confectionery.

Alan White and Campbell: 2CH, 2SM, 2GZ, 2HD.
Griffiths Sweets: 2UW, 2KO, 2GZ, 3UZ, 3TR.
Hoadley's Chocolates: 3DB, 6ML.
Lifesavers (A/sia): 4BU, 6AM, 6IX, 6ML.
MacRobertsons Sweets: 3DB-LK, 3KZ, 6IX, 6ML.
Morrows: 4BC, 4BH, 4BK.
Murray, R. S. and Co.: 3TR.
Nestles: 2KY, 2SM, 2KO, 2GZ, 2HD, 2TM, 2NZ, 2WL, 3KZ, 4BH, 4AY, 4IP, 4RO, 5DN, 6AM, 6IX, 6WB, 6ML.
Paynes Sweets: 2KO.
Peters Ice Cream: 2CH, 2KY, 2SM, 2GZ, 2TM, 2WL, 6WB, 6ML, 7HO.
Smalls Chocolates: 2SM.
Wrigleys Chewing Gum: 2UW, 2GZ, 2KO, 2TM, 2CH, 2LM, 3DB-LK, 3KZ, 3TR, 3HA, 4BK-AK, 4IP, 5AD-MU-PI, 6IX-WB, 6AM, 7HT.

Cosmetics, Beauty Specialists, Etc.

Atkinson's Perfumes: 2KY.
Anna Zelita Beauty Products: 2GZ.
Bardsley's Ltd.: 2CH.
Bells Products: 2GZ.
Bonjois et Cie: 2CH, 5DN.
Bush, W. J. and Co. (Ponds Cream): 2CH, 4BK-AK, 6IX-WB, 3DB-LK, 5AD-MU-PI, 3KZ.
Charmaine: 3KZ.
Continental Drug: 2CH, 2GZ.
Clement Black and Co. (Charmosan): 2GZ.
Dearborn Aust. Ltd.: 2GZ.
Divinia Perfumes: 2SM.
Fauldings Ltd.: 2KY, 2KO, 5DN, 6IX, 6ML.

Kathleen Kerry: 2SM.
Madam Pompadour: 3DB.
O'Shee, T. J. Esq. (Kathleen Court preparations): 2UW, 2SM, 2GB.
Stearns, Frederick and Co. (Nyal products): 2HD, 2GB, 2UE, 2GZ, 2TM, 2WG, 2KA, 2KY, 2TM, 2KO.
Woods, W. E. Ltd. (Nivea Cream): 2CH, 2UW, 2KO, 2KA, 2GZ, 2GF, 2GN, 2AY, 2AD, 2LM, 3DB-LK, 4BC, 4RO, 4GR, 4AY, 5AD-MU-PI, 6IX-WB, 6AM, 6ML.

Electrical and Household Appliances.

Aladdin Lamps: 3KZ.
Aust. Gen. Electric (Madza Lamps): 2UW, 2HD.
Banks, C. A. & Co. (refrigerators): 2GZ.
Electricity Meter and Allied Indust. (refrigerators): 2CH, 2GZ.
Everyday Products (refrigerators): 2DU.
Eureka Stoves: 6IX, 6ML.
Hoare, A. F. & Sons (radiators): 6IX, 6AM, 6WB.
Junkers Heaters: 6IX, 6ML.
Kelvinator: 4DN.
Metters Ltd.: 6IX.
Wilks, E. F. & Co. Pty. (refrigerators, etc.): 2UE, 2KO, 2KY, 2GB, 2HD, 2GZ, 6IX-WB.

Entertainment, Dance Halls, etc.

Ginger Jar Cabaret: 2UW.
Hoyts Theatres: 3KZ, 2SM.
Palais Royal: 2UW.
R.K.O. Pictures: 2UW.
Theatre Royal (Adelaide): 5DN.
Theatre Royal (Newcastle): 2KO.
Trocadere Dance Palais (Brisbane): 4BK, 4BH.
Union Theatres: 3DB, 2UW.
Victoria Theatre (Newcastle): 2KO.

Farm, Station, Gardening Equipment, etc.

Australian Fertilisers Ltd.: 2GZ, 2TM.
A.R.C. Engineering Co. (fencing): 2GZ.
Buzacott and Co. Ltd. (fencing): 2GZ.
Cyclone Fence Co.: 3TR, 3HA.
Dangar Gedye and Malloch (farm machinery, etc.): 2GZ, 2NZ, 2TM, 2WG.
Dearing Engineering Co. Ltd.: 2GZ.
Everyday Products: 2DU.
Hardy Rubber (hoses): 2UW.
Hughes E. Griffith (poultry spice): 2GZ.
Morrison, James and Co.: 2GZ, 2NZ.
Nitrogen Fertilisers Pty. Ltd.: 2GZ, 3TR, 3HA.
Ovo Pty. Ltd. (egg preserver): 3HA, 3TR, 6ML.
Pacific Potash Ltd.: 2GZ.
Qualcast Lawnmowers: 4BU, 6IX, 6WB, 6ML.
Wormold Bros. (fire extinguishers): 2GZ.
Wolseley Sheep Shearing: 2GZ, 2NZ.

Foods, Groceries, etc.

Abco Bread: 2UW.
Armours (butchery and small-goods): 2UW.
Anderson's Sausages: 2KO, 2GZ.
Angliss & Co. (canned meats): 2GZ, 2KO, 2TM, 3AK, 5DN, 6AM, 6IX, 6WB, 6ML.
Arnotts Biscuits: 2SM, 2GZ.
Bickford, A. M. and Son (coffee essence): 5DN.
Brice, A. A. and Co. Ltd.: 5DN.
Bussell, H. L. and Co.: 2KY, 2GZ, 2UW.
Brockhoffs (biscuits, flour): 7HO, 4IP, 3KZ, 2KO, 3TR, 3HA.
Bovril: 2GZ.
Bushells Tea and Coffee: 6IX, 6WB, 6ML, 7HO, 5DN, 4AY, 2KO, 2GZ, 2HD, 2TM, 2UW, 2DN, 2LM, 3TR, 3HA.
Barnes James: 2KO.
Bengal Chutney Co. Ltd.: 4AY, 4RO.
Beilby, S. O.: 5DN.
Cereal Foods: 2UW, 2HD, 6AM, 4RO.
Cereal Foods (W.A.): 6IX, 6WB, 6ML.
Clifford Love: 3DB, 3HA, 6IX.
Celta Products: 2KO, 2HD, 2UW, 2GB, 2CH, 2SM.
Coleman—Keen (Aust.) Ltd. (see Keen's Mustard).
Commerson, E. and Co. (jacket tabs.): 2GZ.
Connell, John: 2SM, 2GZ, 2LM.
Cremalt Bread: 6IX, 6ML.
Dairy Farmers Milk: 2SM.
Davis Gelatine: 2KY.
Douglas, W. C. Ltd. (breakfast foods): 2SM, 2KO, 2GZ, 2HD, 2TM, 2WL, 4BK, 4AK, 4RO.
Defiance Milling Co.: 4BU.
Derrin Bros.: 2UW.

PROMINENT ADVERTISERS IN AUST. B/CASTING—(Cont.)

Edmonds Baking Powder: 7HO.
Farmer George Ltd. (bacon curers): 6WB, 6ML.
Fleming and Co. (Creamoata): 2SM, 4BH, 3HA.
Glen Valley Tea: 7HO, 3AK.
Globex: 6ML.
Gravox: 6IX.
Gartrell White: 2SM.
Horlicks: 2KO.
H. P. Sauce: 6IX, 6ML.
Horlicks: 2KO.
Hughes, E. Griffiths: 3HA, 3TR.
Hansen junket tablets: 5DN, 4RO, 6ML.
Honey Marketing Board: 6IX, 6WB.
Hodgsons and Co. (tinned fish): 2GZ.
Inglis Goldenia Tea: 2SM, 2GZ, 2HD, 7HO, 6IX, 6ML.
Joyce Biscuits: 2KO, 2GZ, 2TM.
Kraft Cheese: 2UW, 2KO, 2GZ, 4BK-AK, 4IP, 3DB-LK, 5AD-MU-PI, 6IX-WB.
Kelloggs: 3KZ, 2UW, 2SM, 2KO, 2HD, 4RO, 6IX, 6ML.
Keylock Cheese: 6AM, 6PR.
Keens Mustard: 5DN, 3KZ, 4BH, 2SM, 2GZ, 2LM, 3TR, 3HA, 4RO, 6ML.
Lea and Perrins (sauces): 5DN, 3UZ, 2GZ, 3HA.
Liptons Tea: 3AW, 3HA, 6IX, 6WB, 6ML.
Lloyds Tea: 2CH.
Longmore, Francis: 3DB.
Love, J. R. (Kinkara Tea): 2SM, 2UW, 2GZ, 2HD, 2GB, 2CH, 2KY.
Morrows Biscuits: 4BC, 4BK, 4BH, 4RO.
Mitchell, D. and Co.: 2GZ, 2TM.
Mac's Provisions: 2KO.
McDonald, A. and G. F. Ltd. (pastry-cooks): 4BH.
Meadow Lea Margarine: 2KY.
Moran and Cato: 3KZ, 2SM, 2GZ.
Matthews Thompson and Co.: 2GZ, 4AY, 7HO.
Maize Products: 2KY, 2CH, 2KO, 2HD, 3KZ, 3TR, 3HA, 6ML.
Metropolitan Milk Supply Co. (Brisbane): 4BH.
Maxam Cheese: 5DN, 4BC.
Mums Food Products: 2GZ, 2SM.
Nut Foods Ltd.: 2SM, 2KO, 4AY, 2LM, 2GB, 6IX, 6ML.
Nestles: 2KY, 2SM, 2KO, 2GZ, 2HD, 2TM, 2WL, 3KZ, 4BH, 4AY, 4IP, 5DN, 6AM, 2NZ, 4RO, 6ML, 6IX-WB.
N.S.W. Flour Millers' Assn.: 2SM.
Parsons Bros. (rolled oats): 4BK-AK.
Paget Mfg. Co. (Lushus Jellies): 3KZ, 2SM, 2KY.
Pick-Me-Up Condiment Co.: 2CH, 2SM, 2GZ, 2TM, 4BC, 4AY, 2LM, 3TR, 4RO.
Phoenix Biscuits: 3HA.
Procera Bread: 2DU.
Purina Grain Foods: 4BC, 4GR, 4MB, 4RO, 4AY, 4CA, 5DN, 6IX, 6ML.
Queensland Cereal: 4BU.
Robinson's Patent Groats: 6ML.
Robur Tea: 3AK, 2AY, 6AM, 6IX, 6WB, 6ML.

Rolle's Tea: 3UZ.
Rosella Preserving Co.: 2GZ, 2TM, 3UZ, 2LM.
Sydney Milling Co.: 2KO.
Sunshine Biscuits: 7HO.
Swallow and Ariell: 2CH, 3KZ, 3UZ, 3AW, 3TR, 3HA, 4BU, 4AY, 7HO, 4RO, 6ML.
Sanatarium Health Foods: 3KZ, 5DN, 4AY, 2GZ, 3HA, 6AM, 4RO, 6ML.
Shelley's Cordials: 2SM.
Saunders Malt Extract: 2CH, 2GZ, 2SM, 5DN, 7HO, 3HA.
Tea Market Expansion Bureau: 2CH, 2KO, 3KZ.
Trufood Milk: 3UZ.
Traders Ltd.: 2UW, 2HD.
Ward, H. K. S. Pty. Ltd. (Aerial Self-raising Flour): 3UZ.
Wood, S. Son and Co.: 5DN.

Footwear.

Bedgood Shoes: 3DB.
Felt and Textiles Ltd. (Merino Slippers): 2SM, 2KY, 5DN, 2GZ, 2HD, 2TM, 3HA, 6ML.
Fostars Shoes: 2KY, 2HD, 2WL, 4BH, 2KO, 2UW.
Golding Pty.: 5DN, 4BH, 6IX, 6WB, 6ML.
Hardy Rubber Co.: 2UW.
John Hunter and Son Ltd.: 2GZ.
O'Connor Shoe Stores: 7HO.
Public Benefit Bootery: 3DB.
Rigney Shoes: 2SM.
Shoegoods Ltd.: 5DN.
Shoe Mart: 7HO.
Stafford Shoes: 3DB.
Waldas Shoes: 5DN.

Furniture, Furnishings, etc.

Basement Furniture Store: 3DB.
Bebards Ltd.: 2GZ.
Bear and Co.: 2KY.
Booth, J. A. and Co.: 2KO.
Cox Bros.: 3KZ.
Campbell, W. W. and Co.: 2UW, 2GB.
Davis Bros.: 3KZ.
Feltex Floor Covering: 5DN, 2GZ, 2HD, 2SM, 2KY, 2TM, 3HA, 6ML.
Glass, E. G. and Co.: 2SM, 2UW.
Greddens Ltd.: 4BU.
Hall and Co.: 2UW, 2UE, 2GB.
Hickman, S. L.: 3KZ.
Hoopers Furniture: 5DN.
J. Mackie and Co.: 2KO.
London Baby Carriage Co.: 3KY.
Maples Ltd.: 3KZ, 3UZ.
Morley Johnston: 2UW.
Nettleton Son and Co.: 2KO.
Orient Home Furnishing: 3DB.
Orient Carpet Co.: 2UW.
Royal Art Furnishing: 2UW.
Sandy, James & Co.: 2UW.
Smith, James, Ltd.: 5DN.
Tye and Co.: 3KZ.
Poveys Mattress Mfgs.: 6AM.

(Continued Overleaf.)

PROMINENT ADVERTISERS IN AUST. B/CASTING—(Cont.)

Furriers.
Biber Furs: 2SM, 2UW, 2KY, 2UE, 2GZ.
Ellemor: 3DB.
Fox Furs: 2GB.
Jackson Furs: 4BK-AK.
Kessler Furs: 6PM.

Finance, Banking, Insurance.
Colonial Mutual Insurance: 5DN, 6WB, 6ML.
Colonial Finance Co.: 2SM.
Commonwealth Bank: 3KZ, 2TM, 2DU, 3TR, 3HA, 4RO.
Manufacturers' Mutual Insurance: 2KY.
N.S.W. Monte de Pierte: 2KO, 2HD, 2WL.
Producers and General Finance Corp.: 2SM.
T. and G. Insurance: 2HD, 3DB, 7HO, 6ML.
Rural Bank of N.S.W.: 2GZ, 2TM.

Hosiery, Lingerie.
Beau Monde Hosiery: 4RO, 6IX, 6WB.
Berlei: 2GZ, 2KO, 2TM, 3DB, 3TR, 3HA, 4RO, 6ML.
Bonds: 2SM, 2GZ, 2KO, 2TM, 2LM, 3KZ.
Holeproof: 2UW.
Kaysler, Julius Ltd.: 2LM, 3HA, 4RO, 6ML.
Lustre Hosiery: 2CH, 2KY, 2SM, 2KO, 2GZ, 2TM, 2WL, 2NZ, 2LM, 3KZ, 3TR, 3HA, 4RO, 4AY, 4BH, 5DN, 6AM, 6IX, 6ML, 7HO.
Mignon Hosiery: 2CH, 2KO, 6IX, 6ML, 6WB.
Mimosa Lingerie: 2UW.
Prestige Hosiery: 2CH, 2UW, 2GZ, 3TR, 3HA, 4BH, 4RO, 5DN, 6AM, 6IX-WB, 6ML.
Sutex: 7HO.

Household Utilities, etc.
Armstrong, R. H. and Co. (Steele): 2GZ, 3HA.
Bryant and May (matches): 3KZ, 5DN.
Coleman Quicklite (stoves): 2TM.
Farley, E. O. (Aust.) Ltd. (soaps): 2GZ, 2KO, 4BU, 4RO.
Fowler's Vacola: 2GZ, 7HO.
Fisher, Wm. Pty. Ltd. (polish): 3DB, 3KZ, 3HA, 3TR.
Heath, T. W. (crocker): 2SM.
Insectobane: 2SM, 4RO, 6ML.
Kiwi Polish: 3DB, 4BH, 4AY, 4RO.
Magpie Polish: 6ML.
Kleeners Aust. Ltd.: 2SM, 2HD, 2TM, 5DN, 6IX-WB, 6ML.
Maize Products Pty. (starch, etc.): 2KY, 2KO, 2HD, 2CH, 3KZ, 3TR, 3HA, 6ML.
Nuggett Polish: 2SM, 2GZ, 6ML.
Paget Mfg. Co. (cleaners and polish): 2SM, 2KY, 3KZ.
Preservene Soap: 2KO, 3DB, 3UZ, 3HA.

Robin Starch: 6ML.
Recketts (Zebra polish): 2KA, 2GZ, 2HD, 2WL, 2LM, 3KZ, 3TR, 3HA, 4BH, 4IP.
Rex Research (Flytox): 2GZ, 4RO, 6AM.
Servex (cooking ware): 2KO.
Taylor, S. Ltd. (Morstein): 2UW, 2KO, 2GB, 2GZ, 2HD, 2LM, 2CA, 3DB, 3KZ, 4BC, 4BK, 4BH, 4GR, 5DN, 7BU, 7LA.
Tarzan's Grip: 2GZ.
Vealls Agencies (Hi-mark Polish): 2UE, 2KO, 3AW, 4BC, 4BK, 4BH, 5AD, 6ML, 6IX.
Whiteloid Products Ltd. (Shu-milk, Nu-Nap): 2SM, 2GB, 2GZ, 4BH, 4AY, 4BK, 4RO.

Jewellers, Jewellery.

Angus and Coote: 2CH.
Bishop, Wallace: 4BC.
Dunkling's Diamond House: 3DB-LK.
Davis, Joe: 2SM.
Direct Supply Jewellery Co.: 3UZ.
Israel, J.: 2KO.
Lands, Sam: 2KY, 2WL.
Nissen, F. W.: 4BH, 4BC.
Saunders Ltd.: 2GB.
Walker and Hall: 2UW.

Liquor.

Ballarat Brewing Co.: 3DB.
Bells Whisky: 3AK, 2GZ, 6IX, 6WB, 6ML.
Black and White Whisky: 6ML.
Buchanan, James and Co. (whisky): 2GZ.
Grants Whisky: 6ML.
Castlemaine-Perkins Ltd. (beer): 4AY.
Gilbeys Gin: 3TR, 3HA, 4RO, 6IX.
Gramp and Co. (Orlando Wines): 2SM, 2KY, 2GZ, 2HD, 3UZ, 5DN, 6IX, 6WB, 6ML.
Haigs Whisky: 6ML.
Hardy, Thos and Sons Ltd. (wines): 2GZ.
King George IV Whisky: 6IX, 6ML.
Lanoma Gin: 3AK.
McWilliams Wines: 2KY, 2SM, 2UW, 2GZ, 4RO.
Peter Dawson's Whisky: 2UW.
Pipers High Hat Gin: 6IX.
Queensland Brewing Co.: 4BH.
Richmond Brewing Co.: 2KY, 3XY, 6IX, 6ML.
Seppelts Wines: 2GZ, 2KO, 2SM, 3DB, 3UZ, 5DN, 3TR, 3HA, 6IX, 6WB, 6ML.
Smith's Gin: 6ML.
Tooth and Co.: 2GB.
Tooheys Ltd.: 2UW, 2HD.
Tolley's Brandy: 2UW, 2HD, 2KO.
Tucker and Co. (brandy): 2SM, 2HD, 2TM, 2GN, 2GZ, 2DU, 2LM.
West End Brewery: 6IX, 6ML.
Yalumba Wines: 5DN, 6ML.
White Horse Whisky: 6ML.

Opticians.

Coles and Garrard Pty. Ltd.: 3DB, 3KZ.
Heans Essence (Heenzo): 2KY, 2GZ, 2HD, 4BH, 5DN.
Junipah Spring Salts: 2KY, 2CA, 2GZ, 2LM, 2TM, 2AD, 2UW, 2MO, 2WL, 2QN, 2GN, 2AY, 2NZ, 2BS, 2GB, 2GF, 2RG, 2HD, 2WG, 2DU, 3AK, 3BA, 3BO, 3GL, 3MB, 3XY, 3UZ, 3YB, 4BK, 4GR, 4IP, 4TO, 4LG, 4AY, 4VL, 4BC, 4BU, 4RO, 4MB, 5KA, 6AM, 7BU, 7UV.

Paints, Lacquers, Builders' Materials

B.A.L.M. paints: 2CH, 2KO, 3KZ, 5DN, 2LM, 4RO, 6IX, 6WB, 6ML.
Berger, Lewis and Son (paints): 2KO, 4BU, 4IP, 6ML.
Campbell, James and Son Pty. (Radiant Homes): 4BK, 4BU, 4LG.
Friend, Walter: 2GZ.
Hardy, James and Co.: 2GZ, 2KY.
Major Bros. (Majora paints): 2GZ, 2NZ, 3HA.
Sherwin Williams: 2SM, 2KO, 4IP, 4BU, 2LM, 4RO, 6ML.
Sandy, James and Co.: 2GZ.
Sterling Varnish Co.: 2HD.
Taylor, H. A. Ltd.: 2CH.
Taylor, Williams and Halliday: 2GZ.
Taubmaus: 2CH, 2UW, 7HO, 3AW, 4BK-AK, 5AD-MU-PI.
United Paint: 3XY.
Williamson Croft (wallpapers): 2UW.

Patent Medicines, etc.

Allens Irish Moss: 6IX, 6ML.
Andrews Liver Salt: 2GZ, 6IX-WB, 6ML.
Associated Sales (Schumann's Salts): 2UW, 2KY, 2GB, 2GZ, 2TM, 2KO, 3KZ, 3AW, 3HA, 4BK, 4BH, 4AK, 4AY, 4BC, 4RO, 5AD, 5DN, 6AM, 6ML.
Bells Products: 2GZ.
Ballay Pills: 3UZ.
Bickford, A. M. and Son (Sal Vital): 5DN.
Bristol-Meyers Co. (Sal Hepatica): 2TM, 2GB.
Bonnington Irish Moss: 2UW, 2KO, 6AM, 6ML.
Blackney Health Treatment: 3KZ.
Beecham's Pills: 2SM, 2HD, 4BH, 6ML.
Beckers Ltd. (Bex A.P.C.): 2SM, 2KO, 2KA, 2GZ, 5DN, 6IX, 6ML.
BiSoDol: 2GZ, 2CH, 2SM.
Carter's Liver Pills: 2KY, 2KA, 2GZ, 2HD, 2TM, 3KZ, 4IP, 5DN, 6IX-WB, 6ML.
Clements Tonic: 2CH, 2KY, 2SM, 2GZ, 2LM, 3KZ, 3HA, 4BC, 4BH, 4BK, 4AY, 4GR, 4RO, 4TO, 5DN, 6ML.
Dr. Jenners Cough Balsam: 3UZ.
De Witt's Pills: 2UW 3UZ.
Douglas Drug Co. (Bidomak): 2KY, 2CH, 2SM, 2KO, 2GZ, 2HD, 2TM, 2WL, 2NZ, 2LM, 3TR, 3HA, 4BH, 4BU, 4AY, 4IP, 4RO, 5DN, 6IX, 6ML, 7HO.
Davies, E. C. (Eocol): 3DB-LK.
Eno's Fruit Salt: 2GZ, 5DN.
Eichhorn's Remedies: 2GZ.
Fisher and Co.: 2KY, 2SM, 2KO, 2WL, 3KZ, 3TR, 4RO, 5DN, 6IX, 6ML.
Hardy, R. M. Ltd. (indigestion remedy): 2UW, 4BH, 4RO.
Harrisons Pills: 2UW, 2SM, 2GB.
Hepburn Spa: 6IX, 6ML.
Hudson's Eumenthol: 3DB-LK.
Hutawai Tea: 2HD.

PROMINENT ADVERTISERS IN AUST. B/CASTING—(Cont.)

Pharmacies.

Chippendale Pharmacy: 4BU.
Davies, E. C.: 3DB.
Fleming, W. R.: 4BU.
Fisher and Co.: 2SM, 2KY.
Hearne, F.: 2GZ.
McHugh, J. J.: 2SM.
Martin and Pleasance: 3KZ.
Washington H. Soul-Pattinson: 2SM, 2KO, 2HD.

Publications.

Best Bets (sporting): 2KY.
Catholic Press: 2SM.
"Daily Telegraph": 2SM.
"Design" (periodical): 5DN.
Greyhound Recorder (sporting): 2UW.
Hutchinsons (books): 3UZ.
Marvel Racing Final (sporting): 2TM.
Publicist, The: 2SM.
"Sun Pictorial": 3KZ.
"Spotlight" (sporting): 2UW.
"Smith's Weekly": 2LM.
"Truth" and "Sportsman": 2UW, 2KY, 2KO, 2NZ.
"Women's Weekly": 2GZ, 2SM, 3KZ, 4RO, 6IX, 6ML.
"Wireless News": 6PR.

Public Utilities.

Australian Gaslight Co.: 2SM.
Australian Telephone Development Assn.: 2GZ, 2TM.
Metropolitan Milk Board (Sydney): 2HD.
Metropolitan Gas (Melb.): 3DB.
Newcastle Gas: 2KO.
Newcastle Electric Light: 2KO.
Sydney County Council Electricity Undertaking: 2UW, 2SM.

Petrol, Oils, etc.

Alba Petroleum Co.: 3DB.
Atlantic Union: 3KZ, 2GZ, 2WL, 3TR, 3HA.
C.O.R.: 3DB, 5DN, 4IP.
Neptune Oil: 2KY, 2CH, 2KO, 2GZ, 2TM, 2LM, 6AM, 6IX, 6ML.
Pennsylvanian Oil (Kendall Oil): 2GZ, 2GB, 2CH, 2UW.
Pacific Oil Co. (Pax): 3XY, 3BO, 3HA, 3TR.
Purr Pull Petrol: 2UW, 2SM, 4BH, 4BK, 4GR.
Shell Co.: 2CH, 2SM, 2KO, 2GZ, 2HD, 2TM, 2UE, 2DU, 3DB, 3AK, 3BA, 3BO, 3HA, 3TR, 3AW, 4BH, 4BC, 4BU, 4AY, 4IP, 5DN, 5RM, 7HO, 2LM, 6AM, 2NZ, 4RO, 6IX, 6ML.
Sleigh, H. C. Ltd. (Golden Fleece and Firezone): 2SM, 2KO.
Texas Oil: 2CH, 4IP.
Vacuum Oil Co.: 2CH, 2KY, 2SM, 2KO, 2GZ, 2HD, 2TM, 2WL, 2UW, 3DB, 3AK, 4BH, 4BU, 4AY, 4RO, 4IP, 5DN, 7HO, 2LM, 3TR, 3HA, 6AM, 2NZ, 6IX, 6WB, 6ML.
Valvoline Oil Co.: 2HD.
Veedol: 2UW.
Wakefield, C. C. and Co.: 2CH, 2GZ, 6AM, 6IX, 6WB, 6ML.

Radios, Music, etc.

A.W.A. (Radiola): 2WG, 2GZ, 2LM, 2GF, 2GN, 2AY, 3AW, 3BO, 3XY, 4WK, 4CA, 4TO, 4BC, 4BK, 4LG, 4IP, 5AD, 6PR, 7LA.
A.W.A. Valve Co.: 2SM, 2CH, 2GF, 2AY, 2GN, 2LM, 2MO, 2DU, 2TM, 2WG, 2GZ, 2BH, 2KO, 2AD, 3TR, 3HA, 3BO, 3MA, 3BA, 3DB, 3LK, 4BC, 4WK, 4TO, 4CA, 4MK, 4RO, 4MB, 5AD, 6KG, 6PR, 7LA, 7BU, 7UV, 7HO, 4PM (Pt. Moresby), VPD2 (Suva).
Airzone (W.A.): 6IX, 6WB.
Airzone (N.S.W.): 2GB.
Boomerang Mouth Organs: 2UW.
Breville Radio: 2TM.
Columbia Records: 3UZ.
Eastern Trading Co. (Ken-Rad valves): 2GZ, 2HD, 2GB, 2UE.
Healing, A. G. Ltd. (radios): 2CH, 3TR, 3HA, 3UZ, 3BA, 3SR, 3GL, 3UL, 3BO, 7BU.
His Master's Voice (radios): 2WG.
Kriesler Radios: 2KO, 2GB, 2GN, 2CA, 2MO.
Laycock, Joseph and Son: 2GZ.
Levenson's: 2DU, 6IX, 6ML, 6PR.
Marco's Radio Auctions: 3KZ.
Music Master's Radio: 4BH.

Neilson, C. (music store): 4BU.
Palings: 2DU, 4BU.
Philco Products: 3UZ, 3SR, 3UL, 3BO, 3HA.
Phillips Valves: 2GB, 2UE, 2KY, 2GZ, 2WG, 2KO, 3KZ, 3AW, 3BA, 4BC, 4BK-AK, 4RO, 5AD-PI-MU, 5DN.
Salonola (radios): 2UW, 2UE, 2KY, 2KO.
Savery's (pianos): 5DN.
Sefte College of Music: 2UW, 2KY, 5DN.
Smith, Son and Rees (Astor Radio): 2GZ.
Stromberg-Carlson (radio): 2GZ, 2TM, 3TR, 3HA, 5DN, 7HO.
Thom and Smith (Tasma radio): 2KY.
Wertheim (pianos): 3DB, 3KZ.
Wilks, E. F. and Co. Pty. Ltd. (radios): 2UE, 2KO, 2GB, 2KY, 2HD, 2GZ.
Winkworths: 2SM.

Sport Requisites.

Alexander Tennis Racquets: 2UW.
Dunlop Tennis Racquets: 2UW.
Hartley's Store: 3DB.
Mick Simmons Sport Store: 2CH, 2UW, 2GB.
Slazengers Tennis Racquets: 7HO, 6IX, 6ML.
Spalding Tennis Racquets: 2CH.
Stuart and Steele Sports Store: 3KZ.
Swift Tennis Balls: 6ML.
Sykes Bats: 5DN.

Stationery Supplies.

Brooks, Wm.: 4RO.
Chartres Ltd.: 2TM.
Collins Bros.: 5DN, 3HA.
Conklin Pens: 7HO.
Stott and Underwood: 2GZ, 2DU.
Royal Typewriters: 6ML.

Stores.

Allan and Stark Ltd.: 4BH.
Anthony Horderns and Son Ltd.: 2UW, 2SM.
Beare and Ley: 2UW.
Bon Marche: 2UW.
Coles, G. J. Ltd.: 2KY, 6IX, 6WB, 6ML.
Cox Bros. (Aust.) Ltd.: 3DB, 3KZ, 6PM, 6AM, 6IX-WB, 6ML.
Clarkson Ltd.: 5DN.
Chas. Birks and Co. Ltd.: 5DN.
David Jones Ltd.: 2SM, 2UW, 2GB.
Finney Isles and Co.: 4RO.
Foy and Gibson: 2KO, 2TM, 3UZ, 6WB, 6ML, 7HO.
George and George: 3UZ.
Grace Bros. Ltd.: 2UW, 2KY, 2UE.
Hendersons Silk Store: 2UW.
Hordern Bros.: 2CH.
John Snow and Co.: 3UZ.
John Black Pty. Ltd.: 4BU.
John Paynter Ltd.: 2KO.
Marcus Clark and Co.: 2LM.
McDonnell and East: 4BH.
McWhirters Ltd.: 4BH, 4AY.
Mantons Ltd.: 3AW, 3UZ.

(Continued Overleaf.)

PROMINENT ADVERTISERS IN AUSTRALIAN BROADCASTING—(Cont.)

Mick Simmons Ltd.: 2CH, 2UW, 2GB.
Overells Ltd.: 4BH.
Paynes: 3UZ.
Snows Ltd.: 3UZ.
Sydney Snow Ltd.: 2UW.
Treadways: 3UZ.
Winns Ltd.: 2KY, 2GB, 2DU.
W. Winn and Co.: 2KO.
Woolworth's: 2GB, 6IX-WB, 6ML.
Wyper Bros.: 4BU.

Tailors, Wearing Apparel, etc.

Anderson's Robes: 2KO.
Blayney's (tailors): 2UW.
Bon Tailoring: 3KZ.
Cash and Carry Drapery: 2KO.
Chas. Birks and Co. (drapers): 5DN.
Coo-ee Clothing Co.: 2KY, 2CH.
Cox Bros.: 3KZ, 3DB, 6PM, 6AM, 6IX-WB, 6ML.
David Solomon and Co.: 2KY.
Davis and Davis: 3KZ.
Geo. Wardrop (tailors): 3KZ.
Gilbert and Stokes Pty. Ltd. (Velvet pyjamas): 2CH, 2KY, 3KZ, 4BK, 5DN.

Greddens Ltd.: 4BU.
Hagon, R. C.: 2UW.
Henderson's Silks: 2UW.
Holborn (tailors): 3KZ.
Jantzen: 2GZ.
Josephson and Son: 4RO.
Millards (men's wear): 2KY, 2UW.
Morley's Underwear: 2CH, 5DN.
Murray, D. & W. (trousers and shirts): 2DU, 2GZ, 2TM, 3BO, 3SR, 4RO, 7BU. (Grip-U trousers): 3XY, 3DB, 3KZ, 3AW, 3BO, 3BA, 3GL, 3MA, 3SR, 3HA, 3TR, 4BK, 4AK, 4BU, 4MK, 4CA, 4TO, 4RO, 2DU.
One Price Tailors: 3KZ.
P. and R. Gowns: 2DU.
Pelaco: 2KO, 2GZ, 2LM, 3TR, 3HA, 2NZ.
Pike Bros. 4BK, 4BC.
Vereys Ltd.: 2UW.
Wiseman's (Tailors): 2KY.
Woulfe and Son: 4RO.

HATS, MILLINERY.

Bon Ton Millinery: 2KO.
R. C. Henderson: 2KO, 2GZ, 6ML.
United Felt Hats: 5DN, 4BH.

Textiles.

Australian Knitting Mills: 4RO.
Cesarene: 5DN, 6ML.
Caesar Serges: 6ML.
Collins Bros. (blankets): 3DB-LK.
Dr. Flannel: 2CH, 3DB, 3KZ, 4BC.
Eagley Blankets: 2UW.
Hughes, F. W. Pty. Ltd. (knitting wools): 2GZ, 2TM.
Laycock, Son and Co. (Laconia blankets): 2GB, 2GZ, 2HD, 2LM, 2NZ, 3TR, 3HA, 4AY, 4RO, 6AM, 6ML.
Murray, D. and W. (blankets, dress materials): 2GZ, 2DU, 2CH, 2UW, 2HD, 2TM, 2SM, 2GF, 2GN, 2AD, 2LV, 2DU, 3XY, 3DB, 3KZ, 3AW, 3BO,

3BA, 3GL, 3MA, 3SR, 3HA, 3TR, 4BK, 4AK, 4BU, 4MK, 4CA, 4TO, 4RO.
McRae Kitting Wools: 2CH.
Paton and Baldwin (knitting wools): 2UW, 3HA, 5DN, 6AM, 6ML.
Pelaco: 2GZ, 2KO, 2LM, 3TR, 3HA, 2NZ.
Queensland Textiles: 4BU.
Walton, F. S. and Co.: 3KZ.

Tobacco, Cigarettes, etc.

Bafla Cigarette Papers: 5DN, 6AM.
Godfrey Phillips: 2UW, 2GZ, 2KO.
3DB, 3TR, 3HA, 5DN, 6ML, 7HO.
Lifeguard Tobacco Co.: 2UW.
Tallyho Cigarette Papers: 6ML.
Walker Tobacco Co.: 3DB, 3KZ.
Wills, W. D. and H. O.: 2CH, 2KY, 2NZ, 2SM, 2UW, 2GZ, 2TM, 2LM, 3DB, 3KZ, 3HA, 4AY, 4RO, 5DN, 6AM, 6ML, 7HO.
Ziz Zag Cigarette Papers: 2CH, 5DN.

Toilet Requisites.

Bristol-Meyer Co. (Ipana Tooth Paste): 2GB, 2TM.
Bush, W. J. and Co.: 3KZ.
Colgate-Palmolive Peet: 2KY, 2CH, 2UW, 2KO, 2GZ, 2WG, 3KZ, 4AY, 6ML.
Elliotts Aust. Drug: 2CH, 2KY, 2SM, 2GZ, 2LM, 3KZ, 3HA, 4BC, 4BH, 4BK, 4AY, 4GR, 4RO, 4TO, 4BU, 5DN, 6IX, 6ML.
Kolynos Tooth Paste: 2CH, 2SM, 4RO, 6PM, 6LM.
Lambert Pharmacal (Listerine): 2GZ, 2KO, 2KA, 3KZ, 4BU, 4AY, 4RO, 6IX, 6ML, 7HO.
Lockwood Magrath Ltd. (Nodor): 2KY.
Pepsodent Tooth Paste: 2CH, 2HD, 3KZ, 5DN.
Tek Tooth Brush: 6IX.
Stearns, Fred. & Co. (Nyal products): 2HD, 2GB, 2UE, 2GZ, 2TM, 2WG, 2KA, 2KY.
Woods, W. E. Ltd. (Pebeco Tooth Paste): 2CH, 2UW, 2KO, 2KA, 3DB, 4RO, 6AM, 6ML.

Toys.

Cyclops: 6IX, 6WB, 6ML.
Meccano: 2CH, 3HA, 4RO, 6ML.
Travel, Tours, Resorts, Hotels, etc.
Burns Philp: 2UW, 2GZ.
Coolangatta (Queensland): 2CH.
Ford Sherrington (travel goods): 2GZ.
Hotel Federal (Melb.): 7HO.
Imperial Hotel (Melb.): 7HO.
Interstate Shipowners' Federation: 2UE.
MacDonald Hamilton: 3KZ.
New South Wales Government Tourist Bureau: 2SM.
Pioneer Tours: 2SM, 2KO.
Port Jackson Ferries: 2SM.

Orient S.N. Co.: 2UW, 2CH, 2GZ, 2HD, 4AY, 7HO, 3HA, 4RO, 6IX, 6WB.
Randwick Municipal Council (Bondi Beach): 2TM.
Royal Packet Navigation Co.: 2CH.
Victorian Government Tourist Bureau: 2SM.
Victoria Palace (Melb.): 5DN.

Veterinary, Animal Foods, etc.

Clubb, A. M. and Co. (Spratts foods): 5DN.
Hamilton Pty. Ltd.: 2GZ.
Mick Simmons Ltd. 2CH, 2UW, 2GB.
Sayers Allport Pty. Ltd.: 2GZ.
Vita Lick: 2GZ.

Miscellaneous (unclassified).

Time would not permit complete checking of the products of a number of advertisers listed in this subsection.

Allen, A. W. Ltd.: 3DB-LK.
Armstrong, R. H. and Co.: 3HA.
Bickford, A. M. and Sons Ltd.: 5DN.
Bruce Pie and Co.: 4BU, 4RO.
Braddock and Neighbour: 3DB-LK.
Cantwell, J. and Co.: 4BU.
Crouch, Connah and Gordon: 4RO, 4AY.
Catholic Taxpayers' Association: 2DU, 2NZ, 4AY, 4RO, 5DN.
David Solomon and Co.: 2NZ, 3HA.
Federal Referendum Committee: 2DU.
Fernon and Co.: 2KO.
Fowler, D. and J.: 6IX-WB.
Gilbert and Stokes: 3KZ, 5DN.
Henry Berry and Co. Pty. Ltd.: 7HO, 6IX-ML, 3HA, 3TR.
Hardie Trading Co.: 4RO.
Hoffnungs Ltd.: 2KO.
Josephson and Son: 4RO.
Joubert and Joubert: 5DN.
James Barnes Ltd.: 2KO.
Kelsall and Kemp (Tas.) Ltd.: 2CH.
Ladderix: 6ML.
Liquid Nu-Metal: 6IX, 6WB.
Lockett Bros.: 2KO.
Melray Products: 6IX-WB, 6ML.
Mills and Ware: 6IX.
Morrison, C.: 2TM.
Morrison, James and Co. Ltd.: 2NZ.
Matthews Thompson and Co. Ltd.: 4AY, 7HO.
Michelides Ltd.: 6IX-WB, 6ML.
McPhersons: 6IX.
Nettleton, Son and Co.: 2KO.
New England, North and North-West Proucers' Co. Ltd.: 2NZ.
Neville B. Curry: 6IX-ML.
Nettlefold, A. J. and Sons: 6IX-ML.
Nu-enamel: 6IX, 6WB.
Package Machine Pty. Ltd.: 5DN.
Pikanti: 6IX, 6ML.
Premiums Ltd.: 4RO.
Punter's Pie: 2DU.
Producers' Shipping Agency: 2DU.
Rumos: 6IX-WB, 6ML.
Thomas Brown and Son: 4RO.
Verm-X: 6IX-WB.
Valdemar Peterson: 4RO.
Wrappers Pty. Ltd.: 4RO.
Watchtower Bible Society: 4IP, 6AM.

Advertising Agencies Handling Radio Accounts

The following list does not necessarily indicate all agents who place advertising over the broadcasting stations, and is compiled only from information received. Advice re any omissions or corrections will be appreciated by the publishers.

A

ADCRAFT SERVICE, 13 James Street, Perth, W.A.
ADSHED ROSE PUBLICITY PTY. LTD., 226a George Street, Sydney. 'Phone B 3136. Director, John Heney. Nominal capital, £5,000. Bankers, Bank of N.S.W. Auditors, H. M. McLean and Hearne.
Solicitors: Walter Parish and Patience.
Business placed during past 13 months with Station 2GZ.
AERIAL PUBLICITY COMPANY LTD., Wingello House, Angel Place, Sydney, N.S.W. (See programmes services and transcription producers).
ALLAN, MERVYN PTY. LTD., 368 Collins Street, Cl. Melbourne.
AMALGAMATED WIRELESS (A/SIA) LTD., 47 York Street, Sydney, and interstate offices of A.W.A.
ANIVITTI-SCHEY LTD., 44 Margaret Street, Sydney.
ATHOL TIER RADIO ADVERTISING SERVICE, Assembly Hall, Margaret Street, Sydney.
AUSTRAL PRESS AND ADVERTISING LTD., 1 Bond Street, Sydney.

B

BARTLETT, L. V. PTY. LTD., 26 O'Connell Street, Sydney, N.S.W. BW 3168 (2 lines). Directors: L. V. Bartlett and C. R. Mitchell. Managing Director, L. V. Bartlett; G. T. Farroll (Production Manager). Nominal Capital: £10,000. Bankers: Bank of Australasia. Auditors, C. Scott Waine and Mitchell. Solicitors, Baldrick, Asprey and Co.
Radio accounts handled: Wolseley Sheep Shearing Machine Co. Pty. Ltd. (sheep shearing machines), Bristol-Myers Co. Ltd. (Mum), Major Bros. & Co. Ltd. (paints), David Dawn (mattresses), Stack & Co. Ltd. (Pontiac cars), Wolverine Lubricants (Aust.) (Wolf's Head oil), John Hunter & Son Ltd. (shoes), Paton's Products (sheep lick), "Smith's Weekly" (Miss Australia Contest).
Placed business on following broadcasting stations: 2NZ, 2TM, 2HD, 2HA, 3DB, 2KO, 2UW, 2KY, 2UE, 2MO, 2AY, 2GB, 2CH, 2GZ, 2LV, 2LM.
BECKETT THOMSON ADVERTISING PTY LTD., 181 Clarence Street, Sydney.
BERESFORD, KINGSBURY CO. PTY. LTD., 247 George Street, Sydney. 'Phone B 3874. Directors: Marcus Beresford, E. E. Wilkins. Nominal capital, £10,000. Paid-up capital, £6,250. Bankers: National Bank of Australasia Ltd. Auditors: R. Hiscocks. Solicitors: S. E. Cook. Interstate representative: Robert Fisher, Melbourne.
Business placed during past 13 months with Stations 2UW, 2GB, 6PR, 5AD, 3KZ, 4BK.
BOURKE, A. D., 5 Barrack Street, Sydney.

BROADCAST SERVICES, Q.N. Bank Building, Cnr. George and Turbot Street, B.12, Brisbane, Queensland. B 9659. Directors: Charles Porter (Managing), E. R. Roush, W. Farmer, W. Clarkson (Engineer), Miss M. Houston (Secretary). Bankers: Commonwealth Bank of Australia. Auditor: Jasper Bentley.

Radio accounts handled: Queensland and interstate clients.

Placed business on following broadcasting stations: 4BC, 4BK, 4BH, 4BO, 4IP, 4AY, 4RO, etc.

BROWNE, T. B. LTD., Bank of Adelaide Chambers, 43 Margaret Street, Sydney.

C

CANBERRA ADVERTISING LTD., 66 King Street, Sydney.
CATTS-PATTERSON COMPANY (N.S.W.) PTY. LTD., City Mutual Building, 60 Hunter Street, Sydney, N.S.W. General Manager, Mr. V. H. Freeth. Nominal Capital: £50,000. Paid-up capital, £14,347. Bankers: Bank of New South Wales, King and George Street, Sydney. Solicitors, Clayton, Utz & Co. Auditors: Robertson, Crane and Gibbons.
CATTS-PATTERSON COMPANY (VIC.) PTY. LTD., Saxon House, 450-4 Little Collins Street, Melbourne, Vic. General Manager, C. A. Ward-Ambler. Nominal Capital, £50,000; Paid-up £15,432. Bankers: Bank of New South Wales, A.B.C. Branch, Melbourne. Solicitor, Alfred C. Cray. Auditors, Court and Court.
CHANDLER, J. B. & CO., 43 Adelaide Street, Brisbane, Q. B 2041. P.O. Box 833L, Brisbane.
CLEM TAYLOR ADVERTISING SERVICE LTD., Albion House, Waymouth Street, Adelaide, S.A. C 3885. Directors, Clem Taylor, J. A. Rinder. Managing Director and Secretary, Clem Taylor. Nominal Capital, £5,000. Paid-up £1,500. Bankers: The Commercial Bank of Australia Ltd. Auditors: A. W. Smith. Solicitors: J. A. Mangan. Interstate Reprs.: Lintas Pty. Ltd., Pattersons Pty. Ltd.
Radio accounts handled: S.A. State Tourist Bureau, Walton's Ltd. (biscuits), Clarkson Ltd. (wallpaper, paints, radio, etc.), R. A. Haines (Maxam Cheese), City Motors Pty. Ltd. (Chevrolet cars and trucks, Buick and La Salle cars), United Motors Ltd. (Vauxhall and Pontiac cars), Dalgety's (Ford cars), Ernest Smith & Co. Ltd. (radio and cycles), Onkaparinga Woollen Co. (blankets, etc.).
Placed business on following broadcasting stations: 5AD, 5DN, 5KA, 3AW, 3XY, 3DB, 2BH.
COHEN, S. CROWNSEN, A.M.P. Chambers, William Street, Perth.
CONSOLIDATED ADVERTISING SERVICES, 44 Market Street, Sydney, N.S.W. 'Phone MA 4531. Directors: George Nicholson Orr. Secretary, L. B. Montague. Art Director, Edwin J. Evans. Production Manager, E. Blyde. (Continued Overleaf.)

ADVERTISING AGENCIES HANDLING RADIO ACCOUNTS—(Cont.)

Nominal capital, £5,000. Paid-up capital, £3,500. Bankers: Bank of N.S.W. Solicitors: Arthur Muddle and Stephenson, 4 O'Connell Street, Sydney.

Radio accounts handled: Ken-Rad Valves, Kriesler Radio, R.C.S. Radio. Business placed during past 13 months with Stations 2GB, 2UE.

COUNTRY PRESS CAMPBELL ADVERTISING, Country Press Chambers, 177 Edward Street, Brisbane, Queensland. Box 53A, G.P.O., Brisbane. Telegraphic address: "Camblad." Phone, B3106 (2 lines). Principal, Allan J. Campbell, F.O.A. Manager, D. Roberts; Production Department Accounts Executive, A. Armstrong; Checking Department, E. G. Webster; Radio Department, O. Neumann; Contact Executive, L. Haussman. Bankers: National Bank of Australia. Auditors: Lance Jones & Co., Brisbane. Solicitors, Thynne & Macartney, 293 Queen Street, Brisbane. Interstate Reprs.: Gotham (Aust.) Ltd., Sydney, N.S.W. Williams McFerran Pty. Ltd., Melbourne, Vic.

Radio audition room completely equipped with high fidelity sound apparatus.

Radio accounts handled: Taylors Elliotts & Aust. Drug Pty. Ltd. (4BC, BK, BH, GR, RO, TO), Metro Milk (4BH), Morrow Pty. Ltd. (4BC, 4BK), Independent Oil Industries (4BK, BH, GR), Malvern Star (4BH, BC, MB, etc.), Pike Bros. (4BK and BC), E. G. Eager & Son, Cars (4BK), James Campbell & Sons Pty. Ltd., Radiant Homes, etc. (4BK, VL, LG), Trocadero Dance Palais (4BK and 4BH).

Placed business on following broadcasting stations: 4BC, 4BK, 4BH, 4GR, 4VL, 4BU, 4MB, 4RO, 4TO, 4CA, 4AY, 4LG, 4WK, 2TM, 4MK, and others.

COUNTRY PRESS LTD., 5 Barrack Street, Sydney.

CUMMINGS-WRIGHT ADVERTISING SERVICE, 239 Collins Street, Cl., Melbourne.

F

FASSETT & JOHNSON, 36 Chalmers Street, Sydney.

FORSTER ADVERTISING COMPANY, 3rd Floor, Union Bank Chambers, Queen Street, Brisbane, Queensland. Box 1004M., G.P.O. B9224. Director, Colonel J. Craven. Private firm. Bankers: National Bank of Australasia, Brisbane. Solicitors: G. Mocatta, Brisbane.

Radio accounts handled: Federal and State elections, McWilliams Wines.

Business placed on all Queensland radio stations.

FOX ADVERTISING SERVICE, 115 Pitt Street, Sydney. Managing Director, Matt. J. Fox. Chief executive and secretary of company, Roger Van H. Welch.

Bankers: National Bank.

Radio accounts handled: Tooheys Ltd., Lea and Perrins, Preservene Soap Co.

Business placed during past 13 months with Stations 2UW, 2HD, 2GB, 2UE, 5DN, 4CA, 4TO, 4BC, 4AK, 4BK, 2CH, 2SM, 2KY, 2GZ etc.

G

GELLERT, OWEN L., ADVERTISING SERVICE, Trustee Building, Grenfell Street, Adelaide, S.A. C1520. Bankers: Bank of Adelaide, Adelaide.

Radio accounts handled: Miller Anderson Ltd. (Department Store), Thompson & Harvey Ltd. (wallpaper, glass, etc.), Zenith Products (paint, varnishes, etc.).

Placed business on following broadcasting stations: 5AD, 5KA, 5DN.

GOLDBERG ADVERTISING (AUSTRALIA) PTY. LTD., Warwick Building, 15 Hamilton Street, Sydney, N.S.W. BW2458. Directors: Frank Goldberg, Agolda Goldberg, F. W. Mothes, W. J. Brooks. Governing Director, Frank Goldberg. Secretary, W. J. Brooks; Manager for N.S.W., A. G. Palmer; Assistant Manager for N.S.W., N. A. Richard-

son; Business Manager, V. Thompson. Nominal Capital, £20,000. Paid up capital: £20,000. Bankers: Bank of New Zealand. Auditors: Smith Johnson and Co.; Solicitors: Lionel Dare and B. P. Purcell.

Interstate Reprs.: Goldberg Advertising Pty. Ltd., Melbourne; Johnson Advertising, Brisbane; Webb-Roberts Advertising, Adelaide; Graham Advertising, Perth.

Radio accounts handled: Ever Ready Battery Co., Widdis Diamond Dry Cells Pty. Ltd., Sydney Cold Stores (ice skating), Australian Broadcasting Health Society (health talks), Potter and Birks (patent medicines), Felt and Textiles of Australia Ltd. (Feltex), "Smith's Weekly," Sydney Snow Ltd. (Departmental Store Advertising), Tooth and Co. Ltd. (Sheaf Stout, Resch's Waverley Bitter, Resch's Export Lager), Bear & Co. Ltd. (furniture), Nestle and Anglo-Swiss Condensed Milk Co. (A/sia) Ltd. (food products), BiSoDol (indigestion powder).

GOLDBERG ADVERTISING PTY. LTD., Bank House, Bank Place, Melbourne, C.I., Vic. M5628. Directors: Frank Goldberg, F. W. Mothes, A. A. Levy, P. R. Clark, J. B. Walker. Manager, F. W. Mothes; Assistant Manager, A. A. Levy; Secretary, E. Parker; Radio Manager, R. C. Hickling. Nominal Capital, £20,000. Bankers: Bank of New Zealand. Auditors, Smith Johnson & Co. Solicitors, Backhouse and Blakemore.

Interstate Reprs.: S. A. Webb-Roberts Advertising; W.A., Graham Advertising Agency; Queensland, Johnston Jones Advertising; N.S.W., Goldberg Advertising (Aust.) Pty. Ltd.

Radio accounts handled: Dunlop Perdrau Rubber Co. Ltd., Australian Knitting Mills Ltd., Godfrey Phillips (Aust.) Pty. Ltd., Rhu Pills Ltd., London Baby Carriage Manufactures.

Business placed on approximately all stations.

GOLLIN & CO. PTY. LTD., 561 Bourke Street, Cl, Melbourne.

GORDON AND GOTCH (A/SIA) LTD. Barrack Street, Sydney. Branches at Melbourne, Adelaide, Perth, Brisbane, Auckland, Wellington, Christchurch, Dunedin and Launceston.

Radio accounts handled: A number of leading National accounts. Business placed during past 13 months with all stations in Australasia.

GORDON & GOTCH (A/SIA) LTD., 511-515 Little Collins Street, Melbourne, Vic. P.O. Box 767G. Telephones: Central 4994 (6 lines), 6037 (3 lines).

Directors: W. H. Craig (Chairman), S. W. Jones, E. S. Gotch, A. T. Jones. General Manager, W. E. Jackson. General Secretary, F. A. Illingworth. Auditor: G. Sutherland Smith (W. H. Tuckett and Sons). Solicitors: Williams and Matthews. Capital: £600,000.

Branches: Sydney, Brisbane, Adelaide, Perth, Launceston, Wellington, Auckland, Christchurch, Dunedin.

Radio Accounts handled: Henry Berry and Co. (Glen Valley Tea, Cookwell Flour, etc.), Monarch Laundry, Arnold Bros. (A. B. Wine Tonic, etc.).

GOTHAM (A/SIA) LTD., Asbestos House, York Street, Sydney.

THE GRAHAM ADVERTISING AGENCY, 7th Floor, Colonial Mutual Building, Perth. B8641. Proprietor, George Burton Graham. Bankers: Bank of N.S.W., Hay Street, Perth. Auditors, P. S. Benny. Solicitors, Robinson Cox McDonald & Touch.

Interstate Reprs.: The Goldberg Advertising Agency, Trans-Radio News and Sales Service.

Radio accounts handled: Charlie Carter's Amateur Trials (6AM, 6PM, 6IX, 6WB), Wireless News (6PR), Keylock Cheese (6AM, 6PB), T. M. Burke Pty. Ltd. (6AM), Wembley Park (6PR, 6IX), Levinsons (6IX, 6ML, 6PR), Airzone Radios (6IX, 6WB), C. S. Baty & Co. (6AM), Sunday Times (6PR), Kessler Furs (6PM).

Placed business on following broadcasting stations: 6IX, 6ML, 6WB, 6PR, 6AM, 6PM.

GRAVES, RICHARD PTY. LTD., 88 Pitt Street, Sydney. BW7467.

GREEN, R. W., Advertising Agency, Goldsborough House, Perth, W.A.

ADVERTISING AGENCIES HANDLING RADIO ACCOUNTS—(Cont.)

H

HANSEN RUBENSOHN COMPANY, Warwick Buildings, Hamilton Street, Sydney, N.S.W. BW4087-8-9. Principal: S. Rubensohn. Bankers: Union Bank of Australia. Auditors, C. W. Stirling & Co. Solicitors, Oakes and Sogar.

