BROADCASTING BUSINESS

1936

YEAR BOOK

PUBLISHED BY AUSTRALIAN RADIO PUBLICATIONS, LTD, SYDNEY.

CONTENTS TABLE

C 820

Foreword . . .

THIS is the first edition of the "Broadcasting Business Year Book" published as a companion to our weekly business paper serving the commercial broadcasting fraternity of Australia.

Hitherto a lot of the main information included in this "Year Book" has been included in the "Radio Trade Annual," which is one of our publications.

It has been forcibly impressed upon us that the advertising service agents, national advertisers and other advertisers who are interested in selling their products over the air, and also many station executives, are not interested in having a reference book a large part of which is taken up with technicalities and some of the balance with matter that is irrelevant to their profession, particularly when the volume occupies about 350 pages, like the 1936 "Radio Trade Annual" does. Just as we find it necessary to publish a weekly business trade paper to cover the business side of broadcasting activities, so do we find it necessary to publish the "Broadcasting Business Year Book" which, in effect, deals principally with the business side of broadcasting.

Such facts and figures as are contained herein are for the earnest consideration of every station manager, irrespective of his location. It is our intention to have included within the covers of this Year Book all the reference matter that is required in the field of broadcasting.

We make no claims that this first effort reaches anywhere near what we require, but it is a step in the right direction and will enable us to show what is intended and to indicate how it can be improved upon for next year. Unfortunately a number of stations are extremely lax in answering correspondence and sending particulars, but to the vast majority we tender our thanks for their assistance and also particularly to those stations and other companies who patronised the Year Book with advertising, thus assisting materially in producing it. Without that, just like any commercial station, the book would never be available.

Such information as is included herein we believe to be authentic, but at the same time we cannot accept any responsibility, and sincerely trust there will be a minimum of omissions or inaccuracies, and that anything of such character will be eliminated from our next edition.

—THE EDITOR.

Contents Table at end of Book

1935

JANUARY							FEBRUARY							MARCH						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
		1	2	3	4	5						1	2					1	2	
6	7	8	9	10	11	12	3	4	5	6	7	8	9	3	4	5	6	7	8	9
13	14	15	16	17	18	19	10	11	12	13	14	15	16	10	11	12	13	14	15	16
20	21	22	23	24	25	26	17	18	19	20	21	22	23	17	18	19	20	21	22	23
27	28	29	30	31			24	25	26	27	28			24	25	26	27	28	29	30
														31						

APRIL							MAY							JUNE						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
	1	2	3	4	5	6				1	2	3	4							1
7	8	9	10	11	12	13	5	6	7	8	9	10	11	2	3	4	5	6	7	8
14	15	16	17	18	19	20	12	13	14	15	16	17	18	9	10	11	12	13	14	15
21	22	23	24	25	26	27	19	20	21	22	23	24	25	16	17	18	19	20	21	22
28	29	30					26	27	28	29	30	31		23	24	25	26	27	28	29
														30						

JULY							AUGUST							SEPTEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
	1	2	3	4	5	6					1	2	3	1	2	3	4	5	6	7
7	8	9	10	11	12	13	4	5	6	7	8	9	10	8	9	10	11	12	13	14
14	15	16	17	18	19	20	11	12	13	14	15	16	17	15	16	17	18	19	20	21
21	22	23	24	25	26	27	18	19	20	21	22	23	24	22	23	24	25	26	27	28
28	29	30	31				25	26	27	28	29	30	31	29	30					

OCTOBER							NOVEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
		1	2	3	4	5						1	2	1	2	3	4	5	6	7
6	7	8	9	10	11	12	3	4	5	6	7	8	9	8	9	10	11	12	13	14
13	14	15	16	17	18	19	10	11	12	13	14	15	16	15	16	17	18	19	20	21
20	21	22	23	24	25	26	17	18	19	20	21	22	23	22	23	24	25	26	27	28
27	28	29	30	31			24	25	26	27	28	29	30	29	30	31				

1936

JANUARY							FEBRUARY							MARCH						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
			1	2	3	4							1	1	2	3	4	5	6	7
5	6	7	8	9	10	11	2	3	4	5	6	7	8	8	9	10	11	12	13	14
12	13	14	15	16	17	18	9	10	11	12	13	14	15	15	16	17	18	19	20	21
19	20	21	22	23	24	25	16	17	18	19	20	21	22	22	23	24	25	26	27	28
26	27	28	29	30	31		23	24	25	26	27	28	29	29	30	31				

APRIL							MAY							JUNE						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2	3						1	2		1	2	3	4	5	6
5	6	7	8	9	10	11	3	4	5	6	7	8	9	7	8	9	10	11	12	13
12	13	14	15	16	17	18	10	11	12	13	14	15	16	14	15	16	17	18	19	20
19	20	21	22	23	24	25	17	18	19	20	21	22	23	21	22	23	24	25	26	27
26	27	28	29	30			24	25	26	27	28	29	30	28	29	30				
							31													

JULY							AUGUST							SEPTEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
						1										1	2	3	4	5
5	6	7	8	9	10	11	2	3	4	5	6	7	8	6	7	8	9	10	11	12
12	13	14	15	16	17	18	9	10	11	12	13	14	15	13	14	15	16	17	18	19
19	20	21	22	23	24	25	16	17	18	19	20	21	22	20	21	22	23	24	25	26
26	27	28	29	30	31		23	24	25	26	27	28	29	27	28	29	30			
							30	31												

OCTOBER							NOVEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2	3														
4	5	6	7	8	9	10	1	2	3	4	5	6	7	6	7	8	9	10	11	12
11	12	13	14	15	16	17	8	9	10	11	12	13	14	13	14	15	16	17	18	19
18	19	20	21	22	23	24	15	16	17	18	19	20	21	20	21	22	23	24	25	26
25	26	27	28	29	30	31	22	23	24	25	26	27	28	27	28	29	30	31		
							29	30												

1937

JANUARY							FEBRUARY							MARCH						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2		1	2	3	4	5	6		1	2	3	4	5	6
3	4	5	6	7	8	9	7	8	9	10	11	12	13	7	8	9	10	11	12	13
10	11	12	13	14	15	16	14	15	16	17	18	19	20	14	15	16	17	18	19	20
17	18	19	20	21	22	23	21	22	23	24	25	26	27	21	22	23	24	25	26	27
24	25	26	27	28	29	30	28							28	29	30	31			
31																				

APRIL							MAY							JUNE						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
													1							
4	5	6	7	8	9	10	2	3	4	5	6	7	8	6	7	8	9	10	11	12
11	12	13	14	15	16	17	9	10	11	12	13	14	15	13	14	15	16	17	18	19
18	19	20	21	22	23	24	16	17	18	19	20	21	22	20	21	22	23	24	25	26
25	26	27	28	29	30		23	24	25	26	27	28	29	27	28	29	30			
							30	31												

JULY							AUGUST							SEPTEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7				1	2	3	4
4	5	6	7	8	9	10	8	9	10	11	12	13	14	5	6	7	8	9	10	11
11	12	13	14	15	16	17	15	16	17	18	19	20	21	12	13	14	15	16	17	18
18	19	20	21	22	23	24	22	23	24	25	26	27	28	19	20	21	22	23	24	25
25	26	27	28	29	30	31	29	30	31					26	27	28	29	30		

OCTOBER							NOVEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2		1	2	3	4	5	6				1	2	3	4
3	4	5	6	7	8	9	7	8	9	10	11	12	13	5	6	7	8	9	10	11
10	11	12	13	14	15	16	14	15	16	17	18	19	20	12	13	14	15	16	17	18
17	18	19	20	21	22	23	21	22	23	24	25	26	27	19	20	21	22	23	24	25
24	25	26	27	28	29	30	28	29	30					26	27	28	29	30	31	
31																				

INTRODUCTION

Summary of Broadcasting in Australia

THE Australian Broadcasting System is controlled under an Act of Parliament by the Postmaster-General, who issues all licenses both for listeners and transmitters.

The Australian system is considered to be probably the ideal broadcasting system of the world. It incorporates the Government-owned national service as is known to exist in Great Britain controlled by the British Broadcasting Corporation, while a large number of commercial broadcasting stations are licensed as in U.S.A. The former participate in the listeners' license revenue to the extent of 12/- per license per annum, and the license figure for the Commonwealth has now reached over 800,000.

The commercial stations or privately-owned stations licensed by the Postmaster-General, pay £25 a year for their license and must rely wholly and solely on the revenue they collect for advertising various products over the air and also from other revenue producing sources. In this way the American system of broadcasting is employed, and therefore our Commonwealth system incorporates the good points of both the British and American, under very prudent control.

Listeners who pay their 21/- per annum, and who do not care to listen to advertising have, in the majority of cases, the opportunity of tuning in to a Government national station.

Development Indicated by Figures

Dealing with the progress of the licensed listeners' figures which is a positive indication of the public acceptance of broadcasting, it is interesting to note that during the calendar year of 1935, 169,621 new licenses were issued. At the end of December, 1935, there were 770,152 licenses in force with a ratio of 11.43 licenses to every 100 people. During 1935, the license situation improved by 88,518, after allowing for 81,103 cancellations during the year.

At the end of December, 1935, in the State of N.S.W., including Federal Capital Territory, 69% of homes within 50 miles of Sydney were equipped with radio receivers and 25% of the homes outside that area.

In Victoria, 67% of the homes within 50 miles of Melbourne had radio installed, while of the remainder of that State 36% of the homes were fitted.

In Queensland, on account of the vast distances and bad radio reception, particularly from atmospherics, while within 50 miles of Brisbane 52% of homes were radio equipped, only 20% of the balance outside had radio.

In South Australia country development outside of 50 miles of Adelaide, has been very good indeed—in fact, the best in Australia, as 40% of homes were fitted with radio last December, as against 65% within the 50-mile radius of Adelaide.

In Western Australia, 61% of homes within 50 miles of Perth had radio installed, while 23% of the remainder of the State also possessed one of the greatest instruments man has ever devised for the comfort and service of the people.

In Tasmania, within 50 miles of Hobart, there were 53% of radio equipped homes, while the remainder of the State had 34% of its homes so equipped.

Taking the whole of each State, 56% of the homes in Victoria are radio equipped, 55% of South Australia, 48% of N.S.W., followed by West Australia and Tasmania both with 42%, while Queensland has 32% of its homes radio equipped.

The country-metropolitan license distribution is rather interesting for the year 1935, and it will be noticed on special reference to the section that follows these pages, that taking a more restricted area of about 12 miles radius we find 65% of the homes in that Sydney area are equipped with radio, while in the balance of the State 31% of the homes are equipped.

Within the metropolitan area of Melbourne, which again is a very restricted area, more details being given on the country-metropolitan license distribution page herein, it will be seen that 73% of the dwellings within a few miles of Melbourne are radio equipped, while in the balance of the State, 37% is the figure.

A few miles from Brisbane covering their metropolitan area, 58% of the dwellings are equipped, and in the balance of Queensland, 21% of dwellings have radio installed.

In Adelaide, 72% of the dwellings have radio, while 39% of the country area is radio equipped.

In Western Australia the metropolitan figure is 66% of homes, while the country figure is 23%.

In Tasmania, the metropolitan radio homes equal 61%, while in the country the figure is 35%.

Taking the Commonwealth figures as a whole, the Postmaster-General's official figures show that 68% of the dwellings in the metropolitan areas are fitted with radio and 31% of country homes.

For the Commonwealth as a whole, radio homes equal 48% of the total, which means that there is still more than the same number of listeners to get as at present, which shows that on the official figures there is still a big future ahead of broadcasting.

(Continued on next page)

Summary of Broadcasting in Australia *(contd.)*

More Stations

During the year about 10 new stations went on the air, the highest being 2,000 watts and others down to 50 watts. Commercial stations are making rapid progress in programme presentation, listener response, advertising support and increased technical efficiency. It can reasonably be claimed that commercial stations entertain at least 75% of the people.

One of the outstanding features of 1935 was the inauguration during February of that year by 2UW Sydney, of a complete 24 hours' service 7 days per week for 52 weeks in the year.

Many other stations operate from about 5.45 a.m. to midnight on week-days and practically every metropolican station is on the air by 7 a.m.

New, big and better stations seem to be the order of the day, both as regards appointments, technical equipment, personnel, general efficiency and public support. During 1935, many wavelengths were reallocated to adequately provide for new stations.

New Regulations

Towards the latter end of 1935 a bombshell was thrown in the ranks of commercial broadcasting stations by the action of the Postmaster-General in having adopted a regulation seriously prohibiting as it were, and as thought by the broadcasting stations, any further development, in that it prevented the multiple ownership of stations by any one person, firm, corporation, etc. A compromise was effected between the Federation of Broadcasting Stations and the Postmaster-General, resulting in a limit of 8 stations being set.

Another important event was that of the long-awaited decision of the High Court of Australia as to the validity of the Wireless Act in relation to the Commonwealth Constitution. The decision and the opinion of the various judges of the High Court is considered so important as to be worthy of permanent record in this Year Book, and for that reason we print herein the full High Court opinion.

In the programme field transcriptions became more popular than ever, a large quantity of transcription material is imported from overseas, and what is more pleasing, more local transcriptions are being made and used. Some enterprising stations have put in their own recording plant, but in other cases several private companies operating on recordings and transcriptions alone, have done a wonderful job.

Live artist shows are somewhat increasing in application and utilisation by stations. For instance, a Sunday night in Sydney—and a lot of other States—is one of the feature nights, and one particular programme which lasted for about one hour, was full of live artists from beginning to end, who gave a wonderful illustration of effective entertainment, combined with modern and still more effective advertising of the product of the sponsor.

During the period of 1936 that has already passed, further development is occurring; programmes are being made more attractive, more country stations are being built, more advertising is being secured, and consequently this snowballing effect is producing excellent results.

It would take many, many pages to adequately summarise the many events during 1935, and as it is getting on late in 1936, we will content ourselves by saying that next year and particularly 1938, when the Australian cricketers will be in England—Australian celebrations will be held in Sydney commemorating the 150th foundation anniversary—radio should reach astoundingly high figures and should be placed in a most prominent and indelible position in the public mind.

Actually broadcasting is one of the greatest gifts to mankind, and we firmly believe that out of the many advances of science in the past 25 years, broadcasting is one of the major and most important contributions for the good of the people and the peace of the world.

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—

(a) transmitting messages by wireless telegraphy within Australia, and receiving messages so transmitted, and

(b) transmitting messages by wireless telegraphy from Australia to any place or ship outside Australia, and

(c) 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—

(a) establish, erect, maintain or use any station or appliance for the purpose of transmitting or receiving messages by means of wireless telegraphy; or

(b) 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—

(a) be subject to the control of the Postmaster-General; and

(b) 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**, 1905-1915.

2. Sections four, five and six of the **Wireless Telegraphy Act**, 1905, are amended by omitting the word "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**, 1905-1915 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 regulation 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 a 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.

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.

COMMONWEALTH WIRELESS REGULATIONS— (Continued)

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.

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.

(Continued on next page)

COMMONWEALTH WIRELESS REGULATIONS— (Continued)

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) For 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 equipment 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 Rules 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.

Amendments to Wireless Regulations

REGULATION UNDER THE WIRELESS TELEGRAPHY ACT, 1905-1919.*

I, The Governor-General in and over the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby make the following Regulation under the **Wireless Telegraphy Act**, 1905-1919.

Dated this twenty-seventh day of November, 1935.
ISAAC A. ISAACS.
Governor-General.

By His Excellency's Command,
A. J. McLACHLAN,
Postmaster-General.

Amendment of the Wireless Telegraphy Regulations †

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 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 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."

* Notified in the "Commonwealth Gazette" on 28th November, 1935.
‡ Statutory Rules 1924, No. 101, as amended by Statutory Rules 1925, No. 123; 1926, No. 114; 1927, Nos. 3, 24 and 63; 1928, Nos. 79 and 129; 1929, No. 81; 1930, No. 113; 1933, No. 136; 1934, No. 99, and 1935, No. 104.

Australian Broadcasting Commission

An Act relating to Broadcasting. No. 14 of 1932. (Assented to 17th May, 1932.)

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

Part 1.—Preliminary

1. This Act may be cited as the **Australian Broadcasting Commission Act, 1932.**

2. This Act shall commence on a date to be fixed by Proclamation.

3. This Act is divided into Parts, as follows:—
Part I.—Preliminary.
Part II.—Establishment and Constitution of Commission.
Part III.—Powers and Functions of the Commission.
Part IV.—Finance.
Part V.—Issue of Debentures by the Commission.
Part VI.—Miscellaneous.

4. In this Act, unless the contrary intention appears—
"Commission" means a member of the Commission;
"National broadcasting stations" means stations made available by the minister for the purpose of the transmission of the National Broadcasting Programmes;
"the Commission" means the Australian Broadcasting Commission appointed under this Act; and
"the Fund" means the Australian Broadcasting Commission Fund established under this Act.

Part 2.—Establishment and Constitution of the Commission

5. (1) For the purposes of this Act, there shall be a Commission, to be known as the Australian Broadcasting Commission, which shall be charged with the general administration of this Act.

(2) The Commission shall be a body corporate with perpetual succession and a common seal, and may acquire, hold, and dispose of real and personal property and shall be capable of suing and being sued in its corporate name.

(3) All Courts, Judges and persons acting judicially shall take judicial notice of the seal of the Commission affixed to any document or notice and shall deem that it was duly fixed.

6. (1) The Commission shall consist of five Commissioners, one of whom shall be a Chairman, and one of whom shall be a Vice-Chairman.

(2) The Commissioners shall be appointed by the Governor-General, and shall hold office, during good behaviour, for the period for which they were appointed.

7. (1) Subject to this Act, the period for which the Commissioners first appointed under this Act shall hold office shall be, in the case of the Chairman, not exceeding five years, in the case of the Vice-Chairman, not exceeding four years, and in the case of each of the remaining Commissioners not exceeding three years.

(2) After the appointment of the five Commissioners first appointed under this Act, each further appointment shall be for a period not exceeding three years.

(3) Each person who is appointed a Commissioner shall, upon the expiration of the term for which he was appointed, be eligible for re-appointment.

8. (1) Subject to this section, the Commissioners shall receive such salaries and allowances as the Governor-General determines.

(2) The salaries of the Commissioners shall not exceed the following:—

in the case of the Chairman	Five hundred pounds per annum;
in the case of the Vice-Chairman	Four hundred pounds per annum; and
In the case of each other Commissioner	Three hundred pounds per annum.

9. (1) In case of the illness or absence of the Chairman, the Vice-Chairman, if present, shall act as Chairman.

(2) In case of the illness or absence of both the Chairman and the Vice-Chairman, the Commissioners present may appoint one of their number to act as Chairman:

Provided that the Governor-General may, if he thinks fit, appoint a person to act as Chairman for such period as the Governor-General specifies.

(3) If the Governor-General appoints a person to act as Chairman the appointment shall be at such salary as is determined by the Governor-General, not exceeding the maximum salary fixed by section eight of this Act.

10. (1) In case of the illness or absence of any other Commissioner, the Governor-General may, if he thinks fit, appoint a person to perform the functions of the Commissioner during such illness or absence.

(2) The salary of any person so appointed shall be determined by the Governor-General but shall not exceed the maximum salary fixed by section eight of this Act in respect of that office.

11. In the event of the absence of any Commissioner, the Governor-General may determine the conditions as to remuneration or otherwise upon which leave may be granted.

12. The Governor-General may terminate the services of a Commissioner or an acting Commissioner for inability, inefficiency or misbehaviour, or for neglect or failure to carry out any of the provisions of this Act.

13. A Commissioner shall be deemed to have vacated his office—
(a) If his appointment is terminated by the Governor-General in pursuance of this Act;
(b) if he becomes bankrupt or compounds with his creditors or makes any assignment of his salary for their benefit or takes advantage of any provision of any Act relating to bankruptcy;
(c) if he becomes of unsound mind;
(d) if he resigns his office by writing under his hand addressed to the Governor-General and the resignation is accepted by the Governor-General;
(e) if he absents himself (except on leave granted by the Governor-General) from all meetings of the Commission held during two consecutive months; or
(f) if he, in any way, otherwise than as a member, and in common with the other members, of an incorporated company consisting of more than twenty-five persons—
(i) becomes concerned or interested in any contract or agreement made by or on behalf of the Commission; or
(ii) participates, or claims to participate, in the profits of any such contract or agreement or in any benefit or emolument arising therefrom.

14. (1) The Commission shall hold such meetings as, in the opinion of the Chairman or at least three other Commissioners, are necessary for the efficient conduct of its affairs.

(Continued on next page)

AUSTRALIAN BROADCASTING COMMISSION ACT—(Continued)

(2) At meetings of the Commission three Commissioners shall form a quorum, and the Chairman shall have a deliberative vote, and, in the event of an equality of votes, a second or casting vote.

15. (1) The Commission shall appoint a general manager and such other officers and such servants as it thinks necessary.

(2) The salaries payable to the general manager and the next six most highly paid executive officers of the Commission shall be subject to the approval of the Governor-General.

(3) Officers and servants appointed by the Commission shall not be subject to the provisions of the **Commonwealth Public Service Act,** 1922-1931, but shall be subject to such conditions (including tenure of office) as are determined by the Commission.

Part 3.—Powers and Function of the Commission

16. The Commission shall provide and shall broadcast from the national broadcasting stations adequate and comprehensive programmes and shall take in the interest of the community all such measures as, in the opinion of the Commission, are conducive to the full development of suitable broadcasting programmes.

17. For the purpose of the exercise of its powers and functions under this Act, the Commission may compile, prepare, issue, circulate and distribute, whether gratis or otherwise in such manner as it thinks fit, such papers, magazines, periodicals, books, pamphlets, circulars and other literary matter as it thinks fit (including the programmes of national broadcasting stations and other stations).

Provided that, prior to the publication of any programme in pursuance of this section, a copy of the programme shall be made available at an office of the Commission on equal terms to the publishers of any newspaper, magazine, or journal published in the Commonwealth.

18. (1) Subject to this Act, the Commission may—

(a) acquire by lease or purchase any land, buildings, easements or other property, rights or privileges which it thinks necessary for the purposes of this Act; and

(b) sell, exchange, lease, dispose of, turn to account or otherwise deal with any property, rights or privileges of the Commission.

(2) The Commission shall not, without the approval of the Minister—

(a) acquire any property, the cost of acquisition of which exceeds the sum of Five thousand pounds, or in any manner dispose of any property having an original or book value exceeding the sum of Five thousand pounds; or

(b) enter into any lease for a period exceeding five years.

19. (1) The Commission shall provide such studios, offices and other accommodation as it thinks necessary for the purposes of this Act, and such accommodation in relation to the studios as the Minister requires for the proper carrying out of the technical services to be provided by the Minister, and shall take over, as arranged by the Minister and at the valuation determined by him, any existing studios, buildings, sites, fittings, furniture or other assets controlled by the Minister which are used for broadcasting purposes, and shall accept an assignment of any leases relating thereto, and of the rights and liabilities of the Minister under any agreements relating thereto.

(2) The location of any studios to be provided by the Commission in pursuance of this section shall be subject to the approval of the Minister.

20. (1) The Commission shall transmit free of charge from all of the national broadcasting stations, or from such of them as are specified by the Minister, any matter the transmission of which is directed by the Minister as being in the public interest.

(2) The Commission shall not, without the permission of the Minister, transmit or receive for transmission any message the transmission of which would, without the authority of, or license granted by, the Minister administering the **Post and Telegraph Act,** 1901-1923, or the **Wireless Telegraphy Act,** 1905-1919, contravene the provisions of either of those Acts.

21. (1) The Commission shall not broadcast advertisements.

(2) Nothing in this section shall be construed as preventing the Commission from broadcasting, if it thinks fit—

(a) any announcements of its own future programmes;

(b) a programme supplied by any organisation, firm or person engaged in artistic, literary, musical or theatrical production or in educational pursuits; or

(c) a programme supplied by any organisation, firm or person, provided the programme is not, in the opinion of the Commission, being used as an advertisement.

22. The Commission may collect in such manner as it thinks fit news and information relating to current events in any part of the world and may subscribe to news agencies.

23. The Commission shall, as far as possible, give encouragement to the development of local talent and endeavour to obviate restriction of the utilisation of the services of persons who, in the opinion of the Commission are competent to make useful contributions to broadcasting programmes.

24. The Commission shall endeavour to establish and utilise, in such manner as it thinks desirable in order to confer the greatest benefit on broadcasting, groups of musicians for the rendition of orchestral, choral and band music of high quality.

25. The Commission may, if it thinks fit, appoint Committees to advise it in relation to all or any matters connected with the provision or rendition of broadcasting programmes, or the exercise of any powers, duties or functions conferred or imposed upon it by this Act.

Part 4.—Finance

26. (1) There shall be an Australian Broadcasting Commission Fund into which shall be paid from time to time out of the Consolidated Revenue Fund, which is hereby appropriated accordingly, an amount which represents such portion of the fees received from broadcast listeners' licenses as is fixed by or under this Act.

(2) For the year commencing on the first day of July, One thousand nine hundred and thirty-two, the amount referred to in the last preceding sub-section shall be twelve shillings in respect of each broadcast listener's license fee received, and this amount shall continue to be paid in each subsequent year unless some other amount is fixed by the Minister.

(3) The payments provided for by the preceding provisions of this section shall be made monthly, and as soon as possible after the last day of each calendar month, and shall in each case represent an amount approximating the appropriate sum relating to the licenses in force during the previous month.

(4) The final adjustments shall be made as soon as conveniently possible after the end of each quarter.

(5) Any account certified by such officer of his Department as is designated for that purpose by the Minister and forwarded by the Minister to the Commission purporting to set out the sum payable to the Commission in pursuance of the foregoing provisions of this section shall be final and conclusive for all purposes.

(6) There shall also be paid into the Fund any other revenue or money received by the Commission.

(7) Income derived from the investment of any portion of the Fund shall form part thereof.

27. The moneys paid into the Fund shall be applied by the Commission as follows:—

(a) In payment of the expenses, charges and other obligations incurred or undertaken by the Commission in the exercise of its powers, duties and functions under this Act;

(b) In payment of the salaries, wages and allowances of Commissioners and of officers and servants of the Commission; and

(c) In investment in any securities of, or guaranteed by, the Government of the Commonwealth or of any State.

28. Moneys held in the Fund, uninvested by the Commission, may be lodged either in an account at call or on fixed deposit, or partly in an account at call and partly in an account at fixed deposit, with the Commonwealth Bank, and while in such Bank shall be held to be moneys of the Crown.

(Continued on next page)

AUSTRALIAN BROADCASTING COMMISSION ACT—(Continued)

29. Cheques drawn on any account referred to in the last preceding section shall be signed in such manner as the Commission directs.

30. (1) For the purpose of enabling the Commission to defray any expenses incidental to its establishment and operation, the Treasurer may advance, out of the Consolidated Revenue Fund, which is hereby appropriated accordingly, such amounts not exceeding in all the sum of Thirty thousand pounds as are, in the opinion of the Minister, required by the Commission.

(2) In addition to the moneys advanced in pursuance of the last preceding sub-section, the Treasurer may advance to the Commission such sums, if any, as are from time to time appropriated by the Parliament for the purpose.

(3) The terms and conditions of any advances made in pursuance of this section, including the security and basis of repayment shall be as determined by the Treasurer.

31. (1) The accounts of the Commission shall be subject to inspection and audit, at least once yearly, by the Auditor-General of the Commonwealth.

(2) The Auditor-General shall report to the Minister the result of each inspection and audit.

32. The Commission shall, as soon as possible after the expiration of each financial year, prepare a profit and loss statement and balance-sheet in the form prescribed, and shall forward them, together with a report on the operations of the Commission during that year, to the Minister, for presentation to both Houses of the Parliament.

33. The payment by the Commission of compensation exceeding in any individual case, One hundred pounds to members of the Commission, its officers or servants, or other bodies or persons, shall not be made without the approval of the Minister.

34. The income, property, and operations of the Commission shall not be subject to any rates, taxes or charges, under any law of the Commonwealth or a State, to which the Commonwealth is not subject.

35. (1) The Commission shall exercise the powers and functions conferred and imposed upon it by this Act, in such a manner that its operations will be financially self-supporting.

(2) The Commission shall establish such sinking funds as are in the opinion of the Treasurer, necessary to enable the Commission to meet repayment of loans and other obligations and to meet losses and depreciation in assets, and may set aside out of its revenue such sums as it thinks proper as a reserve fund for such purposes as the Commission deems desirable (not being purposes for which any sinking fund has been established).

Part 5.—Issue of Debentures by the Commission

36. (1) Subject to this section, the Commission may, from time to time, issue debentures to such amount, bearing such rate of interest and subject to such conditions, as the Treasurer and the Minister approve.

(2) The total amount of debentures so issued, and current at any one time, shall not exceed Fifty thousand pounds.

37. Debentures shall be in accordance with the form approved by the Treasurer, and shall be under the seal of the Commission and shall be signed and countersigned in such manner as the Treasurer directs.

38. The Commonwealth by this Act guarantees the payment by the Commission of the principal and interest due in respect of any debenture issued by the Commission in pursuance of this Act, and the Consolidated Revenue Fund is hereby appropriated for the purpose of this section.

39. (1) Every debenture issued in pursuance of this Act shall be payable to the bearer thereof, and shall pass by delivery only without any assignment or indorsement, and the bearer of a debenture shall have the same rights and remedies as if he were expressly named therein.

(2) At the request of the bearer of a debenture, the Commission may in lieu thereof issue to him inscribed stock of the same currency, and bearing the same interest, and transferable only in manner prescribed.

(3) At the request of the holder of any inscribed stock of the Commission, the Commission may in lieu thereof issue to him debentures of the same currency and bearing the same interest.

40. The Commission may sell debentures, or cause them to be sold, at such times and at such places and in such sums and on such conditions as the Treasurer approves.

41. A trustee, executor or administrator may invest any trust moneys in his hands in the purchase of debentures issued by the Commission.

42. (1) Any person who, with intent to defraud—

(a) forges any security of the Commission, or

(b) utters any forged security of the Commission, or

(c) makes any instrument for forging any security of the Commission, or

(d) has in his possession any such instrument,

or

(e) has in his possession any forged security of the Commission, shall be guilty of an indictable offence.

Penalty: Imprisonment for ten years.

(2) Any person who, without authority, proof whereof shall lie upon him—

(a) makes any form of security of the Commission,

(b) has in his possession any form of security of the Commission, or

(c) makes or has in his possession any instrument or thing by which any distinctive mark or signature on any security of the Commission may be made or imitated,

shall be guilty of an offence.

Penalty: Imprisonment for two years.

(3) In this Part "security of the Commission" means any Commission debenture, Commission inscribed stock, or any coupon, warrant or document for the payment of interest thereon, and includes any transfer of any Commission inscribed stock, and any indorsement on any coupon, warrant or document for the payment of interest on any security of the Commission.

43. All forged securities of the Commission, and all unauthorised forms of security of the Commission, and all unauthorised instruments and things by which any distinctive mark or signature on any security of the Commission, may be unlawfully made or imitated, shall be forfeited to the King and may be seized by any member of the police force of the Commonwealth or of a State.

Part 6.—Miscellaneous

44. The Postmaster-General shall undertake the provision and operation of all technical services associated with the transmission of programmes, including any transmission and reception for the interchange of programmes with other broadcasting administrations which is mutually agreed upon between the Commission and the Postmaster-General.

45. (1) For the purpose of providing and operating the technical services referred to in this Act, the Postmaster-General, or any person acting under the authority of the Postmaster-General, may—

(a) erect, place and maintain any electric line which is, in the opinion of the Postmaster-General, necessary for conveying electric current to a Broadcasting station, and in respect of the erection, placing and maintenance of any electric line, the Postmaster-General and any person acting under his authority shall have the same powers, and be subject to the the same obligations, as are conferred or imposed under Part IV. of the **Post and Telegraph Act,** 1901-1923, in relation to the erection, placing and maintenance of telegraph lines; and

(b) arrange for and obtain from any person the supply of any electric current which, in the opinion of the Postmaster-General, is necessary or advisable for the working of any broadcasting station or the operation of any apparatus for the transmission or reception of programmes.

(2) In this section "electric line" includes all means used for the purpose of conveying, transmittting, transforming or distributing electricity and any casing, coating, covering, tube, tunnel, pipe, pillar, pole, post, frame, bracket or insulator enclosing, surrounding, or supporting the same or any part thereof or any apparatus connected therewith.

(Continued on next page)

AUSTRALIAN BROADCASTING COMMISSION ACT—(Continued)

46. The Postmaster-General shall provide free of cost to the Commission—

(a) the transmissions emanating from recognised National Broadcasting Service studios which are to be radiated from the national broadcasting stations, including such simultaneous transmissions from two or more stations as are mutually agreed upon; and
(b) microphones, pick-up equipment and all other necessary portable apparatus for occasional or periodical transmission from various places within the Commonwealth.

47. The Postmaster-General shall provide, at the expense of the Commission—

(a) for the installation and operation of the apparatus referred to in paragraph (b) of the last preceding section;
(b) the circuits required to connect the various pick-up points with the recognised relevant studios; and
(c) apparatus required permanently for pick-up purposes or for other purposes affecting the rendering of programmes where such apparatus is to be installed at any place other than a recognised National Broadcasting Service studio.

48. Notwithstanding anything contained in this Act, the Commission shall not be empowered to enter into any agreement involving any expenditure in excess of Five thousand pounds, or extending over a period of more than five years, unless the approval of the Minister thereto has first been obtained.

49. The Commission shall at all times indemnify and keep indemnified the Postmaster-General against any action claim or demand brought or made by any person against the Postmaster-General or against any officer of the Postmaster-General's Department in respect of any act done by the Postmaster-General or by such officer on behalf, at the request, or in the interests, of the Commission.

50. The control of the provision and rendition of broadcasting programmes by the Commission shall commence on the first day of July one thousand nine hundred and thirty-two, but the Commission may exercise, prior to that date, any powers or functions conferred on it by this Act for the purpose of enabling it to assume full control on that date.

51. (1) The Minister may from time to time, by notice in writing, prohibit the Commission from broadcasting any matter, or matter of any class or character, specified in the notice, or may require the Commission to refrain from broadcasting any such matter.

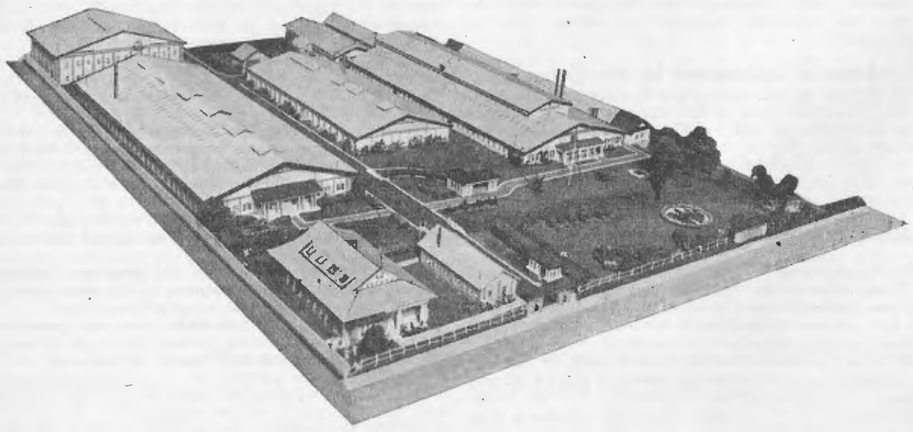
(2) The Minister may at any time revoke or vary any requirement made in pursuance of the last preceding sub-section.

52. The Commission shall have the power to determine to what extent and in what manner political speeches may be broadcast.

53. The Governor-General may, whenever any emergency has arisen, which, in his opinion, renders it desirable in the public interest so to do, authorise the Minister to exercise during the emergency complete control over the matter to be broadcast from the national broadcasting stations, and, thereupon and so long as the emergency continues such persons as are thereto authorised in writing by the Minister shall have access at all times to any premises controlled by the Commission and may exercise full authority over all rights and privileges possessed by the Commission.

54. Nothing in this Act shall be deemed to diminish or affect the rights of any person under any contract or agreement made prior to the commencement of this Act to which the Commonwealth is a party.

55. The Governor-General may make regulations, not inconsistent with this Act, prescribing all matters required or permitted to be prescribed, or which are necessary or convenient to be prescribed, for carrying out or giving effect to this Act and in particular for providing for the issue, inscription, transfer, transmission, and redemption of inscribed stock of the Commission, and all matters in relation thereto.



Australia's largest Wireless Factory, located at Ashfield, Sydney. Owned by Amalgamated Wireless (A/sia) Ltd., the recognised national wireless organisation. This "Factory in a Garden" covers over 7 acres and employs over 1200 people. The floor space is 147,000 square feet.

Australian High Court Judgment on Validity of Wireless Act and Regulations

Delivered by the High Court of Australia in Sydney, Tuesday, December 17, 1935.

THE KING v. BRISLAN

ex parte Williams

REASONS FOR JUDGMENT. BY THE CHIEF JUSTICE

THE question raised upon this application for a writ of prohibition is whether Dulcie Williams, the defendant in the proceedings before the Court of Petty Sessions at Sydney, was rightly convicted for maintaining without authorisation by or under the Wireless Telegraphy Act an appliance for the purpose of receiving messages by wireless telegraphy contrary to the Wireless Telegraphy Act, 1905-1919.

Section 6 (1) of that Act is in the following terms:—

"Except as authorised by or under this Act, no person shall—

(a) establish, erect, maintain or use any station or appliance for the purpose of transmitting or receiving messages by means of wireless telegraphy; or
(b) 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."

It is provided in sec. 2 of the 1905 Act as amended by the Wireless Telegraphy Act 1919 that Wireless Telegraphy "includes all systems "of transmitting and receiving telegraphic or telephonic messages by means of electricity without a continuous metallic connection between the transmitter and the receiver."

The evidence shows that officers of the Postmaster-General's Department visited defendant's premises on the 26th day of September, 1934, and found there a five valve all-electric wireless receiving set connected to an indoor aerial. They heard the broadcasting station 2KY broadcasting speech. On the following day the defendant admitted to the officers that she owned the wireless receiving set, that it had been installed for a week, and that she had no current wireless listener's license. The defendant was convicted and was fined £1 with eight shillings costs or alternatively three days imprisonment.

The objections taken in the Court of Petty Sessions are repeated in the grounds upon which the Order Nisi was granted: these grounds are as follows:—

(1)
  (a) That the Wireless Telegraphy Act 1905-1919 is ultra vires the Commonwealth of Australia Constitution.
  (b) That the Regulations as to Broadcasting made under the Wireless Telegraphy Act are ultra vires the said Act.
  (c) That the Constitution gives no authority to the Commonwealth Parliament to make laws or authorise regulations of a general character in relation to radio broadcasting.
(2) That there was no evidence that the appliance (if any) maintained by the Applicant was for the purpose of receiving messages by means of wireless telegraphy within the meaning of the Wireless Telegraphy Act, 1905-1919.
(3) That there was no evidence that the Applicant did maintain an appliance for the purpose of receiving messages by means of wireless telegraphy as alleged.
(4) That there was no evidence to support the conviction."

1. The first question for consideration is whether, upon the assumption that the relevant provision of the Wireless Telegraphy Act is valid, the defendant committed an offence thereunder.

Sub-sec. 6 of the Act prohibits inter alia the maintenance of any appliance for the purpose of receiving messages by means of wireless telegraphy (which includes telephony) except as authorised by or under the Act. There is no doubt that the defendant was not authorised by or under the Act to maintain the wireless set which she did in fact maintain.

Provision is made under the regulations for an authority or license to maintain a wireless receiving set. It has been argued that the regulations, so far as they deal with broadcasting, are ultra vires the Act. But even if this were so, the only result would be that no valid provision was made for giving a license under the regulations. The success of the argument would not give the defendant a license or other authority. Thus the alleged invalidity of the regulations cannot affect the liability of the defendant in this case. It is therefore necessary to consider carefully the section of the Act itself under which the defendant was charged.

2. The appliance the maintenance of which without authority is prohibited by sec. 6 of the Act is an appliance for the purpose of transmitting or receiving messages by means of wireless telegraphy, which, as defined in the Act, includes all systems of transmitting and receiving wireless telephonic messages. Telephony consists in the reproduction of sounds, with or without amplifiers, at a distance.

It has been suggested that a telephone is an instrument which provides communication from point to point only, and that if what is heard at the receiving end is available for all bystanders to hear, the communication is not telephonic in character. This argument does not appear to be sound. If an amplifier is attached to an ordinary telephone receiver the essential character of the operation, which consists in what is ordinarily described as the reproduction of sounds at a distance, is not changed. Similarly the fact that a large number of receiving instruments can pick up the same message does not alter the telephonic nature of the operation. It can readily be arranged that an ordinary conversation conducted over an ordinary telephone should be audible simultaneously at many receivers which are suitably connected by wires to the system. In such a case there is no doubt that the communication is still of a telephonic nature. Accordingly the grounds which have been suggested for the purpose of reaching a conclusion that wireless broadcasting is not a system of transmitting and receiving telephonic communications do not appear to me to justify that conclusion.

3. The appliance in this case was maintained for the purpose of receiving whatever might be broadcasted from wireless broadcasting stations—whether speeches or music or other audible sounds. It is urged that even if the operation of broadcasting is telephonic in character, yet the definition of wireless telegraphy (which has already been quoted) limits wireless telegraphy for the purpose of the Act to systems of transmitting and receiving messages, and that what was received by the defendant's wireless set could not properly be described by the term "message."

It is difficult to enumerate all the forms of message which may be used by mankind. A message may be communicated by spoken or written words, by notches cut in a stick, by audible or visible symbols which are not ordinary words or not words at all, but to which a meaning can be attached by those who understand the relevant code. Direct conversation is not

(Continued on next page)

AUSTRALIAN HIGH COURT JUDGMENT— (Continued)

usually regarded as a message, though a more or less formal oral deliverance to a number of persons is often, with a well established extension of the more ordinary meaning of the word, called a message.

An understanding of the nature of a message for the purposes of the Act can be obtained from the Act itself. The words of the Act show that a message is something which is transmitted and which may be received. There is a distance between the transmitter and the receiver, and the function of the appliance referred to in the Act is to assist in bridging that distance. This appears from the words of sec. 6. Thus the essential characteristic of a message appears to be found in communication from a distance, as distinguished from direct communication between persons who are face to face.

As a general rule such communications are made for the purpose of conveying "information, news, or intelligence." But the sender may use for this purpose a language that is not generally intelligible. A communication may be a message even if the person actually dispatching it does not understand it. A message sent in code, consisting of permutations of figures, is none the less a message because it means nothing to persons who are not in a position to apply the key to decipher it. The Morse signals which are tapped out by a key at a transmitting telegraphic instrument, and which are recorded by a receiving instrument, constitute a message even before they are interpreted. Where a teleprinter is used, a message has been sent though no one supposes that the actual letters have been sent along the telegraph wire. Thus, in the case of an electric telegraph, a message is received when visible symbols of some kind, generally, but not necessarily, accompanied by audible sounds, are received by a receiving instrument.

It is not out of place to recall that the first telegraphs consisted of manually operated semaphores. Such apparatus is still in use, particularly at sea. The working of such a telegraph leaves no permanent result anywhere in any record. The message can be received by any persons who are within the area from which the apparatus is visible. What such a telegraph sends out is called a message though it is broadcasted to the world.

A telephone message can be heard only through a suitable receiving instrument. The fact that such an instrument is necessary does not affect the character of a communication as a message.

It would therefore appear that neither the number of possible recipients of a communication nor the necessity for a special receiving apparatus is material in determining whether a particular communication is a message. In other words, it has long been recognised that a message does not cease to be a message merely because it is either intended for or may in fact be received by a large number of persons simultaneously. Thus broadcasting by wireless may be a means of transmitting messages which are receivable by large numbers of persons who possess suitable receiving apparatus.

If the broadcasting of speech is in this connection the transmission of messages (i.e. of communications which because they are sent to a distance may be properly called messages), then the reception of such speech by means of an appliance maintained for the purpose of picking up whatever is broadcasted involves the maintaining of an appliance for the purpose of receiving messages by means of wireless telegraphy as defined in section 2 of the Act.

4. It is true that the defendant's wireless receiving set would pick up musical programmes as well as spoken communications and that it was doubtless maintained also, and perhaps mainly, for this purpose. But even if the reception of a musical programme is not the receiving of a message, this fact does not affect the truth of the proposition which has just been stated, namely, that the reception of speech is, in this connection, reception of a message in the sense in which that word has long been used in connection with telegraphy and telephony. For this reason it is not, in my opinion, strictly necessary to decide in this case whether or not the transmission or reception of musical programmes or of sounds as such can be described as the transmission or reception of a message. If, however, it were necessary to decide this question, I would agree with the conclusion reached by my brothers Rich and Starke. I would so agree upon the ground that the essence of a message is to be found in the fact that it is a communication sent from one person to another person or other persons, and that therefore the broadcasting of music does involve the transmission and reception of messages.

Thus, in my opinion, if sec. 6 of the Wireless Telegraphy Act is valid, the defendant was rightly convicted.

5. The next question which arises is therefore the question of the validity of the Act.

The contention raised on behalf of the defendant is that, even if the Act (as a matter of construction) authorises the control of broadcasting, the Constitution does not confer upon the Commonwealth Parliament any power to legislate with respect to broadcasting.

The Constitution provides in sec. 51 (v) that the Commonwealth Parliament may make laws for the peace, order and good government of the Commonwealth with respect to "Postal, telegraphic, telephonic, and other like services."

It is contended for the defendant that broadcasting does not fall within any of the subjects mentioned.

In the earlier part of this judgment I have stated my reasons for the opinion that broadcasting is a form of wireless telephony. It consists in the transmission by wireless of sounds to a distance. The transmission of music by such means is no less telephonic than the transmission of spoken words. It is in my opinion unnecessary to investigate the precise means whereby transmission and reception are effected. Some discussion of these matters is to be found in the cases of **Chappell & Co. Ltd. v. Associated Radio Co. of Australia Ltd.,** 1925 V.L.R. 350 and **Buck v. Jewell-Lasalle Realty Co.** 283 U.S. 191.

The Canadian Constitution does not refer to telephonic services. The Dominion Parliament, however, has exclusive power to control "Lines of steam or other ships, railways, canals, telegraphs and other works and undertakings connecting the Province with any other or others of the Provinces, or extending beyond the limits of the Province"; — British North America Act 1867 sec. 92 (10). It has been held that in this section "telegraphs" includes telephones — **Corporation of the City of Toronto v. Bell Telephone Company of Canada** 1905 A.C. at p. 57.

There is now the further authority of the Judicial Committee of the Privy Council for the proposition that broadcasting also falls within the description of "telegraphs"—**In re the Regulation and Control of Radio Communication in Canada** 1932, A.C. 304. If broadcasting is included in "telegraphs" in the Canadian Constitution, then a fortiori broadcasting is covered by the words "telegraphic" and "telephonic" in the Australian Constitution.

6. It is not however, sufficient that the operation of broadcasting and receiving broadcasted material should be telephonic in character. The Commonwealth Parliament, so far as telephony is concerned, can legislate only with respect to a telephonic service or services. It is contended that broadcasting is not a service in the sense in which that term is used in sec. 51 (v) of the Constitution.

In the first place it was suggested that "service" in sec. 51 (v) should be read in a sense similar to that in which it is used in sec 69, which provides for the transfer to the Commonwealth of specified departments of the public service in each State, including "posts, telegraphs, and telephones." The services so transferred are, it is suggested, the same services as those with respect to which the Parliament can legislate under sec. 51 (v).

In my opinion sec. 69 refers to departments of the State public services in the sense of the servants of the State employed in the departments mentioned. Sec. 69 gives to the Commonwealth the control of those servants from the dates proclaimed or otherwise fixed under the section. The effect of this transfer is stated in detail in sec. 84, and legislative power with respect to the departments is vested exclusively in the Commonwealth Parliament by sec. 52 (ii). The property used in connection with such a department is transferred to the Commonwealth under sec. 85.

These sections, however, do not confer upon the Commonwealth Parliament power to legislate with respect to the subject matter with which these transferred departments deal.

(Continued on next page)

AUSTRALIAN HIGH COURT JUDGMENT— (Continued)

Parallel instances can be found in naval and military defence and in customs. Power to control the actions of officers constituting the defence services and the customs services is to be found in the sections last quoted. But the power to legislate on matters of defence is conferred by sec. 51 (vi) and on matters of customs by sec. 51 (i) and (ii) and sec. 90.

Similarly, in the case of postal telegraphic telephonic and other like services, sec. 51 (v) in my opinion gives a power which is really, and not only nominally, additional to that given by the other sections quoted. It cannot be limited to a power to legislate with respect to public servants.

7. But it is more strongly urged that the power conferred by sec. 51 (v) is a power to legislate only in respect of services in the sense of publicly controlled services of the same general character as those which the colonies controlled before federation. The argument tends to become elusive, but it was expressed by saying that these services were public utilities, including installation, maintenance, operation and organisation, provided and controlled by Parliaments, for the purpose of spoken or written converse between any person and any other person by means of postal, telegraphic and telephonic apparatus and equipment. It was said that it was a characteristic feature and an essential feature of these services that any member of the public had the right to avail himself of them for both sending and receiving. Attention was called to the fact that broadcasting in Australia was provided in part by a Broadcasting Commission and in part by what are known as B Class Stations. The regulations require licenses for both transmitting and receiving broadcasts. It is said that, if such a system be a service at all, it is not a service in the sense in which the term is used in the phrase "postal, telegraphic, telephonic and other like services."

I am unable to see any satisfactory reason for adopting so narrow a construction of sec. 51 (v) as that which is suggested. The character of any service is determined by reference to the function which it performs. A telephonic service consists of the means and organisation provided for sending telephonic communications. Under a power to legislate with respect to telephonic services a Parliament may pass laws to provide and instal telephone apparatus, and to determine rules in accordance with which any such apparatus may be used. On the other hand, the Parliament need not make any such provision at all. If it does make such provision, it may give complete control to a Minister in charge of a department, or it may "farm it out." A Parliament which disapproved of telephones might, so far as legal powers are concerned, repeal all statutes dealing with telephones and prohibit the existence of any telephone service, just as it might (in the exercise of powers under sec. 51) prohibit the existence of any defence force or of any lighthouses or copyrights or patents. It might also allow any persons to instal and use telephones without any governmental authority of any kind.

It is impossible to express or apply any definite measure of legislative power upon the principle suggested for the defendant. To say that postal telegraphic and telephonic services must necessarily be "public" services is to introduce what, in this connection, is a very vague conception. It is a question of policy whether there should be any and what legislation upon such subjects as communication services. A telephone service may be provided by a private person or by an ordinary public company, or by a public company or other corporation operating under a franchise or other special power, or by a Government department. The necessity for acquiring rights to erect poles and to place conduits in public highways has in practice made it necessary for the legislature to confer special powers upon a company or specially created body or upon a Government department. But, whatever form of management and control may be adopted, it is management and control of the same thing—the provision of facilities for telephonic communication, as generous or as limited as Parliament has thought proper.

No standard can be suggested according to which it is possible to determine that one statute providing for the control of telephonic communications is valid because the control is "public" and because all the members of the public have "rights" to use the telephone, whereas another statute is not valid because the control thereunder is not "public" enough, or the service is not sufficiently available to members of the public. The validity of the Post and Telegraph Act can hardly depend upon the extent to which facilities are given to the public or upon the extent of the prohibitions applied by Parliament to sending letters and other articles through the post. It appears to me to be impossible to attach any definite meaning to sec. 51 (v) short of that which gives full and complete power to Parliament to provide or to abstain from providing the services mentioned, to provide them upon such conditions of licenses and payment as it thinks proper, or to permit other people to provide them, subject or not subject to conditions, or to prohibit the provision of such facilities altogether.

If, however, the argument presented on this aspect of the case is sound, it should be remembered that the Wireless Telegraphy Act, the regulations thereunder, and the Australian Broadcasting Commission Act 1932, do in fact permit both broadcasting and the reception of broadcasted material by authorised persons, but under a large measure of public control, exercised either by the statutory Broadcasting Commission or by the Postmaster-General.

Under the power to make laws with respect to telephonic services it is, in my opinion, within the power of the Commonwealth Parliament to regulate as it may think proper that form of wireless telephony known as broadcasting.

8. If, however, this opinion should not be well founded, it is necessary to consider the words "or other like services."

In the first place, it is clear that it was intended by these words to extend the legislative power beyond postal telegraphic and telephonic services. Otherwise the words would be meaningless.

The reasons for the addition of the words "other like services" can be readily understood if reference is made to the history of the subject. In **The Attorney-General v. The Edison Telephone Company of London (Limited)** 6 Q.B.D. 244 it was held, after much argument, that Edison's telephone was a "telegraph" within the meaning of the Telegraphs Acts 1863 and 1869, although the telephone was not invented or contemplated in 1869, and that a telephone conversation was a "message," or at all events "a communication transmitted by a telegraph," and therefore a "telegram" within the meaning of those Acts. It was held that the legislature deliberately used language "embracing future discoveries as to the use of electricity for the purpose of conveying messages." At the time when this decision was given (1880) wireless was completely unknown. But the Court anticipated the possible discovery of wireless when it said (p.249), that the definitions in the Acts included under "telegraph"—"electric signals made, if such a thing were possible, from place to place through the earth or the air," as well as "a set of common bells, worked by wires pulled by the hand, if they were so arranged as to constitute a code of signals." As to the application of the Telegraph Act 1869 to "private" telephone systems see **Postmaster-General v. National Telephone Co. Ltd.** 1909 A.C. 269.

The Constitution of the United States of America provides in Article I Section VIII that Congress shall have power to establish "post offices and post-roads." It was held in **Pensacola Telegraph Company v. The Western Union Telegraph Company,** 96 U.S. 1 that under this power and the power to regulate commerce with foreign nations, and among the several States, Congress could control telephonic messages. It was doubtless hoped by the draftsmen of the Commonwealth Constitution to avoid the uncertainty which led to such litigation.

9. But, in the next place, only "services" can be comprehended within the words. I have already given reasons for my view that legislation with respect to the provision and control of broadcasting facilities, for both transmitting and receiving, is legislation with respect to a service.

10. Further, any service covered by the words in question must be a "like" service. By what test can it be determined whether a service is a "like" service as compared with postal, telegraphic and telephonic services?

It was suggested for the defendant that these services were, when controlled by the States (and are now, when controlled by the Commonwealth), in their nature such that all members of the public could use them for purposes of communication

(Continued on next page)

AUSTRALIAN HIGH COURT JUDGMENT— (Continued)

and that such communications were secret or private in character. Broadcasting, on the other hand, under the system in operation in Australia, is open for use only to those who have licenses for transmitting or receiving, and certainly what is broadcasted cannot be described as secret or private.

It does not appear to me to be a necessary incident of postal, telegraphic or telephonic services as such either that they should be open for use to all members of the public or that they should possess to any particular extent characteristics of secrecy or privacy.

A postal service, for example, would be none the less a postal service because it could only be used, in an autocratic State, by the friends of the autocrat, or because licenses or the payment of heavy fees were required before persons could use it, or because it was enacted that copies of all letters posted should be shown to a censor or even made public in some manner. Such provisions might be highly objectionable, but they would, in my opinion, be provisions with respect to "a service." Similar observations apply to telegraph and telephone services. In addition to these considerations it may be pointed out that any person who obtains the appropriate license can transmit or receive broadcasted matter—just as anybody who buys the necessary stamps can use the post offices, and just as anybody who pays the charges imposed by law can send a telegraphic or telephonic message.

11. Reference has already been made to the contention that these services, in order to be services, must be the subject of public control in some sense. It has similarly been contended that likeness in method of control should be accepted as the test of likeness for the purposes of sec. 51 (v). Thus if the Commonwealth Parliament made the control of the Post Office similar to that now in operation with respect to broadcasting, then it might be that the latter subject could be dealt with by the Commonwealth Parliament as it is actually dealt with in existing legislation, because then the two services would be "like services." Alternatively, it was put that broadcasting could be made a "like service," so as to fall within federal legislative power, by assimilating the form of management of broadcasting to the present form of management of postal telegraphic and telephonic services in Australia.

I can see no reason for interpreting the legislative powers conferred upon a Parliament by a Constitution in relation to one subject by reference to what that Parliament elects to do with respect to another subject, unless there is a positive direction which requires uniformity of treatment as between the two subject matters. I am unable to find any such positive direction in the word "like."

It may be added that if similarity in method of control were the test of "likeness" of services, then the Commonwealth Parliament could legislate about all kinds of matters provided only that a system of control similar to that which happens to obtain in, e.g., the Post Office, were adopted. It is not possible to accept such a proposition.

12. There are difficulties in the way of accepting the view suggested on behalf of the defendant that the means used by the postal telegraphic and telephonic systems constitute the essential features of "likeness." It is true that both telegraphs and telephones use electric energy. So does broadcasting. But so also, do power transmission systems. The Post Office uses horses, motor cars, ships and aeroplanes. But the power to legislate with respect to postal services cannot reasonably be said to contain a power to deal with horses etc., as separate subjects in themselves, or with any system or service which also uses horses, etc.

13. The common characteristic of postal, telegraphic and telephonic services which is relevant in this connection is, in my opinion, to be found in the function which they perform. They are, each of them, communication services. This is also the characteristic of a broadcasting service in all its forms, which is therefore in my opinion, a "like service" within the meaning of sec. 51 (v) of the Constitution. If a new form of communication should be discovered, it too might be made the subject of legislation as a "like service."

14. It was argued for the respondent that the Commonwealth Parliament has power to legislate with respect to broadcasting under the power to make laws with respect to trade and commerce with other countries and among the States—the Constitution sec. 51 (i). It was put that any broadcast is necessarily inter-state in character, or at least that any broadcast may be made inter-state by any increase in the power, and that authority to control inter-state broadcasting must, owing to the very nature of the subject matter, necessarily and inseparably include a power to deal also with broadcasting which did not purport to be inter-state in its operation. It was also said that there was a right in the Commonwealth Parliament to protect and to prevent interference with interstate broadcasting, as an element of inter-state trade and commerce. One broadcasting station can readily interfere with another, and a defective or ill-managed receiving set can interfere with reception by other sets. Accordingly, it was said, the subject must be treated as a whole, and, if the Commonwealth Parliament had any power at all in relation to broadcasting under the trade and commerce power, the subject matter was such that that Parliament had all the power. No actual evidence was given in the Court below as a basis for the argument, though possibly what was alleged as to the nature of broadcasting may be regarded as common knowledge. I abstain from expressing any opinion upon the extent of the trade and commerce power in this direction because, in the view that I have taken, it is unnecessary to do so.

In my opinion, the order of the Court of Petty Sessions was right and the appeal should be dismissed.

JUDGMENTS BY MR. JUSTICE RICH & MR. JUSTICE EVATT

THIS is an appeal from a Court of Petty Sessions exercising Federal jurisdiction. The appellant was convicted under sec. 6 of the Wireless Telegraphy Act 1905-1919. The appliance which she maintained was a broadcasting receiving set. The questions raised by the appeal are—whether such an instrument is within the Wireless Telegraphy Act and if so, whether it is within the power of the Federal Parliament to penalise the possession or maintenance of broadcasting receivers. As the interpretation of the Act must be controlled or affected by the constitutional power, we proceed to express our opinion upon the second question first. The constitutional power primarily relied upon is sec. 51 (5)—power to make laws with respect to postal, telegraphic, telephonic and other like services. The power was expressed in this form, we have little doubt, because of the known difficulties which had arisen in the United States. The constitution of the United States had conferred power to establish "post offices and post roads." When the electric telegraph came into use the objection was made that it was outside the power. The objection was answered it is true. The answer given provides one of the principles of constitutional interpretation.

Waite, C.J., said: "The powers granted are not confined to the instrumentalities of commerce, or the postal service known or in use when the constitution was adopted, but they keep pace with the progress of the country, and adapt themselves to the new developments of time and circumstances." **Pensacola Telegraph Co. v. Western Telegraph Co.** 96 U.S.1 at p9; 24, Lawyers' Edtn. 708 at p. 710. But notwithstanding this principle the difficulty served as a warning to the framers of the Australian Constitution, and accordingly they expressed themselves in terms calculated to cover developments in science and organisation enabling the control of analogous and ancillary services.

We do not think that it is disputed that wireless telegraphy and telephony are a means, although perhaps unthought of in 1897 by the framers of the Constitution, whereby the services described in sec. 51 (5) may be conducted. What is disputed is that the application of wireless telegraphy or telephony to broadcasting falls within the power. The object of the power is to place the control of distant communication carried on according to a systematic plan under Federal authority. Broadcasting both in its means and in the fact that its main purpose is the transmission of sound instantaneously over long distances, possesses the prominent features of telephony. Looked

(Continued on next page)

AUSTRALIAN HIGH COURT JUDGMENT— (Continued)

at from the point of view of the public, however, it differs in the fact that it is the receipt and not the sending of the sound that provides the service, of which the members of the public are at liberty to avail themselves.

It does not give the advantage of one man communicating with another when he wishes. What it does give is the advantage of allowing a listener with a suitable receiving set to entertain himself with such sounds as strike his ear as pleasurable be they musical, vocal or of any other description, which those operating at the transmitting station regard as satisfying a public want. The distinction is apparent, but the question is whether it takes broadcasting beyond the legislative power. In dealing with such a question it must not be forgotten that it is a constitutional power intended to provide for the future and bearing upon its face an attempt to cover unknown and unforeseen developments. A wide operation should be given to such a power.

In the next place the description "telegraphic and telephonic" carries with it not by derivation but by usage, a reference to electrical means of transmission of signals and speech. Broadcasting, whether conducted by private enterprise or by a governmental body is a public service, and it is telephonic in its nature. In the case of the Regulation and Control of Radio Communication in Canada, 1932 A.C. 304, the Privy Council had to deal with the application of both these words to broadcasting by radio. The question arose under sec. 92 (10) of the British North America Act 1867 which has the effect of placing under the power of the Dominion lines of steam or other ships, railways, canals, telegraphs and other works and undertakings "connecting the Province with any other or others of the Provinces, or extending beyond the limits of the Province."

It happened that in a previous case (City of Montreal v. Montreal Street Railway 1912 A.C. 333, 342) an observation had been made that the works in this provision were physical things, not services. When in the subsequent case the Privy Council was called on to decide whether broadcasting was within the power of the Dominion, Lord Dunedin, speaking for their Lordships, said that they were of the opinion that it was and fell "within both the word 'telegraphs' and the general words 'undertakings connecting'," etc. Lord Dunedin went on to say in reference to the word "services" that "undertakings" is not a physical thing, but is an arrangement under which, of course, "physical things are used," thus showing that he regarded broadcasting as fairly within the expression "services."

He returned to the statement that their Lordships thought broadcasting fell within the description of telegraphs and said "No doubt in everyday speech telegraph is almost exclusively used to denote the electrical instrument which, by means of a wire connecting that instrument with another instrument, makes it possible to communicate signals or words of any kind. But the original meaning of the word 'telegraph,' as given in the Oxford Dictionary, is: 'An apparatus for transmitting messages to a distance, usually by signs of some kind.'" This very strong authority, coupled with the principles of interpretation and the other considerations to which we have referred, appears to us ample justification for holding that wireless broadcasting is a telephonic service. Anything which comes within those words must be within the power conferred by sec. 51 (5) which cannot be restricted to those arrangements or systems of communication which were employed or used when the Constitution was adopted.

It remains to consider whether wireless broadcasting is within the Wireless Telegraphy Act 1905-1919. According to sec. 2 wireless telegraphy includes all systems of transmitting and receiving telegraphic or telephonic messages by means of electricity without a continuous metallic connection between transmitter and receiver. The difficulty in applying the Act to broadcasting lies, in our opinion, only in the use of the word "messages" which occurs also in sec. 6. All the other expressions are appropriate.

During the argument before us we had the advantage of an examination of the British statutes and other relevant material relating to telegraphy and wireless. It is clear that the word "message" has become almost a word of art in relation to telegraph and telephone services. This involves no departure from the meaning of which the word is naturally capable. But it does show that it is used to denote the transmission of any complete communication which, so to speak, forms a unit in the traffic going over a line or "the air." The word has no relation to the nature of the communication. Possibly some of the things which are transmitted by broadcast cannot be brought within its fair meaning, but most of them can. In our opinion, a wireless receiving set is an appliance for the purpose of receiving messages by means of wireless telephony which is included within the statutory definition of wireless telegraphy.

For these reasons we think the appeal should be dismissed with costs.

JUDGMENT BY MR. JUSTICE J. STARKE

Appeal by way of Prohibition

THE prosecutor Dulcie Williams, was charged before a Stipendiary Magistrate, sitting in the Court of Petty Sessions at Sydney, for that she did without authorisation by or under the Wireless Telegraphy Act 1905-1919 maintain an appliance for the purpose of receiving messages by means of wireless telegraphy, contrary to the Act, and she was convicted of that offence. She had on her premises an electric wireless receiver connected to an indoor aerial. The receiving equipment was capable of receiving messages or any audible sounds or matter from a wireless transmitting or broadcasting station. The Rule Nisi was granted upon several grounds, but the principal grounds are:

(1) That upon its true construction the Wireless Telegraphy Act 1905-19 only prohibits the maintenance of appliances for the purpose of receiving messages by means of wireless telegraphy and not for the purpose of receiving radio broadcasts.

(2) That if and so far as the Act regulates or authorises the regulation of radio broadcasting, it transcends the Constitution.

The Act, by sec. 6, provides that no person shall, except as authorised by or under the Act, maintain or use any appliance for the purpose of transmitting or receiving messages by means of wireless telegraphy. The Wireless Telegraphy Regulations, made or purporting to have been made under the Act, regulate generally radio broadcasting and the issue of listeners' licenses for stations used solely for the reception of programmes from broadcasting stations. Ordinarily, one would consider whether regulations are authorised by the Act under which they purport to have been made. But in the present case, it is advisable, I think, to determine the extent of the legislative power of the Commonwealth over radio broadcasting.

The Constitution sec. 51 (v) confers upon the Parliament power to make laws for the peace, order and good government of the Commonwealth with respect to "postal, telegraphic, telephonic and other like services." It was argued that the likeness of a service to those enumerated depends upon the character of the service; it must be a service, it was said, under the control of the Government, and it must provide for the transmission and reception of communications between citizens and be private in its nature. But in my opinion the likeness of the service depends upon no such considerations, but upon the likeness of the means by which the service is performed. Thus, there is no material distinction between a telegraphic and a telephonic service **(Attorney-General v. Edison, etc. Co.,** 6 Q.B.D. 244); in both cases communication takes place by means of a wire acted upon by electricity. In a wireless service, communication takes place without a continuous metallic connection between transmitter and receiver.

It is quite unnecessary to discuss the theory of radio transmission and reception. It is sufficiently referred to in **Chappell and Co. v. Associated Co.** 1925 V.L.R., at pp. 357-8, and in **Buck v. Jewell,** 283 U.S. at pp. 199-202. "The important matter," as Cussen J. said in Chappell & Co.'s case, "is that in all cases of reproduction of similar sounds at a distance, the modulations in the original atmospheric disturbances are in a sense preserved, though manifesting themselves at various stages and in various media in various ways." But more important, from a legal point of view, is the decision of the Privy Council in **In re Regulation and Control of Radio Communication in Canada** (1932 A.C. 304). Under the Canadian Constitution (British North America Act, 30 Vic. c. 3), the Provinces have exclusive powers (sec. 92) to make laws in relation to local

(Continued on next page)

AUSTRALIAN HIGH COURT JUDGMENT—
(Continued)

works and undertakings other than such as are of the following classes . . . telegraphs and other works and undertakings connecting the Province with any other or others of the Provinces or extending beyond the limits of the Province (sub-sec. (10)). The matters so excepted become part of the exclusive legislative authority of the Dominion. (Sec. 91 ss (29)).

"Now, said their Lordships, "does broadcasting fall within the excepted matters? Their Lordships are of opinion that it does, falling . . . within both the word 'telegraphs' and the general words 'undertakings connecting the Province with any other or others of the Provinces or extending beyond the limits of the Province.'" (See pp. 314-316). In my opinion, therefore, the Constitution gives the Commonwealth full authority to legislate with respect to wireless telegraphy, including radio broadcasting.

The next question is how far the Commonwealth has exercised this power in the Wireless Telegraphy Act, 1905-19. The Act gives the Minister for the time being administering the Act, the exclusive privilege of establishing, erecting, maintaining and using stations and appliances for the purpose (amongst others) of transmitting messages by wireless telegraphy within Australia and receiving messages so transmitted. (Sec. 4). Wireless telegraphy includes all systems of transmitting and receiving telegraphic or telephonic messages by means of electricity without a continuous metallic connection between the transmitter and the receiver (sec. 2). These sections may be compared with sec. 80 of the Post and Telegraph Act, 1901-23.

"The Postmaster-General shall have the exclusive privilege of erecting and maintaining telegraph lines and of transmitting telegrams or other communications by telegraph within the Commonwealth, and performing all the incidental services of receiving, collecting or delivering such telegrams or communications except as provided by this Act or the regulations."

It will be observed that the word 'messages' is used in the Wireless Telegraphy Act, whereas in the Post & Telegraph Act the words are 'telegrams or other communications.' But a message is a communication, and the use of the one word rather than 'messages or other communications' does not suggest any special limitations of the privilege granted by the Wireless Telegraphy Act. Little difficulty seems to have been found in treating telephonic conversations as messages. (See **Attorney-General v. Edison, etc. Co.** supra at p. 258). Again, in the English Wireless Telegraphy Acts 1904, 1925 and 1926 (4 Ed. VII. c. 24, 15 and 16 Geo. V. c. 67, 16 and 17 Geo. V c. 54), the word 'messages' is used in a sense wide enough to include broadcasting. Thus in sec. 1 (7) of the 1904 Act, as amended in 1925, "wireless telegraphy" is defined to mean—"any system of communication by telegraph as defined in the Telegraph Acts 1863 to 1904 without the aid of any wire connecting the points from and at which the messages or other communications are sent and received: Provided that nothing in this Act shall prevent any person from making or using electrical apparatus for actuating machinery or for any other purpose than the transmission and reception of messages."

The scope and object of the Wireless Telegraphy Act, and the broad sense in which the word 'message' is used in connection with wireless telegraphy lead me to the conclusion that the word 'messages' in the Act includes the dissemination of any sounds or audible matter, e.g. musical performances, speeches, etc., by means of electricity without a continuous metallic connection between the transmitter and the receiver. The Act might well have followed the English legislation, but it is not so futile that it regulates some undefined communications called messages, and leaves radio broadcasting entirely unregulated and beyond the monopoly granted to the Minister in the interest of the whole Commonwealth.

All that remains for consideration is the validity of the regulations. By sec. 10 of the Act, the Governor-General may make regulations not inconsistent with the Act prescribing all matters which by the Act are required or permitted to be prescribed or which are necessary or convenient to be prescribed for carrying out or giving effect to the Act. If the construction I have given to the Act is right, namely that the Commonwealth has authority under it to control and regulate radio broadcasting, then the regulations, or at all events, the licensing clauses, appear to be within power and perfectly valid.

The Rule Nisi should be discharged.

JUDGMENT BY MR. JUSTICE J. DIXON

THE appellant was convicted under sec. 6 of the Wireless Telegraphy Act 1905-1919 of maintaining, without authorisation, an appliance for the purpose of receiving messages by means of wireless telegraphy. "Wireless telegraphy" is defined by sec. 2 to include all systems of transmitting or receiving telegraphic or telephonic messages by means of electricity without a continuous metallic connection between the transmitter and the receiver. What the appellant was in fact maintaining was an ordinary wireless broadcasting receiving set.

The contentions advanced in support of her appeal are that upon its proper interpretation the section under which she was charged does not extend to broadcasting receiving sets and that, if it does, it is to that extent invalid because the power conferred upon the Parliament by sec. 51 (v) of the Constitution to make laws with respect to postal, telegraphic, telephonic and other like services, does not cover broadcasting and there is no other power within which the provision can be brought.

In my opinion, the first of these contentions is well founded and to maintain a broadcasting receiving set for use in the ordinary manner is not an offence against sec. 6 of the Wireless Telegraphy Act 1905-1919. The second contention involves the long standing question of the power of the Commonwealth over broadcasting. From the beginning of broadcasting the difficulty which exists in bringing it within the legislative power of the Commonwealth has been well understood, but the Wireless Telegraphy Regulations governing it have hitherto enjoyed an immunity from attack which suggests a general acquiescence almost in the Commonwealth's assumption of the power. The difficulty, of course, lies in regarding broadcasting for general amusement, information, instruction, or edification, as a service which forms part of, or is like, postal. telegraphic and telephonic services. A similarity undoubtedly exists between the appliances used, on the one hand, in telegraphy and telephony and, on the other, in wireless broadcasting. But it is said that the likeness to which the Constitution refers is to be found in the character of the service performed for the public and not in the mechanical or electromagnetic nature or basis of the instruments employed for the purpose.

The present would appear to me to be anything but suitable for deciding this important constitutional question, if the opinion of the majority of the Court were adverse to the power. No one has thought fit to raise it in the interests of the States, which, apparently, are well content to suffer the Commonwealth to exercise the power. In the United States of America broadcasting by wireless has been held to fall within the power over interstate commerce: **Federal Radio Commission v. Nelson,** 289 U.S. 266 at p. 279: 77 L., Ed. 1166 at p. 1175. If, therefore, a Commonwealth statute dealing with broadcasting were enacted on the basis of the power with respect to trade and commerce between the States, some support might be found to exist, independently of sec. 51 (v), for the Federal claim to control the entire subject. But the Wireless Telegraphy Act 1905-1919 is not based in any way on the commerce power and, in my opinion, cannot be considered as a law with respect to the subject matter of that power.

The question has long been left in suspense and, if a majority of the Court had been, as I am, unable to arrive at the conclusion that broadcasting is within the power with respect to postal, telegraphic, telephonic and other like services, I should have been disposed to limit the expression of my opinion to the ground I have already stated, namely that the ordinary use of a broadcasting receiving set is not within the prohibition contained in sec. 6 (1) of the Wireless Telegraphy Act. As it is, I shall give my reasons for that conclusion and then state very shortly why, in my opinion, wireless broadcasting is not within the subject matter of sec. 51 (v).

The provision applies only when the purpose exists of transmitting or receiving messages by means of wireless telegraphy. It may be that the means employed come within the words forming part of the definition of wireless telegraphy—"by means of electricity without a continuous metallic connection between the transmitter and the receiver." Nevertheless, I do not think broadcasting programmes constitute or contain "messages." This word appears to me to mean a communication sent to one

(Continued on next page)

AUSTRALIAN HIGH COURT JUDGMENT—
(Continued)

definite person by another. It does not mean matter in the form of speech or other sounds disseminated indiscriminately among the public who, being equipped with the mechanical means, desire to hear it. From a listener's point of view, a wireless receiving set may be regarded as a mechanical means of extending the range of natural hearing restricted to sounds which at the place of emission have been mechanically dealt with so that they may be so heard. The very word "broadcast" is used because the sounds are addressed to all who have thus extended their range of hearing by an appropriate appliance. Its meaning involves publicity. The expression "transmit and receive a message" could not, I think, be applied to a speech delivered at a gathering through amplifiers by a speaker a great part of whose audience was beyond the natural range of hearing. But when a speech is broadcast, the operation differs only in the fact that the listeners are not congregated together and, without television, cannot see the speaker.

In the Act, the word "message" is, I think, appropriate only to individual communication. In saying it means a communication to one definite person by another, I do not mean to exclude messages which are simultaneously despatched to many. Each of these is, in fact, a separate message, although identical in expression with the others. Nor do I mean to emphasise the singular in the "one" and the "other." The senders may be a body or collection of people, and the recipients may be a body or collection of people. The difference is between definite individuals and a form of public performance, recital, or utterance.

It may be objected that by the licensing system broadcast listeners are defined and, although a multitude, they are definite individuals. The objection rather misses the substance of the distinction. But, in any case, it is not to the point, because it is not licensed but unlicensed reception that must be considered in determining what is prohibited under the word "message."

It is not surprising if sec. 6 of the Act does not cover broadcast reception. It was passed in 1905 before broadcasting commenced. Of course, a communication sent by radio could be picked up then, as now, by anyone with a suitable receiver. But the object of the Act was to regulate uses of wireless for purposes of communication like the telegraph and telephone. It was for that reason that the word "message" was employed as part of the definition of the offence. It was for that reason also that unauthorised appliances were made forfeit to the Crown by sec. 7.

The Wireless Telegraphy Act is a law with respect to postal, telegraphic, telephonic, and other like services, enacted in the exercise of the power conferred upon the Parliament by section 51 (v) of the Constitution. Upon the construction which I have placed upon the statute, there is, I think, no doubt of its validity. But, as I have already said, I am unable to concur in the opinion that the power is wide enough to include wireless broadcasting and to support the statute if, upon its proper interpretation, it authorises Part III of the Wireless Telegraphy Regulations, 1924-1934 which deals with broadcasting.

The grant of power contained in sec. 51 (v) is expressed in a form plainly adopted in order that it should include every present and future mode of performing the services called postal, telegraphic and telephonic. The feature which the services, so described, possess in common is that they supply an organised means of enabling people at a distance to communicate one with another either by writing or by word of mouth.

The object of the postal service is to provide a system by which a missive may be dispatched by one person and delivered to another. The missive is not necessarily a written message. It may be a journal or a book or any physical thing susceptible of transmission through an organisation ready to undertake the task of receiving articles from individual senders, transmitting them and delivering them to individual addresses. In postal services the physical identity of the missive is preserved.

A telegraphic service resembles the postal service in providing a system by which a communication may be sent by one person for delivery to another separated from him by distance. But rapidity of transmission is obtained by the use of signals, at first mechanical, but later electro-magnetic. This means that the contents of the message are repeated. Perhaps the characteristics which differentiate a telegraph from a postal service are the greater expedition of the telegraph, its limitation to messages and the fact that the message is reproduced and not conveyed in its original material form.

A telephone service provides an interrelated system for oral communication at a distance. It depends, so far at any rate, on the reproduction of sound by electric-magnetic devices. Its purpose is to enable a definite person obtaining access to an instrument at a fixed point to interchange spoken communication at a distance with another definite person having access to another such instrument.

They are all services because they consist in an established system organised for the purpose of performing a function to satisfy the demands of the members of the community. The demand they go to satisfy in common is for means of interchanging intelligence at a distance. The primary requirement of the community they fulfil is for a method by which an individual who desires to communicate with another at a distance may dispatch and have delivered to him his message, or establish direct oral communication with him. No doubt the deed of receiving communications, if sent, is an important want of a community. The two things are mutual. But the ability of the individual to originate the communication received is the first condition. The expression "other like services" covers, I should think, every system or organised process of furnishing means of individual inter-communication, notwithstanding that, at the time when the Constitution was adopted, it was undiscovered and unthought of. The power, of course, extends to everything which is incidental or arises out of the main purpose or its fulfilment. Moreover, although almost from their respective beginnings, these services have in Australia been conducted by government, that is not an essential characteristic.

Electric telegraph and telephone services may use metallic circuits or wireless. Wireless is used in broadcasting, and broadcasting includes the transmission of speech to a distance. It affords an advantage to the public by an organised system and, therefore, may be called "a service." But here, in my opinion, the points of resemblance are exhausted.

Broadcasting provides a means by which those, who secure for themselves an appropriate receiving set, may hear speeches, music, entertainments, announcements and the like, addressed to the public at large from some central point. There is no inter-communication; no means is provided by which one individual can originate a message or establish communication with another, nothing to satisfy the purpose for which any of the enumerated services exist. It appears to me to be outside the scope and purpose of the power. It is said that carrying on such an operation performs a service to the public and that, according to high judicial authority, the adjective "telegraph" may be applied because the means adopted is wireless telephony. This does not meet the difficulty. It takes each of the two words "telephonic" and "service." It applies each of them in a manner differing from that in which they are used in sec. 51 (v). It then combines them and requires the combination to serve the purpose of including a quite different thing. The expression "postal, telegraphic and telephonic services" describes a well known category of public services which, in my opinion, possessed definite characteristics. The addition of the expression "other like services" emphasises the fact that the category looked to those characteristics. In my opinion, altogether different characteristics belong to wireless broadcasting.

For these reasons I think the appeal should be allowed.

JUDGMENT BY MR. JUSTICE McTIERNAN.

I agree that this appeal should be dismissed. Since the decision of the Judicial Committee in the Radio case, 1932, A.C. 304, the view must be accepted that Broadcasting as established and regulated by the Regulations, made pursuant to the Wireless Telegraphy Act, 1905-1919, may be classed with telegraphic and telephonic services. It follows from this decision that Section 51 (v) of the Constitution upon its true interpretation authorises Parliament to legislate with respect to the service of Broadcasting. See also Attorney-General v. Edison Telephone Company of London, 6 Q.B.D. 244, and Attorney-General for New South Wales v. Brewery Employees Union of New South Wales, 6 C.L.R. 501, per Griffith, C. J., and of Halsbury Laws of England, Volume 27 p. 250.

(Continued on next page)

AUSTRALIAN HIGH COURT JUDGMENT—(Continued)

But it is said that the provisions of the Wireless Telegraphy Act do not authorise the making of regulations with respect to Broadcasting, as the scope of the Act is limited to systems of transmitting and receiving telegraphic or telephonic messages by means of electricity without a continuous metallic connection between the transmitter and the receiver. (See Section 2 of the Wireless Telegraphy Act, 1905-1919). This contention depends on the view that the transmission of such messages does not include broadcasting of programmes such as are provided for by the Regulations. In my opinion it is quite in accord with common usage to describe the transmission by radio of sounds representing such programmes as the transmission of messages The word "messages" as applied to the subject-matter of the Wireless Telegraphy Act, 1905-1919 was not intended to have a meaning more limited than it usually bears as applied to the subject-matter of Wireless telegraphy and telephony.

Auditor-General on Broadcasting 1934-5

THE Annual Report of the Auditor-General upon the financial statement of receipts and expenditure during the year ended June 30, 1935, concerning the P.M.G.'s Annual Report.

Paragraph 118 shows that the published accounts of A.W.A. for year ended June 30, 1935, disclose a net profit of £119,824 from wireless services and other sources, which represents a return of 16.08 per cent. on the paid-up capital of £744,283, and is £18,110 less than the net profit for the previous year. Dividends at the rate of 10 per cent. per annum absorbing £74,428 have been paid for 1934-35, the Commonwealth receiving £35,000/1/3 based on its capital holding of £350,000 14/—500,001 shares paid to 14/-.

Under the Wireless Agreement Act, 1927, the company received the sum of £32,896/4/7 from the Government, on account of the year 1934-35. 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.

Broadcasting

During the year 2,190 unlicensed listeners were convicted, fines and costs totalling £5190.

At June 30, licensed listeners numbered 718,896. There are fourteen national stations, nine originating stations including the short-wave station at Lyndhurst, Vic., and five regional stations. Fifty-seven commercial stations were broadcasting at the end of the financial year.

Listeners' License Fees

The broadcast listeners' license fee of 21/- is distributed between Consolidated Revenue and the Australian Broadcasting Commission; 9/- is paid to revenue and 12/- to the Commission.

Income statement showed that balance of undistributed fees in Trust Fund, Wireless Broadcasting Account at June 30, 1934, was £183,958/16/-, license fees received from broadcast listeners and experimenters during 1934-35, £767,488 2/6, total £951,446/18/6.

Expenditure by the Australian Broadcasting Commission totalled £405,048 19/-. Revenue £335,358/10/6, leaving a balance of undistributed fees in Trust Fund Wireless Broadcasting Account of £211,039/9/-, making a total of £951,446 18/6.

Australian Broadcasting Commission

The total revenue of £405,534/12/1 was made up of £405,048/19/- from listeners' license fees; £90 rent from property; £81/2/3 proceeds of concerts, and £314/10/10 interest on fixed deposits. The expenditure totalled £310,455/15/11, leaving a revenue surplus of £95,078 16/2.

The following gives a comparison of the commission's operations over the past two years.

Artists fees and programme expenses (including payments to artists, orchestras, lecturers, announcers, accompanists and production costs, 1933-34, £170,406. 52.3 per cent., 1934-35 £171,297, 42.2 per cent. Copyright fees, 1933-34, £33,787, 10.4 per cent, 1934-35, £40,201, 9.9 per cent. Broadcasting rights, 1933-34, £8,060, 2.4 per cent, 1934-35, £9,370, 2.3 per cent. Rental of telephone lines for broadcasting and outside pick-up costs, 1933-34, £7,283, 2.2 per cent., 1934-35, £11,282, 2.8 per cent. Commission's fees, 1933-34, £1,800, .6 per cent., 1934-35, £1,778, .4 per cent. Staff salaries 1933-34 £33,363, 10.2 per cent., 1934-35, £34,031, 8.4 per cent. Rent of offices and furniture, 1933-34, £8,901, 2.8 per cent, 1934-35 £8,351, 2.1 per cent. Publicity, 1933-34, £8,183, 2.5 per cent., 1934-35,, £6,387, 1.6 per cent. Depreciation, 1933-34, £3,443, 1.0 per cent., 1934-35, £3,852 .9 per cent. Preliminary expenses written off, 1933-34, £1,588, .5 per cent., 1934-35, £1,587, .4 per cent. Other expenses 1933-34, £23,324, 7.2 per cent., 1934-35, £22,320, 5.5 per cent. Balance carried down, 1933-34, £25,594, 7.9 per cent., 1934-35, £95,079, 23.5 per cent.

By revenue from license fees, 1933-34, £314,127, 96.4 per cent., 1934-35, £405,049, 99.9 per cent. Other receipts, 1933-34, £11,605, 3.6 per cent. 1934-35, £486, .1 per cent.

Total 1933-34, £325,732, 100.0 per cent,. 1934-35, £405,535, 100.0 per cent.

For year ended June 30, 1934, revenue was £325,732 and for 1935, £405,535. Expenditure 1934, £300,138, 1935, £310,456. Surplus 1934, £25,594; 1935, £95,079. Reserve for building and accumulated fund, 1934, £52,323; 1935, £147,402.

There has been a consistent increase in broadcast listeners' licenses, and the Commission is now enjoying a very large income. Revenue for the year 1934-35 was greater by £79,803 than that for 1933-34, and the surplus shown in the comparative statement, £95,079, is equal to 23.5 per cent. of the revenue as against £25,594 or 7.9 per cent. of the revenue for the previous year. Expenditure increased by £10,318 from £300,138 to £310,456. This increase was principally due to copyright fees, £6,414; broadcasting rights, £1,310; and rent of telephone lines and outside pick-up costs, £3,999. Other items of expense remained practically stationary except publicity, which showed a decrease of £1,796.

Copyright fees paid by the Commission to the Australian Performing Rights Association are subject to an agreement dated July 2, 1934. The amounts payable to that association in respect of the year 1934-35 was £36,217/4/5.

For comparative purposes, the following latest figures available are of interest:

In New Zealand, where the license fee is 23/-, there was a surplus of £63,937—equal to 38.39 per cent. of the revenue of £166,535, the hours of transmiss, numbering 25,700.

The British Broadcasting Commission had a surplus of £220,490—equal to 10.7 per cent. of the revenue of £2,058,983, the hours of transmission numbering 63,109.

The Australian Broadcasting Commission had a surplus of £147,402—equal to 15.01 per cent. of the revenue for three years, viz,. £981,886, the number of hours of transmission in the latest year being 51,446.

AUDITOR-GENERAL ON BROADCASTING—(Continued)

A summary of balance-sheet items at the end of June for two years follows:

ASSETS:—Land and buildings: Freehold less depreciation, 1934 £14,650, 1935 £16,279; office furniture, musical instruments and equipment, less depreciation 1934 £17,120, 1935 £17,402; stores and stationery, 1934 £1,330, 1935 £1,911; sundry debtors, 1934 £13,463, 1935 £50,159; payments in advance, 1934 £1,394, 1935 £1,890; fixed deposits with accrued interest, 1935 £60,183; cash in hand and at bank, 1934 £25,549, 1935 £12,892; preliminary expenses, 1934 £1,587, 1935 nil. Total, 1934 £75,093; 1935, £160,716.

LIABILITIES:—Loan from Commonwealth Government, 1934 £6,667, 1935 nil; sundry creditors, 1934 £16,103, 1935 £13,314; reserve for buildings, 1934 £50,000, 1935 £145,000; accumulated fund, 1934 £2,323, 1935 £2,402. Total, 1934 £75,093, 1935 £160,716.

In addition to providing and broadcasting programmes for the National Broadcasting Stations, the Commission is required to provide studios, offices and other necessary accommodation.

At June 30, 1935, land and buildings owned by the Commission totalled only £16,279, representing the value of studios at Adelaide, and land at Perth and Hobart. Rents paid for studio and office accommodation during the year amounted to £7,193. In view of the buoyant revenue and the cost of listeners' licenses, it appears to me that a larger surplus than £147,402 out of a revenue of £981,886 in three years, might reasonably have been accumulated to provide capital for the Commission's own buildings.

The Auditor-General also included in his report, an opinion by the Solicitor-General as to whether goods imported by the P.M.G.'s Department, intended for the use of the Australian Broadcasting Commission in connection with national broadcasting, were liable to Customs duty. This is as follows:

"On September 21, 1934, I advised (in Opinion No. 149 of 1934) that goods imported by the Postmaster-General's Department, and intended at the time of exportation for the use of the Australian Broadcasting Commission, in connection with the National Broadcasting Service, were articles to be used for the purpose of trade, and, as such, were not eligible for admission free of duty under Item 370 of the Customs Tariffs 1933.

"I have now given further consideration to this question, and think the view expressed in that Opinion cannot be maintained.

"The National Broadcasting Service provided for in the Australian Broadcasting Commission Act 1932, and the technical services of which are provided by the Postmaster-General's Department, is established by that Act. The constitutional basis of the service is placitum (v) of Section 51 of the Constitution—'postal, telegraphic, telephonic, and other like services.' The postal, telegraphic and telephonic services established under this placitum, and at present in existence, are all recognised as being definitely governmental functions, and the question arises whether the provision by the Commonwealth of equipment to facilitate the transmission of communications by wireless telephony is also the discharge of a Governmental function. The fact that its constitutional basis is 'other like services' in placitum (v) conveys, I think, an implication that it is the discharge of a Governmental function.

"In pursuance of the power contained in placitum (v) of section 51, the Commonwealth has enacted the Australian Broadcasting Commission Act 1932. Under that Act, the Australian Broadcasting Commission is required to broadcast programmes from national broadcasting stations (Section 16). National broadcasting stations are stations made available by the Minister for the purpose of the transmission of the national broadcasting programmes (Section 4).

"The Commission is only concerned with the programmes to be transmitted. The Postmaster-General is responsible for the provision and operation of all technical services associated with such transmission (Section 44), and is to provide certain equipment and apparatus for the use of the Commission (Sections 46, 47).

"It will be seen, therefore, that the means of transmission of the programmes are provided by the Commonwealth, and such provision is clearly, in my opinion, a Governmental function. In exercising this function, the Commonwealth is providing a like service to the telegraphic and telephonic services. In the latter cases, the Commonwealth provides apparatus and equipment, by means of which communications may be sent from one place to another in Australia. The majority of such communications originate with the general public, but, in the case of the national broadcasting service, most of the communications originate with a body created by the Commonwealth. In principle, however, the Commonwealth occupies the same position in relation to these two services as to the services which it provides in relation to national broadcasting. In the last-mentioned connection, the Commission, in relation to the Commonwealth, is in the same position as a member of the public who sends a communication by telephone. In both cases the system provided by the Commonwealth is used. It is the provision of the system which constitutes the exercise of the function of the Government. The fact that the system, whether it be telegraphic, telephonic or wireless telephonic, is or may be used for trading purposes, is not material.

"The fact that the wireless telephonic system is provided primarily to enable the Broadcasting Commission to operate, does not, I think, materially affect the position. Nor is it material that the Commission is a creature of the Commonwealth.

"The system established is capable of being used for the transmission of ordinary commercial and social communications and messages of public interest. Such communications and messages may be transmitted over the system, and some are, indeed, so transmitted, but advertising is not permitted (see Section 21 of the Australian Broadcasting Commission Act 1932). The important fact is that, in setting up and maintaining apparatus and equipment for transmitting communications and messages by wireless telephony, the Commonwealth is acting within its constitutional powers, and is providing a like service to the telegraphic and telephonic services, the provision of which, in Australia, is recognised as a Governmental function.

"In my opinion, therefore, any equipment or materials, imported by the Commonwealth for the purposes of establishing or maintaining the technical services, are imported for the purpose of carrying out purely Governmental functions, and are not for the purposes of trade.

"This opinion is given on the assumption that wireless telephonic services are 'other like services' within the meaning of placitum (v) of Section 51 of the Constitution. The question of the power of the Commonwealth to legislate with respect to wireless telephonic services may be dealt with in the decision of the High Court in a case against one Dulcie Williams, recently heard in Sydney."

THIRD ANNUAL REPORT OF THE AUSTRALIAN BROADCASTING COMMISSION

Year Ended 30th June, 1935

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 have the honour to present to you the Third Annual Report of the Australian Broadcasting Commission and to inform you that during the twelve months extending from 1st July, 1934 to 30th June, 1935, 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. The stations operating were those which were taken over by the Commission at its inception on 1st July, 1932, viz.:

Stations 2FC, Sydney; 2BL, Sydney; 2NC, Newcastle; 2CO, Corowa; 3LO, Melbourne; 3AR, Melbourne; 4QG, Brisbane; 4RK, Rockhampton; 5CL, Adelaide; 5CK, Crystal Brook; 6WF, Perth; and 7ZL Hobart. Since the close of the period under review two new regional stations, 7NT North Regional, Tasmania, and 3GI, Gippsland Regional, Victoria, have been made available for the transmission of the Commission's programmes. It is expected that six more will be in operation during the next twelve months.

LICENSES

(a) Australian Statistics:

We are glad to be able to report that public interest in broadcasting, as evidenced by the number of listeners licenses held by residents of the Commonwealth, has continued to increase rapidly.

High Rate of Increase

In the preceding twelve months (i.e., ended 30th June 1934) the increase in licenses was greater than in any previous year. This progress has been very nearly maintained, and the year 1934-35 saw the second highest license increase in the history of Australian broadcasting. The respective increases were 129,682 for the year ended 30th June, 1934, and 122,693 for the year ended 30th June, 1935. The total number of listeners licenses held in Australia was, at 30th June, 1935: 721,852, or 10.74% of the population of the Commonwealth—a percentage double that of three years ago, when the Commission was formed.

Increase in Various States

Further, the rate of increase has been comparatively evenly maintained in all States, and in both city and country in each State; West Australia advancing by 2.14% of population; South Australia by 2.03%; New South Wales by 1.87%; Tasmania by 1.62%; Victoria by 1.54% and Queensland by 1.52%—an average of 1.74% for the whole of Australia. Since the Commission's last report was furnished, South Australia has replaced Victoria as the State with the highest proportion of licenses to population; its percentage now being 12.97% as compared with 12.90% for Victoria. New South Wales has continued to make good progress, and has the highest number of license-holders in the Commonwealth, as well as the third highest percentage—10.53%. Western Australia and Tasmania both maintained well their rate of improvement. Queensland, with 7.02%, has the lowest percentage, but a good rate of increase has been maintained over the last two years, in marked contrast with the six years immediately preceding.

The Commission, while recognising that various influences may have contributed towards the high rate of license-increase which has been maintained, draws attention to the above figures as indisputable evidence of the increasing popularity of broadcasting, of the part which it is playing in the everyday life of the community, and of its potential influence upon the mental and cultural development of the people of the Commonwealth.

The following comparative table gives a record of the development of broadcasting in Australia since transmitting licenses were first issued in 1924-25 :

Year Ended 30th June	Licenses in Force	Ratio to 100 of Population	Increase (—Decrease) Number	Increase (—Decrease) Per 100 of Population	Organisation Supplying Programmes.
			NEW SOUTH WALES		
1925	34,857	1.54	—	—	Broadcasters (Sydney) Ltd.—Farmer and Company Ltd.
1926	37,082	1.61	2,225	.07	Broadcasters (Sydney) Ltd.—Farmer and Company Ltd.
1927	59,880	2.55	22,798	.94	Broadcasters (Sydney) Ltd.—Farmer and Company Ltd.
1928	80,197	3.34	20,317	.79	Broadcasters (Sydney) Ltd.—Farmer & Company Ltd.—2FC Ltd. (a)
1929	101,012	4.13	20,815	.79	Broadcasters (Sydney) Ltd. — 2FC Ltd.—N.S.W. Broadcasting Co. Ltd. (b)
1930	111,253	4.49	10,241	.36	N.S.W. Broadcasting Co. Ltd.—Australian Broadcasting Co. Ltd. (c)
1931	122,748	4.91	11,495	.42	Australian Broadcasting Co. Ltd.
1932	141,745	5.63	18,997	.72	Australian Broadcasting Co. Ltd.
1933	178,387	7	36,642	1.37	Australian Broadcasting Commission.
1934	227,289	8.66	48,902	1.86	Australian Broadcasting Commission.
1935	279,166	10.53	51,877	1.87	Australian Broadcasting Commission.

Notes :
(a) 2FC Limited (Station 2FC) from 1/12/27.
(b) N.S.W. Broadcasting Co. Ltd. (Stations 2FC and 2BL) from 14/8/28.
(c) Australian Broadcasting Co. Ltd. (Station 2FC) from 16/7/29. (Station 2BL) from 21/7/29.

			VICTORIA		
1925	20,290	1.22	—	—	Associated Radio Co.—Broadcasting Co. of Australia.
1926	64,587	3.83	44,297	2.61	Associated Radio Co.—Broadcasting Co. of Australia Pty. Ltd.
1927	118,965	6.95	54,378	3.12	Associated Radio Co.—Broadcasting Co. of Australia Pty. Ltd.
1928	137,758	7.91	18,793	.96	Associated Radio Co.—Broadcasting Co. of Australia Pty. Ltd.—Dominion Broadcasting Co. Ltd. (d)

A.B.C. THIRD ANNUAL REPORT—(Continued)

Year Ended 30th June	Licenses in Force	Ratio to 100 of Population	Increase (—Decrease) Number	Increase (—Decrease) Per 100 of Population	Organisation Supplying Programmes.
1929	142,750	8.11	4,992	.2	Dominion Broadcasting Co. Ltd.
1930	140,072	7.88	—2,678	—.23	Dominion Broadcasting Co. Ltd.—Australian Broadcasting Co. Ltd. (e)
1931	137,265	7.66	—2,807	—.22	Australian Broadcasting Co. Ltd.
1932	139,592	7.75	2,327	.09	Australian Broadcasting Co. Ltd.
1933	171,318	9.46	31,726	1.71	Australian Broadcasting Commission.
1934	207,324	11.36	36,006	1.97	Australian Broadcasting Commission.
1935	237,247	12.90	29,923	1.54	Australian Broadcasting Commission.

Notes :
(d) Dominion Broadcasting Co. Ltd. (Stations 3LO and 3AR) from 1/3/28.
(e) Australian Broadcasting Co. Ltd. (Station 3LO) from 21/7/29. (Station 3AR) from 7/8/29.

			QUEENSLAND		
1925	1,267	.15	—	—	Queensland Radio Service.
1926	8,450	.98	7,183	.83	Queensland Radio Service.
1927	23,249	2.63	14,799	1.65	Queensland Radio Service.
1928	25,287	2.82	2,038	.19	Queensland Radio Service.
1929	24,744	2.7	—543	—.12	Queensland Radio Service.
1930	23,335	2.51	—1,409	—.19	Queensland Radio Service.—Australian Broadcasting Co. Ltd. (f)
1931	24,216	2.55	881	.04	Australian Broadcasting Co. Ltd.
1932	29,060	3.02	4,844	.47	Australian Broadcasting Co. Ltd.
1933	36,314	3.72	7,254	.7	Australian Broadcasting Commission.
1934	52,185	5.5	15,871	1.67	Australian Broadcasting Commission.
1935	67,546	7.02	15,361	1.52	Australian Broadcasting Commission.

Note : (f) Australian Broadcasting Co. Ltd. from 29/1/30.

			SOUTH AUSTRALIA		
1925	3,331	.62	—	—	Central Broadcasters Ltd.
1926	12,657	2.27	9,326	1.65	Central Broadcasters Ltd.
1927	16,791	2.96	4,134	.69	Central Broadcasters Ltd.
1928	20,319	3.53	3,528	.57	Central Broadcasters Ltd.
1929	24,021	4.15	3,702	.62	Central Broadcasters Ltd.
1930	25,729	4.43	1,708	.28	Central Broadcasters Ltd. — Australian Broadcasting Co. Ltd. (g)
1931	30,333	5.21	4,604	.78	Australian Broadcasting Co. Ltd.
1932	37,235	6.36	6,902	1.15	Australian Broadcasting Co. Ltd.
1933	50,261	8.49	13,026	2.13	Australian Broadcasting Commission.
1934	64,303	10.49	14,042	2.39	Australian Broadcasting Commission.
1935	76,515	12.97	12,212	2.03	Australian Broadcasting Commission.

Note : (g) Australian Broadcasting Co. Ltd. from 13/1/30.

			WESTERN AUSTRALIA		
1925	3,562	.97	—	—	Westralian Farmers Ltd.
1926	4,000	1.07	438	.1	Westralian Farmers Ltd.
1927	3,903	1.03	—97	—.04	Westralian Farmers Ltd.
1928	3,774	.96	—129	—.07	Westralian Farmers Ltd.
1929	3,890	.96	116	—	Westralian Farmers Ltd. — Postmaster-General's Department (h)
1930	5,755	1.38	1,875	.42	Postmaster-General's Department — Australian Broadcasting Co. Ltd. (i)
1931	9,144	2.17	3,389	.79	Australian Broadcasting Co. Ltd.
1932	12,746	3.02	3,602	.85	Australian Broadcasting Co. Ltd.
1933	20,604	4.87	7,858	1.85	Australian Broadcasting Commission.
1934	31,476	7.15	10,872	2.47	Australian Broadcasting Commission.
1935	41,257	9.29	9,781	2.14	Australian Broadcasting Commission.

Notes :
(h) Postmaster-General's Department from 20/12/28.
(i) Australian Broadcasting Co. Ltd. from 21/7/29.

			TASMANIA		
1925	567	.26	—	—	
1926	1,281	.58	714	.32	Associated Radio Co.
1927	2,461	1.14	1,180	.56	Associated Radio Co.
1928	3,172	1.46	711	.32	Associated Radio Co. — Tasmanian Broadcasters Pty Ltd. (j)
1929	4,782	2.21	1,610	.75	Tasmanian Broadcasters Pty. Ltd.
1930	8,048	2.76	1,266	.55	Tasmanian Broadcasters Pty. Ltd.
1931	8,263	3.74	2,215	.98	Tasmanian Broadcasters Pty. Ltd.—Australian Broadcasting Co. Ltd.

(Continued on next page)

(b) World Statistics:

The subjoined table shows how striking has been the growth of interest in broadcasting throughout the civilised world, and also how well Australia has kept pace with this development, ranking sixth, in proportion of listeners to population, among all nations, second in the British Empire, and first among the Dominions.

The figures have been supplied by L'Union Internationale de Radiodiffusion, and relate to 31st December, 1934; the leading "listening" nations being placed in order of precedence according to proportion of licenses (or their equivalent) to population:

WORLD LICENSE DISTRIBUTION.—
(Continued—see page 24)

Newfoundland (264,000—2,632) .996; Spain (23,677,794—23,004) .899; Lithuania (2,476,154—20,240) .817; Salvador (1,550,000 — 10,000) .645; Palestine (1,035,000 — 5,900) .57; Roumania (18,052,896 — 100,981); .559; Hongkong (849,751 — 4,201) .494; Yugoslavia (13,934 — 66,530) .477; Algeria (6,553,451 — 30,904) .471; Portugal (6,825,883 — 27,895) .408; Morocco (4,681,194 — 18,267) .39; Tunia (2,410,692 — 8,1063 .336; Siam (12,000,000 — 24,202) .201; Honduras (854,184 — 1,500) .175; Egypt (14,500,000 — 251,170) .173; Bulgaria (6,081,049 — 9,000) .148; Phillipines (14,158,000 — 20,929) .147; Guatemala (2,195,242 — 1,958) .089; Federated Malay States (2,827,111 — 2,526) .089; Greece (6,204,820 — 5,000) .08; Syria and the Levant (2,768,000 — 2,070) .074; Turkey (13,660,275 — 6,930) .05; Ceylon (5,312,548 — 2,342) .05; Manchuria (32,377,317 — 12,384) .038; Kenya (3,106,945 — 1,152) .037; Dutch East Indies (60,731,025 — 17,950) .029; Madagascar) 3,779,569 — 269) .007.

PROGRAMME ANALYSIS:

The following percentage analysis of all programmes broadcast by the Commission during the year—a total of no fewer than 53,927 programme-hours—reveals little change from that of the preceding year. Music—including opera, musical comedy, and vaudeville—occupied slightly more than half of the total broadcasting time, as in earlier years. The reduction in the percentage-time occupied by plays was due not to a reduction in number, but rather to a shortening of the plays. Lectures, descriptive broadcasts, and essential services, occupied a higher percentage-time than in the preceding twelve months.

The details are:

Item	Percentage of Total Programme Time.
MUSICAL:	
Classical	11.61%
Popular	29.48%
Modern Dance	5.78%
Old Time Dance	.36%
Community Singing	1.42%
	48.65%

A.B.C. THIRD ANNUAL REPORT—(Continued)

Year Ended 30th June	Licenses in Force	Ratio to 100 of Population	Increase (—Decrease) Number	Per 100 of Population	Organisation Supplying Programmes.
					(k)
1932	9,567	4.28	1,304	.54	Australian Broadcasting Co. Ltd.
1933	12,593	5.59	3,026	1.31	Australian Broadcasting Commission.
1934	16,582	7.14	3,989	1.71	Australian Broadcasting Commission.
1935	20,121	8.76	3,539	1.62	Australian Broadcasting Commission.

Notes:
(j) Tasmanian Broadcasters Pty. Ltd. from 19/7/27.
(k) Australian Broadcasting Co. Ltd. from 13/12/30.

COMMONWEALTH OF AUSTRALIA

Year Ended 30th June	Licenses in Force	Ratio to 100 of Population	Increase (—Decrease) Number	Per 100 of popul'n
1925	63,874	1.08	—	—
1926	128,060	2.14	64,186	1.06
1927	225,249	3.68	97,189	1.54
1928	270,507	4.33	45,258	.65
1929	301,199	4.75	30,692	.42
1930	312,192	4.88	10,993	.13
1931	331,969	5.12	19,777	.24
1932	369,945	5.67	37,976	.55
1933	469,477	7.14	99,532	1.47
1934	599,159	9.00	129,682	1.95
1935	721,852	10.74	122,693	1.74

Educational Broadcasts:

Much of the Commission's work, in all branches of its activities, is of an educational nature; but, apart from this, direct educational work has been done by means of a large number of broadcasts to schools. During the year this service was considerably expanded, until all States, except Tasmania, were broadcasting lectures of this type—the intention being, as before, to supplement, but not to replace, the class work of the school teachers. The broadcast lessons have been divided into two general classes, primary and secondary.

The Commission's problems in connection with School Broadcasting are complicated by the fact that education in Australia is under State, not Commonwealth, control; the resulting divergencies in school curricula and requirements for public examinations have rendered it desirable for each State Branch to arrange its own syllabus of broadcasts. Again, the fact that in the majority of capital cities there is only one National transmitting Station has made it extremely difficult for the Commission to devote as much time as it would have liked to this type of broadcast; the result has been that in New South Wales and Victoria considerably more time has been allocated to broadcast lessons than has been possible in Queensland, South Australia and Western Australia. Another disadvantage, which fortunately will soon be removed with the completion of new country relay stations, has arisen through the unsatisfactory nature of daylight reception in the more remote parts of the country (where the lessons would be of great value), and the consequent necessity of purchasing expensive receiving sets, the cost of which is often beyond the resources of small country schools.

In spite of these obstacles, the Commission devoted approximately thirteen hours each week to School Broadcasts, and in the course of that time dealt with such diverse subjects as English Language and Literature, Health, Musical Appreciation, Geography, English History, Australian History, Ancient History, European History, Nature Study, Science

WORLD LICENSE DISTRIBUTION As at 31st December, 1934

Country	Population	Total	Population Per 100 of Licenses
1. U. S. of America	127,900,000	20,750,000*	16.223
2. Denmark	3,550,000	568,175	16.
3. Great Britain	46,047,046	6,780,569	14.725
4. Sweden	6,211,566	733,190	11.803
5. Netherlands	8,351,117	909,127	10.886
6. Australia	6,689,719	681,634	10.189
7. New Zealand	1,551,785	148,284	9.555
8. Germany	65,188,626	6,142,921	9.422
9. Iceland	115,000	10,350	9.
10. Switzerland	4,066,400	356,865	8.775
11. Canada	10,353,778	813,000	7.852
12. Austria	6,760,000	527,295	7.8
13. Belgium	8,213,449	603,860	7.352
14. Danzig	414,114	26,462	6.39
15. Norway	2,870,000	157,434	5.485
16. South Africa	1,828,175	98,562	5.485
17. Czecho-Slovakia	14,726,158	693,694	4.71
18. Chili	4,287,445	200,000*	4.664
19. Luxembourg	299,993	13,750	4.583
20. France	41,834,923	1,755,946	4.197
21. Argentine	12,025,000	500,000	4.158
22. Hungary	8,688,319	340,117	3.914
23. Cuba	4,000,000	150,000*	3.75
24. Finland	3,697,505	129,123	3.492
25. Latvia	1,900,045	64,567	3.397
26. Mexico	16,552,722	500,000*	3.02
27. Japan	90,395,041	1,951,858	2.159
28. Ireland	3,000,000	60,000	2.
29. Esthonia	1,113,647	16,827	1.51
30. Bolivia	3,500,000	50,000*	1.428
31. U.S.S.R.	168,000,000	2,323,000	1.382
32. Poland	32,133,000	374,000	1.163
33. Italy	42,621,000	430,000	1.008

* Listeners are not licensed, and the totals shown are estimates of the number of receiving sets in operation.

Item		Percentage of Total Programme Time
DRAMA:		
Grand Opera	1.83%	
Musical Comedy, etc.	2.34%	
Plays	1.74%	
		5.91%
LECTURES, Etc.:		
General, Speeches Stories	8.16%	
Technical, Farming, etc.	1.35%	
Broadcasts to Schools	1.60%	
Descriptive Broadcasts	1.45%	
		12.56%
SPORT:		
Running Descriptions	5.89%	
Commentaries, Results, etc.	4.9%	
		10.79%
ESSENTIAL SERVICES:		
News, etc.	4.69%	
Reports (Weather, Markets, etc.)	6.13%	
Announcements	1.98%	
		12.8%
DEVOTIONAL:		
Church Services	3.54%	
Studio Broadcasts	1.47%	
		5.01%
CHILDREN'S SESSIONS	4.28%	
Total		100%

A.B.C. 3rd ANNUAL REPORT—(Continued)

Mathematics, French Language and Literature, Civics and Current Topics, Speech Training, Business Methods, and Simple Anatomy. The introduction of mathematics was an experiment which proved unexpectedly successful, although its treatment requires very close co-operation between broadcasters and students. The Commission printed and distributed some twelve thousand booklets setting out the syllabus followed in each subject.

The value of this aspect of the Commission's work may best be gauged from the fact that no fewer than 800 schools listen regularly to the programmes, in addition to some six hundred pupils who live in such remote parts of Australia that they have to be educated by means of correspondence courses. Our service to these correspondence-taught children is a particularly romantic aspect of the Commission's activities, and there is evidence that the broadcast lessons are of great value to children so situated. In New South Wales one half-hour period each week is devoted to talks for the correspondence pupils, and Victoria will be introducing special talks in the first term of 1936.

The Commission takes this opportunity of expressing its appreciation of the ready help and co-operation of the Education Department in each State, and of the schools and other educational authorities who have assisted in the work. It wishes also to express its special appreciation of the services of the members of the honorary Advisory Committees, who have done such splendid work in helping to compile the several courses of broadcast lessons.

Descriptive Broadcasts:

The past year was a particularly favourable period for descriptive broadcasts. Events such as the visit to Australia of His Royal Highness the Duke of Gloucester, the England-Australia Air Race, and the many other public functions, congresses, pageants and demonstrations associated with the celebration of the Victorian Centenary lent themselves to this form of treatment. Expert descriptors brought home to the listening public throughout Australia not only the atmosphere and excitement of the scenes, but also the deeper significance of these important events. Especial reference should be made to the broadcasting of the dedication by His Royal Highness the Duke of Gloucester of the Shrine of Remembrance (the Melbourne War Memorial), of the Anzac Memorial, Hyde Park, Sydney, and to the broadcasting of the Dawn Service held at the Cenotaph in Sydney on Anzac Day.

The broadcasting of the progress of the great International Air Race presented difficulties of a type not previously encountered, but careful organisation enabled most of these difficulties to be satisfactorily surmounted, and there was every indication of public appreciation of the success achieved. The Commission also records with pleasure the initiative of its representative at Albury, who, by broadcasting instructions to the crew of the 'plane, contributed to the safe night landing at that town of one of the leading competitors in the race, the Dutch air-liner piloted by Messrs. Parmentier and Moll. The broadcast associated with this particular incident will be remembered as one of the most dramatic in the history of broadcasting in this country.

The Commission has also arranged descriptive broadcasts from factories and works, coal mines, dairy farms, timber mills, and vineyards, indicating the methods employed in the principal Australian industries. This work, apart from the heightened entertainment and interest arising from the local colour introduced, has definitely served a useful educative purpose.

A comprehensive sporting service, including running descriptions, general commentaries and detailed results, has been maintained in connection with all leading sporting events in Australia, and to some extent, in other parts of the world. The "ball-by-ball" method of broadcasting the Test Cricket Matches played in England was detailed in the last Annual Report and is still remembered as one of the most popular broadcasting features introduced by the Commission. Similar methods will be adopted for the broadcasting of the Test Matches shortly to be played in South Africa. The All-England Lawn Tennis Championship Singles Semi-final between the Australian representative, Mr. J. H. Crawford, and the previous champion, Mr. F. J. Perry, was also described to listeners in the same way; a comprehensive cable service enabling a complete description of the play to be broadcast as from Wimbledon itself.

A number of actual running descriptions of overseas sporting events, including the English Derby and Grand National horse-races, the Oxford-Cambridge Boat Race and the English Association Football Cup Final, were received on short-wave from the British Broadcasting Corporation's Empire Station and re-transmitted for the benefit of listeners in Australia.

ESSENTIAL SERVICES:

Full services designed to be of special value to listeners in more remote parts of the country, including news services, both local and cable (arranged by contract with the newspapers), and reports covering live stock and produce markets, weather data, rainfalls, river gaugings, stock exchanges and news of a similar nature, were maintained throughout the year, and special S.O.S. messages from the police and other public authorities were broadcast whenever required.

DEVOTIONAL:

By arrangements with various churches, religious services were broadcast every Sunday and on other sacred days, and, in addition, proceedings and descriptions of processions and functions of the Eucharistic Congress and the All-Australian Anglican Assembly were transmitted from Melbourne during the Centenary Celebrations.

WOMEN'S SESSIONS:

Items of special interest to women were given a regular place in the programmes, at appropriate times each day, and the relevant mail showed that they were widely appreciated.

CHILDREN'S SESSIONS:

During the year innovations were made in connection with Children's Sessions. The most popular of these has proved to be the dramatising of stories in such a way as to commend them to the younger listeners. Competitions and other similar activities in which children could participate have helped to maintain and enlarge the interest of listeners in these sessions.

COMMUNITY SINGING:

Community Singing Concerts, regularly arranged and broadcast in all States, were again well attended, and, as will be noted later herein, were a source of substantial revenue to charities.

B.B.C. RECORDED PROGRAMMES:

By arrangement with the British Broadcasting Corporation the Commission broadcast a series of recorded features of the Corporation's programmes. Apart from their purely entertainment or educational value, these records enabled the Australian listener to familiarise himself with the work of the B.B.C. Production Department, to follow descriptions of outstanding overseas events, and to hear not only the views but also the voices of leading English men and women.

SHORT-WAVE BROADCASTING:

A number of short-wave transmissions received from overseas were converted to the wave-length of Australian stations and re-broadcast here. The majority came from the British Broadcasting Corporation; notable among them being addresses to his subjects by His Majesty the King, both at Christmas and during the celebrations of the Silver Jubilee Anniversary of Their Majesties' accession to the throne, the description of the wedding of His Royal Highness the Duke of Kent to Princess Marina in Westminster Abbey, and the launching of the "Queen Mary" by Her Majesty. Messages from many other parts of the world were also clearly re-transmitted, and helped substantially to enrich the programmes. In addition, the Commission itself arranged for talks by prominent men and women overseas to be given per radio telephone especially for Australian listeners; the talk between Sir Harrison Moore (whose subsequent death we regret to record) and the Secretary-General of the League of Nations, Mr. Avenol, from Geneva, on 17th June, 1935, being worthy of special mention.

The Commission has been glad to make some small return for this assistance by contributing programmes regularly to short wave station 3LR, Lyndhurst (Victoria), and occasionally, by arrangement with Amalgamated Wireless (Australasia)

(Continued on next page)

A.B.C. 3rd ANNUAL REPORT— (Continued)

Limited, to the short wave stations VK2ME (New South Wales) and VK3ME (Victoria). A contribution to the British Broadcasting Corporation's Empire programmes has been made by the arranging, by radio telephone, of broadcasts of special overseas interest.

ARTISTS:

The Commission continued its policy of providing, whenever possible, employment for local artists, not only because of the intrinsic value of their performances, but also in the hope of discovering and developing artistic talent among Australians and of fostering among listeners generally a liking for, and pride in, the musical, dramatic and literary output of their own country. In all, during the year, there were no fewer than 38,115 local performers engaged on the Commission's programmes. This compares with 26,472 engagements in 1933-34 and 20,099 in 1932-33.

RECORDINGS:

A natural corollary of the increasing employment of artists has been a reduction in the time allotted to recorded broadcasts. These occupied, during the past year, only 37.54% of total programme-time. This proportion is substantially lower than in previous years.

PUBLICATIONS:

Copies of selected addresses having some special interest have been printed and made available free of charge to listeners.

EXHIBITIONS:

The Commission has continued its policy of co-operating with the Radio Trade by supporting public exhibitions which the latter had arranged. This has been done in all States, with good results.

CHARITIES:

The Commission was able, in the course of its work, to give valuable assistance to many public charitable organisations and institutions. Its community singing concerts, boys' clubs entertainments, old time dances, and birthday "calls," resulted in the collection of more than £9,450, included in which was a sum of £3,551 devoted to the relieving of distress arising out of the disastrous floods at Port Pirie. Much indirect assistance was also given to deserving causes by the broadcasting of appeals and similar announcements.

ACCOMMODATION:

The studios at Adelaide have been completely remodelled; premises have been secured in Launceston for studios to serve the new Station 7NT, North Regional, Tasmania*; and plans for studios in both Hobart and Perth are approaching finalisation. Accommodation will be required also in country centres to serve the new Regional Stations which are now being built or will be built in the near future.

* Opened 3rd August, 1935.

The greatest liability facing the Commission, however, is in respect of new studios in both Sydney and Melbourne, where operations are being carried on at present under great disadvantages in leased premises. It is hoped that negotiations, which are now in hand for suitable building sites, will shortly be completed.

In anticipation of the heavy financial commitments which will be involved in the purchase of land and the erection of buildings, the Commission has set aside substantial reserves from its revenue during the past three years as will be seen from the accompanying accounts. This has been done 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 license-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.

EXTENT OF SERVICE:

During the year the extent of the Commission's service remained unchanged in respect of both the number and the power of the National Stations. The well-maintained rate of license-increase is therefore all the more gratifying. There was, however, a considerable extension of broadcasting hours, which have now been standardised on the following basis:

BROADCASTING HOURS:

4QG, 4RK, 5CL, 5CK, 6WF, 7ZL:

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 11.30 p.m.

Sundays

10.30 a.m. to 1.30 p.m.
(4QG and 4RK 10 a.m. to 1.30 p.m.)
3 p.m. to 5 p.m.
(6WF 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.
(3AR 9.35 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 and 2NC:

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 5 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 10.30 p.m.

N.B.—When races are being broadcast on Wednesday afternoons through 4QG, 4RK, 5CL, 5CK and 6WF, the following variations of the schedule will be noted:
5CL, 5CK, 4QG, 4RK } 2 p.m. to 5.10 p.m.
6WF—2.30 p.m. to 5.10 p.m.

FINANCE:

The appended financial statements will show that the Commission's financial position has improved greatly during the twelve months which ended on 30th June, 1935. In the past, the heavy capital expenditure associated with the initiation of such extensive activities as those of the National Broadcasting Service necessitated a policy of rigid economy, and the effect of that policy is revealed in the Balance Sheet now submitted. The substantial surplus on the year's accounts (£95,078/16/2) and the excess of assets and reserves over current liabilities (£147,401/16/0) are the result of a careful supervision of expenditure, and indicate that the Commission will soon be able to commence an extensive building programme to meet studio requirements, which are growing more pressing from day to day. This has been referred to herein under the heading of "Accommodation." The total revenue for the year was £405,534/12/1, only £485/13/1 coming from sources other than the Commission's proportion of revenue from license fees. The principal item of expenditure was artists' fees and programme costs, including payments to artists, musicians, lecturers, announcers and accompanists, and expenses incurred in production. The total paid out on this account was £171,296/12/7. Payment of copyright fees (including payment to the Australasian Performing Right Associa-

(Continued on next page)

AUSTRALIAN BROADCASTING COMMISSION
BALANCE SHEET AS AT 30th JUNE, 1935

Liabilities

Previous Year £ s. d.		1934-5 £ s. d.
6,666 13 4	Loan from Commonwealth Government	—
16,103 11 6	Sundry Creditors	13,314 6 8
50,000 0 0	Reserve for Buildings	145,000 0 0
2,322 19 10	Accumulated Fund £2,322 19 10	
	Add Balance from Profit and Loss Statement 78 16 2	2,401 16 0
£75,093 4 8		£160,716 2 8

Assets

Previous Year £ s. d.		£ s. d.	£ s. d.	1934-5 £ s. d.
	Land & Buildings — Freehold	16,418 18 3		
	Less Depreciation	139 17 3		
14,649 18 5				16,279 1 0
	Office Furniture, Musical Instruments and Equipment	25,802 15 1		
	Less Depreciation	8,401 0 8		
17,120 5 1				17,401 14 5
1,329 19 0	Stores and Stationery			1,910 16 0
	Sundry Debtors— Postmaster-General for License Fees	49,921 6 6		
	Other	238 2 5		
13,463 1 10				50,159 8 11
1,394 1 7	Payments in Advance			1,889 12 6
	Other Investments— Fixed Deposits	60,000 0 0		
	Add Accrued Interest	183 5 10		
			60,183 5 10	
25,548 12 6	Cash in Hand and at Bank		12,892 4 0	
1,587 6 3	Preliminary Expenses		—	
£75,093 4 8			£160,716 2 8	

PROFIT & LOSS STATEMENT TO YEAR ENDED 30th JUNE, 1935

Expenditure

Previous Year £ s. d.		1934-5 £ s. d.
170,405 13 10	To Artists' Fees and Programme Expenses (Payments to Artists, Orchestras, Lecturers, Announcers, Accompanists, and Production Costs)	171,296 12 7
26,387 0 9	Copyright Fees	40,200 13 9
8,060 5 3	Broadcasting Rights	9,370 5 5
7,282 15 0	Rental of Telephone Lines for Broadcasting and Outside Pick-up Costs	11,281 18 10
1,800 0 0	Commissioners' Fees	1,777 13 6
33,362 17 11	Staff Salaries	34,031 2 4
8,901 6 11	Rent of Offices	8,351 3 5
8,183 2 4	Publicity	6,387 6 0
3,442 12 7	Depreciation	3,851 17 5
1,587 6 4	Preliminary Expenses Written off	1,587 6 3
23,324 4 10	Other Expenses	22,319 16 5
32,994 7 4	Balance carried down	95,078 16 2
£325,731 13 1		£405,534 12 1
32,500 0 0	To Transfer to Reserve for Buildings	95,000 0 0
494 7 4	Balance to Accumulated Fund	78 16 2
£32,994 7 4		£95,078 16 2

Revenue

Previous Year £ s. d.		1934-5 £ s. d.
314,126 12 6	By Revenue from License Fees	405,048 19 0
—	Interest on Investments	314 10 10
11,605 0 7	Other Revenue	171 2 3
£325,731 13 1		£405,534 12 1
32,994 7 4	By Balance brought down	95,078 16 2
£32,994 7 4		£95,078 16 2

A.B.C. 3rd ANNUAL REPORT—(Continued)—

tion Limited) amounted to £40,200/13/9, broadcasting rights (principally for sporting events) cost £9,370/5/5, staff salaries were £34,031/2/4, Commissioners' fees. £1,777/13/6, and pick-up charges for mechanical services made up a further £11,281/18/10 of the total. Of the surplus of £95,078/16/2, £95,000 has been transferred to the reserve for buildings, which now amounts to £145,000.

The accounts of the individual States show that all branches except those in Western Australia and Tasmania produced revenue in excess of expenditure. The greatest surplus was shown in New South Wales, where it increased from £18,916 in 1933-34 to £45,294 in 1934-35. The Victorian surplus was £31,871 as compared with £15,931 in the preceding twelve months. The deficit in Western Australia was reduced from £3,329 to £894 during the year, and the deficit in Tasmania from £8,934 to £6,486.

TECHNICAL:

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

STAFF:

The Commission is pleased to record its appreciation of the valuable services rendered by its staff during the year.

For reasons which have already been reported to you, the services of the late General Manager, Mr. W. T. Conder, terminated in June last.

(Note: Since the termination of the period under review, the vacancy so

(Continued on page 39)

Report of the British Television Committee

Presented by the Postmaster-General to Parliament by Command of His Majesty — January, 1935

The Right Hon. Sir Kingsley Wood, M.P., His Majesty's Postmaster-General

THE TELEVISION COMMITTEE

The Right Hon. The Lord Selsdon, K.B.E. (Chairman).

Sir John Cadman, G.C.M.G., D.Sc. (Vice-Chairman).

Col. A. S. Angwin, D.S.O., M.C., B.Sc., Assistant Engineer-in-Chief, General Post Office.

Noel Ashbridge, Esq., B.Sc., Chief Engineer, British Broadcasting Corporation.

O. F. Brown, Esq., M.A., B.Sc., Department of Scientific and Industrial Research.

Vice-Admiral Sir Charles Carpendale, C.B., Controller, British Broadcasting Corporation.

F. W. Phillips, Esq., Assistant Secretary, General Post Office.

Secretary: J. Varley Roberts, Esq., M.C., Telegraph and Telephone Department, General Post Office, E.C.1.

Terms of Reference and Proceedings of the Committee

1. The appointment of the Committee was announced in the House of Commons on the 14th of May, 1934, with the following terms of reference:—

"To consider the development of Television and to advise the Postmaster General on the relative merits of the several systems and on the conditions under which any public service of Television should be provided."

2. A notification was made in the Press on the 29th of May, 1934, and again on the 11th of June, 1934, intimating that the Committee were prepared to receive evidence on the subject of Television from any interested society, firm or individual.

3. We have examined 38 witnesses—some of them on more than one occasion—representing many different interests, on the various aspects of Television. A list of witnesses who have appeared before us is set out in Appendix I. In addition, we have had the benefit of consultation with members of various Departments of the Government, who have afforded us every facility and assistance; and we have received numerous written statements regarding Television from various sources.

4. A note of the formal evidence given is presented in Appendix II (Volumes I to IV), but owing to the fact that much of this information, containing secrets of commercial value, was necessarily received in confidence and under promise of secrecy, we trust that this pledge may be maintained and that accordingly the record, while available for yourself and your responsible officers, will not be published. For similar reasons we recommend that Appendix III, containing reports on developments in the United States and Germany, and Appendix IV, containing a description of each television system we have examined in this country, should not be published. Appendix V, containing certain financial details, is also of a confidential nature (see paragraph 63).

(Appendix II not printed)
(Appendix III not printed)
(Appendix IV not printed)
(Appendix V not printed)

5. We have inspected, in some cases upon several occasions, all the different television systems belonging to firms who were prepared to provide demonstrations. Of the systems under development in this country, the most distinctive are those of the Baird, Cossor, Marconi-E.M.I. and Scophony Companies.

6. Further, we despatched with your approval a delegation headed by the Chairman, to investigate and report upon progress in television research in the United States, and a delegation headed by Mr. O. F. Brown, to Germany for a similar purpose. We have also been furnished with information regarding the position in certain other countries.

7. In America, our delegation visited and inspected many of the chief centres of television experimental research, as well as the plant and laboratories of the principal Broadcasting, Telephone and Telegraph Authorities. They had also the advantage of consultation in Washington with the Federal Communications Commission. To all of these Corporations and Authorities we desire to make the fullest and most sincere acknowledgment of the kindness and courtesy extended to the delegation, who were given every possible opportunity for the fullest examination of methods and plant, and the frankest interchange of opinion. A detailed report of the proceedings and conclusions of the delegation is submitted as Appendix III, A.

8. In Germany, our delegation made a similar inspection of the television experimental installations belonging to the Reichspost and also of those of several private firms in Berlin, and they had many profitable discussions with officials of the Reichspost and others regarding various aspects of Television. As in America, so also in Germany, every facility was accorded to our delegation in their investigations, for which we likewise desire to express our sincere appreciation. A report on the visit to Germany is submitted as Appendix III, B.

Basic Principles of Television

9. Television may be defined as the transmission by telegraphy and reproduction in transitory visible form of images of objects in movement or at rest. The equipment utilised usually consists of combinations of optical and electrical apparatus which at the transmitting or "pick up" end of the system convert the image of the object into electric currents, and of similar combinations at the receiving end of the system which resolve the electric currents into visible forms.

10. When an object is viewed by direct vision, light reflected from the object under observation impinges on the eye and is focussed by the lens on to the retina where it stimulates nerve cells. Each cell communicates with the brain, and the sensation of sight and the perception of any scene result from the relative stimulation applied to the brain by the cells in the retina. As the light sensitive cells of the retina have finite dimensions, details in an object which produce an image on the retina smaller than a single cell cannot be individually perceived. The eye, therefore, really sees a large number of infinitely small objects, which in the aggregate form the image.

11. Thus all vision is of a granular structure, as is also pictorial reproduction, and, in order to transmit pictures or images over electric circuits, a suitable granular structure is adopted, the relative brilliancy of each grain or elementary area of the picture being transmitted telegraphically to the distant point, where by suitable means an equivalent brilliancy is given to a corresponding area on the receiving screen.

12. The transmission of the relative brilliancy of each grain or elementary area of the picture must be effected in some ordered sequence, and the process by which this is achieved is termed "scanning." The usual method employed is to allow light from a selected area of the subject to impinge on a device known as a photo-electric cell, which delivers an electrical output proportional to the light stimulation it receives. This electrical output, after amplification, is used to control the output of a radio transmitter by me-

(Continued on next page)

TELEVISION REPORT— (Continued)

thods similar to those in use for the transmission of speech and music. The position of the selected area of the subject is varied in a definite path so that the whole of the subject is covered in a period which should be less than the time of persistence of vision. The path of selection is usually a series of horizontal or vertical parallel lines, and the process somewhat resembles the action of the human eye in reading a page of printed matter, letter by letter and line by line. A further refinement consists in making the path of selection run first along every alternate line and then, as a second process, along the lines omitted in the first process. This is known as interlaced scanning, and it appears to be successful in reducing "flicker."

13. At the receiver, the radio signal is detected and amplified by methods similar to those used for radio-telephony. The electrical signal from the receiver thus resembles the signal from the photo-electric cell or cells at the transmitter, and is used to control the brilliancy of illumination of an elementary area of the screen on which the received picture is to be displayed.

14. It is essential to arrange that the area illuminated on the viewing screen at any given instant shall correspond in position with the area of which the illumination is then being determined by the scanning device. In other words, precise synchronism is necessary between the movements of the scanning device and the receiving device. Various methods have been proposed for achieving this synchronism; it can, for instance, be accomplished by the sending of two series of special synchronising signals by the transmitter—one series to ensure the correct motion of the picture spot along each line and the second series to signal the instant of termination of one picture and the commencement of the next. As these series of signals occur respectively between successive lines of the picture and between successive pictures, their transmission need not interfere with the picture signals, and they can be sent on the same radio transmitter.

15. The relative brilliancy of each successive grain of the picture is transmitted with such rapidity that persistence of vision produces the effect at the receiving end of a complete picture, the degree of definition and steadiness of which is dependent upon the fineness of the individual grains composing the picture, i.e., the number of lines used for scanning it, and the speed at which complete pictures are successively transmitted.

16. One of the difficulties which has been encountered in direct scanning is the small amount of light available to actuate the photo-electric cell obtained by reflection from objects which are being televised.

17. Accordingly, considerable experimental development has taken place upon a technique whereby the scene to be televised is first photographed on ordinary cinematograph film which, after being developed, is scanned by light transmitted through it. This system can be used to provide a method of delayed Television where direct scanning by a mechanical device would be difficult or impossible. In order to reduce the period of delay, equipment has now been produced in which the cinematograph camera is associated with the film scanner, and the film, after exposure, is immediately developed, fixed, washed and partially dried. It then passes through the scanner, and after further drying is stored for future use if required. In this way, the advances which have been made in photographic processes in the production of rapid and sensitive emulsions can be utilised to overcome the difficulties which are at present encountered due to the comparatively feeble sensitivity of photo-electric cells.

18. The direct scanning of open air scenes and studio subjects without abnormally powerful illuminating devices has also been made possible by the use of cathode rays in combination with photo-sensitive surfaces or minute photo-electric cells. For instance, in one such device which is being developed in America, Germany and this country, the image to be televised is focussed by means of lenses on to a photo-electric mosaic contained in a cathode ray tube. The cathode ray beam is directed on the surface of the mosaic and by a method of magnetic control the image is scanned repeatedly. Electrical energy is thus drawn off from the photo-electric mosaic by the cathode ray which is proportional to the light intensity of the picture and can be transmitted to operate the distant television receiver.

19. Our observations lead us to the opinion that this system of "direct pick up" has already attained a considerable degree of effectiveness, and we should say that satisfactory reproduction of outdoor moving scenes can now be attained by this method in conditions of light, etc., approximating to those under which satisfactory cinematograph pictures can be taken, provided that the recording apparatus can be located reasonably close to and at a moderately constant distance from the scene to be televised. We should regard it as probable that satisfactory reproduction could, even at this stage of development, be obtained of such scenes as a procession, a lawn-tennis match, or the actual finish of a horse race, though the transmission of a view of the whole course of a race, a cricket match, or a football match, would present much greater difficulty.

Experiments in Television

20. We are informed that the Post Office has always given facilities to qualified persons or firms who have applied for permission to conduct experiments in Television, but the licenses issued have been restricted to purely research and experimental work and have given no authority for the conduct of any form of public service.

21. The view taken was that when any system of Television showed sufficient promise to justify its trial for public transmission, the British Broadcasting Corporation should provide reasonable facilities for such a trial service on a limited scale at one or more of their broadcasting stations.

Low Definition Television

22. As far back as the autumn of 1929 the British Broadcasting Corporation gave the Baird Company facilities for experimental transmissions of Television from a broadcasting station. During the next two or three years a large number of experimental transmissions were carried out by the Baird Company independently, as well as in liaison with the British Broadcasting Corporation.

23. Improvements were gradually made in the system, and in August, 1932, the Corporation arranged with Baird Television Limited for public experimental transmissions from their London Station (Brookmans Park) of Television on a wavelength of 261 metres, and of the accompanying sound on a wavelength of 398 metres from the Midland Regional transmitter (Daventry). The Corporation agreed to provide special programme material and also staff for operating the television apparatus, which was installed in Broadcasting House by the Baird Company on a loan basis. These transmissions, the experimental nature of which was emphasised in a notice issued to the Press, have continued up to the present time, although their frequency has been reduced since 31st March, 1934, to two half-hour periods a week which are extended to three-quarters of an hour when circumstances permit.

24. In the case of these transmissions the size of the elements (elementary areas) composing the picture is such as to admit of transmission being effected in a series of thirty lines per picture and each picture is repeated 12½ times per second (see paragraphs 12-15).

25. Any pictures built up with a structure of the order of thirty lines are, however, comparatively coarse in texture. Little detail can be given, and generally speaking the pictures are only fitted for the presentation of "close-ups"—e.g., the head and shoulders of a speaker—and the quality of reproduction leaves much to be desired. Moreover, any frequency of the order of 12½ pictures per second gives rise to a large amount of "flicker."

26. Whilst low definition Television has been the path along which the infant steps of the art have naturally tended and, while this form of Television doubtless still affords scientific interest to wireless experimenters, and may even possess some entertainment value for a limited number of others, we are satisfied that a service of this type would fail to secure the sustained interest of the public generally. We do not, therefore, favour the adoption of any low definition system of Television for a regular public service. We refer later in our report (see paragraph 34) to the question of the temporary continuance of the present low definition transmissions pending the institution of a public television service of a more satisfactory type.

(Continued on next page)

TELEVISION REPORT— (Continued)

High Definition Television

27. With a view to extending the application of Television to a wider field and thereby increasing its utility and entertainment value, much attention has been given in recent years to the problem of obtaining better definition and reduced "flicker" in the received pictures.

28. The degree of definition it is essential to obtain is necessarily a matter of opinion, but the evidence received and our own observations lead us to the conclusion that it should be not less than 240 lines per picture, with a minimum picture frequency of 25 per second. The standard which has been used extensively for experimental work is 180 lines, but we should prefer the figure of 240 and we do not exclude the possible use of an even higher order of definition and a frequency of 50 pictures per second.

29. To attain such degrees of definition and picture frequency, very high modulation frequencies are required, which in practice can only be handled by radio transmitters working on ultra-short waves the effective range of which is much more restricted than the range of the medium waves used for ordinary sound broadcasting (see paragraph 47).

30. For the reception of high definition pictures the cathode ray tube is now usually employed. The cathode ray tube receiver involves no moving parts, and the picture is presented as a fluorescence at the end of the tube. A stream of electrons (particles of negative electricity) is projected along the tube, and impinges on a coating of fluorescent material at the end of the tube, the impact of the electrons on the fluorescent material causing illumination. The amount of illumination can be controlled by varying the flow of electrons, and the point of impact can be changed by deflecting the jet by means of electric or magnetic forces. The jet is modulated or controlled in amount by the received signal, and suitable electrical circuits are provided to move the point of impact in exact synchronism with the transmitter (see paragraph 14).

31. The size of the picture produced naturally depends upon the size of the cathode ray tube. At present the most usual size gives a picture of about 8 in. by 6 in., although good results have been seen with larger tubes. The apparent size can, of course, be increased by viewing the tube through a suitable fixed magnifying device, though with a corresponding loss of definition. Experimental work is proceeding with a view to the projection of pictures on a screen of much larger dimensions, but this is still in an early stage of development.

32. We are informed that the price to the public of a receiving set capable of producing a picture of about the first-mentioned size, with the accompanying sound, would probably at first be considerable, and various estimates have been given ranging from £50 to £80; but it is reasonable to assume that, if and when receivers were made on a large scale under competitive conditions, this price would be substantially reduced.

33. Most of the high definition television systems follow in broad outline the methods of transmission and reception referred to above, with some variations in technique. We are impressed with the quality of the results obtained by certain of these systems, and whilst much undoubtedly remains to be done in order to render the results satisfactory in all respects, we feel that a standard has now been reached which justifies the first steps being taken towards the early establishment of a public television service of the high definition type in this country.