Radio accounts handled: Associated Sales Ltd. ("Schumann's Salts"), Garratt's Ltd. and Overland, Sydney, Ltd., City of Newcastle Electric Supply Department, Felt and Textiles Ltd. (merino slippers), Lockwood, Magrath Ltd. (Nodor Deodorant), J. R. Love and Co. (Kinkara Tea and Mother's Choice Flour), Thom & Smith (Tasma Radio), Frederick Stearns & Co., Whiteloid Products Ltd. (Shu-Milk and Nu-Nap); Biber Furs, Paget Manufacturing Co. (Lushus Jellies, Clever Mary and Shi-Noleum), Samuel Taylor Esq. (Mortein), T. J. O'Shee, Esq. (Harrison's Pills); Pennsylvania Oils (A/sia) Ltd. (Kendall Oils), R. M. Hardy Ltd. (Hardy's Indigestion Remedy).

Placed business on following broadcasting stations: 2GB, 2UW, 2KY, 2KO, 2GZ, 3AW, 3KZ, 4BC, 4BK-AK, 5DN, 5AD, 2CH, 2SM, 2HD, 2UE, 2TM, 2WG, 2KA, 2CA, 2GF, 3DB, 4BH, 4GR, 6PR, 7LA, 7BU.

HARRY JULIUS ADVERTISING SERVICE, 16 Barrack Street, Sydney. Phone B5231. Director: Harry Julius. Manager, W. D. McGregor. Bankers: The Commercial Banking Company of Sydney Limited. Auditors, J. A. L. Gunn and Cohen.

HYAM, G.R., 58 Margaret Street, Sydney.

ILOTT, J. (Aust.) LTD., Turner House, 24 Jamieson Street, Sydney.

J

JOHNSTON ADVERTISING PTY. LTD., 180 Queen Street, Brisbane.

JOHNSTON JONES ADVERTISING, Exton House, Queen Street, Brisbane, Queensland. B2978. Directors: E. A. Johnston, F. O. A., and J. H. Jones, M.A. Copy Department, R. Adams; Art Department, F. Andrews; Radio Department, A. R. Harris.

JONES, WYLIE B., Advertising Agency, Barrack House, Barrack Street, Sydney, N.S.W. Phone: BW6283. Australasian Manager, W. T. McClelland.

Bankers: Union Bank of Australia Ltd. Auditors, Jamieson, Griffith and Byatt, Ltd. Solicitors, Sly and Russell.

Radio accounts handled: Clinton Williams Products (18), Eichorn's Remedies, Airzone (1931) Ltd., radio; Eye Culture; Membrosis.

Business placed during past 13 months over practically all big interstate stations.

L

LEONARD, F. P., 156 Castlereagh Street, Sydney, N.S.W. M3401. Executive: J. McCallum. Bankers: Bank of New South Wales. Auditor, A. Stephens.

Radio accounts handled: Brink Trousers, Challenge Blankets, British Chief Fabrics, Murralt Fabric, Joyce Biscuits, Globite and Regal Travel Goods, Steelo aluminium cleaner, Walter Cavell & Co. Ltd.

Business placed on stations throughout Australia.

M

MCCARTHY-MacVEIGH ADVERTISING SERVICE, 310 George Street, Sydney, N.S.W. B3369. Proprietor, V. C. McCarthy. Copy Chief, C. Tuck. Bankers: Commonwealth Bank of Australia.

(Continued Overleaf.)

**BIGGER
BRIGHTER
BETTER**

Bigger because we've a larger staff and new equipment. Brighter because that's the way we all feel, and Better because we're the Brighter Broadcasting Service—the Station that sways the huge Red Circle Audience of over one million which is concentrated within a 50 mile radius of Melbourne. 3KZ operates on a Bigger Audience, with Brighter Programmes, with Better Results.

Further particulars from:—
Head Office, STRAND BUILDING, 64 ELIZABETH ST., MELBOURNE.
Sydney Representative, JOHN A. ARMSTRONG, c/o RICHARD THOMPSON, 133 PITT STREET.

**3KZ
MELBOURNE**

ADVERTISING AGENCIES HANDLING RADIO ACCOUNTS—(Cont.)

MCCARTHY McVEIGH ADVERTISING SERVICE (Continued.)

Radio accounts handled: Leipzig Trade Fair, Webster Joch & McDonald, Australian School of Radio Engineering.

Placed business on following broadcasting stations: 2UE, 2UW, 2GZ, 2HD.

MARSH LTD., 44 Margaret Street, Sydney.

MAURICE & MOORE PTY. LTD., City Mutual Building.

cnr. Bligh and Hunter Street, Sydney, New South Wales. (See Programme Services and Transcription Producers.)

MERCANTILE EXCHANGE, 380 Collins Street, C.I., Melbourne.

MITCHELL, C. & CO. LTD., London.

MITCHELL, WILLIAM, Bank Place, C.I., Melbourne.

MOONEY WEBB PTY. LTD., 349 Collins Street, C.I., Melbourne.

MOUNT, N. C. S., F.O.A. Advertising Consultant, 15, First Floor, Surrey Chambers, St. George's Terrace, Perth, W.A. Telephone: B 2740. State Representative Advertising Education Board (Melb.). Member of the W.A. Institute of Advertising (Inc.).

Bankers: The Commonwealth Bank of Australia, Perth. Accounts handled: The majority are in the retail field, covering general advertising and sales promotion.

N

NATIONAL ADVERTISING LTD., 21 Adelaide Street, Brisbane.

NATIONAL MERCHANDISERS PTY. LTD., 60 Hunter Street, Sydney.

NIXON, N. V. & CO., 20 Queen Street, Melbourne, Vic. M 5354, MU 1755. Bankers: National. Auditors: Edwin V. Nixon and Partners; Solicitors: Lucas and Mumme.

Radio accounts handled: Victoria Palace, Pioneer Tours, Geo. W. Kelly & Lewis, Alba Petroleum Co., Geo. Wardrop, Alexander Tennis Racquets, Optical House of Raymond Sankey Fraser, Gramps Orlando Wines.

Placed business on following broadcasting stations: 3DB, 3AW, 3XY, 3KZ, 3UZ, 3BO, 3BA, 3MA, 3SH, 3HA, 3YB, 3TR, 3SR, 2CH, 2UW, 2GB, 2UE, 4BC, 5DN, 5RM, 7LA, 7BU, 7HO, 2GZ, 2WG, 2GN, 2CA, 2AY, 2BH.

NOBLE-BARTLETT ADVERTISING, 4th floor, Penney's Building, Adelaide Street, Brisbane. Phone B3148 (3 lines). Directors: W. H. Noble, A. T. Bartlett. Manager, Radio Division, R. A. Wishart. Bankers: Commercial Bank of Australia. Solicitors, Tully and Wilson.

Interstate Rep.: George Patterson Pty. Ltd.

Radio accounts handled: E. G. Eager & Son Ltd. (General Motors products for Queensland), Kiwi Polish Co. Ltd., Swallow & Ariell (S. & A. Biscuits for Queensland), Maxam Cheese Products Pty. (Maxam Cheese and Queensland Camp Pie), Castlemaine Woollen Co. Ltd. (Castlemaine Blankets), Brockhoffs Ltd. (Federation Flour), Charles Hope Ltd. (spring manufacturers and body-builders), Josephson & Sons (Faultless clothing), Metropolitan Milk Supply Co. Ltd. (Metro Milk), Motor Supplies Ltd. (Willard Batteries for Queensland), Bruce Pie & Co. (Tyne Brand Herrings and Farne Fish Paste), V.C. Mfg. Co. Ltd. (State jams and other food products), Peters Arctic Delicacy Co. Ltd. (Peters Ice Cream), W. H. Paling & Co. Ltd. (Musical instruments and Marco refrigerators), Rothwell's Outfitting Ltd. (Men's outfitters), E. Sachs & Co. Pty. Ltd. (Saxon stoves and other metal products), Whiteloid Products Ltd. (Shu-Milk), Wallace Bishop and Son (Loyal watches), B.C.C. Stores (chain grocery), and many locally known accounts.

Placed business on following broadcasting stations: All Queensland stations, also 2LM, 2AD, 2HO, 2GN and 4PM, Port Moresby.

O

O'BRIEN PUBLICITY CO., O'Brien House, 56-58 Young Street, Sydney.

P

PATTERSON, GEORGE PTY. LTD. (incorporating Griffin Shave), Turner House, 24 Jamieson Street, Sydney.

PATON ADVERTISING SERVICE PTY. LTD., THE, Chapel Court, 375 Collins Street, Melbourne, C.I., Victoria.

MU 6088 (3 lines). Directors: Hugh Paton, John McCahon. Ian M. Paton; Radio Manager, Gordon Massey. Banks. Union Bank of Australia Ltd.; Auditors, D. G. Peele, F.C.A. Aust.; Solicitors, A. G. Hall and Wilcox. Nominal capital, £20,000.

Branch offices: Stanton House, 133 Pitt Street, Sydney. N.S.W. (J. C. Mackay, Manager); C.M.L. Building, King William Street, Adelaide, S.A. (M. P. McClelland, Manager).

J. B. PERCEVAL PUBLICITY CO., Margaret and York Streets, Sydney.

POWELL, R. K., 58 Margaret Street, Sydney. Phone B 7669 (2 lines). Proprietor: Reginald Powell. Bankers. Bank of New South Wales. Auditors, N. M. McClung, A.C.A. (Aust.).

Radio accounts handled: Interstate Steamship Owners' Federation (2UE), W. H. Gurton Tyre Co. Ltd. (2UW).

Tolley, Scott and Tolley (N.S.W.) Ltd. (Tolley's T.S.T. Brandy) (2UW, 2HD, 2KO).

Business placed during past 13 months with Stations 2UE, 2UW, 2SM, 2CH, 2KY, 2GZ, 2HD, 2KO.

PUBLICITY SERVICES, Assembly Hall, Margaret Street, Sydney.

R

RADIOVISION PROPRIETARY LTD., Blashki Building, 61 Hunter Street, Sydney. Phone B5453. Managing Director, H. M. Talbot-Lehmann. Nominal capital, £2,600; paid up capital, £2,600. Bankers: Commercial Bank of Australia, 273 George Street, Sydney. Auditors, Holt and Thompson.

Representatives for: National Commercial Broadcasting Service of New Zealand (1ZB Auckland, 2ZB Wellington, 3ZB Christchurch, 4ZB Dunedin).

RAPHAEL ADVERTISING CO., 247 Collins Street, C.I., Melbourne.

REUTERS LTD., 66 Pitt Street, Sydney (Head Office for Australasia). B6655 (2 lines). Head office: Thames Embankment, Blackfriars, London. Branches and agencies throughout the world.

General Manager for Australasia: Major A. E. Wearne. Sydney Manager, C. D. Thomas. Advertising Manager, B. J. W. Caldecoat.

Interstate branches: 406 Collins Street, Melbourne (Manager, W. H. King); Eagle Street, Brisbane (Manager, F. Evans); Brandon House, Featherston Street, Wellington (Manager, M. H. Robinson).

Bankers: Commonwealth Bank of Australia. Auditors. Wm. Tarleton and Co. Solicitors, Macnamara and Smith

Business placed during past 13 months with Stations 2CH, 2GB, 2UW, 2MO, 2SM, 2KO, 2GZ, 2NZ, 2HD, 2WG, 2WL, 2AY, 2CA, 2KA, 2GF, 2DU, 2XN, 2TM, 3AW, 3HA, 3TR, 4BC, 4TO, 5AD, 5PI, 5MU, 6PR, 6ML, 6AM, 6KG.

RICHARDSON-COX PTY. LTD., 130 Exhibition Street, C.I., Melbourne.

RICKARDS ADVERTISING SERVICE, T. & G. Buildings, 145 Collins Street, Melbourne, C.I. Telephones: J 4964, C 2457.

Managing Director: F. S. B. Rickards. Chief Executive, G. M. F. Walch. Production Manager, H. S. Hall. Assistant Executive, R. H. Solomon.

Bankers: National Bank of A/sia Ltd., Melbourne and Sydney. Auditors, F. L. Hayes, 14 McKillop Street, Melbourne, C.I. Solicitors, Raynes, Dickson, Kiddle and Briggs, 422 Collins Street, Melbourne, C.I. Representatives: J. Inglis Wright, New Zealand; Gotham (Aust.) Ltd., Sydney.

ADVERTISING AGENCIES HANDLING RADIO ACCOUNTS—(Cont.)

RICKARDS ADVERTISING SERVICE (Continued.)

Radio Accounts handled: Ladderix (Aust.) Pty. Ltd., Phoenix Biscuit Co. Pty. Ltd., Qualcast (Aust.) Pty. Ltd., Peters American Delicacy Co. (Vic.) Ltd., Mignon Hosiery, Rubber Wheels and Products Pty. Ltd.

Stations over which business placed during past 13 months: 3UZ, 3AW, 3KZ, 3XY, 3SH, 3BA, 3BO, 3TR, 3HA, 3SR, 3MA, 4AK, 4BK, 4TO, 2CH, 2UW, 2GB, 2UE, 5AD, 5DN, 5KA, 6PR, 6ML, 6IX, 7BU, 7LA, 7HO.

S

SAMSON CLARK PRICE-BERRY PTY. LTD., Asbestos House, 67 York Street, Sydney.

SELLERS, O. P., 30 Grosvenor Street, Sydney.

SHIELD ADVERTISING SERVICE, Royal Exchange 54A Pitt Street, Sydney.

SMITH, W. E. LTD., 310 George Street, Sydney.

SMYTH, ARTHUR & SONS, London Bank Chambers, 18 Martin Place, Sydney.

SODEN, A. J., 180 Queen Street, Brisbane.

SPECIALTY PUBLICATIONS & SALES PROMOTION CO. LTD., A.M.P. Chambers, Hunter Street, Newcastle.

STANDARD ADVERTISING & PRINTING CO., 46 Holt Street, Surry Hills, Sydney.

STEVENSON ADVERTISING SERVICE, 175-7 Collins Street, Melbourne, Vic. Telegrams/Cables, "Stevengord Melbourne." Phone Central 10565. Night calls, Haw. 2737. Managing Director, Gordon Stevenson. Nominal Capital, £3,000. Paid-up, £1,500. Bankers: Royal Bank E.S.A., Collins Street, Melbourne, C.I. Auditors: Bruce Laing, 440 Little Collins Street, Melbourne. Solicitors: Rylah & Anderson, 70 Elizabeth Street, Melbourne.

Interstate Reps.: Country Retailers Advertising, 661 George Street, Sydney. English Rep.: W. J. C. Stevenson.

Radio accounts handled: T. B. Guest & Co., American Blacking Co., R. J. Byers, Law Sommers, F. H. Brunning Pty. Ltd., The Foam Salon, Cenovis Yeast Pty. Ltd., Dorlena Frock Salon, Cellular Clothing Co., Dent Allcroft, Milledge Bros.

Placed business on following broadcasting stations: 3KZ, 3XY, 3DB, 3LK, 2WG.

SUCCESSFUL ADVERTISING COMPANY, No. 7, 2nd Floor, National House, 49 William Street, Perth, W.A. Telephone B 3385.

Proprietor and Manager: Charles A. Reed.

Bankers: English, Scottish and Australian. Auditors: John Sinclair and Son, Orient Buildings, William Street, Perth. Solicitors, Lohrmann and Tindal.

Radio accounts handled: A. F. Hoare and Sons, radiator specialists (6AM, 6IX, 6WB), Poveys Mattress Manufacturers (6AM).

Business placed during past 13 months with: 6AM, 6ML, 6IX, 6WB.

SULLIVAN ADVERTISING SERVICE, T. and G. Building, 135 Queen Street, Brisbane.

T

THOMPSON, J. WALTER (Aust.) PTY. LTD., Asbestos House, 65 York Street, Sydney. Phone B 7707. Directors: S. Beardley Dobbs (Managing); E. L. Jarvis, W. A. McNair, H. W. Chancellor. Secretary and Research Manager, W. A. McNair.

Art Director, Reginald Walker. Senior Copywriters, A. N. Weekes and E. J. Moloney. Media Manager, T. R. Carruthers.

Bankers: Commonwealth Bank of Australia, Sydney and Melbourne; National Bank of New Zealand Ltd., Wellington. Auditors: Flack and Flack, Sydney and Melbourne.

Solicitors, Remington and Co.

Branch: Albany Court, 232 Collins Street, Melbourne. Phone Central 5619 (Manager, E. L. Jarvis).

Radio accounts handled: Bond's Industries Ltd. (athletic singlets, hosiery, etc.); Jantzen (Aust.) Ltd. (swimming suits, etc.); Kellogg (Aust.) Pty. Ltd. (Corn Flakes, All-Bran, etc.); Kraft Walker Cheese Co. Pty. Ltd. (Cheese, Bonox, etc.); Pond's Extract Co. (face creams, powder, etc.); Taubman's Ltd. (paints); Wrigley's (A/sia) Pty. Ltd. (chewing sweets); Max Factor (cosmetics).

This Company is a subsidiary of the J. Walter Thompson Company, an international advertising organisation, with offices in New York, London, Chicago, San Francisco, Los Angeles, Hollywood, St. Louis, Seattle, Montreal, Toronto, Paris, Antwerp, The Hague, Bucharest, Buenos Aires, Sao Paulo, Rio de Janeiro, Capetown, Johannesburg, Bombay and Calcutta.

TRANS RADIO NEWS & SALES SERVICE, Asbestos House, York Street, Sydney.

U

UNSTED JACKSON & HAINES LTD., Lisgar House, 30 Carrington Street, Sydney.

V

VEE BEE ADVERTISING SERVICE, 64 Elizabeth Street, C.I., Melbourne.

VINNICOMBE ADVERTISING, Union Bank Chambers, 324 Queen Street, Brisbane.

W

WEBB-ROBERTS PTY. LTD., Norwich Union Buildings, 47 Waymouth Street, Adelaide, S.A. C 3939. Directors: Sidney K. Webb, B. Ainslie Roberts. General Manager, Sidney K. Webb. Assistant Director, E. Ainslie Roberts. Copy Chief, F. R. P. Osborne. Media Manager, F. Hay.

Nominal Capital, £5,000. Paid up Capital, £3,000. Bankers: Commercial Bank of Australia Ltd. Auditors: Taxation Services of Australia Ltd. Solicitors: Pavy Harry and Pavy.

Interstate Reps.: Goldberg Advertising Agency Ltd., Sydney, N.S.W., and Melbourne, Victoria.

Radio accounts handled: Adelaide Brewery Ltd., S.A. Cash Orders Pty. Ltd., Martindales Wild Cherry, J. R. Alexanders & Sons Ltd. (polishes), Biogen Products.

Placed business on following broadcasting stations: 5DN, 5AD, 5KA.

WESTON CO. LTD., THE, Chamber of Commerce Buildings, Grosvenor Street, Sydney.

WHITE, A. N. LTD., A.C.A. Building, King and York Streets, Sydney.

WILLIAMS, A. J., Goldsbrough House, Perth, W.A.

WILLIAMS-McFERRAN PTY. LTD., Safe Deposit Building, 90 Queen Street, Melbourne, C.I., Vic. Cent. 8050-8051. Directors, L. R. Williams, W. R. McFerran. Nominal Capital: £5,000. Paid-up Capital: £5,000. Bankers: Bank of New South Wales. Solicitors, McKinnon and Colles.

Radio accounts handled: Rosella Mfg. Co., Gippsland and Northern Co-op. Co., Hugo Wertheim Pty. Ltd., Martin and Pleasance, A. H. McDonald & Co., Wagstaff & Sons, Jas. A. Munro Pty. Ltd., C. E. Kennett, Beefine Pty. Ltd., Mascot Mills, Gollin & Co. Pty. Ltd., Gifford Bros., Ovo Pty. Ltd.

Placed business on following broadcasting stations: 3DB, 3KZ, 3UZ, 3XY, 3AW, 3SR, 3LK, 3TR, 3SH, 3MA, 3YB, 2GB, 2UW, 2TM, 2LM, 2GZ, 2KO, 2HD, 5AD, 5KA, 5DN, 6PR, 6AM.

WILLMOTT'S ADVERTISING AGENCY LTD., Chamber of Commerce Building, Grosvenor Street, Sydney.

Particulars of Commercial Broadcasting Stations in Australia

2AD ARMIDALE—278 Metres (1080 Kc.)

ARMIDALE NEWSPAPERS CO. LTD. Business address, Faulkner Street, Armidale, N.S.W. Location of studio: Armidale. Location of transmitter: One mile from Armidale P.O. Licensed power: 100 watts. Commenced, 5/2/36.

Slogan Name: "The Voice of New England."

Directors: A. H. McArthur (Chairman), Hon. D. H. Drummond, M.L.A., Hon. E. C. Sommerlad, M.L.C., Dr. R. B. Anshin, M. Eustace Simpson, Manager, R. L. Blake.

Technical description of station: Standard 100 watt, made by Standard Telephones and Cables Ltd., Sydney. 100 watts in aerial, 100% modulated. "T" type aerial, length 120 ft., height 120 ft. Number of studios: 2.

2AY, ALBURY—203 Metres (1,480 Kcs.)

AMALGAMATED WIRELESS (A/SIA) LTD., National Buildings, Dean Street, Albury, N.S.W. P.O. Box 4. Studios: Pool's Hill and Dean Street, Albury. Location of transmitter: Pool's Hill. Telephones: Office 289, Studio 261. Telegrams "Twoay." Licensed for and operating on 100 watts (aerial). Licensed 13/6/30. Commenced 17/12/30.

Slogan name: "The Albury Station."

Manager and Chief Engineer: John Dower. Announcer and Technician, V. Shearstone. Sporting Commentator, Cleaver Burton. Announcer and Continuity Writer, Helen Burnett.

Interstate Representatives: Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney, and 167 Queen Street, Melbourne. Brisbane Rep. for A.W.A. Network, Roger Fair, Room 809, C.M.L. Building, 289 Queen Street, Brisbane.

Transmission times: Monday to Thursday, 12.15 p.m.—1.45 p.m., 5.30 p.m.—10.30 p.m.; Friday, 12.15 p.m.—1.45 p.m., 5 p.m.—10.30 p.m.; Saturday, 12.15 p.m.—1.45 p.m., 5.30 p.m.—12 midnight. Sunday, 8 a.m.—2 p.m., 7 p.m.—10.30 p.m.

Total transmission hours during 1936: 2,265.

Technical description of station: 2AY operates one of the latest types A.W.A. High Fidelity Transmitters, capable of 200 watts output to aerial, controlled by standard A.W.A. crystal frequency drive.

Station activities during 1936: One of Australia's pioneer commercial stations 2AY, Albury, has made noteworthy progress during the past year. The introduction of new feature programmes, high-class local dramatic presentations and outstanding network relays, coupled with the installation of complete new transmitting equipment, has placed 2AY high in the esteem and approbation of its large audience in the rich districts of the Southern Riverina and North Eastern Victoria. The realisation by advertisers, both local and National, that 2AY covers and influences a splendid market, has resulted in ever-increasing commercial programme sponsorships necessitating an increase of 7½ operating hours per week since the last edition of this Year Book.

Recording facilities: Through A.W.A. Recording Studios, 47 York Street, Sydney.

2BE, BEGA—223.7 Metres (1340 Kc.)

BEGA AND FAR SOUTH COAST BROADCASTERS LTD., Office and Studios: Carp Street, Bega, Transmitter located at Carp Street, Bega. Licensed power, 100 watts. Licensed June, 1935. To commence early September, 1937.

Directors: W. H. Balmain (Chairman), R. B. Bush, E. M. Pell, C. Morgan, J. Brady, B. Gowing, J. Martin, W. A. Smith, W. Chapman. Secretary, Longhurst and Dennis. Accountants, Bega. Bankers: Commercial Bank of Sydney.

2BH, BROKEN HILL—283 Metres (1060 Kcs.)

RADIO SILVER CITY LTD., Cummins Street, Broken Hill, N.S.W. Head office, "The News," North Terrace, Adelaide. Tel. C1400 (8 lines). Location of studio and transmitter: Broken Hill. Licensed power: 100 watts. Licensed 6/9/33. Commenced 30/6/34.

Nom. Cap.: £5,000. Paid-up Cap.: £3,500. Bankers: Commonwealth Bank of Australia. Solicitors: Manning Riddle & Co., Commonwealth Bank Building, Cnr. Pitt Street and Martin Place, Sydney.

Chief Announcer: R. P. James. Chief Engineer, M. Brown. Secretary, R. B. Taylor.

2BS BATHURST—200 Metres (1,500 Kcs.)

BATHURST BROADCASTERS LTD., 51A Keppel Street, Bathurst, N.S.W. Location of transmitter: 51A Keppel Street. Power, 100 watts. Slogan name: Carillon City Broadcasting Station.

Directors: C. Y. Callaghan, E. V. Roberts, M.A., B.Sc., R. G. L. Baillie, R. Russell-Smith. General Manager, O. J. Storey. Secretary, R. G. L. Baillie, LL.B. Bankers: Bank of Australasia. Solicitor, R. G. L. Baillie, LL.B. Auditors, G. A. Sterling & Co.

Engineer-Announcer, J. E. Jarvis. Programme Manager-Announcer, R. Russell-Smith.

Interstate Representatives: J. R. McCartney, Melbourne. G. R. Hyam, Sydney.

Transmission times: 7—9 a.m., 12 noon—2 p.m., 5—10 p.m.

The latest P.M.G. figures show 93,000 people and 8,248 licences within a 50 miles radius of Bathurst.

2CA CANBERRA—286 Metres (1050 Kc.)

A. J. RYAN BROADCASTERS LTD. Business address and studios, Giles Street, Kingston, F.C.T. Location of transmitter: Symonston (midway between Canberra and Queanbeyan). Licensed power: 2,000 watts in aerial.

Managing Director: A. J. Ryan. Chief Announcer: G. Barlin. Other announcers: B. Scettrine, N. Norgrove. Chief Engineer, A. J. Ryan, M.Inst.R.E.Aust., A.M.I.R.E. (U.S.A.).

Transmission times: Monday—Friday, 12.30—1 p.m., 5.30—10 p.m. Saturday, 6—10 p.m., Sunday 8—10 p.m.

Technical description of station: Heat controlled crystal oscillator, two buffer amplifiers, modulated amplifier, two linear amplifiers, 3 stage mixer and speech amplifier, remote equipment.

Activities during 1936: Plans were made for the removal of this station to a new site, and provision for additional equipment. This undertaking is now in progress and will be completed by about the end of 1937.



AUSTRALIA'S GREATEST COMMERCIAL BROADCASTING ORGANISATION

Created to serve Advertisers throughout the Commonwealth

QUEENSLAND

4BC Brisbane
4GR Toowoomba
4RO Rockhampton
4MB Maryborough
4SB Kingaroy
4ZR Roma
4AY Ayr

N.S.W.

2UW Sydney
2HD Newcastle
2WG Wagga

SOUTH AUSTRALIA

5KA Adelaide

VICTORIA

3UZ Melbourne
3UL Warragul
3SR Shepparton
3YB Warrnambool

TASMANIA

7UV Ulverstone

Designed to give Maximum Network Cover without overlapping and lost efficiency

— AND —

Greater Service! Greater Features!
Greater Coverage! Greater Programmes!

COMMONWEALTH BROADCASTING NETWORK

"THE RADIO VOICE OF AUSTRALIA"

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

2CH, SYDNEY—252 Metres (1190 Kcs.)

AMALGAMATED WIRELESS (A/SIA) LTD., 47 York Street, Sydney. Studio: "The Grace Building," 77 York Street, Sydney. Location of transmitter: Spurway Street, Dundas. Telegrams: "Expanse." Power: 1,000 watts. Licensed 7/1/31. Commenced 15/2/32.

Slogan name: "Entertains the Whole Family."

CHAIRMAN OF DIRECTORS: Sir Ernest Fisk. Manager, T. Spencer. Announcers: A. S. Cochrane, K. Layton, Charles Stanley, P. Graham Wilson, Philip Geeves.

SALES: R. E. Lane (Sales Manager), S. O. Clarke, J. Minto, H. D. Peters, F. Knowles, G. McGuinness, B. C. Button.

STUDIO: E. Howell, H. Goodsall, G. Bird, L. W. Dart. Misses G. Gibson, L. Deane, Janet Austen, Mrs. M. McSpearin, Miss R. Marcus.

INTERSTATE REPS.: C. J. Sproule, D. Gilder, J. S. Jones, A. W. Cummins, A.W.A., 167-9 Queen Street, Melbourne. Roger Fair, 289 Queen Street, Brisbane.

TRANSMISSION TIMES: Week days, 5.45 a.m.—11 p.m., Sundays 9 a.m.—12.30 p.m., 2.30 p.m. to 5 p.m., 7.15—10 p.m.

Total transmission hours during 1936: Approximately 5825.

TECHNICAL DESCRIPTION OF STATION: This station is equipped with what is known as the two-channel studio equipment. A similar third channel is provided normally for use in producing effects for mixing with programmes, but if necessary this channel, in conjunction with the producer's control unit, can be used as an independent third-channel so that, should occasion arise, three separate programmes could be transmitted from the studios. The producer's control unit enables the producer to take complete control of the programme. Special apparatus is provided for the measuring of the performance of the whole of the studio equipment in order to ensure that it is operating within the limits required for the faithful reproduction of the programme.

STATION ACTIVITIES DURING 1936: Early during 1936, Amalgamated Wireless (A/sia) Ltd. assumed control of Station 2CH, the licence of which is held by the Council of Churches. One of the first moves by A.W.A. was to launch a drive for bigger and better entertainment. This was supported by adequate newspaper advertising and general station publicity, together with a competition designed on lines to raise the maximum of interest in the station, and at the same time supply sponsors with a complete analysis showing entertainment tastes of listeners for future broadcast advertising. Every means of popularising the station was adopted, and as a result 2CH was in a position to present a most attractive proposition to advertisers. In July, Mr. V. M. Brooker was appointed Manager of 2CH, but he relinquished that position in November, 1936, in order to take managerial control of the whole of A.W.A. broadcasting activities. He was succeeded as Manager of 2CH by Mr. T. Spencer, of the Melbourne headquarters of A.W.A., where he held the position as Traffic Accountant to the Beam Wireless and Coastal Radio Services. Mr. Spencer has followed the policy laid down by A.W.A. of constantly improving the 2CH programmes and providing efficient service to advertisers and listeners.

RECORDING FACILITIES: This station has its own recording facilities.

2DU, DUBBO—455 Metres (660 Kc.)

CENTRAL WESTERN RADIO SERVICES LTD., Macquarie Street, Dubbo, New South Wales. Telephone 440. Telegrams: "Radio." Studio and transmitter, Tamworth Street, Dubbo. Licensed and actual operating power, 100 watts. Commenced 3/7/36.

Slogan name: "The Western Station."

Directors: D. E. Holmes, R. B. Pickering, A. J. Allan, E. J. Gordon, K. J. Irvine. General Manager, D. E. Holmes. Secretary, F. L. Keyworth, Chartered Accountant. Advertising representative: E. J. Gordon.

Announcers: M. Moore, R. Ayling. Programme Manager, Miss Betty Drew. Manager's Secretary, Miss L. Blight.

Bankers: Commercial Banking Co. of Sydney Ltd. Solicitors, A. D. Booth and Son, Dubbo. Auditors to be appointed.

Interstate Representatives: Amalgamated, Wireless (A/sia) Ltd.

Transmission times: 7.30—9 a.m., 11 a.m. to 2 p.m., 5.30 p.m.—10 p.m. Sundays, 8.30—10.30 a.m., 12—2 p.m., 6—10 p.m.

Total transmission hours during 1936: 1,456.

Technical description of station: The transmitting equipment is constructed in two units 6ft. high by 3ft. wide. To ensure fidelity of reproduction high power class "A" modulation is used and all audio amplifiers are of triode type operated at class "A" conditions. Four stages of radio frequency are employed, the final or modulated stage being a quarter kilowatt triode delivering 100 watts to the aerial and modulation is effected through a special coupling transformer. Valves used throughout are Philips. Nineteen metres are connected in the circuits of the modulation stages and four radio stages to give a continuous visual indication of operating conditions. The transmitter is supplied from 3-phase rectifying systems for all filament lighting, bias supply and high tension supply. All switching is effected from control operator's desk by the manipulation of 3-phase magnetic switches through remote control interconnected push button stations. Power supply is 415 volts through special underground mains, and a line voltmeter is incorporated in transmitter power switch-board to check on line voltage fluctuation. All cutouts are of the indicator type to facilitate testing.

Studio equipment is duplicated and all telephone and relay lines are run through underground cables throughout.

Station activities during 1936: Station 2DU commenced operations commercially on July 3, 1936, with a staff of four, in a building specially constructed as a radio station situated on high open ground on the outskirts of Dubbo. The station's popularity was established almost immediately, and local advertisers quickly realised the advantages of commercialising this popularity. Advertising revenue from this source exceeded all expectations, and by the end of the year many National advertisers had availed themselves of the service, too. However, the frequency, 1060 k.c., had certain disadvantages, and in September, 1936, following a wavelength re-allocation, the station transmitted on 660 k.c. Increased business required increased staff and accommodation, and before the end of 1936 the transmitting building was extended to just twice its original size and the staff had increased from 4 to 7.

Central New South Wales--TO SELL IT

You Must COVER IT



ONE RADIO STATION

and only one has the necessary power to reach ALL PARTS of this tremendously wealthy district—the heart of New South Wales.

..... 2GZ

ONE COUNTRY RADIO

Station and only one, has its own studios situated in the heart of Sydney, relaying to a country transmitter broadcasting at twice the power of any Sydney Commercial Station.

..... 2GZ

ONE RADIO STATION

and only one can give country folk a balanced presentation of up-to-the-minute entertainment, "hot" local and overseas news, and almost instantaneous reports of SALES, STOCK and MARKETS.

..... 2GZ

ONE MARKET

ONE COST

ONE STATION

The growing importance of the Country Market is reflected by the increasing attention being paid thereto by National Advertisers. No longer do they concentrate nearly all advertising expenditure in the Metropolitan Areas. Manufacturers and Distributors who have surveyed conditions know that the family unit in the Country is larger than the City, and thus the average Country Family purchases for household goods are considerably in excess of city family needs.

The huge amounts of money consequent upon good seasons pouring into Central New South Wales towns and districts, and the recent increases in Rural Awards have brought farm and country town prosperity. The country man now has a wide margin for expenditure on luxury lines farm improvements, machinery, cars—and radio sets.

Several groups of city interests have combined to offer advertisers intensive Radio coverage in various areas of Australia and within certain districts are thorough and effective. The unique position geographically held by Station 2GZ gives undisputed close coverage over the heart of New South Wales in an area that none of the existing chains of Radio Stations can claim to cover.

This unique strategic situation of 2GZ makes it the ONE INDISPENSABLE COUNTRY RADIO STATION, the centre and basis of any Country Campaign, and also the one Station that must be included in any campaign launched through the existing networks or established chains of Radio Stations in order to cover the purchasing potential of Central New South Wales.

MORE NATIONAL ADVERTISERS USE STATION 2GZ THAN ANY OTHER STATION IN NEW SOUTH WALES.

COUNTRY BROADCASTING SERVICES LIMITED

Transmitter: Amarod, via Orange, Central N.S.W. Head Office and Main Studios: HOSKING HOUSE, HOSKING PLACE, SYDNEY Telephone: BW 1428 Country Studios: Commonwealth Bank Building, Orange



PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

2GB, SYDNEY—345 Metres (870 Kc.)

BROADCASTING STATION 2GB LTD., 29 Bligh Street, Sydney. Studios and offices, 29 Bligh Street, Sydney. Telephone B 7876. Telegrams, cables, TWQGB. Location of Transmitter: Homebush, N.S.W. Licensed power, 1000 watts. Licensed 13/5/26. Commenced 23/8/26.

Slogan name: The Nation's Station.

Directors: Sir Hugh Denison, Mr. A. E. Bennett (managing), R. E. Denison, L. A. Denison, F. Daniell, A. W. Perriam and G. B. Bennett. Secretary, G. Millar.

Executive staff: Assistant manager, G. B. Bennett; Chief engineer, L. S. Schultz; Chief Announcer, E. Colman; Advertising Manager, C. A. Fletcher; Sales Promotion Manager, J. Armitage; Sales Service Manager, R. A. Jesson; Copyrighting Department, C. J. Dease; Programme Department, P. Campbell; Production Department, L. Bennett; Accountant, W. H. Calley; Transcription Department, Miss Gibson; Publicity Department, K. Barrett; Managing Director's Secretary, Miss P. Graff.

Interstate Sales Representative: L. G. Mather, Temple Court, Collins Street, Melbourne.

Transmission Hours: Weekdays, 6 a.m.—11.30 p.m. Sundays, 8 a.m.—10.30 p.m. Total transmission hours during 1936: 6249.

Recording facilities installed.

2GF, GRAFTON—248 Metres (1,210 Kc.)

GRAFTON BROADCASTING CO. LTD., Post Office Chambers, Victoria Street, Grafton, N.S.W. Studio and Transmitter, 118 Turf Street, Grafton. Telephones: Office 289, Studio 290. Telegrams: "TwoGF." P.O. Box 154. Licensed for 100 watts. Licensed 16/8/32. Commenced 15/12/33.

SLOGAN NAME: "The Grafton Broadcasting Service."

Manager and Chief Announcer: C. E. Coldwell-Smith. Announcer and Engineer, J. L. Proust. Continuity Writer and Announcer, Miss Kitty Langbourne.

Interstate Reps.: Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney, and 167 Queen Street, Melbourne. Brisbane representative for A.W.A. Network, Roger Fair Room 809, C.M.L. Building, 289 Queen Street, Brisbane.

Transmission times: Monday to Saturdays, 7.30—8.30 a.m., 12 noon—2 p.m., 5.30—10.30 p.m. Sundays, 7 p.m.—10 p.m.

Total transmission hours during 1936: 2,498.

Technical description of station: The transmitter and studios are housed under the same roof at 118 Turf Street, Grafton. The main studio is 21 x 24 feet, furnished in tonings of brown with Masonite walls and felted floor. The control room is about 12 x 12 feet, and contains the transmitter (series modulated), frequency drive crystal units (in duplicate), associated power supply and battery equipment. The apparatus is A.W.A. throughout, incorporating the latest developments in high fidelity broadcast transmission. The half-wave vertical Marconi aerial is erected between two tubular 160 feet steel masts 488 feet apart and incorporates a reflector designed to ensure maximum radiation inland from the coast.

Station activities during 1936: A year of increased business on 2GF finds this progressive station operating an extra 12½ hours weekly to meet the demands of its wide listening audience and additional advertisers. The staff has been increased to further enhance the Grafton station's popularity to both listeners and advertisers. The children's Smile Club continues to grow, over 4,000 members now being enrolled. 2GF has been on the air three and a half years, during which time it has built up a strong radio friendship with thousands of families in the prosperous central north coast district of N.S.W. This has been developed through enjoyable entertainment, helpful service and friendly contact—qualities which form an invaluable asset harnessed to any sales campaign.

Recording facilities: Available through A.W.A. Recording Studios, 47 York Street, Sydney.

2GN, GOULBURN—216 Metres (1,390 Kcs.)

GOULBURN BROADCASTING CO. LTD.: Office, 209 Auburn Street, Goulburn. Studio, River Road, Goulburn. Telephones: Office 265, Studio 91. Telegrams: "TwoGN."

Licensed for and operating on 200 watts (aerial). Licensed 30/9/30. Commenced 17/12/31.

Slogan Name: 2GN, "The Goulburn Broadcasting Station."

Manager and Chief Engineer, H. J. Lewis. Engineer-Announcer, J. K. Lowe. Continuity Writer, Miss J. McNaught. Sporting Commentator, Gordon Millsom.

Interstate Representatives: Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney, N.S.W., and 167 Queen Street, Melbourne, Vic. Brisbane Rep. for A.W.A. Network, Roger Fair, Room 809, C.M.L. Building, 289 Queen Street, Brisbane, Queensland.

Transmission Times: Monday to Fridays, 7 a.m. to 9 a.m., 12 noon to 1.45 p.m., 5.30 p.m. to 10.30 p.m. Saturdays, 12 noon to 1 p.m., 5.30 p.m. to 10.30 p.m. Sundays, 11 a.m. to 12.30 p.m., 7 p.m. to 10 p.m.

Technical Description of Station: The new 2GN transmitter manufactured by A.W.A. throughout, incorporates all the latest improvements in high-fidelity broadcast transmission, and has an output to aerial of 200 watts (unmodulated). Frequency is accurately maintained by crystal control, and class "B" modulation is used. Two 160 feet tubular steel masts support an A.W.A. folded-top aerial coupled by untuned transmission feeders. Recording facilities available through A.W.A. Recording Studios, 47 York Street, Sydney.

Station activities during 1936: 1936 has been a year of notable achievement for 2GN, Goulburn. The past 12 months has seen the installation of complete new A.W.A. 200 watt transmitting equipment, the erection of the 160 folded-top aerial and other technical improvements. Programme and commercial expansion called for the inception of the early morning session, which has increased the station's weekly transmission time by ten hours, and further added to the wide popularity of the Goulburn Station. 2GN provided a unique and valuable service during the 1936 wool sales by broadcasting the whole proceedings from the wool exchange.

2GZ CENTRAL N.S.W.—303 Metres (990 Kc.)

COUNTRY BROADCASTING SERVICES LTD. Studios and office: Hosking House, Hosking Place, 84½ Pitt Street, Sydney, and Lord's Place, Orange, N.S.W. Tel. BW 1428. Telegrams: "TWOZG," Sydney.

Location of transmitter, Amaroo, N.S.W. Licensed and operating power, 2000 watts unmodulated input to the aerial. Licensed 16/4/35; commenced 31/10/35.

SLOGAN NAME: "Central New South Wales."

DIRECTORS: A. F. Manchee (Chairman), J. P. Abbott, R. J. Fagan, F. B. Fleming, J. H. Middleton, D. J. Gilligan.

GENERAL MANAGER, Geo. H. Anderson. Secretary, C. K. Miller, A.F.I.A., A.A.I.S. Bankers: The Commercial Banking Co. of Sydney Ltd. (Exchange Branch), 88 Pitt Street, Sydney. Solicitors: A. J. McLachlan & Co., 74 Pitt Street, Sydney. Auditors: Norton & Faviell, Chartered Accountants (Aust.), 19 O'Connell Street, Sydney.

Assistant Manager, J. E. Ridley. Chief Engineer, E. C. Crouch.

SYDNEY STAFF: Studio Manager, Raymond F. Birmingham. Announcers, Arthur O'Keefe, Frank Cayley, Colin McAlister, Lawrence Gordon, Cecil Lambert, Gordon Ratcliffe, Mrs. Hodgkins, Mrs. Macdougall. Engineers: H. W. Hannam, C. Breed.

ORANGE STAFF: Country Rep., Alan Ridley; Announcer, John Ryan; Engineers, F. Hanna, F. L. Morris.

INTERSTATE SALES REPRESENTATIVES: L. G. Mather, 422 Collins Street, Melbourne, Victoria.

TRANSMISSION TIMES: Monday, Tuesday, Thursday and Friday: 6.30 a.m. to 9.30 a.m., 11 a.m.—2 p.m., 3.30 p.m.—10.30 p.m. Wednesday and Saturday, 6.30 a.m.—9.30 a.m., 11 a.m.—10.30 p.m. Sunday, 9 a.m.—10.30 p.m.

(Continued on Page 116.)



a giant

among stations

in the heart

of the

Metropolis

RING—

MJ 4351



Amalgamated Wireless (A/sia) Ltd.



PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

2GZ (Continued.)

TOTAL TRANSMISSION HOURS during 1936: 5,330.

SALES REPRESENTATIVES: Head Office: H. P. Clarke, L. S. Decent, F. B. Haines.

OTHER STAFF: Sales Department, Misses O. Akehurst, M. Grouse, V. Kenny, A. Pearce, B. Skirrow; Programme Department, Misses J. Bartlett, B. Clinch, D. James, M. Jamieson, Mr. Willis; Accounts Department, Misses B. Adey, M. Checkley, Messrs. T. Radford, A. McLaren, G. Palmer; Administrative Department, Misses W. Hadley, J. Maitland.

TECHNICAL DESCRIPTION OF STATION: The city studios are in Hosking Place, Sydney. The latest modern practice is followed in their construction. Audio control equipment in use was designed and built by Country Broadcasting Service's engineering staff. The Sydney equipment is intended normally to supply three separate programmes. The flexibility of the equipment allows three more audition channels to be in operation whilst the three programmes are being sent to line, making six separate programme channels in all. A feature of the Sydney studios is the type of announcer's control box and producer's control position in use. These were designed for appearance, efficiency, and ease of operation, and are installed on each of the announcer's studio tables, the two producer's booths and the main control room. The producer's and control room positions include six channel mixers, facilities for switching microphone channels, latest type power level indicators, lamp signalling, visual calling arrangement for telephone calls, control for outside programme relays, clock chimes, etc.; also means of attracting attention in any studio by dimming the lights, together with a talk back system which is very effective for controlling programmes.

Only the best standard types of reproducers and microphones are used throughout the studios, and test apparatus is installed to ensure that all equipment retains its high fidelity characteristics.

THE RECORDING DEPARTMENT, with the aid of correct equalising and a little research has developed recordings which compare very favourably with the best makes of overseas processed transcriptions.

The Sydney studios are connected by a physical programme channel and Morse monitoring line nearly 200 miles long via the Orange studio and offices to 2GZ's transmitter at Amaroo, New South Wales. Audio equipment installed at Orange allows local sessions to be presented, and a system of control allows the Sydney and Orange programme to be mixed. Monitoring in Sydney studios is done both on air and from the P.A. system, consequently not a moment's delay occurs in the operation of crossing to or from Sydney or local studio. The transmitter is situated on a high hill with a clear getaway in all directions 13 miles out of Orange. It was manufactured by A.W.A. Ltd.; employs series modulation, and at present feeds two kilowatts of fully modulated radio frequency energy at 990 Kc. to the antenna system. The antenna system includes two 180 feet steel masts 480 feet apart, supporting a folded back type antenna which is excited from a transmission line coupled to the transmitter. A buried cartwheel earth system completes this installation. A remarkably good polar diagram is obtained, and the all year round strong signal that is maintained indicates that very little radiated energy is lost.

2HD, NEWCASTLE—263 Metres (1,140 Kcs.)

IRSALES BROADCASTING COMPANY, Maitland Road, Sandgate. City Studio, 299 Hunter Street, Newcastle, N.S.W. Phone: Waratah 487. LOCATION of Transmitter: Maitland Road, Sandgate. Power: 500 watts. Licensed 1/12/24. Commenced 27/1/25. Secretary, Wm. W. Johnston. Station Manager, John Jameson; Chief Radio Engineer, A. K. Armistead; Programme Director and Studio Manager, E. A. Rowe.

SALES REPRESENTATIVES: C. A. Monks, Grace Building, 77 York Street, Sydney. MA7645. Telegrams:

2HD (Continued.)

"Airads," Sydney. H. W. Allison, 532-542, Bourke Street, Melbourne. MU2375. Telegrams: "Airads," Melbourne.

TRANSMISSION TIMES: Monday to Friday, 6 a.m.—10.30 p.m.; Saturday, 6 a.m.—12 midnight; Sunday, 8 a.m.—4 p.m., 5 p.m. to midnight.

TOTAL TRANSMISSION HOURS during 1936: 6,657.

TECHNICAL DESCRIPTION OF STATION: Transmitter operates on a power of 500 watts. Frequency stability assured by use of AWA precision frequency control equipment. Low level plate modulation is employed. The transmitter is entirely AC operated. At present the power is radiated by an inverted Lantenna with an efficient earth mat. High quality transmission is assured by using the latest types of electrical pickups and microphones.

STATION ACTIVITIES DURING 1936: The past 12 months brought important developments for 2HD. It has seen the adoption of the Station as the Newcastle outlet of the Commonwealth Broadcasting Network and other chains. It has also witnessed a further extension of the social activities of the Station, the 2HD Younger Set being added to the other clubs already existing. The substantial increase in the year's business shows that 2HD possesses the confidence of advertisers—local and national—and reconstructions now being executed will permit of a still larger volume of business being transacted with even greater efficiency.

2HR, SINGLETON—441 Metres (680 Kc.)

HUNTER RIVER BROADCASTERS PTY. LTD., Singleton. Studios and transmitter located at Kaludah, 23 miles from Singleton. Licensed power, 300 watts. Not in operation as at August 1, 1937. Manager, J. A. Radford.

2KA, KATOOMBA—259 Metres (1160 Kcs.)

RADIO KATOOMBA LIMITED, Registered Office, 16 Barrack Street, Sydney. Studio: Katoomba Street, Katoomba. Location of Transmitter: Medlow Bath. Telephone: Sydney B 6958, Katoomba 700. Licensed power: 200 watts. Licensed 7/9/35. Commenced 14/9/35.

Slogan Name: "Voice of the Mountains."

Directors: John P. O'Neill, Alfred C. Paddison, Archibald L. McCauley. **General Manager:** R. J. McMahon. Secretary: McCauley & McCauley, 16 Barrack Street, Sydney. Engineers: Gilbert Pollock, Frank Caldwell. Studio staff: George Foster, Graham Chisholm, Jack Maddock, Miss Hazel Manning.

Daily transmission times: Monday to Friday, 7.30 a.m. to 2.0 p.m.; 6.0 p.m. to 10.30 p.m.; Saturday, 7.30 a.m. to 10.30 p.m.; Sunday, 8.0 a.m. to 2.0 p.m., 6.0 p.m. to 10.0 p.m. Total transmission hours during 1936: 1,216.

2KM, KEMPSEY—305.9 Metres (980 Kc.)

RADIO KEMPSEY LTD., Registered office, 16 Barrack Street, Sydney. Telephone B 6958. Studios and transmitter, Belgrave Street, Kempsey. Licensed power 100 watts. Licensed 17/7/37. To commence September, 1937.

Directors: J. P. O'Neill (Chairman), A. C. Paddison, A. L. McCauley, C. A. Ryan and F. Moses.

First engineer: V. Hutchinson.

Sales Representative: R. J. McMahon, 16 Barrack Street, Sydney. B 6958.

Transmitter built by Philips Lamps (A/sia) Ltd.

2KO, NEWCASTLE—213 Metres (1410 Kc.)

NEWCASTLE BROADCASTING CO. LTD., C.M.L. Buildings, 72 Hunter Street, Newcastle. Location of Transmitter, Sandgate, seven miles north of Newcastle. Telephones 932/957. Telegrams—2KO Newcastle. Power: 500 watts unmodulated aerial power. Licensed 9/3/31. Commenced 1/8/31.

SLOGAN NAME: "The Voice of Industry."

DIRECTORS: Allen Fairhall and Edward Fairhall.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

2KO NEWCASTLE (Continued.)

Managing Director, Allen Fairhall. Secretary, N. O. Whale, A.C.A. (Aust.). Bankers: Bank of New South Wales. Solicitor: A. E. L. Stuart, A.M.P. Chambers, Hunter Street, Newcastle. Auditor: W. Evan Parker, Hunter Street West, Newcastle.

Studio Manager: Harold Pickover. Advertising Manager: J. A. Watson. Chief Engineer: K. N. Greenhalgh, A.M.I.R.E.

Announcers: T. B. King, A. Webber, D. Channel, Mora Downie, Elma Gibbs. Outside sporting announcer: Stan Heaney. Engineering staff: M. Spitzkowsky, H. Chinner, J. Cowen, J. Greenhalgh.

INTERSTATE REPRESENTATIVES: W. H. Thompson, A.C.A. Building, King and York Streets, Sydney; R. J. McCartney, Newspaper House, 247 Collins Street, Melbourne.

TRANSMISSION TIMES: Monday to Fridays, 7 a.m.—4 p.m., 5 p.m.—10.30 p.m.; Saturday, 10 a.m.—12 noon, 2 p.m.—11 p.m.; Sunday, 9—10 a.m., 6 p.m.—10.30 p.m.

TOTAL TRANSMISSION HOURS during 1936: 4,650.

TECHNICAL DESCRIPTION OF STATION: Transmitter consists of crystal temperature controlled oscillator with Master Buffer; 2 Buffer stages; modulated amplifier; and the linear water cooled final amplifier; feeding output of 500 watts unmodulated. Output is capable of 100% modulation, and the overall response curve is flat within 2 DB to 12,000 C.P.S. Studio equipment features all of the necessary facilities for production, rehearsal and control of the most modern studios in Australia... Station activities during 1936: Steady extension in hours on the air and types of programmes produced marked the year 1936. Managing Director spent four months in America and returned bringing plans for better presentation and new studios. Entirely new studio facilities are now in operation.

2KY, SYDNEY—294 Metres (1,020 Kcs.)

THE LABOUR COUNCIL OF NEW SOUTH WALES, Dymock's Building, 428 George Street, Sydney. M6291/2. Location of Transmitter: Beacon Hill, French's Forest.

LICENSED AND ACTUAL POWER, 1000 watts. Licensed 20/5/25. Commenced 31/10/25.

SLOGAN NAME: "The Brightest Station on the Air."

MANAGER: H. E. Beaver. Secretary: R. A. King, M.L.C. Bankers: Bank of N.S.W. Solicitors: Abram Landa and Co. Auditors: R. E. Oaten.

SALES MANAGER: H. E. Beaver. Programme Manager: H. M. Garden. Chief Announcer: John Harper. Other Announcers: Captain Bairnsfather, Jack Farrelley, Eric Walker, Ian Garden, Rion Voigt, John Fox, Mrs. Grey, Lionel Lunn, L. A. Dempsey, Gerry Hardman, Ken Howard (Sporting). Other Executives: Fred. Witt (Asst. Musical Director), Esme Williams (Publicity Officer). Other staff: 2KY Players (Dan Weldon, Production Manager), Moncrieff McCallum, John Saul, Lorna Bingham.

TRANSMISSION TIMES: Monday to Saturday, 6.45 a.m.—12 midnight; Sundays, 7.30 a.m.—11.30 p.m.

TOTAL TRANSMISSION HOURS during 1936: 5,109.

TECHNICAL DESCRIPTION OF STATION: Aerial power 1 KW modulated 100%. Power frequency generated by crystal controlled oscillator at 1020kc. Crystal works in

constant temperature of 90° F. Output of oscillator is simplified by one-15 watt valve, and one-75 watt valve before being modulated. Modulation takes place in a 250 watt valve, and the modulated output of this valve is amplified by a water-cooled valve before being fed to the aerial. Audio frequency power is supplied by an amplifier in the studio, having an output of 14 DB up and three stages of amplification at the station, the last stage being a 500 watt modulator. Power for transmitter is three-phase 50 cycle AC, and four separate units fitted with mercury vapour rectifiers convert it to DC at 22 volts for filament lighting, 750 volts for bias supply, and 2000 and 5000 volts for high tension supply. Radiating system is a T aerial supported by two masts 187 feet high and fed by two-wire transmission line. Beneath the aerial is an earth mat of copper wire connected to copper plates buried in charcoal.

STATION ACTIVITIES DURING 1936: One of the most important steps taken by this station was the launching of the Coronation Player's Quest, a feature which won and held the interest of a vast audience. The Quest was inaugurated with the object of finding the most talented performer in New South Wales to send to London for appearance at the London Palladium, and resulted in Miss Kathleen Bourke being judged the winner by public vote. In the realm of plays, "The Story Behind the Stamp," revealed to listeners the fascination of philately, together with its educational value, each event responsible for the design of the various stamps being dealt with in a colourful and unique manner. This serial struck a new note in radio plays, one which has recently been followed up by the presentation of "Cavalcade of Aviation," which deals with the progress of flying, dating from 1903. In live-artist entertainment, 2KY Sunday Feature Hour is a highlight. This introduced to listeners many recruits from the legitimate stage, Minnie Love, Amy Rochelle, Nellie Kolle, Elsa Lewis (late of London Palladium), all of whom still continue to entertain 2KY listeners. These artists are supported by others, including a number of the most talented competitors heard during the 2KY Radio Trials. As an example of 2KY's policy of "Australian entertainment for Australian listeners," we quote here a regular Sunday two-hour attraction culled from past records. An hour of flesh and blood entertainment presented at 6 p.m. (Wiseman's Quality Tailors), followed at 7 o'clock by a 30-minute recital of instrumental music rendered by a trio (Sam Lands), at 7.30 "The Luxury Cruise," a presentation of 12 outstanding local artists (Palmolive). Thus, during the two-hour period 27 Australian artists were at the microphone.