34. As regards the existing low definition broadcasts, these no doubt possess, as we have said, a certain value to those interested in Television as an art, and possibly, but to a very minor extent, to those interested in it only as an entertainment. We feel that it would be undesirable to deprive these "pioneer lookers" of their present facilities until at least a proportion of them have the opportunity of receiving a high definition service. On the other hand, the maintenance of these low definition broadcasts involves not only some expense, but also possibly considerable practical difficulties. We can only, therefore recommend—

(1) that the existing low definition broadcasts be maintained, if practicable, for the present; and

(2) that the selection of the moment for their discontinuance be left for consideration by the Advisory Committee (see paragraph 41),

with the observation that, if practicable so to maintain these broadcasts, they might reasonably be discontinued as soon as the first station of a high definition service is working.

Scope of Television and Its Relation to Sound Broadcasting

35. In our opinion there will be little, if any, scope for television broadcasts unaccompanied by sound. Television is, however, a natural adjunct to sound broadcasting and its use will make it possible for the eye as well as the ear of the listener to be reached. Associated with sound it will greatly enhance the interest of certain of the existing types of broadcast and will also render practicable the production of other types in which interest is more dependent upon sight than upon sound.

36. We are of the opinion that there are two factors which for a number of years will tend to prevent a television service being made use of to the same extent as present day sound broadcasting—

(1) The difficulties of wireless communication on ultra-short wavelengths, particularly in hilly districts, may seriously limit the extent to which the country can be effectively covered.

(2) Some time is likely to elapse before the price of an efficient television receiver will be comparable with that of the average type of receiver now in use for sound broadcasting.

Nevertheless the time may come when a sound broadcasting service entirely unaccompanied by Television will be almost as rare as the silent cinema film is to-day. We think, however, that in general sound will always be the more important factor in broadcasting. Consequently the promotion of Television must not be allowed to prevent the continued development of sound broadcasting.

37. No doubt the evolution of Television will gradually demonstrate the possibility of its application for many purposes other than those of entertainment and illustrative information. Its uses for purposes of advertisement are obvious, were such deemed desirable. We can conceive, moreover, its potential application—as distinct from existing practice in picture transmission—to public telegraphic and telephonic services, to the transmission of lists of prices, or of facsimile signatures or documents, and to its use by the police and the forces of the Crown, or as an aid to navigation.

38. We have assumed, however, that we were intended by our terms of reference to confine our attention to the question of the introduction of a public broadcast service of Television, and we do not, therefore, make any further observations regarding its other possible applications beyond expressing the earnest hope that it will be allowed the fullest possible freedom for development consonant with the public interest.

Television Operating Authority.

39. Holding the view which we do of the close relationship which must exist between sound and television broadcasting, we cannot do otherwise than conclude that the Authority which is responsible for the former—at present the British Broadcasting Corporation—should also be entrusted with the latter. We therefore recommend accordingly; and we have received an assurance that the Corporation is prepared fully to accept this additional responsibility and to enter whole-heartedly into the development of Television in conformity with the best interests of the license-paying public. In discharging this task the accumulated experience of the Corporation as regards sound broadcasting cannot fail to prove of great value. Presumably a separate license will be required from the Postmaster General specifically authorising the Corporation to undertake the broadcasting of Television.

40. We have, of course, considered the possible alternative of letting private enterprise nurture the infant service until it is seen whether it grows sufficiently lusty to deserve adoption by a public authority. This would involve the granting of licenses for the transmission of sound and vision to several different firms who are pioneering in this experimental field. We should regret this course, not only because it would involve a departure from the principle of having only a single authority broadcasting a public sound service on the air, and because the subsequent process of "adoption" (which we believe would be inevitable) would be rendered costly

(Continued on next page)

TELEVISION REPORT— (Continued)

owing to the growth of vested interests, but also because we foresee serious practical difficulties as regards the grant of licenses to the existing pioneers as well as possibly to a constant succession of fresh applicants. It is therefore our considered conclusion that the conduct of a broadcast television service should from the outset be entrusted to a single organisation, and we are satisfied that it would be in the public interest that the responsibility should be laid on the British Broadcasting Corporation.

Advisory Committee.

41. Whilst we think that the British Broadcasting Corporation should exercise control of the actual operation of the television service to the same extent and subject to the same broad principles as in the case of sound broadcasting, we recommend that the initiation and early development of this service should be planned and guided by an Advisory Committee appointed by the Postmaster General, on which the Post Office, the Department of Scientific and Industrial Research and the British Broadcasting Corporation should be represented, together with such other members as may be considered desirable. We recommend that this Committee should be appointed forthwith, for a period of, say, five years.

42. The Committee should advise on the following:—

(a) The performance specification for the two sets of apparatus mentioned in paragraph 56, including acceptance tests, and the selection of the location of the first transmitting station.

(b) The number of stations to be built subsequently, and the choice of districts in which they should be located (see paragraph 57).

(c) The minimum number of programme hours to be transmitted from each station.

(d) The establishment of the essential technical data governing all television transmissions, such as the number of lines per picture, the number of pictures transmitted per second, and the nature of the synchronising signals.

(e) The potentialities of new systems.

(f) Proposals by the British Broadcasting Corporation with regard to the exact site of each station, and the general lines on which the stations should be designed.

(g) All patent difficulties of a serious nature arising from the operation of the service in relation to both transmission and reception.

(h) Any problem in connection with the television service which may from time to time be referred to it by His Majesty's Government or the British Broadcasting Corporation.

Normally the Committee would not concern itself with detailed financial allocations, or with business negotiations between suppliers of apparatus and the British Broadcasting Corporation. It is further considered that the Committee should deal with the compilation of programmes, the detailed construction of stations, or their day-to-day operation, unless specifically invited to do so under sub-paragraph (h).

43. It will be clear from the foregoing that the Committee would be composed of both technical and non-technical members, and it is anticipated that a part of the Committee's work would best be carried out by a technical sub-committee.

44. Such experimental work as may be necessary for the establishment of stations and the operation of the service would be carried out by the British Broadcasting Corporation in the usual course of its functions, but this would not, of course, preclude the enlistment of the co-operation of Government Departments or other organisations in technical researches.

Use of Ultra-Short Waves for Television and Their Effective Range.

45. As previously mentioned, the transmission of high definition Television is practicable only with ultra-short waves, and a wide band of frequencies is necessary. Fortunately, there should be no difficulty, at present at all events, in assigning suitable wave-lengths in the spectrum—between 3 and 10 metres—for public Television in this country, although in allocating such wavelengths regard must, of course, be paid to the claims of other services. The recent experimental work has been conducted upon wavelengths around 7 metres.

46. Technically, it is desirable that the transmitting stations should be situated at elevated points, and that the masts should be as high as practicable, consistent with any restrictions which may be deemed necessary by the Government. The mast at present in use in Berlin is about 430 feet high, and the question of employing masts of greater height is under discussion in Germany. Quality of reception varies, of course, with the location of the receiving station and the nature of its surroundings. It may be observed that reception on these ultra-short waves does not seem to be materially affected by atmospherics. The most frequent sources of interference appear at present to rise from some types of electro-therapeutic apparatus, and from the ignition systems of motor cars; but we understand that it is possible to prevent or reduce certain types of such intereference by simple remedial devices.

47. Present experience both here and abroad seems to indicate that these ultra-short waves cannot be relied upon to be effective for a broadcast service much beyond what is commonly called "optical range." Generally speaking; it is at present assumed that the area capable of being effectively covered by ultra-short wave stations of about 10 kilowatts capacity will not exceed a radius of approximately 25 miles over moderately undulating country. In more hilly districts this may be considerably reduced, and indeed in certain areas an entirely reliable service may be impracticable. It is clear, therefore, that unless and until the effective range be increased, a large number of transmitting stations would be required to provide a service covering most of the country, though we think that with 10 stations, probably at least 50 per cent. of the population could be covered from suitable locations.

Provision of Television Service.

48. We nevertheless envisage the ultimate establishment of a general television service in this country, and in this connection we contemplate the possibility of television broadcasts being relayed by land line or by wireless from one or more main transmitting stations to sub-stations in different parts of the country. We should observe that recent developments in cable technique render it possible for the first time to transmit, over considerable distances, frequencies such as are required for high definition Television.

49. While the establishment of such a service should be, in our opinion, the aim, we do not feel that we can advise you to proceed at once to approve the construction, at great expense, of a network of stations, intended to cover most of the country. The total number of stations required for such a purpose is as yet unknown to anyone; and the total cost is accordingly purely speculative. Moreover, Television will be a constantly developing art, and new discoveries and improvements will certainly involve continued modifications of methods—at least during its early years. A general service will only be reached step by step; but the steps should be as frequent as possible and in our opinion the first step should be taken now. Solvitur ambulando.

Choice of System and Patent Difficulties.

50. We have been furnished with a great deal of information—much of it of a confidential character—concerning various systems of Television. Continuous progress is being made in the art; and even during the few months of our investigations, research has brought a number of new and important discoveries. We do not think it would be right at this early stage of development, when practical experience is small and the patent position obscure, that we should attempt to pass final judgment on the several systems of Television. A technical description of each system which we have examined in this country, indicating its distinctive features and commenting upon its performance, is, however, submitted for your information in Appendix IV. Comments are also made in Appendix III on the systems examined in the United States and Germany.

51. The task of choosing a television system for a public service in this country is one of great difficulty. The system of transmission governs in a varying degree the type of set required for reception; and

(Continued on next page)

TELEVISION REPORT— (Continued)

it is obviously desirable to guard against any monopolistic control of the manufacture of receiving sets. Further, whatever system or systems are adopted at the outset, it is imperative that nothing should be done to stifle progress or to prevent the adoption of future improvements from whatever source they may come. Moreover, the present patent position is difficult; the number of patents relating to Television is very large, and in regard to many of them there are conflicting views as to their importance and validity.

52. At the same time it is clear from the evidence put before us that those inventors and concerns, who have in the past devoted so much time and money to research and experiment in the development of Television, are looking—quite fairly—to recoup themselves and to gather the fruits of their labours by deriving revenue from the sale of receiving apparatus to the public, whether in sets or in parts, and whether by way of royalties paid by the manufacturers or by manufacturing themselves. It is right that this should be so, and that the growth of a new and important branch of industry, capable of providing employment for a large number of workers, should in every way be fostered and encouraged to develop freely and fully.

53. The ideal solution, if it were feasible, would be that, as a preliminary to the establishment of a public service, a Patent Pool should be formed into which all television patents should be placed, the operating authority being free to select from this pool whatever patents it desired to use for transmission, and manufacturers being free to use any of the patents required for receiving sets on payment of a reasonable royalty to the Pool. We have seriously considered whether we should advise you to refuse to authorise the establishment of a public service of high definition Television until a comprehensive Patent Pool of this type had been formed, on terms considered satisfactory by the Advisory Committee. From evidence we have received, however, we are convinced that, under present conditions, when the relative value of the numerous television patents is so largely a matter of conjecture, the early formation of such a Pool would present extreme difficulty. The Government would have no power to compel an owner of television patents to put them into the Pool against his will; and, with the best will in the world, patent holders might find it exceedingly difficult to agree among themselves on a fair basis for charging royalties and sharing the revenue so obtained. An attempt hastily to negotiate a Pool under these conditions would in all probability end in failure.

54. While, however, we have been compelled to abandon the idea that the formation of a comprehensive Patent Pool should be a condition precedent to the establishment of a public service, we are strongly of opinion that it is in the public interest, and in the interest of the trade itself, that such a Pool should be formed. In framing our recommendations we have kept this objective in mind; and we trust that events will shape themselves in such a way as to lead to the formation of a satisfactory Patent Pool at no distant date.

Start of Service.

55. We have come to the conclusion that a start could best be made with a service of high definition Television by the establishment of such a service in London. It seems probable that the London area can be covered by one transmitting station and that two systems of television can be operated from that station. On this assumption we suggest that a start be made in such a manner as to provide an extended trial of two systems, under strictly comparable conditions, by installing them side by side at a station in London where they should be used alternately—and not simultaneously—for a public service.

56. There are two systems of high definition Television—owned by Baird Television Limited and Marconi-E.M.I. Television Company Limited respectively —which are in a relatively advanced stage of development(and have indeed been operated experimentally over wireless channels for some time past with satisfactory results. We recommend that the Baird Company be given an opportunity to supply the necessary apparatus for the operation of its system at the London station, and that the Marconi-E.M.I. Company be given a similar opportunity in respect of apparatus for the operation of its system also at that station. Besides any other conditions imposed, acceptance of offers should be subject in each case to the following conditions precedent:—

(a) The price demanded should not, in the opinion of the Advisory Committee, be unreasonable.

(b) The British Broadcasting Corporation to be indemnified against any claim for infringement of patents.

(c) The Company to undertake to grant a license to any responsible manufacturer to use its existing patents or any patents hereafter held by it, for the manufacture of television receiving sets in this country on payment of royalty.

(d) The terms of a standard form of such license to be agreed upon by the Company with the Radio Manufacturers' Association, or, in default of agreement, to be settled in accordance with the provisions of the Arbitration Acts, 1889 to 1934, or any statutory modification thereof, either by a single arbiter agreed upon by the Company and the Radio Manufacturers' Association, or failing such agreement, by two arbiters—each of the parties nominating one—and an umpire nominated by the Postmaster-General.

(e) The Company to agree to allow the introduction into its apparatus at the station of devices other than those claimed to be covered under its own patents, in the event of such introduction being recommended by the Advisory Committee.

(f) Transmissions from both sets of apparatus should be capable of reception by the same type of receiver without complicated or expensive adjustment.

(g) The definition should not be inferior to a standard of 240 lines and 25 pictures per second.

(h) The general design of the apparatus should be such as to satisfy the Advisory Committee, and when it has been installed, tests should be given to the satisfaction of the Committee.

Development of Service

57. In the light of the experience obtained with the first station, the Advisory Committee should proceed with the planning of additional stations, until a network is gradually built up. The total number of stations and the speed at which they are provided will naturally depend upon the results obtained from the earlier stations, the popularity of the service, finance and other factors. A tentative programme for the location and provision of stations should be framed by the Advisory Committee, and reviewed by them at frequent intervals.

58. Whatever system be adopted for the second or any subsequent station, we recommend that conditions be imposed similar to those set out in paragraph 56, in so far as applicable. The Advisory Committee would, of course, endeavour to secure the incorporation in each fresh station of any improvements which had come to light, and they would also naturally consider the introduction, if possible, of such improvements into existing stations. There should be no serious difficulty in doing this, so long as the changes did not materially affect the receiving sets, or at any rate so long as the sets already in use could be adapted, without much expense, to the modified system.

59. A more difficult situation would arise if a completely new system, requiring an entirely new type of receiving set, should be evolved and should prove on trial to be definitely superior to the systems already in use. In such a case it might be necessary to adopt the improved system, in the first instance, at new stations only, and to postpone for a time its adoption at the older stations. For it is obvious that many persons would be deterred from purchasing television sets unless they had some assurance that these sets would not be rendered useless at an early date by a complete change in the transmitting system. No radical changes should, therefore, be made in the systems serving particular areas without reasonable notice being given by the

(Continued on next page)

TELEVISION REPORT— (Continued)

British Broadcasting Corporation of the contemplated change. In the initial stages this notice should not be less than, say, two years. The Corporation would naturally consult the Advisory Committee on this point. While giving some reasonable measure of security in this direction, the aim should be to take advantage, as far as possible, of all improvements in the art of Television, and at the same time to work towards the ultimate attainment of a national standardised system of transmission.

Programmes

60. It is scarcely within our province to make detailed recommendations on the subject of television programmes. To what extent those programmes should consist of direct transmissions of studio or outdoor scenes, or televised reproductions of films, must be determined largely by experience, technical progress and public support, as well as by financial considerations. No doubt the televising of sporting and other public events will have a wide appeal, and will add considerably to the attractiveness of the service. We regard such transmissions as a desirable part of a public television service, and it is essential that the British Broadcasting Corporation should have complete freedom for the televising of such scenes, with appropriate sound accompaniment, at any time of the day.

61. With regard to the duration of television programmes, we do not consider that it will be necessary at the outset to provide programmes for many hours a day. An hour's transmission in the morning or afternoon which will give facilities for trade demonstrations and, say, two hours in the evening, will probably suffice. As regards the future, the British Broadcasting Corporation and the Advisory Committee will doubtless be guided by experience and by financial considerations.

Finance.

62. For reasons already explained, it will be clear that at this stage no human being can estimate the cost of constructing and working a national network—nor even of such a partial system of 10 stations, as is referred to in paragraph 47 — with anything resembling accuracy. Even with all the resources at our command we have been quite unable to do so, and we confine ourselves, therefore, to giving what we hope may prove to be a fairly close estimate of the cost of providing and working the London station referred to in paragraph 55 up to 31st December, 1936. We should explain that we have taken this period, firstly on the assumption that it may be possible to start the service during the latter part of 1935, and secondly because 31st December, 1936, is the date on which the British Broadcasting Corporation's present Charter is due to expire. The relevance of this point lies in the fact that, if the television service is continued and expanded on the lines contemplated, then its finance will inevitably become bound up with the question of the Corporation's finance in general. We gather that it is probable that this will come under review in connection with the renewal of the Charter, and accordingly we confine ourselves to the consideration of Television finance for the intervening period only, observing that within that time the Advisory Committee should be able to formulate an opinion as to the development of the service.

63. We estimated that the cost of providing the London station, including all running and maintenance expenses, programme costs and amortisation charges (calculated on the basis of a comparatively rapid obsolescence) for the period up to 31st December, 1936, will be £180,000. For obvious reasons we refrain from specifying here the details upon which this estimate is built, but these are available to you in the confidential section of the Report (see Appendix V). Lest, however, too hasty conclusions be drawn from this figure we add the following observations. It must not be assumed that an accurate estimate of the cost of a number of stations can be reached by the simple process of multiplication. By far the largest factor in the above figure is the programme cost. On the one hand, if the service is a success, the cost of programmes will certainly rise materially, just as the cost of sound programmes has risen. We have not budgeted during this early stage for a programme comparable in duration, variety, or quality, with existing sound programmes, although the service should be amply adequate to provide interest and entertainment for the public, as well as opportunity for daily demonstrations by retailers of sets. On the other hand, if and when a number of stations start working, it is contemplated that one programme may be relayed simultaneously to all stations (see paragraph 48), and that only a small portion of the daily output will consist in each case of topical items of local interest. In the case, therefore, of each additional station, the amount to be added to other charges in respect of programme costs will be merely fractional.

64. We have carefully considered the question of providing the necessary funds. Roughly speaking, the means suggested to us for so doing may be classified under two heads:—

(a) Selling time for advertisements, and

(b) License revenue.

65. Advertisements may take two forms: they may be either (i) direct advertisements for which time is bought by the advertiser such as, for instance, a dress show by Messrs. Blank; or (ii) the acceptance, as a gift, of programmes provided by an advertiser and coupled with the intimation of his name, in accordance with a standard formula, such as, for instance, "This programme comes to you through the generosity of Messrs. Dot & Dash," the latter system being usually known as that of "sponsored programmes." As regards direct advertisements, this proposal has been frequently examined in past years. In relation to sound broadcasting it was discussed and rejected by the Sykes Committee on Broadcasting in 1923 (Cmd. 1951, paragraphs 40-41). We do not differ from that Committee's view and accordingly do not recommend this course. As regards "sponsored programmes," for which the Broadcasting authority neither makes nor receives payment, the Sykes Committee saw no objection to their admission; and they are now specifically allowed under the British Broadcasting Corporation's License, although the Corporation has, in fact, only admitted them on rare occasions. We see no reason why the provision concerning sponsored programmes in the existing license should not be applied also to the television service and we think it would be legitimate, especially during the experimental period of the service, were the Corporation to take advantage of the permission to accept such programmes.

66. In attempting to provide funds from license revenue there appear to be four possible courses:—

(1) The raising of the fee for the general broadcast listener's license.

(2) The issue of a special television looker's license.

(3) The imposition of a license upon retailers.

(4) The retention of the existing listener's license at 10/- and the contribution from that license revenue of the necessary funds during the experimental period.

67. Of these courses, the first has the merit of certainty and simplicity. It is arguable whether an additional charge would seriously diminish the number of existing listeners, or even materially abate the normal rate of growth. It would provide a definite and substantial fund to start and maintain a television service. Moreover, if the view which we have already expressed as to the future development of Television in association with sound broadcasting be well-founded, then there is considerable logical justification for treating it as an indispensable adjunct to sound broadcasting, and accordingly laying any increased consequent charge upon the broadcast license. We, however, see no adequate answer to the inevitable complaint from country listeners "Why should we pay an increased charge for a service which only London or some other centres can receive?"—nor even to the further complaint within such areas as are actually served, "Why should we people with restricted means pay this increased charge for a service which we cannot receive, because the necessary apparatus is at present so dear that it is only within reach of the well-off?" We do not, therefore recommend the adoption of this course.

68. The second course, the issue of a special license, has also considerable logical justification. It provides a means whereby those who use—and can afford

(Continued on next page)

TELEVISION REPORT— (Continued)

the apparatus necessary to use—this service may contribute towards the cost of it. We must, however, repeat at this juncture, that we are concerned with the means necessary to start this service—to try it out and to set it on its feet—and not with its permanent financing as part of the British Broadcasting Corporation's general system. From the former point of view the proposal, however logically justifiable, has the fatal practical defect that, if the license fee is placed high enough even to begin to cover the cost, it will strangle the growth of the infant service—while, if it is placed low enough to encourage growth, the revenue must for some time be purely derisory as a contribution towards the cost. We do not, therefore, recommend that at the start of the service there should be any extra license, but we think that the question should be reviewed when it is seen to what extent the use of the service has taken hold, and when the costs of further extensions of it can be more accurately estimated.

69. This conclusion naturally brought us to examine the question of the imposition of a license upon retailers of receiving sets, based upon the number of sets sold, not wholly — nor even mainly —with a view to the collection of funds, but as providing, in the absence of a special looker's license, the next best means of keeping a tally upon the number of users, and so measuring the extent to which the service is in demand. We regard the securing of such a tally as of great importance, and it is with some regret that we feel ourselves unable to recommend the imposition of a retailer's license on the sale of each set. Apart, however, from the administrative difficulties and the further difficulties which would inevitably arise later on when amateur constructors become sufficiently expert to construct home-made sets, the arguments which have been put before us, and which also moved the Sykes Committee (Cmd. 1951, paragraph 39), have convinced us that the adoption of such a course would be vexatious to traders and detrimental to the development of the service. We hope, however, that it may be possible to negotiate an arrangement with the trade, whereby periodical returns may be made of the total number of television sets sold in each town or district, since this would provide some measure of the growth of the demand.

70. We are therefore left with the conclusion that, during the first experimental period at least, the cost must be borne by the revenue from the existing 10/- license fee. The determination of the allocation of this contribution as between the British Broadcasting Corporation and the Treasury naturally presents a wide field of controversy, which we should have had to survey at length were we attempting to lay down a permanent basis. Since, however, as explained above, we are dealing only with a relatively limited sum, for a very limited period, we suggest that the best course would be for a reasonable share of the amount to be borne by each of the two parties—the Corporation and the Treasury—and we think that the matter should be considered and determined in this light by the Treasury after consultation with the Postmaster-General and the Corporation.

71. We may perhaps be permitted to anticipate three different types of objection which may be raised to the course proposed in the preceding paragraph. As regards any contingent contribution from the British Broadcasting Corporation, it may be argued that the new service will, at first, enure to the benefit of a limited number of people in a limited area, and that it is unfair that the general body of license holders should have any of their payments diverted from the ordinary programmes, to the improvement of which spare cash, if any, in the British Broadcasting Corporation's coffers should primarily be devoted. As regards a contingent Treasury contribution, it may be maintained that this is no time to cast any fresh burden upon the taxpayer in order to make an experiment of this nature. Further, it may be said that there is no hurry, and that the start of a service can well wait until the renewal of the British Broadcasting Corporation's Charter comes to be considered, when the financial question can be fully and finally settled. We respectfully submit in answer to the first contention, that, while we have already recognised its force (see paragraph 67) as regards any extra levy upon the general body of license holders, there can be no denying that the existing programmes represent amazingly good value for one-third of a penny per day and that, in these circumstances, the general body of listeners may not unreasonably be asked to help, at no extra cost to themselves, in a national experiment which, if successful, will ultimately enhance programme values for a large part of their members. As regards the second objection, we feel that the development of British Television, in addition to being of evident importance from the point of view of science and entertainment, and of potential importance from the angles of national defence, commerce and communications, will also directly assist British industries. Lastly, we are quite unable to agree that there is no urgency. On the contrary, our enquiries convince us that, apart altogether from any question of scientific prestige, any delay would be most regrettable; and we feel that, if our conclusions are accepted, it is most desirable that the minimum amount of time should be lost in giving effect to our recommendations.

Wireless Exchanges (Radio Relays)

72. We have considered the question, which has been raised in evidence, of the relaying of public television broadcast programmes by Wireless Exchanges. We see no reason why such a practice, if technically feasible, should not be allowed under the same conditions as are applicable in the case of sound broadcast programmes.

Private Experiments and Research

73. We hope that encouragement will continue to be given to all useful forms of experiment and research in Television by firms or private persons. It is true that much experimental work can be done by transmission from one room to another by wire without recourse to a radio link. In certain cases, however, the use of such a link is necessary; and we trust that the policy referred to in paragraph 20 will be maintained, and that adequate facilities for experimental work will continue to be given.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

74. Our principal conclusions and recommendations are summarised below:—

Type of Service

(1) No low definition system of Television should be adopted for a regular public service. (Paragraph 26.)

(2) High definition Television has reached such a standard of development as to justify the first steps being taken towards the early establishment of a public television service of this type. (Paragraph 33.)

Provision of Service

Operating Authority.

(3) In view of the close relationship between sound and television broadcasting, the Authority which is responsible for the former—at present the British Broadcasting Corporation—should also be entrusted with the latter. (Paragraph 39.)

Advisory Committee.

(4) The Postmaster-General should forthwith appoint an Advisory Committee to plan and guide the initiation and early development of the television service. (Paragraph 41.)

Ultra-short Wave Transmitting Stations.

(5) Technically, it is desirable that the ultra-short wave transmitting stations should be situated at elevated points and that the masts should be as high as practicable. (Paragraph 46.)

(6) It is probable that at least 50 per cent of the population could be served by 10 ultra-short wave transmitting stations in suitable locations. (Paragraph 47).

Patent Pool.

(7) It is desirable in the general interest that a comprehensive Television Patent Pool should eventually be formed. (Paragraphs 53 and 54.)

Initial Station.

(8) A start should be made by the establishment of a service in London with two television systems operating alternately from one transmitting station. (Paragraph 55.)

(9) Baird Television Limited, and Marconi-E.M.I. Television Company, Limited, should be given an opportunity to supply, subject to conditions, the necessary apparatus for the operation of their respective systems at the London station. (Paragraph 56.)

Subsequent Stations.

(10) In the light of the experience obtained with the first station, the Advisory Committee should proceed with the plan-

(Continued on next page)

TELEVISION REPORT— (Continued)

ning of additional stations—incorporating any improvements which come to light in the meantime—until a network of stations is gradually built up. (Paragraphs 57 and 58.)

(11) The aim should be to take advantage, as far as possible, of all improvements in the art of Television, and at the same time to work towards the ultimate attainment of a national standardised system of transmission. (Paragraph 59.)

Finance of Service

(12) The cost of providing and maintaining the London station up to the end of 1936 will, it is estimated, be £180,000. (Paragraph 63.)

(13) Revenue should not be raised by the sale of transmitter time for direct advertisements, but the permission given in the British Broadcasting Corporation's existing License to accept certain types of "sponsored programmes" should be applied also to the television service. (Paragraph 65.)

(14) Revenue should not be raised by an increase in the 10/- fee for the general broadcast listener's license. (Paragraph 67.)

(15) There should not be any separate license for television reception at the start of the service, but the question should be reviewed later in the light of experience. (Paragraph 68.)

(16) No retailer's license should be imposed on the sale of each television set, but arrangements should be made with the trade for the furnishing of periodical returns of the total number of such sets sold in each town or district. (Paragraph 69.)

(17) The cost of the television service—during the first experimental period at least—should be borne by the revenue from the existing 10/- license fee. (Paragraph 70.)

APPENDIX I

List of Witnesses and Organisations Represented

Messrs. Baird Television Ltd.: Major A. G. Church, D.S.O., M.C.; Mr. A. G. D. West, M.A., B.Sc.

Messrs. A. C. Cossor, Ltd.: Mr. W. R. Bullimore, Mr. J. H. Thomas, M.I.E.E.; Mr. L. H. Bedford, M.A., B.Sc.

Messrs. Electric and Musical Industries Ltd., and Messrs. Marconi-E.M.I. Television Co. Ltd.: Mr. Alfred Clark, Mr. I. Shoenberg, Mr. C. S. Agate, Mr. A. D. Blumlein, Mr. C. O. Browne, Mr. G. E. Condliffe, Mr. N. E. Davis, Mr. S. J. Preston.

Messrs. Ferranti Ltd.: Mr. V. Z. de Ferranti, Mr. A. Hall.

Messrs. General Electric Co., Ltd.: Mr. C. C. Paterson, O.B.E., M.I.C.E., M.I.E.E., Mr. T. W. Heather, M.C.

Messrs. Plew Television Ltd.: Dr. C. G. Lemon.

Messrs. Scophony Ltd.: Mr. S. Sagall, Mr. G. W. Walton, Mr. G. Wikkenhauser.

British Broadcasting Corporation: Sir J. C. W. Reith, G.B.E.

Newspaper Proprietors' Association: Col. the Hon. F. E. Lawson, Sir Thomas McAra, J.P., Mr. A. J. Polley, Mr. F. W. Jarvis, Mr. E. J. Robertson

Radio Manufacturers' Association: Mr. W. W. Burnham, Mr. R. Milward Ellis.

"Popular Wireless" and "The Wireless Constructor": Dr. J. H. T. Roberts, F.Inst.P.

The Television Society: Dr. C. Tierney, F.R.M.S., Mr. Ronald R. Poole, B.Sc., Mr. W. G. Mitchell, B.Sc.

And Sir William Jarratt, Mr. W. Barrie Abbott, B.L., Mr. J. Guibiansky, Mr. A. B. Storrar, Mr. R. W. Hughes.

Radio Research Board — 7th Annual Report

FOR THE YEAR ENDED 30th JUNE, 1935

The Radio Research Board of the Council is constituted as follows:—Professor J. P. V. Madsen (University of Sydney), Chairman; Mr. H. P. Brown (Director-General, Postmaster-General's Department); Electrical Commander F. G. Cresswell (Department of Defence); and Professor T. H. Laby, F.R.S. (University of Melbourne).

1. General.

STUDIES of fading and of the behaviour of the ionosphere from the point of view of its reflection of radio waves and investigations concerning atmospherics have been continued. The last year's operations constitute the second year's activities of the three-year period towards the cost of which the Postmaster-General's Department and the Council for Scientific and Industrial Research are contributing on a three to one basis.

Further changes in the staff of the Board have taken place. Early in the period under review, Dr. G. Builder resigned in order to take up an industrial appointment, and Dr. A. L. Green has also notified the Board that he intends to resign in September, 1935, for a similar reason. The Board welcomes this indication of the way its staff is regarded by the industry. Following the resignation of Dr. Builder, Mr. J. H. Piddington, M.Sc., is now engaged on the Board's work in a full-time capacity in Sydney, and as from the 1st July, 1935, Mr. R. W. Boswell, M.Sc., took up a similar appointment at Melbourne.

2. Work on Fading and the Ionosphere.

The investigation of these problems is still centred in New South Wales. As formerly, the object of this work is to investigate the fading of wireless signals. Since the ionosphere is eventually responsible for such fading, it follows naturally that a large part of the programme has been devoted to the examination of its structure and to its diurnal and seasonal fluctuations.

In general, the same points of attack on these problems have been followed as in previous years. During the past year, however, new methods of attack have been developed, while considerable advances in technique have been effected. This year has seen the adaptation of the cathode-ray tube to most of the methods of investigation followed. In particular, it has been found possible to adapt the method of height measurement using high-speed frequency changes outlined in previous reports. This has had the advantage of rendering much of the work independent of the rather cumbersome and delicate Einthoven galvanometer.

During the year, advantage has been taken of the co-operation of Dr. O. O. Pulley, Walter and Eliza Hall Fellow, in the University of Sydney, in order to bring into operation the pulse method of ionospheric investigation. It is anticipated that the application of this method to some of the problems under investigation will greatly facilitate the interpretation of the results in cases where more than one downcoming wave is being received. Automatic height recording by the pulse method has now been in operation for some weeks, and measurements of the ionisation densities in the various layers of the ionosphere have also been made using this method.

In connexion with the work on the theory of the interaction of radio waves mentioned in the last report, advantage has been taken of the visit to Europe of Associate-Professor V. A. Bailey (University of Sydney) in order to examine the latest observations made on this subject. It has been found that the measurements of Drs. Van der Pol and Van der Mark are in very good agreement with the theory previously outlined, and it has now been possible to obtain therefrom a good estimate of the air pressure in the E region of the ionosphere.

(Continued on next page)

RADIO RESEARCH BOARD ANNUAL REPORT—(Continued)

The results obtained with the 3-aerial technique, mentioned in the previous report, have now been analyzed and published. Adequate confirmation has been obtained of the conclusions (1) previously reached from a study of natural fading that there is normally present a considerable degree of lateral deviation of the downcoming rays when reception is at a point not too far distant from the emitting station. The 3-aerial apparatus, however, enables measurements to be made of the polarization of the downcoming ray, in addition to its direction of arrival, and it has been found possible, in one specific case, to show that a correlation exists between these two characteristics of the downcoming ray.

This conclusion, which awaits confirmation by further experiments, is nevertheless in good agreement with the theory previously proposed (2), on the influence of the earth's magnetic field on the limiting polarization of the downcoming ray. According to this hypothesis, the measured polarization of the sky ray at the receiver is that acquired by the ray as it leaves the ionosphere. This limiting polarization is, in turn, determined solely by the frequency of the wave relative to the "critical" frequency of the ionosphere and by the direction of propagation of the ray with respect to the lines of force of the earth's field. The occurrence of lateral deviation of the sky ray necessarily entails marked variations in the angle between the downcoming ray and the direction of the earth's field, so that, on theoretical grounds, it should be expected that there is a close connexion between the measured polarization and the direction of arrival of the ray at the receiver.

In the case of symmetrical propagation of the sky ray from Sydney to Liverpool, New South Wales, the angle between the direction of the downcoming ray reflected from the "F" region and the lines of force of the earth's field is approximately 149 degrees. Corresponding to the angles of lateral deviation and of incidence which have been measured by the 3-systems apparatus, this critical angle must have undergone variations between the limits 146 degrees and 154 degrees. Calculations have been made of the degree of ellipticity to be expected in the polarization of the downcoming ray under these conditions, and it has been found that the measured polarization characteristics agree with the theoretical predictions.

This result is of some importance, as it lends support to the use of the theory of limiting polarization on other occasions. It will be recalled that the earlier measurements of circular polarization with a right-handed sense of rotation (3), at Jervis Bay, are also in agreement with the theory, and that more recently an extension of the analysis to cover the propagation of very long waves (4), has resulted in an explanation being put forward of the rotation of the plane of polarization found to occur at sunrise and sunset.

It has been known for some time that Appleton's frequency-change device is somewhat difficult to apply to experimental investigations using very short waves, and it has been suggested (5) that similar results might be obtained if the carrier is modulated and the required frequency-changes imposed on the audio-frequency modulation.

Some preliminary work with the modulation-frequency-change (m.f.c.) technique has been carried out in England and repeated in Australia, and it is clear that the m.f.c. apparatus, as originally designed, suffers several disadvantages when compared with carrier-frequency change (c.f.c.). In general, the amplitude of the artificial fading fluctuations is very small unless subsidiary apparatus is introduced, such as the two square-law detectors employed by Appleton, so that, unless this addition is made, the records are difficult to decipher. Unfortunately, repeated rectification has the effect of greatly enhancing the disturbances due to atmospherics and interference from adjacent transmissions, while, in addition, the recent work has disclosed that the amplitude of the artificial fringes depends in a complicated way both on the intensities and on the relative phases of the ground and sky rays. In the c.f.c. experiments, the relative intensity of the ground and sky rays alone determines the fringe amplitude.

A new m.f.c. technique (6) has therefore been devised which does not require the use of double detection, and in which the fringe records are more simply related to the characteristics of the downcoming ray. In this case, suppression of the carrier is realized at the transmitter instead of the receiver, and only the modulation sidebands are emitted. Since it is not necessary to insert the carrier again at the receiver, it is possible to use the same apparatus there as for the c.f.c. technique.

A number of comparisons have been made of the c.f.c. and the two m.f.c. techniques in ionospheric measurements, and the following conclusions have emerged:—

(i) Both the m.f.c. and the c.f.c. devices measure the same quantity, namely, the equivalent path of the sky ray.

(ii) The amplitude of the fringes produced by a frequency-change in a m.f.c. experiment is much less than in c.f.c., unless subsidiary apparatus is introduced, such as the two square-law detectors employed by Appleton, or the carrier-suppression technique recently developed.

(iii) With either of these modifications, the interference fringe amplitude is occasionally as great as would have been obtained with the c.f.c. technique. Since, however, the fringe amplitude depends on the relative carrier phases of the ground and sky rays, as well as their relative intensities, the fringe amplitude is, on the whole, less when using m.f.c. technique.

(iv) The phase of the beginning of a set of m.f.c. fringes is independent of the momentary state of the natural fading, of the polarization of the sky ray, and of the orientation of the receiving loop aerial. M.f.c. technique is therefore not applicable to those experimental methods, previously developed for c.f.c. work, which depend for their success on the variation of fringe phases with the state of polarization, lateral deviation, and optical path of the sky ray.

(v) It is found that the system using carrier-suppression at the transmitter is the more satisfactory technique for ionospheric investigations, both in regard to apparatus and to the interpretation of records.

The investigations of the Board into the fundamentals of ionospheric propagation have on several occasions suggested methods by which a certain measure of control of wireless signal variations might be effected. The experiments with modulation-frequency-change technique have proved to be closely allied to a known process of controlling fading in wireless telegraphy (7) in which signals are emitted simultaneously on a number of adjacent frequencies. Since it is known that fading variations are different in the case of signals on neighbouring frequencies (8), it follows that a proper choice of the frequencies should result in a balancing of the fading effects in the several channels, and a consequent smoothing of the combined signals.

The most obvious way of sending signals on different frequencies is to modulate the carrier wave at an audible frequency, and thus to emit three waves, carrier and two sidebands. Investigations have shown, however, that it is not possible to obtain perfect control of fading with the simple modulation. The optimum conditions are realised when the depth of modulation is 100 per cent., and when the frequency of modulation is critically adjusted to correspond with the path-difference between the ground and sky rays. Under these conditions, the depth of fading can be reduced to one-third of normal. On the other hand, it has been found that the newly devised suppressed-carrier technique for m.f.c. experiments can easily be adapted to give perfect control of fading. In one instance when the depth of fading was found to be 80 per cent., the addition of control modulation at a frequency of 380 c.p.s. and the suppression of the carrier were found to reduce the fading fluctuations to less than 2 per cent.

It is clear from the theory that the method of control depends on a precise adjustment of the modulation frequency to the path-difference between the interfering rays. It has also been found that the odd-numbered harmonics of the fundamental control frequency are equally effective, but that the even harmonics leave the fading fluctuations undisturbed. It follows that, in certain special cases of the reception of more than one sky ray in addition to the ground ray, it should be possible to suppress one of the sky rays, and to examine the other by experimental methods which are already known. This should facilitate the interpretation of frequency-change records in complex cases.

(Continued on next page)

RADIO RESEARCH BOARD ANNUAL REPORT—(Continued)

It would appear that the modulation method of controlling fading has a wider field of application than that mentioned above, that is, as an adjunct to ionospheric research. In long-distance communication, where sky rays alone are receivable, there may be occasions during which the fading fluctuations are chiefly due to phase interference between two main sky rays (9). When this is so, it should be possible to smooth out the phase fading by a proper adjustment of the modulation frequency to the path-difference between the two main interfering rays.

Experiments have been made in Melbourne and Perth, distant respectively 700 and 3,300 kilometres from the transmitter in Sydney, and it has been found that a considerable improvement in constancy of signal can be obtained with the suppressed-carrier modulation. The communication circuits were first tested with frequency-change signals, and, from the appearance of the photographic records of the received waves, it was immediately obvious that over long periods of time the bulk of the energy was being carried by two main sky rays. In Melbourne, the path-difference between the two main sky rays was approximately 150 kilometres during the afternoon, and 400 kilometres after sunset, there being, however, occasional reversions to the lesser path-difference during the night, and further periods when three sky rays of comparable intensity were being received. Under these circumstances, it was found that a modulation frequency of 200 c.p.s. gave the best results at night over long periods.

The records obtained in Perth were in all cases much more complicated, and it was realised that multiply-reflected rays of high order were present. Nevertheless, after examining a large number of frequency-change test records, it was possible to select a path-difference of about 500 kilometres as representative of the night conditions. The corresponding modulation of frequency 150 c.p.s. was found to effect a considerable influence on the deep troughs of fading. An attempt to allow for a third sky ray resulted in the use of two modulations simultaneously, 50 and 150 c.p.s. A further improvement in constancy of signal was obtained, but it is obvious that a limit to the degree of fading control which can be achieved in long-distance communication is set by the temporal variations in intensity of individual rays.

The application of this system of fading control to telephonic circuits is very much complicated by the presence of the undesired control modulation. So far, no experiments have been made with a programme modulation in addition to the control, but it is interesting to notice that theoretical considerations point to at least one way of effecting the desired result. It has already been mentioned that the odd-numbered harmonics of the fundamental control frequency are also available for the purposes of correction. Experiments with these harmonics up to the 13th have shown that, in practice, it is somewhat difficult to select the modulation frequency with sufficient precision. However, in the case mentioned, it was possible to obtain good fading control when the corrective modulation was actually supersonic, so that it would appear to be possible to add the programme, consisting of audible notes, without interference from the control modulation.

It is perhaps of interest to recall that considerable difficulty was experienced in some early short-wave experiments conducted in Sydney, the transmissions being given from H.M.A.S. Platypus (10). Frequency-change signals were sent from the ship, but in no cases were sky rays observed. At that time, it was assumed that propagation conditions in the latitude of Sydney were very different from those previously experienced in England, but it now appears that the absence of sky ray interference in those experiments was due to a very effective, but unintentional, control of fading, produced by deep modulation of the signals due to the unsmoothed anode supply at the transmitter.

Special attention has been given to the development of stable oscillators. A dynatron oscillator has been built (11) employing temperature compensation in the coils and condenser. This has proved entirely satisfactory, and several beat frequency oscillators have been built using such temperature compensation.

Considerable attention has also been given to methods of obtaining frequency modulation using resistance-tuned oscillators. In this way, it has been found possible to obtain pure frequency modulation of any desired waveform by purely electrical means.

3. Work on Atmospherics.

In the following a resume is given of the information gained from the atmospherics observations made under the administration of the Board.

1. Origin of Atmospherics.

Considerable evidence has been adduced in favour of the hypothesis, due originally to Watson Watt, that all atmospherics originate in lightning flashes. This evidence has been confirmed and considerably extended by physicists of the Australian Radio Research Board, from observations taken during a voyage from England to Australia and detailed observations made in Australia relating to the greater part of the continent, the Tasman Sea, and adjacent parts of the Southern Ocean. It has been found ((12) p. 43, (13) p. 28) in the first place, that the points of origin of atmospherics, located by radio direction-finders, always lie within a region which subsequent meteorological reports revealed either that a thunderstorm had occurred or that the conditions made the occurrence of a thunderstorm probable, although none was observed owing to the sparsity of observing stations. This is, however, only a small part of the evidence, for it has been found that single atmospherics, on the one hand, and "sources of atmospherics"* on the other, have exactly the properties to be anticipated from the thunderstorm hypothesis.

2. Properties of an Atmospheric.

(i) Wave-form.—Appleton, Watt, and Herd concluded from their observations that an atmospheric consists of an aperiodic or "quasi-periodic" pulse lasting a few milliseconds (sometimes with shorter period ripples superposed). Australian observations (14) showed that the total duration of an atmospheric is usually between 0.2 and 0.5 sec., each atmospheric consisting of a succession of the order of 10 pulses of the type found by Appleton, Watt, and Herd, clear intervals separating the pulses. This corresponds exactly to the temporal structure of a lightning flash as deduced from the moving picture photographs of Walter and others. Atmospherics from sea sources have a rather longer average duration. This and other exceptional characteristics of thunderstorms over the sea are referred to later.

(ii) Polarization.—Atmospherics are frequently observed to be elliptically polarized, particularly at night. In day time, atmospherics from close sources only show such polarization (15). This property has been used to deduce the mean height of the point of origin of the atmospheric, and a value comparable with the mean height of a lightning flash, as directly observed, is obtained.

(iii) Equivalent Power of a Flash.—The term "equivalent power" denotes the power of a station emitting a steady signal which gives the same deflection, on an oscillograph connected to the output of a specified receiver, as the mean deflection produced by atmospherics from a thunderstorm situated immediately over the station. The equivalent power is a function of the frequency to which the receiver is tuned and its bandwidth of reception.

From the study of intensities of atmospherics from lightning at known distances, it has been found that the equivalent power of a flash (i) is sensibly independent of the geographical area in which the thunderstorm occurs, and has a value of about 2 kw. for a receiver tuned to 1,000 kc./s., and with a bandwidth of 20 kc./s., and (ii) is inversely proportional to the square of the frequency within the range 10 kc./s.-1,000 kc./s. (the band-width being maintained constant).

It is interesting to use this result to estimate the "total peak radiated power" of the flash, i.e. the maximum rate of dissipation of energy in the form of electro-magnetic radiation in the "radio" portion of the spectrum. It is necessary to make some assumption as to what happens at the lower frequencies. The most tractable assumption is that the power falls to zero at a critical frequency V_o, which we shall take as 300 c/s., this

(Continued on next page)

* A "source" of atmospherics is a term introduced by Munro and Huxley to denote a well-defined area over which atmospherics arise, which is of linear dimensions of about 100 km. It is a thunderstorm, or a group of thunderstorms which behave as one entity.

RADIO RESEARCH BOARD ANNUAL REPORT— (Continued)

being the reciprocal of the period of a single pulse as found by Appleton, Watt, and Herd. With this assumption, integration leads to a value of 10^5 kw. for the total peak radiated power. The peak current in a lightning flash has been variously estimated. If the value of 3×10^5 amps. is assumed, the effective radiation resistance comes out at 10^{-3} ohm.

The range of intensities* of individual atmospherics coming from a single source has been studied ((12) p. 34, (13) pp. 22, 41). It is found that the distribution of logarithms of the intensities is a normal probability distribution, and that 90 per cent. of the atmospherics usually lie within a range of 4 to 1. The range varies slightly with different sources, and appears to be slightly less for 1,000 kc/s. receiver frequency than for 100 kc/s. This relatively small range has led to considerable simplification in the determinations of the mean intensities of sources, i.e., the mean intensity of atmospherics from a source, which have been used in the deduction of equivalent power.

3. Properties of Sources.

(i) Mean Intensities.—A map, on which points at which lightning flashes give the same mean intensity at the observing station are connected to form "iso-intensity" contours, can be used to determine by interpolation the portion of a source from single station observations, the procedure being somewhat analogous to that used by astronomers in the case of the Cepheid variable stars. Owing to the relatively small range of individual intensities, a few intensity observations suffice for each source.

(ii) Extent.—From carefully selected directional observations, the average extent has been found to be about 10^4 sq. km. ((13) p. 51). Meteorological observers give the area of a thunderstorm as of the order 100 sq. km., but cases are reported of simultaneous occurrence of thunderstorms over an area of the order of 10^4 sq. km. From the number of sources observed in a year's observation in each of several areas and the isobront map for these areas, an independent estimate of the extent of the source can be obtained. The values obtained are of the order of 10^5 sq. km. The discrepancy is probably due to the migration of thunderstorms to which reference will be made later.

(iii) Activity and Duration.—The average activity of sources ranges from less than 10 flashes per minute for sources in Tasmania, to over 40 for north-west Queensland. The mean durations of land sources are about 6 hours for all latitudes, but for sea sources the mean is about 10 hours, and some sea sources persist for days. In agreement with direct observations on thunderstorms, the average mid-point in the life of a source is about 4 p.m.

(iv) Movement.—As mentioned previously, sources are frequently of a migratory type, moving with velocities of the order 50 km/hr. ((13) p. 51). This point will be considered later in more detail.

4. Thunderstorm Areas of the World.

Some information regarding the distribution of world centres of atmospherics was derived from directional observations by Munro and Huxley during a voyage from England to Australia via Suez ((12) p. 19), and this has been confirmed and extended by the records of the atmospheric recorder at Canberra. The most prolific world centre is situated in tropical Africa, the centres next in importance being in the Malay Archipelago and North Australia. Brooke's isobront map, based on reports of meteorological observers, confirm these results.

5. Distribution in Australia.

Some light on the detailed distribution of thunderstorms in eastern Australia has been thrown by atmospherics directional observations from Canberra, Melbourne, and Toowoomba. The correspondence obtained with the isobronts deduced by Barkley* from 10 years' meteorological observations is as close as would be expected in view of the limited period of the atmospherics observations.

6. Interference with Broadcast Reception.‡

Preliminary estimates of the degree of interference with broadcast reception under various circumstances have been made, based on a new definition of degree of interference, viz., the average annual period for which a broadcast listener at a specified place, listening to a signal of specified amplitude, receives more than a specified number of "interfering" atmospherics per minute. Previous estimates of interference have always been based on noise level conception; these have been shown to be somewhat misleading.

The present estimates are based on the provisional conclusion from experiments that an atmospheric interferes seriously with a broadcast programme when its "peak field intensity" is twice the field strength of the broadcast signal. The equivalent power of a lightning flash (for a specified receiver) being known, and the attenuation of the radiation being obtainable from published data, then for a specified locality, with a broadcast signal of specified field strength and wavelength, a "region of interference" can be determined. Lightning flashes within this region will, on the average, give interfering atmospherics, while flashes outside this region will not. Owing, however, to the appreciable range of radiated powers for a given thunderstorm, thunderstorms from without this region will contribute somewhat to the interference, and allowance must be made on this account.

From the distribution of thunderstorms obtained by isobront maps and atmospherics source data, and the activity and durations of these sources, estimates of degree of interference can then be made. Typical results are for (a) Victoria, with signal field strength 0.5 mV/m., wavelength 400 metres, there are 95 hours in the year for which more than 3 interfering atmospherics per minute will occur; (b) for south-east Queensland the corresponding figure is 250 hours. In general, for high signal amplitudes, the degree of interference contours, correspond closely with the isobronts, while for very low signal amplitudes they correspond nearly to parallels of latitude.

7. Meteorological Aspects.†

As mentioned previously, some sources, particularly those south of latitude 35°, show clear evidence of motion. Northern land sources, on the other hand, often appear to be stationary. Meteorologists are accustomed to classify thunderstorms into two types, heat and frontal, the first of which originate from local surface heating, while the second originate in or near a front or frontal zone separating two different air masses. Such fronts are known usually to move with velocities of the order 30-50 km/hr. (although almost stationary fronts are not unknown). A study of the meteorological conditions associated with the sources of atmospherics have enabled many sources to be classified as heat or frontal—in particular, migratory sources all appear to be associated with fronts (as would be expected). The proportion of heat sources increases as the latitude decreases; the thunderstorms of north-west Queensland seem to be mostly heat ones. This conclusion is confirmed by an examination of meteorological observers' thunderstorm reports.

In the region below 35° latitude, in late spring and early summer, nearly all sources, if not all, appear to be associated to some degree with fronts, and are consequently of the migratory type, moving roughly from west to east from the Bight to the Tasman Sea. This is interesting in view of the fact that the regularity of movement of fronts and weather phenomena generally in this region constitutes the basis of weather forecasting for Victoria and Tasmania. The area in this region which is effectively kept under observation by a cathode ray direction-finder is very large, amounting as it does to some millions of square miles.

8. Sea Sources.

The atmospherics observations have shown that the number of sea sources per annum for each 5° "square" (i.e., of latitude and longitude) is comparable with the number of land sources for a square in the same latitude. For the northern part of the Tasman Sea there are rather fewer sea sources than on land, but for the portion of it east of Victoria there is an excess of sea sources.

For obvious reasons sea thunderstorms have been relatively little studied, and it is interesting to summarise the information concerning them given by the atmospherics observations.

(Continued on next page)

* The intensity is measured by the oscillograph deflection. with a receiver sensitivity adjusted so that a single-frequency test signal gives a constant deflection.

* Of the Commonwealth Meteorological Bureau.

‡ A summary of Ref. 13. Paper 2. (pp. 43-60).

† The data referred to in this section are mostly unpublished.

RADIO RESEARCH BOARD ANNUAL REPORT— (Continued)

The durations of atmospherics from sea sources are almost invariably long, usually of the order of a second; in fact, "sea" atmospherics can usually be distinguished from "land" by this characteristic. As mentioned previously, the average total life of a sea source is also of greater duration than of land. The hours of commencement and ending, and also the hour of greatest activity, are less regular than in the case of land sources. A sea source may continue for days with very slight changes in position, extent, and activity—an example of a sea source persisting over a week has been obtained.

The uniformity of the sea's surface and the comparative independence of the sources on the degree of isolation suggests that sea sources would be almost all of the frontal type. While the meteorological observations tend to confirm this in many cases, the stationary position of many long-lived sources is difficult to reconcile with this usual behaviour of fronts.

9. Aviation.

The ability of cathode ray direction-finders to register rapidly the bearings of thunderstorms may have an application to aviation, particularly for night-flying. The movement of sources has been followed in detail on the occasions of two notable flights; in one case an active thunderstorm was situated near, but not on, the route, and in the other case a thunderstorm nearly led to disaster.

4. Publications.

The following publications have been issued during the past year as a result of the Board's investigations:—

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

1. **Bulletin** 87.—"Radio Research Board: Report No. 6." (1) "On the Rotation of the Plane of Polarisation of Long Radio Waves," by A. L. Green, M.Sc., Ph.D., and G. Builder, Ph.D. (2) "A Field Intensity Set," by A. L. Green, M.Sc., Ph.D., and H. B. Wood, B.Sc., B.E. (3) "Measurements of Attenuation, Fading, and Interference in South-Eastern Australia, at 200 Kilocycles per Second," by G. H. Munro, M.Sc., and A. L. Green, M.Sc., Ph.D. (4) "A Frequency Recorder," by D. F. Martyn, Ph.D., A.R.C.Sc., and H. B. Wood, B.Sc., B.E.

2. **Bulletin** 88—"Radio Research Board; Report No. 7." (1) The Propagation of Medium Radio Waves in the Ionosphere," by D. F. Martyn, Ph.D., A.R.C.Sc., (2) "The Characteristics of Downcoming Radio Waves," by D. F. Martyn, Ph.D., and A. L. Green, Ph.D. (3) "The Influence of Electric Waves on the Ionosphere," by V. A. Bailey, M.A., D.Phil., and D. F. Martyn, Ph.D. (4) Long Distance Observations of Radio Waves of Medium Frequencies," by D. F. Martyn, Ph.D., R. O. Cherry, M.Sc., and A. L. Green, Ph.D.

3. **Bulletin** 89.—"Radio Research Board: Report No. 8." (1) "Simultaneous Observations of Atmospherics with Cathode-Ray Direction-Finders at Toowoomba and Canberra," by G. H. Munro, M.Sc., and H. C. Webster, M.Sc., Ph.D., and A. J. Higgs, B.Sc. (2) "Atmospheric Interference with Reception," by W. J. Wark, M.Sc.

(b) Other Publications.

1. "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. **Phil. Mag., 19:** 376, 1935.

2. "The Interaction of Radio Waves," by V. A. Bailey, M.A., D.Phil., and D. F. Martyn, Ph.D., A.R.C.Sc. **Wireless Engineer,** March, 1935.

3. "The Interaction of Radio Waves," by V. A. Bailey, M.A., D.Phil., and D. F. Martin, Ph.D., A.R.C.S. **Nature, 135:** 585, 1935.

4. "A Temperature Compensated Dynatron Oscillator of High Frequency Stability," by J. H. Piddington, B.Sc., B.E., **J. Inst. Eng. Aust., 6:** 1934.

5. "The Amplification of Transients," by G. Builder, Ph.D. **Wireless Engineer, 12:** 246, 1935.

6. "A Graphical Solution of Simple Parallel-Tuned Circuits," by G. Builder, Ph.D. **J. Inst. Eng. Aust. 6:** 1934.

7. "A Multi-Range Push-Pull Thermionic Voltmeter," by G. Builder, Ph.D. **J. Inst. Eng. Aust., 6:** 1934.

8. "The Amplification of Programme Transients," by G. Builder. **J. Inst. Eng. Aust. 6:** 1934.

5. 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 towards the end 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.

6. References.

1. Cherry and Martyn. "Radio Research Board Report 4," Paper 2, Coun. Sci. Ind. Res. (Aust.), Bulletin 63, 1932.
2. Baker and Green. "Radio Research Board Report No. 3," Coun. Sci. Ind. Res. (Aust.), Bulletin 60, 1932.
3. Green. "Radio Research Board Report No. 2," Paper 1, Coun. Sci. Ind. Res. (Aust.), Bulletin 59, 1932.
4. Green and Builder. "Radio Research Board Report No. 6," Paper 1, Coun. Sci. Ind. Res. (Aust.), Bulletin 87, 1935.
5. Appleton. **Proc. Phys. Soc. 42:** 321, 1930.
6. Builder and Green. "Modulation-frequency-change Technique for Ionospheric Measurements." In Press.
7. T. L. Eckersley. **J. Inst. Elec. Eng. 57:** 992, 1929.
8. Potter. **Proc. Inst. Rad. Eng. 18:** 581, 1930.
9. Martyn, Cherry and Green. "Radio Research Board Report No. 7," Paper 4, Coun. Sci. Ind. Res. (Aust.), Bulletin 88, 1935.
10. Radio Research Board Second Annual Report. **J. Coun. Sci. Ind. Res. 3:** 156, 1930.
11. J. H. Piddington. **J. Inst. Eng. Aust. 7:** 53, 1935.
12. "Radio Research Board Report No. 5," Coun. Sci. Ind. Res. (Aust.), Bulletin No. 68.
13. "Radio Research Board Report No. 8," Coun. Sci. Ind. Res. (Aust.), Bulletin No. 89.
14. **Nature. 134:** 880, 1934.
15. "Radio Research Board Report No. 10," Coun. Sci. Ind. Res. (Aust.), Bulletin No. ? (In Press.)

A.B.C. 3rd ANNUAL REPORT—

(Continued from page 27)

created has been filled from within the Commission's service by the appointment, as from 1st November, 1935, of Mr. Charles J. A. Moses, who previously held the position of Federal Liaison Officer).

PERSONNEL OF COMMISSION:

Under the terms of their original appointment, the period of office of three of the Commissioners, Dr. R. S. Wallace, Hon. R. B. Orchard, C.B.E., and Mrs. Claude Couchman, expired on 25th May, 1935. Mr. Orchard and Mrs. Couchman were reappointed for a further term of three years. Dr. Wallace did not seek reappointment, and to the vacancy so created Mr. J. W. Kitto, O.B.E., was appointed for three years. The Commission takes this opportunity of expressing its indebtedness to Dr. Wallace for the valuable contribution made by him to the cause of broadcasting, and in particular to the solution of the Commission's problems during his period of office.

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

Important Australian Statistics

Sub-Section 1.—Population and Vital Statistics

AREA AND POPULATION.

States and Territories	Area Square Miles	Population Estimated 30th September, 1935 Males	Females	Persons	Population Capital Cities, 31st Dec., 1934
N.S.W.	309,432	1,340,730	1,309,050	2,649,780	1,249,040
Victoria	87,884	910,201	929,515	1,839,786	1,000,000
Queensland	670,500	508,201	461,907	970,108	304,930
South Australia	380,070	292,908	292,227	585,135	313,778
West. Australia	975,920	236,998	209,742	446,740	208,448
Tasmania	26,215	115,796	112,768	228,564	60,500
Northern Territory	523,620	3,542	1,647	5,189	1,600
F.C.T.	940	5,110	4,358	9,468	7,500
Total	2,974,581	3,413,486	3,321,284	6,734,770	3,145,796

ESTIMATED INCREASE OF POPULATION.

Adjusted in accordance with the revised results of the Census of the 30th June, 1933.

States and Territories	1932	1933	1934	First Nine Months of— 1934	1935
New South Wales	25,432	21,796	22,684	13,742	13,577
Victoria	9,821	11,096	13,011	9,978	2,296
Queensland	9,391	9,946	10,466	10,421	10,611
South Australia	2,216	3,386	1,617	823	841
West. Australia	2,641	3,948	2,346	2,006	4,190
Tasmania	2,143	1,502	-663	-4,302	-2,883
Northern Territory	-61	32	126	213	245
F.C.T.	-357	689	-61	-74	276
Total	51,226	52,395	49,526	32,807	29,093

NOTE.—Minus sign (-) denotes decrease.

BIRTHS, DEATHS AND MARRIAGES.

Births—Number.

States and Territories	1932	1933	1934	First Nine Months of— 1934	1935
New South Wales	44,895	44,195	43,335	32,552	33,291
Victoria	27,464	28,392	27,828	20,892	20,619
Queensland	17,367	17,150	17,360	12,995	13,319
South Australia	8,521	8,900	8,459	6,368	6,094
West. Australia	7,965	7,874	7,801	5,895	6,060
Tasmania	4,491	4,553	4,470	3,377	3,261
Northern Territory	79	74	88	64	65
F.C.T.	151	131	134	100	107
Total	110,933	111,269	109,475	82,243	82,816

Deaths—Number.

New South Wales	21,343	22,322	23,474	17,783	18,801
Victoria	16,805	17,456	18,648	13,960	14,062
Queensland	7,813	8,354	8,192	6,153	6,806
South Australia	4,957	4,904	5,403	4,136	3,931
West. Australia	3,715	3,790	4,076	3,119	3,111
Tasmania	2,022	2,192	2,345	1,717	1,814
Northern Territory	73	61	60	46	54
F.C.T.	29	38	31	24	33
Total	56,757	59,117	62,229	46,938	48,612

Marriages—Number.

New South Wales	17,362	18,399	20,210	14,559	16,231
Victoria	11,744	12,668	13,862	10,139	11,018
Queensland	6,415	6,471	7,635	5,536	6,007
South Australia	3,636	3,973	4,310	3,074	3,441
West. Australia	2,904	3,374	3,682	2,712	2,929
Tasmania	1,508	1,629	1,678	1,216	1,329
Northern Territory	22	28	30	16	32
F.C.T.	43	53	58	40	52
Total	43,634	46,595	51,465	37,292	41,039

Principal Crops—Australia.

AREA UNDER CROPS.

	1931-32	1932-33	1933-34
	Acres	Acres	Acres
Grain—			
Wheat	14,741,313	15,765,504	14,901,271
Oats	1,085,489	1,027,262	1,373,921
Maize	269,448	228,260	303,761
Hay	2,634,680	2,727,408	3,080,680
Sugar Cane	325,737	307,281	328,839
Total area under all crops	21,166,900	22,408,489	22,454,327

Total Production.

	1931-32	1932-33	1933-34
	Bushels	Bushels	Bushels
Grain—			
Wheat	190,612,188	213,926,981	177,337,803
Oats	15,194,680	16,159,628	16,922,031
Maize	7,062,383	5,066,321	7,494,080
Hay	3,167,459	3,571,047	3,582,748
Sugar Cane	4,213,453	3,703,188	4,898,040
Cane Sugar	603,735	532,594	666,145

Wool (as in the Grease) Produced.

	Season Ended 30th June 1932	1933	1934
	lb.	lb.	lb.
N.S.W. (a)	503,275,416	533,710,404	486,152,493
Victoria	159,721,916	170,807,900	161,146,436
Queensland	184,716,462	185,833,546	169,989,516
South Australia	67,021,312	75,727,946	79,288,903
West Australia (b)	77,985,741	81,307,832	85,118,808
Tasmania	14,700,000	15,200,000	14,200,000
Northern Territory	35,000	35,000	35,000
Total	1,007,455,847	1,062,622,628	995,931,156

(a) Including F.C.T.; (b) For year ended previous 31st December.
NOTE.—The production of wool for the season ending 30th June, 1935, is estimated at 1,031,000,000 lb.

Estimated Gross Value of Production.

	1930-31 £'000	1931-32 £'000	1932-33 £'000	1933-34 £'000
Agricultural	70,500	74,489	75,562	70,732
Pastoral	69,499	61,540	64,851	94,924
Dairy, Poultry and Bee Farming	43,067	41,478	39,622	40,306
Forestry and Fisheries	8,313	7,703	8,470	9,805
Mining	15,361	13,352	15,583	17,608
Manufacturing (a)	112,966	106,456	114,136	121,757
Total	319,706	305,018	318,224	354,932

(a) These amounts differ from those given in the following tables, owing to the inclusion in those tables of certain products which in this table are included with Dairy Farming and Forestry.

MANUFACTURING INDUSTRIES.

Percentage of Each Item of Outlay on Value of Total Output, 1933-34.

Particulars	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Total
	%	%	%	%	%	%	%
Wages (a)	18.85	21.06	16.48	20.14	21.38	21.83	19.52
Fuel & Light	3.84	2.83	2.29	3.61	4.98	6.86	3.40
Materials used	56.60	56.43	65.40	58.69	52.74	48.20	57.50
Margin for profits and miscellaneous expenses and charges	20.71	19.68	15.83	17.56	20.90	23.11	19.58
Total Output	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Per cent. of Wages on value of Production	47.65	51.70	51.01	53.41	50.56	48.56	49.92

(a) Exclusive of amounts drawn by working proprietors.

NOTE.—Production figures for 1934-35 are not available.

Manufacturing Industries.

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

Year	N.S.W.	Vic.	Q'land.	S. Aust	W. Aust.	Tas.	Total
1931-32—	£	£	£	£	£	£	£
Males	225.99	200.27	204.08	191.61	213.43	192.28	210.26
Females	98.74	94.43	81.61	81.21	92.20	83.11	94.18
1932-33—							
Males	213.72	193.84	201.02	188.62	208.05	188.75	202.37
Females	95.78	89.71	81.08	79.62	89.05	79.24	90.58
1933-34—							
Males	206.98	191.45	208.23	185.58	206.27	182.05	199.32
Females	91.88	88.54	82.77	78.43	86.43	81.41	88.69

(a) Exclusive of working proprietors and amounts drawn by them.

Manufacturing Industries.

AVERAGE NUMBER OF MALES AND FEMALES EMPLOYED, 1933-34.

Sex	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Total
Males	111,653	100,959	32,248	23,743	12,930	7,716	289,249
Females	42,408	55,375	7,835	5,743	3,233	2,066	116,660
Masculinity (a)	263	182	412	413	400	373	248

(a) Number of males per 100 females.

Manufacturing Industries.

	1931-32	1932-33	1933-34
	No.	No.	No.
Number of Establishments	21,657	22,330	23,297
Hands Employed	336,658	370,727	405,909
	£	£	£
Salaries and Wages Paid (a)	55,931,818	59,416,436	64,444,660
Value of Plant, Machinery Land and Buildings	228,119,701	226,386,729	227,714,293
Value of Materials Used	161,199,245	175,148,548	189,827,264
Value of Production	110,981,830	119,203,148	129,091,915
Value of Output	281,645,785	304,797,868	330,134,060

(a) Exclusive of amounts drawn by working proprietors.

MOTOR VEHICLES REGISTERED IN AUSTRALIA, 1934-35.

State and Territories	Registrations Motor Cars	Commercial Vehicles	Motor Cycles	Total	Drivers' and Riders' Licences Issued
New South Wales (b)	164,483	56,055	22,777	243,315	341,255
Victoria	140,483	37,487	24,968	202,938	260,288
Queensland	65,261	27,985	7,807	101,053	(a) 125,550
South Australia	42,815	14,450	8,903	66,168	93,258
West. Australia	30,341	16,279	6,597	53,217	63,539
Tasmania	12,900	3,010	3,881	19,791	23,475
Northern Territory	303	182	31	516	773
Federal Capital Territory	1,098	273	81	1,452	2,080
Total	457,684	155,721	75,045	688,450	910,218

(a) Certificates of competency (State Transport Act, 1932).
(b) Number of vehicles on the road.

Saving Banks (a).

AMOUNT OF DEPOSIT.

	30/6/33	31/12/33	30/6/34	31/12/34	30/6/35
	£'000	£'000	£'000	£'000	£'000
New South Wales	72,308	72,504	75,714	76,167	77,906
Victoria	67,814	67,861	69,971	70,375	72,019
Queensland	23,453	24,054	24,834	25,809	26,197
South Australia	22,515	22,813	23,438	23,556	24,208
West Australia	10,064	9,978	10,399	10,539	10,929
Tasmania	5,865	5,855	6,039	6,198	6,430
F.C.T.	225	224	237	228	230
Northern Territory	38	42	44	50	53
Total	202,282	203,331	210,676	212,922	217,972

Average Per Head of Population (b).

	30/6/33	31/12/33	30/6/34	31/12/34	30/6/35
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
New South Wales	27 16 0	27 14 9	28 17 7	28 17 10	29 9 2
Victoria	37 5 1	37 3 10	38 4 10	38 5 11	39 3 8
Queensland	24 14 11	25 6 9	25 18 6	26 17 10	27 1 3
South Australia	38 15 1	39 3 0	40 3 7	40 6 3	41 7 1
West. Australia	22 18 7	22 13 2	23 10 5	23 16 1	24 10 5
Tasmania	25 15 4	25 4 6	26 9 10	26 15 7	28 2 3
F.C.T.	25 3 1	24 4 5	25 8 10	24 15 11	24 15 2
Nth. Territory	7 18 1	8 13 8	8 19 10	10 4 4	10 9 6
Total	30 10 2	30 10 11	31 11 0	31 15 0	32 8 3

(a) Includes Commonwealth Savings Bank.
(b) Averages are based on population at the end of the respective quarters.

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

Capital	1st March, 1935	1st June, 1935	1st Sept., 1935	1st Dec., 1935
	s. d.	s. d.	s. d.	s. d.
Sydney	68 0	68 0	68 0	70 0
Melbourne	66 0	66 0	66 0	66 0
Brisbane	62 0	62 0	62 0	64 0
Adelaide	65 0 (64 0)	65 0	65 0	67 0
Perth	68 0	68 0	68 0	68 0
Hobart	69 0 (68 0)	69 0	69 0	69 0
Weighted Average— Six Capitals	66 0	66 0	66 0	68 0

(a) "C" Series Index Nos.—Commonwealth Arbitration Court's "Restoration" wage of the 17th April, 1934. Rates in brackets represent amount actually being paid after graduated deductions made.
(b) The family unit associated with this wage consists of man, wife and two children.

BASIC WEEKLY WAGE RATES FIXED BY STATE INDUSTRIAL TRIBUNALS.

State	Basic Wage Males	Basic Wage Females	Date of Operation	Family Unit (for Male Rate)
	£ s. d.	£ s. d.		
N.S.W.	(a) 3 8 6	1 17 0	1/5/35	Man, wife and child
Victoria	(b)	(b)	(b)	(b)
Queensland	3 14 0	1 19 0	1/7/31	Man, wife and three children
South Aust.	(c) 3 6 0	(d) 1 11 6	..	Man, wife and three children
West. Aust.	(e) 3 10 6	1 18 1	1/7/35	Man, wife and two children
Tasmania	(b)	(b)	(b)	(b)

(a) Plus child allowances. (b) None declared, but follow Federal rates to a large extent. (c) Judgment dated 21st October, 1935. (d) Judgment dated 4th December, 1931. (e) Metropolitan Area. Basic wage for Goldfields Areas and other portions of State, exclusive of the S.W. Land Division—Males, £4 4s. 4d.; Females, £2 5s. 6d.; Agricultural Areas and S.W. Land Division—Males, £3 11s. 2d.; Females, £1 18s. 5d.

Taxation—Commonwealth & State, per Head.

	Year Ended 30th June. 1933	1934	1935
	£ s. d.	£ s. d.	£ s. d.
Taxation by Commonwealth Government (a):—			
Customs and Excise	5 13 0	4 19 11	5 2 11
Other	(c) 3 2 4	(c) 3 10 1	(c) 3 6 7
Total	8 15 4	8 10 0	8 9 6
Taxation by State Govts. (b)	5 8 11	5 13 3	5 3 7
Total Taxation (a)	14 4 0	14 3 1	13 12 11

(a) Based on mean population of Commonwealth for each financial year. (b) Based on aggregate population of the six States, mean for each financial year. (c) Inclusive of Sales Tax, £1 5s. 9d. per head in 1931-32; £1 8s. 5d. in 1932-33; £1 6s. 2d. in 1933-34, and £1 5s. 4d. in 1934-35; also Flour Tax, 3s. 9d. per head in 1933-34, and 2s. 5d. in 1934-35.

STATISTICS OF BUSINESS CONDITIONS—AUSTRALIA.

Month	Retail Price Index Numbers, Food and Groceries, Six Capitals	Retail Price Index Numbers, Food, Groceries and Rent (all Houses), Six Capitals	Retail Price Index Numbers, Food, Rent (4 and 5 rooms), Clothing and Miscellaneous	Wholesale Price Index Numbers, (all groups), Melbourne	Wool Prices: Brokers' Realisation Price, Greasy Wool, all Centres (*a*)	Wool Prices: Greasy Merino—Standard Average, Sydney (*b*)	Wheat—Shippers' Price, f.o.r. Williamstown	Price of Butter (export parity)	Price of Gold (export parity)
Average for					Pence per lb.	Pence per lb.	Pence per bushel	Shillings per cwt.	£A per oz.
1928.. ..	1,000	1,000	1,000	1,000	—	(*c*) 18.5	(*c*) 61.88	(*c*) 154	4.248
1928-29 ..	—	—	—	—	16.44	(*c*) 16.5	(*c*) 56.50	(*c*) 158	4.248
1935—									
January ..	809			814	9.95	9.4	32.75	88	8.753
February ..	807	796	817	810	9.52	8.7	34.38	94	8.809
March	804			805	9.35	8.6	36.38	78	9.055
April	803			806	10.14	9.5	39.44	79	8.902
May	810	799	820	814	10.82	10.6	38.88	83	8.801
June	815			818	10.23	11.1	36.88	92	8.718
July	822			825	8.20	(11.6)	34.81	96	8.693
August ..	830	814	830	836	8.00	(11.4)	36.81	103	8.656
September ..	836			834	12.27	12.1	40.50	123	8.700
October ..	836			836	12.84	12.4	44.56	131	8.742
November ..	829	816	831	825	14.23	12.9	40.38	112	8.720
December ..	821			815	14.38	13.0	41.44	97	8.707

(*a*) Average prices realised for all greasy wool of whatever type or quality marketed during the month.
(*b*) Compiled by the New South Wales Government Statistician. (*c*) Unweighted average price.
NOTE.—Wool prices in brackets are nominal.

Statistics of Business Conditions—Australia—*Continued.*

Month	Building Permits—Capital Cities and Suburbs: Number of New Buildings and Dwellings	Building Permits—Capital Cities and Suburbs: Value of New Buildings, Dwellings and Alterations and Additions	Bank Clearings, Six Capitals (excluding Treasury Bills Transactions) (*b*)	Savings Bank Deposits, Australia	Bankruptcies (*a*) Australia: Number	Bankruptcies (*a*) Australia: Gross Liabilities	Sterling-dollar Exchange Rates (average of Daily Rates)
Average for							
1928..	—	—	(*d*) 43,947	213,000	(*c*)	(*c*)	4.866
1935.	Number	£'000	£'000	£'000		£'000	$ to £ stg.
January	880	1,404.6	31,051	213,175	95	160	4.895
February	933	1,291.3	37,111	213,374	150	340	4.875
March	994	1,793.7	36,154	213,509	221	520	4.776
April	951	1,512.5	33,988	213,946	163	312	4.835
May	1,142	2,226.3	36,539	214,698	177	439	4.890
June	1,097	1,650.2	38,800	217,972	92	271	4.936
July	1,295	2,174.9	36,271	218,424	155	185	4.956
August	1,283	1,877.4	32,983	219,416	143	234	4.971
September	1,190	1,740.8	36,204	220,020	99	165	4.933
October	1,240	1,914.4	40,600	221,059	119	194	4.908
November	1,111	1,701.3	41,423	221,670	118	171	4.926
December	837	1,129.0	43,092	220,525	112	144	4.929

(*a*) Sequestrations, Compositions and Deeds of Arrangement. (*b*) Average of four or five weekly periods ending the last Monday in each month. (*c*) Not available. (*d*) Weekly average for year.

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—to ensure freedom from interference.

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
Ship Station
Land Station
Broadcasting Station
Broadcast Listeners'
Portable
Experimental 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 of 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 license 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 Radiotelegraphy and Radiotelephony;
Second Class Commercial Operators' Certificate of Proficiency in Radiotelegraphy;
* Third Class Certificate of Proficiency in Radiotelegraphy.
* Third Class Certificate of Proficiency in Radiotelephony;
Broadcast 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 license 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 license 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 license fee covers the administrative costs, the far greater part being what might be termed the subscription fee.

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 license 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:—

(a) the provision of the technical services of the National Broadcasting Stations (installation, erection and operation);
(b) the inter-connecting telephone circuits between the various National Stations;
(c) other technical services, including the investigation of radio inductive interference and research; and
(d) administrative costs in connection with the issue and recording of licenses.

WIRELESS CONTROL IN AUSTRALIA—(Contd.)

Despite the obligation on listeners to obtain a license, 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 1935 there were more than 900 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 License Issuing Office in partial or full payment for a new listener's license or for the renewal of an existing license.

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 license, and, even if it contains stamps to the value of a license, it is illegal to use a receiving set until the actual license has been obtained.

If, after certain stamps have been affixed, the owner of this card does not wish to purchase a broadcast listener's license, 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 License.

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—

(a) blind pensioners;
(b) blind soldiers in receipt of a pension;
(c) 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

The department endeavours to give as much service as possible to broadcast listeners and one of these services which has received special attention during recent years is that of the investigation of radio inductive interference. This form of disturbance to broadcast reception has unfortunately increased, with the introduction of receivers obtaining their power from the house lighting system and the Department has energetically extended its activities in combating the nuisance. Specially qualified Radio Inspectors in each State undertake the investigation of complaints received from groups of listeners in different localities. The investigations have been responsible for considerable success in determining the cause of the interference and in almost every case it is possible for the Inspectors to demonstrate the method of eliminating or reducing the interference by the installation of suppressors.

The installation of the suppressing equipment is obviously not a responsibility of the Department. The cause can be diagnosed, the curative measures to be taken can be demonstrated and it only remains for the owners of the offending electrical equipment to take the necessary steps to instal the suppressors. While in many cases the Department gladly records the co-operation which has been afforded by electric authorities and private owners of offending equipment, it is unfortunate that in some cases the desired co-operation has not been forthcoming.

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 license 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 license. 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.

Radio Inspectors' Addresses

The addresses of the Senior Radio Inspectors in each capital city are as follows:—

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 BY 8371.

Adelaide: Mr. H. W. Harrington, Commonwealth Offices, Post Office Place, Adelaide; 'Phone Central 6100.

Perth: Mr. G. A. Scott, General Post Office, Phone: B 6023.

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.

Communication Services of the Postmaster-General's Department in Australia

AUSTRALIA is a land of vast distances with a few widely separated rather densely populated areas of small extent and extensive territories carrying extremely small densities of population.

The area of the Continent is roughly 3 million square miles and its present population is about 6½ millions, 3¾ millions of whom are resident in the six State capital cities. The average distribution of the remainder is therefore less than two per square mile. To traverse the boundaries of the Continent one would have to travel 12,000 miles. A mental picture of these conditions is helpful in forming a conception of the nature and magnitude of the problem of providing comprehensive communication services. The problem is mainly one of economics resulting from the necessity to maintain long lines of communication—postal, telegraphic and telephonic—for the transaction of comparatively small volumes of business. Almost anything may be achieved if the cost need not be counted.

The Post Office has managed to establish mail services of so extensive a character that it is doubtful whether there is any locality permanently inhabited by so few as two or three white people which is not systematically served with letter delivery. Neither the telegraph nor telephone can claim to be so far-reaching, but as will appear later their ramifications are remarkably extensive.

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. The frequency of the journeys varies in the aggregate from once daily to once a week with a comparatively small percentage extending to once a fortnight or slightly more. It will be realised, therefore, that the journeys during a year would total many millions of miles. Over the road routes mail matter is conveyed by motor vehicle, horse-drawn vehicle, on horse-back, pack-horse, and occasionally by camel. For many miles in the outlying parts roads are not available and somewhat indefinite tracks point the way.

Coastal vessels sailing over the entire circuit of the Continent are also used in the regular transportation of mails. A weekly air-mail service was inaugurated in December, 1934, to link up with the Imperial Airways Service between London and Singapore.

The air-mail services, including the Darwin-Singapore section, cover roughly 14,500 miles of route, the journeys over which total 2,572,000 miles per annum.

MAIL steamers provide a weekly mail service in each direction between Australia and the United Kingdom, these ships running to schedule so that they may effect connection with railway services and air services at various places both at the terminal ports and at intermediate calling places. Letters are landed at Fremantle and conveyed by rail to Adelaide (1,698 miles), Melbourne (2,181 miles), Sydney (2,771 miles), and Brisbane (3,384 miles).

The articles of mail matter posted in the Commonwealth total about 1,000,000,000 per annum and the incoming items from overseas which require distribution over the whole Continent reach over 43,000,000 per annum.

At the end of January, 1936, 550,468 telephones were in use in Australia, of which 224,667 were connected to exchanges situated outside the telephone networks of the State capital cities. Approximately 240,000 telephones are served by automatic exchanges.

Nearly 440,000,000 local and 33,000,000 trunk line calls are completed annually through 6,200 telephone exchanges.

About 2¾ million miles of wire are in use for telephone purposes. The aerial lines are supported on approximately 25,000,000 insulators attached to three million poles.

The capital value of telephone assets and buildings is about £44,000,000.

With the opening of the telephone service between the mainland and Tasmania, there is almost a nation-wide telephone system, which penetrates into practically every settled portion of the Commonwealth. Now a resident in Wiluna, in Western Australia, may converse by telephone with Cloncurry in Queensland, over approximately 5,500 miles of telephone wire, which probably is a world's record in land line telephony.

Direct radio telephone services are established from Australia to the United Kingdom, to New Zealand and to Java. There are few places in the world to which it is impossible to telephone from Australia. Out of a total of 33 million subscribers in the world 93 per cent. are in countries accessible to Australian subscribers and in addition it is possible to telephone to passengers aboard transatlantic liners whilst on their journey between England and the United States.

The telegraph service is conducted from 10,000 offices interconnected by 300,000 channel miles of circuit. It deals with 15 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 88 telegrams and one simultaneous telephone conversation.

Pictures of high quality are also 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.

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 seven 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 land-line 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 Rockhampton station in Queensland to the Perth station in Western Australia the circuit distance is 3,800 miles and on several occasions programmes have been simultaneously broadcast at these extreme distances with many other of the intermediate broadcasting stations transmitting the same programme at the same time.

The privately-owned group consists of 68 broadcasting stations which are distributed in the more densely populated areas of the Commonwealth. Frequently, by mutual arrangements amongst the managements of a number of these stations, extensive simultaneous broadcasting is effected. In a recent instance there were no less than 54 privately-owned stations simultaneously transmitting by means of the Post Office telephone trunk system.

RATES OF POSTAGE

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 Islands, etc.), Nauru, Bougainville, and Buka (Solomon Islands).

Letters and Letter-Cards—2d. per oz.

Postcards—1½d. each.

Second-Class Matter—(a) Commercial Papers, Patterns, Samples, and Merchandise, 1d. per 2 oz.; (b) Printed Matter (comprising Printed Papers, Circulars and Catalogues, and Books, Periodicals and Newspapers not registered at a General Post Office), 1d. per 4 oz.

NOTE.—Commercial Papers include partly printed routine communications as prescribed, and formal documents such as accounts, invoices, etc.

Printed Matter includes wholly printed communications such as acknowledgments of the receipt of correspondence, orders or remittances, and notifications of the despatch of goods, etc., also catalogues containing samples of material subject to prescribed conditions.

Permit Mail, i.e., large quantities of circular letters posted in sealed envelopes under permit previously obtained—Printed matter rate plus special fee of ½d. per article.

Third Class Mail Matter (comprising books, periodicals and Newspapers registered at a General Post Office for transmission as such)—1d. per 6oz.

Beyond the Commonwealth.—Letters and Letter-Cards. To places within the British Empire, and to New Hebrides, Banks and Torres Islands—2d. per oz.

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

Postcards—To places within the British Empire and to New Hebrides, Banks and Torres Islands—1½d. each.

To all other places—2d. each.

Commercial Papers—To New Zealand and the islands annexed thereto, 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, and to New Hebrides, Banks and Torres Islands—1d. per 4 oz.

To all other places—1d. per 2 oz.

Newspapers—To New Zealand and the islands annexed thereto, and Fiji—1d. per 6 oz.

To the United Kingdom and Irish Free State:
via France or America—1d. per 4 oz.
via All Sea Route—1d. per 6 oz.

To all other places Printed Matter Rates apply.

Samples—To places within the British Empire, and to New Hebrides, Banks and Torres Islands—1d. per 2 oz.

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

Merchandise—To New Zealand and the Islands annexed thereto, and Fiji only—1d. per 2 oz.

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

Postal Notes—1/- to 2/6, 1d.; 3/- to 4/6, 1½d.; 5/- to 7/6, 2d.; 10/- to £1, 3d.

The Use of the Long Distance Telephone Service for Broadcasting Purposes

DURING 1935 unprecedented demands were made on the Postmaster-General's Department for the use of trunk line channels for the transmission of programmes for simultaneous broadcasting from two or more stations, and the facilities which were made available in this connection no doubt enhanced substantially the value of the programmes. Since 1932 there has been an increase of over 372 per cent. in the total number of transmissions over trunk lines for broadcasting purposes in any one year, and the progressive growth in the past four years is shown by the following figures:—

Year ended	No. of transmissions over trunk lines
December, 1932	2,118
December, 1933	3,478
December, 1934	7,679
December, 1935	9,997

This particularly heavy demand for trunk line facilities for broadcasting purposes has occurred during a time when normal trunk line business was also increasing substantially, and exceptional measures have had to be taken in an endeavour to cope with both classes of business.

Telephone trunk line channels are normally designed for two-way telephone speech, but when required for broadcasting the characteristics of these circuits must be completely changed to permit of the highest quality transmission in one direction only of both speech and music. To make these circuit changes for an extensive hook-up, a special and highly skilful staff must be provided at several points along the route where the delicate repeater apparatus has to be suitably adjusted.

The preparation of circuits for broadcasting purposes must be controlled by experienced technical officers from specified points known as "zone controls." The work entailed is of a most involved and complex character and, as all types of programmes are relayed, including music and speech, it is important that the transmission characteristics of the telephone channels used should be of the highest possible quality and free from any distortion.

In order to ensure high quality transmissions special arrangements have been made to install channels on important routes which will be satisfactory for broadcasting relay purposes, and, as the popular time for the relay of a programme of special appeal or interest is naturally in the evening when there is a considerable amount of trunk line business offering, because of the application of the reduced night rates, it is often difficult to divert from normal use the channels which are required on behalf of the broadcasting interests.

Of the 9,997 relays which were arranged in 1935, 2,094 involved broadcasting stations in two States, 978 went to stations in three States, 631 to four States, and 346 to five States. The remaining 5,948 relays concerned only stations in the States of origin. The total period for which trunk line channels were occupied for programme transmissions during 1935 exceeded 16,000 hours.

Prior to 1935 the maximum number of broadcasting stations connected together for a simultaneous transmission was 47, but on one occasion last year 67 stations were linked up, involving the use of 12,500 miles of telephone trunk lines.

The diversity of the broadcast items relayed over trunk lines is illustrated by specifying the nature of programmes which have already been covered, viz:—

Musical programmes, including. Symphony Concerts, String quartettes, Choral Concerts, Choral Championships, Operas, Children's Concerts.

Descriptions of sporting events: Cricket Matches, Races, Tennis Tournaments, Football Matches, Boxing Contests, Rowing Events, Bicycle Races.

Talks on a wide variety of subjects: Speeches, Election Results, Debates, Musical Comedies, Plays, Revues, Vaudeville Entertainments.

Descriptions of: Floods, Important aeroplane flights, Funeral services, Royal Jubilee celebrations, the Royal Tour in Australia.

Welcomes to distinguished visitors: The Bells of Bethlehem, Carillon Bells, Consecration of an Archbishop, Opening of new radio stations, Weddings, New Year Greetings, Empire Broadcasts, Lyre Bird Calls, Tours of Australia by telephone.

The busiest periods for interstate broadcasting relays occur on Saturday afternoons and Sunday evenings. Descriptions of sporting events form the main attraction on Saturday afternoons, but the programmes relayed on Sunday evenings cover a very wide range of subjects, including news sessions, talks on various subjects, musical programmes, and radio dramas.

The total mileage of trunk line channels utilised in 1935 for actual programme transmissions exceeded 4,000,000 miles, whilst approximately the same mileage was involved in the channels utilised for the preparation of the transmission channels and for the monitoring of the relays.

The Department appreciates the desire of advertisers and broadcasting organisations to reach the maximum audience practicable, and, in considering the development of the long distance telephone system, is making provision to meet all reasonable demands which might be made in this direction.

In the submarine cable between the mainland and Tasmania, the development of broadcasting made it desirable to include a channel suitable for transmitting programmes in either direction between broadcasting stations situated on the mainland and in Tasmania. The use of this channel will overcome certain disabilities experienced in the past by Tasmanian listeners and will enable them to participate to a greater and more efficient degree in the programmes arranged by mainland stations.

Technical Progress in Australian Broadcasting

An account of the activities of the Postmaster-General's Department in the Radio Broadcasting Field in Australia.–

Introduction

THE Australian system of broadcasting is unique in that it allows for a National undertaking and private enterprise to function side by side. The success of the arrangement may be gauged from the fact that there are 800,000 licensed listeners and a license density which is exceeded by five other countries.

The National Service is financed from listeners' license fees and is intended to supply satisfactory reception of at least one National Station throughout the Commonwealth. The commercial stations rely on advertising for their revenue, and operate under licenses granted by the Postmaster-General.

TECHNICAL ACTIVITIES WITH THE NATIONAL SERVICE.

General:

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, in so far as the National Service is concerned, include the following:—

(a) Provision, maintenance and operation of the technical equipment at the stations and studios;
(b) Provision of the necessary networks of lines for the simultaneous transmission of programmes through the various stations;
(c) 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.

Development:

The basic plan prepared in 1929 had as its aim the provision of stations so distributed throughout the Commonwealth that fading-free service day and night is given to over 90% of the population. This population is approximately seven millions, extending over an area of three million square miles.

The plan provides for over 30 stations, of which 15 have been installed. Six stations are in course of construction.

Technical development work is continually carried on so that the newest and most efficient methods and apparatus are made available to the National Broadcasting Service. Developmental work on aerial design has also been proceeding, and one of the new regional transmitters, now in course of erection, will be fitted with a new type of radiator which will possess novel mechanical and electrical features.

Frequency Allocation:

The frequencies allotted by the International Tele-communication Convention for broadcasting purposes lie within the band 550 to 1500 Kc/s. (545 — 200 m.); and in certain cases between 160 and 224 Kc/s (1875 and 1339 m.). Australia has utilised the former band, and 91 channels are available for the National and the Commercial stations within this band. The allocation of these channels requires very careful consideration to prevent mutual interference between channels and to avoid the heterodyne interference from broadcasting stations in Japan, China, New Zealand and other countries. The consideration of station locations must of necessity take full account of the geographical situation as well as the power and the frequency to be employed.

On 1st September, 1935, a revised frequency plan for Australia was brought into operation. The alteration in station frequencies was carried out without a hitch, and has since given satisfaction to listeners throughout the Commonwealth.

Station Sites:

The preparatory work for the next step in the basic plan was advanced considerably during the past year. Using a portable transmitter and measuring equipment the results of field strength measurements at possible sites were obtained and studied in conjunction with other related data in the selection of sites to give the maximum possible service area. Work in the field has defined the sites for four additional regional transmitters and has given the best location for the sites of new transmitters for Melbourne and Sydney.

Operation and Maintenance of National Stations and Studios

Station Equipment:

THE increase in the number of country regional transmitters taking common programmes from the Capital City studios has introduced complicated branching and switching problems. The Control Room equipment has been modernised to include the number of branching amplifiers required, and special attention is now being given to the design of apparatus which will facilitate the changeover of regional transmitters to the various studios.

Audition equipment, complete with talk-back facilities, has been installed in all studios to assist rehearsals and the dramatic productions of studio plays.

Investigation work on the various types of microphones available has been completed, and standardisation is now proceeding on the lines of moving coil microphones for outside broadcasts and general service, and the ribbon type for dramatic plays. It is common practice now to carry out debates between two persons located in different States, and to produce composite programmes such as the St. David's Day Celebration in which speeches and items are relayed direct from other States and fed into the special control position in one of the Capital City studios.

(Continued on next page)

TECHNICAL PROGRESS IN AUSTRALIAN BROADCASTING—(Contd.)

It will be seen that the facilities to effect the smooth change-over from point to point, separated by many hundreds of miles, as well as the organisation of the programme to include switching times and cue words has become of great importance. The fact that programmes of these types can be successfully produced is a tribute to the co-operation which exists between the officers of the Australian Broadcasting Commission and the Postmaster-General's Department.

Outside Broadcast Equipment:

The portable equipment used during the Royal Tour proved such a success that an installation is now available in each of the States. This equipment employs 4 input microphones, each of which is individually controlled and fed into an amplifier having a gain of 90 db. This amplifier in turn can be operated with special branching amplifiers so that a standby channel is at all times available. Very effective use was made of this equipment during the broadcast of the operas in Melbourne, when one branching channel was fed to a loud speaker operating in a specially treated room at the outside broadcast point. This is an innovation in Australia and contributed a great deal to the aesthetic value of the broadcast, owing to the more effective control of the production and active co-operation with the musical producer. A further interesting addition to the outside broadcasting plant is the use of the ultra short-wave transceivers. This equipment consists of a portable transmitter and receiver located in the one unit and operated by keys. The equipment has been very useful in the description of mobile events, and is operated with the transmitter located in a conveyance in constant touch with the second installation operating as a receiver at some fixed point where the programme is picked up and fed into the line connecting that point with the studio. Its effectiveness was very clearly demonstrated in the description of the yachting events from Moreton Bay in Queensland. Acting on pre-arranged signals the equipments were reversed and the studio was put in direct touch with the mobile equipment for the issue of instructions.

Public Address Systems:

The Australian Broadcasting Commission purchased a public address system in several of the States for use at the various racecourses. At their request the operation and maintenance of this system was carried out by the Postmaster-General's Department.

Recorded Programmes:

The three main methods of recording programmes are known as:—

(a) the disc method;
(b) the steel tape method;
(c) the film method.

Investigation into the relative merits of each type has been completed, and during the past year a decision was reached to adopt for immediate use the disc and the steel tape methods. The Marconi Stille steel magnetic recorder was purchased and installed. This machine will record items of 30 minutes duration. After a complete investigation, special equalisers were designed and fitted to obtain high quality and the machine is now used by the musical directors to prove the tonal balance of symphony orchestras. The demand for methods of recording items of approximately 4 minutes' duration was so great that a Neumann disc recorder was installed in Melbourne and Sydney. This machine will cut and record a 4 minute programme on a specially prepared record, and can be immediately played back. This is a valuable adjunct to the steel tape with its recordings of 30 minutes' duration, and both machines were used extensively to record the ceremonies broadcast from England on the occasion of the death of the late King George V.

Maintenance:

The maintenance of studios and stations is carried out in accordance with a strict procedure designed to ensure that no part of the plant is overlooked and that breakdowns due to negligence shall not occur. This maintenance procedure has been carefully reviewed during the year, and a system of recording and analysing all interruptions to service has been developed. The causes of all faults are determined, and all recurring troubles are followed up, in an effort to remove from the plant any inherent weaknesses due to design or types of equipment.

Staff:

The Department has introduced a training scheme for mechanics who are employed in stations and studios. Juniors who are taken straight from school are given a thorough training for a period of 5 years in all branches of the technical side of telephone and radio work. Subsequently, before the trainee is employed as a mechanic in a studio or station, he is required to pass an examination testing his qualifications. It will be appreciated, therefore, that with such a method of staff recruitment a very high standard in personnel is ensured.

Permanent Programme Lines

THE lines connecting the Capital City regional transmitters with the associated studios are, in general, composed mainly of conductors in underground cables. The attenuation characteristic of such lines increases with frequencies, and it was formerly the practice to treat these lines with equalisers so that a flat characteristic between 35 and 5,000 cycles per second was obtained. In all cases the frequency band has now been extended, and Capital City permanent programme lines now transmit a frequency band from 35 to 10,000 cycles per second.

The transmitting stations situated in country districts are connected to the Capital City studios by means of open wire lines. It has been possible in many cases to keep these lines solely for broadcasting purposes and under these circumstances the open wire lines have been equalised to transmit a frequency band from 35 to 8,000 cycles per second. In other cases where carrier systems are superimposed on the lines the cut-off frequency of the line filters lies between 5,000 and 6,000 cycles. It has not been possible to progress with the conversion work in these cases.

Interstate Relay Lines

The past year has again witnessed a big increase in the demand for interstate lines for the transmission of programmes. The National Service daily operates a network of 5,000 miles and the licensed stations have shown an increasing tendency to demand programme channels from the Department. This demand has necessitated an increase in the plant.

Lines:

The programme channels have been divided into two classes, based on the frequencies transmitted. Carrier telephone lines are used on speech relays where the important consideration is intelligibility. The lines designed for transmitting musical programmes have a frequency band of 35 to 8,000 cycles per second. There is an increasing tendency to demand the latter type of line on account of its more faithful reproduction and the Department, therefore, provided two channels between Sydney and Brisbane, 4 channels between Sydney and Melbourne, and 4 channels between Melbourne and Adelaide.

It was formerly the practice, when transmitting a programme to Tasmania, for a mechanic at Devonport or at Hobart to operate a wireless receiver connected to a trunk line between the pick-up point and the 7ZL studio. On 25th March, a new submarine cable was brought into operation between Victoria and Tasmania, and henceforth all programmes between those points will be transmitted over the high quality programme channel operating on the cable between frequencies of 34 to 42 kilocycles. The initial tests, which have already been carried out on this channel, indicate that the quality is in line with all other high quality channels operated by the Department.

(Continued on next page)

TECHNICAL PROGRESS OF P.M.G.'S BROADCASTING ACTIVITIES

Short Wave Services

Transmitter:

During the year, the reports on the service area of 3LR Lyndhurst, Victoria, were examined. It was apparent that this station was giving excellent service to the centre of Australia and to the islands within the Pacific. Although the service was opened in 1934, it was felt that the power could be increased with advantage, and during the past year the equipment was redesigned to provide for 1 kilowatt being fed into the aerial.

The present hours of Station 3LR are Monday to Friday, 6.15 to 10.30 p.m., Saturday, 1.30 to 10.30 p.m., but it is hoped to give more extended transmissions in the future.

The station is intended primarily for service within Australia. It operates on a frequency of 9,580 kilocycles, and employs a horizontal doublet aerial fed from the transmitter by a transmission line. This aerial is partly directive, and its use accounts for the excellent results achieved in the centre of Australia and in the islands.

A considerable amount of work on propagation to overseas countries was carried out, particularly in co-operation with the British Broadcasting Corporation and the League of Nations short-wave station at Geneva. A special directive aerial of the rhombic type directed on Britain was used. This type of aerial has a gain over the vertical half wave type of 10 db. This gain represents a considerable increase in power, and is partly responsible for the fact that 3LR is heard so well in Great Britain, the Continent and America.

Receiver:

The Postmaster-General's Department also operates a short-wave receiving station at Mont Park, Victoria. The station commenced operation with one panel mounted receiver and one horizontal rhombic aerial, both of which had been designed and constructed by the Postmaster-General's Department. The success attained has increased the demands on the equipment to such an extent that two receivers are now regularly operated and a third receiver will shortly be maintained as a standby. The aerial systems have been extended to include a double horizontal rhombic, a number of vertical V aerials and a vertical half wave aerial. It has been found possible to operate the two receivers with a combination of aerials and so reduce the amount of fading experienced in the audio channel output. Work on other methods to eliminate fading and noise troubles is proceeding, and further improvement in the overseas radio broadcasting service should be made during the coming year.

Research

THE Department has met this need by gathering together in its Research Laboratories a group of physicists, engineers and other officers specially qualified for this type of work. In these laboratories any developments giving promise of being useful in this country are tested, and local problems arising in the engineering, operation or maintenance of radio systems are investigated.

Separate premises, providing 16,500 square feet of floor space, have been set aside to accommodate the Research Staff and to house its equipment, valued at approximately £27,000. Upwards of 50 officers are continually engaged on various problems relating to radio and the other engineering activities of the Department.

In addition to the main laboratories housed at 59 Little Collins Street, Melbourne, there are two field laboratories used mainly for radio investigations; one at Mont Park and the other at Lyndhurst, both in Victoria. This portion of the Department's organisation dealing with broadcasting also maintains close contact with the Radio Research Board, a course designed to ensure the maximum of mutual assistance and to avoid any overlapping.

The bulk of the technical problems met with in broadcasting are basically similar to problems met with in modern telephone engineering, and are susceptible to attack along the same lines and with the same equipment as the latter. The association of the radio research and investigation work with the work already being done by the Department in connection with its telephone and telegraph services has, therefore, avoided unnecessary duplication of expensive equipment, and brought to the radio work research facilities on a scale which would not otherwise have been possible.

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.

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 five 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.

Australia's Radio Communication System

THE following notes, together with the map illustrating the wireless services on the next page, are included in this Year Book with the purpose of giving our readers a specific idea of the ramifications of the Wireless communication services throughout Australia and those emanating from Australia.

A PERUSAL of the map will show that the main radio centre lies in Sydney and from there communication services go down to New Zealand by radio telephony, across to Lord Howe Island by radio telegraphy, over to Suva, direct to Noumea; another service goes to Nauru, also to Rabaul, and then a cross service from Rabaul to Nauru. The service from Rabaul also extends on to Truk Island.

Still another service goes to Port Moresby. From Cooktown the service connects across to Samarai.

From Sydney the service also goes to Darwin and Wyndham. From Darwin it goes across to Koepang and Singapore.

It will also be noticed that the British Telephony System and also the Java Telephone System to Bandoeng is operated from Sydney.

Then coastal communication from Sydney extends to Adelaide, Perth and Melbourne.

In Victoria the Fiskville and Rockbank Beam Centres communicate direct with England on the one hand and across to Canada on the other.

There is also a very well organised radio service between Melbourne, King Island, Hobart and Flinders Island.

It will therefore be seen that by the agency of wireless, both telephony and telegraphy communication from Australia, is available to most parts of the world.

A wireless telegram can be sent from Australia to any part of the world, to ships at sea, and to aeroplanes in flight. This is effected by a number of allied services which may be divided into the following principal categories:—

1. Overseas radio services to Europe and America.
2. Services to the Mandated Territories of New Guinea, Papua, and the Pacific Islands.
3. Service to ships.
4. Service to aircraft.

The overseas wireless telegraph services are operated by Amalgamated Wireless (Australasia) Ltd., and are maintained by high speed short wave transmitters situated at Fiskville, in Victoria. These transmitters are arranged to send highly concentrated waves to Grimsby in England and to Montreal in Canada, from which two points the messages are distributed throughout Europe and America respectively. Similarly, messages are gathered from various places to these two centres, and thence transmitted to Australia, where they are received at the Beam Wireless receiving station at Rockbank, Victoria.

The transmitters at Fiskville and the receivers at Rockbank are connected by landline to the Central Radio Offices in Melbourne and Sydney, so that the operation of keys in these offices causes messages to be transmitted from Sydney and Melbourne direct to Europe and America, the transmitters at Fiskville being remotely controlled by the apparatus in the Central Radio Offices of Amalgamated Wireless in those two capital cities. The incoming signals, although received at Rockbank, are automatically transferred to landlines and reproduced in both city offices without having been relayed in any way.

Huge Volume of Traffic

The transmitting apparatus used in the overseas telegraph service is capable of sending up to 1400 letters a minute, in actual practice during rush periods often handling 1000 letters a minute for sustained periods. The volume of words handled annually totals over 12,000,000, and represents over 75% of the overseas telegraphic business of the community.

The aerial masts at these beam stations are 260 ft. in height, and are so arranged as to be capable of transmitting signals around the globe in either direction, so that the efficiency of the service is maintained during the hours of both daylight and darkness. The station employs an aerial feeder system to convey the high frequency current from the transmitting house to the aerial wires, and these feeder wires are run through copper pipes and so insulated and earthed as to make the entire feeder system electrically and mechanically efficient, and free from breakdown.

Pacific Island Service

The wireless telegraph services between Australia and the neighbouring Islands are now conducted by Amalgamated Wireless from Sydney, and afford direct communication with Fiji, Papua and New Guinea. About three-quarters of a million words a year are handled by this service, by means of which it is possible to reach the most outlying parts of these Islands. Messages destined for the Islands of the Western Pacific group are at present relayed through Suva Wireless Station, which is operated by Amalgamated Wireless (A/asia) Ltd., on behalf of His Majesty's Colonial Government.

Radio Girdle Around Australia

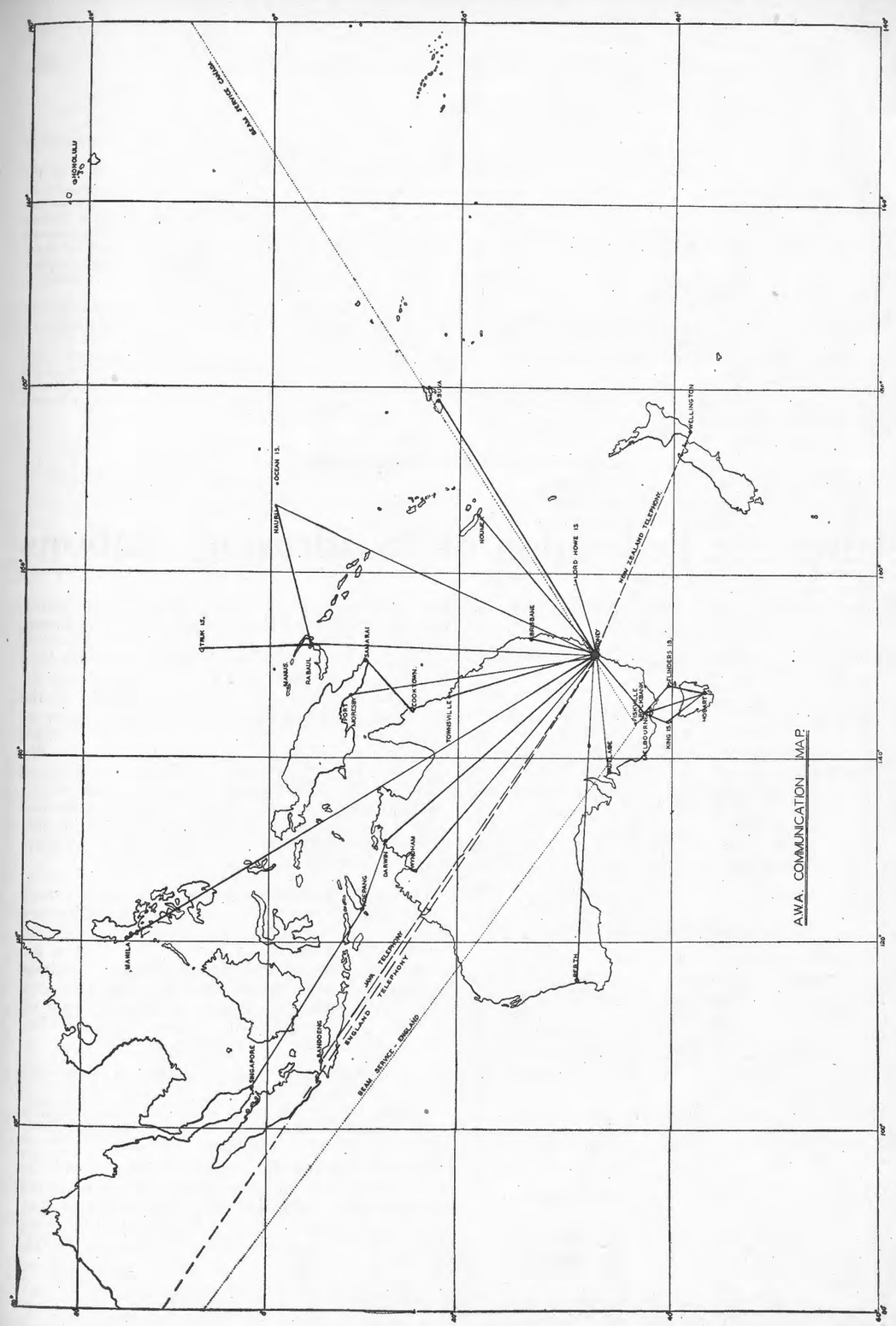
Amalgamated Wireless conducts the maritime wireless service by means of a chain of 19 stations situated at points around the coast of Australia. These stations conduct very comprehensive services to ships at sea, including the daily transmission of press news, official time signals, meteorological bulletins, weather reports, storm warnings, warnings of wreckage or other navigational dangers and the clearing of commercial and social traffic. The primary use of wireless between ship and shore is the safeguarding of life, and a continuous watch is maintained for distress signals, but to-day the application of this science to marine purposes has been extended to embrace not only equipment for the exchange of morse signals, but for direction finding (by means of which equipment the position of the ship can be ascertained at any time), echometers for determining the depth of water under the ship's keel, wireless telephony transmitting and receiving apparatus, enabling conversations to be carried on between ship and shore, lifeboat wireless equipment for use in emergencies, and automatic transmitting and receiving equipment which "keeps watch" when the operator is off duty.

In case of disaster, the automatic transmitter, started by the mere pressing of a switch (and having been previously set with the name of the ship and its position) sends out the distress signal and name and position of the vessel calling, thus releasing the operator for other duties. The automatic receiver is designed to pick up the S.O.S. signal only, and immediately causes a bell to ring, thus summoning the operator to take up watch for further signals.

Radio and Aircraft

With the increasing use of aircraft, a new need for communication by wireless has developed, and regular services are to-day maintained between aircraft in flight on the Bass Strait service, and the service between Sydney and Melbourne. The use of wireless in this connection is invaluable not only to

(Continued on page 52)



AUSTRALIA'S RADIO COMMUNICATION SYSTEM—(Continued)—

protect life, but for weather reports and as a guide to navigation, and for the latter purpose, a direction-finding station has recently been established at Essendon, in Victoria. Machines in flight take bearings from this station, and by this means can be guided home under the most adverse weather conditions.

Telephone Almost Anywhere

By means of the Overseas Wireless Telephone Service, it is possible for anyone in Australia within reach of a telephone to speak to any one of the thirty-five millions of telephone subscribers, or to any place where a telephone is installed, throughout Great Britain, Europe, America and New Zealand. It is even possible to speak from Australia to anyone on board the great trans-Atlantic liners on their voyages between America and Europe. The transmitting and receiving equipment for this service is operated by Amalgamated Wireless, and is linked to the internal telephone networks of each country, and by the establishment of this service, the peoples of the countries linked by it have been brought into even more close touch.

Another form of communication is made possible by the Beam Wireless Facsimile Service, established and operated by Amalgamated Wireless, which enables pictures to be transmitted and received by wireless between Australia and Great Britain and America. As an adjunct to the news service, or as a means of communicating commercial intelligence in the form of drawings or documents of any character, this service takes its place with the other wireless communication services in existence in Australia to-day.

In the A.W.A. short wave broadcasting transmitters VK2ME and VK3ME, there exists a means of communicating news about Australia to the outside world, and these stations play a prominent part in making the Commonwealth well and favourably known abroad. As reports show, these stations are regularly listened to in every country, and their usefulness as agents of goodwill for Australia is unquestionably great. They are located in Sydney and Melbourne respectively.

Australian Federation of Broadcasting Stations

Head Office: 371 Collins Street, Melbourne. 'Phone M 5532.

Branch Office: Kembla Building, Margaret Street, Sydney. 'Phone B 3835.

OFFICE-BEARERS FOR 1935-36: President—A. E. Bennett, Esq.

Vice-Presidents—Messrs. A. N. Kemsley and V. M. Brooker.

Secretary-General—M. B. Duffy, Esq.

Federal Council comprises representatives of City Stations and two Country 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.

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 membership until now it has 65 commercial stations as members. The growth is an indication of the development of commercial broadcasting in Australia during the last few years, and of the popularity of broadcasting as a medium of advertising.

The objects of the Federation may be briefly summarised as follows:—

As commercial broadcasting has developed, so have the problems confronting broadcasters, especially in their relationships with bodies holding various rights, such as musical copyright, gramophone records, patents and the like. In consequence, the time which station managements had to devote to these matters has been increasing each year. In order to strengthen and develop the organisation and to have an official of the Federation authorised to negotiate with the various interests, it was decided at the last Annual Convention to appoint Mr. M. B. Duffy as Secretary-General. Mr. Duffy has been President of the Federation on several occasions and is thoroughly conversant with all the problems confronting the stations. A further development was the formation of a Country Stations Section of the Federation for the discussion of problems peculiar to the country stations.

During the last twelve months, commercial stations have continued to strive for constantly improving programmes, and their efforts have been particularly successful. Representatives of several of the leading stations have been abroad during the year studying broadcasting conditions in other countries, and, generally, the commercial stations in Australia maintain a standard of programme in keeping with the leading broadcasting systems of the world.

The Federation has continued to keep a close watch on all governmental matters affecting broadcasting and has made representation on various subjects, including items suggested for adoption at the forthcoming International Copyright Convention.

In 1935 also agreements were entered into with the Associated Record Manufacturers for the use of gramophone records, and an agreement for a period of years was also completed with the Australasian Performing Right Association Limited for the use of copyright music.

Institution of Radio Engineers (Aust.)

Patron :
His Excellency the Governor-General.
The Right Hon. Lord Gowrie, V.C., K.C.M.G., C.B., D.S.O.
Head Office :
30 CARRINGTON STREET, SYDNEY
B 7188.

Melbourne Branch Secretary :
c/o Technical College, Latrobe St. (Melbourne).

Adelaide Branch Secretary
Box 52, G.P.O., Adelaide.

Objects.

THE objects for which the Institution is founded are subject to Section 53 of the N.S.W. Companies Act, 1899, and are as follows: To promote the science and practice of radio telegraphy and radio telephony in all its branches and the usefulness and efficiency of persons engaged therein. To raise the character and status and advance the interests of the profession of radio telegraphy and radio telephony and those engaged therein. To increase the confidence of the mercantile and general community in the employment of recognised engineers and technical advisers by admitting to the Institution such persons only as shall have satisfied the Council of the Institution that they have a satisfactory knowledge of both the theory and practice of radio-telegraphy and radio telephony. To promote honourable practice, to repress malpractice and to settle disputed points of practice and to decide all questions of professional usage and etiquette among the persons engaged in the profession of radio telegraphy and radio telephony. To collect and circulate statistics and other information relative to radio telegraphy and radio telephony in all its branches. To provide for the delivery and holding of lectures, exhibitions, etc. To encourage the study of radio in all its branches and to improve and elevate the general and technical knowledge of persons engaged or about to be engaged in the profession of radio. To conduct examinations, to award prizes, distinctions, certificates, establish scholarships, etc. In general to do all such other lawful things that the Institution may think incidental or conducive to the attainment of the objects of the Institution.

Officers and Council, 1936

President: E. T. Fisk.
Vice-Presidents: L. P. R. Bean and N. S. Gilmour.
Hon. Treasurer: C. H. Norville.
Hon. Assistant Treasurer: S. V. Colville.
Hon. Secretary: O. F. Mingay.
Hon. Assistant Secretary: K. H. M. Denny.
Councillors: W. T. S. Crawford, L. A. Hooke, A. S. McDonald, C. Tyrrell, E. E. Tree, F. W. P. Thom, L. N. Schultz, R. Allsop, J. N. Briton, P. S. Parker, T. P. Court, R. J. W. Kennell and D. G. Wyles.
Qualifications Board: A. S. McDonald (Chairman), D. G. Wyles, F. W. P. Thom, and W. T. S. Crawford.
Examinations Board: J. N. Briton (Chairman).
Lectures and Papers Board: C. Tyrrell (Chairman).
Social Committee: L. A. Hooke (Chairman).

Victorian Division Committee

Chairman: J. Malone.
Vice-Chairman: S. H. Witt, F. J. Henderson.
Hon. Secretary: R. R. Mackay.
Hon. Assistant Secretary: J. Dobbyn.
Hon. Treasurer: C. W. Evans.
Welfare Officer: R. K. Crow.
Councillors: F. G. Cresswell, W. Conry, F. Canning, R. Kendall, N. Hayes, R. R. Binnion, F. C. Draffin, C. W. Smith, G. F. Williams, J. Johnson, G. Apperley.
Qualifications Board: Convenor, S. H. Witt, N. Hayes, G. F. Williams.
Lectures and Papers Board: F. G. Cresswell, J. Dobbyn, F. J. Henderson, R. Kendall, J. Johnson, W. Conry.

Progress.

During the past 12 months the Institution of Radio Engineers (Australia) has continued to make progress. Over 60 new members of all grades were admitted while quite a number of applicants were requested to sit for examination. The Examination is held on the first Saturday in November of each year and applicants can obtain all particulars from the Hon. Secretary, Box 3120 G.P.O., Sydney.

World Radio Convention

The Institution is proceeding to organise a World Radio Convention in Sydney early in 1938 to coincide with the Sesquicentenary Celebrations of the foundation of N.S.W. and Australia (150 years ago). This promises to be an outstanding function.

Interstate Branches.

The Institution is arranging for the formation of Branches in Brisbane, Adelaide and Perth as soon as circumstances permit.

Annual Award.

Commencing this year, 1936, the Institution will make three awards annually, one each to full member grade, one to Associates and one to juniors, for the most meritorious paper, lecture or thesis presented during the year.

Radio Society of Australia

RECOGNISING the need for the fullest development of radio and all its associated arts and sciences; also to encourage the intercourse of those persons interested in such development, the Institution of Radio Engineers (Aust.), being an institution established by radio engineers for the development of all branches of the science, art and industry of radio-electricity and radio communication, decided to form the Radio Society of Australia.

It is appreciated by the radio engineers that there are many persons interested in the development of radio and its associated arts and sciences in all or many phases, and yet who would not necessarily come within the scope of membership of such a technical body as the Institution of Radio Engineers. There are several thousands of people engaged in radio merchandising and broadcasting. There are also thousands of private citizens keenly interested in the national development of radio and allied arts and sciences. The medical profession is beginning to analyse the radio arts. In fact, the possibilities of the associated radio arts are so widespread and of national importance, as to warrant the formation of such a society.

The organisation and management of the Radio Society is under the direction of the Institution of Radio Engineers, whose President, Treasurer and Secretary occupy similar positions in the Society.

There are two grades of membership: Fellows and Members. The former shall, as a general principle, be leaders in the art, and the latter, all people interested in the development of radio and associated arts and sciences. The annual subscription for Fellows is £2/2/- and Members 21/-.

Society members have the right to attend all lectures, demonstrations, etc., conducted by the I.R.E., and to receive copies of paper, but have no voice or vote in the conduct of the affairs of the I.R.E.

Membership of the I.R.E. automatically carries membership of the Radio Society.

Commonwealth and Customs Tariff Schedule

For Records and Transcriptions

GRAMOPHONE records and wax transcriptions which it is understood are in the nature of gramophone records, are classifiable under Tariff Item 319 (a) (1) (b) with rates of duty as follows:—

Goods	B.P.T. Customs Duty	B.P.T. Primage Duty	General Tariff Customs Duty	General Tariff Primage Duty
Records for Gramophones, Phonographs and other talking machines, viz.:—				
Other:—				
(1) Discs, 6ins. and under in diameter each	6d.	+ 5%	10d.	+ 10%
(2) Discs, over 6 in. in diameter .... each	1/-	+ 5%	1/6d.	+ 10%
(3) N.E.I.	Free	+ 5%	15%	+ 10%

In accordance with the Customs Tariff (Exchange Adjustment) Act 1933-34, goods classifiable under Tariff Items 319 (A) (1) (b) and (2) and admissible under the British Preferential Tariff are at present subject to a deduction from the duty payable under the Item. The following statement embodies Section 5 of the Act explaining the method of Exchange Adjustment. ....

Adjustment in Duties of Customs

Extract From Section 5 of Customs Tariff (Exchange Adjustment) Act, 1933-34.

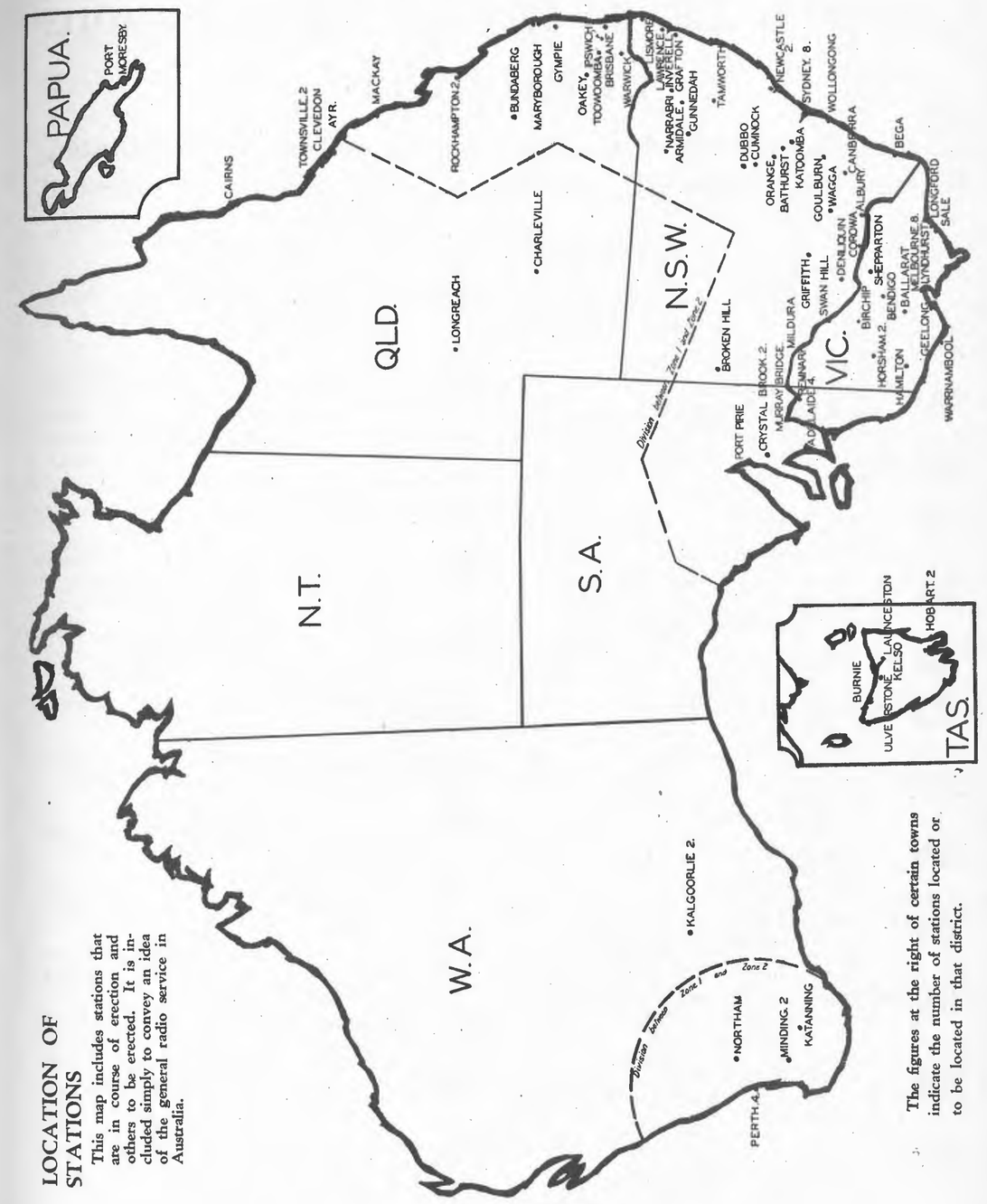
5. The duties of Customs (other than primage duty and duty imposed by the Customs Tariff (Industries Preservation) Act, 1921-1933 or any Act amending or in substitution for that Act) which would, but for the provisions of this Act, be payable on goods to which protective duties apply and which are admissible 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, 1921-1933 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 of 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 Customs (other than primage duty and duty imposed by the Customs Tariff (Industries Preservation) Act, 1921-1923 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.



LOCATION OF STATIONS

This map includes stations that are in course of erection and others to be erected. It is included simply to convey an idea of the general radio service in Australia.

The figures at the right of certain towns indicate the number of stations located or to be located in that district.

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.

New South Wales

2AD 278 metres, 1080 k.c., 100 watts. Northern Broadcasters Ltd., ARMIDALE, N.S.W.

2AY 203 metres, 1480 k.c., 100 watts. Amalgamated Wireless (A/sia) Ltd. Studio, 610 Dean Street, ALBURY, N.S.W.

***2BE** BEGA, N.S.W.

2BH 226 metres, 1330 k.c., 100 watts. Radio Silver City Ltd., cnr. Cummins and Zebiana Sts., BROKEN HILL, N.S.W.

2BL 405 metres, 740 k.c., 3,000 watts. National Broadcasting Service. Studio, 96-98 Market Street, SYDNEY.

***2BS** BATHURST, N.S.W.

2CA 286 metres, 1050 k.c., 500 watts. A. J. Ryan Broadcasters Ltd., Symondston, CANBERRA, F.C.T.

2CH 252 metres, 1190 k.c., 1,000 watts. N.S.W. Council of Churches' Service. Studio, 77 York Street, SYDNEY. Station at Dundas.

2CO 448 metres, 670 k.c., 7,500 watts. National Broadcasting Service. (Relaying 3LO and 3AR), COROWA, N.S.W.

2DU DUBBO, N.S.W. 283 metres, 1060 k.c., 100 watts. Central Western Radio Services Ltd., Tamworth and Dubbo. (3.7.36).

2FC 492 metres, 610 k.c., 3,500 watts. National Broadcasting Service. Studio, 96-98 Market Street, SYDNEY.

2GB 345 metres, 870 k.c., 1000 watts. Theosophical Broadcasting Station Ltd., 29 Bligh Street, SYDNEY.

2GF 248 metres, 1,210 k.c., 100 watts. Grafton Broadcasting Co. Ltd. Station, Turf Street, SOUTH GRAFTON, N.S.W.

2GN 216 metres, 1,390 k.c., 200 watts. Goulburn Broadcasting Co. Ltd., Auburn Street, GOULBURN, N.S.W.

2GZ 303 metres, 990 k.c., 2,000 watts. Country Broadcasting Services Ltd., ORANGE, N.S.W.

2HD 263 metres, 1,140 k.c., 500 watts. Airsales Broadcasting Co., Box 123, NEWCASTLE, N.S.W.

2KA 259 metres, 1,160 k.c., 100 watts. Radio Katoomba Ltd., KATOOMBA, N.S.W.

2KO 213 metres, 1,410 k.c., 500 watts. Newcastle Broadcasting Co. Ltd., A.M.P. Chambers, 57 Hunter Street, NEWCASTLE, N.S.W.

2KY 294 metres, 1,020 k.c., 1,000 watts. The Labour Council, N.S.W. Studio, 424 George Street, SYDNEY.

2LV 366 metres, 820 k.c., 100 watts. Northern Broadcasters Ltd., INVERELL, N.S.W.

2MO 221 metres, 1,360 k.c., 50 watts. M. J. Oliver, Marquis Street, GUNNEDAH, N.S.W.

2NC 244 metres, 1,230 k.c., 2,000 watts. National Broadcasting Service. Relaying 2FC and 2BL. NEWCASTLE, N.S.W.

2NR 429 metres, 700 k.c., 7,000 watts. National Broadcasting Service. Station located at Lawrence.

2QN 208 metres, 1,440 k.c., 50 watts. Deniliquin Broadcasting Co. Ltd., End Street, DENILIQUIN, N.S.W.

2RG GRIFFITHS, N.S.W. Murrumbidgee Broadcasters Ltd.

2SM 236 metres, 1,270 k.c., 1,000 watts. Catholic Broadcasting Co., Australia House, Wynyard Square, SYDNEY.

2TM 231 metres, 1,300 k.c., 50 watts. Tamworth Radio Development Co., Peel Street, TAMWORTH, N.S.W.

LIST OF ALL BROADCASTING STATIONS IN AUSTRALIA—(Continued)—

2UE 316 metres, 950 k.c., 1,000 watts. Radio 2UE Sydney Ltd., 296 Pitt Street, SYDNEY.

2UW 270 metres, 1,110 k.c., 750 watts. Commonweath Broadcasting Corporation Ltd., 49 Market Street, SYDNEY.

2WG 261 metres, 1,150 k.c., 1,000 watts. Riverina Radio Broadcasting Co. Ltd., 16 Fitzmaurice Street, WAGGA, N.S.W.

2WL 210 metres, 1,430 k.c., 300 watts. Wollongong Broadcasting Co., Church and Edward Sts., WOLLONGONG, N.S.W.

2XN 224 metres, 1,340 k.c., 50 watts. Richmond River Broadcasters Ltd., LISMORE, N.S.W.

Victoria

3AK 200 metres, 1,500 k.c., 200 watts. Melbourne Broadcasters Pty. Ltd., 480 Bourke Street, MELBOURNE.

3AR 517 metres, 580 k.c., 4,500 watts. National Broadcasting Service. Studio, 120a Russell Street, MELBOURNE.

3AW 234 metres,1,280 k.c., 600 watts. 3AW Broadcasting Co. Pty. Ltd., 382 Latrobe Street, MELBOURNE.

3BA 227 metres, 1,320 k.c., 500 watts. Ballarat Broadcasters Pty. Ltd., 56 Lydiard Street, BALLARAT, VIC.

3BO 309 metres, 970 k.c., 200 watts. Amalgamated Wireless (A/sia) Ltd., Allen's Walk, BENDIGO, VIC.

3DB 291 metres, 1,030 k.c., 600 watts. 3DB Broadcasting Co. Pty. Ltd., 36 Flinders Street, MELBOURNE.

3GI 361 metres, 830 k.c., 7,000 watts. National Broadcasting Service, Gippsland Regional, LONGFORD, near Sale.

3GL 222 metres, 1,350 k.c., 100 watts. Geelong Broadcasters Pty. Ltd., Moorabool Street, GEELONG, VIC.

3HA 297 metres, 1,010 k.c., 300 watts. Western Province Radio Pty. Ltd., 37 Gray Street, HAMILTON, VIC.

3HS 219 metres, 1,370 k.c., 50 watts. 3DB Broadcasting Co. Pty. Ltd., 84 Wilson Street, HORSHAM, VIC.

3KZ 254 metres, 1,180 k.c., 600 watts. Industrial Printing & Publicity Co., 24-30 Victoria St., CARLTON, N.3.

3LO 390 metres, 770 k.c., 3,500 watts. National Broadcasting Service. Studio, 120a Russell Street, MELBOURNE.

3MA 333 metres, 900 k.c., 100 watts. Sunraysia Broadcasters Pty. Ltd., 22 Deakin Avenue, MILDURA, VIC.

3MB 201 metres, 1,490 k.c., 100 watts. Mallee Broadcasters Pty. Ltd., Cumming Avenue, BIRCHIP, VIC.

3SH 278 metres, 1,080 k.c., 100 watts. Swan Hill Broadcasting Co., Campbell Street, SWAN HILL, VIC.

3TR 242 metres, 1,240 k.c., 500 watts. Gippsland Publicity Pty. Ltd., Raymond Street, SALE, VIC.

3UZ 323 metres, 930 k.c., 600 watts. Nilsen's Broadcasting Service Pty. Ltd., 45 Bourke Street, MELBOURNE, VIC.

3WR 238 metres, 1,260 k.c., 500 watts. Goulburn Valley & N.E. Broadcasters Pty. Ltd., High Street, SHEPPARTON, VIC.

3XY 211 metres, 1,420 k.c., 600 watts. Station 3XY Pty. Ltd., 4 Bank Place, MELBOURNE.

3YB 283 metres, 1,060 k.c., 50 watts. WARRNAMBOOL, VIC. W. & W. Broadcasters Pty. Ltd. Head Office, 430 Little Collins St., Melbourne.

Queensland

4AK 246 metres, 1,220 k.c., 1,000 watts. Brisbane Broadcasting Pty. Ltd., 47 Charlotte Street, BRISBANE. Station located at Oakey, Q'ld.

4AY 207 metres, 1,450 K.C., 100 watts. Ayr Broadcasters Pty. Ltd., Ardmillan Road, AYR, Q'LAND.

4BC 268 metres, 1,120 K.C., 1,000 watts. J. B. Chandler & Co., 43 Adelaide Street, BRISBANE.

4BH 217 metres, 1,380 K.C., 1,000 watts. Broadcasters (Aust.) Ltd., Parbury House, Eagle Street, BRISBANE.

4BK 233 metres, 1,290 K.C., 500 watts. Brisbane Broadcasting Pty. Ltd., 47 Charlotte Street, BRISBANE.

4BU 203 metres, 1,480 K.C., 100 watts. Bundaberg Broadcasters Pty. Ltd., 117 Bourbong Street, BUNDABERG, Q'LD.

4CA 216 metres, 1,390 K.C. Amalgamated Wireless (A/sia) Ltd., CAIRNS, Q'LAND.

4GR 300 metres, 1,000 K.C., 500 watts. Gold Radio Service Ltd., TOOWOOMBA, Q'ld.

***4GY** GYMPIE, Q'LAND.

LIST OF ALL BROADCASTING STATIONS IN AUSTRALIA—(Continued)—

4IP 208 metres, 1,440 K.C., 50 watts. Ipswich Broadcasting Co. Pty. Ltd., Brisbane Street, IPSWICH, Q'LAND.

4LG 273 metres, 1,100 k.c., 300 watts. Central Western Broadcasting Co., LONGREACH, Q'LAND.

4MB 283 metres, 1,060 K.C., 100 watts. Maryborough Broadcasting Co. Ltd. Studio, Kent Street, MARYBOROUGH, Q'LAND.

4MK 259 metres, 1,160 K.C., 100 watts. Mackay Broadcasting Service, 64 Nelson Street, MACKAY, Q'LAND.

4PM 221 metres, 1,360 K.C., 100 watts. Amalgamated Wireless (A/sia) Ltd. Studio, Musgrave Street, PORT MORESBY, PAPUA.

4QG 375 metres, 800 k.c., 2,500 watts. National Broadcasting Service. Studio, State Ins. Buildings, BRISBANE.

4RK 330 metres, 910 k.c., 2,000 watts. National Broadcasting Service (Relaying 4QG), ROCKHAMPTON, Q'LAND.

4RO 226 metres, 1,330 K.C., 50 watts. Rockhampton Broadcasting Co. Pty. Ltd., Cnr. East and William Streets, ROCKHAMPTON, QUEENSLAND.

4TO 256 metres, 1,170 K.C., 200 watts. Amalgamated Wireless (A/sia) Ltd. Studio, Flinders Street, SOUTH TOWNSVILLE, QUEENSLAND.

4VL 209.8 metres, 1,430 K.C., 50 watts. The Charleville Broadcasting Service Pty. Ltd., Burke Street, CHARLEVILLE, Q'LAND.

4WK 333 metres, 900 K.C., 50 watts. Warwick Broadcasting Co. Pty. Ltd., Albion Street, WARWICK, QUEENSLAND.

South Australia

5AD 229 metres, 1,310 K.C., 300 watts. Advertiser Newspapers Ltd., Waymouth Street, P.O. Box 392, ADELAIDE.

5CK 469 metres, 640 k.c., 7,500 watts. National Broadcasting Service (Relaying 5CL), CRYSTAL BROOK, S.A.

5CL 411 metres, 730 k.c., 2,000 watts. National Broadcasting Service. Studio, Hindmarsh Square, ADELAIDE.

5DN 313 metres, 960 K.C., 300 watts. Hume Broadcasters Ltd., 29 Rundle Street, ADELAIDE.

5KA 250 metres, 1,200 K.C., 300 watts. Sport Radio Broadcasting Co. Ltd., Richard's Building, Currie Street, ADELAIDE.

5MU 224 metres, 1,340 K.C., 100 watts. Murray Bridge Broadcasting Co. Ltd., Bridge Street, MURRAY BRIDGE, S.A.

5PI 288 metres, 1,040 K.C., 2,000 watts. Midlands Broadcasting Services Ltd., Box 392, Adelaide, PORT PIRIE, S.A.

5RM 353 metres, 850 K.C., 1,000 watts. River Murray Broadcasters Ltd. Studio, RENMARK, S.A.

Western Australia

6AM 306 metres, 980 k.c., 2,000 watts. Northam Broadcasters Ltd., Studio, NORTHAM, W.A.

6IX 242 metres, 1,240 k.c., 500 watts. W.A. Newspapers Ltd., St. Georges Terrace, PERTH, W.A.

6KG 248 metres, 1,210 k.c., 500 watts. Goldfields Broadcasters (1933) Ltd., Hannan Street, KALGOORLIE, W.A.

6ML 265 metres, 1,130 K.C., 500 watts. W.A. Broadcasters Ltd., Lyric House, Murray Street, PERTH, W.A.

6PR 341 metres, 880 K.C., 500 watts. Nicholson's Ltd., 86-90 Barrack Street, PERTH, W.A.

*6WB W.A. Broadcasters Ltd. KATANNING, W.A.

6WF 435 metres, 690 k.c., 3,500 watts. National Broadcasting Service. Studio, Hay Street, PERTH, W.A.

Tasmania

7BU 455 metres, 660 k.c., 50 watts. Findlay Pty. Ltd., BURNIE, TAS.

7HO 349 metres, 860 k.c., 100 watts. Commercial Broadcasters Pty. Ltd., 82 Elizabeth Street, HOBART, TAS.

7LA 273 metres, 1,100 K.C., 300 watts. Findlays & Wills Broadcasters Pty. Ltd., 67 Brisbane Street, LAUNCESTON, TAS.

7UV 205 metres, 1,460 K.C., 300 watts. Northern Tasmania Broadcasters Pty. Ltd. Studio, Reibey Street, ULVERSTONE, TAS.

7ZL 508 metres, 590 k.c., 1,000 watts. National Broadcasting Service. Studio, Elizabeth St., HOBART, TAS.

7NT 423 metres, 710 k.c., 7,000 watts. National Broadcasting Service. North Regional (Kelso, near Launceston).