2LF, YOUNG—210 Metres (1370 Kc.)

YOUNG BROADCASTERS LTD., 9 Bligh Street, Sydney. Licensed power, 300 watts. Station not in operation as at August 1, 1937.

2MO, GUNNEDAH—219 Metres (1370 Kc.)

2MO, GUNNEDAH LTD., Business address, Market Street, Gunnedah. P.O. Box 62. Studio and Transmitter: Market Street, Gunnedah. Licensed power: 100 watts. Licensed 16/6/30. Commenced 16/6/31.

Slogan name: "The Voice of the North-west."

Directors: L. M. Oliver, H. W. Goddard, M. J. Oliver. Managing Director, L. M. Oliver.

Sales Representatives: Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney. Transmission times: Week-days 7.45—9 a.m., 12.45—1.45 p.m., 6—10 p.m. Sundays, 8—10 a.m., 2—4 p.m., 6—10 p.m.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

2LM, LISMORE—333 Metres (900 Kc.)

RICHMOND RIVER BROADCASTERS LTD., Molesworth Street, Lismore, N.S.W. Telephone: 1028-9. Location of transmitter: Goonellabah.

Power: 500 watts. Station opened 22/9/36.

Slogan Name: "Voice of the Northern Rivers."

Directors: C. M. Robertson (Chairman), A. E. Brand, J. C. McIntosh jun., J. M. McLean, Dr. A. J. Opie. General Manager, Eric Harrison. Secretary, F. G. Jackson. Chief Engineer, S. Tonkin. Salesman-Announcer, J. A. Sharp. Announcers, Tom Ward, Mollie Noonan, Edna Gillies, Sheila Gross. Assistant Engineer, L. J. Aked; Monitor, P. O'Sullivan. Office Staff, Miss P. L. Wilson.



Main Studio, 2LM, North Eastern N.S.W.

Bankers: Bank of New South Wales. Solicitors, J. C. McIntosh. Auditors, A. Fairlie Patterson and Co.

Interstate Representatives: Amalgamated Wireless (A/sia) Ltd., Sydney and Melbourne; E. H. Brewer, Assembly Hall, Margaret Street, Sydney.

Transmission times: 7—10 a.m., 12 noon—3 p.m., 5.30—10.30 p.m. Total transmission hours during 1936: 896.

Technical description of station: A.W.A. type J2221 transmitter, 500 watts aerial power, modulated to 100 per cent. A.W.A. folded half-wave aerial for very low angle radiation. A.W.A. studio equipment, whole system within 2DB between 30 and 10,000 cycles. Provision for all types of outside broadcasts and relays.

2MW, MURWILLUMBAH—204 Metres (1470 Kc.)

TWEED RADIO AND BROADCASTING CO. LTD., Murwillumbah. Licensed power 100 watts. Station not in operation as at August 1, 1937.

2NZ, INVERELL—256.4 Metres (1170 Kc.)

NORTHERN BROADCASTERS LIMITED, Broadcasting House, 20 Otho Street, Inverell. P.O. Box. 3. Telephone: Inverell 9. Telegrams: "TWO NZ."

Location of Transmitter: Little Plain, 9.4 miles west of Inverell.

2NZ, INVERELL (Continued)

Licensed power: 2000 watts. Operating power: 1000 watts.

Slogan Name: "2NZ, broadcasting to Northern New South Wales and Southern Queensland." Commenced 30/3/36.

Directors: H. T. Knapton (Chairman), Hon. E. C. Sommerlad, M.L.C., M. D. Seward, G. H. Anderson, A. F. Manchee, J. H. Middleton. Executive Committee: Hon. E. C. Sommerlad, M.L.C., G. H. Anderson. General Manager, John Murray; Secretary and Accountant, A. R. Chaloner, L.F.C.A.; Studio Manager and Senior Announcer, Stuart Beattie; Playwright, Producer and Copywriter, Hal Saunders; Country Sales Organiser, John Twyford; Chief Engineer, E. S. Stevens; Programme Supervisor and Announcer, John Walker; Chief Clerk and Announcer, Miss Jean Barrie; Engineers, M. J. Chatfield and O. Bartle.

Bankers: Commercial Banking Co. of Sydney Ltd. Solicitors: Anderson, Wiltshire and Manning, Inverell. Auditor: R. C. Dight, F.C.A. (Aust.), Inverell.

Sydney, Melbourne and Newcastle Sales Rep.: Country Broadcasting Services Ltd., Hosking Place, 84½ Pitt Street, Sydney.

Transmission times: Monday—Friday, 7 a.m.—9 a.m., 11 a.m.—2 p.m., 3.30 p.m.—10 p.m.; Saturday, 7 a.m.—9 a.m., 11 a.m.—2 p.m., 5 p.m.—10 p.m.; Sunday, 11 a.m.—2 p.m., 5 p.m.—10 p.m.

Technical Description of Station: The Station was opened under the call sign of 2LV, with a power of 100 watts, on 30/3/36. At the end of January, 1937, the power was increased to 1000 watts, and the call sign was changed to 2NZ. Unmodulated power in the aerial 1000 watts, obtained from a linear amplifier consisting of 2 x 279A Standard valves. Intermediate amplifier 2 x 242 Standard valves is modulated by 2 x 242 Standard valves. Studios consist of Announcers' Studio, Main Studio, Control Room, and Dramatic Control Panel controlling 2 microphones and 4 pick-ups. Microphones throughout are W.E. Dynamics, pick-ups throughout are W.E. type 4A.

Station activities: In May 2NZ established a production department, and is presenting several dramatic features in "flesh and blood." A high standard is maintained, and the listener interest has increased considerably. The introduction of these features has been largely responsible for a rapid increase in revenue.

2QN, DENILQUIN—208 Metres (1440 Kc.)

DENILQUIN BROADCASTING CO. LTD., End Street, Denilquin, N.S.W. Studios and Transmitter: Denilquin. Licensed power, 100 watts. Licensed 29/5/35. Commenced 2/11/35.

2RG, GRIFFITH—204 Metres (1470 Kc.)

IRRIGATION AREA NEWSPAPERS LTD., P.O. Box 388, Griffith, N.S.W. Studio and Transmitter: Griffith. Licensed power: 50 watts.

Directors: Dr. L. M. Jones, Mr. H. B. Whitham. Secretary, Miss E. L. Miller.

Transmission Hours: Daily 5.30—10 p.m.

Sales Representative: D. Scott, 9 Bligh Street, Sydney.

The station is located in modern brick premises at Griffith, which house studio, offices, and transmitter. The announcer's table houses the whole of the studio pre-amplifiers, faders, level indicators and associated equipment, together with turntables, pick-ups and microphone input plugs. Piezo acetate microphones and pick-ups are used. The complete unit is A.C. operated, and requires merely connection to A.C. mains.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

2SM, SYDNEY—236.2 Metres (1270 Kc.)

THE CATHOLIC BROADCASTING CO. LTD., Australia House, Carrington Street, Sydney. LOCATION OF STUDIOS: Australia House, Carrington Street, Sydney.

LOCATION OF TRANSMITTER: A.W.A. Radio Centre, Pennant Hills, Sydney.

LICENSED POWER: 1,000 watts. Licensed 10/9/31. Commenced 24/12/31.

SLOGAN NAME: 2SM "The Modern Station."

DIRECTORS: J. A. Meany, W. Hurley, T. G. Murray, M. O'Neill, R. Fagan, M. L'Estrange. Managing Director and General Manager: J. A. Meany. Secretary: Peter J. Egan. Studio Manager: John S. Dunne. Production Manager: Reg. Hawthorne. Musical Arranger: Fred Webber. Publicity Manager: Eric C. Shaw. Advertising Manager: L. P. Quirk. Chief Announcer: Dominic Harnett. Announcers: John Tuttle, Richard Fair, Miss Doreen Mackay. Sales Reps.: B. B. Stapleton, E. C. Farris, S. C. Linsley-Freeman, J. Digby-Bennett.

NOMINAL CAPITAL: £15,000. Paid-up Capital: £10,000. Bankers: Commonwealth Bank of Australia. Solicitors: Murphy & Maloney. Auditors: S. Kellar White and J. Y. McGrath.

INTERSTATE REPRESENTATIVES: R. J. McCartney (Central 603), Newspaper House, 247 Collins Street, Melbourne. Amalgamated Wireless (A/sia) in all States.

SPECIAL SESSIONS: Children's Session, John Dunne 5—6 p.m. Monday to Saturday. Melodiána, Dom. Harnett, 1—4 p.m. Sunday. Celebrity Recital, George Wollaston, 5—6 p.m. Sunday.

TRANSMISSION TIMES: Monday to Saturday; Breakfast Session, 6 a.m.—9 a.m.; Midday Sessions, 1 p.m.—3 p.m.; Women's Afternoon Session, 3—5 p.m.; Monday, Tuesday, Thursday and Friday, Children's Session, 5—6 p.m.; Early Evening Session, 6—8 p.m.; Evening, 8—10.30 p.m.

TOTAL TRANSMISSION HOURS during 1936: 4,500.

SPECIAL PROGRAMME SERVICES: Every programme facility is available, including manuscripts, artists, producers, sound effects, auditions, continuity, recordings, electrical transcriptions, etc.

2TM, TAMWORTH—230.7 Metres (1300 Kc.)

TAMWORTH RADIO DEVELOPMENT CO. LIMITED, Studios and offices: 312 Peel Street, Tamworth, N.S.W. Telephones: Tamworth 211/212. Sydney BW1118. Telegrams: "TwoTm." Transmitter situated at Duri, 12 miles from Tamworth. LICENSED AND ACTUAL OPERATING POWER, 2,000 watts. Commenced 27/2/35.

DIRECTORS: E. Higginbotham (Chairman), T. Whitcomb, H. M. Sheffer, A. Joseph, O. Bennett. Managing Director: E. Higginbotham. Manager and Secretary: H. F. Dyball. Chief Engineer: T. Whitcomb. Studio Manager, A. L. Bennett, L.D.S. Accountant: C. I. Huxley, L.F.P.A. Musical Director: J. W. Whitmore. Announcer and Copywriter: K. Moginie. Announcers: K. Godfrey, Mrs. W. Langford Penny, W. L. Penny. Second Engineer: F. Potter. Third Engineer, L. Pengilly. Salesmen: J. Leiper, R. Davidson, R. Stewart. Contract Clerk: J. Cornish. Bankers: Bank of New South Wales. Solicitors: Creagh and Creagh. Auditors: Thomas Davis and Co.

INTERSTATE REPRESENTATIVES: E. H. Brewer, Assembly Hall, Margaret Street, Sydney. R. J. McCartney, Newspaper House, 247 Collins Street, Melbourne.

TRANSMISSION TIMES: 17 hours daily, 6 a.m.—11 p.m. Sundays, 8 a.m.—11 p.m.

TOTAL TRANSMISSION HOURS during 1936: 3,790.

TECHNICAL DESCRIPTION OF STATION: The transmitter uses the new Philips Transmitting Pentodes which completely eliminates the need for neutralization. The final stage uses the water-cooled pentode, capable of supply 4KW of unmodulated R.F. energy.

2TM, TAMWORTH (Continued)

Station activities during 1936: The progress of 2TM in 1936 was extremely satisfactory, as the revenue showed an increase of some 50%, while the staff employed was increased to sixteen. On 27/2/37, its second birthday, 2TM developed into a 2KW station with a staff of 23, which staff is still increasing as the Directors meet the right persons. Station slogan is "2TM Broadcasting from Tamworth, the Metropolis of Northern New South Wales."

2UE, SYDNEY—316 Metres (950 Kcs.)

RADIO 2UE, SYDNEY LIMITED, Savoy House, 29 Bligh Street, Sydney, N.S.W. BW3121 (6 lines). Telegrams: "TWOUE." Location of transmitter: Lilli Pili, Port Hacking, N.S.W. Power, 1,000 wats. Licensed 7/11/24. Commenced 26/1/25. Directors: Sir John Butters, R. E. Denison, N. L. Shaw, C. V. Stevenson. Secretary: R. H. H. Wolff. Bankers: Union Bank of Aust. Ltd. Auditors: Parkhill, Lemm and Bell.

Managing Director: C. V. Stevenson; Assistant Manager, D. R. Armstrong; Advertising Manager, S. E. Baume; Chief Engineer, M. H. Stevenson, M. Inst. R.E.; Assistant Engineer, W. H. Robinson, A. Inst. R.E.; Studio Manager, N. M. Stevenson; Senior Announcer, K. Fowles; Musical Dept., K. Blakeney; Presentation, K. Blakeney and A. Carr. Interstate Representative: L. G. Mather, 422 Collins Street, Melbourne, C.I.

Transmission Times: 6 a.m.—11.30 p.m., Monday to Saturday; 8 a.m.—11.30 p.m. Sunday.

Total number of transmission hours during 1936: 6,200.

(Continued on Foot of Page 120.)

**ADVERTISERS WHO WANT
BETTER RESULTS**

COME TO

3XY

MELBOURNE

*The station with the
greatest live artists
programmes in Australia*

MELBOURNE:
Princess Theatre Bldg.,
Spring Street.
Central 6612.

SYDNEY:
A.W.A. Ltd.,
47 York Street.
BW 2211.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

2UW, SYDNEY—270 Metres (1,110 Kcs.)

COMMONWEALTH BROADCASTING CORPORATION PTY. LTD., State Shopping Block, 49 Market Street, Sydney. Telephone, M6686 (5 lines). Cables, "TWOUW," State Shopping Block, Market Street, Sydney. LOCATION OF TRANSMITTER: State Shopping Block. Power, 750 watts. Licensed 13/2/25. Commenced 13/2/25. SLOGAN NAME: "2UW Sydney."

DIRECTORS: Stuart F. Doyle, M. F. Albert, A. F. Albert. Managing Director, Stuart F. Doyle. General Manager, C. F. Marden. Secretary, W. Sayle. Bankers: Bank of New South Wales. Solicitors: Ernest Cohen and Linton. Auditors: Holt and Thompson. Station Manager, N. Lyons. Director of Production, George Edwards. Maurice Francis, author and dramatist, George Edwards Productions. Nell Stirling, George Edwards Productions. Secretary to General Manager, Miss C. H. Wood; Accountant, C. Carter; Service Dept., Miss R. Foott; Publicity Manager, F. Clarke-Cottrell; Programme Dept., Miss G. Lammas; Production, C. Arnold. Announcers: J. M. Prentice, J. S. Wheeler, T. Corrie, J. A. Crawcour, Vernon Lisle, Cyril James, W. Hardy, Henry Gregory, T. Hudson, Thea Lawford, Hilda Morse, Eric Scott, E. Colibee, O. J. Leighton. Sporting Department: Sporting Editor, Arthur Anderson; Sporting Annotator, Charles Lawrence; Race Commentators, Cyril Angles and Eric Welch; Race Reproductions, James McKay; General Sporting, Gordon Peck. Sales Staff: Sales Manager, F. E. Levy; Assistant to Sales Manager, C. Gilder, W. Hardy, J. R. McConnell, R. McKinnon, J. Wheeler, H. Gregory, E. V. Colibee, H. Ringland. Engineering Staff: Chief Engineer, T. A. McNeil; P. Phillips, J. Phillips, C. Hammer, E. Austwick, B. Stephenson.

INTERSTATE REPRESENTATIVE: Peter Sullivan, Melbourne, Vic.

TRANSMISSION TIMES: 24 HOURS CONTINUOUS SERVICE.

TOTAL TRANSMISSION HOURS DURING 1936: 8,760.

TECHNICAL DESCRIPTION OF STATION: The task of conducting a 24 hour, seven day a week, continuous broadcast service, is a difficult proposition from a viewpoint of all departments, but nowhere is the problem keener than in the Technical Branch. Station 2UW employs two transmitters, one used 7 a.m. till midnight, and the other from midnight till 7 a.m. The only part common to both transmitters is the audio equipment and the feeder line aerial system. In every other detail from crystal drive to final

amplifier entirely separate equipment is used. The main transmitter, which is used 17 hours daily, is a splendid example of modern broadcast installation, and incorporates every desirable feature for the radiation of high quality programme material. The well-known series modulation is used followed by a linear amplifier using water-cooled valves. High voltage for these stages is obtained from a 10,000 watt rectifier using mercury vapour tubes. Power for filaments and bias being obtained from generators. Duplicate machines for these supplies are installed, as are also duplicate water pumps and air blowers.

Together with these machines the motor generators for the second transmitter are also installed, and as No. 2 transmitter is entirely run off generators, a very formidable array of machinery is seen. The main supply into the building is 480 volts D.C., so in addition to the abovementioned machinery a 25 KW motor alternator is used to supply the three phase 415 volt A.C. requirements. A frequency meter is installed, and this, together with special controls, enables a constant 50 cycle supply to be generated. The No. 2 transmitter is used 7 hours per day, and change over is made at midnight when No. 2 is run up and all but the final stage switched on. At a suitable point in the programme the final stage of No. 1 is switched off, a change, by means of a switch takes the feeder lines off one transmitter on to the other, and No. 2 final stage is switched on. The whole change only takes a few seconds. No. 2 transmitter uses the familiar Hering high level modulation and the whole machinery for this transmitter is run off 480 volts D.C. In this way the main A.C. alternator is rested, together with No. 1 transmitter, when opportunity is taken for maintenance work. Unless something extremely untoward happens, an uninterrupted service is then conducted and 2UW feel that figures for breakdowns compare very favourably with any throughout the world. On rare occasions, some portion of the equipment which is common to both transmitters, namely aerial system, will need attention, and obviously a shut-down then becomes an unavoidable necessity. With regard to the general broadcasting facilities of 2UW, flexibility is the keynote, and up to three programmes can be listened to separately, and this in addition to recording equipment, enables the complex work of a modern broadcasting station to be carried out with a maximum of efficiency and smoothness.

The Commonwealth Broadcasting Corporation Pty. Ltd., operating Station 2UW, have made great strides in their expansion policy, and now control 4BC Brisbane, with interests in 4RO Rockhampton, 4MB Maryborough, 4GR Toowoomba, 4ZR Roma, 4SB Kingaroy, all of Queensland. Further expansion brought into being the Commonwealth Broadcasting Network with 2UW as the key station. The C.B.N. now operates stations in New South Wales, Victoria, South Australia, Queensland, and Tasmania.

RECORDING FACILITIES: Station 2UW has independent recording equipment.

2WG, WAGGA—261 Metres (1150 Kcs.)

RIVERINA BROADCASTING PTY. LTD., 16 Fitzmaurice Street, Wagga, N.S.W. Telephone, Wagga 164. Telegrams, "TWOWG." Location of transmitter: Oura Road, 7 miles from Wagga. Power, 2000 watts. Licensed 21/8/31. Commenced 29/6/32.

Slogan name: "The Voice of the Riverina."

Managing Director: E. V. Roberts. Sole proprietors, E. V. Roberts, Mrs. I. A. Roberts. Secretary, M. Sheekey. Bankers, Union Bank of Australia, Wagga. Solicitors, Lusher, Young and Stellway, Wagga. Auditors, Camden S. Garrett, Wagga.

Interstate representatives: Cuthbert A. Monks, 77 York Street, Sydney; Harold W. Allison, 532-542 Bourke Street, Melbourne.

2WG is the Riverina member of the Commonwealth Broadcasting Network.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

2WL, WOLLONGONG—210 Metres (1430 Kcs.)

WOLLONGONG BROADCASTING PTY. LTD., Studios

and Offices: Edward Street, Wollongong. Postal Address, Box 34, Post Office, Wollongong. Telephone: W'gong 203. Telegrams: "Twowl." Sydney Office: 12th Floor, 66 Elizabeth Street, Sydney. Phone, BW6155.

Location of transmitter: Farnborough Road, Unanderra. Power, 300 watts. Licensed 1/7/31. Commenced, 18/7/31.

Slogan Name: "The Voice of Central Illawarra."

Directors: Russell A. Yeldon, Reginald E. Denison, Frederick Daniell, Frederick de R. Duncan. General Manager, Russell A. Yeldon. Secretary, J. A. Byron. Advertising Dept., G. I. Smith. Sales Rep., W. G. Herring. Programmes, W. Merchant. Announcers, R. A. Yeldon, G. I. Smith, W. Merchant, Capt. T. Ledgerwood.

Sydney Rep.: E. H. Brewer, Room 112, Assembly Hall, Margaret Street, Sydney.

Bankers: E. S. & A. Bank. Solicitors: Russell and McLelland, Crown Street, Wollongong. Auditor, C.R.M. Shannon, Wollongong.

Transmission Times: 10 a.m.—11.30 a.m. (except Sunday). Afternoon Racing Session, relayed from 2UE Wednesdays and Saturdays, 12 noon to 5 p.m. Evening Sessions, 6.30 p.m. to 10 p.m. except Monday, 6.30 p.m.—10.45 p.m. for Wollongong Dogs. Saturday evening 6.30—10.45 Harold Park Greyhounds, and Sunday evening 7 p.m.—10 p.m.

Station Activity: 2WL commenced operations on 18/7/31 with an aerial power of 50 watts. March, 1936, at Unanderra (6 miles from studio), a 500 watt transmitter was installed, and an aerial power of 300 watts used. Lattice steel self-supporting towers were erected. Additions had been made to the original studios at various times.

Station activity grew apace with the increased power and it was decided to erect more studios and offices to cope with the expansion. In February, 1937, a double-story brick building was added containing studios and offices, making 2WL one of the most modern country units in the Commonwealth. Besides a general control room and a dramatic control room 2WL utilises 3 studios all acoustically treated. The largest studio makes it possible to accommodate a very large gathering.

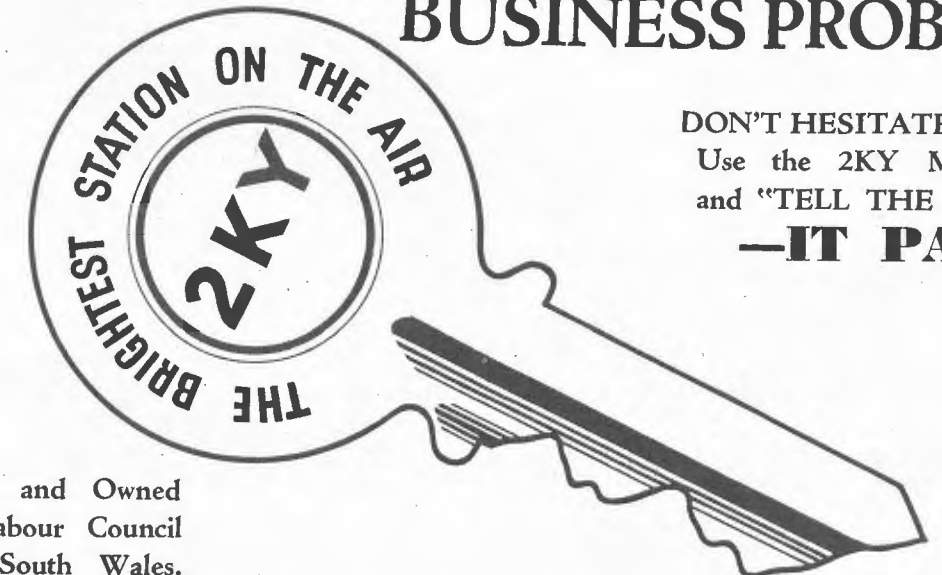
"The Voice of Central Illawarra" is situated in the heart of a growing industrial area, Port Kembla, which promises to become the city of to-morrow, is only three miles from the 2WL transmitter. This station serves an area containing a population of 150,000, excluding entirely, the metropolitan area.

Recording facilities: 2WL has its own recording facilities.

2XL, COOMA—341 Metres (880 Kc.)

COOMA BROADCASTERS PTY. LTD. Box 58 Cooma. Licensed power 100 watts. Station to commence August, 1937.

THE MASTER-KEY TO THE BIGGER BUSINESS PROBLEM



DON'T HESITATE —
Use the 2KY Microphone
and "TELL THE WORLD"
—IT PAYS

Controlled and Owned
by the Labour Council
of New South Wales.

Rate Cards on Application

R. A. KING, M.L.C.,
Secretary.

Phone M 6291-2.

H. E. BEAVER,
Manager.

2UE, SYDNEY (Continued)

Description of Station: Crystal controlled oscillator, followed by two intermediate amplifiers. Low power modulation. Modulation capacity 100%. Two linear amplifiers, following modulated amplifier. Final stage employ two S.T.C. water-cooled valves (type 4228). Studio equipment consists of complete transmission and audition facilities, there being 4 studios, 2 control rooms, and a presentation studio specially designed to handle the most comprehensive presentations. It is possible to have three programmes "on the go" at the one time. The complete Studio equipment is A.C. operated, including microphone amplifiers. The microphones are of the latest pattern, both moving coil and velocity types. The overall frequency response is "Flat" to 10,000 cycles per second, the P.M.G.'s transmission line to the Station being equalised to that figure. New offices and studios were occupied in October, 1936. During 1936 no less than 500 outside broadcasts were handled. The 1936-7 English Cricket tour was covered by 2UE. The 1937 Head of the River Boat Race described from three positions on the Nepean River, necessitating three complete and separate amplifying equipments, three special announcers and 4 technicians, at the River; the three races during the afternoon were described without a hitch—sponsored by Lustre Hosiery.

Recording facilities: Recordings can be made at 78 or 33.1/3 R.P.M. on any size disc.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

Victorian Stations

3AK, MELBOURNE—200 Metres (1500 Kc.)

MELBOURNE BROADCASTERS PTY. LTD., Studio and Office: 450 Bourke Street, Melbourne, C.1. Location of transmitter: 8 Yerrin Street, Balwyn. Telephones: M 5667-8.. W.2100. Telegrams "Melcast."

OPERATING POWER, 200 watts. Licensed, 20/11/'31. Commenced 29/11/'31.

SLOGAN NAME: "The Voice of the Night." Directors: G. F. Palmer, W. H. Williams. Manager, Claude Tilley.

Chief Announcer, Alf Andrew. Announcers, Hal Moors, Eric Spence, Jim McCall, Jean Matheson and Peggy Quinn. Continuity Writers, Ed. Mitchell, Miles Upton, Jean Matheson, Dorothy Fidler. Engineering Staff, Jack Burrage, Lew Harding and L. Rodgers. Band conductor, Wally Bishop. Musical Director, Owen Regan. Sporting Commentator, Claude Tilley.

Bankers: E.S.A. Bank, Melbourne. Auditors: B. J. Jackson, Little Collins Street, C.1. Solicitor, W. H. Harrison, Collins Street, Melbourne.

STATION ACTIVITIES DURING 1936: The Station made rapid progress both from the technical and from a production point of view. The station now broadcasts five live artist shows per week and has one of the best dance bands on the air in Melbourne. The station's sporting session is conducted by "Claude Tilley," and an acquisition to the staff during 1936 was the engagement of Mr. Alf Andrew as Chief Announcer.

3AW, MELBOURNE—234 Metres (1280 Kcs.)

3AW BROADCASTING CO. PTY. LTD., Studio, office and transmitter 382 Latrobe Street, Melbourne, C.1. Telephone Central 1112 (4 lines). Telegrams, Threeaw. Licensed and actual operating power—600 watts (aerial power). Licensed 23/10/'31. Commenced 23/2/'32.

Slogan Name: "The Feature Station." Station call sign, VK3AW.

Directors: J. H. Syme, G. Syme, John H. Tait, Frank S. Tait, George Sutherland, Fred H. Allan, A. E. Bennett. General Manager: John T. Taylor. Secretary, Hector Harris.

Bankers: Bank of Australasia. Solicitors, Gillott Mair and Ahern. Auditors: Cook, Tomlins and Mirams. Programme Manager: Gordon L. Tait. Chief Engineer, John Ryan.

Announcers: Fred Tupper, Cliff Nicholls, John Masters, Ron. Athelwood, George Bills-Thompson, Lloyd Lamble, Douglas Elliot, Kathleen Lindgren, Gwen Varley. Salesmen: David Duff, T. R. Wardle, Jack O'Hagan. Other engineers: George Nolte, Syd. White, M. Israel, M. Cookson.

Interstate Representative: E. H. Brewer, Assembly Hall, Margaret Street, N.S.W.

Transmission Times: Monday to Saturday, 6.30 a.m.—11.30 p.m.; Sundays, 10 a.m.—12.30 p.m., 2 p.m.—10.30 p.m. Total transmission hours during 1936, approximately 5,900.

Description of Station: Four studios, in addition to a just completed audition studio, equipped with high fidelity amplifier and speaker, which provides unique facilities for big "live-artist" productions. All of these studios can be used for one broadcast, or any combination of them; and any combination not being used for broadcast can be employed for either audition or rehearsal. The facilities for "live-artist" presentation are further enhanced by the availability of all J. C. Williamson Ltd.'s theatres exclusively to

3AW, MELBOURNE (Continued)

this station. The audio systems are completely duplicated, and high-power modulation is used on the transmitter. Spare plant is available in case of power failure. The machine is capable of developing sufficient power to maintain the transmitter and all lighting in the building.

The aerial system is erected on the roof of the building, and it consists of two tubular steel masts 133 feet above the roof. Both masts are insulated above ground. As the station is on the air 17 hours daily it is necessary that all testing routine should be carried out after operating hours. Unusual care is taken to eliminate risk of breakdown.

Station activities during 1936. Forerunner of the present place in the "live artist" field held by 3AW was the broadcast throughout Australia by Richard Crooks in September. Its success has gained for the station such big "live-artist" contracts as "the 1937 Shell Show," and "the Swallow Surprise Party." "Flesh and blood" productions were given a further impetus by 3AW's exclusive rights to J. C. Williamson Ltd. artists, which brought direct broadcasts from the stage during a number of musical comedies, and also personal appearances in the studio of leading Australian and overseas artists. Through J. C. Williamson Ltd., came also the Sunday afternoon presentations of vocal recordings from Gilbert and Sullivan operas, while the station's association with Allan and Co. Pty. Ltd., yields a world library of recorded music which is almost inexhaustible. The two-hour community singing session (an hour of which is broadcast) introduced by "Nicky" and "Tuppy" in August, drew the capacity house of 1500 to the King's Theatre regularly; while in the sporting sphere 3AW pioneered in Victoria starting price services as an adjunct to descriptions at all metropolitan race meetings. Manton's popular Sunday morning programmes (10.30 a.m. to 12.30 p.m.) passed its 140th session. The ever-rising figures of "Chatterbox Corner" (4.45 to 6 p.m.), and the 3AW's Women's Association (10.30 a.m. to 12.30 p.m.) went still higher, "Chatterbox Corner" reaching a total of 51,000 members, and the 3AW Women's Association embracing in its varied activities 50 clubs.

As a result of the renovations which were completed at the beginning of 1937, 3AW's premises at 382 Latrobe Street, have gained an additional 1200 sq. ft. in floor space. Among the first buildings in Australia to be erected solely for the purpose of broadcasting, 3AW occupied its premises in January, 1935, but the necessity for future expansion was fully recognised and in the design of the building allowance was made for them. Following the renovation of a wing which had not been previously used the record library now fills three times its former space; the continuity department is now housed in two rooms with double its former space.

3BA, BALLARAT—227 Metres (1320 Kc.)

BALLARAT BROADCASTERS PTY. LTD., 56 Lydiard Street North, Ballarat, Victoria. Telephone, Ballarat 568. Telegrams "3BA" Ballarat. Studios, 56 Lydiard Street North. Location of Transmitter: Cardigan, 4½ miles from Ballarat. Power: 500 watts. Licensed 2/6/'30. Commenced 31/7/'30.

Slogan Name: "The Courier Station." Directors: J. H. Davey, S. W. J. Clark, C. P. A. Taylor, K. Taylor; Managing Director and General Manager, J. H. Davey. Secretary and Advertising Manager, E. J. W. Whykes. Programme Manager and Chief Announcer, E. V. Trotman. Announcers, Jack Neville, J. H. Davey, Trevor Negri, Lela Lake, Maude Jones, Zelle Hillman. Joint Chief Engineers, Alfred D. Kerr and Warne A. Wilson. Technician, Rudolph Buring, B.Sc., B.E. Operator, Walter D. Mather.

Bankers: Bank of New South Wales; Solicitors, Nevett, Nevett and Glenn. Auditors: A. K. Miller.

(Continued on Opposite Page.)

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

3BA, BALLARAT (Continued)

Interstate Representatives: George Hill, Chamber of Commerce Buildings, Grosvenor Street, Sydney. Lou H. Dahlberg, 148 Queen Street, Melbourne.

Transmission Times: Monday—Friday, 7.30—11 a.m., 12—3 p.m., 5—11 p.m. Saturday, 7.30—11 a.m., 1—11 p.m. Sunday, 1—3 p.m., 6.30—10.30 p.m. Total transmission hours during 1936: 4,000 (approx.).

Technical description of station: The transmitter is located 4½ miles out of the city in an ideal radio location, the ground being flat for many miles around. The complete equipment is of modern design, the transmitter being of the low power modulation type with a 5KW water cooled valve used as a linear amplifier. At the present time this is called on to deliver only 500 watts of power to the antenna, being operated at a very conservative output and allowing for a possible subsequent increase of power. For frequency control two Billey crystals are used in a completely shielded and isolated constant temperature oven. Sub modulators, modulators and modulated amplifier are all push-pull connected and provision is made in the water cooled linear stage to add another similar valve in push-pull should power requirements demand it. A vertical steel tube radiator 195 feet high is used as slightly over one quarter wavelength antenna, and is coupled to the transmitter by transmission line 200 feet long. A circular paiter earth mat with a total of over four miles of heavy stranded copper wire is used. Studio equipment consists of velocity microphone and sundry others for outside pickups. Each studio has two turntables and announcers' switching panel on desk. Two other turntables for 33 1/3 and 78 r.p.m., transcriptions are used in the control room, which is between A and B studios, and commands a view of both. The control panels consist of four bays six feet high, containing remote telephone lines and equipment associated with the studio control. In the control room is also a complete 50 watt transmitter in readiness as a standby plant.

3BO, BENDIGO—309 Metres (970 Kc.)

AMALGAMATED WIRELESS (A/SIA) LTD., Beehive Chambers, Pall Mall, Bendigo, Victoria. Telephones: Bendigo 54 (office and studio), Bendigo 26 (station). Telegrams: Threebo Bendigo. Location of studio, Kangaroo 17/9/'30. Commenced 4/6/'31.

Slogan Name: "The Friendly Voice of the North."

Engineer-Manager, J. P. Banney; Assistant Engineer and Announcer, W. S. M. Moore; Chief Announcer, John Scott Griffiths. Lady announcers, Miss Betty Errington, Miss Emily Shipp. Programmes and Continuity, Miss Isabel Poulston and Miss Amy Huxtable. Sporting Observer and announcer of Sporting Sessions, J. E. Mamouney. "The Good Companion," Rev. Goble.

Interstate Representatives: Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney, N.S.W.; 167 Queen Street, Melbourne; Brisbane Representative for A.W.A. Network, Roger Fair, C.M.L. Buildings, 289 Queen Street, Brisbane.

Transmission Times: Mondays—Fridays, 10.30 a.m.—1.30 p.m., 5 p.m.—10.30 p.m. Saturdays, 10.30 a.m.—10.30 p.m. Sundays, 10 a.m.—1 p.m., 7 p.m.—10.30 p.m.

Total transmission hours during 1936: 3,225. Technical description of Station: Operates an A.W.A. designed and manufactured Class "A" transmitter with an aerial power of 200 watts, unmodulated. The radiating

3BO BENDIGO (Continued)

system consists of a "T" type aerial supported by two 160 feet tubular steel masts, 520 feet apart. Studio equipment comprises the most modern high fidelity A.W.A. apparatus, designed to meet the stringent requirements of a high class broadcasting studio. Velocity microphones are employed, and all studio equipment operates from A.C. the overall frequency characteristic of which is within plus or minus 2db., from 30 to 10,000 cycles per second.

Station activities during 1936: New central studios in Beehive Chambers, Pall Mall, Bendigo, were taken, and now spacious offices and studios are compact and situated in the centre of the city. One of the most important sessions inaugurated during the year was the 3BO Home Forum, which is broadcast daily (excluding Sundays) from 11.30 a.m.—12 noon, and covers all subjects dear to the hearts of all women listeners. The 3BO Women's Club was formed in connection with this session, and now has a membership of more than 1800 after only 12 months' activity. This Club is very active and always assists in charitable work. Special sporting sessions are broadcast each Friday and Saturday evenings by the 3BO sporting observer, while regular community singing sessions each week were popular additions to the 3BO programmes. The 3BO Smile Club has a membership of approximately 5000 junior listeners. Increased staff, extensive additions to the record library, bright original features, all contributed to the remarkable progress made by 3BO during the year 1936. Within 50 miles radius of the station the population is 126,454 and number of licences in force at March 31, 1937, was 12,377.

Recording facilities: Available through A.W.A. Recording studios, 47 York Street, Sydney.

3DB, MELBOURNE—291 Metres (1030 Kc.) AND 3LK CENTRAL VICTORIA—275 Metres (1,090 Kc.)

(THE "HERALD" STATIONS)

3DB BROADCASTING CO. PTY. LTD., 36 Flinders Street, Melbourne, Victoria. F 2118 (6 lines). Telegrams: "THREEDB." Location of transmitters: 36 Flinders Street, Melbourne, and Lubeck (Vic.). Power: 600 and 2000 watts respectively. Slogan Name: The "Herald" Stations.

Directors: Sir Keith Murdoch, W. Dunstan, H. Pacini, G. Taylor, T. Fink, A. Whyte. General Manager and Secretary: David Worrall. Bankers: National Bank. Solicitor: Norman A. Miller. Auditors: Hancock and Woodward. Sales Director: R. Russell. Programme Director: C. E. Taylor. Accountant: F. Fardell. Transcription Manager: J. Devine. Chief Announcer: Renn Millar. Director Women's Section: Iris Turnbull. Technical Supervisor: H. Kauper. Chief Operators: M. Hooper (3DB), N. Buzacott (3LK).

Representatives: F. Thompson and G. Gibson, Warwick Building, 15 Hamilton Street, Sydney; A. J. Chard, 92 Fleet Street, London; Joshua B. Powers Inc., 220 East 42nd Street, New York.

Transmission Times: 6.30 a.m.—11.30 p.m.

Total transmission hours during 1936: 6400.

Station activities during 1936: During 1936 the country relay unit 3LK was constructed at a cost of £20,000; two additional studios and additional offices built, at a cost of £1,500; 3DB masts increased in height by 30 feet, and the staff increased by 20 per cent.

Recording facilities: Two Universal recording units and special recording studio.

3AK

MELBOURNE REFUSES TO SLEEP
WHILE
THE VOICE OF THE NIGHT
IS ON THE AIR
WAVELENGTH 200 METERS

3AK

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

3GL, GEELONG—222 Metres (1350 Kc.)

GEELONG BROADCASTERS PTY. LTD., National Mutual Buildings, Moorabool Street, Geelong. Location of Transmitter: Geelong. Licensed power, 100 watts. Licensed, 14/8/30. Commenced 3/12/30.

Managing Director: Ramsay B. Cook. Manager, J. H. McKenzie. Studio Manager, Wilfred W. Gray. Advertising Manager, H. Varley.

Transmission Hours: Monday-Friday, 7—9.30 a.m., 1—10.30 p.m. (Saturdays to 11 p.m.); Sundays, 7—10 p.m.

Interstate Sales Representative: G. Hill, cnr. George and Grosvenor Street, Sydney.

3HA, HAMILTON—297 Metres (1010 Kc.)

WESTERN PROVINCE RADIO PTY. LTD. Studio and office, 37 Gray Street, Hamilton, Victoria. Registered and Head Office, 239 Collins Street, Melbourne. Telephones, Hamilton 316, Melbourne M 4731. Telegrams: 3HA c/o "Age," Melbourne. Location of transmitter: Mt. Bainbridge, five miles from Hamilton. Licensed and operating power: 750 watts. Licensed 9/10/31. Commenced 24/10/31.

Slogan Name: "The Age" Station.

Directors: David F. Syme, G. S. Featonby, G. Sutherland, E. T. Fisk. Managing Director: D. F. Syme. Secretary, June Walls. Manager and Chief Engineer, R. A. Fitts. Acting Melbourne Manager, L. R. Heath. Assistant Manager, Richard Burrows. Announcers: Donald James, Grace Pither. Continuity Writer and News Commentator, F. Chamberlain. Engineers: P. C. Bennett, V. Monaghan. City Sales Staff, N. F. Dixon, Dan Hardy.

Bankers: Commercial Banking Co. of Sydney. Solicitors, Blake and Riggall. Auditors, Wilson, Bishop and Henderson.

Interstate Representative: E. H. Brewer, Assembly Hall, Margaret Street, Sydney.

Transmission Times: Monday to Friday, 7—9 a.m., 12 noon—11 p.m.; Saturday, 7—9 a.m., 12 noon—1 a.m.; Sunday, 11 a.m.—4.30 and 6—11 p.m.

Technical description of station: In the studio the dual channel amplifying systems enable auditions to proceed without interfering with normal broadcast programmes and provision is made for recording important items on the programme. Each announcer's table is equipped with a mixing panel enabling the announcer to control three microphones, two gramophone pick-ups, and outside relays and be in constant touch with the engineer five miles away. In the manager's office the programme may be supervised or attention paid to auditions proceeding in any part of the extensive 3HA buildings. The carrier frequency is primarily controlled by a piezo-electric quartz crystal of high precision. Class B modulation is employed. Assembly is made in two units, each terminating with connecting strips for intersection wiring. High grade indicating instruments are provided on the special panels to provide a constant check on the major circuits. In addition an integral part of the apparatus is a standard cathode ray modulation-indicator using an R.C.A. 906 cathode ray tube. A particularly valuable piece of apparatus related to the studio and transmitting stations is the audio frequency oscillator. This makes it possible to test all equipment on any frequency between 20 and 13,000 cycles. An inter-locking relay system allows the plant to be brought up to its operating condition gradually in an automatic manner. Throughout the studio and transmitting equipment, controls are brought to panels which occupy the minimum of space, yet ensure maximum control.

Station activities during 1936: The hours of 3HA have been considerably extended and 9 a.m.—12 noon are the

3HA, HAMILTON—(Continued)

only hours between 7 a.m. and 11 p.m. that the station is not on the air. New studios have been equipped in Melbourne for broadcasting of relays carried from metropolis. One of these relays is an entirely novel idea, being a weekly broadcast of the Radio Young Farmers' Club. This club is of an educational type, tying in with the growing Young Farmers' Movement in Victoria. A Dramatic Club has been formed at Hamilton, and its work is now produced regularly over the air. An increase of power to 750 watts has been granted, and the latest A.W.A. 1000 watt transmitter installed with a new Ruston and Hornsby Deisel as power unit. Both Hamilton and Melbourne offices have been considerably extended.

Recording facilities available: Recording facilities have been recently purchased, but not installed as at 30/6/37.

3KZ, MELBOURNE—254 Metres (1,180 Kc.)

3KZ BROADCASTING CO. PTY. LTD., Offices 64 Elizabeth Street, Melbourne, Victoria. Studio and transmitter: 40 Victoria Street, Carlton. Telephones, C318-9, C279. Telegrams: "THREEKZ." Power, 600 watts. Licensed 27/5/30. Commenced 8/12/30. Slogan Name: "The Brighter Broadcasting Service."

DIRECTORS: S. Morgan, W. V. Morgan, M. G. Sloman. Managing Director, S. Morgan. Secretary, B. Jackson. Advertising Manager, W. V. Morgan. Sales Manager, A. J. Murray. Assistant Manager, A. Isaacson. Programme Manager, N. E. Balmer. Production Manager, K. Hudson. Chief Announcer, Norman Banks ("Norm.") Other announcers: Alex. Dear ("Terry"), Kenrick Hudson ("Dick"), Pat Corby ("Peter"), Norman Swain ("Billy Bouncer"), Norman Balmer ("Eddie"), Donovan Joyce ("Don"), Iris Greenham ("Pat"), E. Goetze ("Mrs. Rex"). Continuity Writer, D. Joyce. Salesmen, F. Russell, C. Rose, A. Gray, A. Banks. Chief Engineer, A. Grace. Other engineers, S. Thurling, E. Barwick.

INTERSTATE REPRESENTATIVE: John A. Armstrong, c/o Richard Thompson, 133 Pitt Street, Sydney. Telephone: B 1553, B2286.

TRANSMISSION TIMES: Monday to Friday, 6.30 a.m.—11.30 p.m., Saturday 6.30 a.m.—1 a.m. Sunday, 10 a.m.—12.30 p.m., 2.30 p.m. to 10.30 p.m.

TOTAL TRANSMISSION TIMES DURING 1936: 5,564. RECORDING facilities available.

3MA, MILDURA—221 Metres (1360 Kc.)

SUNRAYSA BROADCASTERS PTY. LTD., Langtree Avenue, Mildura, Vic. P.O. Box 200. Telephone 25. Location of Studios and Transmitter: Langtree Avenue, Mildura. Licensed power: 100 watts. Licensed 8/11/32. Commenced 25/5/33.

Directors: R. D. Elliott, G. S. Baxter, C. D. Lanyon. General Manager, Sales Manager and Chief Announcer, E. Holloway. Assistant Announcers, Misses E. Hurrey and D. Sarah. Chief Engineer, M. Folie. Assistant Engineers, J. Russell and L. Vale.

Interstate Representatives: George Hill, Chamber of Commerce Building, Grosvenor Street, Sydney; E. James Clarke, 395 Collins Street, Melbourne; C. Hansen, Albion House, Waymouth Street, Adelaide.

Transmission Times: Weekdays: 7—9 a.m., 12—1.30 p.m., 6—10.30 p.m.; Tuesday and Saturday: 7—9 a.m., 12—1.30 p.m., 6—11 p.m.; Sundays, 9—2 p.m., 6.15—10.30 p.m.

Studio facilities: Two studios, 34 x 16 and 13 x 12. Facilities include 33 1/3 and 78 rev. tables for transcriptions, outside pick-up points and special trunk lines for relays from all points of Commonwealth. Local talent is available for plays, etc.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

3MB, BIRCHIP—201 Metres (1490 Kc.)

MALLEE BROADCASTERS PTY. LTD., Cumming Avenue, Birchip. Location of studios and transmitter: Birchip, Victoria. Licensed and operating power, 100 watts. Licensed 19/6/35. Commenced 26/10/35.

Slogan Name: "The Brighter Country Station."

Technical description of Station: Thermostatic crystal control with "B" class high power modulation. Philips valves used throughout. Crystal microphones, B.T.H. pick-ups, with dual speed motors 33 1/3 and 78 r.p.m.

3SH, SWAN HILL—226 Metres (1330 Kc.)

SWAN HILL BROADCASTING CO. PTY. LTD. (Licensee). Operated by Central Murray Broadcasters Pty. Ltd. Studio and office, Campbell Street, Swan Hill, Victoria. Phone Swan Hill 226. Melbourne M 4731. Telegrams, 3SH. Registered and Head Office, The "Age" Chambers, 239 Collins Street, Melbourne. Location of Transmitter: 749 Campbell Street, Swan Hill. Licensed and operating power, 100 watts. Licensed 19/5/31. Commenced 27/8/31.

Slogan name: "Radio 3SH—The Border Feature Station."

Location of Transmitter: The "Tge" Chambers, 239 Collins Street, Melbourne.

Directors: David F. Syme, Maisie A. Syme, George A. Featonby. Managing Director, David F. Syme. Secretary, June Walls. Manager, Arthur Mathers. Acting Melbourne Manager, L. R. Heath. Announcer and Continuity Writer, Norman Blee. Chief Engineer, C. Mair. City Sales Staff, N. F. Dixon, D. Hardy.

Bankers: Commercial Banking Co. of Sydney. Solicitors, Hedderwick, Fookes and Alston. Auditors, Wilson, Bishop and Henderson.

Interstate Representative: E. H. Brewer, Assembly Hall, Margaret Street, Sydney.

Transmission times: Weekdays, 12—1.30, 6—10.30. Sunday, 6—10.30.

Technical Description of Station: The station itself is situated in Campbell Street, approximately one mile from the post office. The station buildings contain the studio, reception and transmitter rooms. The studio is lined with Celotex and has felt covered floor. A condenser microphone is used for all commercial advertising, together with a Philips carbon type for some studio items. The usual two turntables are situated on announcer's desk with condenser microphone, pickups, faders, etc. The transmitter room contains a transcription turntable, control panel, mixer, high-level amplifier and the transmitter itself. The transmitter uses the TC 1/75 output tube plate modulated by two MCI/50's class AB. Sub-modulators to drive these tubes are 2/2A3's. With a Penthode Crystal oscillator using a precision "Bliley" crystal which has proved very stable as to frequency and output, two buffer stages come between the final Class C amplifier. The input to the final stage is kept at around 150 watts to comply with the P.M.G.'s licence, which limits the station to 100 watts in the aerial. The aerial system is almost of the vertical type. It is 120 feet high and except for four wires hung like an umbrella from the top, each only 30 feet long, all the length is in the down lead. A counterpoise is used for the earth circuit. A remote amplifier, operated from batteries, is used for all outside broadcasts, together with two carbon microphones.

Recording facilities: 3SH have use of 3HA's recording plant.

2HD NEWCASTLE'S Leading RADIO STATION

Serves
*The Richest Market
In N.S.W.
Outside The Metropolis*

ADVERTISE
with **2HD** and
GET RESULTS

Box 123 Newcastle.

SYDNEY: C. A. MONKS, Grace Building,
77 York Street.

MELBOURNE: H. W. ALLISON, 532
Bourke Street, C.1.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

3SR, SHEPPARTON—238 Metres (1260 Kc.)

"THE ARGUS" BROADCASTING SERVICES PTY. LTD.
P.O. Box 193 Shepparton, Victoria. Telephone: Shepparton 505. Telegrams, "3SR" Shepparton. Location of transmitter, Congupna Road, six miles from Shepparton. Power, 2000 watts. Licence was originally granted to 3WR 4/10/30, and operations commenced 5/1/31. The changeover to 3SR and the new power of 2000 watts in aerial, took place 1/2/37.

Slogan Name: "The Argus" Station.

Directors: Staniforth Ricketson, Kingsley A. Henderson, G. Dalziel Kelly, George Fairbairn, J. B. Aitken, Allan Spowers. Secretary, E. J. K. Thompson.

Superintending Manager, N. M. Sheppard. **Manager,** S. J. A. Kemp. **Studio manager,** C. A. Strange. **Chief announcer,** P. Hemery; **second announcer,** G. Bell. **Library and Children's Session,** Margaret Curdie. **Women's Session,** Mrs. Miller ("Mary Ann"). **Chief Engineer,** R. Shortell. **Other engineers,** H. Fuller and J. A. Burrage.

Bankers: Bank of N.S.W. **Solicitors,** Blake and Riggall. **Auditors,** John Stubbs and Son.

Interstate representatives: A. D. Bourke, 5 Barrack Street, Sydney, N.S.W.; V. M. Dinneny, 365 Elizabeth Street, Melbourne.

Daily transmission times: 6—9 a.m., 11—2 p.m., 3—11 p.m. Sunday, 10.30 a.m.—2 p.m., 6 p.m.—10.30 p.m.

3TR, SALE—242 Metres (1240 Kc.)

GIPPSLAND PUBLICITY PTY. LTD. (licensee). Operated by **BROADCAST ENTERTAINMENTS PTY. LTD.** Studio and office, Raymond Street, Sale. Registered and Head Office, "The Age" Chambers, 239 Collins Street, Melbourne. Telephones: Sale 107, Melbourne M4731. Location of transmitter: Myrtlebank, Sale. Licensed and operating power, 1000 watts.

Slogan name: "Gippsland's Station. Associated with 'The Age'."

Directors: David F. Syme, Maisie A. Syme. **Managing Director,** David F. Syme; **Secretary,** June Walls; **Manager,** T. G. Coombs; **Acting Melbourne Manager,** L. R. Heath; **Studio Manager,** Colin Binks; **Announcers,** Donald Moore, Dorothy Wilby; **Chief Engineer,** F. Johnstone; **City Sales Staff,** N. F. Dixon, D. Hardy.

Bankers: National Bank. **Solicitors,** Hedderwick, Fookes and Alston. **Auditors,** Wilson, Bishop and Henderson.

Interstate Representative: E. H. Brewer, Assembly Hall, Margaret Street, Sydney.

Transmission Times: Monday to Friday, 7—9 a.m., 12—4 p.m., 5—10.30 p.m.; Saturday, 7—9 a.m., 12 a.m.—midnight; Sunday, 6—10.30.

Total transmission hours during 1936: 3000.

Technical description of station: The studio and offices are next door to the Post Office, Sale. The studio equipment consists of a six channel electronic mixer, phase inverter stage and push-pull output to P.M.G. line to transmitter. R.C.A. velocity microphone and crystal pick-ups used in main studio. All 33 1-3 r.p.m. transcriptions are played at transmitter control room, which is fully equipped to carry on programmes in event of power failure at Sale. The aerial consists of two quarter-wave vertical aerials spaced half a wavelength apart and fed in phase to give maximum radiation approximately east and west.

Station activities during 1936: On 4/5/37 Broadcast Entertainments Pty. Ltd. took over programmes and advertising from Gippsland Publicity Pty. Ltd. Changes were immediately made in conformity with the new management policy. The children's session was abandoned and the new Koala Children's Club formed. This was an immediate success, with "Cheery" and "Dorothy," and from an original membership of 300 for the old club, the membership has grown to well over 1500 for the 12 months,

On 22/6/36 a "Women's Session" was formed and was conducted by "Jeannette" from 2—4 p.m. daily. The "Women's Club" members number well over 1000. A concert for this club is held in Sale every month, and 200 to 300 members attend, coming from a radius of 70 miles. Other features introduced were market reports (relay). "Age" news service (relay), Melbourne races (relay), metropolitan sporting (relay). A local sporting commentary uses a half hour every Friday night. In February, 1937, a breakfast session was inaugurated from 7—9 a.m. The "Blue Moon 3TR Dance Band" was formed and played from the studio every Friday night for an hour and a half. This band is now sponsored. 3TR operates on 242 metres, 1000 watts, and is on the air 72 hours per week.

Recording facilities: Will have use of 3HA's recording plant.

3UL, WARRAGUL—300 Metres (1000 Kc.)

"THE ARGUS" BROADCASTING SERVICES PTY. LTD.
Studio, office and transmitter, South Road, Warragul, Vic. Phone Warr. 326. Licensed and actual operating power: 200 watts. Licensed 14/4/37, commenced operations 18/5/37.

Slogan Name: "The Argus" Station.

Directors: Staniforth Ricketson, Kingsley A. Henderson, G. Dalziel Kelly, George Fairbairn, J. B. Aitken, Allan Spowers. Secretary, E. J. K. Thompson.

Superintending Manager, N. M. Sheppard; **Manager,** E. J. Lewis. **Chief Announcer,** Denis Cossins. **Other announcers:** J. Riley, Pat Wilson (women and children's sessions). **Engineers:** Murray Clyne (chief) and R. R. McGregor.

Bankers: Bank of N.S.W. **Solicitors:** Blake and Riggall. **Interstate representatives:** A. D. Bourke, 5 Barrack Street, Sydney, N.S.W.; V. M. Dinneny, 365 Elizabeth Street, Melbourne, Victoria.

Daily transmission times: 7—9 a.m., 12 noon—4 p.m., 6—10.45 p.m. Sunday 6 p.m.—10.30 p.m.

3UZ, MELBOURNE—323 Metres (930 Kc.)

NILSEN'S BROADCASTING SERVICE PTY. LTD., 45-7 Bourke Street, Melbourne, Victoria. Phone Central 572 (5 lines), M3529. Studios and transmitter: 45 Bourke Street, Melbourne. Power, 600 watts. Licensed 6/2/25; commenced 8/3/25.

Slogan name: "The Voice of Victoria."

Governing Director: Oliver J. Nilsen. **Directors:** Charles T. Cromie, O. Victor Nilsen, E. L. Cottrell, A. N. Kemsley, J. S. Larkin. **General Manager,** A. N. Kemsley. **Advertising and Sales Manager,** J. S. Larkin; **Programme Director,** Harper Wilson; **Studio Manager,** Walter Pym; **Secretary and Accountant,** E. L. Cottrell; **Chief Engineer,** L. G. Glew. **Other engineers,** W. Virgona, L. Archibald. **Research and Developmental Engineer,** Sydney Riches. **Announcers:** Lewis Myers, Gilbert Charlesworth, Roly Barlee, Ida Coffey, Louise Homfrey, Jack Gurry ("Sport-caster"), Marjorie Morris. **Salesmen,** O. W. Abramowski, G. S. Fawcett, Gordon Christie. **Publicity officer,** Stephani Bini. **Feature and continuity writer,** Frank Allen.

Interstate Representative: A. D. Bourke, 5-7 Barrack Street, Sydney.

Transmission times: Monday to Friday, 6.30 a.m.—11.30 p.m., Saturday 6.30 a.m.—12 noon, 2 p.m. to midnight; Sunday, 10 a.m.—12.30 p.m., 5.45—10 p.m.

Activities during 1936: Outstanding features of the progress of 3UZ, Nilsen's Broadcasting Service, in the past 12 months, has been a re-organisation of staff involving the appointment of some of the best known and most experienced radio men in Australia (such as Walter Pym), to

(Continued on Opposite Page)

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

3UZ, MELBOURNE (Continued)

the studio and programme divisions; also the establishment of personal contact with oversea programme markets for the supply of exclusive material in the form of transcriptions and scripts. Principal among these were the famous Columbia "Workshop" scripts, the new fourth dimensional radio dramas of a type new to Australia. Additions were made to the mechanical facilities in the shape of modern recording equipment. The arrangements for Victoria-wide coverage through linking 3UZ with "The Argus" 2,000 watts station at Shepparton (3SR), and the two other "Argus" stations, strategically located at Warrnambool (3YB) and Warragul (3UL) respectively was followed by the completion of negotiations for the Commonwealth Broadcasting Network.

3XY, MELBOURNE—211 Metres (1420 Kc.)

EFFTEE BROADCASTERS PTY. LTD., Studio and office: Princess Theatre Building, Spring Street, Melbourne, C.I., Vic. G.P.O. Box, 2260 U, Melbourne, C.I. Telephone: Central 6612 (7 lines). Telegrams: "Efftee," Melbourne.

Location of Transmitter: Princess Theatre Buildings, Spring Street, Melbourne. **Operating Power:** 600 watts. Licensed, 17/5/35. Commenced, 8/9/35.

Slogan Name: "The Quality Station."

Directors: O. Thring, V. G. H. Harrison, P. W. Ettelson, and L. Shepherd. **General Manager,** Tom Holt; **Secretary,** V. G. H. Harrison.

Bankers: English, Scottish and Australian Bank Ltd.

3XY, MELBOURNE—(Continued)

Solicitors, Arthur Phillips and Just. **Auditor,** V. G. H. Harrison.

Interstate Representatives: Amalgamated Wireless (A/sia) Ltd. Don Scott, 9 Bligh Street, Sydney.

Daily Transmission Times: 6.30 a.m.—11.30 p.m.

3YB, WARRNAMBOOL—248 Metres (1210 Kc.)

THE ARGUS BROADCASTING SERVICES PTY. LTD., Studio and office: Commonwealth Bank Buildings, Liebig Street, Warrnambool, Victoria. Location of transmitter: Weir Road, Spring Gardens. Telephone: Warrnambool 388. Telegrams: 3YB Warrnambool. Licensed and actual operating power, 100 watts. Licensed, 25/10/35. Commenced, 18/1/36.

Bankers: Bank of N.S.W. **Solicitors,** Blake and Riggall. **Auditors,** R. W. Mack.

Slogan Name: "The Argus" Station.

Directors: Staniforth Ricketson, Kingsley A. Henderson, G. Dalziel Kelly, George Fairbairn, J. B. Aitken, Allan Spowers. Secretary, E. J. K. Thompson.

Superintending Manager, N. M. Sheppard. **Manager,** N. Hallsworth; **Chief Announcer,** J. B. Henderson; **other announcers,** V. Haycroft and W. Martin (part time); **chief engineer,** G. Glover; **assistant engineer,** W. Martin. **Women's Session,** Lyla McGennan. **Sporting,** Jack Frawley.

Interstate Representatives: A. D. Bourke, 5 Barrack Street, Sydney, V. M. Dinneny, 365 Elizabeth Street, Melbourne.

Daily transmission times: 7—9 a.m., 12 noon—4 p.m., 6—10.45 p.m., Sunday, 6 p.m.—10.30 p.m.

3UZ

KEY STATION OF ARGUS NETWORK

3SR Heart of Victoria

3YB Warrnambool

3UL Central Gippsland

*This is the Victorian Section
of the*

**COMMONWEALTH BROADCASTING
NETWORK**

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

Queensland Stations

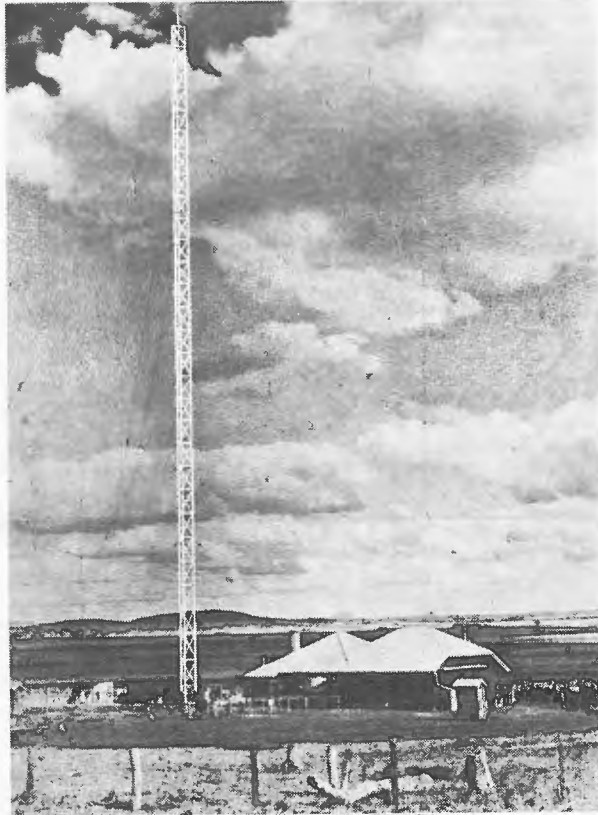
4AK, Oakey—246 Metres (1220 Kc.)

BRISBANE BROADCASTING PTY. LTD., Courier-Mail Building, Brisbane, Q.

Location of Transmitter: Kingside, near Oakey (15 miles from Toowoomba).

Aerial power: 2,000 watts. Licensed 6/2/35. Commenced 31/8/35.

Slogan Name: "The Courier-Mail Station."



A view of 4AK, Oakey. The aerial is of the quarter-wave vertical type and is 210 feet high.

Chairman of Directors: Sir Edward Macartney. General Manager, Alec Robertson; Secretary, H. M. Bayley; Studio Manager, H. Harper; Chief Engineer, A. L. Dixon; Advertising Manager, R. A. Fremlin.

Bankers: English, Scottish and Australian Bank. Solicitors, Thynne and Macartney.

Interstate Representatives: Geo. L. Gibson, 8th Floor, Warwick Building, Hamilton Street, Sydney; R. D. Fisher, Newspaper House, Collins Street, Melbourne.

Transmission Times: 6 a.m.—11 p.m. Monday to Friday; 6 a.m.—midnight, Saturday; 9.30 a.m.—10.30 p.m. Sunday. All programmes are taken on relay from 4BK Brisbane.

4AY, AYR—349 Metres (860 Kc.)

AYR BROADCASTERS PTY. LTD., Ayr, N.Q. Telephone Ayr 219. Telegrams: "FOURAY," Ayr.

Location of transmitter: Airdmillan, N.Q. Operating power, 500 watts input to final stage, 2000. Licensed 4/5/34. Commenced 1/10/34.

Directors: Norman L. Dahl (Managing), J. L. Humphry, R. D. Low. General Manager: Norman L. Dahl, Secretary, V. Bohm. Advertising Manager, C. P. Williams. Chief Engineer, W. Faber. Capital: £25,000.

Representatives: A. D. Bourke, 5-7 Barrack Street, Sydney; R. J. McCartney, 247 Collins Street, Melbourne; Commonwealth Broadcasting Corporation (Qld.) Pty. Ltd., 43 Adelaide Street, Brisbane.

Transmission Times: Monday, Tuesday, Thursday, Friday, 6.30 a.m.—7.30 a.m., 3—5 p.m., 6—10.30 p.m.; Wednesday, 6.30 a.m.—7.30 a.m., 1.30—5 p.m., 6—10.30 p.m.; Saturday, 6.30 a.m.—7.30 a.m., 1.30—5 p.m., 6—10.30 p.m. Sunday, 8 a.m.—2 p.m., 7—10 p.m.

Total transmission hours during 1936: 2,912.

Technical description of transmitter: The transmitter was built by Colville Wireless Equipment Co. Pty. Ltd., under licence to Phillips (Aust.) Ltd. Commencing in 1934 with a power of 50 watts, various increases were made until the present power was reached.

The final stage in the transmitter uses the new Phillips pentode valve, these being suppressor-grid modulated.

4BC, BRISBANE—268 Metres (1120 Kc.)

COMMONWEALTH BROADCASTING CORPORATION (Q'LAND) PTY. LTD., Wintergarden Theatre Buildings, Queen Street, Brisbane. Studio: 43 Adelaide Street, Brisbane. LOCATION OF TRANSMITTER: Oxley. Licensed power, 1000 aerial watts. Licensed 7/6/30. Commenced 16/8/30.

DIRECTORS: Stuart F. Doyle, M. F. Albert, A. F. Albert, C. F. Marden. General Manager, C. F. Marden. Station Manager, Russell F. Roberts. Secretary, E. P. Griffin. Sales Manager, A. K. Forsyth; Chief of Staff, E. Bessemer; Programme Manager, T. McGregor. Announcers: Ruth Rutherford, Jessie McLennan, Thomas McGregor, Eric Bessemer, Keith Howard, Terrence Lambart, John Chance, Ronald Grimstone, Alex. Shiren, Edward Otley, Harry Talbot, Jim Anderson (races), Stan Phillips (general sports), Barney Cook (cricket), Dean Casas (tennis), G. Lambert (markets). Dramatic Department: M. Sorrelle, A. Winn, H. Stallard, Miss Vivienne Taylor, Miss Kath Cook, P. Sorrelle.

SPECIAL SERVICES: Dr. W. G. Goddard (International Affairs); Musical Director and Official Accompanist, E. Otley; Record Department, Miss R. Duncan; Statistical Department, H. Talbot; Continuity Department, E. Littleton and seven assistants; Hospital Charity Activities, Jessie McLennan and Eric Bessemer. Salesmen: R. M. Graham, A. J. Symons. Chief Engineer, G. B. Sutherland. Engineering staff, F. E. Elliott, O. Burmister, S. Smith, A. Searle, G. Ham, C. B. Dunstan, W. Feekings, W. Jack. Bankers: Bank of New South Wales. Solicitors, Macnish, Macrossan and Dowling. Auditors, Griffin and Ralph.

INTERSTATE REPRESENTATIVES: A. D. Bourke, Country Press Chambers, Barrack Street, Sydney, and Station 2UW, Sydney. P. Sullivan, 18 Queen Street, Melbourne, Victoria.

TRANSMISSION TIMES: Monday to Friday, 6.30 a.m.—11 p.m., Saturday 6.30 a.m.—9.30 a.m., 12 noon to 11 p.m.; Sunday, 7 a.m. to 12 noon, 3 p.m.—10.30 p.m.

TOTAL TRANSMISSION HOURS during 1936: 5800.

TECHNICAL DESCRIPTION OF STATION: A.W.A. Standard Equipment, aerial power 1,000 watts. Latest transmission checking and testing apparatus specially imported from overseas. Studio equipment employing all forms of modern microphones with Reis and Crystal Microphones or outside broadcasts. Special Sessions: Sunday, Dr. W. G. Goddard (world affairs), 6.20—6.55 p.m.; Woods' Musical Hour, 7—8 p.m.; Shell Show, 8.15—9 p.m.; Mickey Mouse Club, Monday, Wednesday, Friday, 5.30 p.m.; Inspector Castlemaine 6.30 p.m. nightly; Jim Ander-

(Continued on Opposite Page.)

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)

4BC, BRISBANE (Continued.)

son's Racing Anticipations, Tuesday and Friday 7 p.m.; Queensland Government Official Broadcasts by Cabinet Ministers; Monday, 7 p.m., Old Time Soiree, Saturday 8 p.m., Whitehouse British History Cavalcade; Thursday, 8.15 p.m., Cafe Continental; Tuesday and Friday, 7.15 p.m., Dunlop Presents, 8.30 nightly. Women's Magazine of the Air, Thursday 10.45 a.m. Live artist dramas nightly.

Official broadcasts: All Brisbane Amateur Turf Club Race Meetings at Doomben and Albion Park, also Tattersall's Club at Ascot, Queensland. Country Women's Association, Royal Queensland Aero Club, Brisbane; Rotary Club, Queensland Mothercraft Association, Queensland Dental Association, Queensland Housewives' Association, Round Table Club, Queensland Rugby Union, Queensland Amateur Boxing and Wrestling Union. Special programme services: Complete market research facilities in addition to complete continuity and production services for live artist or recorded presentations.

Recording facilities available at all times.

4BH, BRISBANE—217 Metres (1380 Kc.)

BROADCASTERS (AUSTRALIA) PTY. LTD., Studio 90-92 Queen Street, Brisbane. Secretary's Office: Parbury House, Eagle Street, Brisbane. Telephones: B 3810, B3935. Telegrams: "FOURBH" Brisbane. Power, 1000 watts.

Location of transmitter: Bald Hills, Queensland.

Slogan Name: "Everybody's Station."

Directors: V. F. Mitchell (chairman), Neil O'Sullivan, R. D. Kennedy and E. G. Manson. Secretary, H. Marshall. Bankers: The National Bank of Australasia Ltd. Solicitors: Kennedy, Bowley and Manson, Parbury House, Eagle Street, Brisbane. Auditors, Chas. A. Clarke and Son, Empire Chambers, Wharf Street, Brisbane.

Manager, C. R. Carson. Programme Director, Howard Sleath. Chief Engineer, N. W. Cruickshank.

Announcing staff: Ronald Roberts, Sydney Everett, Peter Le Brun, Russell Callow, Russell Tyson, "Sally," Dulcie Scott. Sales staff: G. Clay, D. Gordon Forsythe, L. Jeffery. Programme department: Miss Sheba Goldman. Technical staff: A. Tonge, C. Moran, B. Harte, R. Sullivan. Clerical staff: Miss M. Dwyer, Miss J. O'Rourke, Miss N. Shepherd, David Joll. Copy Department, Miss V. Stephensen. Publicity, relief announcer, special sessions, etc., Captain B. L. Tankard.

Interstate Representative: A. D. Bourke, 5 Barrack Street, Sydney.

Transmission times: 6.30 a.m.—3 p.m., 5.30 p.m. to 11 p.m. Sundays, 12 noon—3 p.m., 5.30 p.m.—11 p.m.

Total transmission times during 1936: 4,520.

Technical description of station: Crystal-controlled, low-power Heinsing modulation; aerial is a "T" fed in centre. Mast 140 feet. Transmitter designed by Mr. L. Schultze and built by the station's chief engineer, N. W. Cruickshank.

Station activities during 1936: The progressive activities of 4BH during 1936 were epitomised in a number of important "outside" broadcasts, relays, and features of topical and vital interest to listeners. Studio reception broadcasts included Helen Twelvetees, Miss Nee Ta-Long, Aloha Baker, Maude Fane, Margaret Vyner, Mary Maguire and many others. Gladys Moncrieff was featured in exclusive 4BH broadcasts. Anzac Day services and ceremonies were broadcast from various points in the city. In August the great Brisbane Exhibition was covered daily for many hours of the six days. Another important outside broadcast was the coverage of all the week of Brisbane Eisteddfod August 10—15. All R.S.S.I.L.A. activities were also broadcast through 4BH. The 1936 Easter Egg appeal resulted in the receipt of 6000 eggs in three days.

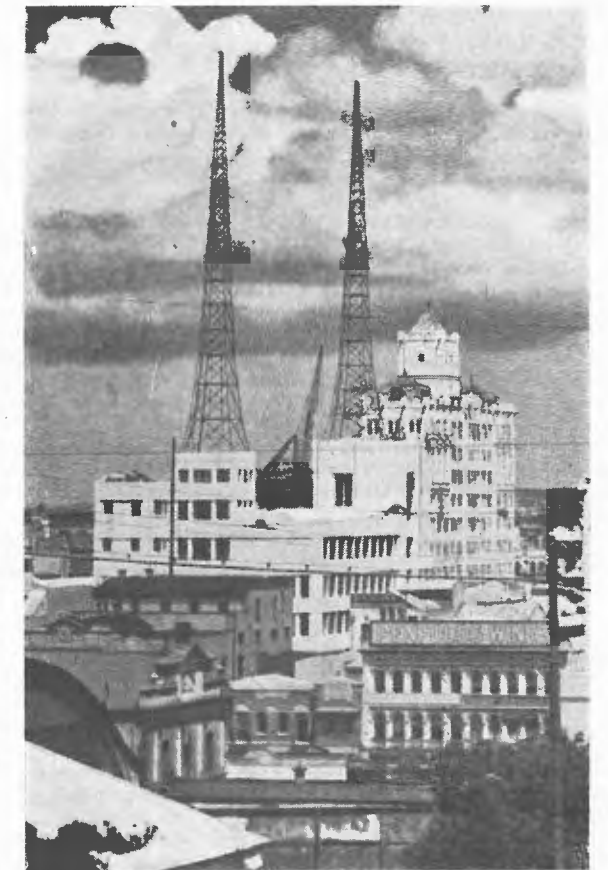
4BK, BRISBANE—233 Metres (1,290 Kc.)

BRISBANE BROADCASTING PTY. LTD., Fourth Floor, Courier-Mail Building, Queen Street, Brisbane, Q. Telephone, B1025. Telegrams: "FOURBK."

Location of Transmitter: Courier-Mail Building. Power (aerial) 500 watts.

Slogan Name: "The Courier-Mail Station."

Chairman of Directors, Sir Edward Macartney; General Manager, Alec Robertson; Secretary, E. M. Bayley; Studio Manager, H. Harper; Chief Engineer, A. L. Dixon; Advertising Manager, R. A. Fremlin.



The new 4BK is situated at the top of the "Courier-Mail" Building in the heart of the city of Brisbane. Its masts reach to a height of 260 ft. above street level and are an outstanding landmark of the city.

Bankers: English, Scottish and Australian Bank. Solicitors, Thynne and Macartney.

Interstate Representatives: Geo. L. Gibson, 8th Floor, Warwick Building, Hamilton Street, Sydney; R. D. Fisher, Newspaper House, Collins Street, Melbourne.

Transmission Times: Monday to Friday, 6 a.m.—11 p.m.; Saturday, 6 a.m.—midnight; Sunday, 9.30 a.m.—10.30 p.m.

Technical Description of Station: The new high fidelity transmitter, control and studio equipment were entirely constructed by Amalgamated Wireless (A/sia) Ltd. The three studios are all carefully built on thorough acoustic principles, and the main studio is capable of comfortably accommodating an audience of 200. The musical library comprises 25,000 titles, and includes the Diamondpoint and N.B.C. Thesaurus services.

In June, 1937, 4BK was transferred from its original location in King House, to the new premises at top of new Courier-Mail Building. The new station is regarded as one of the best equipped in the Commonwealth.

All 4BK programmes are relayed to 4AK, a 2,000 watt station at Oakey, Darling Downs.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)
4BU BUNDABERG—203 Metres (1480 Kc.)

BUNDABERG BROADCASTERS PTY. LTD., Bourbong Street, Bundaberg, Queensland. Location of transmitter, Bourbong Street. Telephone: 505. Telegrams "FOURBU." Power: 100 watts. Licensed 19/6/35. Commenced 16/12/35. Slogan name: "The Voice of the Burnett."

Directors: William James Harvey (Chairman), Richard George Curtis, Andrew John Christensen. General Manager, Harry Humphrey. Secretary, Percival Moller. Bankers: Queensland National Bank Ltd., Bundaberg. Solicitor: Norman S. Harvey, Bundaberg. Auditor, James S. Inglis, Bundaberg.

Engineer, Jas. Jordan. Announcers, W. Diamond, Miss May Mikkelsen. Monitor, H. Bull.

REPRESENTATIVES: G. Gibson, Warwick Building, Hamilton Street, Sydney, and R. J. Macartney, 247 Collins Street, Melbourne.

Transmission Times: 7—8.30, 10.30—1.30, 5.30—10 p.m. Monday to Saturday. Sunday, 9—10.30, 6—10 p.m.

TOTAL TRANSMISSION HOURS during 1936: 2830.

TECHNICAL DESCRIPTION OF STATION: The station is a 4-stage crystal transmitter, built and designed by Colville Wireless Equipment Co., and installed in December, 1936. Crystal oscillator is an E424 valve, crystal A.T. cut, 1st Buffer QB05/15, 2nd Buffer C2/75, and the final amplifier is at TB2/250. Modulated by a pair of MC2/200's in push-pull, sub modulators a pair of 250's in push pull. Studio equipment consists of velocity microphones and crystal pick-ups. Aerial system is a vertical radiator 150 feet high, gives the station a remarkable field strength (approx. 60 millivolts per metre). A cathode-ray oscilloscope is installed at the station for checking purposes. The input power is taken from the town 3 phase power supply and uses 3 phase full wave rectification for plate and filament supply.

4CA CAIRNS—216 Metres (1390 Kc.)

AMALGAMATED WIRELESS (A/SIA) LTD., Studio and Office, 8 Grove Street, Cairns, P.O. Box 414. Location of transmitter: Grove Street, Cairns. Telephone: Cairns 2972. Telegrams: FOURCA. Licensed and operating power: 100 watts unmodulated in the aerial. Commenced May, 1936. Slogan name: "At the Top of Australia."

Manager and Chief Engineer: Frank M. Basden. Assistant Engineer and Programme Manager: Arthur E. Hoad. Women's Session, Mrs. M. Basden. Children's Session, Mrs. M. Webb and Joy Neary.

Interstate Representatives: Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney, and 167 Queen Street, Melbourne. Brisbane representative for A.W.A. Network, Roger Fair, Room 809, C.M.L. Building, 289 Queen Street, Brisbane.

Transmission times: Monday to Friday, 7.30 a.m.—9 a.m., 12 noon—2 p.m., 5.30 p.m. to 10.30 p.m. Saturday: 7.30 a.m.—9 a.m., 5.30 p.m.—10.30 p.m. Sunday: 6.30 p.m.—10 p.m.

TECHNICAL DESCRIPTION OF STATION: The Station is a Class "B" modulated transmitter manufactured by Amalgamated Wireless (A/sia) Ltd., with an input of 100 watts (unmodulated) to the aerial which is an A.W.A. folded type, 100 feet high, and the Studio is situated on the same site as the transmitter. A flexible outside pickup equipment is employed for local broadcasts. Two studios; main 21 x 14½ feet. Talks studio, 10 x 9 feet.

Station activities during 1936: Station opened May 2, 1936. Official opening on May 16. In early stages, working hours were: Noon to 2 p.m., 6 p.m. to 10.30 p.m., week days; 6 p.m. to 10 p.m. on Saturdays. Growth of business was so rapid that within a few months an extra half hour (namely 5.30 to 6) was granted for each week day, also Sunday transmission from 6.30 to 1 p.m. About two months

4CA, CAIRNS—(Continued)

later Early Morning Sessions were commenced from 7.30 to 9 a.m., Sunday excepted. The announcing staff now numbers five.

Recording facilities: Available through A.W.A. Recording Studios, 47 York Street, Sydney.

4IP, IPSWICH—208 Metres (1440 Kc.)

IPSWICH BROADCASTING CO. PTY. LTD., 237 Brisbane Street, Ipswich, Q. Phone, Ipswich 267. Telegrams, "FOURIP." Location of studios and transmitter, 237 Brisbane Street, Ipswich. Power: 100 watts. Licensed 2/9/35. Commenced 2/9/35.

Nominal Capital: £10,000. Bankers: Bank of New South Wales. Solicitors: P. L. Cardew and Simpson. Auditors: H. S. Shapcott, A.F.I.A.

Slogan Name: "In the Heart of Ipswich."

Directors: F. J. Meacham (Chairman), W. J. Johnson, E. B. Johnson and W. Parkinson. Managing Director, F. J. Meacham. Secretary, W. J. Johnson.

Manager: Royston Marcus. Chief Engineer (acting), Keith Fairweather. Programme Directress, Miss Mona Walters, A. Mus. A. Accountant, Phylis Scrivener. Announcers, Bert Brown, W. J. Johnson, W. Nolan, Terry Forsyth, June Saunders (children's sessions). Cadet Engineers: Ronald Smith, Gordon Scriven.

Interstate Representative: E. H. Brewer, Assembly Hall, Margaret Street, Sydney.

Transmission Times: Monday to Friday, 6.30—10 a.m., 12.30—1.30 p.m., 4—10 p.m. Saturday, 6.30—10 a.m., 11 a.m.—12.30 p.m., 6.30—10 p.m. Sunday, 7—10 p.m.

Total transmission hours during 1936: 3,328.

TECHNICAL DESCRIPTION OF STATION: The transmitter was manufactured by Colville Wireless Equipment Co. of Sydney, type KVFH 50/2C, under license and in collaboration with Philips Lamps (Aust.) Ltd., and is of 4 R.F. stages, high level modulated, crystal controlled, and has a carrier output of 50 watts, which is 100% modulated. The oscillator uses a Philips type 443H valve in a pentode circuit, and the two crystals are AT cut, their temperature being controlled to .1 of 1 deg. Fahrenheit. Two separator amplifiers are fitted, the valves being Philips type QC05/15 (screened grids) in each case. The final modulated Philips type TC1/75 arranged as a "C" class amplifier, with a split stator output circuit, and is link coupled to the second separator amplifier. The aerial is an inverted "L" type oscillating against a periodic counterpoise 75 feet below it. The aerial is supported by two wooden masts, one 105 feet high, and the other 65 feet high and mounted on the building. The main speech amplifier consists of a pair of 76's in push-pull, and transformer coupled to the 200 ohm line from the mixing equipment, and resistance-capacity coupled to the sub-modulator. This consists of a pair of type 50 valves in push-pull and drives the modulator (to which it is transformer coupled), a Philips type MC2/200 valve. This valve modulates the final amplifier in its plate circuit by means of a transformer system. A cathode-ray oscilloscope is used as a modulation indicator and is mounted in the modulator panel, which also carries the master gain control from which the transmission is monitored. The equipment is energised from the Ipswich Electric Supply Co.'s mains, 240 volts A.C. Three rectifiers are used, one for bias (250 volts), one for 500 volts, and another for 2,000 volts. The first uses a type 523 valve, the second uses four of this type in a bridge circuit, and the third uses four mercury-vapor rectifiers Philips type DCG2/1000, in another bridge arrangement. Filament supply is from a large 12 volt battery. These circuits are controlled by a switching system, which enforces a certain sequence of operation, and also protects the transmitter against a failure of any of the various power sup

(Continued on Opposite Page.)

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued.)
4IP, IPSWICH (Continued.)

plies. They, in turn, are protected against overloads in the transmitter by overload relays. The equipment is housed on three racks of the relay type, fitted with black bakelite panels. These racks are separated from each other, and from the end walls of the room by expanded metal grills.

The Studio equipment consists of three "Amperite" velocity and one Reisz microphones, and a pair of Piezo-Static crystal pick-ups, two G.E. two-speed grammo-motors, which are fitted to removable inserts in the announcer's desk. Mixing is at present done in the studio, and all the necessary apparatus is mounted on the panel on the desk. At back of this panel, which is contained in a cabinet, are the various primary amplifiers for microphones, pick-ups and line.

Special Programme Services: Broadcasts of events of local interest, and of local musical organisations and artists.

4GR, TOOWOOMBA—300 Metres (1000 Kc.)

GOLD RADIO SERVICE PTY. LTD., Ruthven Street, Toowoomba, Queensland, and 43 Adelaide Street, Brisbane. Location of studios: Ruthven Street, Toowoomba. Location of Transmitter, Drayton, 4 Miles from Toowoomba. Licensed and aerial power, 500 watts. Licensed 5/6/25. Commenced 9/8/25.

Slogan Name: "The Voice of the Downs."

General Manager: E. E. Gold.

Sales Representatives: A. D. Bourke, 5 Barrack Street, Sydney. Peter Sullivan, 18 Queen Street, Melbourne.

4LG, LONGREACH—273 Metres (1100 Kc.)

CENTRAL WESTERN BROADCASTING CO. PTY. LTD., Eagle Street, Longreach.

Location of Transmitter: 3 miles east of G.P.O. Longreach. Telephones: Longreach 224-5 and 102. Licensed power, 500 watts; actual power, 400 watts. Commenced 4/5/36.

Slogan Name: "In the Midst of the Golden Fleece."

Managing Director, R. M. Nicholson; Studio Manager, W. D. Eversen.

Transmission Times: Week day, 7.30—8.30 a.m., 12.30—1.30 p.m., 5.45—10 p.m.; Sunday, 2.30—4.30 p.m.

4MB, MARYBOROUGH—283 Metres (1060 Kc.)

MARYBOROUGH BROADCASTING CO. LTD., Kent Street, Maryborough, Queensland, and 43 Adelaide Street, Brisbane. Studio and Transmitter, Kent Street, Maryborough. Licensed and aerial power, 100 watts. Licensed 28/8/31. Commenced 16/8/32.

General Manager: A. P. Wynne.

Sales representative: A. D. Bourke, 5 Barrack Street, Sydney; Peter Sullivan, 18 Queen Street, Melbourne.

Transmission Hours: Weekdays, 7—10 a.m., 12—2 p.m., 5.30—10 p.m. Sundays, 10.30 a.m.—12 noon, 5.30—10 p.m.

4MK, MACKAY—278 Metres (1080 Kc.)

MACKAY BROADCASTING SERVICE, 64 Nelson Street, Mackay, Queensland. Location of Transmitter: Mackay. Licensed and operating power: 100 watts. Licensed 14/3/30. Commenced 12/1/31.

Interstate Sales Reps.: Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney.

Transmission Hours: 6.30 a.m.—5 p.m., 6—10.30 p.m.

FIRST STATION  IN THE STATE

The Station that guarantees you what you buy

AUDIENCE

Write for Chartered Accountant's Report on exhaustive Telephone Survey, revealing 44.9% listener preference for 5DN.

REGIONAL RELAY STATION—5RM

4PM, PORT MORESBY—221 Metres (1360 Kc.)

AMALGAMATED WIRELESS (A/sia) Ltd., 47 York Street, Sydney. Studio and Transmitter, Musgrave Street, Port Moresby, Papua.

Licensed and operating power: 100 watts. Licensed 6/12/35. Commenced 25/10/35.

Sales Representatives: Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney, and 167/9 Queen Street, Melbourne; Room 809 Colonial Mutual Life Building, Queen Street, Brisbane.

TECHNICAL DESCRIPTION OF STATION: A.W.A. standard transmitter and A.W.A. studio equipment.

Transmission Hours: Mondays to Saturdays, 1—2 p.m., 6—8 p.m.

4RO, ROCKHAMPTON—226 Metres (1330 Kc.)

ROCKHAMPTON BROADCASTING CO. PTY. LTD., Cur. East and William Street, Rockhampton, Q. P.O. Box 80. Telephone, Rockhampton 9. Telegrams: "FOURRO." Location of transmitter: East Street, Rockhampton. Licensed and aerial power: 50 watts. Licensed, 8/10/31. Commenced, 2/2/32.

Slogan Name: "4RO Rockhampton, the Commonwealth Broadcasting Network."

General Manager, E. J. Rheuben; Chief Announcer, G. Keir; Assistant Announcers, C. Beck and N. Alley; Lady Announcer, Miss M. Meldon; Clerks, Misses R. Berry, M. Robson, G. Moran; Engineers, W. Beaney and E. Semfel.

Interstate Representatives: All Commonwealth Broadcasting Network Stations.

Daily Transmission Hours: 6.30—10.30 a.m., 5.30—10.30 p.m.; Sundays, 7—10 p.m.

Activities during 1936: During the last 12 months the broadcasting hours have been increased by additional 12 hours per week.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued)

4SB, KINGAROY—283 Metres (1060 Kc.)

SOUTH BURNETT BROADCASTING CO. LTD., Kingaroy. Licensed power, 2000 watts. Licensed 27/10/36. Not in operation as at August 1, 1937.

4TO, TOWNSVILLE—258.6 Metres (1160 Kc.)

AMALGAMATED WIRELESS (A/SIA) LTD., Studio and Transmitter, Bell Street, South Townsville, Q. Telephone: 349. Telegrams: "FOURTO," Townsville. Licensed and operating power: 200 watts in aerial. Licensed, 30/9/30. Commenced, 5/10/31.

Manager and Chief Engineer, H. E. Cox. Programme Arranger and Announcer, Angus Campbell. Advertising and Announcing, Frank Badger. Accounts and Assistant Announcer, Miss Jean Gray. 4TO Family Players (usually between 8 and 10 performers every week).

Interstate Representatives: Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney, N.S.W., and 167 Queen Street, Melbourne, Vic. Brisbane Representative for A.W.A. Network, Roger Fair, Room 809, C.M.L. Building, 289 Queen Street, Brisbane, Q.

Transmission times: Monday to Friday, 7.30 a.m.—8.30 a.m., 12 noon—3.30 p.m., 6 p.m.—10.15 p.m. Saturday, 7.30 a.m.—8.30 a.m., 12 noon—4.30 p.m., 6—10.15 p.m. Sunday, 7.30 p.m.—9.30 p.m.

Total transmission hours during 1936: 2,705 (approx.)

Description of Equipment: The transmitter was designed and constructed at the A.W.A. Radio-Electric Works at Ashfield, Sydney. It consists of two units, one being the transmitter proper, capable of delivering 50 watts modulated energy to the aerial, this unit being connected to a linear amplifier which ultimately delivers power of 200 watts to the aerial, power being transferred to the aerial by means of letcher feeds to the aerial, situated approximately 100 yards from the building proper. The aerial is of the multiple wire sausage type, supported by a steel tubular mast 250 feet high. The main studio is a very fine room, approximately 20 x 24 feet.

Station activities during 1936: 1936 proved a very busy year for 4TO Townsville. During that period business gradually increased, and the high prestige of the station was fully maintained. During this gradual growth it was quite natural that the staff should also be increased. The hours on the air have also been increased, until now 4TO is on the air 56 hours every week.

Recording facilities: Available through A.W.A. Recording Studios, 47 York Street, Sydney.

4VL CHARLEVILLE—209.8 Metres (1430 Kc.)

CHARLEVILLE BROADCASTING SERVICE PTY. LTD., Alfred Street, Charleville, Q.

Location of Transmitter: Alfred Street, Charleville. Telephone: Charleville 221. Telegrams: 4VL. Licensed and operating power: 50 watts. Licensed, 6/1/36. Commenced, 12/2/36.

Slogan Name: "The Voice of Western Queensland."

Directors: A. G. B. Mars, J. Falknemer. Manager, E. White. Assistant Announcer, R. Akers. Bankers: Commonwealth Bank of Australia.

Interstate Representatives: W. H. Clarke, Box 1275J, Sydney, N.S.W.; R. J. McCartney, Newspaper House, 247 Collins Street, Melbourne, Vic.

Transmission Times: 7.30—9 a.m., 12—2 p.m.; 5.30—9.30 p.m.

Total transmission hours during 1936: 2,500 approx.

Technical Description of Station: Transmitter three-stage C.Cs. high level modulation—town power supply 480 D.C. to generator 240 A.C. $1\frac{1}{2}$ K.W.

4WK, WARWICK—224 Metres (1340 Kc.)

THE WARWICK BROADCASTING CO. PTY. LTD., Studio, Offices and Transmitter, Albion Street, Warwick. Licensed power, 100 watts. Licensed, 1/3/35. Commenced 6/5/35.

Slogan Name: "The Listeners' Companion."

Telephone: 8 Warwick. Telegrams: "FOURWK."

Station Manager, A. E. Lawrence. Technician, Announcer and Programme Director, H. Peaston.

Interstate Representatives: Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney, and 167 Queen Street, Melbourne. Brisbane Rep. for A.W.A. Network, Roger Fair, Room 809, C.M.L. Building, 289 Queen Street, Brisbane.

Transmission times: Monday to Saturday, 12.30 p.m.—1.30 p.m., 5.30 p.m.—10.30 p.m. Sunday, 7.30 p.m.—10.30 p.m.

Total transmission hours during 1936: 2,080.

Technical Description of Equipment: The transmitter was manufactured by Amalgamated Wireless (A/sia) Ltd. and has a power of 50 watts unmodulated in the aerial. The system of modulation is series, and the transmitter is capable of 100% modulation. The whole equipment has a linear characteristic of up to approximately 90%. The aerial consists of a folded-top suspended by two 90 foot steel masts.

Station activities during 1936: Station 4WK was established in May, 1935, and during 1936 has made substantial progress. National advertising has more than doubled in 1936, and December, 1936, was the peak revenue for the Station. The service has improved, and the standard of the programmes has been considerably improved.

Recording facilities: Available through A.W.A. Recording Studios, 47 York Street, Sydney.

4ZR, ROMA—207 Metres (1450 Kc.)

MARANO BROADCASTING CO. LTD., Roma, West Queensland. Licensed power 100 watts. Commenced operations 23/7/37.

Manager: E. Gold, Gold Radio Service Pty. Ltd., Toowoomba.

Sales Representatives: 4BC, Brisbane; A. D. Bourke, 5 Barrack Street, Sydney; P. Sullivan, 18 Queen Street, Melbourne.

Transmission Times: Week-days, 6.30—8.30 a.m., 12 noon—2 p.m., 6—10 p.m.

South Australian Stations

5AD, ADELAIDE—229 Metres (1310 Kc.)

ADVERTISER NEWSPAPERS LTD., Waymouth Street, Adelaide. Location of Studios: "The Advertiser" Building, Waymouth Street, Adelaide. Location of transmitter: Adelaide. Licensed power: 500 watts in aerial. Licensed, 2/6/30. Commenced, 2/8/30.

Slogan Name: "The Advertiser" Broadcasting Network. Number of Studios: Three.

General Manager: A. L. Holtze. Sales Manager: Maurice Chapman. Programme Manager: Miss E. Benson.

Chief Announcer: Jack Burgess. Other announcers: C. Norton, J. Young, J. Cameron, Misses D. Edwards, L. England, and Roberta Russell. Other staff executives: Production, J. Cameron; Continuities, V. A. Jacques; Contracts, Miss D. Edwards; Chief Engineer, D. Gooding; Maintenance Engineer, H. B. Wilson, assisted by seven other engineers.

Sales Representatives: Fred Thompson, Warwick Building, 15 Hamilton Street, Sydney; G. N. Bednall, Newspaper House, Collins Street, Melbourne; A. J. Chard, 92 Fleet Street, London; Joshua B. Powers, Inc., 220 East 42nd Street, New York.

Transmission Times: 6 a.m.—2 p.m., 3 p.m.—11 p.m. Monday to Saturday. Sunday, 5.30—10 p.m.

This Station owns and relays to 5PI, 5MU and 5SE.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued)

5DN, ADELAIDE—313 Metres (960 Kc.)

(RELAYS TO 5RM MURRAY HEIGHTS.)

HUME BROADCASTERS LTD., 12th Floor, C.M.L. Building, King William Street, Adelaide, S.A. Registered office, 29 Rundle Street, Adelaide. C8006/7. Telegrams, "Firstation." Location of studio and transmitter, 12th Floor, C.M.L. Building, King William Street. Licensed and operating power: 500 watts. Licensed 1/12/24. Commenced 24/2/25.

SLOGAN NAME: "First Station in the State."

DIRECTORS: Wm. Queale, H. R. Pinkerton, G. W. Marsh, B. Roberts, M. Syme. General Manager, Gordon W. Marsh. Secretary, A. J. Carvosso.

Bankers: Bank of N.S.W. Solicitors, Bruce Roberts, Lensworth Buildings, Flinders Street, Adelaide. Auditors, Counsell, Booth and Hunwick, Chartered Accountants (Australia), 35 Grenfell Street, Adelaide.

Assistant Manager, Randal M. White. Studio Director, Kenneth Crossman. Chief Engineer, E. J. Hume. Production Department, Miss D. S. Balk. Transcription Department, F. F. Wells. Chief of Staff, Miss M. L. Watt. Announcers, H. F. Woolley, C. A. Freeman, D. Nicholson, Mrs. E. Pullman, R. Sullivan, Miss M. Stephens. Engineering Staff, F. T. Hill, C. R. Howie, A. F. Fisher. Production Department, D. A. Stevens, K. H. Wilson, Miss C. A. Harrison. Record Library, Miss L. Stevens.

SALES REPRESENTATIVES: E. H. Brewer, Room 112, Assembly Hall, Margaret Street, Sydney, N.S.W. (B 3403. Private X 6245. Telegrams: "Brewerads," Sydney). L. G. Mather, 422 Collins Street, Melbourne. (Telephone F 4878. Telegrams: "Mather," Melbourne).

TRANSMISSION TIMES: Monday to Friday, 7 a.m.—11.15 p.m.; Saturday, 7 a.m.—1 p.m., 6 p.m.—midnight; Sunday, 6 p.m.—10.15 p.m.

TOTAL TRANSMISSION hours during 1936: 5,244.

TECHNICAL DESCRIPTION OF STATION: 960 kc. 500 watts (ant.) Permissible peak modulation 100 per cent. Total harmonic content at 95 per cent. modulation 3 per cent. Overall frequency characteristic plus or minus 2.5 d.b. 30-10,000 c.p.s. CONTROL ROOM: All amplifiers are at the control room, where mixing is done. Seventeen channels can be mixed if required without switching or three entirely separate normal programmes can be conveniently handled simultaneously. All input and output terminals can be picked up on a patching board to facilitate the arrangement of any abnormal set-up or to bring spare equipment into use. STUDIOS: There are four studios equipped with W.E. Dynamic and velocity microphones, and R.C.A. transcription pick-ups.

TRANSCRIPTION equipment is provided for both 33 1/3 and 78 r.p.m. lateral-cut records, and Western Electric Wide Range equipment has been installed for Hill-and-Dale (vertical cut) recordings.

STATION ACTIVITIES DURING 1936: On March 17, 1936, new studios, offices, transmission, etc., were occupied, thus providing absolutely new and up-to-date transmission plant, equipment, etc. Occupying the complete 12th floor of the C.M.L. Building, the lay-out of studios, transmission, library and offices is ideal. Installation of Wide Range equipment, and "World" Wide Range library in September, 1936, brought this third dimension sound exclusively to 5DN's audience. Throughout the whole year, 5DN consistently broadcast a great number of feature programmes, the weekly average of sponsored sessions during evening sessions for the latter part of the year being more than seventy. Recording facilities are to be installed.

5KA, ADELAIDE—200 Metres (1200 Kc.)

SPORT RADIO BROADCASTING CO. LTD., Studio and Offices, Richards Buildings, 99 Currie Street, Adelaide, S.A. Location of Transmitter, 99 Currie Street, Adelaide. Telephone: Central 2720-1 (2 lines). Telegrams: "FIVEKA." Operating power, 500 watts output. Licensed, 14/9/35. Commenced, 7/9/35.

Slogan Name: "The Voice of South Australia."

Bankers: Commercial Bank of Australia Ltd. Solicitors: Alderman Reid and Brazel. Solicitor Lionel C. Crosby.

General Manager: R. Lincoln. Assistant Manager, W. K. Schneider. Sales Manager, M. O'Halloran. Chief Engineer, C. A. Tareha. Lady Announcer, "Cousin Dora." Chief Announcers, Arthur Thorn and Andrew Auchterlonie. Community Leader, Andrew Auchterlonie. F. J. Thwaites, Producer of Studio plays and dramatisation of his books over air.

Interstate Representatives: H. W. Allison, Room 205, Shell House, 532 Bourke Street, Melbourne, Vic.; Cuthbert Monks, Grace Building, 77 York Street, Sydney.

Transmission times: Weekdays, 5.30 a.m.—11 p.m. Saturday, 5.30 a.m.—midnight. Sunday, 8 a.m.—12.30 p.m., 1.30 p.m.—11 p.m.

5MU, MURRAY BRIDGE—207 Metres (1450 Kc.)

ADVERTISER NEWSPAPER LTD., Waymouth Street, Adelaide. Location of Studio: "The Advertiser" Building, Waymouth Street, Adelaide. Location of Transmitter: Murray Bridge. Licensed Power: 100 watts. Licensed, 19/4/34. Commenced, 16/9/34.

For general particulars of this station, refer to 5AD, which controls 5MU, 5PI and 5SE, under the title of "The Advertiser" Broadcasting Network.

5PI, CRYSTAL BROOK—288 Metres (1040 Kc.)

ADVERTISER NEWSPAPER LTD., Waymouth Street, Adelaide. Location of Studio: "The Advertiser" Building, Waymouth Street, Adelaide. Location of Transmitter: Near Crystal Brook. Licensed Power: 2000 watts. Licensed, 24/11/31. Commenced, 7/1/32.

For general particulars of this station, refer to 5AD, which controls 5MU, 5PI and 5SE, under the title of "The Advertiser" Broadcasting Network.

5RM MURRAY HEIGHTS—353 Metres (850 Kc.)

RIVER MURRAY BROADCASTERS LTD., 29 Rundle Street, Adelaide, S.A. Location of studios and transmitter, Renmark. Licensed power, 1000 watts. Licensed 5/2/35. Commenced 30/9/35.

Slogan Name: "5RM, Murray Heights."

5SE, MOUNT GAMBIER—224 Metres (1340 Kc.)

ADVERTISER NEWSPAPER LTD., Waymouth Street, Adelaide. Location of Studios and Transmitter: Mount Gambier. Licensed Power, 200 watts. Licensed, December 31, 1936. Commenced, July 3, 1937.

For general particulars of this station, refer to 5AD, which controls 5MU, 5PI and 5SE, under the title of "The Advertiser" Broadcasting Network.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued)

Western Australian Stations

6AM, NORTHAM—306 Metres (980 Kc.)

6AM BROADCASTERS LIMITED, St. Georges House, St. George's Terrace, Perth. Telephones: B8484, B4921. Telegrams: "SIXAM," Perth.

Location of Transmitter: Reservoir Hill, 4 miles west of Northam. Power, 2000 watts. Licensed, 13/12/33. Commenced, 1/6/34.

Slogan Name: "The Happy Station."

Directors: Archer Whitford, Frank Whitford, Irene Whitford, Alice Whitford. General Manager, F. R. Whitford; Secretary, D. White; Assistant Secretary, N. Thomas; Sales Manager, J. Tozer; Programme Manager, H. R. Wells; Chief Announcer, Moray J. Powell; Early Morning Announcer, R. McGregor; Day Announcer, C. Hearn; Lady Announcer, M. Ruck. Other Announcers, Juan Cortez, G. Carter, S. Clementson, A. Higgins (Sporting), Mrs. W. S. Halliday. Sales Staff: W. F. Fuhrmann, J. Patton. Technical Staff: F. Tredrea (Chief Engineer), A. Read, R. Henwood, W. Phipps, R. Choate.

Bankers: Commonwealth Bank. Solicitors, Stone James and Co. Auditors, Paton and Morris.

Interstate Representatives: Hugh Anderson, Poster House, Exhibition Street, Melbourne, Vic.; W. H. Thompson, A.C.A. Building, King Street, Sydney, N.S.W.

Transmission Times: 6.30—8.30 a.m., 12 noon—2 p.m., 5.30 p.m.—10.30 p.m. (week days); 10 a.m.—1 p.m., 5.30 p.m.—10 p.m. (Sundays).

Technical Description of Station: Crystal oscillator, 2 screen grid buffer stages, modulated amplifier and water cooled linear stage. Programme received from studio over 79 miles of land-line, equalised and amplified by two stages before reaching the modulator. The power is generated at the station by a 20 K.V.A. three phase 50 cycle alternator direct coupled to a 34H.P. Diesel engine running at 1000 r.p.m. Several rectifier and filter units are employed, the highest D.C. voltage being 10,000.

Activities during 1936: 1936 was a year of continual expansion, with the figures up to 33% over 1935. September, 1936, the power of the station was increased from 1000 watts to 2000 watts.

6GE, GERALDTON—219 Metres (1370 Kc.)

GREAT NORTHERN BROADCASTERS LTD., Geraldton, W.A. Licensed power 500 watts. Licensed 15/4/36. Station constructed by Amalgamated Wireless (A/sia) Ltd. Not in operation as at August 1, 1937.

6IX PERTH—242 Metres (1240 Kc.)

W.A. BROADCASTERS LIMITED, Lyric House, Murray Street, Perth, W.A. Postal address: Box M 1079 G.P.O. Location of transmitter: Perth. Telephones: B9321 (3 lines). Telegrams: "SIXIX," Perth. Licensed and operating power: 500 watts. Licensed, 26/7/32. Commenced, 27/11/33.

Directors: H. B. Jackson, K.C. (Chairman), M. D'O. Musgrove, C. P. Smith, H. Greig, F. C. Kingston; General Manager, B. Samuel; Secretary, E. H. Rosman; Advertising Manager, Edison C. Churchward; Sales Staff, E. L. Gower, K. P. Hayward, C. H. Giraud; Announcers, F. Atkinson, B. Carter, Misses J. Robertson, P. Hannah; Programme Director, B. F. Saunders; Chief Engineer, H. T. Simmons; other engineers, N. A. Parker, G. Butterfield, C. Robson, J. Canavon.

Bankers: E. S. and A. Bank. Solicitors, Jackson, Leake, Stawell. Auditors, Flack and Flack.

Interstate Representatives: B. Rieusset, Newspaper House, 247 Collins Street, Melbourne, Vic.; R. Butcher, Warwick Building, Hamilton Street, Sydney, N.S.W.

6IX PERTH (Continued.)

Transmission Times: Sunday, 1.30—5 p.m., 6—10.30 p.m.; Monday to Friday, 7.50—8.30 a.m., 9—11 a.m., 2—3 p.m., 6—11 p.m.; Saturday, 7—8.30 a.m.; 9—11 a.m., 3—5 p.m., 6—11 p.m.

Total transmission hours during 1936: 3635.

6KG, KALGOORLIE—248 Metres (1210 Kc.)

GOLDFIELDS BROADCASTERS (1933) LTD., 209 Hanan Street, Kalgoorlie, W.A. Location of studios: Kalgoorlie. Location of Transmitter: Parkston, two miles N.E. of Post Office. Licensed and aerial power: 500 watts. Licensed 22/6/31. Commenced 16/9/31.

Interstate Sales Representatives: A.W.A., 47 York Street, Sydney.

6ML PERTH—265 Metres (1130 Kc.)

W.A. BROADCASTERS LTD., Lyric House, Murray Street, Perth, W.A. Postal Address: Box N 1079 G.P.O.

Location of studio and transmitter: Lyric House, Murray Street, Perth. Telephones: B9321 (3 lines). Telegrams: "SIXML," Perth. Licensed and operating power, 500 watts. Licensed, 2/12/29. Commenced, 19/2/30.

Directors: H. B. Jackson, K.C. (Chairman), M. D'O. Musgrove, C. P. Smith, H. Greig, F. C. Kingston. General Manager, B. Samuel; Secretary, E. H. Rosman; Advertising Manager, Edison C. Churchward; Sales Staff, E. L. Gower, K. P. Hayward, C. H. Giraud; Announcers, A. S. Dye, N. Taylor, J. Allen, Misses L. Berryman, P. Hannah; Programme Director, B. F. Saunders; Chief Engineer, H. T. Simmons; other engineers, M. Urquhart, J. Tapper.

(Continued on Opposite Page.)

YOU
WILL HAVE NOTICED!
THAT
COMPLETE
VICTORIAN
CAMPAIGNS
ALWAYS
INCLUDE
3HA
WESTERN VICTORIA

3TR

GIPPSLAND

3SH

SWAN HILL

239 COLLINS STREET, MELBOURNE, M 4731.
Sydney Representative: E. H. BREWER, B 3403.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued)

6ML, PERTH—(Continued)

Bankers: E. S. and A. Bank. Solicitors, Jackson, Leake, Stawell. Auditors, Flack and Flack.

Interstate Representatives: B. Rieusset, Newspaper House, 247 Collins Street, Melbourne, Vic.; R. Butcher, Warwick Building, Hamilton Street, Sydney, N.S.W.

Transmission Times: Sundays, 7—10 p.m.; Monday to Friday, 7—9 a.m., 11 a.m.—12.30 p.m., 5.30—10.30 p.m.; Saturday, 7—9 a.m., 11 a.m.—12.30 p.m., 6—10.30 p.m.

Total transmission hours during 1936: 2882.

6NA, NARROGIN—259 Metres (1160 Kc.)

THE GREAT SOUTHERN BROADCASTERS LTD., Narrogin, W.A. Licensed power, 500 watts. Station not in operation as at August 1, 1937.

6PM PERTH—216 Metres (1390 Kc.)

6PM BROADCASTERS LIMITED, St. George's House, St. George's Terrace, Perth, W.A. Post Office Box D187. Telephones: B4921 and B8484.

Location of Transmitter: 1½ miles from Fremantle. Power, 100 watts. Commenced, 22/4/37.

Slogan Name: "The Cheerful Station."

Directors: Archer Whitford, Frank Whitford, Irene Whitford, Alice Whitford. General Manager, F. R. Whitford; Secretary, D. White; Chief Announcer, Juan Cortez; Morning Announcer, G. Carter; Lady Announcer, Mrs. Halliday; Day Announcer, C. Hearn. Assistant Secretary, N. Thomas; Sales Manager, J. H. Tozer; Programme Manager, H. R. Wells. Other staff as for Station 6AM.

Bankers: Commonwealth Bank. Solicitors, Stone James and Co. Auditors, Paton and Morris.

Interstate Representatives: Hugh Anderson, Poster House, Exhibition Street, Melbourne, Vic.; W. H. Thompson, A.C.A. Building, King Street, Sydney, N.S.W.

Transmission Times: 6—8.30 a.m., 11 a.m.—3 p.m., 5.30 p.m.—10.30 p.m. (week days), 9 a.m.—12 noon, 5.30 p.m.—10 p.m. (Sundays).

Technical Description of Station: Crystal oscillator, two pentode buffer stages, modulated amplifier, and 600 ohm transmission line. Programme received from studio over 15 miles of underground cable and amplified by three stages before reaching the push pull, class AB modulators. The power is supplied by the local authorities at 250 volts 40 cycles and fed to several rectified-filter units, the highest D.C. voltage being 2000.

6PR, PERTH—341 Metres (880 Kc.)

NICHOLSON'S LTD., 86/90 Barrack Street, Perth, W.A. Location of studio: Barrack Street, Perth. Location of Transmitter: Applecross Radio Centre, near Fremantle.

Licensed power, 500 watts. Licensed 14/8/31. Commenced 14/10/31.

Number of Studios: Two, 33 x 18ft., and 80 x 50 ft.

6WB KATANNING—280 Metres (1070 Kc.)

W.A. BROADCASTERS LTD., Lyric House, Murray Street, Perth, W.A. Postal address: Box N 1079 G.P.O., Perth. Telephones: B9321 (3 lines). Telegrams: "SIXWB," Perth.

Location of Transmitter: Katanning, W.A. Licensed power: 2000 watts. Commenced 26/9/36.

Directors: H. B. Jackson, K.C. (Chairman), M. D'O. Musgrove, C. P. Smith, H. Greig, F. C. Kingston; General Manager, B. Samuel; Secretary, E. H. Rosman; Advertising Manager, Edison C. Churchward; Sales Staff, E. L. Gower, K. P. Hayward, C. H. Giraud; Announcers, R. Gledhill, L. Lewis; Programme Director, B. F. Saunders; Chief Engineer, H. T. Simmons; other engineers, N. C. Greer, C. Sirl, D. Wood, A. Spooner.