EXISTING AUSTRALIAN NATIONAL BROADCASTING STATIONS

Station 1.	Approximate Location 2	Frequency KC. 3.	Wavelength m. 4.	Power Watts 5.	Ultimate Power 6.
2BL, Sydney	Coogee, 4½ miles S.E. of G.P.O.	855	351	3,000	
2CO, Corowa	3½ miles N.N.E. of P.O., Corowa	560	536	7,500	
2CR, Cumnock	Near Dubbo, N.S.W.	550	545	10	60
2FC, Sydney	Pennant Hills, 11¼ mls. N.W. of G.P.O.	665	451	3,500	
2NC, Newcastle	Beresfield, 11½ miles W.N.W. P.O., Newcastle	1,245	241	2,000	
2NR, Lawrence	Near Grafton, N.S.W.	700	429	7	30
3AR, Melbourne	North Essendon, 8 miles N.W. Eliz. St. P.O.	610	492	4,500	
3GI, Longford	Near Sale, Vic.	830	361	7	30
3LO, Melbourne	Braybrook, 5¾ miles W. Elizabeth Street P.O.	800	375	3,500	
3LR, Lyndhurst	5 miles from Dandenong	9,580	31.31	600	
3WV, W. Regional	Near Horsham, Vic.	580	517	10	60
4QG, Brisbane	25 Chains S.W. of G.P.O.	760	395	2,500	
4QN, Clevedon	Near Townsville, Q'ld.	600	500	7	30
4RK, Rockhampton	6 miles S.W. of P.O.	910	330	2,000	
5CK, Crystal Brook	2½ miles N.E. of P.O.	635	472	7,500	
5CL, Adelaide	Brooklyn Park, 3¼ miles W. of G.P.O.	730	411	2,000	
6GF, Kalgoorlie	Kalgoorlie, W.A.	720	417	2	
6WA, Minding	Near Wagin, W.A.	560	536	10	60
6WF, Perth	7 miles N. of G.P.O.	690	435	3,500	
7NT, Kelso	Near Launceston, Tas.	750	400	7	30
7ZL, Hobart	Radio Hill, 1¾ miles S.W. of G.P.O.	580	517	1,000	

New Transmitters are projected for 2BL, 2FC, 3AR and 3LO.

NEW ZEALAND Broadcasting Stations

As at February, 1936

1YA : **N.Z. Broadcasting Board, Karangahape Road, 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 : **N.Z. Broadcasting Board, Karangahape Road, 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 : **The Fellowship of the Friendly Road (Inc.), Queen's Arcade, Auckland.** 350 watts, 1090 k.c., 275.2 m. Transmission hours:—Tuesday, Wednesday, Thursday, Friday, 9 — 9.30 a.m., 10.15—11 a.m., 6.30—9.30 p.m.; Saturday, 9—9.30 a.m., 10.15—11 a.m.. Sunday, 9 a.m. to noon, 6.30—9.30 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. to 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: Tuesday and Thursday, noon to 2 p.m.; Wednesday, 7.30—9.30 p.m.

2YA : **N.Z. Broadcasting Board, Featherston Street, Wellington.** 5000 watts, 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, 6.30—10.30 p.m.; Sunday, 6—10 p.m. (2.30—4.30 Saturdays during football season).

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 : **N.Z. Broadcasting Board, 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 : **N.Z. Broadcasting Board, 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 : **The N.Z. Broadcasting Board, Gloucester St., 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.

(Continued on next page)

NEW ZEALAND BROADCASTING STATIONS— (Continued from page 60)—

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 : **N.Z. Broadcasting Board, 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 : **The N.Z. Broadcasting Board, 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, Clyde Street, 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.

N.Z. Radio Licenses in Force at 31st Dec., 1935

CLASS OF LICENSE	DISTRICTS				
	Auckland	Canterbury	Otago	Wellington	Total
Receivers	56,916	33,102	24,912	67,560	182,490
Dealers	398	225	144	389	1,156
Experimental (Amateur)	234	180	110	415	939
Experimental (Research)	2	—	—	2	4
Special	1	—	—	4	5
Free	171	68	49	104	392
Broadcasting	4	2	7	9	22
Totals	57,726	33,577	25,222	68,483	185,008

EXTRACTS FROM N.Z. RADIO REGULATIONS

Radio receiving licenses cost £1/10/- per annum.

Temporary licenses can be obtained for 10/- per week of 7 days or fraction thereof.

All licenses expire on March 31st of each year, and any licenses renewed within 3 months of March 31st have to pay the additional 12 months license at 2s. 1d. per calendar month.

Free licenses are issued to blind persons, to institutions, homes and asylums for blind persons.

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. Persons wishing to carry on business in more than one fixed place, shall obtain additional license.

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 designed for wireless. Every radio licensed dealer shall exhibit for external observation a sign bearing the words "Licensed Radio Dealer."

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.

Listeners' Licenses (All Classes) in Australia Since 1924

At end of	N.S.W. Licenses in force	N.S.W. Ratio to 100 of Population	VIC. Licenses in force	VIC. Ratio to 100 of Population	Q'LD. Licenses in force	Q'LD. Ratio to 100 of Population	S.A. Licenses in force	S.A. Ratio to 100 of Population	W.A. Licenses in force	W.A. Ratio to 100 of Population	TAS. Licenses in force	TAS. Ratio to 100 of Population	COMMONWEALTH Licenses in force	COMMONWEALTH Ratio to 100 of Population
1924.														
July	906	.04	187	.01	23	.003	74	.01			16	.008	1,206	.02
Aug.	6.945	.3	887	.05	160	.02	309	.05	333	.09	54	.02	8,688	.1
Sept.	13,861	.6	1,398	.08	356	.04	537	.1	576	.1	131	.06	16,859	.3
Oct.	16,721	.8	3,080	.2	456	.05	885	.16	784	.2	161	.08	22,087	.4
Nov.	22,442	.9	5,957	.3	533	.06	1,095	.2	1,301	.3	201	.09	31,529	.54
Dec.	26,071	1.1	8,327	.5	633	.07	1,345	.25	1,716	.4	244	.1	38,336	.66
1925.														
Jan.	28,397	1.2	10,975	.6	697	.08	1,579	.27	2,321	.6	305	.14	44,274	.76
Feb.	30,450	1.3	13,953	.8	825	.09	1,874	.34	2,756	.7	365	.17	50,223	.85
Mar.	31,796	1.4	16,459	.9	942	.11	2,198	.4	3,029	.8	429	.19	54,853	.93
Apr.	32,847	1.4	18,036	1.09	1,050	.12	2,507	.46	3,215	.9	478	.2	58,133	.99
May	33,906	1.5	19,383	1.1	1,177	.14	2,855	.5	3,392	.93	518	.23	61,231	1.04
June	34,857	1.54	20,290	1.22	1,267	.15	3,331	.62	3,562	.97	567	.26	63,874	1.08
July	35,504	1.57	21,357	1.28	1,362	.17	4,096	.77	3,679	1.02	607	.28	66,605	1.1
Aug.	37,565	1.6	23,776	1.4	1,704	.2	4,775	.89	3,943	1.09	720	.33	72,483	1.24
Sept.	38,892	1.7	26,232	1.5	2,229	.26	5,259	.97	4,083	1.1	790	.36	77,485	1.31
Oct.	37,203	1.6	28,442	1.7	2,892	.34	5,774	1.07	4,124	1.1	836	.38	79,271	1.34
Nov.	34,744	1.5	31,318	1.8	3,660	.43	6,099	1.1	4,179	1.1	853	.39	80,853	1.37
Dec.	34,911	1.5	33,988	2	4,141	.49	6,985	1.29	4,192	1.15	913	.41	85,130	1.44
1926.														
Jan.	34,108	1.5	38,323	2.2	4,476	.5	8,568	1.01	4,198	1.1	967	.44	90,640	1.5
Feb.	32,444	1.4	45,274	2.7	4,795	.5	9.734	1.7	3,959	1	1,013	.46	97,219	1.6
Mar.	33,188	1.4	49,402	2.9	5,247	.6	10,480	1.9	3,764	1	1,064	.5	103,145	1.7
Apr.	34,100	1.4	53,547	3.1	5,951	.6	11,029	2	3,759	1	1,114	.5	109,500	1.8
May	35,438	1.5	57,700	3.4	6,681	.7	11,624	2.1	3,877	1	1,171	.5	116,491	1.9
June	37,082	1.61	64,587	3.83	8,450	.98	12,657	2.27	4,003	1.07	1,281	.58	128,060	2.14
July	39,206	1.7	70,070	4.1	12,892	1.4	13,764	2.4	4,113	1.1	1,347	.6	141,392	2.3
Aug.	41,929	1.8	77,493	4.6	15,082	1.7	14,631	2.6	4,157	1.1	1,444	.6	154,736	2.5
Sept.	44,962	1.9	83,077	4.9	16,619	1.9	14,904	2.6	4,225	1.1	1,649	.7	165,436	2.7
Oct.	47,127	2.04	89,055	5.28	17,971	2.08	15,252	2.7	4,143	1.1	1,750	.8	175,298	2.9
Nov.	47,879	2.06	95,136	5.6	18,902	2.1	15,136	2.7	4,118	1.1	1,849	.8	183,020	3.02
Dec.	48,858	2.1	97,744	5.8	19,414	2.2	15,165	2.7	4,114	1.09	1,933	.92	187,228	3.09

Listeners' Licenses (All Classes) in Australia Since 1924

At end of	N.S.W. Licenses in force	N.S.W. Ratio to 100 of Population	VIC. Licenses in force	VIC. Ratio to 100 of Population	Q'LD. Licenses in force	Q'LD. Ratio to 100 of Population	S.A. Licenses in force	S.A. Ratio to 100 of Population	W.A. Licenses in force	W.A. Ratio to 100 of Population	TAS Licenses in force	TAS Ratio to 100 of Population	COMMONWEALTH Licenses in force	COMMONWEALTH Ratio to 100 of Population
1927.														
Jan.	50,301	2.2	101,635	5.9	20,082	2.3	15,469	2.7	4,047	1	2,008	.9	193,542	3.2
Feb.	51,154	2.2	104,428	6.1	20,425	2.3	15,773	2.7	4,014	1	2,078	1	197,872	3.2
Mar.	52,528	2.2	106,081	6.2	20,787	2.3	15,807	2.8	3,932	1	2,153	1	201,288	3.3
Apr.	54,561	2.3	108,732	6.3	21,335	2.4	15,738	2.8	3,890	1	2,259	1	206,515	3.4
May	57,251	2.4	113,977	6.6	22,287	2.5	16,061	2.8	3,874	1	2,351	1	215,801	3.5
June	59,880	2.55	118,965	6.95	23,249	2.63	16,791	2.96	3,903	1.03	2,461	1.14	225,249	3.68
July	62,869	2.68	122,443	7.15	23,957	2.71	17,503	3.09	3,922	1.04	2,592	1.20	233,286	3.82
Aug.	65,803	2.78	126,830	7.36	24,235	2.74	17,797	3.13	3,943	1.03	2,730	1.25	241,338	3.93
Sept.	69,212	2.93	130,236	7.56	24,699	2.79	18,329	3.22	3,987	1.04	2,912	1.38	249,375	4.06
Oct.	71,479	3.03	132,871	7.72	24,914	2.81	18,417	3.23	3,932	1.03	3,125	1.87	254,738	4.15
Nov.	72,162	3.04	133,746	7.75	25,203	2.82	18,645	3.27	3,911	1.02	3,343	1.60	257,010	4.17
Dec.	72,854	3.05	134,825	7.80	24,433	2.73	18,792	3.29	3,872	1.00	3,403	1.63	258,179	4.19
1928.														
Jan.	74,323	3.13	135,729	7.86	24,787	2.77	19,126	3.35	3,829	.99	2,510	1.20	260,304	4.22
Feb.	75,212	3.15	136,410	7.86	24,813	2.77	19,388	3.38	3,820	.98	2,720	1.30	262,363	4.23
Mar.	75,869	3.16	136,481	7.83	24,920	2.77	19,452	3.38	3,780	.96	2,838	1.31	263,340	4.22
Apr.	77,010	3.20	136,712	7.84	25,072	2.79	19,605	3.40	3,756	.96	2,912	1.34	265,067	4.25
May	78,698	3.27	136,496	7.84	25,239	2.80	19,969	3.46	3,740	.95	3,036	1.40	267,178	4.28
June	80,197	3.34	137,758	7.91	25,287	2.82	20,319	3.53	3,774	.96	3,172	1.46	270,507	4.33
July	82,872	3.45	139,023	7.98	25,685	2.86	20,736	3.60	3,798	.97	3,327	1.54	275,441	4.42
Aug.	85,196	3.55	141,344	8.11	25,736	2.86	21,088	3.66	3,844	.98	3,480	1.61	280,688	4.50
Sept.	87,622	3.63	142,597	8.15	25,673	2.84	21,305	3.70	3,848	.97	3,645	1.72	284,690	4.54
Oct.	88,783	3,67	141,988	8.12	25,566	2.83	21,514	3.73	3,844	.97	3,855	1.82	285,550	4.56
Nov.	90,177	3.72	143,250	8.19	25,235	2.77	22,019	3.81	3,830	.96	3,946	1.87	288,457	4.59
Dec.	91,709	3.78	141,890	8.11	25,224	2.77	22,120	3.81	3,814	.95	4,117	1.95	288,874	4.59
1929.														
Jan.	92,681	3.83	141,279	8.08	24,761	2.72	22,420	3.88	3,819	.96	4,204	1.99	289,164	4.60
Feb.	94,404	3.87	141,642	8.07	24,543	2.68	22,682	3.93	3,820	.95	4,198	1.99	291,289	4.61
Mar.	95,487	3.92	141,932	8.09	24,642	2.67	22,942	3.97	3,790	.94	4,327	2.05	293,120	4.64
Apr.	96,877	3.97	143,393	8.17	24,627	2.69	23,186	4.01	3,767	.93	4,467	2.12	296,317	4.69
May	98,550	4.04	143,344	8.17	24,681	2.70	23,573	4.09	3,799	.94	4,604	2.17	298,551	4.73
June	101,012	4.13	142,750	8.15	24,744	2.70	24,021	4.15	3,890	.96	4,782	2.21	301,199	4.75
July	102,787	4.20	142,293	8.08	24,856	2.71	24,346	4.20	3,936	.97	4,974	2.30	303,192	4.78
Aug.	104,580	4.28	140,529	7.98	24,910	2.72	24,474	4.23	3,938	.97	5,131	2.37	303,562	4.79
Sept.	105,549	4.29	140,309	7.94	24,218	2.63	24,647	4.25	4,122	1.01	5,311	2.49	304,156	4.78
Oct.	107,489	4.37	144,295	8.16	23,505	2.54	24,737	4.27	4,353	1.06	5,441	2.56	309,820	4.86
Nov.	108,244	4.40	143,466	8.12	23,204	2.50	25,166	4.34	4,658	1.13	5,575	2.62	310,313	4.87
Dec.	107,503	4.37	144,141	8.16	22,449	2.42	25,481	4.38	4,727	1.15	5,680	2.67	309,981	4.86

Listeners' Licenses (All Classes) in Australia Since 1924

At end of	N.S.W. Licenses in force	N.S.W. Ratio to 100 of Population	VIC. Licenses in force	VIC. Ratio to 100 of Population	Q'LD. Licenses in force	Q'LD. Ratio to 100 of Population	S.A. Licenses in force	S.A. Ratio to 100 of Population	W.A. Licenses in force	W.A. Ratio to 100 of Population	TAS Licenses in force	TAS Ratio to 100 of Population	COMMONWEALTH Licenses in force	COMMONWEALTH Ratio to 100 of Population
1930														
Jan.	108,835	4.41	144,165	8.13	22,388	2.41	25,337	4.37	4,759	1.15	5,590	2.63	311,074	4.86
Feb.	108,780	4.40	142,196	8.02	22,422	2.41	25,140	4.34	4,857	1.17	5,606	2.63	309,001	4.83
Mar.	109,193	4.42	141,853	8.00	22,589	2.43	25,265	4.36	5,023	1.21	5,649	2.66	309,572	4.84
Apr.	109,256	4.41	140,945	7.93	22,476	2.41	25,253	4.35	5,163	1.24	5,668	2.59	308,711	4.81
May	110,682	4.47	141,081	7.94	22,797	2.45	25,448	4.39	5,552	1.33	5,762	2.64	311,322	4.87
June	111,253	4.49	140,072	7.88	23,335	2.51	25,729	4.43	5,755	1.38	6,048	2.76	312,192	4.88
July	115,345	4.65	143,716	8.00	23,628	2.54	27,102	4.67	6,631	1.59	6,582	3.00	323,004	5.03
Aug.	120,673	4.86	147,180	8.25	24,217	2.59	28,227	4.86	7,298	1.25	7,442	3.45	335,037	5.21
Sept.	117,915	4.74	144,925	8.13	24,193	2.57	28,002	4.82	7,547	1.80	7,587	3.52	330,169	5.13
Oct.	118,189	4.75	143,819	8.07	24,214	2.57	28,082	4.83	7,668	1.81	7,655	3.55	329,627	5.12
Nov.	117,885	4.74	142,421	7.99	24,235	2.57	28,266	4.86	7,809	1.86	7,691	3.57	328,307	5.10
Dec.	119,131	4.79	141,687	7.95	24,418	2.59	28,447	4.90	8,030	1.92	7,752	3.59	329,465	5.12
1931.														
Jan.	118,507	4.78	140,142	7.87	24,297	2.59	28,198	4.87	8,103	1.95	7,755	3.60	326,993	5.08
Feb.	118,720	4.77	138,908	7.79	24,193	2.57	28,407	4.90	8,230	1.97	7,812	3.63	326,270	5.06
Mar.	119,398	4.79	138,784	7.76	24,241	2.57	28,723	4.95	8,388	2.01	7,879	3.58	327,413	5.07
Apr.	120,612	4.82	138,152	7.71	24,542	2.59	29,205	5.02	8,645	2.05	7,978	3.61	329,134	5.08
May	120,642	4.84	137,306	7.64	24,256	2.56	29,729	5.12	8,789	2.10	8,093	3.68	328,815	5.09
June	122,470	4.91	137,005	7.66	24,108	2.55	30,238	5.21	9,075	2.17	8,232	3.74	331,128	5.12
July	122,259	4.88	136,183	7.58	24,320	2.55	30,681	5.26	9,219	2.19	8,256	3.76	330,918	5.10
Aug.	120,583	4.81	133,965	7.44	24,182	2.54	30,449	5.22	9,364	2.23	8,077	3.68	326,620	5.03
Sept.	120,686	4.82	132,563	7.37	24,790	2.58	30,679	5.26	9,621	2.29	8,260	3.77	326,599	5.02
Oct.	122,039	4.87	132,968	7.39	25,550	2.66	31,155	5.34	9,961	2.37	8,506	3.88	330,179	5.08
Nov.	123,372	4.92	133,709	7.44	25,931	2.70	31,600	5.42	10,433	2.48	8,669	3.91	333,714	5.13
Dec.	125,409	5.00	134,173	7.46	26,449	2.76	32,160	5.51	10,800	2.57	8,667	3.96	337,654	5.19
1932.														
Jan.	127,734	5.09	134,523	7.48	26,775	2.79	32,560	5.58	11,046	2.63	8,756	4.00	341,394	5.25
Feb.	130,866	5.20	136,211	7.57	27,341	2.84	33,049	5.66	11,269	2.67	8,819	4.02	347,555	5.33
Mar.	132,861	5.28	135,995	7.56	27,671	2.88	33,757	5.78	11,489	2.73	8,888	4.05	350,661	5.38
Apr.	135,295	5.37	138,388	7.68	28,174	2.92	34,608	5.92	11,841	2.81	9,127	4.09	357,433	5.48
May	138,329	5.49	139,397	7.74	28,656	2.97	35,815	6.12	12,234	2.90	9,341	4.18	363,772	5.56
June	141,745	5.63	139,592	7.75	29,060	3.02	37,227	6.36	12,745	3.02	9,567	4.28	369,936	5.67
July	145,101	5.76	141,032	7.82	29,293	3.04	38,206	6.53	13,292	3.15	9,835	4.40	376,759	5.77
Aug.	148,422	5.88	143,270	7.94	29,784	3.09	39,371	6.78	13,827	2.28	10,113	4.56	384,787	5.88
Sept.	150,415	5.95	145,316	8.05	30,051	3.11	40,178	6.86	14,291	3.39	10,301	4.65	390,552	5.97
Oct.	152,996	6.06	147,652	8.18	30,375	3.14	41,039	7.01	14,950	3.55	10,478	4.73	397,490	6.08
Nov.	157,506	6.23	151,498	8.39	31,534	3.24	42,312	7.22	15,568	3.68	10,846	4.90	409,264	6.25
Dec.	159,972	6.33	156,307	8.66	32,183	3.31	43,362	7.40	16,127	3.79	11,229	5.08	419,180	6.40

Listeners' Licenses (All Classes) in Australia Since 1924

At end of	N.S.W. Licenses in force	N.S.W. Ratio to 100 of Population	VIC. Licenses in force	VIC. Ratio to 100 of Population	Q'LD. Licenses in force	Q'LD. Ratio to 100 of Population	S.A. Licenses in force	S.A. Ratio to 100 of Population	W.A. Licenses in force	W.A. Ratio to 100 of Population	TAS Licenses in force	TAS Ratio to 100 of Population	COMMONWEALTH Licenses in force	COMMONWEALTH Ratio to 100 of Population
1933.														
Jan.	163,139	6.45	158,975	8.81	33,037	3.40	44,594	7.61	16,639	3.94	11,437	5.17	427,821	6.53
Feb.	165,282	6.52	161,244	8.92	33,768	3.46	45,605	7.78	17,136	4.05	11,597	5.24	434,632	6.62
Mar.	169,034	6.65	164,393	9.09	34,613	3.55	46,670	7.90	17,691	4.18	11,978	5.42	444,379	6.77
Apr.	171,403	6.72	164,600	9.09	34,904	3.59	47,547	8.03	18,283	4.32	12,051	5.35	448,788	6.83
May	175,125	6.88	167,682	9.17	35,554	3.65	48,900	8.27	19,453	4.60	12,293	5.56	459,007	7.00
June	178,387	7.00	171,318	9.46	36,314	3.72	50,261	8.49	20,604	4.87	12,593	5.59	469,477	7.14
July	182,312	7.15	176,195	9.73	37,000	3.79	51,484	8.70	21,409	5.08	12,884	5.72	481,374	7.32
Aug.	185,864	7.12	178,721	9.83	38,097	4.03	52,682	9.00	22,599	5.16	13,270	5.83	491,233	7.41
Sept.	189,386	7.26	181,425	9.98	38,894	4.11	53,723	9.18	23,452	5.35	13,461	5.91	500,341	7.55
Oct.	192,966	7.29	183,507	10.08	39,902	4.21	54,532	9.31	23,999	5.47	13,628	5.99	508,534	6.67
Nov.	195,509	7.49	184,749	10.15	40,480	4.29	55,057	9.40	24,707	5.63	13,785	6.06	514,287	7.76
Dec.	197,869	7.56	184,861	10.14	40,918	4.31	55,762	9.51	25,325	5.76	13,893	6.11	518,628	7.81
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	9.91	27,202	6.18	14,554	6.27	543,715	8.17
Apr.	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
Apr.	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	280,731	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	80,024	13.56	44,836	10.06	21,615	9.45	754,250	11.22
Nov.	291,924	10.99	249,351	13.56	73,785	7.62	81,007	13.73	45,580	10.22	21,951	9.59	763,598	11.35
Dec.	294,232	11.06	250,758	13.63	74,911	7.72	81,788	13.85	46,219	10.34	22,244	9.73	770,152	11.43

Monthly Totals by States

Broadcast Listeners' License Figures for 1935

Figures in brackets alongside New Issues, Renewals, and Cancellations, indicate the free licenses included in the totals of those respective columns.

To obtain the paid licenses, deduct those figures in brackets from the figure on the left. The totals of free licenses in the last column on the right should be deducted from the monthly total column to obtain the net paid licenses in force. Experimental licenses are paid and are included in all totals.

JANUARY

	New Issues	Renewals	Total Issues	Cancellations	Monthly Total	Net Increase	Popln. Ratio	Total Experimental	Includes Free Blind
N.S.W.	5,160 (17)	14,729 (87)	19,889	2,261 (4)	265,887	2,899	10.08	491	479
Victoria	2,974 (4)	11,537 (88)	14,511	2,349 (5)	227,760	625	12.41	354	509
Queensland	1,441 (2)	3,364 (15)	4,805	305 (1)	63,857	1,136	6.65	164	153
S. Aust.	1,128 (1)	3,735 (22)	4,863	433 (4)	73,171	695	12.43	145	202
W. Aust.	660 (3)	1,886 (13)	2,546	73 (28)	38,004	587	8.59	72	92
Tasmania	483	1,067 (11)	1,550	294 (4)	19,086	189	8.38	36	65
C'wealth	11,846 (27)	36,318 (236)	48,164	5,715 (46)	687,765	6,131	10.28	1,262	1,500

FEBRUARY

N.S.W.	4,403 (11)	14,479 (46)	18,882	896 (3)	269,394	3,507	10.22	490	487
Victoria	2,915 (11)	12,541 (42)	15,456	919 (5)	229,756	1,996	12.52	343	515
Queensland	1,314 (5)	3,283 (11)	4,597	1,468 (1)	63,703	154	6.64	157	157
S. Aust.	1,129 (4)	3,376 (20)	4,505	544 (4)	73,756	585	12.53	143	202
W. Aust.	675 (4)	1,585 (14)	2,260	129	38,550	546	8.71	71	96
Tasmania	504 (8)	666 (2)	1,170	270	19,320	234	8.48	33	73
C'wealth	10,940 (43)	35,930 (135)	46,870	4,226 (13)	694,479	6,714	10.38	1,237	1,530

MARCH

N.S.W.	4,612 (6)	14,980 (47)	19,592	1,664 (2)	272,342	2,948	10.29	494	491
Victoria	3,883 (7)	12,938 (47)	16,821	1,523 (3)	232,116	2,360	12.63	353	519
Queensland	1,270	3,711 (21)	4,981	368	64,605	902	6.74	160	157
S. Aust.	1,233	3,928 (21)	5,161	581 (2)	74,408	652	12.62	144	200
W. Aust.	861 (6)	1,922 (11)	2,783	162	39,249	699	8.87	68	102
Tasmania	487 (3)	828 (12)	1,315	321	19,486	166	8.42	32	76
C'wealth	12,346 (22)	38,307 (159)	50,653	4,619 (7)	702,206	7,727	10.47	1,251	1,545

APRIL

N.S.W.	4,554 (7)	14,723 (27)	19,277	2,532 (2)	274,364	2,022	10.37	510	496
Victoria	4,070 (53)	13,996 (12)	18,066	2,273	233,913	1,797	12.73	358	572
Queensland	1,438 (7)	3,453 (11)	4,891	454 (1)	65,589	984	6.83	168	163
S. Aust.	1,394 (4)	4,472 (18)	5,866	508	75,294	886	12.77	149	204
W. Aust.	913 (3)	2,272 (7)	3,185	194 (1)	39,968	719	9.03	75	104
Tasmania	512 (1)	841 (2)	1,353	345 (2)	19,653	167	8.53	32	75
C'wealth	12,881 (75)	39,757 (77)	52,638	6,306 (6)	708,781	6,575	10.57	1,292	1,614

MAY

N.S.W.	5,798 (5)	20,141 (26)	25,939	2,241 (4)	277,921	3,557	10.50	511	497
Victoria	5,116 (12)	18,652 (54)	23,768	2,176 (20)	236,853	2,940	12.89	347	564
Queensland	1,955 (3)	4,847 (14)	6,802	613 (4)	66,931	1,342	6.97	174	162
S. Aust.	1,619 (2)	6,244 (29)	7,863	627	76,286	992	12.94	150	206
W. Aust.	1,296 (14)	3,242 (11)	4,538	614	40,650	682	9.18	79	118
Tasmania	671 (2)	1,298 (3)	1,969	367 (5)	19,957	304	8.62	32	77
C'wealth	16,455 (38)	54,424 (137)	70,879	6,638 (28)	718,598	9,817	10.71	1,293	1,624

JUNE

N.S.W.	5,768 (11)	22,777 (41)	28,545	4,523 (1)	279,166	1,245	10.53	518	507
Victoria	4,716 (2)	20,482 (40)	25,198	4,323 (5)	237,247	394	12.90	361	561
Queensland	1,913 (3)	5,739 (18)	7,652	1,298 (2)	67,546	615	7.02	177	163
S. Aust.	1,661 (2)	7,423 (18)	9,084	1,432 (1)	76,515	229	12.97	150	207
W. Aust.	1,298 (5)	3,798 (8)	5,096	691	41,257	607	9.29	81	123
Tasmania	744 (1)	1,682 (8)	2,426	580 (3)	20,121	164	8.76	33	75
C'wealth	16,101 (24)	61,901 (133)	78,002	12,847 (12)	721,852	3,254	10.74	1,320	1,636

MONTHLY TOTALS BY STATES—(Continued)—

JULY

	New Issues	Renewals	Total Issues	Cancellations	Monthly Total	Net Increase	Popln. Ratio	Total Experimental	Includes Free Blind
N.S.W.	6,384 (6)	27,944 (29)	34,328	4,819 (1)	280,731	1,565	10.59	520	512
Victoria	5,463 (18)	22,230 (37)	27,693	3,016	239,694	2,447	13.03	359	579
Queensland	2,203 (8)	6,411 (7)	8,614	715 (1)	69,034	1,488	7.17	177	170
S. Aust.	1,912 (3)	8,304 (20)	10,216	671 (3)	77,756	1,241	13.18	155	207
W. Aust.	1,409 (7)	4,160 (6)	5,569	417	42,249	992	9.51	83	130
Tasmania	891 (2)	1,893 (5)	2,784	517	20,495	374	8.92	35	77
C'wealth	18,262 (44)	70,942 (104)	89,204	10,155 (5)	729,959	8,107	10.87	1,329	1,675

AUGUST

N.S.W.	6,077 (11)	26,160 (37)	32,237	4,661 (5)	282,147	1,416	10.64	534	518
Victoria	5,470 (4)	23,876 (45)	29,346	3,128 (2)	242,036	2,342	13.16	356	581
Queensland	1,811 (8)	5,954 (10)	7,765	843	70,002	968	7.27	179	178
S. Aust.	1,734 (6)	8,710 (16)	10,444	1,144	78,346	590	13.28	155	213
W. Aust.	1,169 (4)	4,015 (2)	5,184	197 (4)	43,221	972	9.73	80	130
Tasmania	1,003 (1)	1,915 (3)	2,918	650	20,848	353	9.07	36	78
C'wealth	17,264 (34)	70,630 (113)	87,894	10,623 (11)	736,600	6,641	10.97	1,340	1,698

SEPTEMBER

N.S.W.	4,903 (3)	21,294 (20)	26,197	1,409 (2)	285,641	3,494	10.76	536	519
Victoria	4,510 (5)	16,758 (31)	21,268	1,830 (1)	244,716	2,680	13.31	375	585
Queensland	1,754 (5)	5,039 (10)	6,793	369 (4)	71,387	1,385	7.37	185	179
S. Aust.	1,339 (5)	4,933 (8)	6,272	543	79,142	796	11.41	157	218
W. Aust.	1,009 (7)	2,921 (2)	3,930	173	44,057	836	9.88	80	137
Tasmania	782 (2)	1,110 (3)	1,892	348	21,282	434	9.30	37	80
C'wealth	14,297 (27)	52,055 (74)	66,352	4,672 (7)	746,225	9,625	11.09	1,370	1,718

OCTOBER

N.S.W.	4,687 (7)	19,619 (27)	24,306	1,926 (3)	288,402	2,761	10.87	542	523
Victoria	4,429 (11)	17,182 (26)	21,611	2,558 (5)	246,587	1,871	13.36	372	591
Queensland	1,727 (8)	5,001 (5)	6,728	328	72,786	1,399	7.52	179	187
S. Aust.	1,526 (1)	4,528 (4)	6,054	644 (1)	80,024	882	13.56	160	218
W. Aust.	1,056 (6)	2,947 (4)	4,003	277	44,836	779	10.06	80	143
Tasmania	693 (3)	1,023 (3)	1,716	360	21,615	333	9.45	37	83
C'wealth	14,118 (36)	50,300 (69)	64,418	6,093 (9)	754,250	8,025	11.22	1,370	1,745

NOVEMBER

N.S.W.	4,574 (11)	19,497 (29)	24,071	1,052 (6)	291,524	3,522	10.99	546	528
Victoria	4,085 (13)	15,466 (20)	19,551	1,321 (10)	249,351	2,764	13.56	376	594
Queensland	1,577 (2)	4,626 (11)	6,203	578	73,785	999	7.62	180	189
S. Aust.	1,367 (4)	4,341 (9)	5,708	384	81,007	983	13.73	161	222
W. Aust.	985 (5)	2,901 (4)	3,886	241	45,580	744	10.22	83	148
Tasmania	696 (5)	944 (5)	1,640	360 (2)	21,951	336	9.59	37	86
C'wealth	13,284 (40)	47,775 (78)	61,059	3,936 (18)	763,598	9,348	11.35	1,383	1,767

DECEMBER

N.S.W.	4,043 (14)	16,926 (17)	20,969	1,735	294,232	2,308	11.06	546	542
Victoria	3,533 (7)	13,935 (9)	17,468	2,126 (3)	250,758	1,407	13.63	376	598
Queensland	1,432 (7)	3,648 (4)	5,080	306 (1)	74,911	1,126	7.72	180	195
S. Aust.	1,423 (1)	4,329 (5)	5,752	642	81,788	781	13.85	159	223
W. Aust.	845 (4)	2,394 (2)	3,239	206	46,219	639	10.34	88	152
Tasmania	551 (5)	960 (1)	1,511	258	22,244	293	9.73	38	91
C'wealth	11,827 (38)	42,192 (38)	54,019	5,273 (4)	770,152	6,554	11.43	1,387	1,801

Commonwealth Monthly Totals of Broadcast Listeners' License Figures for 1935

	New Issues	Renewals	Total Issues	Cancellations	Monthly Total	Net Increase	Popln. Ratio	Totals Experimental	Include Free Blind
January	11,846	36,318	48,164	5,715	687,765	6,131	10.28	1,262	1,500
February	10,940	35,930	46,870	4,226	694,479	6,714	10.38	1,237	1,530
March	12,346	38,307	50,653	4,619	702,206	7,727	10.47	1,251	1,545
April	12,881	39,757	52,638	6,306	708,781	6,575	10.57	1,292	1,614
May	16,455	54,424	70,879	6,638	718,598	9,817	10.71	1,293	1,624
June	16,101	61,901	78,002	12,847	721,852	3,254	10.74	1,320	1,636
July	18,262	70,942	89,204	10,155	729,959	8,107	10.87	1,329	1,675
August	17,264	70,630	87,894	10,623	736,600	6,641	10.97	1,340	1,698
September	14,297	52,055	66,352	4,672	746,225	9,625	11.09	1,370	1,718
October	14,118	50,300	64,418	6,093	754,250	8,025	11.22	1,370	1,745
November	13,284	47,775	61,059	3,936	763,598	9,348	11.35	1,383	1,767
December	11,827	42,192	54,019	5,273	770,152	6,554	11.43	1,387	1,801
Totals	169,621	600,531	770,152	81,103		88,518			

Listeners' License Figures in Force in Areas Within 50 Miles of Principal Cities and Towns

Quarter Ended 31st March, 1935

N.S.W. and F.C.T.

Locality.	Licenses.	Population.	Ratio of Licenses to 100 of Popln.	Homes.
Sydney	198,597	1,441,811	13.77	58
Remainder of State	73,745	1,203,841	6.12	27
State (inc. F.C.T.)	272,342	2,645,652	10.29	44
Albury—				
N.S.W. Sec.	2,636	30,792	8.56	38
Vic. Sec.	2,495	38,016	6.56	28
Bathurst	5,596	93,390	5.99	25
Broken Hill (exc. S.A.)	2,154	28,257	7.62	30
Canberra— (inc. N.S.W.)	2,434	33,586	7.25	31
Corowa—				
N.S.W. Sec.	2,924	32,168	9.09	41
Vic. Sec	2,833	48,963	5.78	24
Dubbo	1,767	31,277	5.65	25
Goulburn	3,862	61,541	6.28	28
Grafton	1,997	42,314	4.72	21
Gunnedah	2,190	47,214	4.64	21
Lismore—				
N.S.W. Sec.	3,867	90,680	4.26	20
Q'ld. Sec.	196	5,812	3.37	14
Moss Vale	9,256	114,179	8.11	35
Newcastle	23,814	242,606	9.81	42
Orange	3,461	79,855	4.33	19
Tamworth	2,519	50,312	5.01	23
Wagga	4,442	73,086	6.08	28
Wollongong—				
Inc. Sydney	195,967	1,392,480	14.07	58
Exc. Sydney	15,199	147,073	10.34	42

Victoria

Locality.	Licenses.	Population.	Ratio of Licenses to 100 of Popln.	Homes.
Melbourne	180,688	1,203,822	15.00	62
Remainder of State	51,428	633,767	8.11	34
State	232,116	1,837,589	12.63	52
Ballarat	17,941	161,826	11.09	44
Bendigo	8,811	126,454	6.96	27
Geelong—				
Inc. Melbourne	182,280	1,148,212	15.87	66
Exc. Melbourne	19,318	156,164	12.37	52
Hamilton	4,324	55,555	7.77	33
Horsham	3,369	44,380	7.59	32
Mildura—				
Vic. Sec.	1,967	23,976	8.28	36
N.S.W. Sec.	253	3,584	7.06	28
Sale	4,019	49,869	8.05	33
Shepparton—				
Vic. Sec.	6,135	79,996	7.61	31
N.S.W. Sec.	276	3,085	8.95	35
Swan Hill—				
Vic. Sec.	2,013	29,583	6.80	29
N.S.W. Sec.	269	5,490	4.90	22

Queensland

Locality.	Licenses.	Population.	Ratio of Licenses to 100 of Popln.	Homes.
Brisbane	42,101	400,684	10.50	45
Remainder of State	22,504	559,068	4.02	17
State	64,605	959,752	6.74	29
Ayr	1,999	37,957	5.26	22
Cairns	898	48,850	1.87	7
Mackay	944	29,065	3.24	14
Maryborough	2,580	53,527	4.82	19
Rockhampton	3,327	47,944	6.93	30
Toowoomba	8,337	123,059	6.77	30
Townsville	2,012	40,055	5.02	22
Warwick—				
Q'ld. Sec.	4,953	84,287	5.87	26
N.S.W. Sec.	125	4,052	3.08	11

South Australia

Locality.	Licenses.	Population.	Ratio of Licenses to 100 of Popln.	Homes.
Adelaide	57,327	393,587	14.56	58
Remainder of State	17,081	195,699	8.73	39
State (inc. N.T.)	74,408	589,286	12.62	52
Crystal Brook	6,135	50,128	12.23	52
Port Lincoln	803	7,196	11.15	48
Port Pirie	4,804	43,330	11.08	49
Mt. Gambier—				
S.A. Sec.	969	17,181	5.64	23
Vic. Sec.	1,066	7,922	13.45	56
Murray Bridge (ex. Metrop. area)	5,830	72,910	8.00	33
Renmark	1,627	21,501	7.57	33

Western Australia

Locality.	Licenses.	Population.	Ratio of Licenses to 100 of Popln.	Homes.
Perth	29,601	238,407	12.42	53
Remainder of State	9,648	204,299	4.72	19
State	39,249	442,706	8.86	37
Albany	626	9,416	6.64	25
Bunbury	1,645	33,848	4.86	19
Collie	1,622	35,470	4.57	17
Geraldton	477	9,984	4.79	22
Kalgoorlie	1,079	23,257	4.64	18
Katanning	1,320	14,537	9.08	38
Merredin	898	15,031	5.97	25
Narrogin	754	15,847	4.76	20
Northam— (exc. Perth)	1,498	37,782	3.96	17
Wagin	1,039	17,767	5.84	25
Wiluna	170	10,348	1.64	5

Tasmania

Locality.	Licenses.	Population.	Ratio of Licenses to 100 of Popln.	Homes.
Hobart	10,758	101,383	10.61	46
Remainder of State	8,728	130,070	7.48	32
State	19,486	231,453	8.42	36
Burnie	3,692	48,377	7.63	34
Devonport	7,079	86,597	8.17	35
Launceston	6,598	82,196	8.02	34
Queenstown	744	9,719	7.65	31
Ulverstone	3,323	80,697	4.11	18

Listeners' License Figures in Force in Areas Within 50 Miles of Principal Cities and Towns

Quarter Ended June 30th, 1935

N.S.W. and F.C.T.

Locality.	Licenses.	Population.	Ratio of Licenses to 100 of Popln.	Homes.
Sydney	203,782	1,442,092	14.13	60
Remainder of State	75,384	1,208,669	6.23	27
State (inc. F.C.T.)	279,166	2,650,761	10.52	45
Albury—				
N.S.W. Sec.	2,646	30,792	8.59	39
Vic. Sec.	2,547	38,016	6.69	28
Bathurst	5,819	93,390	6.23	26
Broken Hill—				
(Exc. S.A.)	2,144	28,257	7.59	30
Canberra—				
(Inc. N.S.W.)	2,433	33,586	7.24	31
Corowa—				
N.S.W. Sec.	2,924	32,168	9.09	41
Vic. Sec.	2,979	48,963	6.08	25
Dubbo	1,820	31,277	5.81	26
Goulburn	3,925	61,541	6.38	28
Grafton	2,097	42,314	4.95	22
Gunnedah	2,332	47,214	4.94	23
Lismore—				
N.S.W. Sec.	3,929	90,680	4.33	20
Q'ld. Sec.	206	5,812	3.54	14
Moss Vale	9,574	114,179	8.38	36
Newcastle	24,792	242,606	10.22	44
Orange	3,542	79,855	4.44	19
Wagga	4,551	73,086	6.23	29
Tamworth	2,682	50,312	5.33	24
Wollongong—				
Inc. Sydney	200,973	1,392,480	14.43	59
Exc. Sydney	15,734	147,073	10.70	44

Victoria

Melbourne	185,906	1,203,858	15.44	63
Remainder of State	51,341	635,505	8.07	33
State Total	237,247	1,839,363	12.90	54
Ballarat	17,858	161,826	11.03	44
Bendigo	8,950	126,454	7.07	28
Geelong—				
Inc. Mel.	185,933	1,148,212	16.19	68
Exc. Mel.	19,527	156,164	12.50	53
Hamilton	4,349	55,555	7.82	34
Horsham	3,413	44,380	7.69	32
Mildura—				
Vic. Sec.	1,998	23,976	8.33	36
N.S.W. Sec.	262	3,584	7.31	29
Sale	4,097	49,869	8.21	34
Shepparton—				
Vic. Sec.	6,230	79,996	7.78	31
N.S.W. Sec.	271	3,085	8.78	37
Swan Hill—				
Vic. Sec.	2,103	29,583	7.10	31
N.S.W. Sec.	263	5,490	4.79	21

Queensland

Locality.	Licenses.	Population.	Ratio of Licenses to 100 of Popln.	Homes.
Brisbane	44,480	402,870	11.04	47
Remainder of State	23,066	559,343	4.12	18
State Total	67,546	962,213	7.02	30
Ayr	2,089	41,529	5.03	22
Cairns	954	48,850	1.95	8
Mackay	957	29,065	3.28	14
Maryborough	2,716	53,527	5.07	20
Rockhampton	3,445	47,944	7.18	31
Toowoomba	8,832	123,059	7.17	32
Townsville	2,094	40,055	5.22	23
Warwick—				
Q'ld. Sec.	5,299	84,287	6.28	28
N.S.W. Sec.	128	4,052	3.16	11

South Australia

Adelaide	59,110	393,508	15.02	60
Remainder of State— (inc. N.T.)	17,405	196,411	8.86	39
State (inc. N.T.)	76,515	589,919	12.97	54
Crystal Brook	6,188	50,128	12.34	53
Port Lincoln	804	7,196	11.17	48
Port Pirie	4,848	43,330	11.11	49
Mt. Gambier—				
S.A. Sec.	1,006	17,181	5.85	24
Vic. Sec.	1,102	7,922	13.91	58
Murray Bridge (ex. Metrop. area)	6,114	72,910	8.38	33
Renmark	1,696	21,501	7.88	32

Western Australia

Perth	31,201	243,172	12.83	55
Remainder of State	10,056	200,900	5.00	21
State Total	41,257	444,072	9.29	38
Albany	684	9,416	7.26	27
Bunbury	1,815	33,848	5.36	21
Collie	1,791	35,470	5.05	19
Geraldton	503	9,984	5.04	23
Kalgoorlie	1,089	23,257	4.68	18
Katanning	1,434	14,537	9.86	41
Merredin	937	15,031	6.23	26
Narrogin	821	15,847	5.18	22
Northam, ex Perth	1,615	37,782	4.27	18
Wagin	1,122	17,767	6.31	27
Wiluna	206	10,348	2.00	7

Tasmania

Hobart	11,221	99,911	11.23	48
Remainder of State	8,900	129,800	6.86	30
State Total	20,121	229,711	8.76	38
Burnie	3,864	48,377	7.99	35
Devonport	7,408	86,597	8.55	37
Launceston	6,890	82,196	8.38	36
Queenstown	782	9,719	8.05	32
Ulverstone	3,471	80,697	4.30	19

Listeners' License Figures in Force in Areas Within 50 Miles of Principal Cities and Towns

Quarter Ended September 30th, 1935

N.S.W. and F.C.T.

Locality.	Licenses.	Population.	Ratio of Licenses to 100 of Popln.	Homes.
Sydney	207,725	1,443,527	14.39	61
Remainder of State	77,916	1,210,519	6.43	28
State (inc. F.C.T.)	285,641	2,654,046	10.76	46
Albury—				
N.S.W. Section	2,671	30,792	8.67	39
Vic. Section	2,606	38,016	6.85	28
Bathurst	6,171	93,390	6.61	28
Broken Hill, exc. S.A.	2,387	28,257	8.45	34
Canberra, inc. N.S.W.	2,530	33,586	7.53	32
Corowa—				
N.S.W. Section	2,962	32,168	9.21	41
Vic. Section	3,035	48,963	6.19	25
Deniliquin—				
N.S.W. Section	1,110	15,954	6.96	31
Vic. Section	1,609	22,271	7.22	32
Dubbo	1,904	31,277	6.08	27
Goulburn	4,029	61,541	6.55	29
Grafton	2,178	42,314	5.15	23
Gunnedah	2,415	47,214	5.11	24
Katoomba, ex. Metro. Area	15,087	168,687	8.94	37
Lismore—				
N.S.W. Section	4,055	90,680	4.46	21
Q'ld. Section	203	5,812	3.49	14
Moss Vale	9,933	114,179	8.70	37
Newcastle	25,457	242,606	10.49	45
Orange	3,803	79,855	4.76	20
Tamworth	2,756	50,312	5.47	25
Wagga	4,676	73,086	6.39	29
Wollongong, ex. Syd.	16,339	147,073	11.11	47

Victoria

Melbourne	188,857	1,202,806	15.70	64
Remainder of State	55,859	635,160	8.79	36
State	244,716	1,837,966	13.31	55
Ballarat	18,477	161,826	11.41	45
Bendigo	9,303	126,454	7.35	28
Birchip	2,922	44,214	6.61	30
Geelong, ex. Melb.	20,749	156,164	13.28	55
Hamilton	4,435	55,555	7.98	34
Horsham	3,639	44,380	8.19	34
Mildura—				
Vic. Section	2,146	23,976	8.96	38
N.S.W. Section	278	3,584	7.76	30
Sale	4,403	49,869	8.82	36
Shepparton—				
Vic. Section	6,214	81,247	7.64	33
N.S.W. Section	288	4,319	6.67	30
Swan Hill—				
Vic. Section	2,107	29,583	7.12	31
N.S.W. Section	264	5,490	4.81	21

Queensland

Locality.	Licenses.	Population.	Ratio of Licenses to 100 of Popln.	Homes.
Brisbane	46,671	405,264	11.51	49
Remainder of State	24,716	562,683	4.39	19
State	71,387	967,947	7.37	32
Ayr	2,288	41,529	5.51	25
Bundaberg	2,185	46,421	4.71	19
Cairns	1,086	48,850	2.22	9
Gympie	3,727	68,492	5.44	23
Ipswich, ex. Bris.	6,108	129,964	4.70	21
Mackay	1,037	29,065	3.56	16
Maryborough	3,030	53,527	5.66	23
Oakey	5,031	83,064	6.06	28
Rockhampton	3,785	47,944	7.89	35
Toowoomba	9,291	123,059	7.55	35
Townsville	2,271	40,055	5.66	25
Warwick—				
Q'ld. Sec.	5,504	84,287	6.53	29
N.S.W. Sec.	116	4,052	2.86	10

South Australia

Adelaide	62,250	393,455	15.82	63
Remainder of State (inc. N.T.)	16,892	196,471	8.59	39
State (inc. N.T.)	79,142	589,926	13.41	56
Crystal Brook	6,332	50,128	12.63	54
Port Lincoln	818	7,196	11.36	49
Port Pirie	4,982	43,330	11.49	51
Mt. Gambier—				
S.A. Sec.	1,050	17,181	6.11	26
Vic. Sec.	1,179	7,922	14.88	62
Murray Bridge, exc Metrop. area	6,389	72,910	8.76	37
Renmark	1,837	21,501	8.54	35

Western Australia

Perth	33,329	244,395	13.64	58
Remainder of State	10,728	201,297	5.33	21
State	44,057	445,692	9.88	41
Albany	752	9,416	7.99	30
Bunbury	2,021	33,848	5.97	23
Collie	1,963	35,470	5.53	21
Geraldton	586	9,984	5.87	27
Kalgoorlie	1,189	23,257	5.11	20
Katanning	1,569	14,537	10.79	45
Merredin	988	15,031	6.57	28
Narrogin	898	15,847	5.67	24
Northam, ex. Perth	1,753	37,782	4.64	19
Wagin	1,236	17,767	6.95	29
Wiluna	236	10,348	2.28	8

Tasmania

Hobart	11,745	99,480	11.80	51
Remainder of State	9,537	129,248	7.38	32
State	21,282	228,728	9.30	40
Burnie	4,044	48,377	8.36	37
Devonport	7,822	86,597	9.03	39
Kelso	7,923	90,769	8.72	38
Launceston	7,315	82,196	8.90	38
Queenstown	820	9,719	8.40	34
Ulverstone	3,698	80,697	4.58	20

Listeners' License Figures in Force in Areas Within 50 Miles of Principal Cities and Towns

Quarter Ended December 31st, 1935

N.S.W. and F.C.T.

Locality.	Licenses.	Population.	Ratio of Licenses to 100 of Popln.	Homes.
Sydney	212,699	1,446,320	14.70	69
Remainder of State	81,533	1,212,976	6.72	25
State (inc. F.C.T.)	294,232	2,659,296	11.06	48
Albury—				
N.S.W. Sec.	3,032	30,792	9.85	44
Vic. Sec.	2,643	38,016	6.95	29
Bathurst	6,414	93,390	6.87	29
Broken Hill, exc. S.A.	2,416	28,257	8.55	34
Canberra, inc. N.S.W.	2,672	33,586	7.95	34
Corowa—				
N.S.W. Sec.	3,073	32,168	9.55	43
Vic. Sec.	3,128	48,963	6.38	26
Deniliquin—				
N.S.W. Sec.	1,166	15,954	7.31	32
Vic. Sec.	1,699	22,271	7.62	33
Dubbo	2,002	31,277	6.40	28
Goulburn	4,259	61,541	6.92	30
Grafton	2,305	42,314	5.45	24
Gunnedah	2,581	47,214	5.47	25
Katoomba—				
ex. Metrop. Area	15,507	168,687	9.19	38
Lismore—				
N.S.W. Sec.	4,294	90,680	4.74	22
Q'land Sec.	220	5,812	3.7	15
Moss Vale	10,343	114,179	9.06	39
Newcastle	26,166	242,606	10.78	46
Orange	3,998	79,855	5.01	22
Tamworth	2,940	50,312	5.84	26
Wagga	4,889	73,086	6.69	31
Wollongong—				
Ex. Sydney	16,867	147,073	11.47	48

Victoria

Melbourne	194,872	1,204,139	16.18	67
Remainder of State	55,886	635,653	8.79	36
State	250,758	1,839,792	13.63	56
Ballarat	18,915	161,826	11.72	46
Bendigo	9,376	126,454	7.69	29
Birchip	2,974	44,214	6.72	30
Geelong, ex. Melb.	21,028	156,164	13.46	56
Hamilton	4,490	55,555	8.08	34
Horsham	3,740	44,380	8.42	35
Mildura—				
Vic. Sec.	2,150	23,976	8.96	38
N.S.W. Sec.	284	3,584	7.92	31
Sale	4,649	49,869	9.32	38
Shepparton—				
Vic. Sec.	6,438	81,247	8.04	34
N.S.W. Sec.	301	4,319	6.97	31
Swan Hill—				
Vic. Sec.	2,092	29,583	7.07	30
N.S.W. Sec.	286	5,490	5.21	23

Queensland

Brisbane	48,796	406,144	12.01	52
Remainder of State	26,115	563,910	4.6	20
State	74,911	967,947	7.74	32
Ayr	2,444	41,529	5.89	26
Bundaberg	2,383	46,421	5.13	21
Cairns	1,162	48,850	2.38	10
Gympie	3,839	68,492	5.60	24
Ipswich—				
Ex. Brisbane	6,707	129,964	5.16	23
Mackay	1,116	29,065	3.83	17
Maryborough	3,100	53,527	5.79	24
Oakey	5,268	83,064	6.34	30
Rockhampton	3,988	47,944	8.32	36
Toowoomba	9,762	123,059	7.93	36
Townsville	2,421	40,055	6.04	26
Warwick—				
Q'land Sec.	5,932	84,287	7.03	32
N.S.W. Sec.	120	4,052	2.96	10

South Australia

Adelaide	64,433	393,730	16.36	65
Remainder of State (Inc. N. Ter.)	17,355	196,594	8.82	40
State (inc. N.T.)	81,788	589,926	13.85	55
Crystal Brook	6,411	50,128	12.79	55
Port Lincoln	887	7,196	12.33	53
Port Pirie	5,062	43,330	11.68	51
Mt. Gambier—				
S.A. Sec.	1,072	17,181	6.24	26
Vic. Sec.	1,193	7,922	15.07	63
Murray Bridge—				
exc. Metro. Area	6,651	72,910	9.12	39
Renmark	1,958	21,501	9.1	39

Western Australia

Perth	34,864	244,609	14.25	61
Remainder of State	11,355	202,131	5.62	23
State	46,219	446,740	10.34	42
Albany	789	9,416	8.38	32
Bunbury	2,192	33,848	6.48	25
Collie	2,131	35,470	6.01	23
Geraldton	610	9,984	6.11	28
Kalgoorlie	1,248	23,257	5.37	21
Katanning	1,691	14,537	11.63	50
Merredin	1,022	15,031	6.79	29
Narrogin	961	15,847	6.06	26
Northam—				
Exc. Perth	1,854	37,782	4.91	21
Wagin	1,334	17,767	7.51	32
Wiluna	254	10,348	2.45	8

Tasmania

Hobart	12,176	99,410	12.25	53
Remainder of State	10,068	129,155	7.80	34
State	22,244	228,565	9.73	42
Burnie	4,210	48,377	8.70	38
Devonport	8,148	86,597	9.40	40
Kelso	8,272	90,769	9.11	40
Launceston	7,632	82,196	9.29	40
Queenstown	884	9,719	9.09	36
Ulverstone	3,886	80,697	4.82	21

Country-Metropolitan License Distribution

In Various States and the Commonwealth

THE following figures show the quarterly license figures in the various metropolitan and country areas for each State for 1935.

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.

New South Wales

	31/3/35	30/6/35	30/9/35	31/12/35
Metropolitan				
Licenses	180,768	185,239	188,528	192,883
Population	1,252,318	1,251,839	1,252,938	1,255,389
Ratio: Licenses to 100 Population	14.43	14.80	15.05	15.36
Dwellings	61	63	64	65
% of State	66	66	66	66
Country				
Licenses	91,574	93,927	97,113	101,349
Population	1,393,334	1,398,922	1,401,063	1,403,907
Ratio: Licenses to 100 Population	6.57	6.71	6.93	7.22
Dwellings	29	29	30	31
% of State	34	34	34	34
State				
Licenses	272,342	279,166	285,641	294,232
Population	2,645,652	2,650,761	2,654,046	2,659,296
Ratio: Licenses to 100 Population	10.29	10.53	10.76	11.06
Dwellings	44	45	46	48
% of State	—	—	—	—

Metropolitan Area of Sydney includes: Alexandria, Annandale, Ashfield, Auburn, Balmain, Bankstown, Bexley, Botany, Burwood, Canterbury, Concord, Darlington, Drummoyne, Dundas, Eastwood, Enfield, Ermington and Rydalmere, Erskineville, Glebe, Granville, Holroyd (part), Homebush, Hunter's Hill, Hurstville, Kogarah, Kuringgai, Lane Cove, Leichhardt, Lidcombe, Manly, Marrickville, Mascot, Mosman, Newtown, Paddington, Parramatta, Petersham, Randwick, Redfern, Rockdale, Ryde, St. Peters, Strathfield, Sydney, Sydney North, Vaucluse, Waterloo, Waverley, Willoughby, Woollahra.

Victoria

	31/3/35	30/6/35	30/9/35	31/12/35
Metropolitan				
Licenses	162,962	166,406	171,114	174,919
Population	1,001,486	1,000,966	1,000,025	1,001,200
Ratio: Licenses to 100 Population	16.27	16.62	17.11	17.48
Dwellings	68	69	71	73
% of State	70	70	70	70
Country				
Licenses	69,154	70,841	73,602	75,839
Population	836,103	838,397	837,941	838,592
Ratio: Licenses to 100 Population	8.27	8.44	8.78	9.04
Dwellings	34	35	36	37
% of State	30	30	30	30
State				
Licenses	232,116	237,247	244,716	250,758
Population	1,837,589	1,839,363	1,837,966	1,839,792
Ratio: Licenses to 100 Population	12.63	12.90	13.31	13.63
Dwellings	52	54	55	56
% of State	—	—	—	—

Metropolitan Area of Melbourne includes: Box Hill, Brighton, Brunswick, Camberwell, Caulfield, Chelsea, Coburg, Collingwood, Essendon, Fitzroy, Footscray, Hawthorn, Kew, Malvern, Melbourne, Melbourne South, Mordialloc, Northcote, Oakleigh, Port Melbourne, Prahran, Preston, Richmond, Sandringham, St. Kilda, Williamstown, and Shires of Braybrook (part), Heidelberg (part), Moorabbin.

Queensland

	31/3/35	30/6/35	30/9/35	31/12/35
Metropolitan				
Licenses	36,552	38,405	40,229	42,098
Population	303,569	305,708	307,522	308,188
Ratio: Licenses to 100 Population	12.04	12.56	13.08	13.65
Dwellings	51	54	56	58
% of State	56	57	57	56
Country				
Licenses	28,053	29,141	31,158	32,813
Population	656,183	656,505	660,425	661,866
Ratio: Licenses to 100 Population	4.27	4.43	4.71	4.95
Dwellings	18	19	20	21
% of State	44	43	43	44
State				
Licenses	64,605	67,546	71,387	74,911
Population	959,752	962,213	967,947	970,054
Ratio: Licenses to 100 Population	6.74	7.02	7.37	7.72
Dwellings	29	30	32	33
% of State	—	—	—	—

Metropolitan Area of Brisbane includes: State Electoral Districts, Bremer (part), Brisbane, Brisbane South, Bulimba, Buranda, Enoggera (part), Fortitude Valley, Hamilton, Ithaca, Kelvin Grove, Kurilpa, Logan (part), Maree, Merthyr, Nundah, Oxley (part), Sandgate (part), Toowong, Windsor, Wynnum (part).

South Australia

	31/3/35	30/6/35	30/9/35	31/12/35
Metropolitan				
Licenses	50,075	51,495	54,423	56,179
Population	314,429	314,061	313,984	314,210
Ratio: Licenses to 100 Population	15.88	16.39	17.33	17.81
Dwellings	64	66	69	72
% of State	67	66	69	69

Metropolitan Area of Adelaide includes: Corporations Adelaide, Brighton, Colonel Light Gardens, Glenelg, Henley and Grange, Hindmarsh, Kensington and Norwood, Port Adelaide, St. Peters, Thebarton, Unley, and the following District Councils: Burnside, Campbelltown, Marion, Mitcham, Payneham, Prospect, Torrens West, Walkerville,

COUNTRY-METROPOLITAN LICENSE DISTRIBUTION—(Continued)—

South Australia (Contd.)

Country				
Licenses	24,333	25,020	24,719	25,609
Population	274,857	275,858	275,942	276,114
Ratio: Licenses to 100 Population	8.85	9.07	8.95	9.27
Dwellings	37	39	39	39
% of State	33	34	31	31
State				
Licenses	74,408	76,515	79,142	81,788
Population	589,286	589,919	589,926	590,324
Ratio: Licenses to 100 Population	12.62	12.97	13.41	13.85
Dwellings	52	54	56	57
% of State	—	—	—	—

Western Australia

	31/3/35	30/6/35	30/9/35	31/12/35
Metropolitan				
Licenses	28,214	29,727	31,683	33,137
Population	209,222	214,473	215,639	215,734
Ratio: Licenses to 100 Population	13.50	13.86	14.69	15.36
Dwellings	58	60	63	66
% of State	72	72	72	72

Metropolitan Area of Perth includes: Municipalities: Claremont, Cottesloe, Fremantle, Fremantle East, Fremantle North, Guildford, Midland Junction, Perth, Subiaco, and the following Road Board Districts: Bassendean, Bayswater, Belmont Park, Buckland Hill, Canning, Melville, Nedlands, Peppermint Grove, Perth, Perth South, Swan (part).

Country				
Licenses	11,035	11,530	12,374	13,082
Population	233,484	229,599	230,053	231,006
Ratio: Licenses to 100 Population	4.73	5.02	5.38	5.66
Dwellings	19	20	22	23
% of State	28	28	28	28
State				
Licenses	39,249	41,257	44,057	46,219
Population	442,706	444,072	445,692	446,740
Ratio: Licenses to 100 Population	8.87	9.29	9.88	10.34
Dwellings	37	38	41	42
% of State	—	—	—	—

Tasmania

	31/3/35	30/6/35	30/9/35	31/12/35
Metropolitan				
Licenses	7,684	7,921	8,268	8,518
Population	61,427	60,038	59,777	59,735
Ratio: Licenses to 100 Population	12.51	13.19	13.83	14.26
Dwellings	53	56	59	61
% of State	39	39	39	38

Metropolitan Area of Hobart includes: Glenoreby, Hobart, Kingborough (part), Clarence (part).

Country				
Licenses	11,802	12,200	13,014	13,726
Population	170,026	169,673	168,951	168,830
Ratio: Licenses to 100 Population	6.94	7.19	7.70	8.13
Dwellings	30	31	33	35
% of State	61	61	61	62
State				
Licenses	19,486	20,121	21,282	22,244
Population	231,453	229,711	228,728	228,565
Ratio: Licenses to 100 Population	8.42	8.76	9.30	9.73
Dwellings	36	38	40	43
% of State	—	—	—	—

Commonwealth

	31/3/35	30/6/35	30/9/35	31/12/35
Metropolitan				
Licenses	466,255	479,193	494,245	507,734
Population	3,142,451	3,147,085	3,149,930	3,154,466
Ratio: Licenses to 100 Population	14.83	15.22	15.68	16.09
Dwellings	62	64	66	68
% of State	66	66	66	66
Country				
Licenses	235,951	242,659	251,980	262,418
Population	3,563,987	3,568,954	3,574,375	3,580,315
Ratio: Licenses to 100 Population	6.62	6.80	7.04	7.33
Dwellings	28	29	30	31
% of State	34	34	34	34
State				
Licenses	702,206	721,852	746,225	770,152
Population	6,706,438	6,716,039	6,724,305	6,734,771
Ratio: Licenses to 100 Population	10.47	10.74	11.09	11.43
Dwellings	44	45	47	48
% of State	—	—	—	—

Quarterly Progressive Totals and Percentage of Radio Homes

TWO YEAR PERIOD – JANUARY, 1934 TO DECEMBER, 1935

Locality	31/3/34 Total Licenses	31/3/34 % Radio Homes	30/6/34 Total Licenses	30/6/34 % Radio Homes	30/9/34 Total Licenses	30/9/34 % Radio Homes	31/12/34 Total Licenses	31/12/34 % Radio Homes	31/3/35 Total Licenses	31/3/35 % Radio Homes	30/6/35 Total Licenses	30/6/35 % Radio Homes	30/9/35 Total Licenses	30/9/35 % Radio Homes	31/12/35 Total Licenses	31/12/35 % Radio Homes
Sydney and Federal Capital Territory	156,594	46	168,823	50	183,660	54	191,878	56	198,597	58	203,782	60	207,725	61	212,699	69
Albury—																
N.S.W. Section	2,083	30	2,201	32	2,532	37	2,640	38	2,636	38	2,646	39	2,671	39	3,032	44
Vic. Section	1,738	21	1,951	22	2,126	23	2,424	26	2,495	28	2,547	28	2,606	28	2,643	29
Bathurst	3,967	18	4,323	19	5,096	23	5,301	24	5,596	25	5,819	26	6,171	28	6,414	29
Broken Hill (exc. S.A.)	1,392	20	1,651	23	2,072	29	2,099	30	2,154	30	2,144	30	2,387	34	2,416	34
Canberra (inc. N.S.W.)	1,580	20	1,944	25	2,320	30	2,376	30	2,434	31	2,433	31	2,530	32	2,672	34
Corowa—																
N.S.W. Section	2,251	31	2,413	34	2,719	38	2,844	40	2,924	41	2,924	41	2,962	41	3,073	43
Vic. Section	2,067	18	2,325	20	2,775	24	2,829	24	2,833	24	2,979	25	3,035	25	3,128	26
Deniliquin—																
N.S.W. Section	—	—	—	—	—	—	—	—	—	—	—	—	1,110	31	1,166	32
Vic. Section	—	—	—	—	—	—	—	—	—	—	—	—	1,609	32	1,699	33
Dubbo	1,233	17	1,411	20	1,674	23	1,692	24	1,767	25	1,820	26	1,904	27	2,002	28
Goulburn	2,717	19	3,122	22	3,675	26	3,741	27	3,862	28	3,925	28	4,029	29	4,259	30
Grafton	1,192	12	1,442	15	1,818	19	1,936	20	1,997	21	2,097	22	2,178	23	2,305	24
Gunnedah	1,476	14	1,704	17	2,071	20	2,132	21	2,190	21	2,332	23	2,415	24	2,581	25
Katoomba (ex. Sydney)	—	—	—	—	—	—	—	—	—	—	—	—	15,087	37	15,507	38
Lismore—																
N.S.W. Section	2,492	13	3,129	16	3,767	19	3,823	19	3,867	20	3,929	20	4,055	21	4,294	22
Queensland Section	144	10	141	10	185	13	196	14	196	14	206	14	203	14	220	15
Moss Vale	7,119	27	7,712	29	8,597	32	8,961	34	9,256	35	9,574	36	9,933	37	10,343	39
Newcastle	16,661	29	18,287	32	21,294	38	22,634	40	23,814	42	24,792	44	25,457	45	26,166	46
Orange	2,332	13	2,644	14	3,090	17	3,179	17	3,461	19	3,542	19	3,803	20	3,998	22
Tamworth	1,718	15	2,024	18	2,411	21	2,484	22	2,519	23	2,682	24	2,756	25	2,940	26
Wagga	3,207	20	3,590	23	4,124	26	4,283	27	4,442	28	4,551	29	4,676	29	4,889	31
Wollongong (ex. Sydney)	11,707	33	12,658	36	14,006	39	14,672	41	15,199	42	15,734	44	16,339	47	16,867	48
Victoria																
Melbourne	151,134	52	164,188	56	174,044	60	176,098	61	180,688	62	185,906	63	188,857	64	194,872	67
Ballarat	13,748	34	15,883	39	16,956	42	17,441	43	17,941	44	17,858	44	18,477	45	18,915	46
Bendigo	6,664	21	7,421	23	8,249	25	8,430	26	8,811	27	8,950	28	9,303	28	9,736	29
Birchip	—	—	—	—	—	—	—	—	—	—	—	—	2,922	30	2,974	30
Geelong (ex. Melb.)	16,423	44	18,038	49	19,250	52	19,753	53	19,318	52	19,527	53	20,749	55	21,028	56
Hamilton	3,074	23	4,211	33	4,309	33	4,318	33	4,324	33	4,349	34	4,435	34	4,490	34
Horsham	2,352	22	2,728	26	3,138	30	3,270	31	3,369	32	3,413	32	3,639	34	3,740	35
Mildura—																
Vic. Section	1,435	26	1,574	28	1,710	31	1,918	34	1,967	36	1,998	36	2,146	38	2,150	38
N.S.W. Section	185	20	196	21	221	24	233	25	253	28	262	29	278	30	284	31
Sale	2,960	24	3,339	27	3,656	30	3,914	32	4,019	33	4,097	34	4,403	36	4,649	38
Shepparton—																
Vic. Section	—	—	—	—	5,790	29	6,005	31	6,135	31	6,230	31	6,214	33	6,438	34
N.S.W. Section	—	—	—	—	246	34	264	34	276	35	271	37	288	30	301	31
Swan Hill—																
Vic. Section	1,738	25	1,848	27	1,964	28	1,956	28	2,013	29	2,103	31	2,107	31	2,092	30
N.S.W. Section	239	19	267	21	271	22	253	20	269	22	263	21	264	21	286	23

QUARTERLY PROGRESSIVE TOTALS & PERCENTAGES OF RADIO HOMES.—(Continued).