Bankers: E. S. and A. Bank. Solicitors, Jackson, Leake, Stawell. Auditors, Flack and Flack.

Interstate Representatives: B. Rieusset, Newspaper House, 247 Collins Street, Melbourne, Vic.; R. Butcher, Warwick Building, Hamilton Street, Sydney, N.S.W.

Transmission Times: Sunday, 11 a.m.—1.30 p.m., 3—5 p.m., 6—10.30 p.m.; Monday to Friday, 6.30—8.30 a.m., 12 noon to 2 p.m., 6—11 p.m.; Saturday, 6.30—8.30 a.m., 12 noon to 2 p.m., 3—5 p.m., 6—11 p.m.

Total transmission hours during 1936: 876½ (from 26/9/36—31/12/36).

Tasmanian Stations

7BU BURNIE—450 Metres (660 Kc.)

THE BURNIE BROADCASTING SERVICE PTY. LTD., P.O. Box 101, Burnie, Tas. Telephone: 125/268. Location of Transmitter: Burnie. Power: 100 watts. Licensed, 6/2/35. Commenced, 19/10/35.

Slogan Name: "The Station with a Smile."

Directors: A. P. Findlay, P. A. Findlay. General Manager, Arthur D. Towner; Secretary, P. A. Frith. Studio Manager-Announcer, Cliff Parish; Announcer, Trevor Brain; Engineer, Tasman Lord; Engineer and Announcer, James Trethewie; Continuity, Max Green; Coastal Representative, Keith Harris; Accountant, Miss Eileen Elliott; Announcer and Stenographer, Miss Betty Raymond (Aunt Betty); Announcer, entertainer, Miss Vera Keltie (Auntie Kitty).

Bankers: Bank of Australasia.

Interstate Representatives: Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney, and 167 Queen Street, Melbourne; Mr. E. H. Brewer, Assembly Hall, 44 Margaret Street, Sydney.

Transmission Times: Monday to Friday (inclusive): 7—9 a.m., 11—2 p.m., 5—11 p.m.; Saturday, 7—9 a.m., 1—11 p.m.; Sunday, 5—11 p.m.

Activities during 1936: 7BU has steadily grown in strength and importance. It is recognised as the farmers' station, and is up-to-the-minute with news, and advice to farmers regarding markets, etc. The "Sunpolishers' Club" (Children's Session) now has 4000 members; 7BU has its own choir of 38 members.

7HO HOBART—349 Metres (860 Kc.)

COMMERCIAL BROADCASTERS PTY. LTD., Studio and Office: 80/2 Elizabeth Street, Hobart, Tas. Transmitter at present located at same address. Possibility of removal shortly. Telephone: 6008 Hobart. Telegrams: "Sevenho." LICENSED AND ACTUAL operating power: 100 watts. LICENSED, 10/4/30. Commenced, 13/8/30.

Directors: Selwyn H. Findlay, Len Nettlefold, G. R. Robertson. General Manager, Selwyn H. Findlay. Secretary, Rupert S. Paton. Bankers: E. S. & A. Bank. Solicitors: Page, Hodgman, Seager and Doyle. Auditors: Wise, Lord and Ferguson.

Studio Manager and Chief Announcer, Jack Broadbent. Advertising Manager, J. L. Rycroft.

Other staff: Announcer and Dog Racing Commentator, Brian Hodgman; Announcer, John Armstrong; Chief Engineer, William Nicholas; Assistant Engineers, John Dodds and John Butler; Horse Racing Commentator, Jul Jones; Women's Session Announcer, Molly Findlay; Assistant Announcer, Molly Broadbent; Advertising Assistant, G. L. Rycroft.

(Continued Overleaf.)

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS—(Continued)

7HO, HOBART (Continued)

INTERSTATE REPRESENTATIVES: F. Rieusset, Newspaper House, Collins Street, Melbourne, Vic.; Amalgamated Wireless (A/sia) Ltd., 167 Queen Street, Melbourne; E. H. Brewer, 44 Margaret Street, Sydney; Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney; M. R. Barnes, Lisgar House, Carrington Street, Sydney, N.S.W.

TRANSMISSION TIMES: Monday to Friday, 8 to 9 a.m., 11 a.m. to 2 p.m., 3 p.m. to 11 p.m. Saturday, 8—9 a.m., 11 a.m. to 11 p.m. Sunday, 7—10.30 p.m.

TOTAL TRANSMISSION hours during 1936: 3,953.



Main Studio—7HO, Hobart, Tasmania.

TECHNICAL DESCRIPTION OF STATION: The present transmitter is capable of 150 watts carrier output, of modern design, using crystal control and low-power modulation. Transmitter has a modulation capability of 100%, and the overall response is within plus or minus 2 decibels from 50 to 8,000 cycles. The entire equipment has recently been rebuilt by the station's Chief Engineer, W. R. Nicholas, Assoc. M. Inst. R.E. (Aust.), and Assistant Engineer, M. J. Dodds.

STATION ACTIVITIES DURING 1936: The year 1936 saw a marked change in the order of broadcasting at 7HO. Sponsored sessions with their short, but effective sales talks showed the way to advertisers. Notable successes were B.A.L.M., "The Hunchback of Noetre Dame," and "William the Conqueror." Vacuum Oil Co.—"Ports of Call"—Shoe Mart All Comedy Session. Selby Arch Pre-server Sessions sponsored by New O'Connors. The long wordy announcements faded out, and were replaced by short selected messages which brightened up the programmes, and produced better results in all directions. 1936 also saw enthusiastic support for the children's concerts, held in the Strand Theatre. Plans for the new high power transmitter, new studios, and offices were drawn up, and are now taking effect. The enormous amount of correspondence and "fan" letters from listeners proved that 7HO gained tremendously in popularity with the radio public of Southern Tasmania.

7HO was the first commercial station established in Tasmania. Has a selection of 60,000 of the world's best recordings, stocked by Findlays Pty. Ltd., Music Warehouse, Tasmania's daily newspaper—"The Mercury"—is linked up with the Station, and supplies the "News Service." 7HO is the senior station in the chain of Tasmanian Broadcasting Stations, linking 7LA Launceston, 7BU Burnie, and 7QT Queenstown into a complete network covering the whole of the State.

7HT, HOBART—278 Metres (1080 Kc.)
METROPOLITAN BROADCASTERS PTY. LTD., 44 Elizabeth Street, Hobart, Tas. Licensed power, 300 watts. Interstate Representative: A. L. Finn, 66 King Street, Sydney.

7LA LAUNCESTON—273 Metres (1100 Kc.)
FINDLAY & WILLS BROADCASTERS PTY. LTD., 67 Brisbane Street, Launceston, Tas.

Location of Transmitter: Prospect Hill, 2½ miles south of Launceston Post Office. Licensed power: 300 watts. Licensed, 27/6/30. Commenced, 13/12/30.
Directors: Senator J. D. Millen (Chairman), A. P. Findlay, N. A. Findlay. General Manager, John T. Gough; Secretary, A. E. Garrott; Asst. Secretary, Miss M. Bonser; Studio Manager, Edward W. Davies; Chief Announcer, John T. Gough; First Assistant, Edward W. Davies. Other announcers: "Nanette" (Nancy Young), "June" (Mabs Munro), and Keith Harris; Chief Engineer, Val Sydes; Assistants, Lloyd Harris and Rex McLean.
Bankers: Bank of Australasia. Solicitors: Shields and Heritage.

Interstate Representative: Amalgamated Wireless (Aust.) Ltd.

Transmission Times: Monday to Saturday, 7.30—9 p.m.; Monday to Friday, noon—3 p.m.; Monday, Tuesday, Wednesday evening, 5.30—10.30; Thursday and Friday, 5.30—11 p.m.; Saturday afternoons, 1.30—5, 5.30—10.30 p.m.; Sunday, 6—10 p.m.

7LX, LAUNCESTON

W. R. ROLFE AND SONS, licensees. Power and wave-length not finalised as at August 1, 1937.

7QT QUEENSTOWN, WESTERN TASMANIA, 333 Metres (900 Kc.)

WEST COAST BROADCASTERS PTY. LTD. (Stromberg-Carlson (Aust.) Ltd., and Wills and Company), Hodgson's Buildings, Orr Street, Queenstown, Tas. Location of Studio and Transmitter: Conlan Street, South Queenstown. Telephone: Queenstown 124. Aerial Power: 100 watts (unmodulated). Commenced 29/5/37.

Directors: L. P. R. Bean (Chairman), N. A. Findlay (Managing), A. E. Garrott.

General Manager, R. M. Vertigan; **Secretary,** A. E. Garrott; **Engineer-Announcer,** F. R. Holland; **Announcer,** Miss Eileen Ward. **Bankers:** Commercial Bank of Australia Ltd.

Interstate Representatives: Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney; 167-9 Queen Street, Melbourne.

Transmission Times: Monday to Friday, 7.30—9 a.m., 5—10.30 p.m.; Saturday, 7.30—9 a.m., 1.15—5 and 5.15—10.30 p.m.; Sunday, 6—10 p.m.

Technical Description of Station: 100 Watt Transmitter designed by Constructional Engineer S. V. Sydes, and built in association with Stromberg-Carlson (Aust.) Ltd. 120ft. masts, "T" type aerial. Housed in first building built in Tasmania expressly for commercial broadcasting.

7UV, ULVERSTONE—205 Metres (1460 Kc.)
NORTHERN TASMANIA BROADCASTERS PTY. LTD., Reibey Street, Ulverstone, Tas. Location of Studios: Ulverstone. Location of Transmitter: Gawler, Tas. Licensed power, 300 watts. Licensed 30/9/31. Commenced 6/8/32.

Slogan Name: "Tasmania's Premier Broadcasting Service."

Directors: O. Walsh, T. Kitto. **Manager,** Eric Wood. Studios located at Town Hall Chambers, Ulverstone; fitted with several microphones and turntables, and comprehensive record rack. Control panel enables simultaneous mixing of several different inputs.

Transmission Times: Weekdays, 7—9 a.m., 11 a.m.—2 p.m., 5—10.30 p.m. Sunday, 10 a.m.—2 p.m., 5—10.30 p.m.

Broadcasting Transmission Equipment Manufacturers

ACE AMPLIFIERS LTD., 10 Grosvenor Street, Neutral Bay, N.S.W. Phone, X3312. (Complete, and components).

AMALGAMATED WIRELESS (A/SIA) LTD., 47 York Street, Sydney, N.S.W. Phone, BW2211. (Complete, and components).

AUSTRALIAN ENGINEERING EQUIPMENT CO. PTY. LTD., 415-19 Bourke Street, Melbourne, Vic. Phone MU 2315. (Condensers).

CONDENSER SPECIALTY CO. LTD., 112 Rothchild Av., Rosebery, N.S.W. Phone Mascot, 700. (Condensers).

COLVILLE WIRELESS EQUIPMENT CO. PTY. LTD., 8 Smail Street, Broadway, Sydney, N.S.W. Phone MA 3172. (Complete, and components).

DUCON CONDENSER PTY. LTD., Bourke Street,

Waterloo, N.S.W. Phone MA6104. (Condensers). HILCO TRANSFORMER PTY. LTD., 97-111 Berkley Street, Carlton, Vic., N.3. Phone F1661. (Transformers).

LEKMEK RADIO LABORATORIES (N. S. Gil-mour), 75 William Street, Sydney, N.S.W. Phone FL2626. (Complete, and components).

PHILIPS LAMPS (A/SIA) LTD., Philips House, Clarence Street, Sydney, N.S.W. Phone BW2121. (Complete, and components).

STANDARD TELEPHONES AND CABLES (A/SIA) LTD., Botany Road, Alexandria, N.S.W. Phone MX1161. (Complete, and components).

TRANSMISSION EQUIPMENT PTY. LTD., 85 Queen's Bridge Street, South Brisbane, Vic. SC5. Phone M4836. (Complete, and components).

Important Broadcasting Social Clubs

VICTORIAN MICROPHONE CLUB.

President: W. S. Sharland (Australian Broadcasting Commission).

Vice-President: G. Bills-Thompson (3AW).

Hon. Secretary: R. W. Pfeil ("Broadcasting Business.")

Hon. Treasurer: J. O'Connor (Australian Broadcasting Commission).

Assistant Hon. Secretary: K. Hudson (3KZ).

Objects:—Objects of the Club are to create comradeship between the staffs of all radio stations, and to establish a provident fund to aid all members of the broadcasting industry in times of distress.

The Victorian Microphone Club was inaugurated on December 22, 1936, when representatives from National and Commercial stations attended. Luncheons are held regularly each Wednesday at Buckley and Nunn's. The Club's first Microphone Ball was organised for September 22, 1937, in conjunction with the Radio Women's Club of Victoria.

RADIO WOMEN'S CLUB OF VICTORIA

President: Miss G. Varley (3AW).
Vice-Presidents: Miss C. Neill (3XY), Mrs. Lynch (3LO).
Secretary: Miss B. O'Brien (3LO).
Treasurer: Miss M. Morris (3UZ).
Committee: Mrs. S. Bini, 3UZ; Mrs. Richards, 3DB; Miss Greenham, 3KZ; Miss E. Wilson, 3AW.

The Club was founded with the idea of a social organisation in which all members will get to know each other, and from time to time hold functions or help charity as the executive may think fit. Mutual improvement is also the basis of the Club's formation.

Luncheons are held at Buckley and Nunn's the first Monday of each month. The Club co-operated with the Victorian Microphone Club for the purpose of staging the first Victorian Microphone Ball at the Palais de Danse, St. Kilda, on September 22, 1937.

THE MICROPHONE CLUB OF N.S.W.

(affiliated with the Civic Club), 128 Pitt Street, Sydney.
President: Si Meredith (2UE).

Vice-Presidents: Bert Beaver (Manager 2KY), Eric Colman (chief announcer 2GB), John Prentice (2UW), John Dunne (2SM), and Ken Layton (2CH).

Secretary: Henry Gregory (2UW).
Committee Members: C. Honeyfield, C. Holland, F. Witt, S. Freeman, J. Farrelly, C. Stanley, C. Angles, F. Cayley.

Treasurer: Oscar Lind.
Auditors: J. Crawcour and J. Lumdsane.

The Club was formed in October, 1925, having as its objects the promotion of social benefits for its members. Organised the Announcers' Ball, 1936, and the Announcers' Ball, 1937.

COVERAGE
It's a SENSELESS word, but we've got to use it.

We know that **COVERAGE** alone MEANS NOTHING, but **COVERAGE** OF THE MAJORITY OF 50,000 LISTENERS is a "Horse of a different colour." We, at 7HO Hobart, do not claim to satisfy every one of the 50,000 Listeners in Southern Tasmania, but we can PROVE that more than 30,000 of them enjoy our programmes.
And that's what you, Sir, want to know.

From this accurate Statement it is easy to realise that Advertisers get IMMEDIATE and SATISFACTORY results from:

7HO HOBART

THE PRICE LIST SHOWS THE BEST RADIO PUBLICITY VALUES IN AUSTRALIA.

N.Z. NATIONAL COMMERCIAL BROADCASTING SERVICE

OWNED AND OPERATED BY THE NEW ZEALAND GOVERNMENT

Controller: C. G. Scrimgeour.
National Advertising Manager: Beaumont T. Sheil.
National Programme Director: Dorothy Wood.
National Secretary: Harry Bell.
National Business Manager: W. J. Crowther.
Chief Engineer: R. E. Grainger.
Australian Representatives: Radiovision Pty. Ltd.

2ZB, WELLINGTON (N.Z.)—1000 Watts (1120 k.c.)

Slogan Name: "The Feature Station." Phone Wellington, 54-290. Telegrams: "Comradio," Wellington.

Studio and office address: Hope Gibbons Building, Dixon Street, Wellington. Transmitter, Mount Victoria, Wellington.

Station Director: Kenneth W. Kilpatrick. Advertising Manager, Stewart J. Duff. Programme Manager, L. E. Strachan. Station Engineer, H. Holloway. Senior Copywriter, Marcus Tozer.

Transmission Hours: 6 a.m. to midnight, daily.

Technical Data: Frequency, 1120 k.c. Wavelength, 267.8. High level plate modulation, input 1.0 k.w.; final stage 4 × 204A's, parallel; modulators, 2 × 849's push-pull, antenna, Marconi quarter wave. The Studio is about 3 miles from the transmitter, which is on the summit of Mt. Victoria.

Studio Equipment: W.E. Dynamic microphones, R.C.A. pickups, Collins speech equipment.

PROMINENT NATIONAL ADVERTISERS.

Kolynos Incorporated, 45 Brougham Street, Sydney. (Goldberg Agency.)

Bushells Limited, 121 Harrington Street, Sydney. (Radiovision.)

Dr. Du Maurier, Sydney. (Goldberg Agency.)

Godfrey Phillips (N.Z.) Ltd., Jervis Quay, Wellington. (Goldberg Agency.)

Phillips Lamps Ltd., 286 Wakefield Street, Wellington.

Bidomak, Douglas Drug Co., Adelaide, South Australia. (Unsted, Jackson, Haines Ltd., agency.)

C. J. Brown and Co., 188 Hereford Street, Christchurch. (Continuous Adv. Co., Agency.)

W. E. Woods Ltd., Sydney. (Ilott Ltd., Agency.)

Nestle Anglo-Swiss Cond. Milk Co. (Aust.) Ltd., Auckland.

Cathie and Sons Ltd., Marion Street, Wellington. (Radio Advertising Service Ltd., Agency.)

Frank Jackson Ltd., Parnell, Auckland. (Carlton Carruthers Ltd., Agency.)

British Australian Lead Mfg. (N.Z.) Ltd., Albert Street, Auckland. (Goldberg Agency.)

Paget Mfg. Co. Ltd., 120 Hobson Street, Auckland. (Carlton Carruthers Ltd., Agency.)

Alfred Bishop (N.Z.) Ltd., France Street, Auckland.

The Knox Company, 811W 7th Street, Los Angeles, California, U.S.A.

Clements Tonic Ltd., Terry Street, Rozelle, N.S.W. (George Patterson Pty. Ltd., Agency.)

PROMINENT LOCAL ADVERTISERS.

C. Smith Ltd., Cuba Street, Wellington.

D.I.C. Ltd., Lambton Quay, Wellington.

Whitcombe and Tombs Ltd., Lambton Quay, Wellington.

James Smith Ltd., Manners Street, Wellington.

Star Stores Ltd., Wellington.

Shillings Ltd., Manners Street, Wellington.

Woolworths (N.Z.) Ltd., Cuba Street, Wellington.

R. and E. Tingey Co. Ltd., Manners Street, Wellington.

E. J. Lloyd Ltd., Cuba Street, Wellington.

Adams Bruce Ltd., Wellington.

Manthel Motors Ltd., Jervois Quay, Wellington.

1ZB, AUCKLAND (N.Z.)—500 Watts (1090 k.c.)

Slogan Name: "The Feature Station." Phone Auckland 32-165. Telegrams: "Comradio," Auckland.

Studio and Offices: Queen's Arcade, Queen Street, Auckland. Transmitter: Symonds Street, Auckland.

Station Director: Walter Elliot. Advertising Manager, John W. Griffiths. Programme Manager, John R. Brown. Station Engineer, W. Illingworth.

Transmission hours: Weekdays, 6 a.m. to midnight. Sunday: 7 a.m. to 10.30 p.m.

PROMINENT NATIONAL ADVERTISERS.

Beatty Bros. (Stannage Radio Ltd., agency). Alf. Bishop (Goldberg), Brown, C. J. and Co. (Continuous Advtg. Co.), Horace Bull Ltd. (Stannages Ltd.). Bushells Ltd. (Radiovision). Brown Barrett (Dormer Beck). Citrus Products. Clements Tonic (J. Ilott Ltd.). Kolynos Inc. (Goldbergs). Phillips Lamps (Radiovision). Potter and Birks (Catts Patterson (N.Z.) Ltd.). Self-Help (Goldberg). Scott and Browne (Weston). W. F. Tucker (Stannages). Whitome Stevenson (Stannages). W. E. Woods (Ilott Ltd.).

PROMINENT LOCAL ADVERTISERS.

Geo. Court and Sons Ltd., Karangahape Road, Auckland. Adams Bruce Ltd., Ponsonby, Auckland. Chas. Begg and Coy., Customs Street, East Auckland. Barker and Pollock, Karangahape Road, Auckland. Bond and Bond Ltd., Commerce Street, Auckland. D. and A. Campbell, High Street, Auckland. Crichton D'ora Studios, Karangahape Road, Auckland. T. J. Edmonds, Christchurch. R. Jaffe, Queen Street, Auckland. Frank Jackson Ltd., Parnell, Auckland. W. Lambourne, Ponsonby Road, Auckland. Macky, Logan, Caldwell Ltd., Elliott Street, Auckland. Modern Bag Co., Upper Queen Street, Auckland. Paramount Bedding Coy., Grey's Avenue, Auckland. Jas. Pascoe, Queen Street, Auckland. Quigleys Ltd., Customs Street, East Auckland. "C.O." Products, Wellington. Kleenezy Brush Coy., Queen Street, Wellington. Paget Manufacturing Coy., Hobson Street, Wellington.

Total transmission hours during 1936: 1795 hours.

Activity in 1936: When the Government set out to establish the National Commercial Broadcasting Service in 1936, it chose Station 1ZB for the first unit of the service. 1ZB had been maintained solely on voluntary contributions from listeners, and it was the most suitable station in Auckland for commercial transmissions. On October 28, 1936, it adopted an 80-hour week, as compared with 25 previously, and commenced commercial operations. It met with a success that was phenomenal, and the stunts and new features that are always associated with commercial broadcasting drew a great deal of attention. Several noteworthy events during the few weeks of 1936 that radio advertising was done in Auckland, were "The Laugh of the Week" competition, which drew 54,000 entries in the last 4½ days it was open, the acquisition of a wide range library, and the 1ZB Personality Quest, which unearthed a great deal of valuable talent.

Technical Data: Frequency 1090 k.c. Wavelength 275.2 metres; plate modulation input 500 watts; final stage, 2 × 204A's in parallel; modulators, 2 × 849's push-pull. Power supplies: Rectified A.C. Antenna: Voltage fed pi network filter. Situated on top of a reservoir in an elevated position within the city area.

The studio is about 1½ miles from the transmitter. Studio equipment includes crystal microphones, magnetic pickup and W.E. Hill and Dale.

(Continued on Foot of Page 140.)

MAORILAND ON THE AIR WITH Commercial Broadcasting

AUCKLAND 1ZB
WELLINGTON 2ZB
CHRISTCHURCH 3ZB
DUNEDIN 4ZB

NATIONAL COMMERCIAL BROADCASTING SERVICE
CABLES - 'COMRADIO' WELLINGTON

RADIOVISION PTY. LTD.
BLASHKI BUILDING, 61 HUNTER STREET, SYDNEY.
Telephone: B 5453.
Sole Australian Representatives

Broadcasting Station Representatives

The following list of Station Representatives is compiled from information received, and whilst every care has been exercised, there may be omissions, but the publishers cannot accept any responsibility for inaccuracies. The station call alongside a name indicates the station advised as being represented.

- A**
AMALGAMATED WIRELESS (A/sia) Ltd., 47 York Street, Sydney. BW 2211. 2AY, 2DU, 2GF, 2GN, 2LM, 2MO, 2SM, 3BA, 3BO, 3XY, 4CA, 4MK, 4PM, 4TO, 4WK, 7BU, 7LA, 7HO, 7QT.
AMALGAMATED WIRELESS (A/sia) Ltd., 167 Queen Street, Melbourne. F 4161. 2LM, 3BA, 4PM, 7QT, 7BU.
ALLISON, H. W., Shell House, Bourke Street, Melbourne. 2HD, 2WG, 5KA.
ANDERSON, HUGH, Poster House, Exhibition Street, Melbourne. 6AM, 6PM.
ARMSTRONG, J. A., Stanton House, 133 Pitt Street, Sydney. B 1553. 3KZ.
- B**
BARNES, M. R., Lisgar House, Carlington Street, Sydney. BW 5179. 7HO.
BEDNALL, G. N., Newspaper House, Collins Street, Melbourne. 2BH, 5AD, 5MU, 5PI, 5SE.
BOURKE, A. D., 6 Barrack Street, Sydney. B 2085. 2UW, 3SR, 3UL, 3UZ, 3YB, 4AY, 4BC, 4BH, 4GR, 4MB, 4RO, 4ZR.
BREWSTER, E. H., Assembly Hall, 44 Margaret Street, Sydney. B 3403. 2CA, 2LM, 2TM, 2WL, 3AW, 3HA, 3SH, 3TR, 4IP, 5DN, 5RM, 6PR, 7BU.
BROADCAST SERVICES, Queensland National Building, George Street, Brisbane. B 9659. 2TM.
BUTCHER, R., Warwick Building, Hamilton Street, Sydney. 6IX, 6ML, 6WB.
- C**
CHARD, A. J., 92 Fleet Street, London. 3DB-LK, 5AD.
- CLARKE, E. JAMES**, 395 Collins Street, Melbourne. 3MA.
COMMONWEALTH BROADCASTING CORP. (Q.LD.) PTY. LTD., 43 Adelaide Street, Brisbane. 4AY, 4MB, 4GR, 4ZR, 4RO, 4BC, 2UW.
COUNTRY BROADCASTING SERVICES LTD., Hosking Place, 84½ Pitt Street, Sydney. BW 1428. Sydney, Melbourne and Newcastle Sales Representative for 2NZ, Inverell.
CUMMINS, A. W., Amalgamated Wireless (A/sia) Ltd., 167-9 Queen Street, Melbourne. F 4161. 2CH.
- D**
DAHLBERG, LOUIS, Radio House, 148 Queen Street, Melbourne. 3BA.
DINNENY, V. M., 365 Elizabeth Street, Melbourne. 3SR, 3UL, 3YB.
- F**
FAIR, ROGER, 239 Queen Street, Brisbane. 2AY, 2CH, 2GF, 2GN, 3BO, 4CA, 4TO, 4WK.
FINN, A. L., 66 King Street, Sydney. 7HT.
FISHER, R. D., Newspaper House, Collins Street, Melbourne. 4AK, 4BK.
- G**
GIBSON, G., Warwick Building, Hamilton Street, Sydney. 3DB-LK, 4AK, 4BK, 4BU, 5AD, 2BH.
GILDER, G., Amalgamated Wireless (A/sia) Ltd., 167-9 Queen Street, Melbourne. F 4161. 2CH, 3BO.
- H**
HANSEN, C., Albion House, Waymouth Street, Adelaide. 3MA.
HILL, G., Cnr. George and Sussex Street, Sydney. 3BA, 3GL, 3MA.
- J**
JONES, J. L., Amalgamated Wireless (A/sia) Ltd., 167-9 Queen Street, Melbourne. F 4161. 2CH, 3BO.
- M**
MATHER, L. G., Temple Court, 422 Collins Street, Melbourne. F 4878. 2GB, 2GZ, 2UE, 5DN.
MCCARTNEY, R. J., Newspaper House, 247 Collins Street, Melbourne. 2BS, 2KO, 2SM, 2TM, 4AY, 4BU, 4VL, McMAHON, R., Barrack House, Barrack Street, Sydney. B 6958. 2KA.
MONKS, C. A., 77 York Street, Sydney. MA 7645. 2BS, 2HD, 2WG, 3AK, 5KA, 7UV.
MORSE, P. A., 102 Sussex Street, Sydney. BW 2994, 6PM, 6AM.
- P**
POWERS, Joshua B., 220 East 42nd Street, New York, U.S.A. 3DB-LK, 5AD.
- R**
RIEUSSET, B., Newspaper House, 247 Collins Street, Melbourne. 6IX, 6ML, 6WB, 7HO.
- S**
SCOTT, DON, 9 Blight Street, Sydney. BW 7283. 2RG, 3XY.
SPROULE, C. T., Manager, Broadcasting Department, Amalgamated Wireless (A/sia) Ltd., 167-9 Queen Street, Melbourne. F 4161. 2CH, 3BO.
STATION 2UW, State Shopping Block, Market Street, Sydney. M 6686. Sales representative, 4BC, 4GR, 4RO.
STATION 4BC, Wintergarden Theatre Building, Queen Street, Brisbane. Sales Representative, 4GR, 4RO, 2UW, 4MB, 4ZR.
SULLIVAN, P., 18 Queen Street, Melbourne. 2UW, 4BC, 4GR, 4MB, 4RO, 4ZR.
- T**
THOMPSON, W. H., A.C.A. Building, King Street, Sydney. 2KO.

N.Z. National Commercial Broadcasting Service

(Continued from Page 138.)

3ZB, CHRISTCHURCH, N.Z.—1000 Watts (1430 k.c.)

Slogan name: "The Feature Station." Phone Christchurch 34-816. Telegrams: "Comradio," Christchurch.
 Studio and offices: McDuff's Bldg., Colombo Street, Christchurch.

Station Director: F. W. Simpson. Advertising Manager, Merton S. Bullivant.

Transmission hours: 6 a.m. to midnight daily.
 Technical data: Frequency, 1430 k.c. Wavelength 210 metres (approx.). High level plate modulation, input 1.0 k.w. Final stage, 4 × 204A's parallel. Modulator, 2 × 349's push-pull. Antenna, Marconi quarter wave.

The studio is approximately 6 miles from the transmitter, which is at New Brighton, a suburb of Christchurch.

Studio equipment: W. E. dynamic microphones, R.C.A. pickups. Collins speech equipment.

Recording facilities installed.

Station opened September, 1937.

4ZB, DUNEDIN, N.Z.—1000 Watts (1220 k.c.)

Slogan name: "The Feature Station." Phone Dunedin 11-816. Telegrams: "Comradio," Dunedin.

Station Director: Len. J. Greenberg.

Transmission Hours: 6 a.m. to midnight.

Technical data: Frequency, 1220 k.c. Wavelength 245 metres approx. High level plate modulation, input 1.0 k.w. Final stage, 4 × 204A's parallel. Modulators, 2 × 849's push-pull. Antenna, Marconi, quarter-wave.

Studio equipment: W.E. dynamic microphones, R.C.A. pickups, Collins speech equipment.

Recording facilities installed.

Station opened September, 1937.

STATION SLOGANS

Most Commercial Broadcasting Stations in Australia have adopted slogans which are used frequently in association with each station's call sign. The following is a list of Station Slogans known to be in use at the date of publication of this Year Book:—

- | | | |
|--|---|--|
| 2AD: "The Voice of England." | 2UE: "Radio 2UE Sydney." | 4AK-BK: "The Courier-Mail Stations." |
| 2AY: "The Albury Station." | 2UW: "2UW Sydney, from the Top of the State." | 4BC: "Queensland's Premier Station." |
| 2CH: "Entertains the Whole Family." | 2WG: "The Voice of the Riverina." | 4BU: "The Voice of the Burnett." |
| 2DU: "The Western Station." | 2WL: "The Voice of Central Illawarra." | 4CA: "At the Top of Australia." |
| 2GB: "The Nation's Station." | 3AK: "The Voice of the Night." | 4GR: "The Voice of the Downs." |
| 2GF: "The Grafton Broadcasting Service." | 3AW: "The Feature Station." | 4IP: "In the Heart of Ipswich." |
| 2GN: "2GN, the Goulburn Broadcasting Service." | 3BO: "The Friendly Voice of the North." | 4LG: "In the Midst of the Golden Fleece." |
| 2GZ: "Central New South Wales." | 3DB-LK: "The Herald Stations." | 4RO: "4RO Rockhampton, the Commonwealth Broadcasting Network." |
| 2HD: "2HD Newcastle Tells the World." | 3HA: "The Age Station." | 4VL: "The Voice of Western Queensland." |
| 2KY: "The Brightest Station on the Air." | 3KZ: "The Brighter Broadcasting Service." | 4WK: "The Listeners' Companion" |
| 2KA: "The Voice of the Mountains." | 3SH: "Radio 3SH—The Border Feature Station." | 5AD-MU-PI-SE: "The Advertiser Broadcasting Network." |
| 2KO: "The Voice of Industry." | 3SR: "The Argus Station, the Heart of Victoria." | 5DN: "The First Station in the State." |
| 2LM: "The Voice of the Northern Rivers." | 3TR: "The Gippsland Station Associated with the Age." | 5KA: "The Voice of South Australia." |
| 2MO: "The Voice of the North-West." | 3UL: "The Argus Station, Central Gippsland." | 6AM: "The Happy Station." |
| 2NZ: "2NZ, Broadcasting to Northern New South Wales and Southern Queensland." | 3UZ: "The Voice of Victoria." | 6PM: "The Cheerful Station." |
| 2SM: "The Modern Station." | 3XY: "The Quality Station." | 7HT: "The Feature Station." |
| 2TM: "2TM, Broadcasting from Tamworth, the Metropolis of Northern N.S. Wales." | 3YB: "The Argus Station, Best of the West." | 7UV: "The Premier Broadcasting Station." |

When preparing your advertising campaign consider these facts—

76.6% of the advertisers on Station 2SM are renewal advertisers

56.5% of these advertisers are taking more time than previously

When you want profitable results too from your advertising investment use

STATION 2SM SYDNEY

Commercial Broadcasting Personnel

The following list of names is taken from information supplied by various stations and no responsibility is accepted by the publishers for omissions or inaccuracies. Any alteration desired in the next "Broadcasting Business" Year Book (1938) should be forwarded to the publishers.

A

Abbott, J. P., Director 2GZ.
 Abramowski, O. W., Salesman, 3UZ.
 Adey, Miss B., Accounts Dept., 2GZ.
 Aitken, J. B., Director 3UL, 3YB, 3SR.
 Aked, L. J., Assistant Engineer, 2LM.
 Akehurst, Miss O., Sales Dept., 2GZ.
 Akers, R., Asst. Announcer, 4VL.
 Albert, A. F., Director 2UW, Sydney, 4BC.
 Albert, M. F., Director 2UW, Sydney, 4BC.
 Aldridge, H., Sales Manager, 3MB.
 Allan, A. J., Director 2DU.
 Allan, Fred. H., Director 3AW.
 Allen, Frank, Feature Writer, 3UZ.
 Allen, H. F., Engineer, 2CH.
 Allen, J., Announcer, 6ML.
 Alley, N., Assistant Announcer, 4RO.
 Anderson, A., Sporting Editor, 2UW.
 Anderson, G. H., General Manager, 2GZ, Director 2NZ.
 Anderson, Jim., Announcer, 4BC.
 Andrew, Alf., Chief Announcer, 3AK.
 Angles, Cyril, Race Commentator, 2UW.
 Anshin, Dr. R. B., Director 2AD.
 Archibald, L., Engineer, 3UZ.
 Armistead, A. K., Chief Engineer, 2HD.
 Armitage, J., Sales Promotion Manager, 2GB.
 Armstrong, D. R., Asst. Manager, 2UE.
 Armstrong, John, Announcer, 7HO.
 Arnold, C., Production Manager, 2UW.
 Athelwood, Ron, Announcer 3AW.
 Atkinson, F., Announcer 6IX.
 Autchlerlonie, Andrew J. T., Chief Announcer, 5KA.
 Austen, Miss Janet, 2CH.
 Anstwick, E., Engineering Staff, 2UW.
 Ayling, Announcer, 2DU.

B

Badger, F., Announcer and Advertising, 4TO.
 Baeyertz, C. N., Salesman, 2UE.
 Baillie, R. G. L., Director 2BS.
 Bairnsfather, Captain, Announcer, 2KY.
 Balk, Miss D. S., Production Dept., 5DN.
 Balmer, N. E., Programme Manager, 3KZ.
 Banks, A., Salesman, 3KZ.
 Banks, Norman, Chief Announcer and Studio Manager, 3KZ.
 Banney, J. P., Manager and Engineer 3BO.
 Barber, R. J., Director, 3MB.
 Barlee, Roly, Announcer 3UZ.
 Barlin, G., Chief Announcer, 2CA.

Barnes, J., Announcer 3XY.
 Barrett, K., Publicity Department, 2GB.
 Barrie, Miss Jean, Chief Clerk and Announcer, 2NZ.
 Bartle, O., Engineer 2NZ.
 Bartlett, Miss J., Programme Department, 2GZ.
 Barwick, E., Engineer 3KZ.
 Basden, Frank M., Manager and Chief Engineer, 4CA.
 Basden, Mrs. M., Women's Session, 4CA.
 Baume, S. E., Advertising Manager, 2UE.
 Baxter, G. S., Director, 3MA.
 Bayley, H. M., Secretary, 4AK Darling Downs, 4BK.
 Bean, L. P. R., Chairman of Directors, 7BU.
 Beaney, W., Engineer 4RO.
 Beatson, R. G., Chief Engineer 4MB.
 Beattie, Stuart, Studio Manager 2NZ.
 Beatty, W., Librarian, 2SM.
 Beaver, H. E., Manager and Sales Manager, 2KY.
 Beck, C., Asst. Announcer, 4RO.
 Bell, G., Sec. Announcer, 3SR.
 Bennett, A. E., Managing Director, 2GB, Director 3AW, 5DN.
 Bennett, A. L., Studio Manager, 2TM.
 Bennett-Bremner, E., Announcer 2CH.
 Bennett, G. B., Director and Assist. Manager, 2GB.
 Bennett, L., Production Dept., 2GB.
 Bennett, O., Director, 2TM.
 Bennetts, W., Engineer, 3UZ.
 Benson, Miss E., Programme Manager, 5AD.
 Bermingham, R. F., Studio Manager, 2GZ.
 Berry, Miss R., Clerk, 4RO.
 Berryman, Miss L., Announcer 6ML.
 Bessemer, E., Chief of Staff and Announcer, 4BC.
 Bills-Thompson, George, Announcer 3AW.
 Bilton, H., Accountant, 7UV.
 Bingham, Lorna, 2KY Players.
 Bini, Stephanie, Publicity Officer, 3UZ.
 Binks, Colin, Studio Manager, 3TR.
 Bird, G., Studio Staff, 2CH.
 Bishop, Wally, Band Conductor, 3AK.
 Blackney, L., Engineer, 3GL.
 Blackshaw, G., Announcer, 3XY.
 Blake, R. L., Manager, 2AD.
 Blakeney, K., Musical Dept. and Presentation, 2UE.
 Blandford, F., Announcer, 3XY.
 Bleazby, C., Announcer, 3XY.
 Blee, Norman, Announcer and Continuity Writer, 3SH.
 Bleechmore, R. C., Announcer, 4TO.
 Blight, Miss L., Manager's Secretary, 2DU.

Bluut, G., Producer, 3XY.
 Boast, H., Engineer 3DB-LK.
 Bohm, V., Secretary and Announcer, 4AY.
 Bonney, Ralph, Announcer, 7UV.
 Bonser, Miss M., Assistant Secretary, 7LA.
 Borrett, F. B., Announcer, 6AM.
 Brain, Trevor, Announcer 7BU.
 Brand, A. E., Director 2LM.
 Bray, G., Salesman, 2HD.
 Breed, C., Engineer, 2GZ.
 Brewin, D. J. S., Salesman, 3DB-LK.
 Bridges, B., Programme Manager, 3XY.
 Briggs, L., Record Dept., 2GZ.
 Broadbent, Jack, Studio Manager and Chief Announcer, 7HO.
 Broadbent, Molly, Announcer, 7HO.
 Brown, Miss A., Sales Rep., 3DB-LK.
 Brown, Bert, Announcer, 4IP.
 Brown, J. H., Chief Engineer, 2KY.
 Brown, M., Chief Engineer, 2BH.
 Bryant, E. E., Director 3MB.
 Bull, H., Monitor, 4BU.
 Burgess, Jack, Chief Announcer, 5AD.
 Buring, R., Technician, 3BA.
 Burnett, Helen, Announcer and Continuity, 2AY.
 Burns, Cecil, Engineer, 2CH.
 Burminster, O., Engineering Staff, 4BC.
 Burrage, J. A., Engineer, 3SR.
 Burrage, Jack, Engineer, 3AK.
 Burrows, Richard, Assistant Manager, 3HA.
 Burton, Cleaver, Sport Commentator, 2AY.
 Butler, John, Assistant Engineer, 7HO.
 Butterfield, G., Engineer 6IX.
 Butters, Sir John, Director 2UE.
 Button, B. C., Sales Department, 2CH.
 Buzacott, H., Engineer, 4GR.
 Buzacott, N., Chief Operator, 3LK.
 Byron, J. A., Secretary, 2WL.

C

Caldwell, Frank, Engineer, 2KA, Katoomba.
 Callaghan, C. Y., Director, 2BS, Bathurst.
 Callard, M., Announcer 3DB-LK, Melbourne.
 Calley, W., Accountant, 2GB, Sydney.
 Callow, R., Announcer, 4BH, Brisbane.
 Cameron, J., Production Section and Announcer, 5AD, Adelaide.
 Campbell, A., Announcer and Programme Arranger, 4TO, Townsville.
 Campbell, B., Sales Dept., 3XY, Melbourne.
 Campbell, K. M., Sales Manager, 3XY, Melbourne.

COMMERCIAL BROADCASTING PERSONNEL—(Cont.)

Campbell, P., Programme Department, 2GB, Sydney.
 Canavon, J., Engineer, 6IX, Perth.
 Carmichael, Alan, Publicity and Continuity, 3AW, Melbourne.
 Carr, A., Presentation, 2UE, Sydney.
 Carson, C. R., Manager, 4BH, Brisbane.
 Carter, B., Announcer, 6IX, Perth.
 Carter, C., Manager, 5RM, Murray Heights.
 Carter, C., Accountant, 2UW, Sydney.
 Carter, G., Morning Announcer, 6AM, 6PM, Perth.
 Carter, M., Chief Announcer, 4GR, Toowoomba.
 Carvosso, A. J., Secretary, 5DN, Adelaide.
 Casos, Dean, Announcer (tennis), 4BC, Brisbane.
 Cayley, Frank, Announcer, 2GZ, Central N.S.W.
 Chaloner, A. R., Secretary and Accountant, 2NZ, Inverell.
 Chamberlain, F., Continuity Writer and News Commentator, 3HA, Hamilton.
 Chamberlain, W., Engineer, 3XY, Melbourne.
 Chance, John, Announcer, 4BC, Brisbane.
 Chandler, J. B., President Australian Federation Broadcasting Stations.
 Channel, D., Announcer, 2KO, Newcastle.
 Chapman, Maurice, Sales Manager, 5AD, Adelaide.
 Chapman, Miss S., Typiste, 2NZ, Inverell.
 Charlesworth, Gilbert, Announcer, 3UZ, Melbourne.
 Chaston, Neta, Programme Director, 7HT, Hobart.
 Chatfield, M. J., Engineer, 2NZ, Inverell.
 Checkley, Miss M., Accounts Department, 2GZ, Central N.S.W.
 Chinner, H., Engineering Staff, 2KO, Newcastle.
 Chisholm, G., Studio Staff, 2KA, Katoomba.
 Choate, R., Technical Staff, 6AM, 6PM, Perth.
 Christensen, Andrew John, Director 4BU, Bundaberg.
 Christie, Gordon, Salesman, 3UZ, Melbourne.
 Churchward, Edison C., Advertising Manager, 6IX, 6ML, Perth, 6WB, Katanning.
 Clark, Miss F. M., 3BA, Ballarat.
 Clark, S. W. J., Director, 3BA, Ballarat.
 Clarke, H. P., Sales Rep., 2GZ, Central N.S.W.
 Clarke, S., Programme Dept., 3DB-LK, Melbourne.

Clarke, S. O., Sales Dept., 2CH, Sydney.
 Clay, G., Salesman, 4BH, Brisbane.
 Cleeland, M., Secretary 2HD, Newcastle.
 Clementson, S., Announcer, 6AM, 6PM, Perth.
 Clinch, Miss B., Programme Dept., 2GZ, Central N.S.W.
 Clyne, Murray, Chief Engineer, 3UL, Central Gippsland.
 Cochrane, A. S., Announcer, 2CH, Sydney.
 Coffey, Ida, Announcer, 3UZ, Melbourne.
 Coldwell-Smith, C. E., Manager and Chief Announcer, 2GF, Grafton.
 Coleman, E. F., Chief Announcer, 2GB, Sydney.
 Collibee, E., Announcer, 2UW, Sydney.
 Cook, Barney, Announcer (cricket), 4BU, Brisbane.
 Cook, Miss Kath, Dramatic Dept., 4BC, Brisbane.
 Cook, R. B., Managing Director, 3GL, Geelong.
 Cookson, M., Engineer, 3AW, Melbourne.
 Coombs, T. G., Manager, 3TR, Gippsland.
 Cooper, A., Programme Dept., 3DB-LK, Melbourne.
 Cooper, Miss B., Secretary, 5DN, Kipling Boys' Club, 5DN.
 Corby, Pat, Announcer, 3KZ, Melbourne.
 Cornish, J., Contract Clerk, 2TM, Tamworth.
 Corrie, T., Announcer, 2UW, Sydney.
 Cortez, Juan, Chief Announcer, 6PM, 6AM, Perth.
 Cossins, Denis, Chief Announcer, 3UL, Central Gippsland.
 Cottrell, F. Clarke, Publicity Manager, 2UW, Sydney.
 Cottrell, L. Lambert Clarke, Engineer, 3XY, Melbourne.
 Cotterell, E. L., Director and Secretary, 3UZ, Melbourne.
 Cotterell, W., Engineer, 2CH, Sydney.
 Cousins, C., Announcer, 2GB, Sydney.
 Cowen, J., Engineering Staff, 2KO, Newcastle.
 Cox, A., Engineer, 3AK, Melbourne.
 Cox, H. E., Manager and Chief Engineer, 4TO, Townsville.
 Crago, J. C., Chief Announcer, 2MO, Guinedah.

Crawcour, J. A., Announcer, 2UW, Sydney.
 Creighton, A. R., Manager, 2AD, Armidale.
 Cromie, Charles T., Director 3UZ, Melbourne.
 Cross, C. J., Sales Manager-Announcer, 7HT, Hobart.
 Crossman, Ken., Studio Director, 5DN, Adelaide.
 Crouch, E. C., Chief Engineer, 2GZ, Central N.S.W.
 Cruikshank, N. W., Chief Engineer, 4BH, Brisbane.
 Curdie, Margaret, Library and Children's Session, 3SR, Shepparton.
 Currie, Bob., Control Room, 2CH, Sydney.
 Curtis, Richard George, Director 4BU, Bundaberg.

D

Dahl, Norman L., Managing Director 4AY, Ayr.
 Daniell, Frederick, Director, 2GB, Sydney, 2WL, Wollongong.
 Dart, L. W., Studio Staff, 2CH, Sydney.
 Davey, J., Announcer, 2GB, Sydney.
 Davey, J. H., Managing Director and General Manager, 3BA, Ballarat.
 Davidson, R., Salesman, 2TM, Tamworth.
 Davies, Edward W., Studio Manager and First Assistant Announcer, 7LA, Launceston.
 Day, D., Announcer, 3XY, Melbourne.
 Deane, Miss L., Studio Staff, 2CH, Sydney.
 Dear, Alex., Announcer, 3KZ, Melbourne.
 Dearth, H., Announcer, 2GB, Sydney.
 Dease, C. J., Copywriting Dept., 2GB, Sydney.
 Debelle, E., Accountant, 2CH, Sydney.
 Decent, L. S., Sales Rep., 2GZ, Central N.S.W.
 Dempsey, L. A., Announcer, 2KY, Sydney.
 Denison, Sir Hugh, Director, 2GB, Sydney.
 Denison, L. A., Director, 2GB.
 Denison, Reginald E., Director 2WL, 2GB, 2UE.
 Derriman, G., Chief Announcer, 4TO.
 Devine, J., Transcription Manager, 3DB-LK.
 Diamond, W., Announcer, 4BU.
 Digby-Bennett, J., Sales Rep., 2SM.
 Dixon, A. L., Chief Engineer, 4AK, 4BK.
 Dixon, N. F., City Sales Staff, 3HA, 3SH, 3TR.



2TM GIVES THE PUSH
 AT THE POINT OF SALES

COMMERCIAL BROADCASTING PERSONNEL—(Cont.)

Dodds, John, Assistant Engineer, 7HO.
 Dower, John, Manager and Chief Engineer, 2AY.
 Downie, Mora, Announcer, 2KO.
 Doyle, Stuart F., Managing Director, 2UW; Director, 4BC; Chairman of Directors, C.B.N.
 Drew, Betty, Programme Manager, 2DU.
 Drummond, Hon. D. H., M.L.A., Director 2AD.
 Duff, David, Salesman, 3AW.
 Dunbar, D. W., Sales Manager, 4RO.
 Duncan, Frederick de R., Director, 2WL.
 Duncan, Miss R., Record Dept., 4BC.
 Dunne, John S., Studio Manager, 2SM.
 Dunstan, C. B., Engineering Staff, 4BC.
 Dunstan, W., Director 3DB-LK.
 Dwyer, Miss M., Clerical, 4BH.
 Dyball, H. F., L.I.C.A., Manager and Secretary, 2TM.
 Dye, A. S., Announcer, 6ML.
 Ebrall, H., Engineer, 5KA.
 Eden, K., Announcer, 3DB-LK.
 Edwards, Miss D., Announcer and Contracts, 5AD.
 Edwards, George, Director of Productions, 2UW.
 Edwards, H., Engineer, 2KY.
 Edwards, S., Announcer, 5KA.
 Egan, P. J., Secretary, 2SM, Sydney.
 Elliott, Eileen, Accountant, 7BU.
 Elliott, F. E., Engineer, 4BC.
 Elliott, Douglas, Announcer, 3AW.
 Elliott, R. D., Director, 3MA.
 Ellison, L. B., Announcer, 4AY.
 England, Miss L., Announcer, 5AD.
 Errington, Betty, Announcer, 3BO.
 Ettelson, P. W., Director, 3XY.
 Everard, J., Announcer, 3XY.
 Everett, Syd., Announcer, 4BH.
 Eversen, W. D., Studio Manager, 4LG.

F

Faber, W., Chief Engineer, 4AY.
 Fagan, R., Director, 2SM.
 Fagan, R. J., Director, 2GZ.
 Fair, Richard, Announcer, 2SM.
 Fairbairn, George, Director, 3UL, 3YB, Warrnambool, 3SR.
 Fairhall, Allen, Managing Director, 2KO.
 Fairhall, Edward, Director, 2KO.
 Fairweather, Keith, Acting Chief Engineer, 4IP.
 Falknemer, J., Director, 4VL.
 Fardell, F., Accountant, 3DB-LK.
 Farrelly, J., Announcer, 2KY.
 Farris, E. C., Sales Rep., 2SM.
 Fawcett, G. S., Salesman, 3UZ.
 Featonby, George A., Director, 3SH.
 Featonby, George S., Director, 3HA, Hamilton.
 Feeckings, W., Engineering staff, 4BC.
 Fidler, Dorothy, Continuity Writer, 3AK.
 Filmer, Mrs. M., Announcer, 2UE.
 Findlay, A. P., Director, 7BU, Burnie, 7LA.

Findlay, Molly, Announcer, 7HO.
 Findlay, N. A., Director, 7LA, Managing Director, 7QT.
 Findlay, P. A., Director, 7BU.
 Findlay, Selwyn H., Director and General Manager 7HO.
 Fink, T., Director, 3DB-LK.
 Fisher, A. F., Engineer, 5DN.
 Fisk, Sir Ernest T., Chairman of Directors A.W.A.
 Pitts, R. A., Manager and Chief Engineer, 3HA.
 Fleming, F. B., Director 2GZ.
 Fletcher, C. A., Advertising Manager, 2GB.
 Fletcher, R., Engineer, 4BH.
 Foard, Miss D. H., Copywriter, Argus Broadcasting Services.
 Folie, M., Chief Engineer, 3MA.
 Foott, Miss R., Service Dept., 2UW.
 Forsyth, A. K., Sales Manager, 4BC.
 Forsythe, G., Gordon, Salesman, 4BH.
 Forsyth, Terry, Announcer, 4IP.
 Foster, G., Studio Manager, 2KA.
 Fowles, Ken., Senior Announcer, 2UE.
 Fox, John, Announcer, 2KY.
 Francis, Maurice, Author and Dramatist, 2UW.
 Fraser, A., Director, 3MB.
 Frawley, Jack, Sporting Session, 3YB.
 Freeman, C. A., Announcer, 5DN.
 Fremlin, R. A., Advertising Manager, 4AK, 4BK.
 French, C., Continuity Manager, 3XY.
 Frith, D. A., Secretary, 7BU.
 Fuhrmann, W. F., Sales Staff, 6AM, 6PM.
 Fuller, H., Engineer, 3SR.

G

Gainford, R., Announcer, 2GB.
 Garden, H. M., Programme Manager, 2KY.
 Garden, Ian, Announcer, 2KY.
 Garrott, A. E., Secretary, 7LA, 7BU, Director, 7BU.
 Geeves, Phillip, Announcer, 2CH.
 Gibbons, A. E., Engineer, 2GB.
 Gibbs, Elma, Announcer, 2KO.
 Gibson, Miss, Transcription Dept., 2GB.
 Gibson, Miss G., Studio Staff, 2CH.
 Gilder, L., Assistant Sales Manager, 2UW.
 Gillies, Edna, Announcer, 2LM.
 Gilligan, D. J., Director, 2GZ.
 Giraud, C. H., Sales Staff, 6IX, 6ML, 6WB.
 Gledhill, R., Announcer, 6WB.
 Glew, L. G., Chief Engineer, 3UZ.
 Glover, G., Chief Engineer, 3YB.
 Goble, Rev. ("The Good Companion"), 3BO, Bendigo.
 Goddard, H. W., Director, 2MO.
 Goddard, W. G., Dr. (International Affairs), 4BC.
 Godfrey, K., Announcer, 2TM.
 Goetze, E., Announcer, 3KZ.
 Gold, Edward, Managing Director, 4GR, 4ZR.
 Goldman, Miss Sheba, Programmes, 4BH.

Gooding, D., Chief Engineer, 5AD.
 Goodsall, H., Studio Staff, 2CH.
 Gordon, E. J., Director and Advertising Rep., 2DU.
 Gordon, L., Announcer, 2GZ.
 Gough, John T., General Manager and Chief Announcer, 7LA.
 Gower, E. L., Sales Staff, 6IX, 6ML, Perth, 6WB.
 Grace, A., Chief Engineer, 3KZ.
 Graff, Miss P., Secretary to General Manager, 2GB.
 Graham, R. M., Salesman, 4BC.
 Grano, Miss, Programme Dept., 3UZ.
 Grant, W., Engineer, 2KY.
 Gray, A., Salesman, 3KZ.
 Gray, Miss J., Assistant Announcer and Accounts, 4TO.
 Gray, N. W., Studio Manager and Chief Announcer, 3GL.
 Green, Max, Continuity, 7BU.
 Greenhalgh, J., Engineer, 2KO.
 Greenhalgh, K. N., Chief Engineer, 2KO.
 Greenham, Iris, Announcer, 3KZ.
 Greer, N. C., Engineer, 6WB.
 Gregory, Henry, Announcer and Sales Staff, 2UW.
 Greig, H., Director, 6IX, 6ML, Perth, 6WB.
 Grey, Mrs., Announcer, 2KY.
 Griffin, E. P., Secretary, 4BC.
 Griffiths, J. Scott, Chief Announcer, 3BO.
 Grimstone, Ronald, Announcer, 4BC.
 Grist, S. W., Salesman, 3DB-LK.
 Grose, F., Announcer, 2GB.
 Gross, Sheila, Announcer, 2LM.
 Grouse, Miss M., Sales Department, 2GZ.
 Gurry, Jack ("Sportcaster"), Announcer, 3UZ.
 Gyles, E., in charge transmissions for 2FC, 2CH, 2SM.

H

Hadley, Miss W., Administrative Dept., 2GZ.
 Haines, F. B., Sales rep., 2GZ.
 Halliday, Mrs., Announcer, 6PM.
 Hallsworth, N., Manager, 3YB.
 Ham, G., Engineer, 4BC.
 Hambly, E., Announcer, 3DB-LK.
 Hammer, C., Engineer, 2UW.
 Hanna, F., Engineer, 2GZ.
 Hannah, Miss P., Announcer, 6ML, IX.
 Hannah, R. G., Sales Staff, 6AM, 6PM.
 Hannahm, H. W., Engineer, 2GZ.
 Harding, Lew, Engineer, 3AK.
 Hardman, Gerry, Announcer, 2KY.
 Hardy, D., City Sales Staff, 3SH, 3HA, 3TR.
 Hardy, W., Sales Staff, 2UW.
 Harland, W., Engineer, 4AK.
 Harnett, Dominic, Chief Announcer, 2SM.
 Harper, H., Studio Manager, 4BK, AK.
 Harper, John, Chief Announcer, 2KY.
 Harrington, G. R., Sales Manager, 4GR.
 Harris, A. C., Man.-Director, 3MB.
 Harris, Hector, Secretary, 3AW.
 Harris, Keith, Coastal Rep., 7BU.
 Harris, Lloyd, Engineer, 7LA,

COMMERCIAL BROADCASTING PERSONNEL—(Cont.)

Harrison, Miss C. A., Production, 5DN, Adelaide.
 Harrison, Eric, Gen.-Manager, 2LM.
 Harrison, V. G. H., Director and Secretary, 3XY.
 Harte, B., Technician, 4BH.
 Harty, F. Sturge, Announcer, 2UE.
 Harvey, Anne, Announcer, 3XY.
 Harvey, Miss J., Office Staff, 6AM, 6PM.
 Harvey, Wm. J., Chairman Directors, 4BU.
 Hawthorne, Reg., Production Manager, 2SM.
 Haycroft, V., Announcer, 3YB.
 Hayward, K. P., Sales Staff, 6ML, IX-WB.
 Heaney, Stan., Sport Commentator, 2KO.
 Hearn, C., Announcer, 6PM, 6AM.
 Heath, H., Engineer, 2HD.
 Heath, L. R., Acting Melbourne Manager, 3SH-HA-TR.
 Hele, J. A., Director, 5DN.
 Hemery, P., Chief Announcer, 3SR.
 Henderson, J. B., Chief Announcer, 3YB.
 Henderson, Kingsley A., Director, 3UL, 3SH, 3YB.
 Henwood, R., Technical Staff, 6AM, 6PM, Perth.
 Herring, W. G., Sales Representative, 2WL.
 Hibbert, C. T., Engineer, 2GB.
 Higginbotham, E., Chairman Directors and Man.-Director, 2TM.
 Higgins, A., Sport Announcer, 6AM, 6PM.
 Hill, D., Announcer, 4MB.

Hill, F. T., Engineer, 5DN.
 Hillman, Zelle, Announcer, 3BA, Ballarat.
 Hoad, Arthur E., Asst. Engineer and Prog. Manager, 4CA.
 Hodgkins, Mrs. J., Announcer, 2GZ.
 Hodgman, Brian, Announcer, 7HO.
 Holland, F. R., Engineer-Announcer, 7QT.
 Holland, C., Announcer, 2UE.
 Holloway, E., General Manager, Sales Manager and Chief Announcer, 3MA.
 Holman, D. E., Director and Gen.-Manager, 2DU.
 Holt, Thomas, General Manager 3XY.
 Holtze, A. L., General Manager, 5AD.
 Homfrey, Louise, Announcer, 3UZ.
 Honeyfield, C. H., 2UE.
 Hooper, M., Chief Operator, 3DB.
 Howard, Ken., Sport Announcer, 2KY.
 Howard, Keith, Announcer, 4BC.
 Howell, E., Studio Staff, 2CH.
 Howie, C. R., Engineer, 5DN.
 Hudson, Tom, Announcer, 2UW.
 Hudson, K., Production Manager, 3KZ.
 Hughes, R., 2GB.
 Hume, E. J., Chief Engineer, 5DN.
 Humphrey, Harry, General Manager, 4BU.
 Humphry, J. L., Director, 4AY.
 Huntley, H., Announcer and Engineer, ZJV, Suva.

Hurley, W., Director, 2SM.
 Hurrey, E., Miss, Announcer, 3MA.
 Hutchinson, V., Engineer, 2KM.
 Huxley, C. I., Accountant, 2TM.
 Huxtable, Amy, Continuity Department, 3BO.

I

Ingleton, Miss E., 5DN.
 Innes, A., Announcer, 4AY.
 Irvine, K. J., Director, 2DU.
 Isaacson, A., Assistant Manager, 3KZ.
 Israel, M., Engineer, 3AW.

J

Jack, W., Engineering Staff, 4BC.
 Jackson, B., Secretary, 3KZ.
 Jackson, F. G., Secretary, 2LM.
 Jackson, H. B., K.C., Chairman of Directors, 6IX, 6ML, 6WB.
 Jacomb, Miss M., Typiste, 2TM.
 Jacques, V. A., Continuities, 5AD.
 James, Cyril, Announcer, 2UW.
 James, Miss D., Programme Dept., 2GZ.
 James, Donald, Announcer, 3HA.
 James, R. P., Chief Announcer, 2BH.
 Jameson, John, Station Manager, 2HD.
 Jameson, Mrs. J., Announcer, 2HD.
 Jamieson, Miss M., Programme Department, 2GZ.
 Jarvis, J. E., Announcer and Engineer, 2BS.
 Jeffery, L., Salesman, 4BH.
 (Continued Overleaf.)

LET'S SETTLE THE DUST!



We know you divide those "Rate Card" Coverages" by 2—or maybe 3. We'll go one better—

WE'LL DIVIDE BY FOUR!

Even then you'll find that the other fellow's 100 mile coverage claim doesn't offer nearly as big a market as 2KO's 25 mile coverage **GUARANTEE**. In 2KO's 25 mile area, 250,000 people live and buy, which represents Australia's most concentrated non-metropolitan market. **Advertise with**

2KO

NEWCASTLE

The Best "Test" Market in Australia

YOU CAN'T REACH
BUNDABERG
 and The Burnett
 without



4BU has the winning hold—a friendly hold—making new friends day by day, because of the high standard of programme service. Your Sales Message—to this rich Sugar and Dairying district—could not find a better medium.

BUNDABERG BROADCASTERS Pty. Ltd.

BOURBONG STREET, BUNDABERG,

203 Metres

100 Watts

COMMERCIAL BROADCASTING PERSONNEL—(Cont.)

Jesson, R. A., Sales Service Manager, 2GB.

Johnson, E. B., Director, 4IP.

Johnson, W. J., Director, Secretary and Announcer, 4IP.

Johnston, Wm. W., Secretary, 2HD.

Johnstone, F., Chief Engineer, 3TR.

Joll, David, Clerical, 4BH.

Jones, Jul., Racing Commentator, 7HO.

Jones, Dr. L. M., Managing Director, 2RG.

Jones, Miss M., Announcer, 3BA.

Jordan, Mrs. Dorothy, Announcer, 2GB.

Jordan, Jas., Engineer, 4BU.

Joseph, A., Director, 2TM.

Joyce, D., Announcer and Continuity, 3KZ.

Joyce, James, Sales Promotion Manager, Featuradio Sound Productions (N.S.W.) Pty. Ltd.

Judd, N., Announcer, 2GB.

K

Kauper, H., Technical Supervisor, 3DB.

Keir, G., Chief Announcer, 4RO.

Kelly, G. Dalziel, Director 3UL, 3SR, 3YB.

Keltie, Miss Vera, Announcer, Entertainer, 7BU.

Kemp, S. J. A., Manager, 3SR.

Kemsley, A. N., Director and Gen. Manager, 3UZ.

Kennedy, R., Continuity Writer, A.W.A., Melbourne.

Kennedy, R. D., Director, 4BH.

Kenny, Miss V., Sales Department, 2GZ.

Kermond, L., Engineer, 3YB.

Kerr, A. D., Joint Chief Engineer, 3BA.

Kerry, Shawn, Announcer, 2SM.

Keyworth, F. L., Secretary, 2DU.

King, R. A. Secretary, 2KY.

King, T. B., Announcer, 2KO.

Kingston, F. C., Director, 6ML-IX-WB.

Kinley, R., Assistant Engineer, 7UV.

Kitto, T. C., Director and Chief Engineer, 7UV.

Knapton, H. T., Chairman Directors 2NZ.

Knowles, F., Sales Dept., 2CH.

L

Lake, Miss L., Announcer, 3BA.

Lambert, Terrence, Announcer, 4BC.

Lambert, Cecil, Announcer, 2GZ.

Lambert, G., Announcer (markets), 4BC.

Lamble, Lloyd, Announcer, 3AW.

Lammas, Miss G., Prog. Dept., 2UW.

Lane, R. E., Sales Manager, 2CH.

Langborne, Miss Kitty, Announcer and Continuity, 2GF.

Lange, Bob, Office Staff, 7HO.

Lanyon, C. D., Director, 3MA.

Larkin, J. S., Director, Sales Manager, 3UZ.

Lawford, Thea, Announcer, 2UW.

Lawrence, A. E., Station Manager, 4WK.

Lawrence, C., Sporting Commentator, 2UW.

Layton, K., Announcer, 2CH.

Le Brun, P., Announcer, 4BH.

Ledgerwood, Capt. T., Announcer, 2WL.

L'Estrange, M., Director, 2SM.

Leighton, O. J., Announcer, 2WG.

Leiper, J., Salesman, 2TM.

Le Pla, V., Engineer, 4GR.

Levy, F. E., Sales Manager, 2UW.

Lewis, E. J., Manager, 3UL.

Lewis, H. J., Manager and Chief Engineer, 2GN.

Lewis, L., Announcer, 6WB.

Lincoln, R., General Manager, 5KA.

Lindgren, Kathleen, Announcer, 3AW.

Linke, E., Programme Manager, 5KA.

Linsley-Freeman, S. C., Sales Rep., 2SM.

Lippmann, L., Sydney Rep., "Broadcasting Business."

Lisle, Vernon, Announcer, 2UW.

Littleton, E., Continuity Dept., 4BC.

Long, Miss E., Office Staff, 2TM.

Lord, Tasman, Engineer, 7BU.

Louer, C. R., Engineer, 2GB.

Low, R. D., Director, 4AY.

Lowe, J. K., Announcer and Engineer, 2GN.

Lumsdaine, J., Announcer, 2GB.

Lunn, Lionel, Announcer, 2KY.

Lyons, R., Station Manager, 2UW.

M

Macartney, Sir Edward, Chairman of Directors, 4AK, 4BK, Brisbane.

Macdougall, Mrs., Announcer, 2GZ.

Mackay, Miss Doreen, Announcer, 2SM.

MacKenzie, J. A., Manager, 3GL.

McAlister, C., Announcer, 2GZ.

McArthur, A. H., Director, 2AD.

McCallum, M., 2KY Players.

McCauley, A. L., Director, 2KA.

McColl, Jim, Announcer, 3AK.

McConnell, J. R., Sales Staff, 2UW.

McCormick, N., Announcer, 4MB.

McDonald, I., Announcer, 2KA.

McDonald, K., Accountant, 4MB.

McGennan, Lyla, Women's Session, 3YB.

McGregor, R., Early Morning Announcer, 6AM, 6PM.

McGregor, R. R., Engineer, 3UL.

McGregor, T., Programme Manager and Announcer, 4BC.

McGuinness, G., Sales Dept., 2CH.

McIlwain, Miss D., Typiste, 2TM.

McIntosh, J. C., jun., Director, 2LM.

McKay, James, Race Reproductions, 2UW.

McKinnon, R., Sales Staff, 2UW.

McLaren, A., Accounts Department, 2GZ.

McLean, J. M., Director, 2LM.

McLean, Rex, Engineer, 7LA.

McLennan, Jessie, Announcer, 4BC.

McMahon, R. J., General Manager, 2KA.

McMaster, R., Programme Dept., 3UZ.

McNaught, Miss J., Continuity, 2GN.

McNeil, T. A., Chief Engineer, 2UW.

McSpearin, Mrs. M., Studio Staff, 2CH.

Maddock, J., Studio Staff, 2KA.

Mair, C., Chief Engineer, 3SH.

Maitland, Miss J., Administrative Dept., 2GZ.

Malone, O., Staff Superintendent, 2SM.

Maloney, C., Announcer, 2RG.

Mamouney, J. E., Sport Commentator and Announcer, 3BO.

Manchee, A. F., Chairman Directors, 2GZ, Director 2NZ.

Manning, Miss Hazel, Studio Staff, 2KA.

Manson, E. G., Director, 4BH.

Marcus, Miss R., Studio Staff, 2CH.

Marcus, Royston, Manager, 4IP.

Marden, C. F., General Manager, 2UW, Dir. and Gen. Manager, 4BC.

Mars, A. G. B., Director 4VL.

Marsh, G. W., Director and General Manager, 5DN.

Marshall, Don, Control Room, 2CH.

Marshall, H., Secretary, 4BH.

Martin, W., Engineer, 3HA.

Mason-Wood, E., B.S.A. Dramatist, 2GB.

Masters, John, Announcer, 3AW.

Mather, W., Engineer, 3BA.

Mathers, Arthur, Manager, 3SH.

Matheson, Jean, Announcer and Continuity, 3AK.

Matthews, J., Chief Engineer, 3GL.

Maughan, F., Engineer, 3DB-LK.

Maurice, L., Director, Maurice and Moore, Sydney.

Meakins, S., Engineer, 2HD.

Meany, Rt. Rev. Monsignor James A., Managing Director, 2SM.

Meacham, F. J., Chairman and Managing Director, 4IP.

Mead, J., Chief Engineer, 6GE.

Meeke, R. F., Engineer, 2GB.

Meldon, Miss M., Announcer, 4RO.

Merchant, W., Announcer, 2WL.

Meredith, S., Announcer, 2UE.

Middleton, J. H., Director, 2NZ, Inverell, 2GZ.

Mikkelsen, Miss May, Announcer, 4BU.

Miles, G., Chief Engineer, 7HT.

Millar, C. K., Secretary, 2GZ.

Millar, G., Secretary, 2GB.

Millar, Renn, Chief Announcer, 3DB.

Millen, Senator J. D., Chairman of Directors, 7LA.

Miller, Miss C., Announcer, 4WK.

Miller, Miss E. L., Secretary, 2RG.

Miller, Mrs. ("Mary Ann"), Women's Session, 3SR.

Miller, Rosalind, Continuity Writer, 3AW.

Millson, Gordon, Sport Commentator, 2GN.

Minto, J., Sales Department, 2CH.

Mitchell, E., Announcer and Continuity, 3AK.

Mitchell, V. F., Chairman of Directors, 4BH.

Moginie, K., Announcer, Copywriter, 2TM.

Moller, Percival, Secretary, 4BU.

Monaghan, V., Engineer, 3HA.

Moore, A. S. W., Engineer, 3BO.

Moore, Donald, Announcer, 3TR.

Moore, M., Announcer, 2DU.

Moore, Vida, Stenographer, 7HO.

Moore, W. S. M., Assistant Engineer Announcer, 3BO.

Moors, Hal., Announcer, 3AK.

COMMERCIAL BROADCASTING PERSONNEL—(Cont.)

Moran, C., Technician, 4BH.

Moran, Miss G., Clerk, 4RO.

Morgan, R., Musical Entertainer, 2GB.

Morgan, S., Managing Director, 3KZ.

Morgan, W. V., Director and Adv. Manager, 3KZ.

Morris, F. L., Engineer, 2GZ.

Morris, Marjorie, Announcer, 3UZ.

Morrow, J., Engineer, 2GB.

Morse, Hilda, Announcer, 2UW.

Moss, W., Salesman, 2HD.

Munro, Mabs., Announcer, 7LA.

Murdoch, Sir K., Director, 3DB-LK.

Murphy, Jas., Engineer, 3HA.

Murray, A. J., Sales Manager, 3KZ.

Murray, John, General Manager, 2NZ.

Murray, T. G., Director, 2SM.

Musgrove, M. D'O., Director, 6IX, 6ML, 6WB.

Myers, Lewis, Announcer, 3UZ.

N

Neary, Joy, Children's Session, 4CA.

Negri, T., Announcer, 3BA.

Neill, Catherine, Announcer, 3XY.

Nettleford, Len., Director, 7HO.

Neville, J., Announcer, 3BA.

Nicholas, Wm., Chief Engineer, 7HO.

Nicholls, Cliff, Announcer, 3AW.

Nicholson, D., Announcer, 5DN.

Nicholson, R. M., Managing Director, 4LG.

Nilsen, Oliver J., Governing Director, 3UZ.

Nilsen, O. V., Director, 3UZ.

Nolan, W., announcer, 4IP.

Nolte, Geo., Engineer, 3AW.

Noonan, Miss M., Announcer, 2LM.

Norgrove, N., Announcer, 2CA.

Norman, E., Programme Department, 3UZ.

Norman, Miss N., office staff, 2NZ.

Norton, C., Announcer, 5AD.

O

O'Brien, Basil, announcer, 7UV.

Ockendon, Miss Muriel, Secty., 7UV.

O'Hagan, J., Salesman, 3AW.

O'Halloran, M., Sales Manager, 5KA.

O'Keefe, Arthur, Announcer, 2GZ.

O'Neill, J. P., Director, 2KA.

O'Neill, N., Director, 2SM.

Oliver, J., Salesman, 3AK.

Oliver, L. M., Managing Director, 2MO.

Opie, Dr. A. J., Director, 2LM.

O'Rourke, Miss J., Office Staff, 4BH.

O'Sullivan, N., Director, 4BH.

O'Sullivan, P., Monitor, 2LM.

Otley, E., Musical Director, 4BC.

P

Pacini, H., Director, 3DB-LK.

Paddison, Alfred C., Director, 2KA.

Paice, H., Engineer, 3MB.

Paine, D. W., Secretary, 3MB.

Palmer, G., Continuity Writer, 3DB-LK.

Palmer, G. F., Managing Director, 3AK.

Palmer, G., Accounts Dept., 2GZ.

Parish, C., Studio Manager and Announcer, 7BU.

Parker, N. A., Engineer, 6IX.

Parkinson, W., Director, 4IP.

Paton, J., Continuity Writer, 3UZ.

Paton, R. S., Secretary, 7HO.

Patton, J., Sales Staff, 6AM, 6PM.

Pearce, Miss A., Sales Department, 2GZ.

Pearce, F., Salesman-Announcer, 3BO.

Pearson, Miss A., 6AM, 6PM, Perth.

Pearson, A. H., Director, 3MB.

Peaston, Hugh, Announcer and Technician, 4WK.

Peck, Gordon, General Sporting, 2UW.

Pengilly, L., Engineer, 2TM.

Penny, Warren, Announcer, 3AW.

Penny, W. L., Announcer, 2TM.

Perriam, A. W., Director, 2GB.

Petters, H. D., Sales Department, 2CH.

Pfeil, H., Melbourne Rep. "Broadcasting Business."

Phillips, J., Engineering Staff, 2UW.

Phillips, P., Engineering Staff, 2UW.

Phillips, Stan., Sport Announcer, 4BC.

Phillips, Miss D., Office Staff, 2TM.

Phipps, W., Technical Staff,

COMMERCIAL BROADCASTING PERSONNEL—(Cont.)

Schmidt, R., Engineer 3TR.
Schneider, Mrs. W. K., Announcer
5KA.
Schneider, W. K., Assistant Manager
5KA.
Scholes, N., Announcer and Production Manager, 2HD.
Schultz, L., Chief Engineer 2GB.
Scott, Dulcie, Announcer 4BH.
Scott, Eric, Announcer, Script Writer 2UW.
Scott, R. J. H., Pianist 2GZ.
Scriven, Gordon, Cadet Engineer
4IP.
Scrivener, Phyllis, Accountant 4IP.
Searle, A., Engineering Staff 4BC.
Sellars, Vernon, Announcer, 2UE.
Semfel, E., Engineer, 4RO.
Seward, M. D., Director, 2NZ.
Sharland, A. B., Control Room, 2CH.
Sharp, J. A. Salesman-Announcer,
2LM.
Shaw, Eric C., Publicity Manager,
2SM.
Shaw, Miss G., Announcer, 2UE.
Shaw, N. L., Director, 2UE.
Shearstone, V., Announcer, Technician,
2AY.
Sheekey, M., Secretary, 2WG.
Sheffer, H. M., Director, 2TM.
Sheppard, N. M., Superintending
Manager, 3UL, 3SR, 3YB.
Shepherd, L., Director, Chief Engineer,
3XY.
Shepherd, Miss N., Clerical, 4BH.
Shipp, Emily, Senior Clerk, Asst.
Announcer, 3BO.
Shiren, Alex., Announcer, 4BC.
Shortell, R., Chief Engineer, 3SR.
Sibary, H., Station Manager, 6PR.
Simmons, H. T., Chief Engineer,
6IX, 6ML, 6WB.
Simmons, N. W., Managing Director,
6KG.
Simpson, E., Director, 2AD.
Sirl, C., Engineer, 6WB.
Skeggs, Miss R., Office Staff, 6AM.
Skirrow, Miss B., Sales Dept., 2GZ.
Slater, W. W., Copywriter, Argus
Broadcasting Services Ltd.
Sleath, H., Programme Director,
4BH.
Sleep, M., Engineer, 3DB-LK.
Sloman, M. G., Director, 3KZ.
Smith, C. P., Director 6ML, 6IX
6WB.
Smith, G. I., Advertising Dept.,
Announcer 2WL.
Smith, Ronald, Cadet Engineer, 4IP.
Smith, S., Engineering Staff, 4BC.
Smyth, P. A., Salesman, 5DN.
Sommerlad, Hon. E. C., Director,
2NZ, 2AD.
Sorrelle, M., Dramatic Dept., 4BC.
Sorrelle, P., Dramatic Dept., 4BC.
Spann, Miss G., Typiste, 2TM.
Sparkes, E., Announcer, 2HD.
Sparkes, R. C., Sales Manager, 2HD.
Spence, Eric, Announcer, 3AK.
Spencer, T., Manager, 2CH.
Spinner, L., Engineer, 2KY.
Spitzkowsky, M., Engineering Staff,
2KO.
Spooner, A., Engineer, 6WB.
Spowers, Allan, Director, 3UL, 3SR,
3YB.

Stallard, H., Dramatic Dept., 4BC.
Stanley, Chas., Announcer, 2CH.
Stapleton, B. B., Sales Rep., 2SM.
Stelling, L., Salesman, 3DB-LK.
Stelzer, Mrs. W. J., Announcer, 2GB.
Stephens, Miss M., Announcer, 5DN.
Stephenson, Miss V., Copy Dept.,
4BH.
Stephenson, B., Engineering Staff,
2UW.
Stevens, D. A., Production Dept.,
5DN.
Stevens, E. S., Chief Engineer, 2NZ.
Stevens, F., Control Room Supervisor,
2CH.
Stevens, Miss L., Record Library,
5DN.
Stevenson, C. V., Managing Director,
2UE.
Stevenson, M. H., Chief Engineer,
2UE.
Stevenson, N. M., Studio Manager,
2UE.
Stewart, K., Engineer, 2CH.
Stewart, R., Salesman, 2TM.
Steyne, R., Producer, 3XY.
Stirk, F., Engineer, 2GB.
Stirling, Nell, George Edwards' Productions,
2UW.
Stokes, G., Salesman, 2UE.
Storey, O. J. Announcer and Manager,
2BS.
Storr, J., Announcer, 3XY.
Strange, C. A., Studio Manager, 3SR.
Stuart, J., Announcer, 3DB-LK.
Stuart, R. A., Studio Manager, 3XY.
Sullivan, R., Technician, 4BH.
Sullivan, R., Announcer, 5DN.
Sutherland, G. B., Chief Engineer,
4BC.
Sutherland, George, Director, 3AW.
Sutherland, G., Director, 3HA.
Swain, Norm., Announcer, 3KZ.
Sydes, Val., Chief Engineer, 7LA.
Syme, David F., Managing Director,
3SH, 3HA, 3TR.
Syme, G., Director, 3AW.
Syme, J. H., Director, 3AW.
Syme, M., Director, 5DN.
Syme, Maisie A., Director, 3SH, 3TR.
Symons, A. J., Salesman, 4BC.

T
Taafe, Miss A. A., Typiste, 2TM.
Tait, Frank S., Director, 3AW.
Tait, Gordon L., Programme Manager,
3AW.
Tait, John H., Director, 3AW.
Talbot, H., Statistical Dept. and Announcer,
4BC.
Tankard, Capt. B. L., Publicity and Special Sessions, 4BH.
Tapper, J., Engineer, 6ML.
Tareha, C. A., Chief Engineer, 5KA.
Taylor, C. E., Programme Director,
3DB-LK.
Taylor, C. P. A., Director, 3BA.
Taylor, G., Director, 3DB-LK.
Taylor, John T., General Manager,
3AW.
Taylor, K. A., Director, 3BA.
Taylor, N., Announcer, 6ML.
Taylor, R. B., Secretary, 2BH.
Taylor, Miss Vivienne, Dramatic Dept., 4BC.
Teese, L., News Editor, 3XY.

Thomas, H. A., 5DN.
Thomas, H. K. R., Engineer, 2GB.
Thomas, Madge, Announcer, 3XY.
Thomas, N., Assistant Secretary,
6AM, 6PM.
Thomas, Miss N., Office Staff, 6AM.
Thomas, P. B., Secretary, 4WK.
Thomas, Richard Chas., Manager and Chief Announcer, 7HT.
Thomas, S., Sales Dept., 3XY.
Thompson, E. J. K., Secretary, 3UL,
3YB, 3SR.
Thompson, M., Engineer, 3DB-LK.
Thorn, Arthur, jr., Chief Announcer,
5KA.
Thring, O., Director, 3XY.
Thurling, S., Engineer, 3KZ.
Thwaites, F. J., Production, 5KA.
Tilley, Claude, General Manager and Sport Commentator, 3AK.
Tonge, A., Technician, 4BH.
Tonkin, S., Chief Engineer, 2LM.
Towner, A. D., General Manager,
7BU.
Tozer, J. H., Sales Manager, 6PM,
6AM.
Tredrea, F. T., Chief Engineer, 6AM,
6PM.
Trehewie, J., Engineer and Announcer,
7BU.
Trotman, E. V., Programme Manager and Chief Announcer, 3BA.
Tupper, Fred., Announcer, 3AW.
Turnbull, Iris, Women's Section,
3DB.
Tuttell, John, Announcer, 2SM.
Twyford, John, Country Sales Organiser,
2NZ.
Tyson, R., Announcer, 4BH.

U
Upton, Miles, Continuity Writer and Announcer, 3AK.
Urquhart, M., Engineer, 6ML.

V
Varley, Gwen., Announcer, 3AW.
Vaude, C., Announcer, 3DB-LK.
Vautier, Miss D., Announcer, 2GB.
Vertigan, R. M., General Manager,
7QT.
Virgona, W., Engineer, 3UZ.
Voigt, Rion, Announcer, 2KY.

W
Walker, Eric, Announcer, 2KY.
Walker, John, Programme Supervisor and Announcer, 2NZ.
Walker, R., Continuity Writer, 3KZ.
Walls, June, Secretary, 3SH, 3HA,
3TR.
Walsh, E., Announcer, 2UE.
Walsh, O., Director, 7UV.
Walters, Miss Mona, A.Mus.A., Programme Directress, 4IP.
Ward, Eileen, Announcer, 7QT.
Ward, Tom, Announcer, 2LM.
Wardle, T. R., Salesman, 3AW.
Warren, Derek, Continuity, 3AW.
Warrington, Miss J., 5DN.
Watson, J. A., Advertising Manager,
2KO.
Watt, Miss M. L., Chief of Staff,
5DN.
Webb, Mrs. M., Children's Session,
4CA.
Webber, A., Announcer, 2KO.
(Continued foot opposite page.)

Australian Radio Publications

THE following details concern the various publications issued by Australian Radio Publications Ltd. Head office, 30 Carrington Street, Sydney, 'phone B7188 (3 lines). Branch office, Mingay Publishing Co., 422 Little Collins Street, Melbourne, 'phone M5438. Interstate representatives:—C. R. Porter, C/- Broadcast Services, Queensland National Buildings, Cnr. George and Turbot Streets, Brisbane, 'phone B9659; H. L. Russack, C.M.L. Building, King William Street, Adelaide, phone C1.3244.

Managing Director and Managing Editor, Oswald F. Mingay, M. Inst. R.E. Aust. Technical Editor, J. R. Edwards, A.M. Inst. R.E. Aust. Advertising Manager, G. W. Doyle. Advertising Rep., E. R. Clark. Melbourne Rep.: R. W. Pfeil.

Publishers of BROADCASTING BUSINESS (weekly business paper for commercial broadcasting station activities); BROADCASTING BUSINESS YEAR BOOK (containing all reference matter for those interested in commercial broadcasting); RADIO RETAILER OF AUSTRALIA (established 1930; weekly trade journal covering the radio industry throughout Australia); RADIO REVIEW (monthly technical publication, recording the progress of radio in Australia); RADIO TRADE ANNUAL (an annual publication, published about May of each year, containing all reference matter required by those engaged in radio).

BROADCASTING BUSINESS, published by Australian Radio Publications Ltd., 30 Carrington Street, Sydney. National weekly trade paper covering activities of commercial broadcasting stations throughout the Commonwealth, issued every Thursday. Circulates to broadcasting stations, advertising agents, national advertisers, etc. Price 6d. per copy, or by subscription, 15/- p.a. (52 issues post free), including copy of the Broadcasting Year Book. Advertising page size 9in. x 7in., three 13 em. columns (2-1/6in.) per page. Overall size 11in. x 8½in. Blocks, half tone, 110 screen.

BROADCASTING BUSINESS YEAR BOOK, published annually, about July, by Australian Radio Publications Ltd., 30 Carrington Street, Sydney. Contains full particu-

lars of all commercial stations in the Commonwealth, also various acts, regulations, applicable to broadcasting; complete survey of listeners' licence figures, and includes a who's who in broadcasting. Price 10/- per copy, post free in Australia, 15/- overseas. Included free in annual subscription to Broadcasting Business of 15/- p.a. in Australia. Advertising page size 9in. x 7in., two columns 20 ems (3½in.) per page. Overall size 11in. x 8½in. First published in 1936.

RADIO RETAILER OF AUSTRALIA, published by Australian Radio Publications Ltd., 30 Carrington Street, Sydney. The only national weekly trade newspaper covering the radio industry in Australia, dealing chiefly with the merchandising side of all radio and electrical domestic appliances, and service problems. Subscription 15/- p.a., 6d. per copy. Advertising page size 9in. x 7in., three 13 em columns (2-1/6 in.) per page. Overall size 11ins. x 8½ ins. Blocks half tone, 110 screen.

RADIO TRADE ANNUAL OF AUSTRALIA, published about May of each year, by Australian Radio Publications Ltd., 30 Carrington Street, Sydney. —A stiff-covered cloth bound year book, published every year since 1933. Contains over 300 pages, covering all subjects allied to radio, including particulars of broadcasting stations; wireless acts and regulations; patents information; trade association data; manufacturers and wholesalers' directory; a who's who in radio, and over 100 pages of up-to-date technical information of interest to all technical men. Price 10/- per copy, post free (included in subscription to Radio Retailer). Overseas price 15/- per copy, post free. Advertising page size 9ins. x 7ins., two columns 20 ems (3½in.) per page. Overall size 11ins. x 8½ins. Blocks half tone, 110 screen.

RADIO REVIEW OF AUSTRALIA, published by Australian Radio Publications Ltd., 30 Carrington Street, Sydney. A monthly technical journal covering the technical side of all radio activities in Australia. Price 1/- per copy, or by subscription, 10/- p.a., post free. Advertising page size 9ins. x 7ins., columns 20 ems 3½ins., and also

COMMERCIAL BROADCASTING PERSONNEL—(Cont.)

Webber, F., Musical Arranger, 2SM.
Weiss, C., Salesman, 3AK.
Welch, Eric., Race Commentator,
3DB.
Weldon, Dan, Production Manager,
2KY.
Wells, F. F., Transcription Dept.,
5DN.
Wells, H. R., Programme Manager,
6PM, 6AM.
Whale, N. O., Secretary, 2KO.
Wheeler, J. S. Announcer and Salesman,
2UW.
Whitcomb, T., Director and Chief Engineer, 2TM.
White, D., Secretary, 6PM, 6AM.
White, E., Manager, 4VL.
White, G. N., Director, 5RM.
White, R. M., Assistant Manager,
5DN.
White, Syd., Engineer, 3AW.
Whitford, Alice, Director, 6AM, 6PM
Whitford, Archer, Director, 6AM,
6PM.
Whitford, Frank, Director, 6AM,
6PM.

Whitford, F. R., General Manager,
6AM, 6PM.
Whitford, Irene, Director, 6AM, 6PM
Whitmore, J. W., Musical Director,
2TM.
Whykes, E. J. W., Secretary and Advertising Manager, 3BA.
Whyte, A., Director, 3DB-LK.
Willy, Dorothy, Announcer, 3TR.
Wilde, R., Announcer, 2HD.
Williams, C. P., Advertising Manager,
4AY.
Williams, Esme, Publicity Officer,
2KY.
Williams, W. H., Director, 3AK.
Willis, M., Programme Dept., 2GZ.
Wilson, Ella, Continuity, 3AW.
Wilson, Harper, Programme Director,
3UZ.
Wilson, H. B., Maintenance Engineer,
5AD.
Wilson, K. H., Production Dept.,
5DN.

Wilson, Pat., Announcer, 3UL.
Wilson, P. Graham, Announcer, 2CH
Wilson, Miss P. L., Office Staff, 2LM
Wilson, W. A., Joint Chief Engineer,
3BA.
Winn, A., Dramatic Dept., 4BC.
Wishart, A. P., Director, 5RM.
Witt, Fred., Musical Director, 2KY.
Wolf, R. H. H., Secretary, 2UE.
Wood, Miss C. H., Secretary to General Manager, 2UW.
Wood, D., Engineer, 6WB.
Wood, E. A., Manager, 7UV.
Wood, I., Announcer, 7UV.
Woolley, H. F., Announcer, 5DN.
Worrall, David, General Manager,
3DB-LK.
Wright, G., Engineer, 3AK.
Wynne, A. P., General Manager,
4MB.

Y

Yeldon, Russell A., Director and General Manager, 2WL.
Young, J., Announcer, 5AD.
Young, Nancye, Announcer, 7LA.
Young, —, Engineer, 2CH.

GEORGE EDWARDS' PRODUCTIONS

Following is a list of features and dramas produced by George Edwards and broadcast over the Stations whose call signs are shown, together with the sponsors of the programmes mentioned, and commencing dates:—

"Notable British Trials," a series of ten plays 2GB, 2HD, 3KZ, 4BK-AK, 4IP, 5DN, 6PR, 7HO, sponsored by British Australasian Lead Manufacturers (B.A.L.M. paints).

"William the Conqueror," "Hunchback of Notre Dame" and "Westward Ho": 2UW, 2GZ, 2HD, 2LM, 3KZ, 3XY, 3BA, 3MA, 3GL, 4BC, 4BK, 4MB, 4BU, 4RO, 4MK, 4TO, 4CA, 5DN, 6PR, 7HO, 7LA (for "Westward Ho" add. 7UV).

"Knights of the Round Table": July 12, 1937, to October 15, 1937: 2UW. Sponsored by W. W. Campbell.

"Inspector Scott of Scotland Yard" series of 13 dramas, and "Darby and Joan" (evening session), 2KO, 3KZ, 4BK, 4RO, 5DN, 7LA.

"The Search for the Missing Link," May 11, 1936, to November 6, 1936: 2UW, 3KZ, sponsored by Wrigleys.

"David and Dawn with George Edwards in Fairyland," May 11, 1936, to October 9, 1937. 2UW, sponsored by Sydney Snow Ltd.

"The Love Stories of Casanova," May 11-September 3, 1936, 2UW, and "The Return of Casanova," September 7—November 12, 1936, 2UW, sponsored by H. L. Bussell and Co.

"It is Never Too Late to Mend," "Six Wives of Henry VIII," "The Love Stories of Queen Elizabeth," "Indiscretions of Charles II," "The Sun King," "Nero the Tyrant of Rome," "The Borgias," "Trial of George Joseph Smith," "The Mystery of Edwin Drood" and "Dombey and Son," May 11, 1936, to April 1, 1937, 2UW, sponsored by W. W. Campbell and Co. Ltd.

"Fifty Famous Women Series," nine plays, April 5—July 5, 1937, 2UW, sponsored by W. W. Campbell and Co. Ltd.

"The Case of the Vitriol Thrower," "Cave of Horror," "Murdered Stranger," "House of Hatred," "Druid Priest," "Missing Clue," "Chinese Treasure," "Stolen Trophy," "Mysterious Harp," "Wicker Basket," "Vendetta," "Broken Statue," "Missing Heir," May 11—August 6, 1936, 2UW, sponsored by S. R. Buttle Ltd.

"George Edwards Fantasia," July, 1936, 2UW, 2GZ, 2HD, sponsored by Aspro.

"King's Organist," "Love Story of Lord Nelson," "Life of Giuseppe Verdi," "George Edwards Follies," "The First Prophet of Israel," "Impulse," "More Phantoms of Fantasy," "Dmitri the Impostor," "The Genius of John Sebastian Bach," "The Monument of Colonel Light," "Further Phantoms of Fantasy," "The Story of Esther," "The Pavilion by the Lake," "The Founder of Constantinople," "The All Conquering Cellini," "Boris Godunov," "Jury's Verdict," "The Moonlight Sonata," "Espionage," May 10, 1936, to January 31, 1937, 2UW, 2GZ, 2HD, 3KZ, 3BO, 3TR, 3HA, 4BK, 4AK, 5KA, 7UV, sponsored by Aspro.

"The Sin of David," "A Romance of Picardy," "The White Ship," "The Grim Reaper," "The Snake Charmer," "The First Czar of Russia," "The Black Cloud," "The Ten Plagues of Egypt," "Sugger's Gold," "The Father of His People," "Fall of the House of Usher," "The Romance of Robert Schumann," "The Inevitable," "Saul, the First King of Judea," "Soul of Audrey Summers," "Legend of the Londonderry Air," "The Girl with the Golden Eyes," "Phantoms of Fantasy," "Joan of Arc," "The Phantom Plane," "The Jeweled Sword of Morgal Khan," "The Guardian of Scotland," "The Promised Land," "The Pit and The Pendulum," "The Painted Fan of Yo Shan," "Richard Double-Dick," "The Love of Prince Igor," "A Dickens Fantasy," "Morte D'Arthur," "Icebound," "The Illustrious House of York," June 7, 1936, to May 1, 1937, 2UW, 2GZ, 2HD, 3KZ, 3BO, 3TR, 3HA, 4BK, 4AK, 5KA, 7UV, sponsored by Aspro.

"The Elusive Baronet," March, 1937, 2UW, sponsored by De Witts Pills.

"Dad and Dave from Snake Gully," commenced May 31, 1937, 2UW, 2KO, 2GZ, 3DB—LK, 4BK-AK, 5DN—MU—PI, 6IX-WB, sponsored by Wrigleys.

"Fifty Famous Women," 3KZ, 4BK, 5KA.

"Mannequin in Paris," 2UW, sponsored by McDowells.

"Darby and Joan," 2UW, sponsored by W. W. Campbell, Treasure Store, and S. R. Buttle Ltd.

"Voice of the People," "Last Hundred Years," "Dust of the Ages," 2KO, 2KZ, 4BK-AK, 5DN, 7LA.

"Darby and Joan," 2KO, 3KZ, 4BK-AK, 5DN, 6IX, 7LA.

"Cavalcade of Industry," June 14, 1936, to July 17, 1937, 2UW, sponsored by Tea Marketing Expansion Bureau.

THE R.I.F. CLUB OF SYDNEY

(Radio Industry Functions' Club)

A Social Club, proceeds for Charity — formed by those engaged in the Radio and Broadcasting Industry.

MEMBERSHIP APPLICATION.

I (full name)

of (firm's name)

do hereby apply for Membership of the R.I.F. Club of Sydney and agree to abide by the rules.

Herewith is my subscription fee of 5/- (year commences March 1st).

Signed

Date

Secretary's Office: 30 Carrington Street, Sydney, Box 3765, G.P.O., Sydney.

WHO'S WHO In Australian Commercial Broadcasting

The following particulars are supplied by the persons and no responsibility is accepted by the publishers for any errors or omissions. All persons prominent in Commercial Broadcasting are requested to advise the Editor of any alterations required.

A

ANDERSON, George Herbert: General Manager Country Broadcasting Services Ltd. Director, Northern Broadcasters Ltd. (2GZ and 2NZ). Pre-war Civil Engineer. Railway Survey and Construction. War, 43 years' service with A.I.F.



After war, 4 years orchardist, grazier and farmer (Director, Derwent Valley Fruitgrowers' Co-op. Ltd.); 2 years business agency; 8½ years Assist. General Secretary, the Graziers' Association of N.S.W. Private address: "Hillside," 1 Highlands Av., Gordon, N.S.W. Born 20/3/97, Hobart. Tas. Member Tattersall's Club. Recreations: Golf, tennis and swimming.

APPERLEY, Geo. (M.Inst. R.E., Aust.): Manager of Communications, Amalgamated Wireless (A/sia) Ltd., Melbourne. Early training and experience telegraphy, telephony and wireless with N.Z. Govt. Telegraphs. 1910-1912 Wireless Service of British Colonial Government. 1913 joined A.W.A. 1914-1916 Chief of Marconi Wireless School. 1916-1919 A.W.A. Works Manager. 1919-1923 A.W.A. Technical Superintendent and i/c Patent Dept. 1924, i/c Beam Wireless Service. Visited England and the Continent of Europe in 1924 and again in 1933 on Beam Wireless investigation. 1937 in England. Born 24th March, 1887.

ARMITAGE, John: Sales Service Manager, 2GB Sydney. Transferred from the editorial side of newspaper work when he became Advertising Manager of "The Cairns Daily Times Ltd." in 1917, after placing the shares and arranging the details for the company flotation. In 1923 joined "Hong Kong Daily Press" as night editor, and the same year was appointed Advertising Manager of "The Directory and Chronicle" of the Far East, published by "The

Daily Press." Then went to Mexico to write editorials and supervise advertising in a special Japan-Mexico edition of the "Japan Chronicle." When completed, during next 7 years,



was attached to a number of North American broadcasting stations. Appointed to 2GB in June, 1934. Publications: "Wing Po" (novel) and "The Chinese Constitutional System" (economics).

B

BAIRD, William Reginald, A.M.I.R.E. (U.S.A.): Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney, N.S.W. Joined A.W.A. Marine Service, 1921. Transferred Coastal Radio Service in 1926, and later to technical section of Broadcasting Department. Transferred Head Office Engineering Department 1932. Private address: 687 Old South Head Road, Rose Bay. Born Fremantle, 1902.

BAIRNSFATHER, Tom Duncan, M.C.: Order of the Crown of Italy. Announcer 2KY Sydney. Educated at Oundle, Northants, England, Royal Military College, Sandhurst; served throughout Great War in France; Armistice Commission, Russia, Afghanistan and China. Invalided from Regular Army with rank of Captain. Commenced broadcasting, 1928 2LO London, and since arrival in Australia has broadcast from 3LO, 3AR, 3GL, 2FC, 2BL, 2CH, 2UE. Recreations: Swimming, boxing, golf, and motoring. Hobbies: Work.

BARKER, Jacob Harry, Jun.: Managing Director, Diamond-point Services Pty. Ltd., 1920-1924, Special Agent, Department of Commerce, Washington, D.C. Chief Investigation section Western Electric Company Inc. New York City, 1925-28. Assistant Export Manager, Electrical Research Products Inc., 1929. Established, Western. Electric

BARKER, J. H. (Cont.)



Company (New Zealand) Ltd. and later Managing Director of Western Electric Co. in charge operations in Australia, New Zealand, Dutch East Indies and Straits Settlements. In present position since April, 1936. Private address: 16 Ocean Avenue, Edgecliff. Born 26/1/1894 Oakland, California, U.S.A. Married. Clubs: Royal Sydney Yacht Squadron, N.S.W. Aero Club, N.S.W. Lawn Tennis Club, Tattersall's.



ter Sound," Pitt Street, Sydney. Later, engineer 2UW, Sydney. Rejoined A.W.A. Engineering Department, and engaged on H.F. experimental work 12 months. Transferred to Marconi School of Wireless as Lecturer. Appointed first manager 4CA May, 1936. Born 6/5/01. Sydney. Private address, 222 Grafton Street, Cairns. Married.

BAUME, Sydney Erne: LL.B., M.I.S.B. (Aust.): Advertising Manager, 2UE Sydney. Educated Waitaki (N.Z.), Boys' High School and Victoria University College. Many years U.S.A., Canada, Mexico. Joined



2CH in 1933, joined 2UW as an announcer and advertising executive late 1933, joined 2UE as Advertising Manager, 1934. Lecturer and author of various treatises on radio advertising and practice. Recreations: Motoring, boxing and swimming.

BEARD, Ernest Gordon, M.Inst.R.E. Aust.: Director Ace Amplifiers Ltd., 10 Grosvenor Street, Neutral Bay, 1914, joined R.N. for wireless work; 1919, Christiana W.T. Station, Jamaica, experimental work R.N. Signal School, Devonport, 1920, transferred R.A.N. 1924-29, Chief Engineer, United Distributors Ltd.; 1930, President Wireless Institute of Australia (N.S.W. Div.). 1931, Chief Engineer and Managing Director Ace Amplifiers. Built original 2GB and 2KY broadcasters. Patentee of numerous inventions. Private address: 14 Dalkeith Street, Northbridge. Born March, 1897, Derby, England.

BEATTIE, Stuart: Studio Manager and Senior Announcer, Broadcasting Station 2NZ Inverell. Previously "Good Morning" man on 2CH, concert baritone, etc. Private address: Andrew Street, Inverell, N.S.W. Born Brisbane, 1898.

BEAVER, Herbert Edward: Manager, Station 2KY, Sydney. One of radio's early personalities, joining 2KY at its inception 10 years ago and was responsible for 2KY's first children's radio club, with a membership of over 30,000; conducted the children's party at Marcus Clark's for over 5 years. Wrote and produced the Christmas Pantomimes. Private address: "Capri," Blair Street, Bondi. Born 23/3/97, Broken Hill, N.S.W. Member of North Brighton Golf Club and Magicians' Club. Recreations: Golf and magic.

Who's Who in Commercial Broadcasting (Continued).

BENNETT, A. E., A.C.A. boola, Vic. Married. Clubs: R.S.S.I.L.A., Royal Yacht Club Sydney. Was public accountant by profession before he entered the field of radio entertainment in 1926, since when all his energies have gone into station 2GB, and building up



equipment and maintained a service route from the Observatory to headquarters in Washington. From there went to London and two years later obtained doctorate for Radio Investigations of the Ionosphere. Then in charge of the British Polar Year expedition work in Norway. Returned to Australia and carried out investigations for the Australian Radio Research Board until joining A.W.A. in 1934. Has published a number of papers on various aspects of radio research. Recreations: Tennis and swimming. Born, 21/6/06.



BROOKER, Vivian M., M.Inst. R.E.Aust., M.Inst.R.E. (U.S.A.), M.I.W.T. (London): Manager Broadcasting Division, Amalgamated Wireless (A/sia) Ltd. Joined Amalgamated Wireless in 1917. During 1926 was Chief Wireless Officer of s.s. "Jervis

Australian commercial broadcasting. Realising that Australian B class stations have much to learn from similar broadcasting systems in U.S.A., has twice visited that country in search of new ideas. Introduced American Radio transcriptions, and on his 1934 trip obtained exclusive Australasian rights to the World Broadcasting Wide Range Recordings. President of the Ausn. Federation of Broadcasting Stations for 1935 and 1936. In the latter part of 1935 the Broadcasting Service Association was formed, and Mr. Bennett was appointed Joint Managing Director. He spends much of his time flying between Melbourne, Adelaide, and Sydney in connection with commercial broadcasting.

BENNETT, Alfred Lewis, L.D.S.: Studio Manager 2TM Tamworth. Seven years dance band and theatrical experience. With 4BH for seven months,



staff of the superintending engineer, Newcastle, England (Post Office Department). Later he was attached to the engineer-in-chief's staff, London, in charge of cable designs and the undergrounding of telephone lines. In 1922 selected by the Commonwealth to act in an advisory capacity in carrying out a large works programme of the Postmaster General's Dept. Appointed present position December, 1923. Born 28/12/1878.

BROADBENT, Jack: Studio Manager and Chief Announcer, 7HO, Hobart. After the war, secretary to G.O.C. in United Kingdom. In radio for over 12 years, 7ZL, 3LO, 3AR. Has been with 7HO for over five years. Private address: Cnr. Harrington and Davey Streets, Hobart. Born 19/6/1898, Dim-

BROWN, Harold Percival, C.M.G., M.B.E., M.I.E.E.: Director-General, Postmaster General's Department, Commonwealth of Australia, Treasury Gardens, Melbourne. As a youth on the



BUILDER, Geoffrey, B.Sc., Ph.D., F.Inst.P., A.M.I.E. (Aust.): M.Inst.R.E. Aust., Officer-in-charge of A.W.A. Research Laboratories, Ashfield. Educated at Guildford Grammar School, W.A., University of W.A., University of London.

One time Observer at the Watheroo Observatory of the Carnegie Institution of Washington. There carried out experiments with low power radio



COCHRANE, Arthur Stanley: Senior announcer, broadcasting station 2CH, 77 York Street, Sydney. The greater part of his life was spent in Melbourne. Came to Sydney in 1914 and joined Farmer & Co. Ltd., with whom he spent several years. When the company secured the first "A" class broadcasting licence he was the first "A" class announcer in Australia, commencing in 1923.

CARRUTHERS, Thomas Ramsay, Media Manager J. Walter Thompson (Aust.) Pty. Ltd. Educated Sydney Technical High School. Studied architecture before entering advertising. Joined J. Walter Thompson (Aust.) Pty. Ltd. in 1931, and for several years acted as Production Manager. Recreation: Golf.

CARSON, Charles R.: Manager 4BH, Brisbane, since August, 1936, and previously programme manager 4BC, Brisbane. Originally in Queensland Railways service, and first became interested in radio through association with Brisbane Repertory Society, from which he graduated to position as announcer with 4BC. Was also connected with sales staff of J. B. Chandler and Co., Brisbane. Born and educated at Rockhampton, Queensland.

CHANDLER, John Beals: Born Norfolk, England, in 1887, and arrived in Australia in 1907. In 1913 established the firm of J. B. Chandler & Co.,



of Brisbane. Prominent Radio and Electrical Wholesaler; also interested in several Broadcasting Stations.

CHASTON, Neta: Programme Director, 7HT Hobart. Past experience: Production at 5DN Adelaide. Private address: Murray Street, Hobart. Single. Born Adelaide, 19/2/08. Recreations: Radio.

CLUBB, Alex. M.: A. M. Clubb and Co. Ltd., 76 Clarence Street, Sydney. Qualified electrical Engineer, early training with Aberdeen (Scotland) City Council Electricity Dept. Arrived Australia 1922, commenced with Scott and Co. (A/sia) Pty. Ltd. Melbourne, when this company was formed, representing A.E.G., Berlin, and Telefunken, Berlin. Continued with Scott & Co. until 1929 when own business was formed in Sydney, taking over amongst others N.S.W. Agency for Telefunken Radio. A pioneer of Recording of Acetate Discs in Australia.

COLDWELL-SMITH, Charles Edmund: Manager Grafton Broadcasting Co. Ltd. (Station 2GF). Three and a half years marine operating. Eight years Merchandising Department with A.W.A. Three and a half years in present position. Holds 1st Class Washington Certificate. Private address: Commercial Hotel, Grafton. Born 21/8/1896 Ballarat, Vic. Single. Clubs: Rotary Grafton, and Grafton Club. Recreations: Fishing and shooting.

COLMAN, Eric: Joined 2GB as Announcer in December, 1932. Chief Announcer, January, 1934. Formerly on staff of Universal Pictures, Sydney. Played part of "Flying Padre" in "Splendid



Fellows" (Australian film), and also small part in "Flying Doctor." Appeared in several amateur productions in London and Sydney. Brother to film star, Ronald Colman.

COLVILLE, Sydney: Councillor and Member Inst.R.E.Aust. Proprietor Colville Wireless Equipment Co. Pty. Ltd., 8 Small Street, Broadway, Sydney. Entered Radio field experimentally in 1911 and commercially in 1921. Founder of Queensland Wireless Institute, 1914-19. Colville-Moore Wireless Supplies Ltd., 1921. Commissions: Technical Adviser to Siamese Government, 1928.

COLVILLE, S. (Cont.)



Lieut. Instructor Navy League. Radio Engineer Royal Aero Club of N.S.W. Designer of Broadcast Stations 4AY, 4IP, 4BU. Specialty Aircraft Radio. Conducted numerous tests over past eight years; particularly interested in its development. Recreations: Flying and golf.

CONRY, William Henry, M. Inst. R.E. Aust.: Radio Inspector, P.M.G.'s Dept., Melbourne. 1910, appointed Engineer's Branch, P.M.G.'s Dept. 1915-1918, Wireless Operator R.A.N. Radio Service (Transport). Born, 3/6/1892.

COOKSON, Joseph George, M.Inst.R.E.Aust.: Engineer-in-Charge, Radio Centre, Pennant Hills, A.W.A. Ltd. 1917-24 Radio Mechanic Townsville, Cooktown and Sydney. 1924-26 Maintenance of Station 2FC, Sydney. Visited Marconi College, Chelmsford, England, 1926 appointed Engineer-in-Charge Radio Centre, Pennant Hills. Born 1888.

COOMBS, Tom Gordon: Manager, 3TR Sale. Educated St. Peter's College, Adelaide. Worked in advertising agencies. Over 15 years with J. C. Williamson, Musgroves, J. & N. Tait, and costume comedy shows under the management of Cedric Johnson, Hugh Huxham, Sutton Crowe, and many others. Gravitated to 3LO, 3AR, 3CL, and from there to commercial radio stations. Continuity, announcing and advertising with 5KA Adelaide, and then joined "The Age" Broadcasting Service, Melbourne. Went to 3HA Hamilton as Assistant Manager, and from there to present position. Private address: Club Hotel, Sale. Born Adelaide, 1896. Married. Recreations: Motoring, dancing, writing.

COOPER, Stanley A. B., M.Inst.R.E.Aust.: Beam Wireless Technician, Rockbank, Vic. Joined A.W.A. staff 1924. 1925-26 completed special course of instruction in radio engineering, Marconi College, Chelmsford. 1927-32 Technician at Beam Transmitting Station, Fiskville. 1932 to date Rockbank. Born 27/4/1897.

COTTRELL, Eric L.: Secretary and Accountant, 3UZ Nilsen's Broadcasting Service Pty. Ltd., Oliver J. Nilsen Pty. Ltd., Nilsen Cromie Pty. Ltd. Private address: Kew, Vic. Born Bulawayo, South Africa. Married. Recreations: Tennis, golf, rowing.

COTTRELL, F. C. Clarke: Publicity and Advertising Manager 2UW Sydney. For many years associated with Union Theatres engaged in technical and production activities. Script

writing and radio production work over the past seven years gave him a thorough grip of the broadcasting business. Hobbies: Music, landscape painting, yachting.

COX, Harold Edward: Manager, 4TO Townsville. Has had 26 years uninterrupted wireless, joining English Marconi Co. 1911. Came to Australia, 1914. Served as W/T operator aboard Australian troopship during the Great War. Drafted into R.A.N. Coastal Wireless Service, later A.W.A. Coastal Radio. Entered the Broadcasting Dept. of A.W.A. 1931. Opened 3BO Bendigo; appointed Manager 4TO Townsville. Has had many years experience elocution and acting, and is now producing radio plays regularly at 4TO. Born in England.

CRAWFORD, W. T. S.: Senior Radio Inspector for New South Wales. Councillor and Member I.R.E. (Aust.). Appointed O.I.C. Hobart Radio,



1912. O.I.C. V.I.M. Melbourne, 1914. Transferred to Naval Wireless, October, 1915, as Radio Inspector, Melbourne. Appointed Radio Lieutenant and Inspector Sydney, January, 1918. After the war reverted to P.M.G.'s Department as Radio Inspector October, 1920. Classified Senior Radio Inspector May, 1934. Born Bendigo, 14/12/1880.