Locality	31/3/34 Total Licenses	31/3/34 % Radio Homes	31/12/34 Total Licn's	31/12/34 % Radio Homes	31/3/35 Total Licenses	31/3/35 % Radio Homes	30/6/35 Total Licenses	30/6/35 % Radio Homes	30/9/35 Total Licenses	30/9/35 % Radio Homes	31/12/35 Total Licenses	31/12/35 % Radio Homes
Queensland												
Brisbane	31,204	34	40,712	44	42,101	45	44,480	47	46,671	49	48,796	52
Ayr	—	—	—	—	1,999	22	2,089	22	2,288	25	2,444	26
Bundaberg	—	—	—	—	—	—	—	—	2,185	19	2,383	21
Cairns	539	5	—	—	898	7	954	8	1,086	9	1,162	10
Gympie	—	—	—	—	—	—	—	—	3,727	23	3,839	24
Ipswich (ex. Bris.)	—	—	—	—	—	—	—	—	6,108	21	6,707	23
Mackay	624	9	925	14	944	14	957	14	1,037	16	1,116	17
Maryborough	1,562	12	2,945	22	2,580	19	2,716	20	3,030	23	3,100	24
Oakey	—	—	—	—	—	—	—	—	5,031	28	5,268	30
Rockhampton	2,502	23	3,180	29	3,327	30	3,445	31	3,785	35	3,988	36
Toowoomba	5,584	21	8,102	30	8,337	30	8,832	32	9,291	35	9,762	36
Townsville	1,199	13	1,957	22	2,012	22	2,094	23	2,271	25	2,421	26
Warwick—												
Queensland Section	3,374	18	4,935	26	4,953	26	5,299	28	5,504	29	5,932	32
N.S.W. Section	60	5	124	10	125	11	128	11	116	10	120	10
South Australia												
Adelaide	44,369	45	54,749	56	57,327	58	59,110	60	62,250	63	64,433	65
Crystal Brook	5,304	45	6,012	51	6,135	52	6,188	53	6,332	54	6,411	55
Port Lincoln	598	36	785	47	803	48	804	48	818	49	887	53
Port Pirie	4,011	41	4,686	47	4,804	49	4,848	49	4,982	51	5,062	51
Mt. Gambier—												
Vic. Section	699	37	1,023	53	1,066	56	1,102	58	1,179	62	1,193	63
S.A. Section	937	23	930	23	969	23	1,006	24	1,050	26	1,072	26
Murray Bridge (ex. Adelaide)	—	—	—	—	5,830	33	6,114	33	6,389	37	6,651	39
Renmark	—	—	—	—	1,627	33	1,696	32	1,837	35	1,958	39
Western Australia												
Perth	21,023	38	28,311	51	29,601	53	31,201	55	33,329	58	34,864	61
Albany	389	16	597	24	626	25	684	27	752	30	789	32
Bunbury	755	9	1,545	18	1,645	19	1,815	21	2,021	23	2,192	25
Collie	1,033	11	1,530	17	1,622	17	1,791	19	1,963	21	2,131	23
Geraldton	237	11	452	21	477	22	503	23	586	27	610	28
Kalgoorlie	527	9	903	15	1,079	18	1,089	18	1,189	20	1,248	21
Katanning	683	20	1,254	36	1,320	38	1,434	41	1,569	45	1,691	50
Merredin	561	16	858	24	898	25	937	26	988	28	1,022	29
Narrogin	384	10	710	19	754	20	821	22	898	24	961	26
Northam (ex. Perth)	965	11	1,402	16	1,498	17	1,615	18	1,753	19	1,854	21
Wagin	541	13	992	23	1,039	25	1,122	27	1,236	29	1,334	32
Wiluna	71	2	159	5	170	5	206	7	236	8	254	8
Tasmania												
Hobart	7,958	34	10,420	45	10,758	46	11,221	48	11,745	51	12,176	53
Burnie	2,974	27	3,642	33	3,692	34	3,864	35	4,044	37	4,210	38
Devonport	5,509	27	6,933	34	7,079	35	7,408	37	7,822	39	8,148	40
Kelso	—	—	—	—	—	—	—	—	7,923	38	8,272	40
Launceston	5,023	26	6,433	34	6,598	34	6,890	36	7,315	38	7,632	40
Queenstown	472	19	709	29	744	31	782	32	820	34	884	36
Ulverstone	2,626	14	3,278	18	3,323	18	3,471	19	3,698	20	3,886	21

Analysis of License Figures For 1935

AUSTRALIA is somewhat fortunate in having Government radio license figures available to take periodical analysis of the public acceptance of broadcasting programmes.

As is generally known, the Commonwealth Government, under authority of the Wireless Act, requires all people possessing a wireless receiving set to take out a listener's license, which costs £1/1/- in zone 1 within 250 miles of such stations as are determined by the P.M.G. and 15/- in zone 2—all other territory outside zone 1. Of this 21/- the Australian Broadcasting Commission receives 12/-, while 9/- goes to the P.M.G.'s Department to carry out the technical requirements of the A.B.C., maintain existing stations and erect new stations, provide land lines and all technical equipment.

The P.M.G.'s Wireless Inspectors' Branch supervises the issuing, etc., of licenses through the post offices. This system provides a reliable method of ascertaining the number of radio sets in operation, with the exception of those who have not taken out a license, and who if found out, will be prosecuted.

The figures detailed below showing general growth, reveal that the rate of growth is slowing up, which of course must be more pronounced as more homes possess radio sets. In effect the market is decreasing and therefore the rate must slow up. For instance, the percentage increase during 1935 was 12.9 compared to the total licenses in force on December 31, 1934, but during 1934 the percentage growth was 31.4 compared to 1933—23.7

During last year there was a net increase of 88,518 out of 169,261 new issues as per the following table. Actually 1935 was the second best year for new issues, but only fourth in respect to the net increase.

	New Issues	Net Increase
1924	38,336	—
1925	55,087	46,794
1926	123,332	102,098
1927	115,714	70,951
1928	88,830	30,695
1929	82,711	21,107
1930	89,978	19,484
1931	92,844	8,193
1932	141,247	81,522
1933	162,986	99,448
1934	229,004	163,006
1935	169,621	88,518

Cancellations During 1935

IN the question of broadcast listeners' license cancellations, it must be remembered that for accountancy purposes, the Postmaster-General's Department regards as cancelled, every license due for renewal which is not renewed in the particular month.

If a license is not renewed this month, but say is renewed in two months' time, it will be treated as a renewal unless an explanation and acceptance by the wireless inspector is obtained, but generally these are treated as renewals; so that it can be accepted that every new issue means a new radio home with a new wireless set.

It must be expected that the number of cancellations will be greater as the licenses in force increase. The real test of the cancellation position is to ascertain what percentage of licenses issued in one year is not renewed in the next. Such a study shows that in the year 1935, although the cancellations were greater in number they had the lowest percentage, as will be seen by the following table.

Licenses issued in		Cancelled following year. Number	Percentage
1924	38,336	8,278	21.6
1925	85,130	21,145	24.8
1926	187,228	44,682	23.9
1927	258,179	58,112	22.5
1928	288,874	61,605	21.3
1929	309,981	70,523	22.7
1930	329,465	84,651	25.7
1931	337,658	59,725	17.7
1932	419,180	63,538	15.2
1933	518,628	65,998	12.7
1934	681,634	81,103	11.9

Cancellations of Broadcast Listeners' Licenses During 1935.

Month.	C'wealth	N.S.W.	Vic.	Q'land	S.A.	W.A.	Tas.
January	5,715	2,261	2,349	305	433	73	294
February	4,226	896	919	1,468	544	129	270
March	4,619	1,664	1,523	368	581	162	321
April	6,306	2,532	2,273	454	508	194	345
May	6,638	2,241	2,176	613	627	614	367
June	12,847	4,523	4,323	1,298	1,432	691	580
July	10,155	4,819	3,016	715	671	417	517
August	10,623	4,661	3,128	843	1,144	197	650
September	4,672	1,409	1,830	369	543	173	348
October	6,093	1,926	2,558	328	644	277	360
November	3,936	1,052	1,321	578	384	241	360
December	5,273	1,735	2,126	306	642	206	258
	81,103	29,719	27,542	7,645	8,153	3,374	4,670
Percentage of Total		36.6	33.9	9.4	10	4.1	5.7
Total for 1934	65,998	22,656	26,510	5,290	5,362	2,878	3,304
Percentage for 1934		34.3	40.1	8	8.1	4.3	5

ANALYSIS OF LICENSE FIGURES FOR 1935—(Continued).

THE total number of new licenses issued during 1935 was 169,621, and of these 60,963 (35.9 per cent.) were issued in N.S.W., 51,164 (30.1 per cent.) in Victoria, 19,835 (11.6 per cent.) in Queensland, 17,465 (10.2 per cent.) in South Australia, 12,176 (7.1 per cent.) in Western Australia, and 8.017 (4.6 per cent.) in Tasmania. See following table for details of figures.

New Issues Broadcast Listeners' Licenses from January to December, 1935.

Month.	C'wealth	N.S.W.	Vic.	Q'land	S.A.	W.A.	Tas.
January	11,846	5,160	2,974	1,441	1,128	660	483
February	10,940	4,403	2,915	1,314	1,129	675	504
March	12,346	4,612	3,883	1,270	1,233	861	487
April	12,881	4,554	4,070	1,438	1,394	913	512
May	16,455	5,798	5,116	1,955	1,619	1,296	671
June	16,101	5,768	4,716	1,913	1,661	1,298	744
July	18,262	6,384	5,463	2,203	1,912	1,409	891
August	17,264	6,077	5,470	1,811	1,734	1,169	1,003
September	14,297	4,903	4,510	1,754	1,339	1,009	782
October	14,118	4,687	4,429	1,727	1,526	1,056	693
November	13,284	4,574	4,085	1,577	1,367	985	696
December	11,827	4,043	3,533	1,432	1,423	845	551
Totals	169,621	60,963	51,164	19,835	17,465	12,176	8,017
Percentage of total		35.9	30.1	11.6	10.2	7.1	4.6

Renewals During 1935

DURING 1935 renewals of licenses totalled 600,531, of which 233,269 (36.9 per cent.) were taken out in N.S.W., 199,593 (33.2 per cent.) in Victoria, 55,076 (9.1 per cent.) in Queensland, 64,323 (10.7 per cent.) in South Australia, 34,043 (5.6 per cent.) in West Australia, and 14,227 (2.3 per cent.) in Tasmania.

Renewals of Broadcast Listeners' Licenses from January to December, 1935.

Month.	C'wealth	N.S.W.	Vic.	Q'land	S.A.	W.A.	Tas.
January	36,318	14,729	11,537	3,364	3,735	1,886	1,067
February	35,930	14,479	12,541	3,283	3,376	1,585	666
March	38,307	14,980	12,938	3,711	3,928	1,922	828
April	39,757	14,723	13,996	3,453	4,472	2,272	841
May	54,424	20,141	18,652	4,847	6,244	3,242	1,298
June	61,901	22,777	20,482	5,739	7,423	3,798	1,682
July	70,942	27,944	22,230	6,411	8,304	4,160	1,893
August	70,630	26,160	23,876	5,954	8,710	4,015	1,915
September	52,055	21,294	16,758	5,039	4,933	2,921	1,110
October	50,300	19,619	17,182	5,001	4,528	2,947	1,023
November	47,775	19,497	15,466	4,626	4,341	2,901	944
December	42,192	16,926	18,935	3,648	4,329	2,394	960
Totals	600,531	233,269	199,593	55,076	64,323	34,043	14,227
Percentage of total		36.9	33.2	9.1	10.7	5.6	2.3

The following table shows the total licenses in force at December 31, for the years 1932 to 1935.

DECEMBER	C'wealth	N.S.W.	Vic.	Q'land	S.A.	W.A.	Tas.
1935—Total at 31/12/35	770,152	294.232	250,758	74,911	81,788	46,219	22,244
Increase for 1935	88,518	31,244	23,623	12,190	9,312	8,800	3,647
% Increase for year	12.9	11.8	10.4	19.4	12.8	23.5	19
1934—Total at 31/12/34	681,634	262,988	227,135	62,721	72,476	37,419	18,597
Increase for 1934	163,006	65.119	42,274	21,703	16,714	12,094	4.704
% Increase for year	31.4	32.9	22.8	70.5	29.9	47.7	33.8
1933—Total at 31/12/33	518,628	197.869	184,861	40,918	55,762	25,325	13.893
Increase for 1933	99,448	37.897	28,554	8,735	12,400	9,198	2.664
% Increase for year	23.7	23.6	18.2	27.1	28.5	57	23.7
1932—Total at 31/12/32	419,180	159,972	156,307	32,183	43,362	16,127	11,229
Increase for 1932	81,526	34,463	22,134	5,734	11,202	5,327	2,562
% Increase for year	24.1	27.4	16.4	21.6	34.8	49.3	29.5
1931—Total at 31/12/31	337,654	125.409	134,173	26,449	32,160	10,800	8.667
Increase over 4 years	432,498	168,723	116,585	48,363	49,638	35,419	13,577
Percentage gain in 4 years	128	134	86	108	154	327	156

The progress by various States makes very interesting reading. During 1935, West Australia progress 23.5 per cent., Queensland 19.4 per cent., Tasmania 19 per cent., South Australia 12.8 per cent., N.S.W. 11.8 per cent. and Victoria 10.4 per cent.

During the past 4 years, the greatest percentage growth was also registered by West Australia at 327 per cent.. then Tasmania 156 per cent., South Australia 154 per cent., N.S.W. 134 per cent., Queensland 108 per cent., and Victoria 86 per cent., while the Commonwealth aggregate was 128 per cent.

It is obvious that the Cricket year, 1934, when the Australian Eleven toured England, was responsible for the highest gain in most States.

ANALYSIS OF LICENSE FIGURES FOR 1935—(Continued).

COMPARISON OF DECEMBER FIGURES

THE monthly progress of license figures is always watched carefully by those interested in selling radio sets, and likewise those interested in selling other products to those owners per medium of advertising over the air. The following table gives the figures for the month of December for the past 5 years, 1931 to 1935.

It will be seen that the Commonwealth aggregate, Queensland, South Australia, West Australia and Tasmania for 1935 are above the average for the five-year period, while the two major States, N.S.W. and Victoria, are below the 5-year average.

New Issues During Months of December For Years 1931 to 1935.

December	C'wealth	N.S.W.	Vic.	Q'land	S.A.	W.A.	Tas.
1935	11,827	4,043	3,533	1,432	1,423	845	551
1934	11,761	4,727	3,273	1,266	1,217	855	423
1933	12,079	4,686	3,843	958	1,275	901	416
1932	13,866	4,517	5,834	968	1,355	686	508
1931	8,737	3,916	2,467	798	847	457	252
Total	58,270	21,889	18,950	5,422	6,117	3,744	2,150
Average per year	11,654	4,378	3,790	1,084	1,223	749	430

POPULATION RATIO GROWTH

PROBABLY the best idea of comparative growth of the various States is reflected in the ratio of 100 of population to radio licenses over the year 1935.

Again, it is seen that West Australia is in the lead of percentage increase over the year, with 1.75, while South Australia is second with 1.42, then Tasmania with 1.35, Victoria with 1.22, Queensland with 1.07 and N.S.W. runs in a bad last place with only 0.98.

But, while those figures indicate the improvement during the year, it is a different story when one considers the ratio figures as at December 31 last. One then sees that South Australia retains its place of greatest number of licenses per 100 of population, followed by Victoria, N.S.W., W.A. and Tasmania, and then Queensland.

Ratio of Licenses to 100 of Population from January to December, 1935

Month.	C'wealth	N.S.W.	Vic.	Q'land	S.A.	W.A.	Tas.
January	10.28	10.08	12.41	6.65	12.43	8.59	8.38
February	10.38	10.22	12.52	6.64	12.52	8.71	8.48
March	10.47	10.29	12.63	6.74	12.62	8.89	8.42
April	10.57	10.37	12.73	6.83	12.77	9.03	8.53
May	10.71	10.50	12.89	6.97	12.94	9.18	8.62
June	10.74	10.53	12.90	7.02	12.97	9.29	8.76
July	10.87	10.59	13.03	7.17	13.18	9.51	8.92
August	10.97	10.64	13.16	7.27	13.28	9.73	9.07
September	11.09	10.76	13.31	7.37	13.41	9.88	9.30
October	11.22	10.87	13.36	7.52	13.56	10.06	9.45
November	11.35	10.99	13.56	7.62	13.73	10.22	9.59
December	11.43	11.06	13.63	7.72	13.85	10.34	9.33
Percentage Increase in 1935	1.15	0.98	1.22	1.07	1.42	1.75	1.35

Australian Commercial Broadcasting Stations as at June 1st, 1936

Federal Capital Territory

2CA **CANBERRA.** Licensee—A. J. Ryan, Broadcasters Ltd., Canberra. Wavelength 286m. 1050 K.C. Aerial Power 500 watts. Licenced 27/8/21. Commenced 14/11/31. Station located at Canberra.

NEW SOUTH WALES

Metropolitan

2CH **SYDNEY.** Licensee—New South Wales Council of Churches' Service, 77 York Street, Sydney. Station owned and operated by Amalgamated Wireless Ltd. Wavelength 252 m. 1,190 K.C. Aerial power 1,000 watts. Licensed 7/1/31. Commenced 15/2/32. Station located at Dundas.

2GB **SYDNEY.** Licensee — Theosophical Broadcasting Station Ltd., 29 Bligh Street, Sydney. Wavelength 345 m. 870 K.C. Aerial power 1,000 watts. Licensed 13/5/26. Commenced 23/8/26. Station located at Mosman.

2KY **SYDNEY.** Licensee—The Labour Council of New South Wales, 424 George Street, Sydney. Wavelength 294 m. 1,020 K.C. Aerial power 1,000 watts. Licensed 20/5/25. Commenced 31/10/25. Station located near Manly.

2SM **SYDNEY.** Licensee—Catholic Broadcasting Co., Australia House, Wynyard Square, Sydney. Wavelength 236 m. 1,270 K.C. Aerial power 1,000 watts. Licensed 10/9/31. Commenced 24/12/31. Station located at Pennant Hills.

2UE **SYDNEY.** Licensee—Radio 2UE Sydney Ltd., 296 Pitt Street, Sydney. Wavelength 316 m. 950 K.C. Aerial power 1,000 watts. Licensed 7/11/24. Commenced 26/1/25. Station located near Cronulla.

2UW **SYDNEY.** Licensee—Commonwealth Broadcasting Corporation Ltd.. 49 Market Street. Sydney. Wavelength 270 m. 1,110 K.C. Aerial power 750 watts. Licensed 13/2/25. Commenced 13/2/25. Station located in Sydney, city.

Country.

2AD **ARMIDALE.** Licensee — Northern Broadcasters Ltd., 5 Barrack Street, Sydney. Wavelength 278 m. 1,080 K.C. Aerial power 100 watts. Commenced 5/2/36. Station located at Armidale.

2AY **ALBURY.** Licensee—Amalgamated Wireless A/sia Ltd., 47 York Street, Sydney. Wavelength 203 m. 1,480 K.C. Aerial power 100 watts. Licensed 13/6/30. Commenced 17/12/30. Station located at Albury.

2BH **BROKEN HILL.** Licensee — Radio Silver City Ltd., Head Office, O'Brien House, Young Street, J. M. Wilcox, B 1364, Sydney. Wavelength 226 m. 1,330 K.C. Aerial power 100 watts. Licensed 6/9/33. Commenced 30/6/34. Station located at Broken Hill.

2DU **DUBBO.** Licensee—Central Western Radio Services Ltd., Dubbo, N.S.W. Wavelength 283 m. 1,060 K.C. Aerial power 100 watts. Station located at Dubbo. Commenced 3/7/36.

2GF **GRAFTON.** Licensee—Grafton Broadcasting Co. Ltd., 47 York St., Sydney. Wavelength 248 m. 1,210 K.C. Aerial power 100 watts. Licensed 16/8/32. Commenced 15/12/33. Station located at Grafton.

2GN **GOULBURN.** Licensee — Goulburn Broadcasting Co. Ltd., Auburn Street, Goulburn. Wavelength 216 m. 1,390 K.C. Aerial power 200 watts. Licensed 30/9/30. Commenced 17/12/31. Station located at Goulburn.

2GZ **ORANGE.** Licensee — Country Broadcasting Services Ltd., 12 Spring Street, Sydney. Sydney. Wavelength 303 m. 990 K.C. Aerial power 2,000 watts. Licensed 16/4/35. Commenced 31/10/35. Station located near Orange.

2HD **NEWCASTLE.** Licensee—Airsales Broadcasting Co., P.O. Box 123, Newcastle. Wavelength 263 m. 1,140 K.C. Aerial power 500 watts. Licensed 1/12/24. Commenced 27/1/25. Station located at Sandgate, near Newcastle.

2KA **KATOOMBA.** Licensee—Radio Katoomba Ltd., Commonwealth Bank Chambers, Katoomba. Wavelength 259 m 1,160 K.C. Aerial power 100 watts. Licensed 14/9/35. Commenced 7/9/35. Station located near Katoomba.

2KO **NEWCASTLE.** Licensee—Newcastle Broadcasting Co. Ltd., 57 Hunter Street, Newcastle. Wavelength 213 m. 1,410 K.C. Aerial power 500 watts. Licensed 9/3/31. Commenced 1/8/31. Station located at Sandgate, near Newcastle.

COMMERCIAL BROADCASTING STATIONS.—(Continued).

2LV **INVERELL.** Licensee—Northern Broadcasters Ltd., 5 Barrack Street, Sydney. Wavelength 366 m. 820 K.C. Aerial power 100 watts. Commenced 30/3/36. Station located at Inverell.

2MO **GUNNEDAH.** Licensee — M. J. Oliver, Marquis Street, Gunnedah. Wavelength 221 m. 1,360 K.C. Aerial power 50 watts. Licensed 16/6/30. Commenced 16/1/31. Station located at Gunnedah.

2NZ **NARRABRI.** Licensee — Country Broadcasting Services Ltd., 12 Spring Street, Sydney. Wavelength 256 m. 1,170 K.C. Aerial power 2,000 watts. (Station not yet completed).

2QN **DENILIQUIN.** Licensee—Deniliquin Broadcasting Co. Ltd., End Street, Deniliquin. Wavelength 208 m. 1,440 K.C. Aerial power 50 watts. Licensed 29/5/35. Commenced 2/11/35. Station located at Deniliquin.

2RG **GRIFFITH.** Licensee—Murrumbidgee Broadcasters Ltd., Griffith. Wavelength 204 m. 1,470 K.C. Aerial power 50 watts. Station located at Griffith.

2TM **TAMWORTH.** Licensee—Tamworth Radio Development Co., Peel Street, Tamworth. Wavelength 231 m. 1,300 K.C. Aerial power 50 watts. Licensed 21/1/35. Commenced 27/2/35. Station located at Tamworth, 2,000 watts station now being planned.

2WG **WAGGA.** Licensee—Riverina Radio Broadcasting Co. Ltd., 16 Fitzmaurice Street, Wagga. Wavelength 261 m. 1,150 K.C. Aerial power 1,000 watts. Licensed 21/8/31. Commenced 29/6/32. Station located near Wagga.

2WL **WOLLONGONG.** Licensee — Wollongong Broadcasting Co., Church and Edward Streets, Wollongong. Wavelength 210 m. 1,430 K.C. Aerial power 300 watts. Licensed 1/7/31. Commenced 18/7/31. Station located at Wollongong.

2XN **LISMORE.** Licensee — Richmond River Broadcasters Ltd., Lismore. Wavelength 224 m. 1,340 K.C. Aerial power 500 watts. Licensed 6/1/30. Commenced 1/5/30. Station located at Lismore.

VICTORIA

Metropolitan

3AK **MELBOURNE.** Licensee—Melbourne Broadcasters Pty. Ltd., 480 Bourke Street, Melbourne. Wavelength 200 m. 1,500 K.C. Aerial power 200 watts. Licensed 20/11/31. Commenced 29/11/31. Station located at Balwyn.

3AW **MELBOURNE.** Licensee — 3AW Broadcasting Co. Pty. Ltd., 382 Latrobe Street. Melbourne, C.1. Wavelength 234 m. 1,280 K.C. Aerial power 600 watts. Licensed 23/10/31. Commenced 23/2/32. Station located at Melbourne.

3DB **MELBOURNE.** Licensee — 3DB Broadcasting Coy. Pty. Ltd., Flinders Street, Melbourne, C.1. Wavelength 291 m. 1,030 K.C. Aerial power 600 watts. Licensed 18/10/26. Commenced 21/2/27. Station located at Melbourne.

3KZ **MELBOURNE.** Licensee — Industrial Printing and Publicity Co., 24-30 Victoria Street, Carlton, N.3. Wavelength 254 m. 1,180 K.C. Aerial power 600 watts. Licensed 27/5/30. Commenced 8/12/30. Station located at Melbourne.

3UZ **MELBOURNE.** Licensee — Nilson's Broadcasting Service Pty. Ltd., 45 Bourke Street, Melbourne, C.1. Wavelength 323 m. 930 K.C. Aerial power 600 watts. Licensed 6/2/25. Commenced 8/3/25. Station located at Melbourne.

3XY **MELBOURNE.** Licensee — Station 3XY Princess Theatre Building, 163 Spring Street, Melbourne. Wavelength 211 m. 1,420 K.C. Aerial power 600 watts. Licensed 17/5/35. Commenced 8/9/35. Station located at Melbourne.

Country

3BA **BALLARAT.** Licensee — Bllarat Broadcasters Pty. Ltd., 56 Lydiard Street, Ballarat. Wavelength 227 m. 1,320 K.C. Aerial power 500 watts. Licensed 2/6/30. Commenced 31/7/30. Station located at Ballarat.

3BO **BENDIGO.** Licensee — Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney. Wavelength 309 m. 970 K.C. Aerial power 200 watts. Licensed 17/9/30. Commenced 4/6/31. Station located at Bendigo.

3GL **GEELONG.** Licensee — Geelong Broadcasters Pty. Ltd., National Mutual Buildings, Moorabool Street, Geelong. Wavelength 222 m. 1,350 K.C. Aerial power 100 watts. Licensed 14/8/30. Commenced 3/12/30. Station located at Geelong.

3HA **HAMILTON.** Licensee — Western Province Radio Pty. Ltd., 37 Gray Street, Hamilton. Wavelength 297 m. 1,010 K.C. Aerial power 300 watts. Licensed 9/10/31. Commenced 24/10/31. Station located at Hamilton.

3HS **HORSHAM.** Licensee — 3DB Broadcasting Co. Pty. Ltd., 84 Wilson Street, Horsham. Wavelength 219 m. 1,370 K.C. Aerial power 50 watts. Licensed 1/3/33. Commenced 11/9/33. Station located at Horsham.

3MA **MILDURA.** Licensee — Sunraysia Broadcasters Pty. Ltd., 22 Deakin Avenue, Mildura. Wavelength 333 m. 900 K.C. Aerial power 100 watts. Licensed 8/11/32. Commenced 25/5/33. Station located at Mildura.

COMMERCIAL BROADCASTING STATIONS.—(Continued).

3MB **BIRCHIP.** Licensee — Mallee Broadcasters Pty. Ltd., Cumming Avenue, Birchip. Wavelength 201 m. 1,490 K.C. Aerial power 100 watts. Licensed 19/6/35. Commenced 26/10/35. Station located at Birchip.

3SH **SWAN HILL.** Licensee — Swan Hill Broadcasting Co., Campbell Street, Swan Hill. Wavelength 278 m. 1,080 K.C. Aerial power 100 watts. Licensed 19/5/31. Commenced 27/8/31. Station located at Swan Hill.

3TR **SALE.** Licensee — Gippsland Publicity Pty. Ltd., Raymond Street, Sale. Wavelength 242 m. 1,240 K.C. Aerial power 500 watts. Licensed 26/5/30. Commenced 29/9/30. Station located at Sale.

3WR **SHEPPARTON.** Licensee — Goulburn Valley and North Eastern Broadcasters Pty. Ltd., High Street, Shepparton. Wavelength 238 m. 1260 K.C. Aerial power 500 watts. Licensed 4/10/30. Commenced 5/1/31. Station located near Shepparton.

3YB **WARRNAMBOOL.** Licensee — W. & W. Broadcasters Pty. Ltd., 430 Little Collins St., Melbourne. Wavelength 283 m. 1,060 K.C. Aerial power 50 watts. Licensed 25/10/35. Commenced 18/1/36. Station located at Warrnambool.

QUEENSLAND

Metropolitan

4BC **BRISBANE.** Licensee — J. B. Chandler & Co., 43 Adelaide Street, Brisbane. Wavelength 268 m. 1,120 K.C. Aerial power 1,000 watts. Licensed 7/6/30. Commenced 16/8/30. Station located at Oxley.

4BH **BRISBANE.** Licensee—Broadcasters (Aust.) Ltd., Parbury House, Eagle Street, Brisbane. Wavelength 217 m. 1,380 K.C. Aerial power 1,000 watts. Licensed 4/2/31. Commenced 2/1/32. Station located at Bald Hills.

4BK **BRISBANE.** Licensee — Brisbane Broadcasting Pty. Ltd., 47 Charlotte Street, Brisbane. Wavelength 233 m. 1,290 K.C. Aerial power 500 watts. Licensed 5/8/30. Commenced 29/9/30. Station located at Brisbane.

Country

4AK **OAKEY.** Licensee — Brisbane Broadcasting Pty. Ltd., P.O. Box 531H Brisbane. Wavelength 246 m. 1,220 K.C. Aerial power 2,000 watts. Licensed 6/2/35. Commenced 31/8/35. Station located at Oakey.

4AY **AYR.** Licensee — Ayr Broadcasters Pty. Ltd., Ardmillan Road, Ayr. Wavelength 306 m. 980 K.C. Aerial power 300 watts. Licensed 4/5/34. Commenced 1/10/34. Station located at Ayr.

4BU **BUNDABERG.** Licensee—Bundaberg Broadcasters Pty. Ltd., 117 Bourbong Street, Bundaberg. Wavelength 203 m. 1,480 K.C. Aerial power 100 watts. Licensed 19/6/35. Commenced 16/12/35. Station located at Bundaberg.

4CA **CAIRNS.** Licensee — Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney. Wavelength 216 m. 1,390 K.C. Aerial power 100 watts. Commenced May, 1936. Station located 1 mile from Cairns.

4GR **TOOWOOMBA.** Licensee — Gold Radio Service Ltd., 43 Adelaide Street, Brisbane. Wavelength 300 m. 1,000 K.C. Aerial power 500 watts. Licensed 5/6/25. Commenced 9/8/25. Station located at Toowoomba.

4IP **IPSWICH.** Licensee — Ipswich Broadcasting Co. Pty. Ltd., Brisbane Street, Ipswich. Wavelength 208 m. 1,440 K.C. Aerial power 50 watts. Licensed 2/9/35. Commenced 2/9/35. Station located at Ipswich.

4LG **LONGREACH.** Licensee — Central Western Broadcasting Co. Wavelength 273 m. 1,100 K.C. Aerial power 300 watts. Commenced 4/5/36. Station located at Longreach.

4MB **MARYBOROUGH.** Licensee — Maryborough Broadcasting Co. Ltd., 43 Adelaide Street, Brisbane. Wavelength 283 m. 1,060 K.C. Aerial power 100 watts. Licensed 28/8/31. Commenced 16/8/32. Station located at Maryborough.

4MK **MACKAY.** Licensee — Mackay Broadcasting Service, 64 Nelson Street, Mackay. Wavelength 259 m. 1,160 K.C. Aerial power 100 watts. Licensed 14/3/30. Commenced 12/1/31. Station located at Mackay.

4RO **ROCKHAMPTON.** Licensee — Rockhampton Broadcasting Co. Pty. Ltd., 43 Adelaide Street, Brisbane. Wavelength 226 m. 1,330 K.C. Aerial power 50 watts. Licensed 8/10/31. Commenced 2/2/32. Station located at Rockhampton.

4TO **TOWNSVILLE.** Licensee — Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney. Wavelength 256 m. 1,170 K.C. Aerial power 200 watts. Licensed 30/9/30. Commenced 5/10/31. Station located at Townsville.

4VL **CHARLEVILLE.** Licensee — Charleville Broadcasting Service Pty. Ltd., Burke Street, Charleville. Wavelength 209.8 m. 1.430 K.C. Aerial power 50 watts. Licensed 6/1/36. Commenced 12/2/36. Station located at Charleville.

4WK **WARWICK.** Licensee — Warwick Broadcasting Co. Pty. Ltd., Cnr. King and Albion Streets, Warwick. Wavelength 333 m. 900 K.C. Aerial power 50 watts. Licensed 1/3/35. Commenced 6/5/35. Station located at Warwick.

COMMERCIAL BROADCASTING STATIONS.—(Continued).

Papua

4PM **PORT MORESBY.** Licensee — Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney. Wavelength 221 m. 1,360 K.C. Aerial power 100 watts. Licensed 6/12/34. Commenced 25/10/35. Station located at Port Moresby.

SOUTH AUSTRALIA

Metropolitan

5AD **ADELAIDE.** Licensee — Advertiser Newspapers Ltd., Waymouth Street, Adelaide. Wavelength 229 m. 1,310 K.C. Aerial power 300 watts. Licensed 2/6/30. Commenced 2/8/30. Station located at Adelaide.

5DN **ADELAIDE.** Licensee — Hume Broadcasters Ltd., 29 Rundle Street, Adelaide. Wavelength 313 m. 960 K.C. Aerial power 300 watts. Licensed 1/12/24. Commenced 24/2/25. Station located at Adelaide.

5KA **ADELAIDE.** Licensee—Sport Radio Broadcasting Co. Ltd., Richard Buildings, Currie Street, Adelaide. Wavelength 250 m. 1,200 K.C. Aerial power 1,500 watts. Licensed 26/8/26. Commenced 25/3/27. Station located at Adelaide.

Country

5MU **MURRAY BRIDGE.** Licensee — Murray Bridge Broadcasting Co. Ltd., Bridge Street, Murray Bridge. Wavelength 224 m. 1,340 K.C. Aerial power 100 watts. Licensed 19/4/34. Commenced 16/9/34. Station located at Murray Bridge.

5PI **CRYSTAL BROOK.** Licensee — Midlands Broadcasting Services Ltd., Advertiser Building, Weymouth Street, Adelaide. Wavelength 288 m. 1,040 K.C. Aerial power 2,000 watts. Licensed 24/11/31. Commenced 7/1/32. Station located at Crystal Brook.

5RM **MURRAY HEIGHTS.** Licensee — River Murray Broadcasters Ltd., 29 Rundle Street, Adelaide. Wavelength 353 m. 850 K.C. Aerial power 1,000 watts. Licensed 5/2/35. Commenced 30/9/35. Station located near Renmark.

WESTERN AUSTRALIA

Metropolitan

6IX **PERTH.** Licensee — West Australian Newspapers Ltd., St. George's Terrace, Perth. Wavelength 242 m. 1,240 K.C. Aerial power 500 watts. Licensed 26/7/32. Commenced 27/11/33. Station located at Perth.

6ML **PERTH.** Licensee — W.A. Broadcasters Ltd., Lyric House, Murray Street, Perth. Wavelength 265 m. 1,130 K.C. Aerial power 500 watts. Licensed 2/12/29. Commenced 19/3/30. Station located at Perth.

6PR **PERTH.** Licensee — Nicholson's Ltd., 86-90 Barrack Street, Perth. Wavelength 341 m. 880 K.C. Aerial power 500 watts. Licensed 14/8/31. Commenced 14/10/31. Station located at Applecross, near Fremantle.

Country.

6AM **NORTHAM.** Licensee — Northam Broadcasters Ltd., Princess Chambers, 23 William Street, Perth. Wavelength 306 m. 980 K.C. Aerial power 2,000 watts. Licensed 13/12/33. Commenced 1/6/34. Station located at Northam.

6KG **KALGOORLIE.** Licensee—Goldfields Broadcasters 1933 Ltd., 209 Hannan Street, Kalgoorlie. Wavelength 248 m. 1,210 K.C. Aerial power 500 watts. Licensed 22/6/31. Commenced 16/9/31. Station located near Kalgoorlie.

6NA **NARROGIN.** Licensee — Great Southern Broadcasters Ltd. Wavelength 259 m. 1,160 K.C. Aerial power 500 watts. Station located 2¼ miles from Narrogin.

6WB **KATANNING.** Licensee — W.A. Broadcasters Ltd., Lyric House, Murray Street, Perth. Wavelength 280 m. 1,070 K.C. Aerial power 2,000 watts. Station located four and a half miles from Katanning.

TASMANIA

Metropolitan

7HO **HOBART.** Licensee — Commercial Broadcasters Pty. Ltd., 82 Elizabeth Street, Hobart. Wavelength 349 m. 860 K.C. Aerial power 100 watts. Licensed 10/4/30. Commenced 13/8/30. Station located at Hobart.

Country

7BU **BURNIE.** Licensee — Findlays Pty. Ltd., Wilson. Wavelength 455 m. 660 K.C. Aerial power 50 watts. Licensed 6/2/35. Commenced 19/10/35. Station located at Burnie.

7LA **LAUNCESTON.** Licensee — Findlay & Wills Broadcasters Pty. Ltd., 67 Brisbane St., Launceston. Wavelength 273 m. 1,000 K.C. Aerial power 300 watts. Licensed 27/6/30. Commenced 13/12/30. Station located at Launceston.

7UV **ULVERSTONE.** Licensee — Northern Tasmania Broadcasters Pty. Ltd., 116 Queen St., Melbourne. Wavelength 205 m. 1,460 K.C. Aerial power 300 watts. Licensed 30/9/31. Commenced 6/8/32. Station located at Ulverstone.

Particulars of Commercial Broadcasting Stations in Australia

2AD ARMIDALE—277.7 metres

NORTHERN BROADCASTERS LTD. (controlling 2AD and 2LV). Business Address, Faulkner Street, Armidale. Managing Director: Hon. E. C. Sommerlad, M.L.C. Directors: Hon. D. H. Drummond, M.L.A.; Messrs. A. H. MacArthur, Knapton, and Seward. Location of Studio: Armidale. Location of Transmitter: One mile from the Armidale P.O. Licensed Power: 100 watts.

Slogan Name: "The Voice of the North."

Number of Studios: Two.

Sales Manager: John Creighton. **Chief Announcer:** John Creighton. **Other Announcers:** Peter Macgregor and Lindo-Taylor. **Chief Engineer:** Lindo-Taylor. **Engineer:** W. Prince. **Secretary:** R. L. Blake, Sec. Northern Broadcasters Limited for 2AD and 2LV.

Nominal Capital: £30,000. **Paid-up Capital:** £6,000. **Bankers:** Commercial Banking Co. of Sydney. **Solicitors:** A. W. Simpson. **Auditors:** W. S. Forsyth & Co.

Sales Reps.: A. D. Bourke, 5-7 Barrack Street, Sydney; R. J. McCartney, Newspaper House, 274 Collins Street, Melbourne.

Special Sessions: "Monte Cristo," nightly 7.30 to 7.45; "Glimpses of the Great Monday Nights," 8 to 8.15 (John Creighton); "Ports of Call" (Sponsored); "B.B.C. on Parade" (Sponsored); "Beauty That Endures" (Sponsored), Wednesday nights 7.15; "Reflections of a War-time Pilot," Thursday nights 8 to 8.15 (John Creighton); "Historical Romances"; "The Man on the Land" (Sponsored), etc.

Transmission Times: Every day 7 to 9 a.m., 11 a.m. to 2 p.m., 5 to 10.30 p.m.

2AY ALBURY—203 metres

AMALGAMATED WIRELESS (A/SIA) LTD. Business Address: National Buildings, Dean Street, Albury. General Manager: John Dower. Location of Studios and Transmitter: Pooles Hill, Albury. Licensed Power: 100 watts, unmodulated.

Slogan Name: "The Albury Station."

Number and Size of Studios: No. 1, 25ft. x 12ft.; No. 2, 22ft. x 11ft.

Chief Announcer: John Dower. **Other Announcers:** Angus Campbell, Cleaver Bunton, B. Schneider.

Sales Reps.: Amalgamated Wireless (A/sia) Ltd., Sydney and Melbourne.

Special Sessions: Childen's Session, daily, 5.30 p.m. (Uncle John and Uncle Gus); Children's Community Singing (Uncle John, J. Dower), Friday, 5 to 6 p.m.; Sporting Session (Cleaver Bunton), nightly, 7.30 p.m.; Old Time Dance, Saturday, 8.30 to 11 p.m. (Angus Campbell); "The Good Companion," Friday, 9.30 p.m. (Rev. C. G. Lavender); 2AY Players in radio plays (producer, John Durant), Tuesday, 8 p.m.; "Film and Film Stars" (George Osbourne), Monday, 6.40 p.m.; "The Countryman's News" (John Dower), nightly, 9.15 p.m.; "Nemesis Incorporated" (T.), Monday, 9 p.m.; "The Ghost Corps" (T.), Thursday, 8.30 p.m.; Judge Rutherford (T.), Tuesday, 9.45 p.m.; "Theatre of the Air" (Angus Campbell), Thursday, 8 p.m.; Rutherglen Session, 8.30 p.m., Tuesday (Angus Campbell); Holbrook Session, 8.45 p.m., Wednesday (John Dower); "You're Telling Me," 9.30 p.m., Wednesday (John Dower and Angus Campbell); Thiel's "Bright Music," 8.30 p.m., Wednesday (John Dower); Preservene "Musical Box," 8.15 p.m. Tuesday and Thursday (Angus Campbell); "The Shell Show," 8.30 p.m., Sunday (relay).

Transmission Times: Monday to Saturday (inclusive), 12.15 to 1.45 p.m.; Monday to Thursday, 5.30 to 10.30 p.m.; Friday, 5 to 10.30 p.m.; Saturday, 5.30 to 11 p.m.; Sunday, 7 to 10 p.m.

Total Transmission Hours During 1935: 2,080 hours.

2BH BROKEN HILL—226 metres

RADIO SILVER CITY LTD. Business Address: O'Brien House, Young Street, Sydney. Directors: G. H. Bassett (Chairman), A. E. Norton, Roy Allen (General Manager). Location of Studio and Transmitter: Broken Hill. Licensed power: 100 watts.

Chief Announcer: W. Joyce. **Chief Engineer:** Roy Allen. **Secretary:** J. M. Wilcox.

Nominal Capital: £5,000. **Paid-up Capital:** £3,500. **Bankers:** Commonwealth Bank of Australia. **Solicitors:** Manning Riddle & Co., Commonwealth Bank Building, Cnr. Pitt Street and Martin Place, Sydney.

2CA CANBERRA—286 metres

A. J. RYAN BROADCASTERS LIMITED. Business Address: Giles Street, Kingston, F.C.T. Managing Director: A. J. Ryan. Location of Studios: Giles Street, Kingston. Exact Location of Transmitter: Symonston (midway between Canberra and Queanbeyan). Licensed Power: 500 watts.

Chief Announcer: G. Barlin. **Other Announcers:** B. Scetrine, N. Norgrove. **Chief Engineer:** A. J. Ryan, M.Inst.R.E. Aust., A.M.I.R.E. (U.S.A.).

Transmission Times: Mondays to Fridays, 12.30 to 1 p.m., 5.30 to 10 p.m.; Saturdays, 6 to 10 p.m.; Sundays, 8 to 10 p.m.

How Business Men Have Rallied to Support of Commercial Broadcasting

Its Growth During Past Year

Leading sales executives have, perhaps, done more for the development of better broadcasting in Australia than all other efforts yet put together.

The State Building, which houses 2UW . . . transmitting from the heart of the city.

THROUGH the medium of sponsored programmes, artistic talent comparing favourably with that used on radio in any other part of the world, has been brought before the microphone. Yet it is only a few years ago that listeners regarded the message of the advertiser as something that intruded upon their enjoyment of a broadcast programme.

Of late, however, particularly during the past twelve months, methods of presentation have been evolved that completely eliminate any suggestion of former harshness in the delivering of the sales message.

As a result commercial radio has become what is tantamount to a habit with millions of listeners who tune in to broadcast programmes.

They follow the news contained in the commercial presentations on the air with the same avidity as a stock exchange investor follows the daily share market quotations.

What has been the result in big business of this intimate method of carrying the advertiser's message into the very homes of millions of people?

Many prominent manufacturers will supply the answer by supplying facts to show that present-day commercial broadcasting is producing startling results both in sales and goodwill.

Showmen in Radio

One very important realisation that has come with the growth of commercial broadcast entertainment, is that to succeed in attracting an enormous listening audience, a radio station should be controlled by showmen.

No better illustration of this showman angle could be afforded than the amazing growth of Station 2UW since, some four years ago, it was acquired by the Commonwealth Broadcasting Corporation.

The Directorate controlling 2UW, consists of men with more than twenty years' experience in show business—men who have lived and learned public requirements, and who are backed all the while by the greatest of Australia's entertainment organisations.

This means that the public get what they want and that, in natural sequence, the advertiser receives the support of pleased listeners.

It was the showman instinct that caused those directors to realise that during every minute of tweny-four hours a day someone, in some sphere, required entertainment. The result was the establishment of the all-round-the-clock service, the only one of its kind in the Empire, and a monument to the growth and development of commercial broadcasting.

Popular Features

With the expansion of the station activities has come features that strike the happy medium of listener appeal—the ideal in radio. The George Edwards productions, presented in an entirely new manner, provide easily the most popular features of Australian broadcasting. With new casts, new themes and new methods of production, these presentations offer entertainment of the highest possible order, and what is so important to sales executives—selling power that cannot be bettered, a fact that has been proved by amazing expressions of public appreciation during recent months.

Nor is any expense spared in catering for child listeners per medium of whom many a sales message is repeated to the parents. Frank Hatherley, known to radio listeners from coast to coast, is enjoying prenomenal success with his Bobby and Betty Bluegum sessions; his Sunshine Soldiers' Club with listening membership of over 10,000; and his Community Concerts.

Then, realising that Australia is a sporting nation, the directorate of this progressive radio station has seen to it that regardless of cost, only the finest sporting experts procurable are utilised for this very important broadcasting service with its tremendous listener interest and consequent marketing opportunity for the advertiser.

Finally there is what may be termed the life blood of a station from an entertainment point of view—the musical programme, and naturally a station never off the air, such as 2UW, must be in a position to feed the ever hungry demand for the most modern in recordings.

Here 2UW is in a very happy position because affiliation with the best-known houses of the world ensures a continuous supply of the works of all composers of note as well as a comprehensive market of electrical transcriptions from which to draw.

Behind it all, special attention is paid to production and continuity departments which are in the hands of men who have made a complete study of presentation and spoken advertising and understand the type of programme that has punch and selling power.

Transmitting the Message

Naurally the success of all these things from the advertiser's point of view depends on the clarity of the transmission and here, thanks to the foresight of its showmen directors, 2UW is in the fortunate possession of two transmitters, each representing the very latest in high fidelity production, which ensure an uninterrupted service and perfect reception during the twenty-four hours a day that the station is on the air.

That is the organisation behind a station that commands such a huge listening audience—an audience that is hungry in its demand for new features and bright entertainment—an audience that has increased out of all knowledge with the growth of commercial broadcasting and provides a tremendous field in which the advertising executive can market his wares.

(Ad.)

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

2CH SYDNEY—252 metres

Owners and Operators of Station: AMALGAMATED WIRELESS (A/SIA) LTD. (Licensee, N.S.W. Council of Churches, 77 York Street, Sydney). Location of Studios: 77 York Street, Sydney. Exact Location of Transmitter: Dundas, 9¾ miles N.W. of G.P.O. Licensed Power: 1,000 watts.

Slogan Name: "Entertains the Whole Family."

Number and Size of Studios: Main studio 35 x 25, with two smaller studios for dramatic productions.

General Manager: V. Brooker. **Sales Manager:** R. E. Lane. **Programme Manager:** Dion Wheeler. **Chief Announcer:** A. S. Cochrane. **Other Announcers:** K. Fowles, W. Penny, G. Wilson, E. Howell, D. Hill, D. Perry, C. Stanley, Janet Austen, Hope Suttor. **Salesmen:** Messrs. Clark, Minto, Perry. **Chief Engineer:** T. A. E. McNeill. **Other Engineers:** R. Gill, W. Cottrell, C. Binns, D. Marshall, H. F. Allen, K. Stewart.

Sales Reps.: Amalgamated Wireless (A/sia) Ltd., 167-169 Queen Street, Melbourne, Victoria (F 4161).

Special Sessions: "Danger Unlimited," Mon., Wed., Thurs., Sat., 7 p.m.; "The Ghost Corps," Mon., Wed., 7.45 p.m.; "Mr. and Mrs. Everybody," Mon. to Thurs., 8.5 p.m.; "Realm of Drama," Wed., 8.30 p.m.; "Solve Your Problem," Mon. and Thurs., 9 p.m.; "Contributed Comedy," Tues., 9 p.m.; "You're Telling Me," Tues., 7 p.m.; "The Puzzle King," Tues., Thurs., 8.40 p.m.; Serial Reading by John Longden, Mon. to Thurs., 9.30 p.m.; "One Thing After Another," Sat., 8.12 p.m.; "Nigger Minstrels," Wed., 9 p.m.; "Mr. Weary and Mr. Worn," Tues. and Thurs., 10 p.m.; "Stars of the Network," Tues., 8.20 p.m.; "A.W.L. Quartette," Mon., 8.50 p.m.; Knight Barnett at the Organ, Friday, 7 and 8.10 p.m.; "Pick o' the Week" (Recorded), Wed., 10 p.m.; "Songs From the Shows" (recorded), Sat., 7.30 p.m.

Transmission Times: Monday to Friday, 5.45 a.m. to 11 p.m.; Saturday, 5.45 a.m. to 12 midnight; Sunday, 10.30 a.m. to 12.30 p.m., 2.30 to 6.15 p.m., 7 to 10 p.m.

Total Transmission Hours During 1935: 5,300.

Special Programme Services: Musical programmes, scripts, artists and all broadcasting facilities are available to sponsors on request. 2CH can arrange a recorded programme for syndication throughout the Commonwealth. This service is unique and is made possible through the recent acquisition of a most up-to-date recording plant.

2DU DUBBO—283 metres

CENTRAL WESTERN RADIO SERVICES LTD., Box 44 Dubbo. Managing Director and General Manager: D. E. Holmes. Location of studio and transmitter: Dubbo. Licensed Power: 100 watts.

Slogan Name "Western Radio."

Number of Studios: One.

Secretary: F. L. Keyworth (Chartered Accountant).

Nominal Capital: £3,000. **Paid-up Capital:** £3,000. **Bankers:** Commercial Bank of Sydney. **Solicitors:** A. D. Booth, Dubbo.

2GB SYDNEY—344.8 metres

THEOSOPHICAL BROADCASTING STATION LTD.

Business Address: 29 Blight Street, Sydney. Directors: A. E. Bennett, R. E. Bennett, H. Morton, J. Mackay, F. W. Houstone, G. Millar. Managing Director: A. E. Bennett, A.C.A. (Aust.). Location of Studios: 29 Bligh Street, Sydney. Exact Location of Transmitter: Iluka Road, Mosman. Licensed Power: 1,000 watts.

Slogan Name: "The Nation's Station."

Number of Studios: Five.

1936 will see the rise of "Broadcasting House," which will incorporate offices and studios on a grand scale. Plans are in hand for this building, which will be equipped with every device for the mechanical perfection of 2GB's programmes and provide the utmost service to 2GB sponsors. Some time during 1936 the station will remove to "Broadcasting House."

Sales Manager: John Armitage. **Programme Manager:** E. Mason-Wood. **Chief Announcer:** Eric Colman. **Other Announcers:** Children's Session, George Saunders, Arthur Hahn; Breakfast Session, Jack Davey, Jack Lumsdaine, Noel Judd; Sports and Motor Sessions, Richard Hughes, Oscar Lawson; Special Sessions, Harry Dearth, C. J. Dease, Charles Cousens. Musical Entertainers: Albert Russell, Reg. Morgan. Women's Session, Dorothy Jordan, Kathleen Jordan, Etta Field, Dorothea Vautier. Happiness Club Sessions, Mrs. W. J. Stelzer. Radio Sunday School and Cheer-up Session, Frank Grose. Tiny Tots' Bluebird Session, Muriel Valli.

Other Staff Executives: Advertising Sales Manager: Charles A. Fletcher. **Copywriting Manager:** C. J. Dease. **Electrical Recording Manager:** G. B. Bennett. **Accountant:** W. Galley. **Chief Engineer:** Len Schultz. **Other Engineers:** H. K. R. Thomas, T. H. Innes, R. F. Meakes, C. K. Louer, T. C. Hibbert, J. Morrow, F. Stirk, A. E. Gibbons, R. D. Watson, R. Ferrie.

Musical Direction: Dorothy Wood and Percy Campbell. World Broadcasting System of A/sia Ltd., J. A. Watson. American Radio Transcription Agencies, Grace Gibson. Publicity Committee: J. Armitage (Editor), K. Barratt (Asst. Editor), R. A. Jesson, P. Inglis, Moira Andrews. "Broadcast Advertising": Alice Cowan (Editress). 2GB Happiness Club: Mrs. W. Stelzer (President), E. Stevenson (Secretary). 2GB Public Library: Harold Morton. Talks and Educational Committee: F. W. Houstone, B.A. Psychology Board: Richard Want, B.A. Book Reviewer: Evelyn Bennett, B.A. Dramatic Features: B.S.A. Players, Betty Suttor, Lou Vernon, Eric Masters, Leonard Bennett, James Raglan, Peter Brunton-Gibbs.

Secretary: George Millar.

Bankers: The Commonwealth Bank of Australia, Sydney.

Solicitors: C. Don Service and Company. **Auditors:** John Millar, Chartered Accountant.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

2GB SYDNEY.—(Continued).

Sales Reps.: W. F. Denby, Temple Court, 422 Collins Street, Melbourne, Vic.

Special Sessions: Early Morning, Jack Davey, 6 to 7.30 a.m. daily, except Sunday; Breakfast Club, Russell and Morgan, 7.30 to 7.45 a.m., Tuesday, Thursday and Saturday; "Rastus & Remus," Rastus and Remus, 7.45 a.m. Monday, Wednesday and Friday; Bluebirds, Aunty Val and Bimbo, 8.30 to 9 a.m., daily, except Sunday; Inspiration, Dorothy Jordan, 9 to 10 a.m., daily, except Saturday and Sunday; Talk, A. E. Bennett, 10 to 10.15 a.m., Monday, Wednesday and Friday; Talk, Richard Want, B.A., 10 to 10.15 a.m., Tuesday and Thursday; Housewives, Dorothea Vautier, 10.45 to 11.45 a.m.; 2GB Public Library, Evelyn Bennett, 12 to 12.15 p.m., daily, except Saturday and Sunday; Luncheon Music, Jack Lumsdaine, 1 to 2 p.m., Monday to Friday; Happiness Club, Mrs. Stelzer, 2 to 2.30 p.m., Monday to Friday; College Daze, Eileen Robinson and Theresa Carmo, 3 to 3.15 p.m., Monday to Friday; Fashions, Fads and Fancies, Grace Saville, 3.15 to 3.30 p.m., Monday to Friday; Musical Gems, Dorothea Vautier, 3.30 to 3.45 p.m., Monday to Friday; Afternoon Tea, Etta Field, 3.45 to 4 p.m., Monday to Friday; The Science of Life, Harold Morton, 4.30 to 4.45 p.m., Mon., Wed. and Fri.; Garden of Happiness, Mrs. Osborne-Wilson and Mrs. A. Smith, 4.30 to 4.45 p.m., Tues. and Thurs.; The Tiny Tots, "Bimbo," 4.45 to 5.15 p.m., daily, except Sunday; Quips and Quavers, Russell & Morgan, 5.15 to 5.30 p.m., daily, except Sunday; Krazy Kollege, Jack Lumsdaine, Uncle George, "Bimbo," 5.30 to 5.35 p.m., daily, except Sunday; "Bimbo's" Cooking Class, "Bimbo," 5.45 to 6, daily, except Sunday; Evening Feature Sessions: Various, 6 to 11.30 p.m.

Transmission Times: Monday to Saturday, 6 a.m. to 11.30 p.m.; Sunday, 8 a.m. to 10.30 p.m.

Total Transmission Hours During 1935: 6,009¾ hours.

Special Programme Services: B.S.A. Players, a group of Australia's outstanding radio actors, exclusive to B.S.A. (2GB and 2UE) will write and produce dramatic productions to suit advertisers' needs. 2GB's Radio Musicians, comprising over 20 artists exclusive to the station, are continually preparing and presenting new features. The pick of American and British transcriptions are continually being secured. 2GB claims the largest exclusive transcription library in the world. The Service Department continually contacts advertisers who have sessions in operation, continually receiving and offering suggestions for the perfection of programmes. The Publicity Department has a chain of "tie-ups" with leading newspaper and radio magazines.

2GF GRAFTON—248 metres

GRAFTON BROADCASTING CO. LTD. Business Address: 13 Prince Street, Grafton. P.O. Box 154. Location of Studios and Transmitter: 118 Turf Street, Grafton. Licensed Power: 100 watts.

Slogan Name: 2GF. Grafton Broadcasting Service.

Number and Size of Studios: One, 21ft. x 24ft.

Chief Announcer: C. E. Coldwell-Smith (Uncle Col). **Other Announcers:** John Proust, Mollie Noonan. **Chief Engineer:** C. E. Coldwell-Smith.

Bankers: Bank of N.S.W.

Sales Reps.: Amalgamated Wireless (A/sia) Ltd., Sydney and Melbourne; J. B. Chandler, Brisbane.

Special Sessions: C. G. Wingfield, half-hour sponsored session of live artists, Thursday, 7.45 p.m.; Count of Monte Christo (recorded), Monday to Saturday, 8 p.m.; Memory Lane, Tuesday 9 to 10 p.m., Mollie Noonan; Historical Readings, Tuesday 9.15 to 9.30 p.m., Mollie Noonan; Listening-in on Hollywood, Saturday 8.30 p.m., Miss M. Noonan; "You're Telling Me," Monday and Wednesday, 9 p.m., C. E. Coldwell-Smith and J. Proust; Ports of Call, Sunday night 8 p.m.

Transmission Times: Monday to Saturday, 7.30 to 8.30 a.m.; Monday, 12 noon to 1 p.m.; Tuesday to Saturday, 1 to 2 p.m.; Monday to Saturday, 6 to 10 p.m.; Sundays, 7 to 9.30 p.m.

2GZ CENTRAL N.S.W.—303 metres

COUNTRY BROADCASTING SERVICES LTD. Head Office, 12 Spring Street, Sydney. Directors: A. F. Manchee (Chairman), J. P. Abbott, R. J. Fagan, J. H. Middleton, D. J. Gilligan, F. B. Fleming. General Manager: George H. Anderson. Location of Studio: Commonwealth Bank Chambers, Lords Place, Orange. City Studio: 12 Spring Street, Sydney. Exact Location of Transmitter: Amaroo, N.S.W., 10 miles north-west of Orange. Licensed Power: 2,000 watts unmodulated input to the aerial.

Slogan Name: "2GZ, Central New South Wales."

Number and Size of Studios: Orange Studios (2), 22ft. x 16ft. and 14ft. x 10ft; City Studio (1), 19ft. x 20ft.

Sales & Programme Manager: J. E. Ridley. **Chief Announcer:** Bryson Taylor. **Other Announcers:** A. O'Keefe, L. Briggs, P. Phillips, F. Cayley, Mrs. J. Hodgkins, Miss K. Lamond. **Production Manager:** F. Cayley. **Publicity Manager:** Miss B. Bray. **Salesmen: City Reps.,** L. S. Decent, F. B. Haines, C. P. Williams; **Country Rep.:** Alan Ridley. **Chief Engineer:** E. C. Crouch. **Other Engineers:** H. J. Scarlett, F. Hanna, H. Hannam, R. J. H. Scott. **Secretary:** C. K. Millar, A.F.I.A., A.A.I.S.

Nominal Capital: £100,000. **Bankers:** The Commercial Banking Company of Sydney Ltd. **Solicitors:** A. J. McLachlan & Co. **Auditors:** Norton & Faviell.

Sales Reps.: Victoria, W. F. Denby, 422 Collins Street, Melbourne.

Special Sessions: Market Reports, Wool, produce, stock, Monday to Saturday inclusive, 6.40-7 a.m., Monday to Friday inclusive, 7.15-7.45 p.m. Sporting Sessions: Race Descriptions, Saturday (and Public Holidays), 12

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

2GZ CENTRAL N.S.W.—(Continued).

noon to 5 p.m., "resume of to-day's sporting events," Wednesday, 7-7.12 p.m., and Saturday, 7-7.30 p.m. Local Sporting Results and Fixtures: Tues., Fri. and Sat., 6.50-7 p.m.; Mon. and Thurs., 7-7.12 p.m., Wrestling Descriptions: Sat., 9.10-10.25 p.m. Women's Sessions: Conducted by "Janet Archer"; the After-Breakfast Hour, Mon. to Fri. inclusive, 8.30-9.30 a.m. (including "Shopping Snapshots," Serial Story and Music). Home Service Session: Mon. to Fri. inclusive, 11-11.45 a.m. (including "The Kitchen of the Air," "Our Household Scrap-book," News through the eyes of a Woman, and music). Afternoon Entertainment: Mon. to Fri. inclusive, 3.30 to 5 p.m. (including "Over the Tea-cups," "The Radio Lucky Bag," and other competitions, Book Review, Health and Beauty Talks, etc.). Bush Nursing Association and Far West Scheme, 11.35 a.m., Fri. Country Women's Association Session, conducted by Mrs. Satchell: 11.35 a.m., Mon. Hospitals' Commission Session, conducted by Mrs. Tracey Lane: 11.35 a.m., Wed. Children's Session (conducted by "Mr. Touch, Mr. Go, Mr. Stop and Miss Went"): Mon. to Fri. inclusive, 5-6 p.m. "Talkie Time" (local Theatre Programmes): 6.30-6.45 p.m., Mon. to Sat. inclusive. Community Singing (conducted by Mr. Bryson Taylor): 9.15-10.30 p.m., Fri. News Service: Mon. to Sat. inclusive, 7.5 a.m. Weather Reports: Mon. to Sat. inclusive, 6.35 and 7.12 a.m., and 7.30 p.m., Sunday, 11 a.m. Agricultural Sessions: Talks arranged by the Department of Agriculture, 6.50 a.m., Monday and 6.46 a.m. Wednesday.

Transmission Times: Mon. to Fri., 6.30-9.30 a.m., 11 a.m. to 2 p.m., 3.30-10.30 p.m.; Sat., 6.30-9.30 a.m., 11 a.m.-10.30 p.m.; Sun., 11 a.m.-10.30 p.m.

Total Transmission Hours during 1935: Since commencement of service on October 31, 1935, average hours per week have been 91.

Special Programme Services: In addition to its Country Studios at Orange, 2GZ has a complete and up-to-date Studio at its Head Office, Sydney, where auditions and other services are available to advertisers. Provision is also made for clients to hear, at this Studio, the actual broadcast of the programmes at any hour of the day or night. With the most modern equipment for studio work, including high quality microphones, two-speed turntables and mixing panels, as well as a comprehensive library of sound-effects records, any form of programme can be presented from the Sydney Studio. These programmes can be relayed to the transmitting centre, or recorded by the special equipment which has been installed.

2GZ employs a staff of continuity writers, whose services are at the disposal of advertisers, for the preparation of special announcements, feature sessions, and general advertising campaigns, and the utmost co-operation is given to clients and to their Advertising Service Agents. Programmes are published in many local country papers, as well as in the metropolitan daily press and the leading radio magazines of both New South Wales and Victoria. In addition, publicity paragraphs in regard to any feature sessions or special programmes appear in these publications.

Personal contact with distributors and dealers has been provided for by the appointment of representatives in each of the larger towns in the area served by 2GZ. When any new advertising campaign is arranged to go on the Station, these representatives make contact with dealers handling the lines featured, advise them of the campaign and endeavour to arrange for counter and/or window displays of the product or any display material supplied by the client, as well as seeking the dealers' general co-operation in the advertising campaign.

Extension of Distribution: Should a client desire extension of his points of distribution, calls are made on retailers considered most suitable for handling the lines concerned and an endeavour made to arrange initial orders for such lines. When a client wishes to distribute pamphlets or other advertising matter, or samples of his products, to listeners applying for them, such applications will be received and handled by us, if so desired. In the case of a client whose staff is limited this service enables him to effect this distribution without the inconvenience which would otherwise be entailed and, as he is advised from time to time of the number of applications sent in, in response to his advertising, he is quite as conversant with the position as though the matter were being handled by his own office.

Assessing Sales Potentialities: When required, we collect and compile market data and any other information which will give an indication of sales potentialities for any particular client.

Co-operative and Group-advertising Schemes: The "Ford" Session which has been a feature of 2GZ's programmes for some months is an example of this. The "Ford" Dealers of the district were approached and persuaded to share between them the cost of this session.

Response Research: In the case of advertisers whose products are supplied direct and not through retailers, researches are conducted to ascertain the response to programmes by the listening audience.

2GN GOULBURN—216 metres

GOULBURN BROADCASTING COMPANY LTD.

Business Address: 209 Auburn Street, Goulburn. Manager: H. J. Lewis. Location of Studio: River Road, Goulburn. Exact location of transmitter: Two miles west south west of Goulburn P.O. Licensed Power: 200 watts.

Number and Size of Studios: Two. 27ft. x 21ft., 16ft. x 12ft.

Chief Announcer: H. J. Lewis. **Other Announcers:** J. MacDonald, J. K. S. Lowe and J. McNaught. **Chief Engineer:** J. K. S. Lowe. **Other Engineer.** H. J. Lewis.

Bankers: Bank of N.S.W.

Sales Representatives: Amalgamated Wireless (A/sia) Ltd.

Special Sessions: Monday to Friday, Household hints and cooking recipes, conducted by Judy, 1 to 1.15 p.m.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

2GN GOULBURN.—(Continued).

Monday to Saturday, Children's Session, 5.30 to 6.15, conducted by Uncle Bert, Aunt Judy and Uncle Jock. Monday, Smile Club Concert, 6 to 7 p.m. (members of the 2GN Smile Club); 7.15 p.m., Goulburn Liedertafel Session, conducted by Eric Stuart. Tuesday, 6.30 p.m., Boy Scouts session, conducted by Rover Thwaite; 7.15 p.m., Talk by R. M. Shaw on Hollywood News; 7.30 p.m., One Man's Family, radio play; 9.15 p.m., Session of Hot Rhythm, conducted by Jock Lowe; 9.45 p.m., Session of Hill Billy Harmony, conducted by Jock Lowe. Wed., 7 p.m., The Ghost Corps, a radio drama; 8 p.m., Log Cabin Review; 8.30 p.m., L.W.G. Lee talks to graziers; 9 p.m., Wal Lambert Session. Thursday, 7.15 p.m., St. Saviour's Session; 7.40 p.m., Book review by Cecil W. Morris; 9 p.m., Band music Session, arranged by Jock Lowe. Friday, 1.30 p.m., Bookshelf Library programme; 7.15 p.m., Screen News and Chatter, by R. M. Shaw; 9 p.m., Session of Humour, conducted by H. J. Lewis. Saturday, 7 p.m., Cycling notes and results, by Jack Ohlback; 7.15 p.m., Gordon Millsom gives the results of the day's racing; 9.30 p.m., Jock Lowe conducts 2GN dance programme. Sunday, 7.30 p.m., Judge Rutherford lecture; 9 p.m., Radiola session.

Transmission Times: Monday to Friday, 12 to 1.45 p.m., 5.30 to 10.30 p.m. Saturday, 12 to 1 p.m., and 5.30 to 10.30 p.m. Sunday, 10.45 to 12.30. Note: On the first and third Sundays of each month a relay is taken from St. Saviour's Cathedral from 11 to 12.15 a.m. and 7 p.m. to 10 p.m.

Total Transmission Hours during 1935: 1,630 hours.

2HD NEWCASTLE—261 metres

AIRSALES BROADCASTING COMPANY.

Business Address: Sandgate, N.S.W. City Office: C/o Pinnacle Radio Service, 299 Hunter Street, Newcastle. Postal Address: Box 123, P.O. Newcastle. Location of Studios: Sandgate, N.S.W. City Studios: 299 Hunter Street, Newcastle. Exact location of Transmitter: Sandgate, N.S.W. Licensed Power: 500 watts.

Slogan Name: "Tells the World."

Number and Size of Studios: Two. La Salle Studio, 30ft. x 15ft.; Sunshine, 10ft. x 10ft.; City Studio, 13ft. x 20ft.

Sales Manager: R. C. Sparkes. **Programme Manager:** E. W. Rowe. **Chief Announcer:** James (Jim) C. Crago. **Other Announcers:** H. Ebrall, I. Wood, E. Sparkes, M. Johnston, N. Scholes, R. Wilde.

Other Staff Executives: Keith Armistead, Studio Director. **Merchandising Department:** R. Hudson. **Production:** N. Scholes. **Publicity:** W. W. Johnston. **Copy Writing Department:** M. Johnston. **Names of Salesmen:** R. C. Sparkes, Geo. Bray, W. Moss and L. Hartwig. **Chief Engineer:** Tom Kitto. **Other Engineers:** Harvey Heath, Syd Meakins, Bob Oakley, F. Butt. **Secretary:** M. Cleeland. **Auditors:** R. Hudson.

Sales Reps.: Amalgamated Wireless (A/sia) Ltd., Queen Street, Melbourne, Vic.; Cuthbert A. Monks, 3rd Floor, Grace Building, 77 York Street, Sydney.