CROMIE, Charles Thomas: Director Station 3UZ—Nilsen's Broadcasting Service Pty. Ltd., Oliver J. Nilsen Pty. Ltd., Nilsen Cromie Pty. Ltd., Neon Electric Signs Pty. Ltd. Married. Born at Sale. Recreations: Gardening and golf.

CROSS, Charles James: Sales Manager-Announcer, Metropolitan Broadcasters Pty. Ltd., Hobart. Past experience: Announcer 6KG Kalgoorlie, W.A., 7UV Ulverstone, Tas., 7HO Hobart, Tas. Private address: 51 Murray street, Hobart, Married. Born Donald, Vic., 4/1/05. Recreations: Tennis, golf, football.

CROSSMAN, Kenneth D.: Studio Director and Night Announcer, Station 5DN Adelaide.



Who's Who in Commercial Broadcasting (Continued).

Educated Prince Alfred College, Adelaide. Entered radio as Announcer and Engineer 5DN in 1925. Qualified commercial radio engineer, joined A.W.A. Marine staff. Joined sales staff Mick Simmons Radio Department, Sydney, and later Manager Sheffield Trading Company's Radio and Electrical Divisions. Was Announcer and Programme Director 5AD. Recreations: Caravanning, swimming. Born 20/1/1908.

CROUCH, E. C.: Chief Engineer Country Broadcasting Services Ltd. Educated Mosman, Neutral Bay and Sydney Technical schools. Joined P.M.G. Department 1924, engaged in installation, operation and maintenance of Common Battery, Magneto and Automatic systems of telephonic communication, short wave work; in 1929 transferred to Wireless Branch and attached to 2BL, engaged in installation, operation and maintenance of studio and station equipment, and associated with Australian Broadcasting Company. Leaving P.M.G. Department at end of 1931, joined staff of 2GB, engaged in designing and constructing audio control equipment and complete transmitter. Resigned from 2GB October, 1935, to join present company. Acted as consultant in the case of several stations and carried out constructional work, including new extensive control equipment for 2GZ's Sydney and Orange studios. Experimented in short and medium wave transmission since 1920. Trained with Royal Australian Naval Reserve, and finished as Petty Officer, First Class P.M.G. Commercial Certificate (Washington Convention). Born Beechworth, Vic., 1908.

DAHL, Norman L.: Managing Director, 4AY, Ayr, Queensland. Well-known in radio circles in Australia and prominent in international short wave broadcasts, including Southern Seas Broadcast (1933), Royal Visit (1934), Centenary Air Race (1934), Jean Batten (1934), as well as big news hook-ups, such as the occasions of the outbreak of war in Abyssinia and the King's death. During 1935 as Programme Manager and Producer at 2UE. Now also associated with films as General Manager of National Productions Ltd.

DAVEY, James Henry: Managing Director, 3BA Ballarat. Was one of the founders of 3BA and has always occupied the position of Managing Director. Is a well-known personality in Ballarat and has been prominent in musical and dramatic circles in Victoria for many years. Recreations: Golf, music and horticulture.

DEARMAN, Reginald Vincent: Chief Accountant Amalgamated Wireless (A/sia) Ltd., Sydney. Associate member, Commonwealth Institute of Accountants. Educated Fort Street High School. Served in A.I.F. Accountancy, 1st place N.S.W. Institute, June, 1924. Final Accounts. Joined Amalgamated Wireless (A/sia) Ltd., January, 1924. Private address: 20 Selwyn Street, Artarmon. Born 2/8/97. Recreations: Tennis, fishing, swimming, gardening.

DEVLIN, John S.: Executive in charge of Transcriptions, 3DB Melbourne. A.I.F., 1915-1919. Previously had experience in broadcasting, advertising, newspaper work and motion pictures. Private address: 38 Grey Street, St. Kilda, Vic. Recreations: Reading and sport. Born London, 1894.

DAHLBERG, Louis: Melbourne representative for 3BA Ballarat. Previously Melbourne Sales Manager for 3TR Sale, and on sales staff A.W.A. Melbourne. Commercial radio pioneer. Former Commercial Manager 3UZ; founder and original Managing Director 3KZ; Sporting Commentator 3UZ and 3KZ. Committee member Vic-



torian Microphone Club. Hobbies: Golf, fishing, writing. Private address: 23 Inverness Ave., Armidale, Vic. Born Richmond, Vic.

DANIELL, Frederick H. W.: Radio Liaison Officer, Sun Newspapers Ltd., also Assistant to the Managing Directors of Broadcasting Service Association Ltd.; well known for his organisation of feature broad-



casts, including Southern Seas Broadcast (1933), Royal Visit (1934), Centenary Air Race (1934), Jean Batten (1934), as well as big news hook-ups, such as the occasions of the outbreak of war in Abyssinia and the King's death. During 1935 as Programme Manager and Producer at 2UE. Now also associated with films as General Manager of National Productions Ltd.

DAVEY, James Henry: Managing Director, 3BA Ballarat. Was one of the founders of 3BA and has always occupied the position of Managing Director. Is a well-known personality in Ballarat and has been prominent in musical and dramatic circles in Victoria for many years. Recreations: Golf, music and horticulture.

DEARMAN, Reginald Vincent: Chief Accountant Amalgamated Wireless (A/sia) Ltd., Sydney. Associate member, Commonwealth Institute of Accountants. Educated Fort Street High School. Served in A.I.F. Accountancy, 1st place N.S.W. Institute, June, 1924. Final Accounts. Joined Amalgamated Wireless (A/sia) Ltd., January, 1924. Private address: 20 Selwyn Street, Artarmon. Born 2/8/97. Recreations: Tennis, fishing, swimming, gardening.

DEVLIN, John S.: Executive in charge of Transcriptions, 3DB Melbourne. A.I.F., 1915-1919. Previously had experience in broadcasting, advertising, newspaper work and motion pictures. Private address: 38 Grey Street, St. Kilda, Vic. Recreations: Reading and sport. Born London, 1894.

Who's Who in Commercial Broadcasting (Continued).

DOBBS, S. Beardley: Managing Director, J. Walter Thompson (Aust.) Pty. Ltd., 65 York Street, Sydney. Wide experience of advertising and selling past 14 years. Joined Boston Paint and Varnish Co. 1922, and later assistant to advertising manager. In 1925 joined Cambridge Associates, of Boston, specialising in syndicated news and publicity services, as editor of syndicated organs for bond and investment houses. Later joined staff of Livermore and Knight, advertising agents, of Providence, Rhode Island. For 6 years worked as sales and advertising consultant and account executive. Went to New York in 1932 as sales and advertising manager of Calsodent Company of New York, and the following year became a member of J. Walter Thompson Co.'s New York office, which handles the advertising of the Calsodent Co. Was the programme director of several important radio programmes, including Burns and Allen, sponsored by General Cigar Co., the famous Walter Winchell broadcasts, sponsored by Jergen's Hand Lotion; Pathe News of the Air, sponsored by the Emerson Drug Co., makers of Bromo Seltzer; also for Standard Brands (Fleischmann's Yeast, Chase and Sanborn's Coffee, Royal Gelatine and Royal Baking Powder, etc.); the unique series of broadcasts known as "Vox Pop"—The Voice of the People. For the past two years Mr. Dobbs has been assistant account executive on the Shell Company's advertising in the United States. Mr. Dobbs joined the Australian Company in July, 1936, and has worked as co-director with Mr. M. L. Stiver.

DOBBYN, Joseph McMullen, M.Inst. R.E. Aust.: Radio Inspector, P.M.G.'s Dept., Melbourne. 1908-1911 apprentice electrical engineering. 1911-1925 Electrical Engineers' Branch, P.M.G.'s Dept., Melbourne. During the Great War, served as Wireless Operator, R.A.N. Transport Service, 1925. Radio Inspector Born 20/7/1892.

DODDS, John S.: Assistant Engineer, Commercial Broadcasters Pty. Ltd. (7HO). Formerly with United Distributors Ltd. and Service Engineer for Findlays Pty. Ltd. Private address: 14 Augusta Road, Hobart. Born 9/1/06, Hobart. Recreation: Rowing.

DONNER, W. A.: Managing Director, Columbia Gramophone (A/sia) Ltd., Homebush, N.S.W. Following the amalgamation

overseas of Columbia, H.M.V. and Marconi, appointed General Manager in Australia for His Master's Voice, Manager in Australia for Parlophone. Previously Export Manager, Columbia Gramophone Co. Ltd., Clerkenwell Road, London. Came to Australia as Managing Director Columbia Gramophone (A/sia) Ltd., 1929. Married. Private address: Olphert Avenue, Vaucluse. FU 7113.

DOOLEY, Raymond: Administrative Secretary, Australian Federation of Broadcasting Station, Commonwealth Bank Chambers, 371 Collins Street, Melbourne. Born 28/2/96. Educated Wesley College, Melbourne. Was Lieutenant 8th Machine Gun Company, Great War; Adjutant No. 1 Command Depot, England. Awarded M.B.E. Fellow Chartered Institute of Secretaries, Diploma of Commerce, Melbourne University; Associate Federal Institute of Accountants.

DOWER, John Michel: Manager and Chief Engineer, Station 2AY Albury. Has had 15 years' service with A.W.A. Holds First Class Operator (Madrid Convention) Certificate. Private address: Garden View Plats, Dean Street, Albury, N.S.W. Born Glen Innes, 29/10/01. Married. Recreation: Bowling.

DRAFFIN, James Charles, M. Inst. R.E. Aust.: Engineer, Broadcasting Department, Amalgamated Wireless A/sia Ltd., Sydney. Commenced in radio as Telegraphist with the Australian Forces in New Guinea 1916-21. 1922-25, Officer in Charge, Bitapapa Radio, New Guinea. 1927-35, Engineer in Charge, Beam Station, Fiskville, Victoria. 1935, transferred to head office, A.W.A., Sydney. Born 23/5/1893.

DUDMAN, Victor H., M. Inst. R.E. (Aust.), Manager, Transmitting, Industrial and Cine Sonor Departments, Philips Lamps (A/sia) Ltd., 69-73 Clarence Street, Sydney. N.S.W. 1919-28 Royal Navy and Royal Australian Navy. 1928 to date, Philips Lamps. Private address: 31 Bunyula Road, Bellevue Hill, Sydney. Born London, 2/7/03. Married.

DUFFY, Maurice Boyce: Secretary General, Australian Federation of Broadcasting Stations since 1933, past president of the Federation. Member of the Commonwealth Bank Board, and has been reappointed for a further seven years. Formerly associated with 3KZ Melbourne as secretary. Former assistant secretary and secretary of Melbourne Trades Hall

DUFFY, M. B. (Cont.)



Council. Served on Royal Commission on Taxation 1921, Royal Commission on Valuations of Crown Leaseholds 1923, Royal Commission on the Constitution in 1928. As Government Adviser attended Ottawa Conference in 1932. Born Bendigo, Vic. Private address: Hornby Road, Windsor, Vic. Hobby: Tennis.

DUNNE, John S.: Studio Manager, Broadcasting Station 2SM. Twelve years with J. C. Williamsons in musical comedy and dramatic productions. Six



years at N.S.W. Conservatorium of Music. Had broadcast with every National station in Australia and New Zealand for five years before joining 2SM. Toured the world in 1935 for 2SM in search of programme features. Born Sydney, N.S.W.

DUNNE, Peter Edmund Langton, M. Inst. R.E. Aust.: Radio Inspector, P.M.G.'s Department, Melbourne. 1914-1919 P.M.G.'s Dept. 1919-1925, served in Coastal Wireless Service as Radio Telegraphist. 1925-28, P.M.G.'s Dept., Radio Station. 1928 to date, Radio Inspector. Born 19/12/1892.

DYBALL, Harold Frederick, L.I.C.A.: Manager and Secretary, 2TM Tamworth. Nine years with Australian General Electric Co. Ltd. Joined 2TM as Secretary 1/5/35. Appointed present position May, 1937. Private address: 51 Fitzroy Street,



Tamworth, N.S.W. Born 19/11/11, Croydon, Surrey, England. Single. Clubs: Tamworth Apex and Tamworth Golf. Recreation: Swimming, golf and tennis.

E

EDWARDS, George: Producer 2UW, Sydney. 30 Years as playwright, producer vaudeville, musical comedy, drama. Private



address: "Darjoa," Longworth Avenue, Point Piper, N.S.W. Born Adelaide, S.A., 11/3/1886. Club: Tattersall's. Recreations: Golf, racing.

EDWARDS, James Roy, A.M. Inst. R.E. (Aust.): Technical Editor and Director, Australian Radio Publications Ltd., 30 Carrington Street, Sydney. Honorary Secretary, Sydney Division, Institution of Radio Engineers, Australia. Entered radio as amateur experimenter 1919. General experience in radio, sound and broadcasting fields in South Australia until trans-



ferring to Sydney during 1930. Took over Factory Management of Custom Built Radio, transferred to Kriesler Radio Company as Chief Engineer, and has held similar positions at Paramount, Radio and Crown Radio. Joined Australian Radio Publications Ltd. in July, 1935. Experience covers practically every phase of radio and sound equipment design and production, and special attention has been paid to the design and construction of testing and measuring equipment for laboratory, production and service work. Private address: "Brantwood Hall," Edgecliff, N.S.W. Born, 11/12/1907.

EXON, Frank C.: Managing Director, Fiji Broadcasting Co. Ltd., and Superintendent, A.W.A. Fijian Radio Service. Joined Royal Australian Naval Service 1915. Appointed A.W.A. marine staff 1920 in 1923, transferred to Coastal Radio Service. 1926, A.W.A. Engineering Dept., and in following year appointed to Beam Transmitting Station, Fiskville. Member Fiji Club. Private address: Vatuwaqa, Suva, Born 6/4/96, England.

Who's Who in Commercial Broadcasting (Continued).

F

FAIRHALL, Allen: Managing Director, Newcastle Broadcasting Co. Ltd. Five years electrical trade. Six years present position. Private address: "Seg-



lahoe" Flats, Wolfe Street, Newcastle. Born 24/11/09, Morpeth, N.S.W. Married. Club: Newcastle Rotary. Recreations: Golf, tennis, experimental radio.

FARRELL, Stephen H.: Sales Manager, Featuradio Sound Productions Pty. Ltd., 32 Market Street, Melbourne. Spent several years on the Continent studying advertising and manufacturing. Started in radio by giving travel talks at Johannesburg, South Africa. Came to Australia in 1926, later joined 2UE as announcer, later to 2CH and 2KO. Married. Born Capetown, South Africa, 27/9/03. Keenly interested in all sports, Rugby Union, tennis, golf and cricket, particularly.

FEAGAN, Dudley Milbank: Talent Sales Manager, Trans-Radio News and Sales Service. Conducted early experiments with E. J. Hume on Station that became 5DN. Travelled into the Northern Territory on camel in 1924 with four valve



regenerative set picking up 5DN on test. Charge of Sales Control Division, Shell Co. of Australia (North Queensland); Manager of Innes Milbank Co. (Q.); Advertising Agents and Publishers; Managing Editor "Capricorn" (Q.); Director Animated Slides Ltd. (Canberra and Sydney). Private address: 65 Darlinghurst Road, King's Cross, N.S.W. Born Brisbane, 7/5/07. Married. Club: Constitutional. Recreations: Sporting cars, golf, tennis, surfing, shooting, fishing, yachting.

FINDLAY, Selwyn H.: Director, Findlays Pty. Ltd., 80-82 Elizabeth Street, Hobart. Twenty years' experience in Piano and Music Business, ten years in handling Radio Merchandise. Proprietor and present General Manager of first commercial broadcasting station in Tasmania, 7HO (1930).

Afterwards followed Findlays' Chain of Stations, 7HO, 7LA and 7BU; Director of Commercial Broadcasters Pty. Ltd.; Findlay & Wells Pty. Ltd.; Wells & Co. Pty. Ltd. Clubs: Royal Hobart Golf Club; Kingston Beach Golf Club; Athenaeum Club; Royal Tennis Club; Royal Yacht Club; Autocar Club, etc. Private address: 14 Lord Street, Sandy Bay, Hobart. Born Launceston 13/2/1897.

FISK, Sir Ernest Thomas, K.B.: Chairman and Managing Director, Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney. F. inst. R.E., A.M.I.E. (Aust.). Born at Sunbury-on-Thames, near London, 1886, joined Marconi Co. 1905. Trained and worked in all branches wireless engineering operating in England, America and other countries. 1909



went to Arctic icefields, demonstrated possibilities of sealing with Newfoundland Sealing Fleet. 1910, on board s.s. "Otranto," exchanged messages with H.M.S. "Powerful" in Sydney Harbour when "Otranto" was 200 miles north-west of Fremantle, a distance of 1800 miles—a record in those days. Came to Australia 1911, as representative of Marconi Wireless Telegraph Co. Amalgamated Wireless incorporated, 1913, appointed General Manager with a seat on the Board, three years later became Managing Director. In September 1918, received first direct wireless telegraphic messages transmitted from England at his station at Wahrenoonga, N.S.W. August, 1920, gave first public demonstration of broadcasting at Royal Society of N.S.W., Sydney. The establishment of the Beam Wireless Service between Australia and England was largely due to his experimental work and his consistent advocacy with both British and Australian Governments for the adoption of his plans for the service. Wireless Telephone Service between Australia and Homeland mainly due to his experimental work. The prestige of Amalgamated Wireless as one of the foremost wireless companies of the world is due to the broad vision and high executive ability of Sir Ernest Fisk, who, during the past 20 years, has developed wireless in Australia and in the Pacific from a national point of view. He is considered the foremost wireless authority in Australia. Visited England, U.S.A., and the Continent of Europe in 1933 investigating latest developments in wireless. Made a Chevalier of the Order of the Crown of Italy by the King of Italy. President, Institution of Radio Engineers (Aust.), since 1932. Created Knight Bachelor in Coronation Honours, 1937.

FOX, Matt. J., F.R.S.S. Managing Director, Fox Advertising Service Ltd. Educated Trinity College, Dublin. Has been over 30 years in Australia. First Manager of Aust. Metrop. Life Office in Sydney. First Advertising Manager, "Daily Guardian," Sydney, 1924 established Fox Advertising Service. Became Manager and Director Campbell Ewald (Aust.) Ltd. of Canada on that firm's entry into Australia. Recommended with Fox Advertising 1929, still retaining Australian representation for Campbell Ewald Ltd. Compiled "The History of Queensland" (3 vols), "History of North-West Australia," "Encyclopaedia of W.A.," and other authoritative historical works. Born County Meath Ireland, 30/1/80. Recreations: Polo and golf.

FRANCIS, Maurice: Dramatist, George Edwards Productions. Has been journalist, commercial traveller in Melbourne and New Zealand. Educated Wesley College, Melbourne



and Melbourne University. Private address: 112 Roseville Ave., Roseville, N.S.W. Borne 1904 Durban, South Africa. Married. Clubs: C.T.A., Old Wesley Collegians. Recreations: Motoring, golf and bridge.

G

GARDEN, Harcourt M.: Educated at Fort Street High School and Newington College, Sydney. Joined 2KY as announcer in July, 1929; graduated to Assistant Manager and Programme Director, which positions he now holds. Private address: 42 Cooper Street, Maroubra. Recreations: Golf, motoring and riding.

GARDEN, John Smith, M.H.R.: Executive member 2KY. Educated Lossiemouth High School, Scotland, and St. John's College, Sydney. Was a member of the Church of Christ for 12 years. Then became Secretary of the Labour Council of Sydney, which position he held for 15 years. Elected Member of Federal Parliament in 1934, and was one of the two originators of Station 2KY. Private address: 42 Cooper Street, Maroubra. Recreations: Reading and motoring.

GENDLE, Charles H.: Director and General Manager of Featuradio Sound Production Pty. Ltd. Founder Company. Was previously General Manager of



Vocalion Gramophone Co. Ltd. (Aust.), 1926-33 Secretary and General Manager of Vocalion Gramophone Co. in London, 1921-26. Arrived in Australia 1926 to establish the factory for recording and production of records.

GILCHRIST, Archibald: 3TR, Sale, Vic. Born Melbourne, educated Sydney High School. Public library and journalistic experience. Member of Westminster Australian Parliament 1914—17. General Secretary New Settlers' League, Vic., 1922-27. Issued pamphlet on "Outback Wireless," 1925. Broadcast weekly for Pioneer Tours, 1929—32. Manager and afterwards proprietor of 3TR, 1932. Leased the station's programmes and advertising to Broadcast Entertainments Pty. Ltd., May, 1936, retaining direct control of transmitter.

GILMOUR, Norman Stanley: Proprietor, Lektrek Radio Laboratories, 75 William Street, Sydney. M.Inst. R.E. Aust., and Vice-President of the Institu-



tion since 1932. Millions Club. Amateur Experimenting 1910. Telegraph Branch P.M.G.'s Dept., till 1915, Engineer Postmaster-General's Department (N.S.W.) 1915-1922, 1922-1927 Director L. F. R. Bean & Co. Ltd.; 1927-31, Director Stromberg-Carlson (A/sia) Ltd.; 1931, founded Lektrek Radio Laboratories. Born 25/9/1890. Recreations: Swimming and tennis.

GODFREY, Knox: Announcer, 2TM Tamworth. First stage appearance at 8 years of age. Concert work in Queensland until joining Edward Branscombes Westminster Glee Singers, with whom a world tour was made covering Australia,



Who's Who in Commercial Broadcasting (Continued).

GODFREY, K. (Cont.)

Java, Malaya, Philippine Islands, China, Siam, India, Africa and Seychelle Islands. Was with 4RO Rockhampton 4½ years as announcer, station accompanist, and later responsible for the musical programmes. Joined 2TM as night time announcer 31/5/37.

GOLD, Edward: Managing Director, Gold Radio Service Pty. Ltd., 4GR and Chairman of Directors 4ZR Roma. Consulting Engineer to Empire Theatre (electrics and sound). 1912, electrical mechanic and fitter; 1916 theatre operator-electrician. 1920 entered experimental radio. 1925 designed, operated and owned Queens-



land's Pioneer Commercial Broadcasting Station, 4GR. 1925 designed and constructed the new ½ k.w. 4GR installed in Drayton. Designed and now supervising (in 4GR workshops) the new station for 4ZR Roma. Designed and supervised all lighting and power equipment, including modernistic lighting) in Queensland's best and largest provincial theatre (Empire, Toowoomba). Private address: 16 Lindsay Street, Toowoomba. Clubs: President R.A.C.Q. and M.C.C. Tennis Clubs, Vice President City Golf Club. Member Rotary Club. Recreations: Tennis and golf.

GOODY, Herbert: Technical Manager. Featuradio Sound Productions Pty. Ltd., 32 Market Street, Melbourne, C.I. Has spent the past 20 years with



various record manufacturers in all departments. Private address: "Kildare," Alexandra Avenue, South Yarra, Vic. Born London. Single. Recreations: Golf, horse riding, and wrestling.

HARPER, JOHN (Cont.)



1922. With 11th Battalion, A.I.F. Private address, Statler Flats, King's Cross. Born Mosman, N.S.W., 4/6/01. Member of Automobile and Microphone Clubs and Y.M.C.A.

HARRIS, Hector McDonald: Secretary, 3AW Broadcasting Co. Pty. Ltd., Melbourne. Joined 3AW at inception, February, 1932, and was appointed secretary October, 1932. Born 22/12/1901. Recreations: Golf and tennis.

HARRISON, Eric: General Manager 2LM, North Eastern N.S.W., Lismore. Past experience: Director of Publicity, Palais Royal, Sydney, 7 years. Publicity Manager, Union



Theatres, St. James, Sydney, etc. General Manager Broadcasters Aust. Pty. Ltd. (4BH, Brisbane). Private address: 265 Ballina Street, Lismore, N.S.W. Born Nottingham, England, 17/2/93. Married. Clubs: R.A.C., Lismore Golf. Recreations: Motoring, fishing, golfing.

HARTY, Frank Sturge: "Radio Adviser," 2UE, Sydney. Conducts "Between Ourselves" session. Educated Jamaica College, B.W.I. Served with Imperial Forces (1914-1919) France,



Greece, Serbia, Egypt, Palestine. Lecturer in Industrial Organisation, New Zealand, United States, Great Britain, Australia. Edited a weekly journal 1930-33. "2UE Radio Adviser" since 1934. Recreations: Tennis and walking.

HARVEY, William James: Chairman of Directors, 4BU, Bundaberg Broadcasters Pty. Ltd., Bourbong Street, Bundaberg, Queensland. Arrived



in Queensland, 1908. Manager, Bundaberg Hardware Co. Ltd., 1909-1917. Joined Wyper Bros. Ltd., Hardware Merchants and Manufacturers, October, 1917, appointed Managing Director, 1929. Clubs: Rotary, Burnett, Bowling. Private address: "Dumrobin," Barolin Street, Bundaberg. Born 13/6/1877, Banff, Scotland.

HEATH, L. Roy, Acting Melbourne Manager, 3HA, TR, SH. Trained as Civil Engineer; entered commercial world and was Sales Manager and Manager of car firms. Joined Melbourne "Age" advertising staff. Transferred to 3HA as Sales



Manager. Private address: Balmerino Avenue, Toorak. Married. Recreations: Amateur dramatics, gardening, swimming, motoring.

HICKLING, Rupert Charles, Manager, Radio Division Goldberg Advertising Pty. Ltd., Bank Place, Melbourne, Vic.



Production Manager for Catts-Patterson Co. (Vic.) Pty. Ltd. Private address: "Grandcourt," Grey Street, St. Kilda, Vic. Born 24/9/06.

Who's Who in Commercial Broadcasting (Continued).

HIGGINBOTHAM, E.: Chairman of Directors and Managing Director. 2TM. Arrived Australia 1930, joined B.G.E. Radio Department 1924, left as Radio



Department Manager 1927; joined A.G.E. as country representative, occupied that position for three years; four years as assistant Radio Department Manager, resigned 14/2/35 to open up Station 2TM.

HOAD, Arthur E.: Programme Manager and Assistant Engineer, Station 4CA Cairns. Appointed to present position 3/9/36, after two years as engineer and announcer 3BO Bendigo. Earlier experience at 4TO Townsville and Sydney. Born 24/3/11, Greenwich, England. Private address: "Alda-Claren," Mulgrave Street, Cairns.

HOOKER, Lionel Alfred: General Manager, Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney, N.S.W. M.I.R.E. (America), M.Inst.R.E. Aust.



Joined Amalgamated Wireless, 1913, and in 1914 joined Shackleton's Polar Expedition. During war commissioned in New Zealand Royal Naval Volunteer Reserve, served as commissioned officer in submarine chasers. Transferred as pilot to Air Force, subsequently commanding Air Station at Bude. On return to Australia appointed Melbourne office A.W.A., and later became Melbourne Manager. Transferred to Sydney as Assistant Manager and became Deputy-General Manager 1925. Appointed to present position 1936. Travelled Europe and America for A.W.A. in 1930-32 investigating world's development in radio. Councillor Institution Radio Engineers, Australia. Born 31/12/1894.

HOOPER, Edgar M., A.Inst. R.E.Aust., Assoc.I.R.E.(Amer.): Engineer in Charge 3DE, Melbourne. Experienced in marine operating, a class broadcasting, equipment design, construction and maintenance. Private address: 223 Auburn Road, Melbourne, E.2. Recreations: Amateur radio, tennis and motoring.

HUME, Ernest J.: Chief Engineer, 5DN Adelaide. Actively engaged in broadcasting since 1923, and associated with 5DN



since its inception. Has had experience in designing several complete installations. Educated at Scotch College, Adelaide.

JAMES, Cyril: Announcer, 2UW, Sydney. Born in Adelaide and educated at St. Peter's College, where he studied for Ministry. Won scholarship for singing at Adelaide Conservatorium. Enlisted 1915; served through the War. After Armistice resumed singing studies in London and played in vaudeville and musical comedy. Returned to Australia in 1920. Followed theatrical career until 1933. Then went into radio. Sports: All games. Studies: Psychology and Astrology. Hobby: Gardening.

JOHNSON, William John: Secretary and Advertising Manager, Station 4IP, Ipswich. Saw service with A.I.F. at Gallipoli and in France. Partner in F. W. Johnson and Sons, motor traders, Ipswich. Private address: 8 Kendall Street, East Ipswich. Born at Ipswich 10/11/33. Member of Rotary and Legacy Clubs. Ardent bowler.

JOHNSTON, William W.: Secretary 2HD, Newcastle. Has travelled in Africa, U.S.A., and



Canada. Came to Australia in 1918. Broke into radio at Newcastle with 2HD, where he is well-known and popular. Born 26/10/1873. Recreation: Hiking.

JOYCE, James: Sales Promotion Manager, Featuradio Sound Productions (N.S.W.) Pty. Ltd., Pacific House, 296-300 Pitt Street, Sydney. Joined original Melbourne Company 1934, later becoming Manager for Victoria. Transferred to Sydney Company in 1936 to take charge of sales and production.

JOYCE, James (Cont.)



Spent nine years in the professional theatre and nine years broadcasting and recording. Produced the first Australian electrical transcriptions and recorded announcements when operating the old Decca studios. Station Manager for 3YB for two years, later with 3DB and 3AW. Also writes many radio scripts.

KAUPER, Henry Alexis, M. Inst.R.E.(Aust.), Technical Supervisor 3DE. 1918-19 Research Branch, Royal Air Force. 1919-22 Aircraft Engineer. 1922-35 various radio activities, including 3 years Chief Engineer of 5CL. Born 12/3/1888.

KEMP, Sydney Joseph Albert: Manager, Station 3SR "Heart of Victoria." Educated St. Peter's Grammar School, Sussex, England. Served during war with Royal Naval Volunteer Reserve. Five years with Marconi International Marine Communication Co. (London). Private wireless operator to the late Viscount Leverhulme on his yachting business expedition to West Africa in 1924. Associated with The Argus past ten years on the Advertising Staff, and from 1932-6 as Sales Promotion Manager. Private address: 14 Oram Street, Shepparton, Vic. Born 6/11/1900, Bexhill-on-Sea, England. Married. Clubs: Shepparton Golf. Recreation: Golf.

KEMSLEY, A. N.: General Manager, Station 3UZ, Nilsen's Broadcasting Service Pty. Ltd. Born South Australia. Married. Private address: Elwood. Past



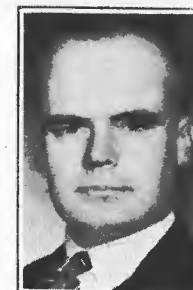
President of Legacy Club and Past Vice-President of Australian Federation of Broadcasting Stations. Member of the State War Council of Victoria and member of the Advisory Committee of the Toc H. for Victoria.

KERR, Alfred Dixon: Engineer, 3BA Ballarat. Has held experimental transmitting licence since 1926. Was one of the founders of 3EA and a Director until the original company sold out to "The Courier." Is member of Wireless Institute of Australia and member R.A.F. Wireless Reserve.

KING, Charles Calvert: Recording Manager for Chas. E. Blanks Pty. Ltd., Theatre Advertising Specialists, "Kelvin House," 15 Castlereagh Street, Sydney. Experience in radio dates back to 1910, when he was associated with Australasian Wireless Co. in Sydney. In 1911 in charge first Australian Coastal Station installed at Hotel Australia, Sydney. Appointed 1912 Engineer Operator Commonwealth Radio Service at "POH" Hobart. Later served Commissioned Warrant Telegraphist R.A.N. at Perth, Geraldton, and Port Darwin until 1920. Widely experienced musician and one of adjudicators appointed for the City of Sydney Eisteddfod 1935 and 1936.

KING, Robert Arthur, M.L.C.: Secretary, 2KY, Sydney. Four years organising secretary and 3 years as Secretary of the Labour Council of N.S.W. A member of the Legislative Council for 3 years and on the reconstruction of the Council was elected for 12 years. Private address: 9 Lunduff Street, Waverley. Born 10/4/86 in Launceston, Tas. Recreations: Swimming, football and athletics.

LANE, Reginald E., Sales Manager 2CH, Sydney. Branch Manager, Cooper Engineering Co. Ltd., Melbourne, 1923-8. Advertising Manager Ford Motor Co. of Aust. Pty. Ltd., 1928-31. Toured the world to write



articles on overseas conditions for Australian newspapers in 1931. Publisher and Editor 1932-4. Entered broadcasting at 2CH August, 1934. Educated at Newington College, Stanmore, N.S.W. Began commercial career in accountancy and qualified in that profession but gradually worked into sales and advertising management. Former Rugby International and prominent in other sports in Sydney and Melbourne. Born Tenterfield, N.S.W., 1898.

Who's Who in Commercial Broadcasting (Continued).

LEWIS, E. J. (Cont.)

LARKINS, Frederick William: Publicity Manager, Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney. Associate of Commonwealth Institute of Accountants. Associate of the Chartered Institute of Secretaries. Holder of Diploma in Economics and Commerce (Sydney University). Joined Australasian Wireless Co. Ltd., as Accountant July, 1912, appointed Accountant to Amalgamated Wireless (A/sia) Ltd., on formation, July, 1913, until 1923, when he took over duties of Publicity and Advertising Manager on the creation of that section of A.W.A. activities. Private address: 61 Wolseley Road, Mosman.



LEOPOLD, Ward: Casting Director and Programme Manager, Trans-Radio News and Sales Service. First appeared on stage at age of three. Experience of musical comedy and drama since 1915. Took up writing and producing for the stage. Entered radio, writing own songs and productions. Developed 24 radio voices. Combined journalism and radio, 1925-1935. Joined Trans-Radio News October, 1935, as Producer of Woman's Magazine of the Air. Now controlling Programme and Casting Division. Private address: "The Statler," 117 Hastings Parade, North Bondi, N.S.W. Born, Sydney, 1904. Married. Recreations: Swimming, literature, fishing, gardening.

LARKIN, J. S.: Advertising and Sales Manager, Station 3UZ - Nilsen's Broadcasting Ser-



vice Pty. Ltd. Private address: Black Rock. Born Melbourne. Married. Recreations: All sport.

LAWRENCE, Arnold Eger- ton: Station Manager, Warwick Broadcasting Co. Pty. Ltd., Station 4WK, Warwick, Southern Queensland. Entered radio in Marine Service A.W.A. 1919. After 6 years sea service transferred to engineering staff A.W.A. Melbourne, and appointed to studio of 3LO in 1925. Associated with phenomenal growth of radio in Victoria and divided time between studio and station, including A.W.A. short wave transmitter VK3ME. Then appointed Manager of 3BO Bendigo, transferred to A.W.A. station 2AY, Albury, in 1931 as Station Manager. 1935 installed 50 watt transmitter of 4WK Warwick, was appointed Manager and organised the station. Holder of Washington-Madrid Convention Certificate of Proficiency in Radio Telephony and Telegraph, 1st Class. Private address: 57 Percy Street, Warwick.

Wellington, October, 1924; returned to Auckland, 1925; appointed a director 1926; Director of Australian Company with headquarters in Sydney 1930-34; joined 2UW September, 1934, as service manager, and was appointed Sales Manager July, 1935; President Auckland Advertising Club, 1929. Born 5/2/'02 in Wellington, N.Z.

LEWIS, Edwin James: Manager Station 3UL Warragul. Joined 3LO, 1924, in Charge Programme Department, 1925-9. Went to 3DB until April, 1930, then became Manager 7ZL Hobart. Transferred Brisbane as Manager for Queensland in January, 1934. Born 1/10/1891, Ystradygynlais, Wales. Mar-



McDONALD, Arthur Stephen: Chief Engineer and Assistant



Manager, Amalgamated Wireless (A/sia) Ltd., 47 York St., Sydney. M.Inst.R.E.E. (America) and M.Inst.R.E.E. (Aust.). Councillor of I.R.E.Aust. Born Castle Donnington, now Swan Hill, Vic. Educated at public school and Melbourne Technical College.

McGUIRE, Wm. S.: Construction Engineer, Colville Wireless Equipment Co. Pty. Ltd. Technical training with Marconi School. Eleven years with

ried. Recreations: Fishing, motoring, gardening.

Manager, Amalgamated Wireless (A/sia) Ltd., 47 York St., Sydney. M.Inst.R.E.E. (America) and M.Inst.R.E.E. (Aust.). Councillor of I.R.E.Aust. Born Castle Donnington, now Swan Hill, Vic. Educated at public school and Melbourne Technical College.



ated Wireless 1925 at draftsman at Radio Electric Works; became works buyer and then buyer for the Company. Transferred to Broadcasting Department, January, 1936.

LINCOLN, Reginald: General Manager, Sport Radio Broadcasting Co. Ltd., 5KA, Adelaide, since June, 1932. Associated intermittently with radio since 1923. Private address: "Baroona," Fifth Avenue, St. Peters, S.A. Born in London, England, 29/6/'93. Recreation: Golf.

LYONS, Norman: Station Manager 2UW. Educated Greenwood. Entered radio 1927. Conducted boys' sessions for 2FC and 2BL under the nom-de-plume of "Mr. Norman." Created Australian wide interest in Model Aeroplanes.



Joined the Australian Broadcasting Company when they controlled the National Stations as Officer-in-charge of Outside Broadcasts, and Talks Editor. Transferred from National Stations to 2UW as Studio Manager when it came under control of the Commonwealth Broadcasting Corporation. Appointed present position January, 1937. Hobbies: Radio, aviation and golf.

Colvilles. Born 1911, Sydney. Private address, Storey Street, Maroubra, N.S.W. Hobbies, tennis and motoring.

McNAIR, William Allan, M. Com., Dip.Soc.Sc., A.A.I.S., A.R.A.N.Z., Director, Secretary and Research Manager, J. Walter Thompson (Aust.) Pty. Ltd., since 1932. Educated Auckland Grammar School and Auckland University College. Ten years business, legal and teaching experience in New Zealand before entering advertising. In 1927 wrote extensive study of New Zealand's trade with the East. Joined J. Walter Thompson organisation in 1930, as Accountant and Research Manager, Wellington office. Since specialising in advertising, has conducted numerous market and media surveys, and in April, 1937, published a comprehensive text book on advertising and broadcasting, entitled, "Radio Advertising in Australia."

McNEIL, Thomas A. E.: Commenced radio March, 1918, with Marconi Company as marine operator. Broadcast experience dated from 1926. Joined 2BL as Technician in 1927, and was made supervisor when P.M.G. took over the engineering side of "A" class stations in 1929. Left P.M.G.'s Department October, 1921, to take position as Chief Engineer of 2CH, which station opened in February, 1932. Continued in this position until August, 1936, when transferred to A.W.A. Transmitter

McNEIL, T. A. E. (Cont.)



Installation work. Joined Station 2UW as Chief Engineer in December, 1936. Born London, February, 1901.

McQUILLAN, Cecil John: Chief Radio Systems Engineer, Standard Telephones and Cables (A/sia) Ltd., 258 Botany Rd., Alexandria, N.S.W. B.Sc. (Engineering) Honors London University, D.I.C. (Diploma of the Imperial College, London), Whitworth Exhibition, M.I.R.E. (America). Private address: "Cheddington," Elizabeth Bay Road, Sydney. 1923, joined Standard Telephones & Cables Ltd., London. 1933, visited England and the Continent to study latest technique and returned to Australia to carry out contract with Postmaster General's Department for the manufacture, supply and installation of seven new Regional Stations to be erected at Launceston, Townsville, Grafton, Sale, Dubbo, Murtoa and Katanning.

MALONE, James J.: M.Inst. R.E.Aust. Chief Inspector Wireless Postmaster-General's



Department, Treasury Gardens, Melbourne, Past Chairman Melbourne Division, Institution Radio Engineers Australia, 1935-6-7. Served as Wireless Officer R.A.A.F. in France. Recreation: Golf.

MARDEN, Charles Frank: General Manager Australian Broadcasting Co. Pty. Ltd., and Commonwealth Broadcasting



Corporation Pty. Ltd. Director and General Manager Commonwealth Broadcasting Corporation (Q'land) Pty. Ltd. Was General Manager for Australian Broadcasting Company when it controlled the National Stations, was responsible for co-ordinating all services and the formation of the National Network, and at present General Manager of Station 2UW Sydney, 4BC Brisbane, 4RO Rockhampton, 4GR Toowoomba, and 4MB Maryborough. Private address: 41 Chamberlain Avenue, Rose Bay, N.S.W.

MARSH, Gordon W.: Director and General Manager, Station 5DN Adelaide since June, 1935. Prior to that was Assistant Manager 4BK Brisbane, and before that Manager 3HA Hamilton. As a newspaper man was



associated with "Daily Guardian," "Daily Telegraph," "World," "Motor in Australia," and "Flying." Held executive positions in four States. Travelled abroad. Clubs: Amateur sports. Naval and Military, United Services (Q.). Recreations: Squash racquets and golf.

MARSHALL, Herbert A.: Managing Director, Kayem Pty. Ltd., Darlinghurst (Recording Discs) formerly Chief Engineer of 2UW Broadcasting Station, Sydney. Member of the I.R.E. (Aust), also member of R.A.A.F. Reserve. Born in Punjab, In-



dia, 1888. Received primary education in India and secondary education in England. Trained as Power Electrical Engineer. Arrived in Australia 1907. Built and installed 5 k.v. broadcasting transmitter, 2XC, Broken Hill. Private address: 94 Francis Street, Bondi, New South Wales.

MASSEY, Gordon Frederick: Radio Manager, The Paton Advertising Service Pty. Ltd., Capel Court, 375 Collins Street, Melbourne, C.I. Graduated to Queensland Managership of Commercial Investment Trust by way of Vacuum Oil and

Who's Who in Commercial Broadcasting (Continued).

General Motors Acceptance Corporation. Obtained experience in England, Europe and the Far East. On return to Australia entered 3KZ Melbourne for first commercial radio experience.



Joined 3AW in same capacity, and in turn became Feature Announcer, Continuity Chief, Studio Manager, Programme Manager, and finally, Production Manager. After four years intensive experience with 3AW in every branch of commercial broadcasting, resigned November, 1936, to establish Radio Division for The Paton Advertising Service Pty. Ltd. Private address: Burnie Street, Toorak, S.E.2, Vic. Born Melbourne, 1907.

MATHERS, Arthur Joseph: Manager, Central Murray Broadcasters Pty. Ltd., 3SH Swan Hill, Vic. Past experience: Chief announcer and sporting commentator 3KZ, 1930-31; Studio and Advertising Manager 3BA, 1932; Radio Dept., McKay Advertising Agency, 1933; Continuity writer and ad-



vertising rep. 3HA, 1934; free lanced sporting broadcasts and travel talks 3DB, 3UZ, 3KZ, 1935; then joined 3TR as continuity writer and transferred 3HA as Assistant Manager, Dec., 1936; appointed manager 3SH, April 1, 1937. Private address: White Swan Hotel, Swan Hill. Born 26/10/'10, Hawthorne, Vic. Clubs: Old Xaviers, Swan Hill, S.H.J.C. Single. Recreations: Tennis, golf, riding, playwriting.

MAXWELL, Sidney Aubert: Director and Founder, Trans-Radio News and Sales Service. Was Officer of Commonwealth Bank for over 9 years. Prominent in Automotive circles holding Sales Executive positions. Chairman of the Commercial Vehicle Division of the Motor Traders' Association. Member of the Executive of the M.T.A., 1931. Sales Executive experience in Grocery and Chemical

Industries. Prominent sportsman Captain of Leichhardt Rowing Club for some years; Hon. Secretary of the N.S.W. Rowing Association. Regarded as an able organiser with a natural flair for entertainment. Private address: 10 Elizabeth Avenue, Hurlstone Park, N.S.W. Born 22/10/1900, Waverley, N.S.W. Married. Club: Royal Automobile Club of Australia. Recreations, Rowing, tennis, swimming, surfing and physical culture.

Priest, Archdiocese of Sydney. Domestic Prelate to His Holiness Pope Pius XI.

MEANY, Right Rev. Monsignor James: Managing Director Station 2SM Sydney. Parish



MEREDITH, St.: Announcer 2UE, Sydney. Born and educated in N.S.W. Originally intended to become an accountant, but relinquished lucrative position to take up stage career. Has toured Australia and N.Z.

extensively. Entered radio 10 years ago, and for past 7 years with 2UE as announcer. President of the N.S.W. Microphone Club for 1936-37. Fond of all sports, especially fishing and motoring.



MILLAR, Renn: Chief Announcer, 3DB, Melbourne. Is the possessor of a fine baritone voice which found him a job with various travelling companies. He was for 7 years with the Scarlet Troubadours, during which time he travelled New Zealand. His radio debut was made as announcer of 3LO from which he transferred to 3DB. Soon after, the "Herald" bought out the station and he has been there ever since.

MITCHELL, V. F.: General Sales Manager, J. B. Chandler & Co., 43 Adelaide Street, Brisbane. Director 4BC, 4GR, 4MB, 4RO, 4SB. Clubs: R.A.C.Q., Royal Aero Club. Born Bendigo, Vic.

Who's Who in Commercial Broadcasting (Continued).

MINGAY, Oswald Francis: Principal in firm of Val Morgan and Sons Pty. Ltd. Associated with advertising activities in Melbourne since 1917. December, 1930, one of the founders and Director of Station 3KZ. Appointed Managing Director, June, 1932. Private address: 31 Nott Street, East Malvern, Vic. Clubs: Yarra Golf and C.T.A.



"Radio Review of Australia," "Broadcasting Business," 30 Carrington Street, Sydney. Hon. Gen. Secretary Institution of Radio Engineers Australia, since its inception in 1932. Hon. Secretary, RIF (Radio Industry Functions) Club of Sydney. Served in Signals A.I.F. 1915-1919. Member Millions Club, Imperial Service Club, Sydney Legacy Club. Founded Australian Radio College 1930-33. Founded Australian Radio Publications 1930. Private address: 4 Woodside Avenue, Lindfield, N.S.W. Born 1/7/95.

MONKS, Cuthbert A.: Sydney Sales Rep. for 2HD, Newcastle, 5KA, Adelaide, and 2WG Wagga. Business address: 3rd



Floor, Grace Building, King and York Street, Sydney. Phone MA 7645. Associated with 2HD for 7 years, 5KA for 3 years.

MORELL, Musette: Member of Fellowship of Australian writers. Adapts musical comedies for radio presentation, writes original radio musical comedies and plays for A.B.C. Stations. Has written verse, short stories, lyrics, etc. Written additional verses and choruses for Ella Shields, Gladys Moncrieff, Cecil Kellaway, Hetty King, Marie Burke, etc. Also written three full length plays and produced them at the Sydney Savoy and the Suburbs. Private address: Ocean Street, Narrabeen, N.S.W. Born Sydney, N.S.W. Recreations: Play-acting and reading.

MORGAN, Sydney: Managing Director 3KZ Broadcasting Co. Pty. Ltd., 64 Elizabeth Street, Melbourne. Member Victorian Institute of Advertising. Prin-



cipal in firm of Val Morgan and Sons Pty. Ltd. Associated with advertising activities in Melbourne since 1917. December, 1930, one of the founders and Director of Station 3KZ. Appointed Managing Director, June, 1932. Private address: 31 Nott Street, East Malvern, Vic. Clubs: Yarra Golf and C.T.A.

MURRAY, Archibald James: Sales Manager 3KZ Advertising Service Pty. Ltd. since July, 1936. Served with A.I.F. for 3 1/2 years, attaining the rank of Captain; the Military Cross, and was mentioned in Despatches. Has had considerable experience in the commercial world, including a long connection with the Texas Oil Co. Whilst in America made an extensive survey of modern merchandising methods, and is a keen student of scientific selling.

MURRAY, John: Manager, Northern Broadcasters Ltd. Past experience: Copywriter and announcer 2UE; chief announcer 2KA; announcer 2UW. Private address: High Street, Inverell, N.S.W.

MURRAY, John William: Director, Fidel-a-Tone Sound Productions. Formerly Hoyts Theatres Sound Technician; Recording Engineer Effite Films 1931-36; Recording Engineer Effite Broadcasters (3XY). Recorded first radio dramas on film for 3XY. Private address: 370 Albert Street, East Melbourne. Born 29/12/05. Married. Club: Old Scotch Collegians. Recreations: Tennis, boxing.

N

NICHOLAS, William R.: Engineer-in-Charge, Commercial Broadcasters Pty. Ltd. (7HO). Previously assistant engineer 7HO and private experimental work. Private address: 18 Elphinstone Road, North Hobart. Recreation: Motoring. Born 17/11/13 at Hobart, Tas.

NICHOLSON, Russell Malcolm, B.O.C.P., Assoc.I.R.E.: Managing Director, Central Western Broadcasting Co. Pty. Ltd., Eagle Street, Longreach, Q. Born 9/8/09. Recreations: Swimming, tennis.

NILSEN, Oliver J.: Governing Director, Station 3UZ—Nilsen's Broadcasting Service Pty. Ltd., Oliver J. Nilsen Pty. Ltd., Melbourne and Adelaide. Neon

Electric Signs Pty. Ltd., Nilsen Cromie Pty. Ltd. Private address: Elsternwick. Born Melbourne. Married. Melbourne



City Councillor, Member Electric Supply Committee, Public Works Committee, Traffic and Building Regulations Committee Properties Special Committee. City Council's representative on Victorian Civil Ambulance Service. Club: Rotary.

NILSEN, Oliver Victor: Manager of Construction Department of Oliver J. Nilsen Pty. Ltd., also Director of Oliver J. Nilsen Pty. Ltd., Nilsen's Broadcasting Service Pty. Ltd., and Nilsen, Cromie Pty. Ltd. Private address: Kew, Vic. Born Melbourne. Married. Club: Councillor Old Scotch Collegian Club. Recreations: Keen follower of all sport.

O

OVERDIEP, J. A.: General Manager and Director of Philips



Lamps (A/sia) Ltd., 69-73 Clarence Street, Sydney. Appointment made by Mr. A. den Hertog, Managing Director as from January 1, 1936. Awarded D.H. (Rotterdam). Associated with Philips Company for many years. Two years in Holland and Czechoslovakia; 4 years in British India, Ceylon, Burma, Siam and Java and Straits Settlements. Has been connected with the Australian organization of Philips since 1930. Private address: "Ashcroft," Bogota Avenue, Cremorne. Born 17/10/01.

P

PALMER, George F.: Managing Director, Melbourne Broadcasters Pty. Ltd., owners of 3AK and Northern Tasmania Broadcasters Pty. Ltd., owners of 7UV Ulverstone; is probably the youngest man to own and control two B class stations. Six years ago he inaugurated a late night and early morning broadcasting service in Melbourne through the medium of 3AK, and has now launched out in

new city studios for 3AK, giving a, continuous service throughout the night from 11.30 p.m. to 7 a.m. Born Melbourne, 1909.

PALMER, G. F. (Cont.)



new city studios for 3AK, giving a, continuous service throughout the night from 11.30 p.m. to 7 a.m. Born Melbourne, 1909.

PENNY, Langford W.: Announcer 2TM Broadcasting Station, Tamworth. Commenced radio activities with David Jones Ltd. (Radio Dept.) in 1923. From 1925 to 1927 served as sea-going operator on staff



of A.W.A.; 1927-8 A.G.E. Co. Ltd., Queensland Country Sales; 1928-9 Manager Radio Dept., Aeolian Co., Newcastle; 1931-3 Manager, Radio Dept., J. A. Booth and Co. Ltd., Sydney. 1934-5 own radio business, Northbridge. Joined staff of 2TM, February, 1935. Born 4/1/06.

PFEIL, Ronald William: Melbourne Representative, Australian Radio Publications Ltd., and Mingay Publishing Co., publishers of "Broadcasting Business," "Radio Retailer," "Radio Review," etc. Was



Sales Manager, Studio Manager and Announcer 7HT Hobart at its opening this year. Past experience: Advertising Manager, 5RM, Murray Heights from station's inception, until joining 3MA, Mildura. Member Victorian Microphone Club. Born in Adelaide, S.A.

PICKHOVER, Harold: Production Manager, Station 2KO. Starting in the motor industry, in which he worked up to Sales Manager, joined up with a radio selling organisation. Six years ago went into commercial broadcasting, where he has had experience in all branches of work. Private address: "Abergele," Date Street, Adams-town. Born 3/11/1909, Lancs., England. Single. Recreations: Swimming and golf.

PINKERTON, Harold Richard: Managing Director Savery's Pianos Ltd., Managing Director Radio Wholesalers Ltd. Director Humie Broadcasters Ltd. (5DN). Music and radio business twenty-seven years. Broadcasting for past three years.

PRINCE, Arthur Lionel: Manager, radio division, Goldberg Advertising Agency Ltd., Sydney. Has been theatrical and vaudeville performer, announcer and continuity writer, 4BC Brisbane.



bane. Manager Station 4RO, Rockhampton. Manager 4BH, Brisbane. Private address: "Rockwell," New South Head Road, Edgecliffe. Born Oxford, England, 1890. Recreations: Golf, photography.

PYM, Walter: Studio Manager 3UZ—Nilsen's Broadcasting Service. Does straight announcing, producing and feature



work. Has had long stage experience. Born Sydney. Private address: South Yarra. Married. Recreation: Swimming.

Q

QUIRK, Lancelot Paul: Advertising Manager 2SM since October, 1933. Prior to that, with Weston Advertising Company for 12 years (Manager for last 5 years). Born 1902.

QUIRK, L. P. (Cont.)



R

REED, Joseph Griffiths, A.M. I.E. (Aust.), M.Inst.R.E.(Aust.): Design Engineer, Amalgamated Wireless (A/sia) Ltd. Transferred from Professional Division, P.M.G. Radio Service, 1922. Carried out experimental radio telegraph transmissions in association with R.A.N. Reserve at Newcastle, in 1914. Visited England 1935 in connection with large transmitter design. Recreations: Model making and photography. Born 30th June, 1897.

RIDLEY, John Edward: Assistant Manager, Country Broadcasting Services Ltd. (2GZ). Commenced business career as accountant. Entered radio commercially in 1929 as Manager of wholesale radio



house in Melbourne. Joined "The Age" Broadcasting Service, 3HA, Hamilton, in October, 1931, as Manager and Secretary. Appointed 2GZ August, 1935. Appointed present position July, 1936. Private address: 58 Nelson Road, Killara. Born Sydney, 4/9/02.

ROBERTS, Ronald: Chief announcer, 4BH, Brisbane. Has been associated with this station for the past 18 months. Formerly with 4BC and 4GR, and earlier still with J. C. Williamson's and Invicta. Films. Producer of "One Man's Family" for 4BH. A native of Sydney, and has toured in every capital city of Australasia.

ROBERTS, Russell F.: Manager 4BC Brisbane. Musical training at Trinity College of Music, London, and Matthey Pianoforte School, London. Business training London Stock Exchange. After responsible positions theatrical world and Sales Manager, W. J. Paling & Co., appointed present position 1930 on opening of 4BC, Brisbane's first commercial broadcasting station. Holds record for com-

Who's Who in Commercial Broadcasting (Continued).

ROBERTS, R. F. (Cont.)



—merged with Paton Advertising Service—foundation member and senior executive of Price-Berry Pty. Ltd., and Samson Clark, Price-Berry until joining 3DB 7 years ago. Private address: 135 Riversdale Road, East Camberwell, Vic. Member Naval and Military Club (Melb.) and Emerald Country Club. Recreation: Golf. Born Coburg, Vic., 2/1/1898.

RYAN, Albert John, M.Inst. R.E. (Aust.), A.M.I.R.E. (U.S.A.) Managing Director, A. J. Ryan Broadcasters Ltd. (2CA), Canberra. For 7 years was with Electrical Engineers Branch



P.M.G.'s Dept.; 5 year's Municipal Power Supply Management; 8 years radio retailing and broadcasting. Private address: Teuch Street, Kingston, Canberra. Member Rotary Club and Royal Canberra Golf Club. Born Chiltern, Vic., 1897.

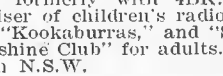
RYAN, John: Chief Engineer, 3AW, Melbourne. Served with R.A.N. and at the age of 16 was attached to H.M.A.S. "Sydney," and took part in action on November 9, 1914, with "Emden" at Cocos Island. Was mentioned in despatches. Also served on the "Sydney" when that vessel escorted the first Australian contingent to Colombo. In January, 1924, was attached to the engineering staff of 3AR, and 1927 transferred to 5CL, Adelaide. In 1929 joined 7ZL, Hobart as Chief Engineer, and in 1932 joined 3AW in that capacity.