Special Sessions: Children's Joy Club Sessions, daily 8 a.m. and 5.15 p.m. On Tuesday and Thursday these evening sessions are held in various suburbs and relayed to the station at Sandgate. Ladies' Sessions (morning and afternoon), conducted by Cousin Joy (Mrs. Ivy Wood), Auntie Betty (Mrs. E. Sparkes) and Auntie Maude (Mrs. M. Johnston). Musical Clock Sessions, 6 to 8 a.m. daily, except Sunday. Racing Sessions, Wednesday and Saturday afternoons from 1 p.m. Dance Music (continuous), 10 to 12 midnight Saturday and Sunday. Devotional, Exercises. Lectures, 6.45 a.m. and 6.20 p.m. daily. Sunday, 10.30 a.m., 3.15, 6.30 and 11.40 p.m. Comedy programmes. Drama and thrilling narratives of adventure daily. Feature Programmes: "Tales of Superstition," "Moments of Melody," "Thirteen Windoes of the Jade Pagoda," "Police Reporter," "Do You Believe in Ghosts," "Omar, the Wizard of Persia,' "Threads of Tradition," "Royal Intrigue," "Bill, Mack and Jimmie," "Paul Wing," "Funfest," "Police Headquarters," "Robin Hood and his Merry Men," "Swiss Family Robinson," "Memories of Paris," "The Adventures of Donald Ayer," "The Ghost Corps," "Kay Seven," "Tom Sawyer," "Sunshine Farm," "Pinto Pete," "Cessnock Male Voice Choir," "Fireside Evening," "Song Scena," "Judge Rutherford World-wide Broadcast from Washington, D.C.," "Drama of the Israelites," Studio Parties, "One Man's Family," "White Horse Inn," Leo Cherniavsky recitals, Piano Request programmes, Radio School, Duke of Gloucester's Visit, Earnshaw's Cameos, "The Phantom Detective," "Birds of a Feather," "Cecil and Sally," "Eb and Zez," "Emma and 'Erbert," "General Store," "Memories of Hawaii," "Heart Songs," "Joe and Cynthia," "Metropolis," "Nemesis Incorporated," "Songs without Words," "Shamrocks," "Wings of the Dragon," "Mrs. 'Arris and Mrs. 'Iggs," Races descriptions, including Melbourne Cup, Tour of the Talkies, Joy Club Parties, Rhythm Style Programmes, "Huckleberry Finn," Talks—Fashion, Gardening, Racing, Motoring, Sporting Review.

Transmission Times: 6 a.m. to 10.30 p.m., 16½ hours daily, except Saturday and Sunday. Saturday, 6 a.m. to 12 midnight—18 hours.

Total Transmission Hours during 1935: 5,668 hours.

Special Programme Services: Latest and best transcriptions, Australian and overseas available to advertisers, also services of a staff of qualified artists for stage productions for broadcasting. A Merchandising Service tieing up with programmes, checking up on results, reporting and advising on advertisements. A display cabinet for small articles advertised at the Station. Time Service.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

2KA KATOOMBA—259 metres

RADIO KATOOMBA LTD. Business Address: Box No. 1, P.O. Katoomba. Directors: R. G. Lamb, H. A. Bowden, E. V. Street. Managing Director: R. G. Lamb. Location of studio and exact location of transmitter: Portland Road and Rutland Road, Katoomba. Licensed Power: 100 watts.

Slogan Name: "The Happiness Station."

Number and Size of Studios: Two. 12ft. x 9ft., 35ft. x 16ft.

Sales Manager: R. G. Lamb. **Programme Manager:** K. G. Stephens. **Chief Announcer:** K. G. Stephens. **Other Announcers:** J. Nutt, J. Graham, W. Wilkie, P. Dawson, M. B. Woodhouse. **Other Staff Executives:** M. B. Woodhouse, Bookkeeper. **Chief Engineer:** W. Wilkie. **Secretary:** H. McLean.

Nominal Capital: £3,000. **Paid-up Capital:** Approximately £2,450. **Bankers:** C.B.A.. **Solicitors:** C. R. Sweeting. **Auditors:** Treweeke and Treweeke.

Special Sessions: Old Time Sessions, The Wanderers Short Talks, Helen Cameron at the Piano, Screen Rambler, Racing Talks, Shell Show, Transcriptions, Studio Plays, The Storyman, The Younger Folks, 2KA Dance Band, Dance music from ballroom of Hydro Majestic and other hotels.

Transmission Times: Week days, 7.30 to 8.30 a.m., 6 to 10.30 p.m. Sundays, 6 to 10 p.m.

Total Transmission Hours since September, 1935: 416 hours.

Special Programme Services: Excellent local talent, complete range of transcriptions, extension record library, first-class dance orchestra of six players. We have call on J. C. Williamson artists.

2KO NEWCASTLE—213 metres

THE NEWCASTLE BROADCASTING COMPANY LIMITED. Business Address: Wolfe Street, Newcastle. Directors: Allen Fairhall, E. Fairhall and N. O. Whale. Managing Director: Allen Fairhall. General Manager: Harold Pickhover. Location of Studios: Wolfe Street, Newcastle. Exact location of Transmitter: Sandgate (7 miles north of Newcastle). Licensed Power: 500 watts.

Slogan Name: "The Industrial Hub of the Commonwealth."

Number and Size of Studios: Three, 15ft. x 19ft, 10ft. x 12ft., 12ft. x 12ft.

Sales Manager: C. Crichton. **Programme Manager:** Tom King. **Chief Announcer:** Harold Pickhover. **Other Announcers:** Tom King, Allan Webber, Vernon Lisle, Elma Gibbs, Lawrence Gordon. **Chief Engineer:** K. N. Greenhalgh, M.I.R.E. (Aust.). **Other Engineers:** Max Spitzkowsky, James Gowen. **Secretary:** N. O. Whale.

Nominal Capital: £2,000. **Bankers:** Bank of N.S.W. **Solicitors:** A. L. Stewart, A.M.P. Chambers, Hunter Street, Newcastle. **Auditors:** W. Evan Parker.

Sales Reps.: W. H. Thompson, A.C.A. Building, York and King Streets, Sydney; R. J. McCartney, 247 Collins Street, Melbourne.

Special Sessions variable.

Transmission Times: Mondays to Saturdays, inclusive, 7 a.m. to 4 p.m., 5 to 10.30 p.m. Sunday, 9 to 10 a.m., 6 to 10 p.m.

Total Transmission Hours during 1935: 4.800 hours.

2KY SYDNEY—294 metres

Business Address: 428 George Street, Sydney. General Manager: H. E. Beaver. Location of Studios: Dymock's Block, George Street, Sydney. Exact Location of Transmitter: Beacon Hill, French's Forest. Licensed Power: 1000 watts.

Number of Studios: Three.

Sales Manager: H. T. Hungerford. **Programme Manager:** H. M. Garden. **Chief Announcer:** John Harper. **Other Announcers:** Captain T. D. Bairnsfather, Jack Farrelly, Eric Walker, Ian Garden, Rion Voight, John Fox, Mrs. Grey, Lionel Lunn, Fred Garland, L. A. Dempsey, Donald Day. **Other Executives:** Fred Witt, Asst. Musical Director; Esme Williams, Publicity Officer. **Chief Engineer:** J. H. Brown. **Other Engineers:** H. Edwards, W. Grant, W. Collick, L. Spinner. **Secretary:** R. A. King, M.L.C.

Bankers: Bank of New South Wales. **Solicitors:** Abram Landa & Co. **Auditors:** R. E. Oaten.

Special Sessions: Mon. to Fri. (inclusive), 6.45-7 a.m., Labour Daily News, H. E. Beaver; 7-10 a.m., Sam Land's Happy Hours, Donald Day; 10.30-11.45 a.m., Women's Session, Mrs. Grey; 2.30-3 p.m., Suburban Session, Fred Garland; 4.25-5.15 p.m., Double D. Melody Session, John Harper; 5.15-5.30 p.m., Children's Session, Algy, Rion and Esme; 5.30-6.30 p.m., Dinner Divertissements, Lionel Lunn; 6.30-7 p.m., Dinner Entertainment, Uncle Bert and Goodo; 8.45-9 p.m., Bear's Radio Theatre, John Harper; 10.30-12 p.m., Sam Land's Happy Hours, Donald Day; Tuesday, 8.15-8.30 p.m., "The Adventures of Algy and Rastus," sketch. Wednesday, 12.30 p.m., broadcast of races, Eric Gordon; 7.15-7.30 p.m., Fred Witt, vocalist; 9-10 p.m., Radio Trials from the Assembly Hall, Uncle Rus. Thursday, 7.30 p.m., "The Two Hoboes," sketch. Friday, 12.30-2.30 p.m., "Hollywood Presentation," The Hollywood Reporter; 8.30-8.45 p.m., "Sport Shorts," Andy Flanagan; 9.15-9.30 p.m., "Ring Radios." Saturday, 10-11 a.m., 2KY Radio Party for the Children; 1-5 p.m., Relay Melbourne Races, 3AW, Fred Tupper, broadcast local races, Eric Gordon; 9-10 p.m., broadcast of wrestling from Leichhardt Stadium, Rion Voigt. Sunday, 8 a.m., "Wake Up" Session, Uncle Bert and Goodo; 10.30 a.m., at the piano with the melody girl; 12.30 p.m., Trader's Topics, John Harper; 2 p.m., Bear's Radio Theatre entertainment, John Harper; 4 p.m., a visit to the Zoo, Samuel Biber; 6 p.m., Wiseman's feature session, Captain Bairnsfather; 7.30 p.m., Musical Jigsaw with piano-duettists; 7.45 p.m., "The Investor"; 8.30 p.m., Crotchets and Quavers, Lionel Lunn; 9.15 p.m., "Police Headquarters," radio serial; 10.30 p.m., Sam Land's Happy Hour, Donald Day; 8 p.m., "Around the Globe."

Transmission Times: 6.45 a.m.-12 midnight.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

2LV INVERELL—336 metres

NORTHERN BROADCASTERS LTD. Business Address: 5 Barrack Street, Sydney. Location of Transmitter: Inverell, N.S.W. Licensed Power: 100 watts.

2MO GUNNEDAH—221 metres

2MO GUNNEDAH, LIMITED. Business Address: Marquis Street, Gunnedah, P.O. Box 62. Directors: L. M. Oliver, H. W. Goddard, M. J. Oliver. Managing Director: L. M. Oliver. Location of Studios and Transmitter: Marquis Street, Gunnedah. Licensed Power: 50 watts.

Slogan Name: "The Voice of the North West."

Number and Size of Studios: Two. 24ft. x 14ft. and 18ft x 12ft.

Sales Manager: H. W. Goddard. **Announcers:** H. W. Goddard, H. Wharf, M. J. Oliver, Mrs. L. M. Oliver, D. Palmer, C. Hardman.

Sales Reps.: Amalgamated Wireless (A/sia) Ltd.

Special Sessions: At 8 p.m. each evening. Sundays, "Memories of Hawaii"; Monday, "General Store"; Tuesday, "Pinto Pete in Arizona"; Wednesday, "Life of Victor Herbert"; Thursday, "General Store" (7-10 p.m.), "Songs Without Words" (8 p.m.); Friday, "The Black Spider"; Saturday, "General Store."

Transmission Times: Weekdays, 7-9 a.m., 12-2 p.m., 6-10 p.m.; Sundays, 8-10 a.m., 2-4 p.m., 6-10 p.m.

2QN DENILIQUIN—208 metres

DENILIQUIN BROADCASTING CO. LTD. Business Address: End Street, Deniliquin. Location of Transmitter: Deniliquin. Licensed Power: 50 watts.

2SM SYDNEY—236.2 metres

THE CATHOLIC BROADCASTING COMPANY LIMITED. Business Address: Australia House, Carrington Street, Sydney. Directors: J. Meany, W. Hurley, T. G. Murray, M. O'Neill, R. Fagan, M. L'Estrange. Managing Director and General Manager: J. Meany. Location of Studios: Australia House, Carrington Street, Sydney. Exact Location of Transmitter: A.W.A. Radio Centre, Pennant Hills, Sydney. Licensed Power: 1,000 watts.

Slogan Name: 2SM, "The Modern Station."

Number of Studios: Three.

Sales Manager: L. P. Quirk. **Programme Manager:** J. S. Dunne. **Chief Announcer:** Dom. Harnett. **Other Announcers:** Doreen McKay, Reg. McKenzie, John Tuttell, Claude Healy, Richard Fair, Harry Millard. **Other Executives:** O. Malone. **Staff Superintendent:** E. Shaw, Publicity. **Salesmen:** B. B. Stapleton, S. C. Linsley-Freeman, J. Digby-Bennett, E. C. Farris. **Engineers:** Amalgamated Wireless (A/sia) Ltd. **Secretary:** Peter J. Egan.

Nominal Capital: £15,000. **Paid-up Capital:** £10,000. **Bankers:** Commonwealth Bank of Australia. **Solicitors:** Murphy & Maloney. **Auditors:** S. McKellar White and J. Y. McGrath.

Sales Reps.: Amalgamated Wireless (A/sia) in all States.

Special Sessions: Children's Session, John Dunne, 5 to 6 p.m., Monday to Saturday. Radio Racing Service, H. A. Millard, 12 to 5 p.m., Wednesday and Saturday. Melodiana, Dom. Hartnett, 1 to 4 p.m. Sunday. Celebrity Recital, Robert McCall, 4 to 6 p.m., Sunday.

Transmission Times: Monday to Saturday: 7 to 9 a.m., Breakfast Session; 1 a.m. to 3 p.m., Midday Session; 3 to 5 p.m., Women's Afternoon Session. Monday, Tuesday, Thursday and Friday: 5 to 6 p.m., Children's Session; 6 to 8 p.m., Early Evening Session; 8 to 10.30 p.m., Evening Session.

Total Transmission Hours during 1935: 4,500 hours.

Special Programme Services: Every programme facility is available including manuscripts, artists, producers, sound effects, auditions, continuity, recordings, electrical transcriptions, etc.

2TM TAMWORTH—201 metres

TAMWORTH RADIO DEVELOPMENT CO. LTD. Business Address: 80 Brisbane Street, Tamworth. Directors: E. Higginbotham, T. Whitcomb, H. M. Sheffer, A. E. Norton. Managing Director: E. Higginbotham. Location of Studios and Transmitter: Manilla Road, Tamworth. Licensed Power: 50 watts.

Number of Studio: Control room and one studio.

Sales Manager: W. L. Penny. **Programme Manager:** J. Whitmore. **Announcers:** H. J. Dyball, T. Whitcomb, W. L. Penny, P. Hugill. Mrs. Langford Penny. **Salesman:** T. H. Jacomb. **Chief Engineer:** T. Whitcomb. **Engineer:** F. Potter. **Secretary:** H. F. Dyball.

Nominal Capital: £5,000. **Bankers:** Rural Bank of N.S.W., Tamworth. **Solicitors:** Creagh & Creagh, Tamworth.

Special Sessions: 7.45 a.m., Wake-up Session, Wilson's Treasure Store; 7 a.m., News Session; 8 a.m., News Session; 8.15 a.m., George Najor & Co.'s Session; 1.15 p.m., Pharmacy Session; 7.15 p.m., Quality Session, T. J. Theloar & Co. Ltd.; 8 p.m., The Old Firm, P. G. Smith & Co. Ltd.; 8.15 p.m., "Flash Gordon," Mondays and Wednesdays, Grosvenor Laboratories Ltd.; 8.15 p.m., "Pinto Pete in Arizona," every Tuesday night; 8.30 p.m., The Mirth Parade, every Thursday night, Domino Bedding & Gordon Gow Furnishing Co.; 8.45 p.m., Weather forecasts and Market reports, Vare Brooke & Co.; 8.30 p.m., The Shell Show, every Sunday night; 9 p.m., "Police Reporter," every Tuesday night; 9 p.m., "Strange Adventures in a Strange Land," Thursday nights; 7.30 p.m., "One Man's Family," every Tuesday night; 8 p.m., Health Talk, every Tuesday night.

Transmission Times: 7 to 9 a.m., 11 to 2 p.m., 3.30 to 10.30 p.m.

Total Transmission Hours during 1935: 2,623 hours.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

2UE SYDNEY—316 metres

RADIO 2UE SYDNEY LIMITED. 6th Floor, 296 Pitt Street, Sydney, N.S.W. Managing Director: C. V. Stevenson. Location of Studios: 6th Floor, 296 Pitt Street, Sydney. Exact location of Transmitter: Lilli-Pilli, Port Hacking (8 miles south of Sydney G.P.O.). Licensed Power: 1,000 watts in aerial.

Slogan Name: "The Feature Station."

Number and Size of Studios: 2 studios, each 18ft. x 25ft.; 1 studio, 18ft. x 12ft; two control rooms.

Sales Manager: Sidney E. Baume. **Programme Manager:** Cyril James. **Chief Announcer:** Ernest Walsh. **Other Announcers:** Si Meredith, F. Harty, C. Agassiz, C. Honeyfield, C. O'Keefe, C. Holland, Mrs. M. Filmer, Miss G. Shaw. **Other Executives.—Studio Manager:** N. Stevenson. **Musical Director:** R. A. Shaw. **Salesmen:** H. D. Petters, C. N. Baeyertz, G. Stokes, L. Nunn. **Chief Engineer:** M. H. Stevenson. **Other Engineers:** W. Robinson (assistant), R. M. Pieremont, N. Pieremont. **Secretary:** R. H. H. Wolff.

Bankers: Commonwealth Bank of Australia.

Transmission Times: Monday to Saturday, 6 a.m. to 11.30 p.m.; Sunday, 8 a.m. to 11 p.m.

2UW SYDNEY—270 metres

COMMONWEALTH BROADCASTING CORPORATION LTD. State Shopping Block, 49 Market Street, Sydney. Directors: Messrs. Stuart F. Doyle, M. F. Albert and A. F. Albert. Managing Director: Stuart F. Doyle. General Manager: C. F. Marden. Location of Studios: 7th Floor, State Shopping Block, Market Street, Sydney. Licensed Power: 750 watts in the aerial, full capacity used.

Slogan Name: 2UW.

Number of Studios: Five.

Sales Manager: F. E. Levy. **Programme Managers:** K. Blakeney and Miss G. Lammas. **Other Announcers:** Messrs. Collibee, Anderson, Arnold, Gregory, Lawrence, Prentice, Layton, Maurice, Murray, Wheeler. **Other Executives.—Studio Supervisor:** N. J. Lyons. **Sporting Dept.:** A. Anderson. **Service Dept.:** Miss R. Foott. **Continuity Dept.:** G. Davis. **Production Dept.:** C. Arnold. **Publicity:** Mr. MacKinnon. **Pastoral Dept.:** J. A. Crawcour. **Salesmen:** Messrs. Baldry, McConnell, Hardy, Maurice, Wheeler, Collibee. **Chief Engineer:** H. A. Marshall. **Other Engineers:** Messrs. Buzacott, Tonkin, P. Phillips, J. Phillips, Stevenson. **Secretary:** W. Sayle.

Solicitors: Ernest, Cohen & Linton. **Auditors:** Holt & Thompson.

Sales Reps.: P. Sullivan, 485 Bourke Street, Melbourne, Vic.

Transmission Hours: 24 hours continuous service.

Total Transmission Hours during 1935: 8,760 hours.

2WG WAGGA—261 metres

RIVERINA RADIO BROADCAST CO. LTD. Business Address: 16 Fitzmaurice Street, Wagga. Location of Transmitter: Near Wagga. Licensed Power: 1000 watts.

Transmission Times: Monday to Saturday, 7.30-9 a.m., midday to 2 p.m., 3-5 p.m. and 6-11 p.m.; Sunday, 7-11 p.m.

2WL WOLLONGONG—210 metres

WOLLONGONG BROADCASTING CO. Business Address: Cnr. Edward and Church Streets, Wollongong. Manager: Russell A. Yeldon. Location of Studios and exact Location of Transmitter: Farnborough Road, Unanderra. Licensed Power: 300 watts.

Slogan Name: "The Voice of Illawarra."

Number and Size of Studios: Two. One has floor space of 316ft. and the other 140ft.

Programme Manager: K. R. V. MacAndrew.

Sales Rep.: W. Herring.

Bankers: Commonwealth Bank of Australia. **Solicitors:** Russell & McLelland, Crown Street, Wollongong.

Transmission Times: Monday to Saturday, 6.30 to 10 p.m.; Sunday, 7 to 10 p.m.

2XN LISMORE—224 metres

RICHMOND RIVER BROADCASTERS LIMITED. Molesworth Street, Lismore, N.S.W. Managing Director: G. W. Exton. General Manager: W. G. Exton. Location of Studios and Transmitter: 173 Molesworth Street, Lismore. Licensed Power: 500 watts (50 watts are being used until new transmitter is installed).

Slogan Name: "The Station of Smiling Service."

Number of Studios: One main studio.

Programme Manager: W. G. Exton. **Chief Announcer:** W. Exton. **Other Announcer:** Mr. W. J. Merchant. **Chief Engineer:** G. W. Exton.

Special Sessions: Monday, 6 p.m., Kiddies' Request Session, Uncle Eck; Tuesday, 2.30, "Listening-in on Hollywood," W. Exton; 7.0, "Pinto Pete,"; 7.30, Diggers' Session, W. J. Merchant; Wednesday, Request Afternoon; 7.15, Watchtower; Friday, 7.30, Old Folks; 9.45, Sporting Session; Saturday, 9.0, Request; 9.45, Sporting ("Count of Monte Cristo" each night at 8 o'clock.)

Transmission Times: Monday to Friday, 7-8 a.m., 2-3 p.m., 6.-10 p.m.; Saturday, 7-8 a.m., 6-10 p.m.

Total Transmission Hours during 1935: 2,184 hours.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

3AK MELBOURNE—200 metres

MELBOURNE BROADCASTERS PTY. LTD. Business Address: 480 Bourke Street, Melbourne. Names of Directors: G. F. Palmer, W. Williams. Managing Director: G. F. Palmer. Location of Studios: 480 Bourke Street. Exact Location of Transmitter: Yerrin Street, Balwyn, Victoria. Licensed Power: 200 watts.

Slogan Name: The "Voice of the Night."

Number and Size of Studios: Two, 25ft. x 21ft., 15ft. x 10ft.

Programme Manager: Basil O'Brien. **Chief Announcer:** Roland Barlee. **Other Announcers:** Basil O'Brien and T. Lelliott. **Name of Salesman:** P. G. Trotter. **Chief Engineer:** T. Lelliott. **Other Engineers:** A. Marris. **Secretary:** W. Williams.

Bankers: E.S.&A. Royal Branch. **Solicitors:** W. Harrison, Bank Place. **Auditors:** Basil Jackson, Little Collins Street.

Sales Reps.: H. H. Miscamble, Challis House, Martin Place, Sydney.

Special Sessions: Greatest feature, all-night service.

Transmission Times: 11.30 p.m. continually to 7 a.m. Sunday, 12.30 to 2.30 p.m.; Saturday, 1 p.m. to 2 p.m.

Total Transmission Hours during 1935: 1,820 hours.

Special Programme Services: Extensive library of recordings enables station to cope with any programme using recordings. Facilities for 33 1-3 r.p.m. transcriptions. Mixing Panel enables continuous recorded programmes to be presented. Full facilities for land line relays.

3AW MELBOURNE—234 metres

3AW BROADCASTING CO. PTY. LTD. 382 Latrobe Street, Melbourne, Vic. Directors: J. H. Syme, Geoffrey Syme, J. H. Tait, F. S. Tait, George Sutherland, F. H. Allan. General Manager: John T. Taylor. Location of Transmitter-Studios: 382 Latrobe Street, Melbourne. Licensed Power: 600 watts.

Slogan Name: "The Feature Session."

Number of Studios: Four.

Programme Manager: Gordon L. Tait. **Chief Announcer:** G. Bills-Thompson. **Other Announcers:** Bob Molyneux, Fred Tupper, Cliff Nicholls, Gordon Massey, Jack O'Hagan, John Masters, Theo Scales, Gwen Varley, Kathleen Lindgren. **Other Executives.—Studio Manager:** Gordon Massey. **Secretary:** Hector Harris. **Salesmen:** David Duff, T. R. Wardle, Jack O'Hagan. **Chief Engineer:** John Ryan. **Other Engineers:** George Nolte, Gilbert Miles, Syd. White, Max. Thompson.

Bankers: Bank of Australasia. **Auditors:** Cook, Tomlins & Mirams.

Sales Reps.: E. H. Brewer, Room 112, Assembly Hall, Margaret Street, Sydney, N.S.W.

Special Sessions: "Manton's Sunday Morning Session," 10.30 to 12.30; "Breakfast Session," 6 to 9.15 a.m.; description of all metropolitan races; "3AW Women's Association," 2 to 4.35 p.m.; "Children's Session," 4.45 to 6 p.m.; "The Lee Murray Players," 7.30 to 8 p.m., Sundays.

Transmission Times: Monday to Saturdays, 6.30 to 10 a.m., 11 a.m. to 11.30 p.m.; Sundays, 10 a.m. to 12.30 p.m., 2.30 to 10.30 p.m.

Total Transmission Hours during 1935: 5,700 hours.

Special Programme Services: The association of this station with Allan & Co. Pty. Ltd., the music house, makes it possible to have available a most complete musical library and enables it to draw upon reserve of recorded music which is almost inexhaustible. In addition, the association with J. C. Williamson Ltd., the firm of entrepreneurs in Australia, provides the station with the exclusive Victorian rights to play such popular items as vocal renditions of the musical comedies controlled by that organisation, Gilbert & Sullivan Operas, and their numerous plays. It also provides the station with the opportunity of broadcasting performances direct from their theatres and of many prominent artists visiting Australia.

The Company retains its own company of players to whom is made available the whole of the plays controlled by J. C. Williamson Ltd. A complete and authentic news service is made available to the station by "The Age" (a Melbourne daily newspaper), which is also part proprietor of the station. The general programmes embrace every type of entertainment and are planned to appeal to every type of listener. It is noted for the many outstanding studio productions conceived and produced by its own staff.

3BA BALLARAT—227.2 metres

BALLARAT BROADCASTERS PTY. LTD. Business Address: 56 Lydiard Street North, Ballarat. Directors: J. H. Davey, C. P. A. Taylor, S. W. G. Clark, Miss F. M. Clark. Managing Director and General Manager: James H. Davey. Location of Studio: 56 Lydiard Street North, Ballarat. Exact Location of Transmitter: Cardigan, 4½ miles west of Ballarat. Licensed Power: 500 watts.

Slogan Name: The "Courier Station."

Number and Size of Studios: Two, "A", 31ft. x 25ft. x 13ft.; "B", 18ft. x 15ft. x 13ft.

Sales Manager: E. J. W. Whykes. **Programme Manager and Chief Announcer:** E. V. Trotman (Uncle George). **Other Announcers:** Jack Melville (Early Bird), Lela Lake (Aunt Lela), Maude Jones (Margery Daw), J. H. Davey (Uncle Jim and Sunday Announcer). **Salesman:** L. G. Boreham. **Chief Engineers:** Alfred D. Kerr and Warne A. Wilson, Joint Engineers in charge. **Other Engineers:** R. Buring, B.Sc., B.E., W. Mather. **Secretary:** E. J. W. Whykes.

Nominal and Paid-up Capital: £2,000. **Bankers:** Bank of New South Wales. **Solicitors:** Nevett, Nevett & Glenn, Lydiard Street South, Ballarat.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

3BA BALLARAT.—(Continued).

Sales Reps.: Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney, and 167 Queen Street, Melbourne.

Special Sessions: Week days, 7.30-9.30 a.m., Breakfast Session conducted by the Early Bird; 9.30-10.30 a.m., Ladies' Session by Margery Daw; 2-3 p.m., Ladies' Afternoon programme, Margery Daw; 5-6 p.m., Children's Session, conducted by Uncle George, assisted by Aunt Lela; 6-7 p.m., Teatime Tunes, conducted by Jack Neville; Tuesday, 1.30 p.m., Organ Recital, Mr. James Gullan; Wednesday, 2 p.m., Community Singing, Uncle George; Friday, 9 p.m., Boxing from Fitzroy Stadium; Saturday, 1 p.m., Race Descriptions by Eric Welch.

Transmission Times: 7.30-11 a.m. Monday-Saturday; 12-3 p.m., Monday-Frdiay; 5-11 p.m., Monday-Friday; 1-11 p.m., Saturday; 12.45-3 p.m. and 6.30-10 p.m., Sunday.

Total Transmission Hours during 1935: 3,000 hours approximately.

3BO BENDIGO—309 metres

AMALGAMATED WIRELESS (A/SIA) LIMITED. Business Address: Beehive Chambers, Pall Mall, Bendigo. Manager: Roger Fair. Location of Studios: Beehive Chambers, Pall Mall, Bendigo. Exact Location of Transmitter: Kangaroo Flat, 3 miles south of Bendigo. Licensed Power: 200 watts.

Slogan Name: "The Friendly Voice of the North."

Number and Size of Studios: Two, 21ft. 2½ins. x 23ft. 2½ins., 24ft. x 20ft.

Programme Manager: J. P. Banney. **Chief Announcer:** Scott Griffiths. **Other Announcers:** Kath. Major, A. Hoad and J. Mamouney. **Chief and Other Engineers:** J. P. Banney, A. E. Hoad.

Sales Rep.: Amalgamated Wireless (A/sia) Limited, 47 York Street, Sydney.

Special Sessions: Monday to Saturday, 5 to 6 p.m., Children's Session by Scott Griffith; Monday to Friday, 11 to 11.30 a.m., Housewives' Session, conducted by Kath. Major; Monday, 9.30 p.m., "Stepping the Stave," with Scott Griffiths and Arthur Norman; Monday and Friday, 10 p.m. to 10.30 p.m., Meditation Music, conducted by Arthur Hoad; Tuesday and Friday, 11.45 a.m., "The Story Teller," conducted by Scott Griffith; Tuesday, 8.15, "Matters Concerning Men," conducted by Scott Griffith; Tuesday, 9.45, Bendigo Apex Club Players in "The Eyes of Brian Calvert"; Wednesday, 11.30 to 12, "The Good Companion" conducts "A Message of Cheer for the Sick" Session; 8.30, Myer's Staff Programme, conducted by G. Leech; 9.45, "The Good Companion"; Thursday, 9.30, "Radio Pete," Tom Griffiths; 9.45, Community Singing from the Bendigo Town Hall, conducted by W. Baxter; Once a month "Diggers' Programme" at 9.45; Friday, 5, Smile Club Community Singing; 8, "You're Telling Me"; 9.30, 3BO Sporting Observer; Saturday, 1.30, Eric Welch Racing Session; 6.30, Relay from Melbourne of the day's Sporting events; 7, 3BO Sporting Observer (Jack Mamouney); Sunday, 11.30, Travelogue Session; 7, Lecture by Judge Rutherford; 7.30, "Pathway of Golden Memories," conducted by Roger Fair; 8.30, "The Shell Show," conducted by Frank J. Cave; 9.30, Rolfe's Quality Hour, conducted by George King.

Transmission Times: Monday to Friday, 11 to 1.30 p.m., 5 p.m. to 10.30 p.m.; Saturday, 1.15 to 10.30 p.m.; Sunday, 10 a.m. to 1 p.m., 7 p.m. to 10.30 p.m.

Total Transmission Hours during 1935: 2,750.

3DB MELBOURNE—291 metres

3DB BROADCASTING CO. PTY. LTD. 36 Flinders Street, Melbourne, Vic. Directors: Thorold Fink, Sir Keith A. Murdoch, George Taylor, E. A. Price, A. S. Whyte, W. Dunston (Chairman). Manager: D. T. Worrall. Location of Studios: 36 Flinders Street, Melbourne. Exact Location of Transmitter: 42-74 Flinders Street, Melbourne. Licensed Power: 600 watts.

Slogan Name: "3DB Melbourne—The Herald Broadcasting Service."

Number and Size of Studios: Two, 45ft. x 36ft. and 18ft. x 18ft.

Sales Manager: R. McC. Russell. **Programme Manager:** C. E. Taylor. **Chief Announcer:** Renn Millar. **Other Announcers:** J. Stuart, G. Palmer, C. Vaude, A. Cooper, E. Walch, M. Callard, J. Devine, K. Eden, Miss Iris Turnbull, Miss A. Brown, Miss M. Osmond. **Other Staff Executives.—Assistant Manager:** R. McC. Russell. **Accountant:** F. W. Fardell. **Manager Transcription Dept.:** J. Devine. **Manager Record Dept.:** S. Clark. **Salesmen:** L. Stelling, S. Grist, D. Brewin, Miss A. Brown. **Chief Engineer:** Max Hooper. **Consulting Engineer:** H. Kauper. **Other Engineers:** H. Boast, F. Maughan, I. MacLeod. **Secretary:** D. T. Worrall.

Nominal Capital: £20,000. **Paid-up Capital:** £10,000. **Bankers:** National Bank of A/sia Ltd. **Solicitors:** Norman, Miller. **Auditors.** Hancock & Woodward.

Sales Reps.: F. Thompson, Warwick House, Hamilton Street, Sydney.

Special Sessions: "Smile Away Club," 6.60 p.m.; "Women's Radio Service," 11 a.m.; "Children's Session," 5 p.m.; Race Broadcasts and Sporting Session, 6.45 p.m.

Transmission Times: Monday to Friday, 6.30 a.m. to 11.30 p.m. Saturday, 6.30 a.m. to 12 midnight. Sunday, 10 a.m. to 12.15 p.m. and 2.30 to 10.30 p.m.

Total Transmission Hours during 1935: Approx: 5,900 hours.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

3GL GEELONG—222 metres

GEELONG BROADCASTERS PTY. LTD. Business Address: National Mutual Buildings, Moorabool Street, Geelong. Location of Transmitter: Geelong. Licensed Power: 50 watts.

3HA HAMILTON—297 metres

WESTERN PROVINCE RADIO PTY. LTD. Business Address: 239 Collins Street, Melbourne. General Manager: R. A. Fitts. Location of Studios: 37 Gray Street, Hamilton. Exact Location of Transmitter: Mt. Bainbridge. Licensed Power: 300 watts.

Slogan Name: "The Age" station.

Number and Size of Studios: Two, 24ft. x 36ft., 12ft. x 12ft.

Sales Manager: L. R. Heath. **Programme Manager and Chief Announcer:** R. Burrows. **Other Announcers:** T. Coombs, Don James, Mrs. H. Pither. **Salesmen:** N. F. Dixon. **Chief Engineer:** R. A. Fitts. **Other Engineers:** P. C. Bennett, V. Monaghan. **Secretary:** Miss J. Walls.

Bankers: Commercial Banking Co. of Sydney. **Solicitors:** Blake & Riggall. **Auditors:** Wilson, Bishop & Henderson.

Sales Reps.: E. H. Brewer, Room 112, Assembly Hall, Margaret Street, Sydney.

Transmission Times: Daily, 7 to 9 a.m., 12 to 4.15 p.m., 5.15 to 11 p.m.; Saturday, 7 to 9 a.m., 1 p.m.-last race, 6.15 to 1 a.m.; Sunday, 11 to 4.30, 6.45 p.m. to 11 p.m.

Total Transmission Hours during 1935: 4628 hours.

3HS HORSHAM—218 metres

WIMMERA BROADCASTING CO. PTY. LTD., 15 Firebrace St., Horsham, Vic. Directors: J. V. S. Ward and Mrs. A. L. Ward. Managing Director: J. V. S. Ward. Manager and Engineer: A. T. Hopton. Exact Location of Transmitter and Studios: 15 Firebrace Street, Horsham. Licensed Power: 50 watts aerial.

Announcers: A. T. Hopton (Chief Announcer), Miss Nell Orloff and Mr. M. Hinneberg. **Secretary:** Miss N. Orloff.

Nominal Capital: £5,000. **Bankers:** Union Bank of Australasia.

Sales Reps.: N.S.W., Mr. G. Hill, Chamber of Commerce Bldgs., Sydney; Vic., Amalgamated Wireless A/sia Ltd., Queen Street, Melbourne.

Special Sessions: "Adventures of Flash Gordon," 9.15, Monday; "Listening in on Hollywood." 7.10, Tuesday: "Musical Moments for the Children," 6.0, Wednesday; "Diggers' Session," 8.30, Saturday; "Modern Dance Music," 9.30, Saturday; "Judge Rutherford," 8.0, Sunday.

Transmission Times: Monday to Saturday, Luncheon Session, 12 to 1.30 p.m.; Monday, Tuesday, Thursday, Friday, 6.30 to 10.30 p.m.; Wednesday, 6-10.30 p.m.; Saturday, 6.30-11 p.m.; Sunday, 7-10 p.m.

Total Transmission Hours During 1935: 2,100.

3HS since taken over by 3DB Broadcasting Co. Pty. Ltd.

3KZ MELBOURNE—254 metres

3KZ BROADCASTING CO. PTY. LTD. Business Address: 64 Elizabeth Street, Melbourne. Names of Directors: S. Morgan, W. V. Morgan, M. G. Sloman. Managing Director: S. Morgan. Location of Studios: Trades Hall, 40 Victoria Street, Carlton. Licensed Power: 600 watts.

Slogan Name: "Brighter Broadcasting Service."

Number and Size of Studios: Two, 27ft. x 42ft. x 18ft., 13ft. x 20ft. x 12ft.

Sales Manager: W. V. Morgan. **Programme Manager:** N. E. Balmer. **Chief Announcer:** Norman Banks ("Norm"). **Announcers:** Norman Balmer ("Eddie"), Alex. Dear ("Terry"), Kenrick Hudson ("Dick"), Stephen McDonald ("Uncle Mac"), Pat Corby ("Peter"), Donovan Joyce ("Don"), Margaret Reid ("Pat"), Iris Greenham ("Dot").

Other Executives: A. Isaacson, Assistant Manager, Donovan Joyce, Continuity Writer. **Salesmen:** F. Russell, F. Blanshard, A. Gray, J. Van Dyke. **Chief Engineer:** A. Grace. **Other Engineers:** S. Thurling, E. Barwick. **Secretary:** B. Jackson.

Bankers: Bank of Australasia. **Solicitors** W. D. Sykes. **Auditors:** Sloman & Mogg.

Sales Reps.: A. M. Ross Smith, 133 Pitt Street, Sydney.

Special Sessions: Monday: "Star" Women's Session, 11 to 11.15 a.m.; Women's Radio Magazine, conducted by Mrs. Rex, 1.30 to 2 p.m.; "Emma and 'Erbert," 6.45 and 6.50 p.m.; "Air Adventures of Jimmy Allen," 7.30 to 7.45 p.m.; "Moving Stories of Life," 8.15 to 8.30 p.m.; "Doc Savage," 8.45 to 9 p.m.; "Notable British Trials," 9.45 to 10 p.m.; "Star" News Service, 10.30 to 10.35 p.m.; 90 minute Dance Programme, 10 to 11.30 p.m. Tuesday: "Star" Women's Session, conducted by P. W. Pearce, 11 to 11.15 a.m.; Women's Radio Magazine, conducted by Mrs. Rex, 1.30 to 2 p.m.; "Emma and 'Erbert," 6.45 to 6.50 p.m.; "Air Adventures of Jimmy Allen," 7.30 to 7.45 p.m.; "Notable British Trials," 9.45 to 10 p.m.; "Star" News Service, 10.30 to 10.35 p.m.; 90 minute Dance Programme, 10 to 11.30 p.m. Wednesday: "Star" Women's Session, 11 to 11.15 a.m.; Women's Radio Magazine, conducted by Mrs. Rex, 1.30 to 2 p.m.; "Emma and 'Erbert," 6.45 to 6.50 p.m.; "Composers at Home," 7 to 7.15 p.m.; "Air Adventures of Jimmy Allen," 7.30 to 7.45 p.m.; "Strange As It May Seem," 7.45 to 8 p.m.; "Comedy Capers," 9.15 to 9.30 p.m.; "Notable British Trials," 9.45 to 10 p.m.; "Star" News Service, 10.30 to 10.35 p.m.; 90 minute Dance Programme, 10 to 11.30 p.m. Thursday: "Star" Women's Session, conducted by May Maxwell, 11 to 11.15 a.m.; "Women's Magazine," conducted by Mrs. Rex, 1.30 to 2 p.m.; "Emma and 'Erbert," 6.45 to 6.50 p.m.; "Air Adventures of Jimmy Allen, 7.30 to 7.45 p.m.; "Voice of Wisdom," 8 to 8.15 p.m.; "Hour of Romance," 8.15 to 8.30 p.m.; "Notable British Trials," 9.45 to 10 p.m.; "Star" News Service, 10.30 to 10.35 p.m.; 90 minute Dance Programme, 10 to 11.30 p.m. Friday: "Star" Women's Session, conducted by P. W. Pearce, 11 to 11.15 a.m.; Women's Radio Magazine, conducted by Mrs. Rex, 1.30 to 2 p.m.; "Air Adventures of Jimmy Allen," 7.30 to 7.45 p.m.; Health and Physical Culture session, conducted by P. W. Pearce, 7.45 to 8

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

3KZ MELBOURNE—(Continued)—

p.m.; "Referee" Sporting Session, conducted by N. Hampton, 8.45 to 9 p.m.; "Notable British Trials," 9.45 to 10 p.m.; "Emma and 'Erbert," 10.15 to 10.20 p.m.; "Star" News Service, 10.30 to 10.35 p.m.; 90 minute Dance Programme, 10 to 11.30 p.m. Saturday: 2½ hour Special Musical Programme, 2.40 to 5.10 p.m.; Sporting Session, 6 to 6.15 p.m.; "Emma and 'Erbert," 6.45 to 6.50 p.m.; "Voice of the People," 7.45 to 8 p.m.; conducted by Norman (Eddie) Balmer; 5 hour Dance Programme ,8 p.m. to 1 a.m.; "Pick and Pat and their Minstrels," 11.15 to 11.30 p.m. Sunday: "Strange As It Seems," 8.30 to 8.45 p.m.; George Edwards' Cesarine Play from Sydney, 8.45 to 9.15 p.m.; Professional and Amateur Parade, 9.15 to 10 p.m.; "Star" News Service, 10.15 to 10.20 p.m.

Transmission Times: Monday to Friday, 6.30 a.m. to 4.30 p.m., 5 p.m. to 11.30 p.m.; Saturday, 6.30 to 1 a.m.; Sunday, 10 a.m. to 12.30 p.m., 2.30 to 4.30 p.m., 6 to 10.30 p.m.

Total Transmission Hours for 1935: 5,820 hours.

3MA MILDURA—333.1 metres

SUNRAYSIA BROADCASTERS PTY. LTD. Business Address: Zimmer's Buildings, Langtree Avenue, Mildura. Directors: R. D. Elliott, G. S. Baxter, C. D. Lanyon. General Manager: E. Holloway. Location of Studios and Transmitter: Zimmer's Buildings. Licensed Power: 100 watts.

Number and Size of Studios: Two, one large enough for an orchestra.

Sales Manager and Chief Announcer: E. Holloway. **Other Announcers:** E. Hurrey, D. Sarah. **Chief Engineer:** M. Folie. **Other Engineers.** L. Vale, H. James. **Secretary:** C. D. Lanyon.

Sales Reps.: G. Hill, Chamber of Commerce Bldg., George Street, Sydney.

Transmission Times: Weekdays, 7-9 a.m., 12.30-1.30 p.m., 6-10.30 p.m. (Sat., -11 p.m.); Sundays, 10 a.m.-2 p.m., 6.15-10 p.m.

3MB BIRCHIP—201 metres

MALLEE BROADCASTERS PTY. LTD. Business Address: Cumming Avenue, Birchip. Names of Directors: A. C. Harris, R. J. Barbour, A. H. Pearson, A. Fraser, E. E. Bryant. Managing Director: A. C. Harris. Location of Studios and exact Location of Transmitter: Cumming Avenue, Birchip. Licensed Power: 100 watts.

Slogan Name: "The Brighter Country Station."

Number and Size of Studio: One, 18ft. x 15ft.

Sales Manager: H. Aldridge. **Programme Manager and Chief Announcer:** A. R. Creighton. **Other Announcers:** H. Aldridge and A. C. Harris. **Chief Engineer:** H. Aldridge. **Other Engineer:** R. Paice. **Secretary:** D. W. Paine.

Nominal Capital: £2,500 in £1 shares. **Paid-up Captial:** £1,150. **Bankers: National Bank of Australia Ltd.** Solicitors: Oakley & Thompson, Birchip.

Special Sessions: Dance Session, Saturdays, 10 to 11.30 p.m.; Children's Session, Sundays, 5.30 to 6.30 p.m.

Transmission Times: Monday to Friday, 12.15 to 1.45 p.m., 6.30 to 10.30 p.m.; Saturdays, 12.15 to 1.45 p.m., 6.30 to 11.30 p.m.; Sundays, 12.15 to 1.45 p.m., 5.30 to 6.30 p.m., 7.30 to 10 p.m.

3SH SWAN HILL—278.8 metres

SWAN HILL BROADCASTING COMPANY PTY. LTD. Business Address: Campbell Street, Swan Hill. Managing Director: E. Wendel. Director and General Manager: W. Cornish. Licensed Power, 100 watts.

Slogan Name: "Border Feature Station."

Programme Manager. N. J. Blee. **Chief Announcer:** N. J. Blee. **Other Announcers:** W. Cornish, E. Freeman, Miss M. Fitzgerald. **Salesmen:** C. Atkinson, E. Jenkin. **Chief Engineer:** J. Mair. **Secretary:** Miss M. Fitzgerald.

Bankers: New South Wales. **Solicitors:** Garden & Green. **Auditors:** F. Jukes.

Sales Reps.: Amalgamated Wireless, A/sia Ltd., 47 York Street, Sydney; Paton Advertising Service Pty. Ltd., 14 Spring Street, Sydney; Goldberg Advertising Agency Ltd., 15 Hamilton Street, Sydney.

Special Sessions: The Argus, Tuesday and Friday; The Shell Company, Sunday.

Transmission Times: Week days, 12.30-1.30 p.m., 7-10.30 p.m.; Saturdays, till 11 p.m.; Sundays, 12.15-2.15 4.15-6 p.m., 7.15-10 p.m.

3TR SALE—242 metres

Station owned and operated by Gippsland Publicity Pty. Ltd. Business Address: 7 Raymond Street, Sale. 'Phone 107. Studio programme and advertising is conducted by Broadcast Entertainments Pty. Ltd., with headquarters c/o 3HA, The Age Chambers, 239 Collins St., Melbourne, M 4731. Managing Director of Gippsland Publicity Pty. Ltd.: Archibald Gilchrist. General Manager: T. Coombs. Location of Studios: 7 Raymond Street, Sale. Exact Location of Transmitter: Myrtlebank, five miles North of Sale. A studio also at Bairnsdale, equipped and conducted by Les Hammer. Licensed power: 500 watts.

Studio Director: Alf Andrew. **Continuity Writer:** Arthur Mathers. **Country Sales Manager:** Fred McClaren. **Chief Engineer:** Stanley Johnson. **Other Engineer:** Ronald Schmidt.

Total Transmission Hours during 1935: About 3,500 hours.

Special Programme Services: Plays under direction of Alfred Andrew; Mouth Organ Band; Modern and Old Time Dance Band. The station is well equipped for dialogue advertising, with a wide variety of effects. Large library of music records.

Special Sessions: News Sessions, 11 a.m., 1.25 p.m., 10.25 p.m.; Farm and Stock, 1 p.m. and 7.30 p.m.; Entertainments, 12.45 p.m. and 6.20 p.m.; Eric Welch every night 6.45 p.m.; Local Sport, 6.50 p.m.; Mrs. Meggs and Miss Obbs, Tuesday, 8.30 p.m.; Mouth Organs, Thursday, 8.45 p.m.; Fight description, Friday, 9 p.m.; 50-50 Dance, Saturday, 9-11.30 p.m.; Church Relay, Sunday, 7 p.m.; Gippsland Cameos, Sundays from 6.30 p.m.

Transmission Times: Mon. to Fri., 11 a.m.-3 p.m., 5.30-10.30 p.m.; Sat. and holidays, 11 a.m.-1 p.m., 6-11.30 p.m.; Sun., 6.30-10.30 p.m.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

3UZ MELBOURNE—322 metres

NILSEN'S BROADCASTING SERVICE PTY. LTD. Business Address: 45-47 Bourke Street, Melbourne. Directors: O. J. Nilsen, C. T. Cromie, O. V. Nilsen. Governing Director: O. J. Nilsen. General Manager: A. N. Kemsley. Location of Studios and Transmitter: 45-47 Bourke Street, Melbourne. Licensed Power: 600 watts.

Slogan Name: Nilsen's Broadcasting Service Pty. Ltd.

Number and Size of Studios: Two. No. 1, 50ft. x 35ft., No. 2, 20ft. x 18ft.

Sales Manager: J. S. Larkin. **Programme Manager:** G. English. **Chief Announcer:** Hal Percy. **Other Announcers:** H. Wilson, D. Foster, C. Bradley, F. Jenkin, I. Coffey, M. Manning, L. Homfrey. **Salesmen:** O. W. Abramowski, G. S. Fawcett. **Chief Engineer:** L. G. Glew. **Other Engineers:** R. Riches, W. Virgona, E. Higgenbotham. **Secretary:** E. L. Cottrell.

Sales Reps.: A. D. Bourke, 5-7 Barrack Street, Sydney.

Special Sessions: Monday, 8 p.m., Maple's 4 M's, featuring ensemble of ten leading professional artists with orchestra; 9.15 p.m., Current affairs from Easy Chairs—plain man's discussion of major world problems from Swallow & Ariell Ltd. Tuesday, 8 p.m., "Ports of Call," the Vacuum Oil Co.'s outstanding musical travelogue; 9 p.m., "The Roar of the Crowd," "Big Moments in the Lives of Famous Athletes" (Griffiths Sweets). Wednesday, 7.30 p.m., "The Secret of Flat 14," a Hal Percy thriller serial (Sunshine Biscuit Company); 8.15 p.m., "The Puzzle King" (A.C. Spark Plugs); 9 p.m., Comedy and Musical Comedy (Seppelts Wines). Thursday, 7.30 p.m., "Mr. S. and Mr. E.'s Information Bureau," a riot of fun and nonsense from (Fred Hesse); 8 p.m., "Ports of Call"; 9 p.m., Home Gardeners' Session (Watters & Sons); 9.15 p.m., Stories of the Victoria Cross (W. C. Craigie & Co.). Friday, 7 p.m., "The Diggers' Session," conducted by Major Scrivenor; 8 p.m., Jack Gurry's Football Review; 9 p.m., Boxing from Fitzroy Stadium, by Jack Gurry (Griffiths Sweets). Saturday, 10.40 a.m., Herbert Rothwell's "Last Minute" Racing Review; 2.30 p.m., Principal League Football Match from Richmond or St. Kilda ground, described by Jack Gurry for Maples Home Furnishers; 7.10 p.m., Sporting Results Summary by Percy Taylor of the "Argus"; 7.25 p.m., The Argus official starting prices; 8 p.m., Healing's quest for the "Golden Voice of the Air"; 9 p.m., The radio treat of the week, Hal Percy, the live artists' hour. Daily: 7.50 a.m., Norman McCane's broadcast, "The Argus News Service"; 8 p.m., Observatory time signal and weather report; 8.15 a.m., Interstate trains; 8.30 a.m., Children's session conducted by Frank Jenkin; 9.15 a.m., Penelope's Housewives' Session; 12 noon, Bright Luncheon Music; 2.15 p.m., Louise, Dorothy Foster and Margaret Manning present the afternoon tea programme; 4.30 p.m., Swallow Cook; 6 p.m., Dinner music; 6.20 p.m., Free theatre tickets; 8.45 p.m., Charlie Chan (Woods Nivea Cream); 10.30 p.m., The Argus News and Weather Report. Sundays: 10 a.m. and 5.45 p.m., 3UZ's famous Sunday programme selected from the world's best recordings.

Transmission Times: Mon. to Fri. inclusive, 6.30 a.m.-11.30 p.m.; Sat., 6.30 a.m.-12 noon, 2 p.m.-midnight; Sunday, 10 a.m.-12.30 p.m., 5.45-10 p.m.

Total Transmission Hours during 1935: 5500.

Special Programme Services: 3UZ specializes in live artist performances, comprising orchestras and instrumentalists as well as comedy and drama, also transcriptions.

3WR SHEPPARTON—238 metres

THE GOULBURN VALLEY AND NORTH-EASTERN BROADCASTERS PTY. LTD. Business Address: 13a High Street, Shepparton. Directors: L. J. Hellier, R. McPherson, W. Callander. Managing Director: L. J. Hellier. Location of Studios: 13a High Street, Shepparton. Exact Location of Transmitter: Congupna Road, Congupna. Licensed Power: 500 watts.

Number of Studios: Two.

Chief Announcer: L. J. Hellier. **Other Announcers:** Ray Shortell, Mrs. T. Shortell (Plain Jane), Roy McPherson. **Chief Engineer:** Ray Shortell, A.M.I.R.E.

Nominal Capital: £6,000, being increased to £15,000, special meeting on 26th March, 1936. **Paid-up Capital:** £4,625. **Bankers:** Bank of N.S.W. **Solicitors:** Morrison, Sawers & Teare. **Auditors:** J. Stubbs & Son..

Special Sessions: Shell Show, Lee Murray Players.

Transmission Times: 11 a.m. to 1 p.m., 7 p.m. to 10.30 p.m.

3XY MELBOURNE—211 metres

EFFTEE BROADCASTERS PTY. LTD. Business Address: Princess Theatre Building, Spring Street, Melbourne. General Manager: Tom Holt. Location of Studios and Transmitter: Princess Theatre, Melbourne. Licensed Power: 600 watts.

Slogan Name: "The Quality Station."

Transmission Times: Weekdays: Mondays to Saturdays, 6.30 a.m.-11.30 p.m.; Sundays, 10 a.m.-12.30, and 2.50 p.m. to 10.30 p.m.

Sales Reps.: Sydney, Amalgamated Wireless Limited of A/sia Ltd., 47 York Street, Sydney.

3YB WARRNAMBOOL—283 metres

W. & W. BROADCASTERS PTY. LTD. Business Address: 430 Little Collins Street, Melbourne. Directors: V. M. Dinneny, A. F. Crosby, G. I. Purbrick. General Manager: V. M. Dinneny. Location of Studios: Spring Gardens, Warrnambool. Licensed Power: 50 watts, maximum allowable.

Slogan Name: "City of Warrnambool."

Number and Size of Studio: One, 18ft. x 16ft.

Chief Announcer: W. Bennetts. **Other Announcer:** J. Woods. **Salesman:** F. A. Hood. **Chief Engineer:** A. G. Glover. **Secretary:** L. G. Callaway.

Nominal Capital: £6,000. **Bankers:** National Bank of Australia.

Special Session: Noon to 2 p.m., 6 to 10.30 p.m.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Cont.)

Queensland Stations

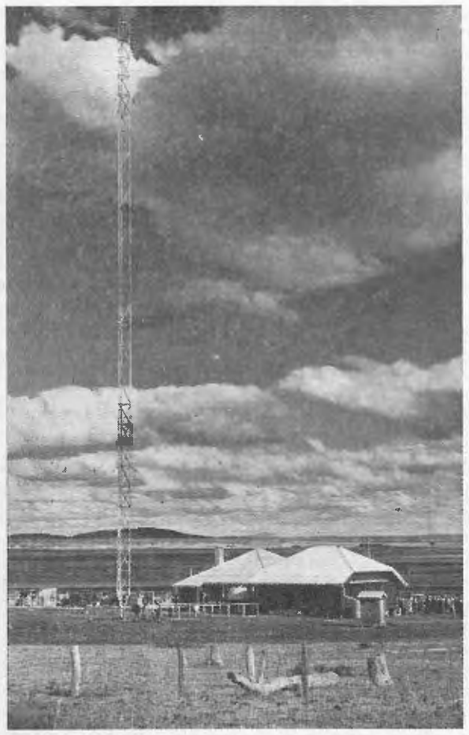
4AK OAKEY—246 metres

BRISBANE BROADCASTING PTY. LTD. Business address: Courier-Mail Building, Queen Street, Brisbane. General Manager: Alec Robertson. Location of Studios: Studios at Station 4BK (Brisbane) and at Oakey. Exact Location of Transmitter: Kingside (2 miles from Oakey, 15 miles west of Toowoomba). Licensed Power: 2,000 watts.

Chief Engineer: A. L. Dixon. **Engineer-in-Charge:** W. Harland.

Transmission Times: Same as 4BK (Brisbane), except for two hours early evening, which are devoted to exclusive 4AK programmes.

This is 4BK Brisbane's high power country relay station. See 4BK particulars which apply to 4AK.



A view of 4AK (Oakey), the high-powered relay station of 4BK (Brisbane), operated by the Courier-Mail. The aerial is of the quarter-wave vertical type, and is 210 feet in height.

4AY AYR—207 Metres

AYR BROADCASTERS PTY. LTD. Business Address: Airdmillan Road, Ayr, North Queensland. Directors: Norman L. Dahl, J. L. Humphry, R. D. Low. Managing Director: Norman L. Dahl. Location of Studio and exact Location of Transmitter: Airdmillan Road, Ayr, North Queensland. Licensed Power: 300 watts.

Slogan Name: "The Voice of the Canefields."

Sales Manager: Norman L. Dahl. **Programme Manager:** V. Bohm. **Chief Announcer:** Norman L. Dahl. **Other Announcers:** A. Innes, V. Bohm.

Nominal Capital: £2,000. **Paid-up Capital:** £2,000. **Bankers:** Union Bank of Australia Ltd. **Solicitors:** R. J. Ruddy & Tomlins.

Sales Reps.: J. B. Chandler & Co., Southern Queensland; A. D. Bourke, N.S.W.

Transmission Times: Monday to Saturday, 2.30 to 5 p.m., 6 to 10.30 p.m.; Sunday, 8 to 10 p.m.

Total Transmission Hours during 1935: 2,360 hours.

Chief Engineer: W. Faber. **Secretary:** V. Bohm.

4BC BRISBANE—268 Metres

CHANDLER'S BROADCASTING SERVICE, 43 Adelaide Street, Brisbane. Managing Director: J. B. Chandler. General Manager: Russell F. Roberts. Location of Studios: 45 Adelaide Street, Brisbane. Exact Location of Transmitter: Oxley, Queensland, 9 miles from Brisbane on the main Ipswich Road. Licensed Power: 1,000 aerial watts.

Number and Size of Studios: Three studios. Main, 30 x 15, drama 15 x 15, talks 12 x 12.

Sales Manager: A. K. Forsyth. **Programme Manager:** Cecil R. Carson. **Announcers:** Eric Bessemer, Thomas McGregor, Edward Webster, Richard Matthews, Terence Lambart, Jim Anderson (Races), Stan Phillips (General Sports), Barney Cook (Cricket), Dean Casos (Tennis), Oscar Craig (Markets); female, Ruth Rutherford, Marie London, Jessie McLennan. **Other Staff Executives:** Musical Director, Howard Sleath; Official Accompanist, J. P. Wallis; Record Department, Miss Rosa Duncan; Studio Technical Adviser, T. McGregor; Statistical Department, Harry Talbot; Continuity Department, Edgar Littleton; Miss J. McLennan, Director Children's Hospital Flower League. **Salesmen:** R. M. Graham, W. H. Carroll. **Chief Engineer:** W. Sutherland. **Other Engineers:** F. E. Elliott, O. Burmister, S. Smith. **Secretary:** W. G. Duncan.

Bankers: English, Scottish & Australian Bank. **Solicitors:** Messrs. Morris, Fletcher & Cross. **Auditors: Messrs.** White & Hancock.

Sales Reps.: A. D. Bourke, Country Press Chambers, Barrack Street, Sydney; David Duff, 382 Latrobe Street, Melbourne, C.1.

Special Sessions: Russell F. Roberts, Sundays, 7-8 p.m. ("Boer War" Lectures); Dr. W. G. Goodard, Sundays, 6.20-6.55 p.m. (World Affairs); Sunrise Sam (E. Bessemer), Mondays to Saturdays, 6.30-9.30 a.m., Breakfast Session; Ruth Rutherford, Mondays to Fridays, 9.30-12 noon, Women's Session; R. Mathews, Mondays to Fridays, 12-2 p.m., "Man on the Land" Session.

Transmission Times: Mondays to Fridays, 6.30 a.m. to 11 p.m.; Saturdays, 6.30 a.m. to 9.30 a.m., 12 noon to 11 p.m.; Sundays, 7 a.m. to 12 noon, 3 p.m. to 10.30 p.m.

Total Transmission Hours during 1935: 5,620.

Special Programme Services: Complete continuity and production services available with thorough market research facilities.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

4BK BRISBANE—233 Metres

BRISBANE BROADCASTING PTY. LTD. Business address: Courier-Mail Building, Queen Street, Brisbane. General Manager: Alec Robertson. Location of Studios and Exact Location of Transmitter: King House, Queen Street, Brisbane. Licensed Power: 500 watts.

Slogan Name: The Courier-Mail Station.

Number and Size of Studios: Two.

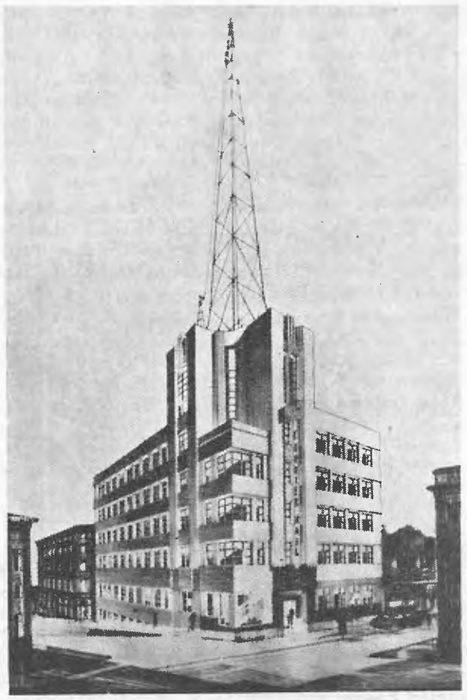
Advertising Manager: R. A. Fremlin. **Production Manager and Chief Announcer:** Rod Gainford. **Chief Engineer:** A. L. Dixon. **Secretary:** H. M. Bayley.

Bankers: English, Scottish and Australian Bank Ltd. **Solicitors:** Thynne & Macartney. **Auditors:** Munro Jennings & Co.

Sales Reps.: Sydney Rep., Robt. Jackson, 9th Floor, Warwick Building, Hamilton Street, Sydney. Melbourne Rep., R. D. Fisher, Newspaper House, Collins Street, Melbourne.

Transmission Times: Monday to Friday, 7 a.m. to 2 p.m., 3.30 to 11 p.m.; Saturday, 7 a.m. to 12 noon, 2.30 p.m. to midnight; Sunday, 11.30 a.m. to 2 p.m., 5 to 10.30 p.m. Regular relays to 4AK Oakey (2,000 watts).

Special Programme Services: Complete, up-to-date programme facilities including station artists, electrical transcriptions, and exclusive musical recordings from all parts of the world.



The new Courier-Mail building carries 4BK, the Courier-Mail broadcasting station on its top floor, and the tall aerial masts are one of Brisbane's outstanding landmarks have been installed on the most modern lines.

4BH BRISBANE—217 Metres

BROADCASTERS AUST. PTY. LTD. Business Address: Parbury House, Eagle Street, Brisbane. Names of Directors: V. F. Mitchell, Neil O'Sullivan, R. D. Kennedy. General Manager: Eric Harrison. Location of Studios, 90-92 Queen Street, Brisbane. Location of Transmitter: Bald Hills (nine miles north of Brisbane). Licensed Power: 1,000 watts.

Slogan Name: 4BH (for brighter hours).

Programme Manager: John Cazabon, jun. **Chief Announcer.** George Hardman. **Other Announcers:** "Sally," Ronald Roberts, Sydney Everett, Archie Graham. **Salesmen:** Gordon Forsythe, George Clay and C. F. Watts. **Chief Engineer:** N. W. Cruickshank. **Other Engineers:** Cyril Moran, Arthur Tonge, Dawson Hare, B. Hart, R. Fletcher. **Secretary:** R. D. Kennedy, c/o Kennedy, Bowly & Manson, Chartered Accountants, Eagle Street, Brisbane. **Auditors:** C. A. Clarke.

Sales Reps.: A. D. Burke, Country Press Chambers, Barrack Street, Sydney; David Duff, 382 Latrobe Street, Melbourne.

Special Sesions: Ned Tyrrell's Regent Theatre Orchestra, 8 to 9 p.m. Sundays conducted by George Hardman; "One Man's Family," Wednesday, 8.15 p.m., Friday 8.30 p.m., produced by Eric Harrison; Friday night races, 7 p.m., conducted by George Hardman; The Rambling Pianist, daily, 7.30 a.m., conducted by Sydney Everett; Sheldon Follies, Mondays 9 p.m., conducted by Ronald Roberts; Tritton's High-spots of Harmony, Sundays, 12 to 2 p.m., conducted by Ronald Roberts; Boden's Bouquet of Symphony and Song, Sunday, 9.15 to 9.45 p.m., conducted by George Hardman; Community Concerts, Arcadia Theatre, Ascot, Mondays 8 p.m. and Theatre Royal, Thursdays, 12 noon, conducted by Archie Graham; "The Monkey's Paw," Tuesday, 7.50 p.m., produced by Eric Harrison; Brisbane Stadium, Wednesdays and Saturdays, 9 p.m., conducted by George Hardman; The Carnegie Concert, Sundays, 2 to 3 p.m., conducted by Ronald Roberts.

Transmission Times: Monday to Friday, 7 a.m. to 3 p.m., 5.30 to 11 p.m.; Saturday, 7 to 10 p.m., 5.30 to 11 p.m.; Sunday, 12 to 3 p.m., 5.30 to 11 p.m.

4BU BUNDABERG—203 Metres

BUNDABERG BROADCASTERS PTY. LTD. Business Address: Bourbong Street, Bundaberg, Queensland. Directors: William James Harvey (chairman), Richard George Curtis, Andrew John Christensen. Location of Studio and Transmitter: Bourbong Street, Bundaberg, 100 yards S.S.W. of Bundaberg Post Office. Licensed Power: 100 watts.

Slogan Name: The Voice of the Burnett.

Number and Size of Studios: One studio (30ft. x 15ft.).

Manager-Announcer: C. V. Woodland. **Other Announcers:** Miss K. Russell. **Chief Engineer:** James Jordan. **Secretary:** Percival Moller.

Nominal Capital: £5,000. **Bankers:** Queensland Natl. Bank Ltd., Bundaberg. **Solicitors:** Norman S. Harvey. **Auditors:** James S. Inglis, Bundaberg.

Sales Reps.: Sydney, Robt. Jackson, Warwick Buildings, Hamilton Street, Sydney. Melbourne, Robt. D. Fisher, Newspaper House, 247 Collins Street, Melbourne.

Total Transmission Hours: 7-8.30 a.m., 10-11.30 a.m., 12.30-1.30 p.m., 5.30-10 p.m.; Sunday, 7-10 p.m.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

QUEENSLAND STATIONS.—(Continued).

4CA CAIRNS—216 Metres

AMALGAMATED WIRELESS A/SIA LTD., 47 York Street, Sydney, N.S.W. Directors: Amalgamated Wireless A/sia Ltd. Manager: Frank M. Basden. Location of Studios: Grove Street, Cairns, Queensland. Exact Location of Transmitter: 1⅛ miles N.W. of Cairns Post Office. Licensed Power: 100 watts.

Number of Studios: Two.

Chief Announcer and Chief Engineer: F. M. Basden.

Sales Reps.: Amalgamated Wireless A/sia Ltd., 47 York Street, Sydney and 167-169 Queen Street, Melbourne; Chandler, Brisbane.

Transmission Times: Monday to Friday, 12 noon to 2 p.m., 6 to 10.30 p.m.; Saturday, 6 to 10.30 p.m.

Special Programme Services: Transcriptions and dramatic scripts of the National Broadcasting Company of New York.

4GR TOOWOOMBA—300 Metres

GOLD RADIO SERVICE PTY. LTD. Business address: 380 Ruthven Street, Toowoomba. General Manager: E. E. Gold. Location of Studios: 380 Ruthven Street, Toowoomba. Location of Transmitter: Drayton, four miles (air line) from Toowoomba. Licensed Power: 500 watts.

Slogan Name: "The Voice of the Downs."

Sales Manager: G. R. Harrington. **Programme Manager and Chief Announcer:** N. Carter. **Other Announcers:** R. Beattie and J. Chance. **Accountant:** A. J. Faulkner, Cumming Street, Toowoomba. **Engineers:** N. Bishop, H. Buzacott and V. Le Pla. **Secretary:** W. G. Duncan. **Auditors:** Messrs. Symington and Fowler.

Bankers: E.S. & A. Bank.

Sales Reps.: Sydney, Mr. A. D. Bourke, Melbourne; Messrs. Gloria Lights, Australian Federation of Broadcasting Station Account Agents; Brisbane, Messrs. J. B. Chandler.

Special Session: Mr. G. R. Harrinton.

Transmission Times: Mondays to Fridays inclusive, 6.30 a.m. to 2 p.m., 5.30 to 10 p.m.; Saturdays, 6.30 to 10 a.m., 5.30 to 10 p.m.; Sundays, 11 a.m. to 1 p.m.

4IP IPSWICH—208 Metres

IPSWICH BROADCASTING CO PTY. LTD. Business Address: 237 Brisbane Street, Ipswich, Queensland. Directors: F. J. Meacham (chairman), W. J. Johnson, E. B. Johnson and W. Parkinson. Managing Director: F. J. Meacham (Chairman). General Manager: Royston Marcus. Location of Studios: 237 Brisbane Street, Ipswich, Queensland. Location of Studios and exact Location of Transmitter: 237 Brisbane Street, Ipswich, Queensland. Licensed Power: 50 watts.

Slogan Name: "Station 4IP, in the Heart of Ipswich."

Number and Size of Studios: One, 25ft. x 22ft.

Sales Manager: W. J. Johnson. **Programme Manager:** Miss Mona Walters, A.Mus.A. **Chief Announcer:** Royston Marcus. **Other Announcers:** Bert Browne and W. J. Johnson. **Chief Engineer:** Fred Hoe, jun., A.Inst.R.E. (Aust.). **Other Engineers:** K. Fairweather (monitor). **Secretary:** W. J. Johnson.

Nominal Capital: £10,000. **Bankers:** Bank of New South Wales. **Solicitors:** P. L. Cardew & Simpson. **Auditors:** H. S. Shapcott, A.F.I.A.