RYCROFT, James Lumley: Advertising Manager, 7HO Hobart. Master Mariner and Naval Officer. Holds rank of Lieutenant R.A.N.V.R. Hon. Aide-de-Camp to His Excellency the Governor of Tasmania. Connected with radio since 1928. Radio playwright, actor and speaker. Advertising representative Tasmanian and Victorian Stations. Private address: 3 Lynton Avenue, Hobart, Tas. Born Grimsby, England, 15/4/94. Married. Clubs: Old Stamfordians, Royal Yacht Club of Tasmania, United Services. Recreations: Yachting, motoring, and philately.

S

"SALLY": Conducts the morning session from 9.30 to 1 p.m., and the children's session from 5.30 to 6 p.m. from 4BH, Brisbane. Has been with the station nearly four years, and was formerly with 4BK. Organizer of children's radio club, the "Kookaburras," and "Sally's Sunshine Club" for adults. Hails from N.S.W.

RUSSELL, R. McCowan, A.O.A.: Assistant Manager 3DB Melbourne; A.I.F. 1916-19. Joined E. A. Price Advertising 1920



Who's Who in Commercial Broadcasting (Continued).

SAMUEL, Bryn: Station Manager, W.A. Broadcasters Ltd., Perth, W.A. Originally member of commercial staff "West Australian" Newspapers Ltd., joined Musgrove's Ltd., in 1924; appointed Station Manager 6ML, 1930; on foundation of W.A. Broadcasters Ltd. March, 1933, appointed Station Manager for Company, which operates Stations 6ML, 6IX, and 6WB. Private address: 28 McKenzie Street, Wembley, W.A. Born Monmouthshire, 30/6/'01. Married.

SCHULTZ, L. N.: Chief Engineer 2GB. Broadcast Consultant. M.Inst.R.E. (Aust.) First took up radio as a hobby at school. Went to America, England and Germany and came back to Sydney. Joined 2GB, and was appointed Chief En-

SHEPPARD, Alexander William, B. Com.: Exhibition in Economics. General Secretary-Treasurer, Professional Radio Employees' Institute of Australasia. Commenced career in journalism. Was with A.W.A.



as a clerk, and afterwards became an announcer on Station VK3ME. Private address: 31 Kareela Road, Cremorne, New South Wales. Born 2/6/1910. Welbeck, England. Single. Recreations: Riding, motoring, study of languages.

SOUTHEY, Reginald V.: M. Inst. R.E. Aust.: Radio and Recording Engineer, Columbia Graphophone Aust. Ltd., Homebush, 1919-1923 with General Electric Company of London. 1923 to date with Columbia Graphophone Co., London and Sydney. Also with Standard Telephones, London and Bell Telephone Labs., New York. Educated Alleyn's College, Dulwich, London. Born 4/8/1903.

SPENCER, Thomas: Manager 2CH, Sydney. Joined Amalgamated Wireless (A/sia) Ltd., in Melbourne in 1927, and held position of Traffic Accountant to Beam Wireless and Coastal



Radio Service. Received present appointment in November, 1936. War record includes service at Gallipoli, Egypt and France. Private address: Craigham, Pickham Avenue, Chatswood, Born Ayrshire, Scotland, 1/5/1893. Recreation: Golf.

SPROULE, Cyril Thomas: Manager, Broadcasting Department, A.W.A., Melbourne. Ten years A.W.A. Beam Dept., publicity and broadcasting; two years A.I.F.; ten years P.M.C.'s Department. Private address: 43 Scott Grove, Gardiner, Vic. Born 18/5/1898. Recreations: Golf, fishing, gardening.

STACEY-GREEN, D.: Associated with Mr. Charles Calvert King at the Chas. E. Blanks Pty. Ltd. recording studios. Was educated at Forbes High School. War service with the A.I.F. 1915 to 1917. Mr. Green was with the Small Arms Factory at Lithgow, N.S.W. in 1920 and has studied at the Marconi School. Has also taken the X-Ray Technicians' Course at the University of Sydney. Has been actively engaged in design and manufacture of Custom built radio receivers and special sound equipment.

STEVENSON, Cecil Vincent: Electrical engineer. Founder and Managing Director of Radio 2UE Sydney Limited. Has been actively experimenting in radio transmission of signals since before the war, and took out one of the first commercial



SUTTON, F. G. (Cont.)



London. Private address: Toorak, Vic. Born 28/3/1894, Melbourne, Vic. Single. Clubs: Athanaeum, Racu, Sandringham. Recreations: Dogs, cricket, tennis, theatres, all outdoor.

SYME, David S.: Managing Director, 3HA, TR, SH. Private address: Toorak Road, Melbourne.

T

TALBOT-LEHMANN, H. M.: Managing Director, Radiovision Proprietary Ltd., 300 Pitt Street, Sydney. Educated Clifton College and Royal Military College, Sandhurst, England. Retired Captain Imperial Regular Army and Royal Air Force. Served in Royal Flying Corps, Manager with British American Tobacco



Co. Ltd. in England, European countries and Far East—Aeronautical Adviser to late Marshall Change Tso Lin, Dictator of China. Sales Manager National Flying Service Ltd., England. Foreign Rep.: Westland Aircraft Works, England. Broadcasting experience Canada, America, Australia, New Zealand since 1933. Private address: 88 Elizabeth Bay Road, Elizabeth Bay. Married. Born London 3/11/'97. Club: Imperial Service, Sydney. Recreations: Flying, sailing, fishing.

STEVENSON, Norman: Studio Manager for 2UE. Born and educated N.S.W. Entered commercial life in 1928 on joining 2UE in association with his father and brother. Has been through every phase of broadcasting as Assistant to Advertising Manager, Programme arranger, Control Monitor, etc. Married. Lives at Bexley.

TATHAM, Sydney Ernest: Manager Sound Recording Studios Ltd., 160 Castlereagh Street, Sydney. Started radio



STORY, Oliver James: Announcer-Manager 2BS, Bathurst. Was Advertising Manager-Announcer 2WG, Wagga Radio player, Shakespearean, stage and screen actor. Private address: 51a Keppel Street, Bathurst. Born London, 1907. Recreations: Riding, shooting, swimming, tennis.



gineer. During 1934 supervised the building of a complete new transmitter for 2GB capable of transmission in line with High Fidelity Standard. Has carried out many improvements throughout the system to make extended range reproduction possible both as regards audition facilities and actual transmission. Hobby: Flying. Won N.S.W. Aero Club Championship 1934. Born 24/9/1906.

SHAW, Reginald Albert (Rex): Managing Director, Radio Associated Services Ltd. Wrote original theme music for the Australian talks "Mystery Island" and "Phantom Gold." Practised as an architect (Fellow of Institute of Architects)



for 22 years. Musical Director Radio 2UE for 7 years. For same period Assistant Secretary N.S.W. branch British Astronomical Association and corresponding secretary to the B.A.A. Journal, London. Private address: 17 Port Street, Petersham. Born Rockhampton, Q., 1885. Married. Recreation: Motoring.

Who's Who in Commercial Broadcasting (Continued).

TYRRELL, Charles W. M., Inst. R.E. (Aust.): Technical



vertising Manager and later Manager, Australia and Vancouver, Canada, of a large rubber manufacturing and retailing organisation. Entered broadcasting with 2GB, having in the latter respect announced and wrote dramatic scripts, as well as advertising copy and programme continuities. In 1932, as delegate for Australia, attended the Annual Convention of the Pacific Coast Advertising Clubs of America, and since lectured to educational and business organisations. Was a N.S.W. swimming record holder, twice swimming for Canada against U.S.A. teams. A University "Blue" for boxing and Rugby Union in Australia, New Zealand and Canada. Hobbies: Tennis, golf, amateur theatricals. Has played leading roles with Bryant's Playhouse and other repertory theatre organisations.

Superintendent Philips Lamps (A/sia) Ltd., Sydney. Councillor I.R.E. (Aust.). Joined Philips 1930. Private address: "Mentone," Beach Street, Coogee. Born, 8/11/05. Captain 2nd Divisional Signals.

V

VAN GESSEL, Karel Marinus: Philips Lamps (A/sia) Ltd., Valve Factory, 100 Mallet St., Camperdown, N.S.W. Has had 18 years' experience in valve making in Philips Company, Holland. Four trips to U.S.A. to study manufacture of American types, glass and metal. Has had experience in condenser making and neon lamps. Private address: "Villa Maria," Yosefa Avenue, Warrawee, N.S.W. Born 4/1/1901, Hertogenbroch, Holland.



WALLS, June, L.A.B.: Secretary, Western Province Radio Pty. Ltd., Broadcast Entertainments Pty. Ltd., Central Murray Broadcasters Pty. Ltd. Private address: 274 Domain Road, South Yarra, Vic. Born 15/9/'15. Coleraine, single. Recreations: Tennis, skating, music, swimming.

WALTERS, Mona: Programme Directress, Station 4IP, Ipswich. Brilliant pianiste, playing classical and jazz compositions and accompaniments equally well. Gained her A.Mus.A. degree in 1933. Studied under Sisters of Mercy, Ipswich, and Miss Nancy White, L.A.B., F.T.C.L.

WATSON, J.A.: Advertising and Sales Promotion Manager, 2KO, Newcastle. Born 22/7/1907 Hawkes Bay, New Zealand, educated at Wellington College

wealth Service Department for two years. Newspaper work occupied his attention for the next five years, then he was special turf writer for the "Argus." From this position he became sporting commentator for 3LO, which position he held for six years prior to becoming sporting and special commentator for 3DB. Hobbies: Racing and tennis.



WELLS, Harold R.: Programme Manager, 6AM Broadcasters Ltd. Private address: 92 Herbert Road, Shenton Park, W.A. Married. Was for 5 1/2 years with 6WF, being original announcer (1924) in W.A., also 5 years programme director; 2 years Manager of High Flyers' Concert Party, London; 18 months editor "Wireless News," Perth. He is very interested in D.X. work.

WHITCOMB, T.: Director and Chief Engineer, 2TM, Tamworth. Originally with B.G.E. joining Radio Department in 1925. Toured New Zealand as Radio Instructor to B.G.E. branches and left that organisation in 1928 to join the A.G.E. as Country Representative. During the last four years with

TATHAM, S. E. (Cont.)

experimenting 1910. Joined A.W.A. 1914. Served five years Mercantile Marine, thence transferred head office, Sydney. Opened Marconi School of Wireless, Melbourne, 1919. Organised first British Newspaper Service on Pacific ships for A.W.A., 1923. Resigned 1924 and commenced own business representing American and Continental manufacturers. 1927 designed and built theatre talking picture equipment. Travelled extensively overseas, studying latest radio and broadcasting practice. April, 1935, established Sound Recording Studios Ltd., Sydney. Born 4/4/1896. Recreations: Golf, swimming and motoring.

TAYLOR, Charles: Programme Director 3DB, Melbourne Well-known journalist. Edited Sydney "Sun" for seven years and Melbourne "Sun Pictorial" for two years. Held newspaper jobs all over Australia. Federal Director of Publicity for National Party in 1925. Private address: 10 Molesworth Street, Kew, Vic. Born at Mount Barker, S.A. Sports: Golf, tennis.

TAYLOR, John T.: General Manager, 3AW Broadcasting Co. Pty. Ltd., Melbourne. Joined 2CH (Feb., 1932), as Advertis-



ing Manager, appointed General Manager October, 1932. Resigned May, 1936, to accept present position. Born 1904. Recreations: Golf and surfing.

THOMAS, Richard Charles: Manager and Chief Announcer 7HT, Hobart. Past experience Senior Announcer with Australian Broadcasting Co. Ltd., and Australian Broadcasting Commission Ltd., 7ZL, Hobart, and in charge of Regional Station 7NT. Conductor of Children's Sessions and Assistant Producer of Plays and Studio Presentations. Prior to joining broadcasting was for many years associated with picture theatres in Australia and N.Z.

THOMPSON, William Henry: A.C.A. Building, York and King Street, Sydney. City representative 2KO, Newcastle. Representative 6PM-6AM, Perth. Previously selling newspaper space in Sydney for years, both for daily and interstate papers. With 2KO for past 3 years, at present looking after their interests in Sydney. Born Sydney. Recreations: Fishing and races.

THORN, Arthur: Announcer, 5KA, Adelaide. A native of Windsor, England, came to Australia in 1922, and after a varied career made advent into radio in Queensland during 1929. Then became announcer on a N.S.W. commercial station. After 12 months, commenced with 5KA. During 5 1/2 years as Chief Announcer of 5KA, has become favourite with S.A. listeners. His character portrayals, a branch of entertainment at which he is adept, have long been a popular station feature.

TOZER, Jack: Sales Manager, 6AM Broadcasters Ltd. Private address: Thomas Street, Nedlands, W.A. Married. Club: Member C.T.A. Recreation: Sport.

TRENAM, Harold C.: Managing Director, Standard Telephones and Cables (A/sia) Ltd., 258 Botany Road, Alexandria, N.S.W. Educated Manchester Technical College, M. Inst. R.E. (Aust.). Qualified City and Guilds, London. Up to 1906, Engineer British Post Office. To 1926 Superintendent of Installations, Western Electric Co. Ltd. 1925-28, General Sales Manager, Western Electric Co. Ltd. 1928-30, Deputy Manager, Standard Telephones and Cables Ltd., London. To 1932, Managing Director Creed and Co. Ltd. Telegraph Engineers, London. Director Standard Telephones and Cables Ltd., London. Director International Telephone and Telegraph Co. Ltd., 1933, came to Australia in present position.

TUPPER, Frederick Cyril: Sporting Commentator, 3AW, Melbourne. Has done several outstanding broadcasts in Victoria, including visit of Duke of Gloucester, finish of Centenary Air Race, Henley Regatta.



Junior Cycling Championships. Racing commentator for 5 years. Visited India 1917, N.Z. 1922, Straits Settlement 1923, America 1924. Joined 3AW 22/2/'32. Recreations: Golf and motoring. Born 11/3/'03

TURNBULL, Iris, A.C.M.M. (Conservatorium of Music Diploma): Women's Session Controller, 3DB, Melbourne. Conservatorium library experience. Taught singing. Private address: 1 Murray Street, Armadale, Vic. Member Lyceum Club and Glen Waverley Golf Club. Born 8/4/'01.

Who's Who in Commercial Broadcasting (Continued).

WHITCOMB, T. (Cont.)



periments from 1920 to date. Well-known amateur transmitter since 1922—A3RY and VK 3WA. Manager and Engineer 3BA Ballarat since inception in 1930 to 1935. At that time sold holding of founder's shares to Ballarat Courier, 215 Raglan Street, Ballarat. Born 12/12/1900 at Auburn, Vic. Hobby: Amateur movies.

WORRALL, David: General Manager and Secretary, 3DB, Melbourne. Was a newspaper man in various country and city newspapers, including the "Herald," where he was responsible for much stunt work, including the "Herald" "Learn to Swim" campaign. Was in New

that Company was in Technical Department, resigning to construct 2TM's transmitter.

WHITE, David: Secretary 6AM Broadcasters Ltd. Private address: 60 Cambridge Street, Leederville, W.A. Single. Recreations: Swimming, tennis.

WHITE, Randal M. M.A. (T.C.D.): Assistant Manager Station 5DN, Adelaide. Prior to entering the radio field was Sales Manager for South Aus-



York for three or four years with an advertising firm representing a group of foreign newspapers. Went on world tour to survey broadcasting in America England and the Continent. Private address: 73 Amerway, Camberwell, Vic. Born Parramatta, N.S.W., 1894. Member Eastern Golf Club. Recreations: Golf and squash rackets.

tralia General Motors (Aust.) Pty. Ltd. World tour, 1928, U.S.A., Great Britain, Europe, studying merchandising and sales promotion methods. Hobby: Philately.

WHITFORD, Frank Roy: Manager, 6AM Broadcasters Ltd. Private address: 45 Stanley Street, Nedlands, W.A. Married. Recreations: Gardening, fishing, golf.

WILSON, Harper: Programme Director, 3UZ—Nilsen's Broadcasting Service. Born Melbourne. Private address: Mt. Eliza. Single. Recreations: Tennis and playwriting.

WHYKES, Ernest J. W.: Secretary, 3BA Ballarat. Has been Secretary since inception of 3BA. Is a Public Accountant in Ballarat and a member of the Commonwealth Institute of Accountants and A/sian Institute of Secretaries, and Licensed Companies Auditor. In August, 1935, was also appointed Advertising Manager 3BA. Born 6/4/03. Recreation: Bowls.

WILSON, Warne A.: M.Inst. R.E. Aust., M. Wireless Inst. Aust. Marconi Diploma. Manager and Station Engineer 3BA Ballarat. Served apprenticeship as electrical winder and fitter engaged in radio work and ex-

periments from 1920 to date. Well-known amateur transmitter since 1922—A3RY and VK 3WA. Manager and Engineer 3BA Ballarat since inception in 1930 to 1935. At that time sold holding of founder's shares to Ballarat Courier, 215 Raglan Street, Ballarat. Born 12/12/1900 at Auburn, Vic. Hobby: Amateur movies.



WYLES, David G. M. Inst. R.E. (Aust.), M. Inst. R.E. (U.S.A.): Technical and Commercial Manager, Radio Division, Philips Lamps (A/sia) Ltd., 69-73 Clarence Street, Sydney. Councillor Institution

Radio Engineers Aust. Served engineering apprenticeship. Joined Amalgamated Wireless, 1914. Visited Europe, Gt. Britain 1922-23, investigating radio on behalf of A.W.A. Appointed Chief Engineer, Station 2BL, 1925, later appointed engineer National Electric Co., N.Z. Joined Philips Lamps (A/sia) Ltd., Melbourne, as Technical and Commercial Manager, 1929. 1932 transferred to Philips Head Office, Sydney. Visited England, Europe and the U.S.A. on behalf of Philips Lamps, 1933 and 1935. Private address: 36 Burra Road, Artarmon. Born Adelaide, 20/7/94.

The Members of the Australian Broadcasting Commission



Mr. W. J. Cleary, Chairman A.B.C.



Mr. Herbert Brookes, Vice-Chairman A.B.C.



Hon. R. B. Orchard, Commissioner.



Mr. J. W. Kitto, Commissioner.



Mrs. Claude Couchman, Commissioner.

EXECUTIVE OFFICERS OF THE AUSTRALIAN BROADCASTING COMMISSION

MOSES, Charles Joseph Alfred: General Manager of Australian Broadcasting Commission. Born January 21, 1900, at Atherton, Lancashire, England. Was educated at Oswestry Grammar School and Royal Military College, Sandhurst. He



nis, swimming, Australian Rules football, golf, flying, sheepdog trials.

BEARUP, Thomas William: Federal Superintendent Aust. Broadcasting Commission, and previously manager for Victoria. Joined Amalgamated Wireless (A/sia) Ltd., in 1916. Visited England to investigate, inter alia, developments in broadcasting. December, 1923, joined 2FC



KIRKE, Basil.



FINLAY, A. N.: Recently appointed Queensland Manager of Australian Broadcasting Commission. Previously sporting



THOMAS, L. R., Lieut.-Col.: A.B.C. Manager for S.A., 1937. Born England, educated Mill Hill School and Middle Temple, London, Barrister-at-Law. Military Service-Auxiliary Forces since 1903. Served in Gallipoli, Suvia Bay and Mesopotamia.



held a commission in the British Regular Army (The Border Regiment) from 1918 to 1922, serving in France, Germany and Ireland. Owing to slowness of promotion in British Army, he took advantage of "Geddes Scheme" and retired in October, 1922, coming to Australia in December, 1922, to join his parents, who had been in Australia for some years. Was fruit-growing in the Bendigo district from December, 1922 to June, 1924. In motor business in Melbourne from July, 1924 to August, 1930, first as salesman, then as executive. Joined Melbourne staff of the Australian Broadcasting Company in August, 1930, as announcer, later taking on wider responsibilities as sporting and news commentator. Was transferred to Sydney in January, 1933 as Sporting and News Editor. Shortly afterwards, in addition to those duties, was appointed Talks Controller and organised the school broadcasts. In May, 1934, was appointed Federal Talks Controller, and also supervised the Commission's sporting activities, from a Federal point of view. On September 1, 1935, appointed Federal Liaison Officer, and on November 1, 1935, appointed General Manager of Australian Broadcasting Commission.

at its opening. October, 1924-July, 1929, Studio Manager 3LO—3AR, Melbourne. July, 1929-June, 1932, Victorian Manager Australian Broadcasting Commission. March, 1936, visited overseas on behalf of the Commission. Appointed present position June, 1937.

HORNER, H. G.: Manager for A.B.C. in N.S.W. Educated at King's College, Canterbury; thereafter for a period of approximately three years travel-



Staff Officer Army Headquarters Baghdad, 1917-1919; awarded D.S.O. 1917. Headquarters Staff—Southern and Northern Commands, England. Registrar University of Tasmania, 1922-1933. Controller of Talks and Educational Broadcasts, Australian Broadcasting Commission, Victorian Division 1933-1934. Manager in Tasmania prior to present position.

WICKS, C. C.: Acting-Manager for Tasmania comes from Western Australia. He joined Perth Division of Australian



led extensively, visiting every British Colony and many other parts of the world. He finally settled in Canada for a period of four years, came to Australia in 1914, and has been in this country ever since. A qualified accountant and secretary, and has held the following positions: Secretary William Atkins Ltd., Secretary Palmolive Company, Assistant Secretary "Sun" Newspapers Ltd., Manager Broadcasters (Sydney) Ltd., Secretary Australian Broadcasting Co. Ltd., Manager N.S.W. Branch Australian Broadcasting Commission.

Passed Oxford Junior Local Examination at 13, passed Oxford Senior Local Examination at 15, passed London Matriculation Examination at 16, passed Army Entrance Examination at 17 (passing in 27th out of 3,000 entrants). Represented Regiment in every sport—Athletics, Boxing, Cross-country running, Cricket, Hockey, Rugby and Soccer. Won Irish Command Boxing and Shot-putting Championships, 1920, 21, 22, won Victorian Amateur Heavyweight Boxing Championship in 1925, won Victorian Discus Throwing Championship in 1927-28. Represented Victoria at Rugby Union Football in 1926-32 inclusive.

Has broadcast no less than twenty different forms of sport including athletics, boxing, cricket, cross-country running, soccer, Rugby League, Rugby Union, cycling, speedway racing, rowing, wrestling, ice hockey, trotting, baseball, ten-

KIRKE, Basil: Vic. Manager for A.B.C. Mr. Kirke was born in Australia, served in the A.I.F. and later was engaged in the planting industry in the Pacific Islands. He first became associated with broadcasting through 2BL Sydney, and was appointed Manager of A.B.C. in W.A. in 1930.

Broadcasting Commission in 1929, commencing as accountant and controller of sporting broadcasts. Was made Programme Controller for Western Australia in 1936 and was appointed acting-Manager for Tasmania in 1937. Before going to Tasmania he was sent from Perth to Adelaide to take part in the Test match descriptions in the Commission.

editor N.S.W. National Stations. Educated Sydney Grammar School and St. Andrew's College, Sydney University, where he studied law. Was Associate to Mr. Justice James three years. Was a member of the "Waratahs" football team. Later joined teaching staff of Sydney Grammar, specialising in sport and coaching Grammar crews for "Head of the River" race for five years. He represented Grammar and Sydney University at rowing, football, athletics and swimming. Won blues for rowing and football at University and was captain of the University football team. Represented N.S.W. in Rugby Union 1926-1931, and was captain of N.S.W. team for three years. Was vice-captain of Australian Rugby Union team 1929-1930. Generally excelled in most sports.

CHARLTON, Conrad: A.B.C. Manager for West Australia. Born in New Zealand. Saw ac-



tive service in Egypt and France with the N.Z. forces during the war. Rose from ranks to captain. Was badly knocked about at the Battle of the Somme and only through skill of Colonel Rigby, later Sir Hugh Rigby and physician to the late King that Mr. Charlton was able to walk again. After war was appointed vocational training officer to N.Z. Defence Department to organise training of returned soldiers in various occupations. Later came to Australia, took up the stage and eventually joined staff of 3LO National Station. Later joined 2FC. In his younger days was a prominent Rugby Union wing three-quarter in N.Z. and the army. Specialises in raising of poultry and pigeons.

EXECUTIVE OFFICERS OF THE AUSTRALIAN BROADCASTING COMMISSION.

BARRY, Dr. Keith: Federal controller of programmes for Australian Broadcasting Commission. Born at Parramatta, N.S.W., educated at Sydney Grammar and Sydney University, graduating M.B. and Ch.M.



critic. He is the author of "Music and the Listener," and his brochure "Chopin and His Doctors" has been translated into French and German. In 1936 Dr. Barry returned from a two years trip to Europe where he studied broadcasting very extensively.

JAMES, W. G.: Federal controller of music of the Australian Broadcasting Commission.



CLEWLOW, F. D.: Federal Controller of Productions of the Australian Broadcasting Commission. Became associated with National broadcasting in



including the supervision of variety, vaudeville and musical comedy as well as the more serious forms of drama.

McCALL, Robert: Controller of celebrity concerts of the Australian Broadcasting Commission. Joined the Commission Federal staff as programme



editor in October, 1936. Was previously Record Sales Manager for the Columbia Graphophone Company. Has a wide knowledge of music and of the recorded type. He is in charge of the Federal record library for the A.B.C.

degrees. Served as Captain in British Army during war. Although a medical practitioner, Dr. Barry has been associated with the musical life of Sydney since he graduated. Has broadcast in many countries and on the A.B.C. on many occasions prior to his appointment to the Broadcasting Commission. He is an experienced film critic, writer and music

tion. A brilliant pianist, has appeared at the Queen's Hall, as celebrity artist in a season when Kreisler, Melba, and other

1932. Is frequently invited to adjudicate in the speech sections of eisteddfods. Has had wide experience in broadcasting

GENERAL INDEX

A
 Ace Amplifiers Ltd., 137.
 Acts—Commonwealth Wireless, 7.
 Adcraft Service, 105.
 Adthead Rose Publicity Pty. Ltd., 105.
 Advertiser Newspapers Ltd., 52, 132, 133.
 Advertisers in Australian Broadcasting, 100.
 Advertising Agencies Handling Radio Accounts, 105.
 Aerials—Efficiency—Rules, 80.
 Aerial Publicity Co. Ltd., 96, 105.
 Aerials Broadcasting Co., 50, 116.
 Allan, Mervyn Pty. Ltd., 105.
 Allison, H. W., 140.
 Amalgamated Wireless (A/sia) Ltd., 50, 52, 87, 96, 105, 115, 110, 112, 123, 130, 131, 132, 137, 140.
 Anderson, G. H., 151.
 Anderson, Hugh, 140.
 Anivitti-Schey Ltd., 105.
 Ansell, W. D., 54.
 Apperley, Geo., 151.
 Argus Broadcasting Services Pty. Ltd., The, 52, 126, 127.
 Armidale Newspapers Co. Ltd., 110.
 Armitage, J., 151.
 Armstrong, J. A., 140.
 Athol Tier Radio Advertising Service, 105.
 Atwater Kent Radio Service Ltd., 54.
 Auditor-General's Report on Wireless Accounts, 24.
 Austral Press & Advertising Ltd., 105.
 Australian Broadcasting Commission (4th Annual Report), 15.
 Australian Broadcasting Commission (Balance Sheet), 23.

Australian Broadcasting Commission, Executive Officers, 165.
 Australian Engineering Equipment Co. Pty. Ltd., 137.
 Aust. Federation of Broadcasting Stations, 55.
 Australian Radio Publications, 149.
 Australian Radio Research Board, 12.
 Australian Radio Tariff Schedule, 77.
 Ayr Broadcasters Pty. Ltd., 52, 128.

B
 Baird, W. R., 151.
 Bairnsfather, 151.
 Ballarat Broadcasters Pty. Ltd., 52, 122.
 Barker, J. H., Junr., 151.
 Barnes, M. R., 140.
 Barnett's Radio Supplies, 54.
 Barry, Dr. K., 166.
 Bartlett, L. V. Pty. Ltd., 105.
 Basden, F. M., 151.
 Bathurst Broadcasters Ltd., 50, 110.
 Baume, S. E., 151.
 Beard, E. G., 151.
 Bearup, T. W., 165.
 Beattie, S., 151.
 Beaver, H. E., 151.
 Beckett Thompson Advertising Pty. Ltd., 105.
 Bednall, G. N., 140.
 Bega and Far South Coast Broadcasters Ltd., 110.
 Bennett, A. E., 152.
 Bennett, A. L., 152.
 Beresford, Kingsbury Co. Pty. Ltd., 105.
 Bilton, John I., 54.
 Blanks, Chas E. Ltd., 96.

Bourke, A. D., 105, 140.
 Brewer, E. H., 140.
 Brisbane Broadcasting Pty. Ltd., 52, 128, 129.
 Broadbent, J., 152.
 Broadcast Fees & Charges by P.M.G.'s Dept., 4.
 Broadcast Services, 96, 105, 140.
 Broadcasters (Aust.) Ltd., 52, 129.
 BROADCASTING BUSINESS, 69, 149.
 Broadcasting Business Year Book, 149.
 Broadcasting in Australia, 3.
 Broadcast Station Separation, 88.
 Broadcasting Stations in Australia, 50.
 Broadcasting Station 2GB Ltd., 114.
 Broadcasting Station Representatives, 140.
 Broadcasting Transmission Equipment Manufacturers, 137.
 Brooker, V. M., 152.
 Brookes, H., 164.
 Brown, H. P., 152.
 Browne, T. B. Ltd., 105.
 B.S.A. Players, 96.
 Builder, G., 152.
 Bundaberg Broadcasters Pty. Ltd., 52, 130, 145.
 Burnie Broadcasting Service Pty. Ltd., The, 135.
 Butcher, R., 140.
 2MO Gunnedah Ltd., 117.
 2ZR Radio Club, 54.
 3AW Broadcasting Co. Pty. Ltd., 50, 122.
 3DB Broadcasting Co. Pty. Ltd., 52, 123.
 3KZ Broadcasting Co. Pty. Ltd., 124.
 6AM Broadcasters Ltd., 53, 134.
 6PM Broadcasters Ltd., 53, 135.

GENERAL INDEX (Cont.)

Broadcasting Stations:
 2AD 50, 110, 141.
 2AY 50, 110, 141.
 2BE 50, 110.
 2BH 50, 110.
 2BL 50, 53.
 2BS 50, 110.
 2CA 50, 110.
 2CH 50, 115, 112, 141.
 2CO 50, 53.
 2CR 50, 53.
 2DU 50, 112, 141.
 2FC 50, 53.
 2GB 50, 114, 141.
 2GF 50, 114, 141.
 2GN 50, 114, 141.
 2GZ 50, 113, 114, 141.
 2HD 50, 125, 116, 141.
 2HR 50, 116.
 2KA 50, 116, 141.
 2KM 50, 116.
 2KO 50, 116, 141, 145.
 2KY 50, 121, 117, 141.
 2LF 50, 117.
 2LM 50, 118, 141.
 2MO 50, 117, 141.
 2MW 50, 118.
 2NC 50, 53.
 2NR 50, 53.
 2NZ 50, 118, 141.
 2QN 50, 118.
 2RG 50, 118.
 2SM 50, 119, 141.
 2TM 50, 119, 141, 143.
 2UE 50, 119, 141.
 2UW 50, 120, 140, 141.
 2WG 50, 120, 141.
 2WL 50, 121, 141.
 2XL 50, 121.
 3AK 50, 123, 122, 141.
 3AR 50, 53.
 3AW 50, 122, 141.
 3BA 52, 122.
 3BO 52, 123, 141.
 3DB 52, 98, 123, 141.
 3GI 52.
 3GL 52, 53, 124.
 3HA 52, 134, 124, 141.
 3KZ 52, 99, 107, 124, 141.
 3LK 52, 123, 141.
 3LO 52, 53.
 3LR 52, 53.
 3WV 53.
 3MA 52, 124.
 3MB 52, 125.
 N.Z. Broadcasting Stations:
 1YA 54.
 1YX 54.
 1ZB 54, 138, 139.
 1ZM 54.
 1ZJ 54.
 2YA 54.
 2YB 54.

2ZL 54
 2ZR 54.
 2ZD 54.
 3YA 54.
 3ZR 54.
 3YL 54.
 3ZM 54.
 4ZP 54.
 4YA 54.

C
 Calenders for 1937-8-9., 2
 Call Sign Allocations, 86.
 Canberra Advertising Ltd., 105.
 Carruthers, T. R., 152.
 Carson, C. R., 152.
 Catholic Broadcasting Co. Ltd., 50, 119
 Catts-Patterson Co. Pty. Ltd., 105.
 Central Western Radio Services Ltd., 50, 112, 131, 52.
 Chandler, J. B., 152.
 Chandler, J. B. and Co., 96, 105.
 Chard, A. J., 140.
 Charleville Broadcasting Service Pty. Ltd., 52, 132.
 Charlton, C., 165.
 Chaston, N., 152.
 Clarke, E. James, 140.
 Cleary, W. J., 164.
 Clem Taylor Advertising Service Ltd., 105.
 Clewlow, F. D., 166.
 Clubb, A. M., 152.
 Clubb, A. M. and C. Ltd., 95.
 Cochrane, A. S., 152.
 Cohen, S. Crossen, 105.
 Colman, E., 152.
 Columbia Graphophone (Aust.) Ltd., 96, Back Cover.
 Goldwell-Smith, C. E., 152.
 Colville, S., 152.
 Colville Wireless Equipment Co. Pty. Ltd., 137.
 Commercial Broadcasting Personnel, 142.
 Commercial Broadcasters Pty. Ltd., 53, 135.
 Commonwealth and State Taxes, 28.
 Commonwealth Broadcasting Corporation Ltd., 50, 97, 120, 128.
 Commonwealth Broadcasting Corporation (Q'ld.) Pty. Ltd., 52, 140.
 Commonwealth Broadcasting Network, 111, 127.
 Commonwealth Govt.—A.W.A. Agreement, 26.
 Commonwealth Postal Information, 26
 Commonwealth Wireless Regulations, 8.
 Commonwealth Wireless Telegraphy Act, 7.
 Communication Services of P.M.G.'s Dept., 35.
 Condenser Specialty Co. Ltd., 137.
 Consolidated Advertising Services, 105
 Conry, W. H., 153.
 Cookson, J. G., 153.
 Cooma Broadcasters Pty. Ltd., 121.
 Coombs, T. G., 153.
 Cooper, S. A. B., 153.
 Cottrell, E. L., 153.
 Cottrell, F. C. Clarke, 153.
 Couchman, Mrs. Claude, 164.
 Country Broadcasting Services Ltd., 50, 97, 113, 114, 140.
 Country Licence Distribution, 44, 46.
 Country Press Campbell Advertising, 106.

Country Press Ltd., 106.
 "Coverage," 82.
 Cox, H. E., 153.
 Crawford, W. T. S., 153.
 Cromie, C. T., 153.
 Cross, C. J., 153.
 Crossman, K. D., 153.
 Crouch, E. C., 153.
 C.T.C. Hands, 54.
 Cummins, A. W., 140.
 Cummings-Wright Advertising Service, 106.
 Customs Tariff Schedule, 77.

D
 Dahl, N. L., 153.
 Dahlberg, Louis, 140, 153.
 Daniell, F. H. W., 153.
 Davey, J. H., 153.
 Dearman, R. V., 153.
 Decibel System, 70.
 Deniliquin Broadcasting Co. Ltd., 50, 118.
 Devine, J. S., 153.
 Diamondpoint Services Pty. Ltd., 97.
 Dictionary of Radio Definitions, 66.
 Dinneny, V. M., 140.
 Disc Recording, 89.
 Dobbs, S. B., 154.
 Dobbys, J. McM., 154.
 Dodds, J. S., 154.
 Donner, W. A., 154.
 Dooley, R., 154.
 Dower, J. M., 154.
 Draffin, J. C., 154.
 Ducon Condenser Pty. Ltd., 97.
 Dudman, V. H. M., 154.
 Duffy, M. H., 154.
 Dunne, J. S., 154.
 Dunne, P. E., 154.
 Dyball, H. F., 154.

E
 Edwards, G., 154.
 Edwards, J. R., 154.
 Efftee Broadcasters Pty. Ltd., 127.
 Exon, F. C., 154.
 Experimental Stations, 84.

F
 Fair, Roger, 140.
 Fairhall, A., 155.
 Farrell, S. H., 155.
 Fassett and Johnson, 106.
 Featuradio Sound Productions Pty. Ltd., 93, 97.
 Featuradio Sound Productions (N.S.W.) Pty. Ltd., 97.
 Fegan, D. M., 155.
 Fidel-a-tone Sound Productions, 97.
 Findlay and Wills Broadcasters Pty. Ltd., 53, 136.
 Findlay, S. H., 155.
 Findlay's Pty. Ltd., 53.
 Finlay, A. N., 165.
 Finn, A. L., 140.
 Fisher, R. D., 140.
 Fisk, E. T. Sir, 155.
 Fitts, R. A., 155.
 Forster Advertising Company, 106.
 Fox Advertising Service, 106.
 Fox, M. J., 155.
 Francis, M., 155.
 Frequency Spectra of Musical Instruments, 71.
 Frequency Wavelength Conversion Chart, 65.

GENERAL INDEX (Cont.)

- G
Garden, H. M., 155.
Garden, J. S., 155.
Geelong Broadcasters Pty. Ltd., 52, 124.
Gellert, Owen L. Advertising Service, 106.
Gendle, C. H., 155.
George Edwards, 91.
George Edwards Productions, 91, 98, 150.
Gibson, C., 140.
Gilder, C., 140.
Gilchrist, A., 155.
Gilmour, N. S., 155.
Gippsland Publicity Pty. Ltd., 52, 126.
Godfrey, K., 155.
Gold, E., 156.
Goldberg Advertising (Australia) Pty. Ltd., 106.
Goldfields Broadcasters (1933) Ltd., 53, 134.
Gold Radio Service Pty. Ltd., 52, 131.
Gollin and Co. Pty. Ltd., 106.
Goody, H., 156.
Gordon and Gotch (A/sia) Ltd., 106.
Gotham (A/sia) Ltd., 106.
Goulburn Broadcasting Co. Ltd., 50, 114.
Grafton Broadcasting Co. Ltd., 50, 114.
Graham Advertising Agency, The, 106.
Graves, Richard Pty. Ltd., 106.
Great Northern Broadcasters Ltd., 134
Great Southern Broadcasters Ltd., The, 135.
Green, A. L., 156.
Green, R. W., 106.
Greenhalgh, K. N., 156.
Growth of Listeners' Licenses since 1924, 39, 41.
Guide in Determining Station Sites, 75
Gunnedah Ltd., 50, 117.
- H
Hall, P. R., 156.
Hallsforth, N. F. D., 156.
Hansen, C. B., 54, 140.
Hansen Rubensohn Company, 107.
Harnett, D., 156.
Harper, J., 156.
Harris, H. M. D., 156.
Harrison, E., 156.
Harvey, Julius Advertising Service, 107.
Harvey, W. J., 156.
Hasty, F. S., 156.
Heath, L. R., 156.
Hickling, R. C., 156.
Higginbotham, E., 157.
Hilco Transformer Pty. Ltd., 137.
Hill, G., 140.
Hoad, A. E., 157.
Hooke, L. A., 157.
Hooper, E. M., 157.
Horner, H. G., 165.
Hume Broadcasters Ltd., 52, 133.
Hume, E. J., 157.
Hunter River Broadcasters Pty. Ltd., 116.
Hyam, G. R., 107.
- I
Hott, J. (Aust.) Ltd., 107.
Important Australian Statistics, 33.
- Important Broadcasting Social Clubs, 137.
Industrial Printing and Publicity Co., 52.
Institution of Radio Engineers (Aust.), 56.
Institution of Radio Engineers, Annual Report, 1937, 61.
Ipswich Broadcasting Co. Pty. Ltd., 52, 130.
Irrigation Area Newspapers Ltd., 50, 118.
- J
James, C., 157.
James, W. G., 166.
Jones, J. L., 140.
Jones, Wylie B., 107.
John Holden, 54.
Johns Ltd., 54.
Johnson, W. J., 157.
Johnston Advertising Pty. Ltd., 107.
Johnston Jones Advertising, 107.
Johnston, W. W., 157.
Joyce, J., 157.
- K
Kauper, H. A., 157.
Kemp, S. J. A., 157.
Kemsley, A. N., 157.
Kerr, A. D., 157.
King, C. C., 157.
King, R. A., 157.
Kirke, B., 165.
Kitto, J. W., 164.
Kyle, J. V., 54.
Labour Council of N.S.W., 50, 121, 117.
Lane, R. E., 157.
Larkins, F. W., 158.
Larkin, J. S., 158.
Lawrence, A. E., 158.
Legionnaire Radio Productions Pty. Ltd., 98.
Lekmek Radio Laboratories, 81.
Leonard, F. P., 107.
Leopold, W., 158.
Levy, F. E., 158.
Lewis, E. J., 158.
Lewis, H. J., 158.
License Distribution, 44, 46.
License Distribution—World, 23.
Licenses—Growth since 1924, 39, 41.
Lincoln, R., 158.
List of Broadcasting Stations in Australia, 50.
Listeners' Licenses 1934-5-6, 39.
Listeners' License Figures for 1936, 42
Locations of Broadcasting Stations, 51
Locations of Broadcasting Transmitters, 74.
Long Distance Telephone Services, 40.
Lyons, N., 158.
- M
Mackay Broadcasting Service, 52, 131.
McCall, R., 166.
McCarthy-MacVeigh Advertising Service, 107.
McCartney, R. J., 140.
McCracken and Walls, 54.
McDonald, A. S., 158.
McGuillan, C. J., 159.
McGuire, W. S., 158.
McMahon, R., 140.
McNair, W. A., 158.
McNeil, T. A. E., 158.
Mallee Broadcasters Pty. Ltd., 52, 125.
- Malone, J. J., 159.
Manawatu Radio Club, 54.
Map showing location of Broadcasting Stations, 51.
Marden, C. F., 159.
Marona Broadcasting Co. Ltd., 132.
Marsh, G. W., 159.
Marsh Ltd., 108.
Marshall, H. A., 159.
Maryborough Broadcasting Co. Ltd., 52, 131.
Massey, G. F., 159.
Mather, L. G., 140.
Mathers, A. J., 159.
Maurice and Moore Pty. Ltd., 98, 108.
Maxwell, S. A., 159.
Meaney, Right Rev. Monsignor James, 159.
Melbourne Broadcasters Pty. Ltd., 50, 122.
Mercantile Exchange, 108.
Meredith St., 159.
Metropolitan Broadcasters Pty. Ltd., 53, 136.
Metropolitan License Distribution, 44, 46.
Microphone Club of N.S.W., The, 137.
Midlands Broadcasting Services, Ltd., 53.
Millar, R., 159.
Mingay, O. F., 160.
Mitchell, C. and Co. Ltd., 108.
Mitchell, William, 108.
Mitchell, V. F., 159.
Modern Disc Recording, 98.
Monks, C. A., 140, 160.
Mooney Webb Pty. Ltd., 108.
Morell, M., 160.
Morgan, S., 160.
Morse, P. A., 140.
Moses, C. J., 165.
Mount, N. C. S., 108.
Murray Bridge Broadcasting Co. Ltd., 53.
Murray, A. J., 160.
Murray, J., 160.
Murray, J. W., 160.
- N
National Advertising Ltd., 108.
National Broadcasting Stations, 53.
National Broadcasting Service, 50, 52, 53.
National Commercial Broadcasting Service, 54, 138, 139.
National Merchandisers Pty. Ltd., 108.
Newcastle Broadcasting Co. Ltd., 50, 116.
New England Broadcasters, 50.
N.S.W. Council of Churches Services, 50.
New Zealand Broadcasting Stations, 54.
N.Z. Licenses for 1936, 45.
N.Z. National Broadcasting Service, 54
Nicholas, W. R., 160.
Nicholson's Ltd., 53, 135.
Nicholson, R. M., 160.
Nielsen's Broadcasting Service Pty. Ltd., 52, 126.
Nielsen, O. J., 160.
Nielsen, O. V., 160.
Nixon, N. V. and Co., 108.
Noble-Bartlett Advertising, 108.
North Taranaki Radio Society, 54.
Northern Broadcasters Ltd., 50, 118.
Northern Tasmania Broadcasters Pty. Ltd., 53, 136.

GENERAL INDEX

(Continued.)

- O
O'Brien Publicity Co., 108.
Orchard, R. B., 164.
Otago Radio Association, 54.
Overdiep, J. A., 160.
- P
Palmer, G. F., 160.
Parsons, R. T., 54.
Particulars of Commercial Broadcasting Stations in Australia, 110.
Patterson, Geo. Pty. Ltd., 108.
Paton Advt. Service Pty. Ltd., The, 108
Percival, J. B. Publicity Co., 108.
Perry, E. A., 54.
Perry, L. W., 160.
Pfeil, R. W., 160.
Philips Lamps (A/sia) Ltd., 137, Front Cover.
Pickhover, H., 161.
Pinkerton, H. R., 161.
P.M.G.'s 26th Annual Report, 72.
P.M.G.'s Dept. Communication Services, 35.
Postal Information, 26.
P.M.G.'s Dept., Auditor-General's Report, 24.
Powell, R. K., 108.
Power Analysis of Aust. Commercial Broadcasting Stations, 99.
Powers, Joshua B., 140.
Presto Recordings, 95.
Prestophone Pty. Ltd., 98.
Prince, A. L., 161.
Prominent Advertisers in Aust. Broadcasting, 100.
Publicity Services, 108.
Pym, W., 161.
- Quirk, L. P., 161.
- R
Radcliffe, Una, 98.
Radio 2UE Sydney Ltd., 50, 116, 119.
Radio Dictionary, 50.
Radio Inductive Interference, 6.
Radio Industry Functions Club, 60.
Radio Katoomba Ltd., 50.
Radio Kempsey Ltd., 116.
Radiophonic Recording, 98.
Radio Research Board, 12.
RADIO REVIEW, 76, 149.
RADIO RETAILER, 149.
Radio Service Ltd., 54.
Radio Silver City Ltd., 50, 110.
RADIO TRADE ANNUAL, 149.
Radiovision Proprietary Ltd., 108, 139.
Radio Women's Club of Victoria, 137.
Raphael Advertising Co., 108.
Recadio Productions, 98.
Recording, 89.
Reed, J. G., 161.
Renton and Clark, 54.
Reuter's Ltd., 108.
Richardson-Cox Pty. Ltd., 108.
Richmond River Broadcasters Ltd., 50, 118.
Rickards Advertising Service, 108.
Ridley, J. E., 161.
Rieusset, B., 140.
R.I.F. Club of Sydney, 150.
Riverina Radio Broadcasting Co. Ltd., 50, 120.
River Murray Broadcasters Ltd., 53, 133.
Roberts, R., 161.
- Roberts, R. F., 161.
Robertson, A., 161.
Rockhampton Broadcasting Co. Pty. Pty. Ltd., 52, 131.
Rolfe, R. N. and Sons, 136.
Rowe, E. W., 161.
Roycroft, J. L., 161.
Russell, R. McC. 161.
Ryan, A. J., 161.
Ryan, A. J. Broadcasters Ltd., 50, 110.
Ryan, J., 161.
- S
"Sally," 161.
Samson Clark Price-Berry Pty. Ltd., 109.
Samuel, B., 162.
Schultz, L. N., 162.
Scott, Don, 140.
Sellers, O. P., 109.
Sensitivity of the Ear, 71.
Shaw, R. A., 162.
Shearman, T. H., 98.
Sheppard, A. W., 162.
Shield Advertising Service, 109.
*Short Wave Transmission Schedules, 85.
Smith, W. E. Ltd., 109.
Smyth, Arthur and Sons, 109.
Social Clubs, 137.
Soden, A. J., 109.
Sound Recording Studios Ltd., 98, 99.
South Burnett Broadcasting Co. Ltd., 132.
Southey, R. V., 162.
Specialty Publications and Sales Promotion Co. Ltd., 109.
Spencer, T., 162.
Sport Radio Broadcasting Co. Ltd., 53, 133.
Sproule, C. T., 140, 162.
Stacey-Green, D., 162.
Standard Advertising and Printing Co., 109.
Standard Telephones and Cables (A/sia) Ltd., 137.
State Taxes, 28.
Station Slogans, 141.
Station 3XY Pty. Ltd., 52.
Statistics, 33.
Stevenson Advertising Service, 109.
Stevenson, C. V., 162.
Stevenson, M. H., 162.
Stevenson, N., 162.
Storey, O. J., 162.
Successful Advertising Company, 109.
Sullivan Advertising Service, 109.
Sullivan, P., 140.
Sunraysia Broadcasters Pty. Ltd., 52, 124.
Sutton, F. G., 162.
Swan Hill Broadcasting Co., 52, 125.
Syme, D. S., 162.
Talbot-Lehmann, H. M., 162.
Tamworth Radio Development Co., 50, 119.
Tariff Schedule—Radio, 77.
Tatham, S. E., 162.
Taxes—Commonwealth and State, 28.
Taylor, C., 163.
Taylor, J. T., 163.
Technical Consideration Governing Location of B'cast Transmitters, 74.
Technical Progress in Aust. Broadcasting, 37.
Telephone Services for Broadcasting Purposes, 40.
"The Argus" Broadcasting Services Pty. Ltd., 52.
- Thompson, J. Walter (Aust.) Pty. Ltd., 109.
Thompson, W. H., 140, 163.
Thorn, A., 163.
Thurston, Harry, 99.
Tozer, J., 163.
Transmission Equipment Manufacturers, 137.
Transmission Equipment Pty. Ltd., 137
Trans-Radio News and Sales Service, 96, 99, 109.
Transcription Producers, 96.
Trenam, H. C., 163.
Tupper, F. C., 163.
Turnbull, I., 163.
Tweed Radio and Broadcasting Co. Ltd., 118.
Tyrrell, C. W., 163.
- Unsted, Jackson and Haines Ltd., 109.
- V
Van Gessel, K. M., 163.
Vee Bee Advertising Service, 109.
Victorian Microphone Club, 137.
Vinnicombe Advertising, 109.
- W
W.A. Broadcasters Ltd., 53, 134, 135.
Walls, J., 163.
Walters, M., 163.
Warwick Broadcasting Co. Pty. Ltd., 52, 132.
Watson, J. A., 163.
Wavelength-Frequency Conversion Chart, 65.
Webb-Roberts Pty. Ltd., 109.
Wells, H. R., 163.
Welsh, E., 163.
West Australian Newspapers Ltd., 53.
West Coast Broadcasters Pty. Ltd., 136
West Coast Radio Society, 54.
Western Province Radio Pty. Ltd., 52, 124.
Weston Co. Ltd., The, 109.
Whitcomb, T., 163.
White, A. N. Ltd., 109.
White, D., 164.
White, R. M., 164.
Whitford, F. R., 164.
Whykes, E. J. W., 164.
Wicks, C. C., 165.
Williams, A. J., 109.
Williams-McFerran Pty. Ltd., 109.
Willmott's Advertising Agency Ltd., 109.
Wilson, H., 164.
Wilson, W. A., 164.
Wireless Control in Australia, 5.
Wireless Telegraphy Act (Commonwealth), 7.
Wollongong Broadcasting Pty. Ltd., 50, 121.
World Licence Distribution, 23.
Worrall, D., 164.
Who's Who in Commercial Broadcasting, 151.
W. W. Rogers Ltd., 54.
Wyles, D. G., 164.
- Young Broadcasters Ltd., 117.

Memorandum

- ★ Commercial Broadcasting
- ★ More New Stations
- ★ The Value of "Airtime"
- ★ Sponsored Programmes
- ★ The Public Appreciation of Commercial Stations

BROADCASTING BUSINESS

During the last few years the Broadcasting Industry in Australia has shown such remarkable progress that it is unparalleled in any other industry. As the National trade paper in commercial broadcasting, BROADCASTING BUSINESS has recorded this growth, week by week, and continues to do so, spreading the gospel of broadcast advertising.

In this capacity BROADCASTING BUSINESS is rendering a service to the broadcasting stations as well as to the advertisers and other sections of the industry—a service which has proved to be real, because more and more stations are consistently advertising in its columns, and because BROADCASTING BUSINESS itself has more than trebled in size in the last 2½ years.

BROADCASTING BUSINESS is read each week by the men who buy time, in many cases men whom the stations' salesmen cannot reach—it tells your story to the right men at the right time.

AUSTRALIAN RADIO PUBLICATIONS LTD.

Goes—

- ★ Commercial Broadcasting
- ★ More New Stations
- ★ The Value of "Airtime"
- ★ Sponsored Programmes
- ★ The Public Appreciation of Commercial Stations Services



and



Goes—

BROADCASTING BUSINESS

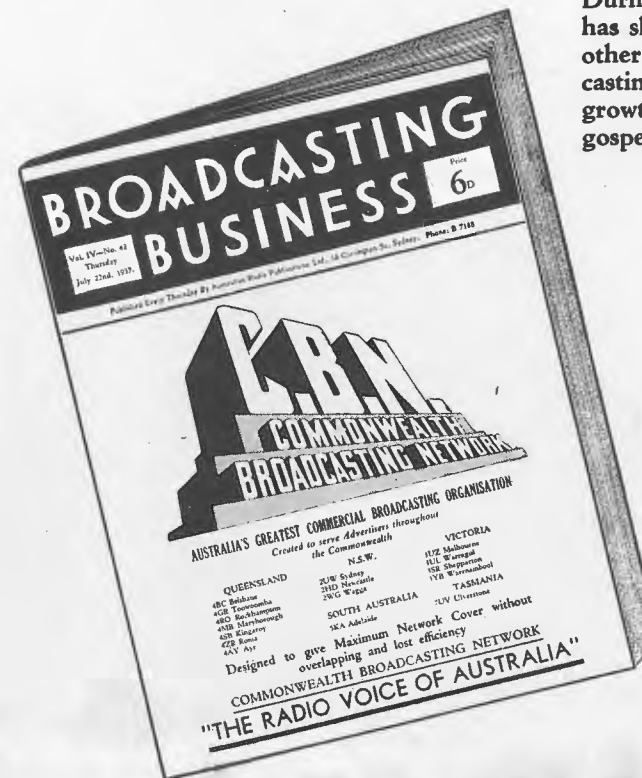
During the last few years the Broadcasting Industry in Australia has shown such remarkable progress that it is unparalleled in any other industry. As the National trade paper in commercial broadcasting, BROADCASTING BUSINESS has recorded this growth, week by week, and continues to do so, spreading the gospel of broadcast advertising.

In this capacity BROADCASTING BUSINESS is rendering a service to the broadcasting stations as well as to the advertisers and other sections of the industry—a service which has proved to be real, because more and more stations are consistently advertising in its columns, and because BROADCASTING BUSINESS itself has more than trebled in size in the last 2½ years.

BROADCASTING BUSINESS is read each week by the men who buy time, in many cases men whom the stations' salesmen cannot reach—it tells your story to the right men at the right time.

For details of advertising and subscription rates send direct to the publishers:—

AUSTRALIAN RADIO PUBLICATIONS LTD.
30-32 CARRINGTON STREET, SYDNEY.
BOX 3765 G.P.O. 'PHONE B 7188
or Melbourne Branch, 422 Little Collins Street. M 5438.



N
384.50994
BRO



Let Columbia
record your

RADIO
ADVERTISING
PROGRAMMES

FOR more than thirty years Columbia has led the field in the science of sound reproduction and record manufacture and is to-day able to offer advertisers the most complete recording facilities available in Australia. No matter what the need for radio advertising—Columbia can supply it—single Acetate recordings or conventional processed recordings in any quantity, each faithfully reproducing the the original studio performance. Many of Australia's leading national advertisers are using Columbia recordings for Broadcast Presentations.

Enquiries to Recording Dept.

COLUMBIA GRAPHOPHONE (AUST.) LTD.
2 Parramatta Road, Homebush, N.S.W. - Telephone: UM 6671