Sales Reps.: Noel L. Roberts, 11c Castlereagh Street, Sydney.

Special Sessions: "Harmony Isle," Sundays, 9 p.m. (Royston Marcus); "Furniture Dramas," Mondays, 7.30 p.m. (Royston Marcus); "Music of the Home," Mondays, 8.15 p.m. (Bert Browne); "The Talkie Critic," Mondays, 8.30 p.m. (Royston Marcus); Amateur Trials, Tuesdays, 7.30 p.m. (Royston Marcus); Home Refrigeration, Tuesdays, 8 p.m. (Bert Browne); Stories of the Operas, Wednesday, 8.15 p.m. (Royston Marcus); Life of Queen Victoria, Wednesday, 8.45 p.m. (Royston Marcus); Great Flights of the World, Thursday, 8 p.m. (Royston Marcus); Do You Believe in Ghosts, Thursday, 8.15 p.m. (Bert Browne); Pianoforte Recital, Thursday, 8.30 p.m. (Royston Marcus); S.T.C. Feature Session, Fridays, 7.45 p.m. (Royston Marcus); "Black Ghost," Fridays, 8 p.m. (Royston Marcus); "The Talkie Critic," Fridays, 8.15 p.m. (Royston Marcus); Sporting Resume, Saturdays, 7 p.m. (Bert Browne); "Teleradio" Feature Session, Saturdays, 7.15 p.m. (Bert Browne); Studio Concert, Sundays, 7.30 p.m. (Royston Marcus); "Notable British Trials," Mondays, Tuesdays, Wednesdays, Thursdays and Fridays (relayed from 4BK, Brisbane); Golden Casket Drawings (as drawn, relayed from 4BK Brisbane).

Transmission Times: Monday to Friday, 6.30-7.30 a.m., 8.30-10 a.m., 12.30-1.30 p.m., 3.30-4.30 p.m., 6.30-10 p.m.; Saturday, 6.30-7.30 a.m., 8.30-10 a.m., 11 a.m.-12.30 p.m., 6.30-10 p.m.; Sunday, 7-10 p.m.

Total Transmission Hours during 1935: 1042 hours (operations commenced on September 2nd, 1935).

Special Programme Services: Broadcasts of events of local interest, and of local musical organisations and artists.

4LG LONGREACH—273 Metres

CENTRAL WESTERN BROADCASTING CO. PTY. LTD., Longreach. Licensed Power: 300 watts. Manager, Engineer and Announcer: R. M. Nicholson. Assistant Announcer: W. McPhee.

Slogan Name: "In the Midst of the Golden Fleece."

Sales Reps.: Broadcast Services, A.M.P. Building, Edward Street, Brisbane.

Transmission Times: Daily, 7.30-8.30 a.m., 12.30-1.30 p.m., 6-9 p.m.

4MB MARYBOROUGH—283 Metres

MARYBOROUGH BROADCASTING CO. PTY. LTD. Business Address: Kent Street, Maryborough. Directors: J. B. Chandler, A. P. Wynne, V. F. Mitchell. Managing Director: J. B. Chandler. General Manager: A. P. Wynne. Location of Studios: Kent Street, Maryborough. Location of Transmitter: Kent Street West, Maryborough. Licensed Power: 100 watts aerial unmodulated.

Slogan Name: Wynnes Station.

(Continued on page 104)

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

4MB MARYBOROUGH, Q'LAND.—(Continued).

Number and Size of Studios: Two. No. 1 18ft. x 14ft., No. 2, 25ft. 6in. x 18ft.

Sales Manager: W. G. Diamond. **Programme Manager:** N. McCormack. **Chief Announcer:** W. G. Diamond. **Other Announcers:** Noel McCormack, Thornhill Weedon. **Accountant:** K. McDonnell. **Chief Engineer:** R. J. Beatson. **Secretary:** W. G. Duncan.

Nominal Capital: £5,000. **Bankers:** Commercial Bank of Australia Ltd. **Solicitors:** Morris, Fletcher and Cross. **Auditor:** Kevin McDonnell.

Sales Reps.: A. D. Bourke, 5 Barrack Street, Sydney.

Special Sessions: News session, lunch, children's, dinner music, etc.

Transmission Times: Monday to Saturday, 8.30-10 a.m., 12- 2p.m., extending to 5 on Wednesday and Saturday for race broadcasts, 5.30-10 p.m.

4MK MACKAY—259 Metres

MACKAY BROADCASTING SERVICE. Business address: 64 Nelson Street, Mackay. Location of Transmitter: Mackay. Licensed Power: 100 watts.

4PM PORT MORESBY—221 Metres

AMALGAMATED WIRELESS A/SIA LTD. Business Address: Port Moresby. General Manager: K. T. Frank. Location of Studio .and Transmitter: Port Moresby Licensed Power: 100 watts.

Number of Studios: One large studio.

New Guinea Representative: B.N.G. Trading Co. Ltd., Port Moresby. **Chief Announcer and Engineer:** K. T. Frank. **Other Announcer:** C. E. Searle.

Sales Reps.: Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney; and 167-169 Queen Street, Melbourne.

Special Session: Weekly play presented by company of local artists.

Transmission Times: Monday to Saturday, 7-8 a.m., 1-2 p.m.

4RO ROCKHAMPTON—225.5 Metres

ROCKHAMPTON BROADCASTING CO. PTY. LTD. Business Address: Corner East and William Streets, Rockhampton. General Manager: E. J. Rheuben. Location of Studio and Transmitter: East Street, Rockhampton. Licensed Power. 50 watts.

Size of Studio: 27ft. x 15ft.

Sales Manager: D. W. Dunbar. **Announcers:** G. Keir, K. Godfrey, D. Crow. **Engineers.** G. Ham and W. S. Beaney.

Sales Reps.: 4BC Brisbane, 43 Adelaide Street, Brisbane.

Special Sessions: Sunday, 8 p.m., Dramatic Plays written and produced by Vivian Pugh. Monday, 8 p.m., Serial Play, "Nemesis Incorporated." Tuesday, 7.15 p.m., "Cystex" Newspaper Drama. Thursday, 8 p.m., "Shell" Programme. Friday, 6.20 p.m., Special Children's Session, conducted by "Aunt Dorothy," with the 4RO Juveniles. Friday, 8 p.m., "Ports of Call."

Transmission Times. Sundays, 7-10 p.m.; Mondays to Saturdays (inclusive), 8.30-10.30 a.m., 6-10 p.m.

4TO TOWNSVILLE—278 Metres

AMALGAMATED WIRELESS (A/SIA) LTD. Business Address: Bell Street, South Townsville. Managing Directo: E. T. Fisk. Location of Studio and Transmitter: Bell Street, South Townsville. Licensed Power: 200 watts in aerial.

Number and Size of Studio. One large studio, 24ft. x 20ft.

Sales Manager and Programme Manager: H. E. Cox. **Chief Announcer:** B. Derriman. **Other Announcers:** H. Huntley, R. C. Bleechmore. **Chief Engineer:** H. E. Cox. **Other Engineer:** H. Huntley.

Bankers: Bank of New South Wales.

Sales Reps.: Amalgamated Wireless (A/sia) Ltd., Melbourne and Sydney; Chandlers Broadcasting Service, Brisbane.

Special Sessions: F. & B. radio plays every Thursday, conducted by H. E. Cox; Sporting Sessions, Wednesdays and Saturdays, conducted by R. C. Bleechmore; Napoleonic readings every Sunday, conducted by H. E. Cox; Sporting Commentary (Athletics), conducted by local sporting enthusiast; "Listening in on Hollywood," conducted by the "Radio Tatler," special recorded features, "Metropolis Musical Review," "Flash Gordon," "Birds of a Feather," "Joe and Cynthia," etc., etc.

Transmission Times: Mondays-Saturdays, 7-8 a.m., 6-6.30 p.m., 7-10.15 p.m.; Mondays-Fridays, 12 noon-2 p.m., 3.30-4.30 p.m.; Saturdays, 12 noon-5 p.m.; Sundays, 7 p.m.-10 p.m.

Total Transmission Hours during 1935: 2,500 hours, approx.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Cont.)

4WK WARWICK—333 Metres

THE WARWICK BROADCASTING CO. PTY. LTD. Business Address: Albion Street. Location of Studios and Transmitter: Albion Street, Warwick. Licensed Power: 50 watts.

Slogan Name: Slogan competition now being conducted.

Number and Size of Studios: Three studios, one for speakers, one for recordings, concert hall for community singing and concerts.

Sales Manager and Station Manager: A. E. Lawrence.

Sales Reps.: Represented in Sydney and Melbourne by A.W.A. and in Brisbane by Chandlers.

Special Sessions: The Radio Rascals Symphonic Dance Orchestra, Wednesday ,8.30 p.m.; Special Sunday programmes orchestral music, 8.30 p.m. (conducted by Jack McShane); 4WK Mouth Organ Band, conductor Mr. C. Hackwood; 4WK Musicale of local artists, Friday, 8.30 p.m., conducted A. E. Lawrence; Skehan the Mercer's Session of Celebrity Artists, Thursday, 8.30; Pigotts Best Value Store Session, Monday, 7.30 p.m.; 7.45 p.m., Session of selected recordings, Tom Collins Shoe Store; Monday to Saturday, 12.30-1.30 p.m., 5-30 p.m. to 10.30 p.m.; Sunday, 7.30 p.m. to 9.30 p.m.

4VL CHARLEVILLE—209.8 Metres

CHARLEVILLE BROADCASTING SERVICE PTY. LTD. Business Address: Alfred Street, Charleville. Location of Studio and Transmitter: Quarter of a mile east of P.O. Licensed Power: 50 watts in aerial.

Slogan Name: "Voice of Western Queensland."

Number of Studios: One studio, and one transmitter room.

Engineer. G. Chisholm.

Transmission Times: Week days, 7.30-9 a.m.; Sundays, 10.30 a.m.-12 noon, 12 noon-2 p.m., 6-10 p.m.

Total Transmission Hours since 12/2/36: 670.

5AD ADELAIDE—229 Metres

ADVERTISER NEWSPAPERS LTD. Business Address: Waymouth Street, Adelaide. General Manager: A. L. Holtze. Location of Studios: "The Advertiser" Building, Waymouth Street, Adelaide. Exact Location of Transmitter: Adelaide. Licensed Power: 300 watts in aerial.

Slogan Name: "The Advertiser" Broadcast Network.

Number of Studios: Three.

Sales Manager: Maurice Chapman. **Programme Manager:** Acting, Miss E. Benson. **Chief Announcer:** Jack Burgess. **Other Announcers:** J. Young, R. Binns, Misses D. Edwards, L. England, B. Stirk. **Other Staff Executives:** Production, Maurice Chapman; Continuities, V. A. Jacques; Contracts, Miss D. Edwards. **Chief Engineer:** D. Gooding. H. B. Wilson, Maintenance Engineer, assisted by seven other engineers.

Sales Reps.: 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, 220 East 42nd Street, New York.

Transmission Times: 6 a.m.-2 p.m., 3-11 p.m., Monday to Saturday; Sunday, 5.30-10 p.m. This station owns and relays to 5PI and 5MU.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

5DN ADELAIDE—313 Metres

HUME BROADCASTERS LTD. Business Address: C.M.L. Building, King William Street, Adelaide. Directors: William Queale (Chairman), H. R. Pinkerton, A. E. Bennett, J. A. Hele. General Manager: Gordon W. Marsh. Location of Studio and Transmitter: C.M.L. Building, King William Street, Adelaide. Licensed Power: 300 watts.

Slogan Name: "First Station in the State."

Number of Studios: Four.

Sales Manager: Randal M. White, M.A. **Programme Manager:** Finlay Robb. **Chief Announcer:** H. P. Woolley. **Production Manager:** Max Afford. **Announcers:** Ron Sullivan, Don Nicholson, Cyril Freeman, Mrs. E. Pullman, Joy Badenoch. **Other Staff Executives:** Margaret L. Watt, Secretary to General Manager; Neta A. M. Chaston, Chief of Staff. **Chief Engineer:** E. J. Hume (Acting). **Other Engineers:** F. Hill, C. Howie, F. Wells. **Secretary:** A. J. Carvosso.

Bankers: Bank of New South Wales. **Solicitors:** Shierlaw, Frisby Smith & Romilly Harry. **Auditors:** Counsell, Booth & Hunwick.

Sales Representatives: Walter F. Denby, Temple Court, Collins Street, Melbourne; E. H. Brewer, Assembly Hall, Margaret Street, Sydney.

Transmission Times: 7 a.m. to 11.25 p.m., Monday to Friday, and until midnight on Saturday; 5.45 p.m. until 10.15 p.m. on Sundays.

This station also relays to 5RM.

5KA ADELAIDE, S.A.—250 Metres

SPORT RADIO BROADCASTING COMPANY LTD. Business Address: Richards Buildings, 89 Currie Street, Adelaide, S.A. General Manager: W. K. Schneider. Location of Studios: Richard Buildings. Location of Transmitter: Richard Buildings, between "Sunshine" and No. 2 studio. Licensed Power. 1,000 watts.

Slogan Name: "The Voice of South Australia."

Number and Size of Studios: Two, 25 x 24 and 23 x 16.

Sales Manager: M. O'Halloran. **Programme Manager:** E. Linke. **Chief Announcer:** Arthur Thorn. **Other Announcers:** Cyril A. Freeman, Stewart Edwards, Mrs. W. K. Schneider ("Cousin Dora"). **Other Staff Executives:** J. K. Jameson (Advertising Manager). **Salesmen:** M. O'Halloran, Gordon Crago, Joan Jameson. **Chief Engineer:** Charles Tareha. **Other Engineers:** Oliver Nestrum, Wallace Ryrie. **Secretary.** W. K. Schneider.

Bankers: Commercial Bank of Australia Limited. **Solicitors:** Alderman, Reid and Brazel. **Auditors:** Lionel C. Crosby, A.I.A.S.A.

Sales Reps.: Cuthbert A. Monks, 3rd Floor, Grace Building, 77 York Street, Sydney.

Total Transmission Hours during 1935: 5,668.

Special Programme Services: Studio Presentations, dramatic plays, humorous plays, concert items, etc. Special continuity programmes, transcriptions, etc.

5MY MURRAY BRIDGE—224 Metres

ADVERTISER NEWSPAPERS LTD. Business Address: Waymouth Street, Adelaide. Location of Studios: "The Advertiser" Building, Waymouth Street, Adelaide. Location of Transmitter: Murray Bridge. Licensed Power: 100 watts.

For general particulars of this station, please refer to 5AD, which controls 5MU and 5PI, under the title "The Advertiser" Broadcasting Services.

5PI CRYSTAL BROOK—288 Metres

ADVERTISER NEWSPAPERS LTD. Business Address: Waymouth Street, Adelaide. Location of Studios: "The Advertiser" Building, Waymouth Street, Adelaide. Location of Transmitter: Near Crystal Brook. Licensed Power: 2,000 watts.

For general particulars of this station, please refer to 5AD, which controls 5PI and 5MU, under the title "The Advertiser" Broadcasting Services.

5RM MURRAY HEIGHTS—353 Metres

RIVER MURRAY BROADCASTERS LIMITED, 29 Rundle Street, Adelaide, S.A. Directors: H. R. Pinkerton, Wm. Queale, C. S. Ruston, A. P. Wishart, G. N. White, H. Dennis. Managing Director: H. R. Pinkerton. General Manager: J. A. Young. Location of Studios and Transmitter: Murray Heights. Licensed Power: 1,000 watts in aerial.

Slogan Name: "5RM, Murray Heights."

Number and Size of Studios: One studio, 18ft. x 16ft.

Sales Manager: J. A. Young. **Programme Manager:**

(Continued on next page)

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

5RM MURRAY HEIGHTS.—(Continued)

Miss B. Underhill. **Chief Announcer:** Chas. Carter. **Announcer and Salesman:** R. Pfeil. **Chief Engineer:** J. P. Jack. **Other Engineers:** C. Sirl. **Secretary:** A. J. Carvosso.

Nominal Capital: £10,000. **Paid-up Capital:** £7,175. **Bankers:** Bank of N.S.W. **Solicitors:** Shierlaw, Frisby Smith and Romilly Harry. **Auditors:** Counsell, Booth & Hunwick.

Sales Reps.: E. H. Brewer, Margaret Street, Sydney, N.S.W.; W. F. Denby, 422 Collins Street, Melbourne, Vic.

Transmission Times: Monday to Saturday inclusive, 7 to 8.30 a.m., 12 to 2 p.m., 6 to 10 p.m.; Sunday, 6-10 p.m.

6AM NORTHAM—306 Metres

NORTHAM BROADCASTERS LIMITED. Location of Studios: Princess Chambers, 23 William Street, Perth ('Phones : B 4921 and B 8484). Station on Perth-Northam Road, Northam, 4 miles west of Post Office. Licensed Power: 2,000 watts.

Directors: Archer Whitford and F. R. Whitford. **Advertising Manager:** J. Tozer. **Engineer in Charge:** F. Tredrea. **Secretary:** D. White.

Sydney Representative: Mr. A. D. Bourke, 5-7 Barrack Street, Sydney.

Announcers and Sessions: Mr. Joynsen-Powell, Early Morning, "Breezy Bird"; Fred Borrett, relieving announcer; and M. Joynsen-Powell, Children's Session; Miss June Austin, Women's Session; H. R. Wells, Evening; Alex Higgins, Sporting.

Transmission Times: Monday to Friday, 6-30 to 8 a.m., 12.0 to 2 p.m., 5.45 to 10.30 p.m.; Saturday, 6.30 to 8 a.m., 12.0 to 2 p.m., 6 to 10.30 p.m.; Sunday, 10 a.m. to 1 pm., 6 to 10 p.m.

6IX PERTH, W.A.—242 Metres

WEST AUSTRALIA BROADCASTERS LTD. Business Address: Lyric House, Murray Street, Perth. Directors: H. B. Jackson, K.C. (Chairman), M. D'O. Musgrove, C. P. Smith, H. Greig, F. C. Kingston. General Manager: B. Samuel. Location of Studios: Lyric House, Murray Street, Perth. Location of Transmitter: Newspaper House, St. Goerge's Terrace, Perth. Licensed Power: 500 watts—aerial power.

Number and Size of Studios: Two studios, 27 x 44 and 10 x 12.

Sales Manager: Edison Clifton Churchward. **Programme Manager:** Bramwell F. B. Saunders. **Chief Announcer:** Paul Daly. **Other Announcer:** Ron Gledhill. **Salesmen:** Edison Clifton Churchward, E. Leveson Gower. **Chief Engineer:** H. T. Simmons. **Other Engineers:** N. Parker, G. Buckeridge, G. Butterfield. **Secretary:** E. H. Rosman.

Bankers: E.S.&A. Bank. **Solicitors:** Jackson, Leake Stawell. **Auditors:** Flack & Flack.

Sales Reps.: B. Rieusset, Newspaper House, 247 Collins Street, Melbourne, and D. Virtue, Warwick Building, Hamilton Street, Sydney.

Special Sessions: Morning Session, 9 to 11 a.m., including "Phoebe—the Early Cook," Session from 9.30 to 10.15 a.m.; Afternoon Session, 2 to 3 p.m: 6IX only Perth station on the air at this time; Evening News' Services, 7.50 to 8 p.m., 8.50 to 9 p.m., 9.50 to 10 p.m.

Transmission Times: Monday to Friday, 9 to 11 a.m., 2 to 3 p.m., 6 to 11 p.m.; Saturdays, 9 a.m. to 12.15 p.m., 3 to 5 p.m., 6 to 11 p.m.; Sundays, 1.30 to 3 p.m., 6 to 10.30 p.m.

Special Programme Services: Creation and arrangement of feature programmes, suitable for advertisers' products; comedy sketches, plays, and continuities.

Total Transmission Hours during 1935: 2,909¼.

6KG KALGOORLIE—248 Metres

GOLDFIELDS BROADCASTERS (1933) LTD. Hannan Street, Kalgoorlie, W.A. Location of Transmitter: Parkeston, 2 miles north east of Post Office and Studios, Kalgoorlie. Licensed Power: 500 watts.

Manager: Norman W. Simmons. **Directors:** Frederick Beach Hicks, Norman W. Simmons, John McCarthy. **Secretary:** Victor Beames. **Accountant:** Walter F. Bennetts. **Advertising Executive:** Chester Bond. **Announcers:** W. H. Lonergan, W. F. Bennetts, F. W. Buchan.

Special Sessions: Mining, Educational, Goldfields Boys' Club 6KG, Tuesday; Golden Mile Grasshoppers, Wednesday; School of Music, Wednesday; Sporting: Cycling, Trotting, Racing, Cricket, Football, Humour, Dan & Dusty, Tuesday and Thursday (6.30 to 7 p.m.).

Feature Artists: Patricia Schwann, Pianist; Archer Norwood, Elocutionist; Dan & Dusty, Humorists; Percy Louis, Conductor Boys' Club; Bert Teague's Railway Dance Band, Six-Piece, 2 Piano; Betty Black, Mezzo Soprano; Patricia Thompson, Soprano; Doss Donaldson, Soprano; Rex Mitchell, Football; M. Curtin, Cricket. Sporting Commentators: "Reveille" (Racing Anticipator); "Sportman" 6KG's Saturday Afternoon's Sporting Session; G. A. McDonald, Flautist; and J. McDiamond, Elocutionist; and Goldfields Repertory Club.

6ML PERTH—265 Metres

WEST AUSTRALIA BROADCASTERS LTD. Business Address: Lyric House, Murray Street, Perth, W.A. Directors: H. B. Jackson, K.C. (Chairman), M. D'O. Musgrove, C. P. Smith, H. Grieg, F. C. Kingston. General Manager: B. Samuel. Location of Studios and Transmitter: Lyric House, Murray Street, Perth. Licensed Power: 500 watts—aerial power.

Number and Size of Studios: Two Studios, 27 x 44 and 10 x 12.

Sales Manager: Edison Clifton Churchward. **Programme Manager:** Bramwell F. B. Saunders. **Chief Announcers:** Val. Anderson and Ned Taylor. **Other Announcers:** Siebert Dye, Laurel Berryman. **Salesmen:** E. Leveson Gower. **Chief Engineer:** H. T. Simmons. **Other Engineers:** M. Urquhart, J. Tapper. **Secretary:** E. H. Rosman.

Bankers: E.S.&A. Bank. **Solicitors:** Jackson, Leake, Stawell. **Auditors:** Flack & Flack.

Sales Reps.: B. Rieusset, Newspaper House, 247 Collins Street, Melbourne, Vic., and D. Virtue, Warwick Building, Hamilton Street, Sydney.

(Continued on next page)

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Cont.)

6ML PERTH.—(Continued)

Special Sessions: "Breakfast Session," 7 to 9 a.m., Ned Taylor; Women's Session, 11 a.m. to 12.15 p.m., Laurel Berryman; Children's Session, 5.30 to 6 p.m., Val Anderson, Ron Gledhill.

Transmission Times: Monday to Friday, 7 to 9 a.m., 11 a.m. to 12.15 p.m., 5.30 to 10.30 p.m.; Saturdays, 7 to 9 a.m., 11 a.m. to 12.15 p.m., 6 to 10.30 p.m.; Sundays, 7 to 10 p.m.

Special Programme Services: Creation and arrangement of feature programmes, suitable for advertisers' products, comedy sketches, plays, and continuities.

Total Transmission Hours during 1935: 3,032.

6PR PERTH—341 Metres

NICHOLSON'S BROADCAST SERVICE. Business Address: Barrack Street, Perth. Station Manager: H. Sibary. Location of Studio: Barrack Street, Perth. Exact Location of Transmitter: Applecross Radio Centre. Licensed Power: 500 watts.

Number and Size of Studios: No. 1, 33ft. x 18ft.; Concert Hall, 80ft. x 50ft.

Programme Manager: J. Grant. **Chief Announcer:** H. Sibary. **Other Announcers:** J. Grant, A. Kurtz, F. Buchan, and Miss Farrelly. **Salesman:** Mr. Wilson. **Engineers:** A.W.A. staff.

Sales Reps.: E. H. Brewer, Assembly Hall, Margaret Street, Sydney.

Special Sessions: Bright Breakfast Session, A. Kurtz; Women's Session, Miss Farrelly; Children's Session, Peter and Pongo.

Transmission Times: 7-8.30 a.m., 10.30 a.m.-12 noon, 5.30-10.30 p.m.; Sunday, 8-10 p.m.

Special Programme Services: Multivoice announcing throughout night session male and female. Recording service by equipment as used by B.B.C.

Total Transmission Hours: 2,800.

6WB KATANNING—280 Metres

W. A. BROADCASTERS LIMITED. Business Address: Lyric House, Murray Street, Perth. Directors: H. B. Jackson, C. P. Smith, M. D'O. Musgrove, F. C. Kingston, H. Greig. General Manager: B. Samuel. Location of Studio: Lyric House, Murray Street, Perth. Exact Location of Transmitter: Four and half air miles from Katanning, Western Australia: 160 miles from Perth. Licensed Power: 2,000 watts—aerial.

Sales Manager: Edison C. Churchward. **Chief Engineer:** Harry T. Simmons. **Other Engineers:** N. C. Greer, G. Buckeridge. **Secretary:** E. H. Rosman.

Bankers: E.S.&A. Bank, Perth. **Solicitors:** Jackson, Leake, Stawell & Co., Atlas Building, Esplanade, Perth. **Auditors:** Messrs. Flack & Flack, Perth.

Sales Reps.: B. Rieusset, Newspaper House, 247 Collins Street, Melbourne; D. Virtue, Warwick Building, Hamilton Street, Sydney.

7BU BURNIE—455 Metres

FINDLAY'S BROADCASTING SERVICE. Business Address: Burnie, Tasmania. Directors: Findlay's Pty. Ltd. Managing Director: Mr. A. P. Findlay. General Manager: Mr. A. D. Towner. Location of Studios and Transmitter: Wilson Street, Burnie, Tasmania. Licensed Power: 50 watts (unmodulated in aerial).

Slogan Name: "The Station with a Smile!"

Number and Size of Studios: Two, General and large artists' studio, accommodating up to 50 for concert work, etc.

Sales Manager: Mr. A. D. Towner. **Programme Manager:** Mr. Cliff Parish. **Chief Announcer:** Mr. Cliff Parish. **Other Announcers:** Mr. J. Trethewie, Miss Iris Gray (Patsy), Mr. A. D. Towner, and Miss E. Elliott. **Chief Engineer:** Mr. Cliff Parish. **Secretary:** Mr. P. A. Firth.

Bankers: Bank of Australasia. **Solicitors:** Messrs. Crisp & Edwards. **Auditors:** Messrs. Cruikshank, Creasey, Gow & Layh.

Sales Reps.: Mr. J. F. Brady, Melbourne; Mr. E. H. Brewer, Sydney; Mr. C. J. Cross, Tasmania.

Special Sessions: Farmers' market session, Children's session (Sunpolishers' Club), Sunday night special studio sessions, Sunday night relays with 7LA Launceston and 7HO Hobart, "Creamoata" session, "Procera" Bread session, "Hillman Minx" session, "Griffiths Sweets" session, "Radiola," "Huon Pine" products session, "Wawn's Wonder Wool" session, "Grosvenor Laboratories" session, "Neptune Oil Co." session, City of Launceston session, etc., etc.

Transmission Times: Monday to Friday inclusive, 12 to 2 p.m.; Monday to Friday inclusive, 5.30 to 10.30 p.m.; Saturdays, 2 to 4 p.m., 5.30 to 10.30 p.m.; Sundays, 6 to 10 p.m.

7LA LAUNCESTON—273 Metres

FINDLAY & WILLS BROADCASTERS PTY. LTD. Business Address: 67 Brisbane Street, Launceston. Directors: Senator J. D. Millen (Chairman), A. P. Findlay, N. M. Findlay. General Manager: John T. Gough. Location of Transmitter: Prospect Hill, 2¼ miles south of P.O. Licensed Power: 300 watts.

Chief Announcer: J. T. Gough. **Other Announcers:** E. W. Davies, G. Martin, Misses M. Bonser, L. Nicholls, I. Wright, B. Jebb. **Chief Engineer:** Val Sydes. **Asst. Engineer:** G. Holland. **Secretary:** A. E. Garrott.

Interstate Reps.: Amalgamated Wireless (A/sia) Ltd., Sydney and Melbourne.

Transmission Times: Monday to Friday, 12-2 p.m., 5.30-10.30 p.m.; Saturday, 2-4 p.m., 5.30-10.30 p.m.; Sunday, 5.45-10 p.m.

7HO HOBART—349 Metres

COMMERCIAL BROADCASTERS PTY. LTD. Business Address: 82 Elizabeth Street, Hobart. General Manager: Selwin H. Findlay. Location of Transmitter: Hobart. Licensed Power: 100 watts.

Chief Announcer and Studio Manager: J. Broadbent. **Other Announcers:** A. J. P. Cross, M. A. M. Eisdell.

Other Staff Executives.—Ellen G. Rycroft, Advertising Agent. **Chief Engineer:** W. R. Nicholas. **Asst. Engineer:** J. S. Dodds.

Transmitting Hours: Monday to Friday, 8-9 a.m., 1-2 p.m., 3-11 p.m.; Saturday, 8-9 a.m., 1-2 p.m., and 5.30-11 p.m.; Sunday, 7-11 p.m.

PARTICULARS OF COMMERCIAL BROADCASTING STATIONS.—(Continued).

7UV ULVERSTONE—205.5 Metres

NORTHERN TASMANIA BROADCASTERS PTY. LTD. Business Address: Ulverstone, Tasmania. Directors: G. F. Palmer, W. Williams. Managing Director: G. F. Palmer. General Manager: L. Hereward Barrington. Manager: R. C. Brearley. Location of Studios: Ulverstone. Location of Transmitter: Gawler, Tasmania. Licensed Power: 300 watts.

Slogan Name: "Tasmania's Premier Broadcasting Service."

Number and Size of Studios: Two, 10 x 15 and 10 x 9. **Chief Announcer:** R. C. Brearley. **Other Announcers:** V. L. Hutchinson, K. Andrews, E. Cooper. **Salesmen:** E. Cooper, W. Lloyd. **Chief Engineer:** E. Cooper and V. L. Hutchinson. **Secretary:** H. Bilton, Ulverstone.

Bankers: E.S.&A. **Solicitors:** F. B. Edwards, Ulverstone. **Auditors:** E. Nicol, Burnie, Tasmania.

Sales Reps.: 3AK Melbourne; A. D. Bourke, Barrack Street, Sydney.

Special Sessions: 10 a.m. to 2 p.m., Sunday, only Tasmanian station on the air; various features all through the week.

Transmission Times: Monday to Friday, 7.30 to 9 a.m., 5.30 to 10.30 p.m.; Saturday, 7.30 to 9 a.m., 12 to 11 p.m.; Sunday, 10 a.m. to 2 p.m., 5.30 to 10 p.m.

Total Transmission Hours during 1935: 2,622 hours

Special Programme Services: Extensive library of recordings enables station to cope with any programme using recordings. Facilities for 33 1-3 r.p.m. Transcriptions. Mixing panel enables continuous recorded programmes to be presented. Full facilities for land line relays.

BROADCAST 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 221. 2AY — 2BO — 2GF — 2GN — 2MO — 2SM — 3SH — 3XY — 4CA 4PM — 4TO — 4WK — 7LA.

AMALGAMATED WIRELESS (A/SIA) LTD., 167-169 Queen Street, Melbourne, F 4161. 2AY — 2CH — 2GF — 2GN — 2HD — 2MO — 2SM — 3HS — 4CA — 4PM — 4TO — 4WK — 7LA.

B

BEDNALL, G. N., Newspaper House, Collins Street, Melbourne. 5AD — 5MU — 5PI.

BOURKE, A. D., 5-7 Barrack Street, Sydney, B 2085. 2AD — 3UZ — 4AY — 4BC — 4BH — 4GR — 4MB — 6AM — 7UV.

BRADY, J. F., Estate & Business Agent, 243 Collins Street, Melbourne, C.1., Cent. 7811. 7BU.

BREWER, E. H., Assembly Hall, 44 Margaret Street, Sydney, B 3403. 3AW — 3HA — 4PM — 5DN — 5RM — 7BU.

BROADCAST SERVICES, A.M.P. Building, Edward Street, Brisbane, B 9659. 4LG.

BROADCASTING STATION 3AK, 480 Bourke St., Melbourne. 7UV.

C

CHANDLER, J. B. & CO., 43 Adelaide Street, Brisbane, B 2041. 52 Carrington Street, Sydney, B 6401. 2GF — 4AY — 4CA — 4GR — 4TO — 4WK — 4BC — 4BH.

CHARD, A. J., 92 Fleet Street, London. 5AD — 5MU — 5PI.

D

DENBY, W. F., 422 Collins Street, Melbourne. 2GB — 2GZ — 5DN — 5RM.

DUFF, D., 382 Latrobe Street, Melbourne. 4BH — 4BC.

F

FISHER, R. D., Newspaper House, Collins Street, Melbourne. 4BK — 4BU.

G

GLORIA LIGHT CO. PTY. LTD., 433 Spencer St., Melbourne. C.1. F 4052. 4GR.

GOLDBERG ADVERTISING AGENCY LTD., 15 Hamilton Street, Sydney, BW 2458. 3SH.

H

HERRING, W., Wollongong, N.S.W. 2WL.

HILL, G., Chamber of Commerce Buildings, Grosvenor Street, Sydney. 3HS — 3MA.

J

JACKSON, R., Warwick Building, Hamilton Street, Sydney. 4AK — 4BK — 4BU.

M

McCARTNEY, R. J., 247 Collins Street, Melbourne. 2AD — 2KO — 2SM.

MISCAMBLE, H. H., A.C.A. Building, York & King Streets, Sydney. 3AK.

MONKS, C. A., 3rd Floor, Grace Building, 77 York Street, Sydney, MA 7645. 2HD — 5KA.

P

PATON ADVERTISING SERVICE PTY. LTD., 14 Spring Street, Sydney, B 6965. 3SH.

POWERS, JOSHUA B., 220 East 42nd Street, New York. 5AD — 5MU — 5PI.

R

RIEUSST, B., Newspaper House, 247 Collins Street, Melbourne, and Warwick Building, Hamilton St., Sydney. 6IX — 6ML — 6WB.

ROSS SMITH, A. M., 133 Pitt Street, Sydney. 3KZ.

ROBERTS, N. L., 11c Castlereagh Street, Sydney. 4IP.

S

SULLIVAN, P., 485 Bourke Street, Melbourne. 2UW.

T

THOMPSON, S. F., Warwick House, Hamilton St., Sydney, B 6451. 3DB — 5AD — 5MU — 5PI.

THOMPSON, W. H., A.C.A. Building, York & King Streets, Sydney, B 5370. 2KO.

V

VIRTUE, D., Warwick Building, Hamilton Street, Sydney. 6WB.

Power Analysis of Commercial Broadcasting Stations in Australia

Summary

Licensed Power Watts	Number of Stations
2,000	5
1,000	9
750	1
600	5
500	14
300	8
200	4
100	17
50	11
Total	74

Location of Stations with Number of Transmission Hours During 1935

2,000 watts

2GZ Central N.S.W. (819 hours since 31/10/35).
4AK Oakey
5PI Crystal Brook
6WB Katanning.

1,000 watts

2CH Sydney (5,300 hours).
2GB Sydney (6,009¾ „)
2KY Sydney
2SM Sydney (4,500 „).
2UE Sydney
4BC Brisbane (5,620 „).
4BH Brisbane
5KA Adelaide (5,668 „)
5RM Murray Heights
6AM Northam

750 watts

2UW Sydney (8,760 hours).

600 Watts

3AW Melbourne (5,700 hours).
3DB Melbourne (5,900 „).
3KZ Melbourne (5,820 „).
3UZ Melbourne (5,500 „).
3XY Melbourne.

500 watts

2CA Canberra
2HD Newcastle (5,668 hours).
2KO Newcastle (4,800 „).
2WG Wagga
2XN Lismore (2,184 „).
3BA Ballarat (3,000 „).
3TR Sale (3,500 „).
3WR Shepparton
4BK Brisbane
4GR Toowoomba
6IX Perth (2,909¼ „).
6KG Kalgoorlie
6ML Perth (3,032 „).
6PR Perth (2,800 „).

300 watts

2WL Wollongong
3HA Hamilton (4,628 hours).
4AY Ayr (2,360 „).
4LG Longreach
5AD Adelaide
5DN Adelaide
7LA Launceston, Tas.
7UV Ulverstone (2,622 hours).

200 watts

2GN Goulburn (1,630 hours).
3AK Melbourne (1,820 „).
3BO Bendigo (2,750 „).
4TO Townsville (2,500 „).

100 watts

2AD Armidale
2AY Albury (2,080 „).
2BH Broken Hill
2DU Dubbo
2GF Grafton
2KA Katoomba (416 hours since September, 1935).
2LV Inverell
3MA Mildura
3MB Birchip
3SH Swan Hill
4BU Bundaberg
4CA Cairns
4MB Maryborough
4MK Mackay
4PM Port Moresby
5MU Murray Bridge
7HO Hobart

50 watts

2MO Gunnedah
2QN Deniliquin
2TM Tamworth (2,623 hours).
3GL Geelong
3HS Horsham (2,100 „).
3YB Warrnambool
4IP Ipswich (1,042 hours since 2/9/35).
4RO Rockhampton.
4VL Charleville (670 hours since 12/2/36).
4WK Warwick
7BU Burnie.

NOTE.—Some stations have a license for the use of higher power than indicated above and may be using such before this year book is published.

Details of Some Advertising Agencies

The following details were supplied by the agencies concerned, and are understood to be correct, but no responsibility is accepted, although all care has been taken in compilation.

Canny Advertising Co. Ltd., The., Perpetual Trustees Buildings, St. George's Terrace, Perth. B 8418.
Principal: F. F. Canny. Managing Director: G. B. Graham. Director: K. McGibbon.
Nominal and Paid-up Capital: £1,000. Bankers: E.S. & A. Solicitors: Nairn & McDonald. Auditors: S. J. McGibbon & Co.
Interstate Reps.: Goldberg Advertising Agency Ltd.

Catts-Patterson Company Ltd., 375-377 Kent Street, Sydney. M 6401.
General Manager: Vincent H. Freeth.
Nominal Capital: £100,000. Paid-up Capital: £31,439. Bankers: Bank of New South Wales. Solicitors: Clayton, Utz & Company. Auditors: Robertson, Crane & Gibbons.

Catts-Patterson Company (Vic.) Pty. Ltd., Ayers Building, 122-128 Flinders Street, Melbourne, C.1. F 3638.
General Manager: C. A. Ward-Ambler.
Nominal Capital: £50,000. Paid-up Capital: £15,432. Bankers: Bank of New South Wales. Solicitors: Alfred C. Cray. Auditors: Court & Court.

Darke, Harold S., Organization Ltd., The., Grace Building, 77 York Street, Sydney. M 3823.
Managing Director: Harold S. Darke, F.O.A. Other Directors: Edna G. Davidson, D. A. Harper.
Capital: £2,000. Bankers: The National Bank of Australasia Ltd., George Street, Sydney. Solicitors: McFadden & McFadden, 26 O'Connell Street, Sydney.
Forster Advertising Coy., Union Bank Chambers, Queen Street, Brisbane. (Box 1004M, G.P.O., Brisbane). B 9224.
Director: Colonel J. Craven, D.C.M.
Bankers: National Bank. Solicitors: Mocatta & Co., Brisbane.

Fox Advertising Service Ltd., Dalton House, 115 Pitt Street, Sydney. B 3679.
Managing Director: Matt. J. Fox.

Goldberg Advertising Agency Ltd., The., 15 Hamilton Street, Sydney. BW 2458.
Governing Director: Frank Goldberg. Director: Agolda Goldberg. Director and Secretary: W. J. Brooks.
Nominal and Paid-up Capital: £20,000. Bankers: Bank of New Zealand. Solicitors: Lionel Dare and B. P. Purcell. Auditors: Smith Johnson & Co.
Branch Offices: Brisbane, Adelaide, Perth. Separate Companies: Melbourne, Victoria; Wellington, N.Z.; and branches in that Dominion in Auckland, Christchurch, and Dunedin.
Interstate Reps.: Johnston Advertising Pty. Ltd., Brisbane, Queensland; Canny Advertising Service, Perth, W.A.

Goldberg Advertising Pty. Ltd., Bank House, Bank Place, Melbourne. M 5628.
Directors: Frank Goldberg, Agolda Goldberg, S. M. Ballantyne-Russell, A. A. Levy, P. R. Clark, J. B. Walker.
Nominal Capital: £20,000. Bankers: Bank of New Zealand. Solicitors: Blake & Riggall. Auditors: Smith, Johnson and Co.
Interstate Reps.: Canny Advertising Service, Perth; Johnston Advertising Agency, Brisbane; Goldberg Advertising Agency Ltd., Sydney.

Gordon and Gotch (Australasia) Ltd., 511-515 Little Collins Street, Melbourne. Central 4994.
Directors: W. H. Craig (Chairman), S. W. Jones, E. S. Gotch, A. T. Jones. General Manager: W. E. Jackson General Secretary: F A. Illingworth.
Nominal Capital: £600,000 in 100,000 8 p.c. cum. prefs., and 500,000 ordinaries, all of £1 each. Paid-up Capital: £600,000 in 100,000 prefs. and 500,000 ords., all fully paid.
Bankers: Union Bank of Australia. Solicitors: Williams and Matthews. Auditor: G. Sutherland Smith, of W. H. Tuckett & Sons.
Branches throughout the Commonwealth and New Zealand.

Hawkins Advertising Service, 7th Floor, M.U.I.O.O.F. Building, Castlereagh Street, Sydney. MA 3636.
Principals: E. R. Hawkins and Irene N. Hawkins.
Bankers: Bank of New South Wales.
Solicitors: Mervyn Doyle & Co.
Special Note: This agency specialises in the Automotive and Industrial field.

Leonard, F. P., Union Bank Chambers, 156 Castlereagh Street, Sydney. M 3401.
Principal: F. P. Leonard.
Bankers: Bank of New South Wales. Auditor: T. A. Stephens, A.I.C.A., Box 11 P.O., Crows Nest.

McCarthy-MacVeigh Advertising Service, 310 George Street, Sydney. B 3369.
Principal: Vincent C. McCarthy, F.O.A. Art Director: Esmond J. Turner. Copy: C. R. Tuck.
Bankers: Commonwealth Bank of Australia.

Maynard, R. S., Advertising, 8th Floor, A.M.P. Building, Queen Street, Brisbane. B 6579.
Ralph S. Maynard and C. A. McMillan, partners.
Branch Office: 39 Park Street, Sydney. Associate houses in capital cities.

Nixon, N. V., & Co., 20 Queen Street, Melbourne. Victoria. M5354. Principal: Noel V. Nixon.
Bankers: National Bank of A/asia Ltd. Solicitors: Lucas & Mumme. Auditors: Edwin V. Nixon and partners.
Interstate Reps.: R. S. Maynard Advertising, Sydney and Brisbane.

ADVERTISING AGENCIES.—(Continued)

O'Brien Publicity Company, The, 56 Young Street, Sydney. BW 1501. Principal: Edward H. O'Brien.

Bankers: E.S. & A. Solicitors: F. H. Spier. Auditors: H B. Smith.

Branch Offices: Temple Court, Collins Street, Melbourne.

Queensland Country Press Pty. Ltd., Country Press Chambers, 177 Edward Street, Brisbane. B 3288.

Director: Mr. H. J. Manning (Chairman). General Manager: A. E. Joseph. Publicity Manager: A. J. Campbell, F.O.A.

Reuters Limited, "Sydney Morning Herald" Building, 66 Pitt Street, Sydney. B 6655.

Branch Offices: Worldwide.

Thompson, J. Walter, Australia Pty. Ltd., Asbestos House, 65 York Street, Sydney. B 7707.

The Australasian Company is a subsidiary of the J. Walter Thompson Company, an international advertising organisation, with offices in eleven different countries, and headquarters in New York.

President: Stanley Resor. London Manager: Rae Smith. Local Executives: Managing Director, Michael L. Stiver; Secretary and Director, W. A. McNair; Art Director, Reginald Walker; Media Manager, George L. Gibson.

Bankers: Commonwealth Bank of Australia. Solicitors: Remington & Company. Auditors: Flack & Flack.

Williams-McFerran Pty. Ltd., Safe Deposit Buildings, 90 Queen Street, Melbourne, C.1. Central 8050.

Principals: L. R. Williams, W. R. McFerran.

Nominal and Paid-up Capital: £5,000.

Bankers: Bank of New South Wales. Solicitors: Mackinnon & Colles, 379 Collins Street, Melbourne.

Interstate Reps.: Working in conjunction with Associate Houses.

Willmott's Advertising Agency Ltd., Chamber of Commerce Building, Grosvenor Street, Sydney. BW 7191.

Directors: C. H. Willmott, E. R. Badgery-Parker, R. Willmott.

Nominal Capital: £30,000. Bankers: The National Bank of Australasia Ltd. Auditors: Horley & Horley, Sydney.

Branch Offices: Associate Houses throughout the world.

Advertising Agencies Placing 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.

NEW SOUTH WALES

Aerial Publicity Co., Wingello House, Angel Place, Sydney. B 3397.
Amalgamated Wireless A/sia Ltd., 47 York Street, Sydney. BW 2211.
Anivitti-Schey Ltd., 14 Spring Street, Sydney. B 3946.
Associated Sales Ltd., 18 Martin Place, Sydney. B 3963.
Austral Press and Advertising Ltd., 1 Bond Street, Sydney. B 4695.
Becket, Thomson Advertising Pty. Ltd., 181 Clarence Street, Sydney. MA 7395.
Beresford Kingsbury Co. Ltd., 247 George Street, Sydney. B 3874.
Bourke, A. D., 5 Barrack Street, Sydney. B 2085.
Brewer, E. H., 44 Margaret Street, Sydney. B 3403.
Browne, T. B. Ltd., Bank of Adelaide Chambers, 43 Margaret Street, Sydney. B 7093.
Caldecoat, E. J. W., 30 Pitt Street, Sydney. BW 6175.
Catts-Patterson Co. Ltd., 375 Kent Street, Sydney. M 6401.
Central Agency Aust. Ltd., 114 Day Street, Sydney. M 4791.
Chandler, J. B. Ltd., Australia House, Carrington St., Sydney. B 6401.
Country Press Co-op. Co. Ltd., 5 Barrack Street, Sydney. B 2283.
Darke, Harold S. Organisation Ltd., 77 York Street, Sydney. M 3823.
Fox Advertising Service Ltd., 15 Pitt Street, Sydney. B 3679.
Goldberg Advertising Agency Ltd., Warwick Building, Hamilton Street, Sydney. BW 2458.
Gordon & Gotch A/sia) Ltd., Barrack Street, Sydney. BW 1321.
Hansen-Rubensohn Co., Warwick Building, Hamilton Street, Sydney. BW 6584.
Hyam, Geo. R., 32 Jamieson Street, Sydney. B 3515.
Julius, Harry Advertising Service, 16 Barrack Street, Sydney. B 5231.
Leonard, F. P., 156 Castlereagh Street, Sydney. M 3401.
Lintas (Aust.) Ltd., Asbestos House, York Street, Sydney. B 7011.
Marsh Brown Ltd., 44 Margaret Street, Sydney. B 1060.
McCarthy-MacVeigh Advertising Service, 310 George Street, Sydney. B 3369.
O'Brien Publicity Co., O'Brien House, 56 Young St., Sydney. BW 1501.

ADVERTISING AGENCIES.—(Continued)

Paton Advertising Service Pty. Ltd., 14 Spring Street, Sydney. B 6965.
Patterson, Geo. Pty. Ltd., 24 Jamieson Street, Sydney. BW 1261.
Powell, R. & K. Advertising Agency, 58 Margaret St., Sydney. B 7669.
Publicity Services, J. B. Perceval, Assembly Hall, Margaret Street, Sydney. BW 6572.
Reuters Ltd., 66 Pitt Street, Sydney. BW 6655.
Samson Clark Price-Berry Pty. Ltd., Asbestos House, 67 York Street, Sydney. B 7061.
Smyth, Arthur & Sons Ltd., 18 Martin Place, Sydney. B 7996.
Thompson, J. Walter & Co., 65 York Street, Sydney. B 7707.
Tier, Athol, Radio Advertising Service, 44 Margaret Street, Sydney. B 1414.
Unsted, Jackson, Haines Ltd., Lisgar House, 30 Carrington Street, Sydney. B 7117.
Westen Co., Ltd., Chamber of Commerce Bldg., George Street, Sydney. BW 1337.
White, A. N., Ltd., London Bank Chambers, Martin Place, Sydney. B 3963, B 5885, M 4985.
Willmotts Advertising Agency Ltd., Chamber of Commerce Bldg., George Street, Sydney. BW 7191-4.

VICTORIA

Age Broadcasting Service, 233 Collins Street, Melbourne. M 4731.
Amalgamated Wireless A/sia Ltd., 167 Queen Street, Melbourne. F 4161.
Automobile & General News Service Pty. Ltd., 430 Little Collins Street, Melbourne. Cl. 6804.
Catts-Patterson (Vic.) Pty. Ltd., 122 Flinders Street, Melbourne. F 3638.
Goldberg Advertising Pty. Ltd., Bank House, Bank Place, Melbourne. M 5628.
Gordon & Gotch A/sia Ltd., 511 Little Collins Street, Melbourne. Cl. 4994 and Cl. 6037.
Griffiths-Huse, 145 Collins Street, Melbourne. F 6285.
Harris Advertising Service, 247 Collins Street, Melbourne. M 2911.
Lintas (Aust.) Ltd., Manchester Unity Bldgs., 96 Swanston Street, Melbourne. F 1491.
Mooney-Webb Pty. Ltd., 182 Collins Street, Melbourne. F 3501.
Nixon, N. V., & Co., 20 Queen Street, Melbourne. M 5354.
O'Brien Publicity Co., 422 Collins Street, Melbourne. Cl. 5944.
Paton Advertising Service, Argus Bldg., 369 Elizabeth Street, Melbourne. F 2151.
Patterson, Geo., Pty. Ltd., 59 William Street, Melbourne. Cl. 4377.
Raphael Advertising Co., 247 Collins Street, Melbourne. Cl. 6285.
Richardson Advertising Co. (A. H. Stevens), Champion House, 57 Swanston Street, Melbourne. Cl. 4401.
Richardson-Cox Pty. Ltd., 108 Queen Street, Melbourne. F 4232-F5878.
Rickards Advertising Service, 145 Collins Street, Melbourne. J 4964.
Samson Clark Price-Berry Pty. Ltd., 247 Collins Street, Melbourne. Cl. 8845.
Smyth, Arthur, & Sons, 422 Collins Street, Melbourne. M 3291.
Williams-McFerran Pty. Ltd., 90 Queen Street, Melbourne. Cl. 8050.

OVERSEAS

Dillon & Kirk, National Fidelity Bldg., Kansas City, U.S.A.
Mitchell, C., & Co., 1-2 Snow Hill, London, E.C.1.

QUEENSLAND

Broadcast Services Ltd., Q.N. Bank Building, Cr. George & Turbot Streets, Brisbane. B 9659.
Chandler, J. B., & Co., 43 Adelaide Street, Brisbane. B 2041.
Forster Advertising Co., Union Bank Chambers, 324-330 Queen Street, Brisbane. B 9224.
Graybar Advertising Service, 135 Queen Street, Brisbane. B 8759.
Hall, J., c/o Edwards & Lamb, 52-60 Queen Street, Brisbane. B 4204.
Hunter, David, Commonwealth Bldgs., 71 Adelaide Street, Brisbane. B 7739.
Johnston Advertising Pty. Ltd., Exton House, 331 Queen Street, Brisbane. B 2978.
Maynard, R. S., Advertising, A.M.P. Bldg., Queen St., Brisbane. B 6579.
National Advertising Ltd, 21 Adelaide Street, Brisbane. B 4782.
Noble-Bartlett Advertising, Griffiths House, 307 Queen Street, Brisbane. B 8002-B 5332.
Queensland Country Press Association, 177 Edward Street, Brisbane. B 3288.
Reuters Ltd., Queen Street, Brisbane. B 4874.
Soden, A. J., 180 Queen Street, Brisbane. B 5627.
Sullivan Advertising Service, T. & G. Bldg., 135 Queen Street, Brisbane. B 3178.
Vinnicombe, H., Union Bank Chambers, 324 Queen Street, Brisbane. B 9089.

SOUTH AUSTRALIA

Taylor, Clem R., 24 Weymouth Street, Adelaide, S.A. Cl. 2885.
Webb-Roberts Advertising, 47 Weymouth Street, Adelaide.

WESTERN AUSTRALIA

Ad-Craft Service, 13 James Street, Perth. B 9331.
Bailey, H., Perth.
Canny Advertising Service, St. George's Terrace, Perth. B 8418.
Cohen S. Crownson, A.M.P. Chambers, William Street, Perth. B 6584.
Gordon & Gotch A/sia Ltd., 21 William Street, Perth. B 7106.
Mount, N. C. S., Advertising Consultant, Surrey Chambers, St. George's Terrace, Perth. B 2740.
Successful Advertising Co. (C. A. Reed), National House, 49 William Street, Perth. B 3385.
William, A. J., Advertising, Perpetual Trustee Bldg., St. George's Terrace, Perth. B 1810.

Prominent Advertisers Over Commercial Broadcasting Stations

The Station call after each name indicates that station over which the advertising has been broadcast. No responsibility is accepted for any errors or omissions, but all necessary future alterations will be adjusted if the publishers are advised.

A

Advanx Tyre & Rubber Co. Ltd., Neild & McLachlan Avenues, Rushcutters Bay, Sydney, N.S.W. 2KA.

Airzone (1931) Ltd., 16 Australia Street, Camperdown, N.S.W. (Radio Mfrs),. 3TR.

Alba Petroleum Co. of Australia Pty. Ltd., 328 Flinders Street, Melbourne, Cl. Vic. 2AY, 3BA, 3BO.

Allen, A. W., White & Campbell Ltd., 1 Pine Street, Sydney, N.S.W. (Allen's Sweets). 2GB, 2GN, 2HD, 2SM, 3AW, 3DB, 3TR, 5KA.

Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney, N.S.W. 2AY, 2GF, 2GN, 2CH, 2KA, 2SM, 2UW, 3BO, 4TO.

Amalgamated Wireless Valve Co. Ltd., 47 York Street, Sydney, N.S.W. 2AY, 2GF, 2GN, 3BO, 3KZ, 4TO.

Armstrong, R. H., & Co. Ltd., 44-46 King Street, St. Peters, N.S.W. Agency: F. P. Leonard. 2GZ, 3KZ.

Arnott, William Ltd, George Street, Homebush, N.S.W. (Biscuits). 2GF, 3BO.

Atkinson's, J. & E. (Aust.) Ltd., 469 Kent Street, Sydney, N.S.W. (Cosmetics). Agent: Lintas Aust. Ltd. 2GB, 3KZ, 6ML.

Atlantic Union Oil Co. Ltd., 66 Pitt Street, Sydney, N.S.W. Agencies: Amalgamated Wireless (A/sia) Ltd., Goldberg Advertising Agency Ltd. 2AD, 2AY, 2BH, 2GF, 2GN, 2GZ, 2HD, 2KA, 2MO, 2TM, 2XN, 3AW, 3BA, 3BO, 3HA, 3SH, 3TR, 3WR.

Australian Broadcasting Health Service, 201 Macquarie Street, Sydney, N.S.W. 2GB, 2KO, 2KY, 2MO, 2TM, 2UW, 2WG, 2WL, 3AK, 3AW, 3BA, 3GL, 3HA, 3HS, 3MA, 3SH, 4AY, 4BC, 4BH, 4GR, 4MB, 4MK, 4RO, 4TO, 5AD, 5DN, 5GS, 5MO, 6PR, 7BU, 7HO, 7UV.

Australian General Electric Ltd., 93 Clarence Street, Sydney, N.S.W. 2TM.

Australian Knitting Mills Ltd., 29 Stewart Street, Richmond, E1, Vic. Agency: Goldberg Advertising Agency Ltd. 4BC, 4RO, 5KA, 6PR.

Australian Telephone Development Association, 350 George Street, Sydney, N.S.W. Agency: Amalgamated Wireless (A/sia) Ltd. 2AD, 2AY, 2GF, 2GN, 2GZ, 2TM, 2XN, 3KZ, 3TR, 4BC.

B

Bear & Co. Ltd., 403-411 George Street, Sydney, N.S.W. (Furniture). Agency: Amalgamated Wireless (A/sia) Ltd. 2CH, 2KA, 2MO, 2UE.

Beckers Ltd., 174-176 Campbell Street, Sydney, N.S.W. (Bex A.P.C. Powders). Agency: The Weston Co. Ltd. 2GF, 2GN, 2GZ, 2HD, 2TM, 2XN, 5KA.

Bedggood & Co. Pty. Ltd., 77 York Street, Sydney, N.S.W. (Footwear). Agency: Geo. Patterson Pty. Ltd. 2GB, 4BC, 5KA, 6PR.

Bell's Products, 18 Margaret Street, Sydney, N.S.W. (Toilet Preparations). 4AY, 4MB, 4RO, 4TO, 5KA.

Beau Monde (Aust.) Ltd., Moore Street, Mooreland, Melbourne, Vic. (Hosiery). 3TR, 6PR.

Bengal Chutney Co., Wellington Road, East Brisbane, Q'land. 4RO, 4TO.

Bennett & Wood Ltd., Park & Pitt Streets, Sydney, N.S.W. Agency: Amalgamated Wireless (A/sia) Ltd. 2AY, 2GF, 2GN, 2MO.

Berger, Lewis & Sons (Aust.) Ltd., Rhodes, N.S.W. (Paints). Agency: The Weston Co. Ltd. 2AD, 2BH, 3DB, 4AK, 4BK, 4IP.

Berlei Ltd., 39 Regent Street, Sydney, N.S.W. (Corsets). Agency: Catts-Patterson Pty. Ltd. 2GB, 2GZ, 3TR, 4BC.

Berry, Henry & Co. Pty. Ltd., 568 Collins Street, Melbourne, Vic. 3AW, 3BA, 3BO, 3DB, 3HA.

Best Bets (T. Ellis), 295 Elizabeth Street, Sydney, N.S.W. Agency: Amalgamated Wireless (A/sia) Ltd. 2AY, 2GF, 2GN, 2GZ, 2TM, 2XN, 4AK, 4BK, 4RO.

Bond's Industries Ltd., 301 Flinder's Street, Melbourne, Vic. 2UE, 3TR.

British Australian Lead Manufacturers Pty. Ltd., Cabarita Road, Cabarita, N.S.W. Agency: Samson Clark Price-Berry Pty. Ltd. 2GF, 2HD, 2KO, 2MO, 3KZ, 4AK, 4BK, 4MB, 4RO, 5RM, 6ML, 6PR.

British Israel World Federation, 242 Pitt St., Sydney, N.S.W. 2GZ, 2TM.

Brockhoff, A. F. & Co. Pty. Ltd., Miller Street, West Melbourne, Vic. (Biscuits). 3AK, 3AW, 3BA, 3BO, 3SH, 3TR, 3WR.

Brunel's, 316 Flinders Lane, Melbourne, Vic. 2AY, 3BO.

Burford, W. H. & Sons Ltd., Dry Creek, Adelaide, S.A. (Velvet Soap). Agency: Lintas Aust. Ltd. 3TR, 3WR, 6ML.

Burns, Philp & Co. Ltd., 7 Bridge Street, Sydney, N.S.W. 2GZ, 3KZ.

Bushells Ltd., 121-127 Harrington Street, Sydney, N.S.W. (Tea, Coffee, Cocoa). 2SM, 3AW, 3DB.

Bushell, H. L. & Co. Ltd., 32 Meagher Street, Sydney, N.S.W. (White Wings Flour, etc.). 2GB, 2GF.

PROMINENT ADVERTISERS IN BROADCASTING.—(Continued)

C

Cadbury-Fry-Pascall Pty. Ltd., 570 Bourke Street, Melbourne, Vic. (Cocoa and Confectionery). 3KZ, 4AK, 4BK, 6ML.

Carters Little Liver Pills, London, Eng. Agency: C. Mitchell & Co. Ltd. 3AW, 3DB, 3KZ, 4AK, 4BK.

Cavill, Walter & Co., 379 Sussex Street, Sydney, N.S.W. (Cascade Ale). 2SM.

Clement's Tonic Ltd., Terry Street, Rozelle, N.S.W. Agency: Geo. Patterson Pty. Ltd. 2GZ, 2SM, 3AW, 3DB, 3KZ, 6ML.

Cohen, David & Co. Ltd., 13 Bond Street, Sydney, N.S.W. Agencies: Goldberg Advertising Agency Ltd., Hansen-Rubensohn Co. 2KO, 3TR, 4BC.

Coles, G. J. & Co. Ltd., 133 Liverpool Street, Sydney. 3BA, 4AK, 4BK.

Colgate-Palmolive-Peet Co. Ltd., Balmain, N.S.W. (Toilet Preparations). Agency: Geo. Patterson Pty. Ltd. 2GZ, 2KO, 3KZ, 4BC, 5KA, 6ML, 6PR, 4AK, 4BK.

Collins Bros. & Co. Ltd., Mentmore Avenue, Rosebery, N.S.W. 3DB, 3HA, 4AK, 4BK.

Colman-Keen (Aust.) Ltd., 145 Bourke Street, Redfern, N.S.W. (Keen's Mustard, etc.). Agency: Geo. Patterson Pty. Ltd. 2GB, 2GZ, 2SM, 3AW, 3BA, 3DB, 3HA, 3KZ, 3TR, 4AK, 4BC, 4BK, 4MB, 4RO, 6ML, 6PR.

Commonwealth Oil Refineries Ltd., 90 William Street, Melbourne, Vic. (C.O.R. Motor Spirit). 2AY, 3BO, 4MB.

Commonwealth Wool & Produce Co. Ltd., 89 Phillip Street, Sydney, N.S.W. 2GZ, 2MO, 3SH.

Conklin Pen Co., 497 Collins Street, Melbourne, Vic. 3DB, 4BC, 5KA.

Connell, John & Co. Ltd., 355 Kent Street, Sydney, N.S.W. 2GB, 2GZ, 3AW.

Consolidated Press Ltd., 168-174 Castlereagh Street, Sydney, N.S.W. (Daily Telegraph, Women's Weekly). Agency: J. Walter Thompson Co., Gordon & Gotch. 2GF, 2GZ, 2MO, 2UE, 2XN, 3BA, 3BO, 3HA, 3KZ, 3TR, 4RO, 5KA.

Coo-ee Clothing Co., 196 Pitt Street, Sydney, N.S.W. 2HD, 2KA.

Court, Kathleen, Co., 46 Carrington Street, Sydney, N.S.W. (Cosmetics). 2CH, 2SM.

D

Dalgety & Co. Ltd., 15 Bent Street, Sydney, N.S.W. 2GB, 2GZ, 3BO, 3SH.

Dangar, Gedye & Co. Ltd., 10-14 Young Street, Sydney, N.S.W. 2GZ, 2TM.

Davis Gelatine (Aust.) Ltd., 247 George Street, Sydney, N.S.W. 2XN.

Dearborn (Aust.) Pty. Ltd., 24 Jamieson Street, Sydney, N.S.W. 2GZ.

Douglass, W. C. Ltd., 2 Foveaux Street, Sydney, N.S.W. (Breakfast D-Light, "Fountain" food products). Agency: J. B. Perceval. 2GB, 2GZ, 2TM, 3AW, 4AK, 4BK.

Douglas Drug Co., Australia House, 46 Carrington St., Sydney, N.S.W. (Bidomak). Agencies: Unsted, Jackson, Haines Ltd., Amalgamated Wireless (A/sia) Ltd. 2AD, 2AY, 2GF, 2GN, 2GZ, 2KA, 2KO, 2TM, 3BO, 3KZ, 3TR, 4BC, 4RO, 4MB, 5KA, 6ML.

E

Essex Paint Co. Pty. Ltd., 80a Delbridge Street, North Fitzroy, Vic. 3BO, 3HA, 3TR.

Ever-Ready Co. (Aust.) Ltd., 40 Marshall Street, Surry Hills, N.S.W. Agency: Goldberg Advertising Agency Ltd. 2AY, 2GF, 2GN, 2MO, 2XN, 3BA, 3BO, 3HA, 3TR, 3WR, 4BC, 4MB, 4RO, 4TO, 6PR.

Exide Batteries of Aust. Ltd., 77 York Street, Sydney, N.S.W. Agency: Catts-Patterson Co. Ltd. 2AD, 2KO, 4BC, 4RO, 6IX, 6ML.

F

Fisher & Co., 554 George Street, Sydney, N.S.W. (Fisher's Phospherine). Agency: J. B. Percevel, Publicity Services. 2KA, 2KO, 2MO, 2SM, 2XN, 3AW, 3BA, 3BO, 3DB, 3KZ, 3UZ, 3TR, 4AK, 4BK, 4MB, 4RO, 4TO, 5KA.

Felt & Textiles of Aust. Ltd. 33 Macquarie Place Sydney, N.S.W. (Feltex). Agencies: The O'Brien Publicity Co., Goldberg Advertising Agency Ltd. 2GZ, 2HD, 2TM, 4BC, 4RO, 6ML, 6PR.

Fleming & Co. (Aust.) Pty. Ltd., 422 Collins Street, Melbourne, Vic. Agency: Geo. Patterson Pty. Ltd. 3BA, 3HA, 3KZ, 3WR, 5KA.

PROMINENT ADVERTISERS IN BROADCASTING.—(Continued)

Ford Sherington Ltd., 119 Kippax Street, Sydney, N.S.W. Agency: F. P. Leonard. 2GF, 2GZ, 4BC, 6IX, 6ML.

Fostar Clark (Aust.) Ltd., 17 Thurlow Street, Redfern, Sydney, N.S.W. Agency: George Patterson Pty. Ltd. 4AK, 4BK.

Fostar's Shoes Ltd., Liverpool & Castlereagh Streets, Sydney, N.S.W. 2HD, 2KO, 2KY, 2SM, 4AK, 4AY, 4BK, 4TO.

Fowler's Pty. Ltd., 257 Burwood Road, Hawthorn, Melbourne, Vic. (Vacola). 2AY, 2GF, 3BO, 3TR, 5KA, 6PR.

G

General Motors, Holdens Ltd., 182 William Street, Sydney, N.S.W. 2AY, 2UE.

Gibb & Beeman Ltd., Hotel Australia Building, Martin Place, Sydney, N.S.W. 2HD, 2SM.

Godfrey, Phillips (Aust.) Pty. Ltd., Drewery Lane, Melbourne, Vic. Agency: Goldberg Advertising Agency Ltd. 2KO, 3DB, 3KZ, 4BC.

Golden Casket Art Union, Edward Street, Brisbane, Q'land. 4RO, 4TO.

Good Health Club of Australia, National Mutual Buildings, 293 Queen Street, Brisbane, Q'land. Agency: Amalgamated Wireless (A/sia) Ltd. 4AK, 4BC, 4BK.

Grace Bros., Broadway, Sydney, N.S.W. 2KA, 2KY.

Gramp, G. & Sons Ltd., 119 York Street, Sydney, N.S.W. (Orlando Wine). Agencies: Amalgamated Wireless (A/sia) Ltd., N. V. Nixon & Co. 2GN, 2GZ, 2HD, 2SM, 5KA.

Great Southern Hotel, 717 George Street, Sydney, N.S.W. 2AY, 2GF, 2GZ, 2BO.

Gresham Hotel, York Street, Sydney, N.S.W. 2AY, 2GF.

Griffiths Hughes, E. Ltd., Manchester, England. (Kruschen Salts). Agency: Catts-Patterson Co. Ltd. 2KO, 4AK, 4BK, 6ML.

Griffiths Sweets Pty. Ltd., Commonwealth Street, Sydney, N.S.W. (Confectionery). 2GF, 2GN, 2KO, 3BA, 3BO, 3TR.

Grosvenor Laboratories Ltd., 17 Grosvenor Street, Sydney, N.S.W. (Junipah Mineral Spring Salts). Agency: Goldberg Advertising Agency Ltd. 2GZ, 2MO, 2TM, 3BA, 3HA, 3KZ, 4AY, 4BC, 4RO, 4TO, 6PR.

Gurton Tire Co. Ltd., 70 William Street, Sydney, N.S.W. 2GB, 2KO, 3BA.

H

Hardie, Jas. & Co. Ltd., Cnr. York & Barrack Streets, Sydney, N.S.W. Agency: Hansen-Rubensohn Co. 2GZ, 2KO.

Hardie Rubber Co. Ltd., York & Barrack Streets, Sydney, N.S.W. 2HD.

Hardy, Thomas & Sons Ltd., East Circular Quay, Sydney, N.S.W. 2GZ.

Healing, A. G. Ltd., 164 Goulburn Street, Sydney, N.S.W. 2KO, 3BO.

Heans Essences Pty. Ltd., 58 Margaret Street, Sydney, N.S.W. 2HD, 3AW, 5KA.

Henderson, R. C. Ltd., 11 Randle Street, Sydney, N.S.W. (Millinery). 2GZ, 2KO, 4RO.

Hoffnung, S. & Co. Ltd., 165 Pitt Street, Sydney, N.S.W. Agencies: Amalgamated Wireless (A/sia) Ltd., Weston Co. Ltd. 2MO, 4AK, 4BK.

Hordern, Anthony & Son, Brickfield Hill, Sydney, N.S.W. 2CH, 2KA.

Horlick's Malted Milk Co. (Aust.) Ltd., 46 Foster St., Sydney, N.S.W. Agency: Willmotts Advertising Agency Ltd. 2KO, 4BC, 4RO.

Hotel Federal, Collins Street, Melbourne, Vic. 2AY, 3BA, 3TR.

Hotel Sydney Ltd., Pitt & Hay Street, Sydney, N.S.W. 2GF, 2GN.

Hudson's Eumenthol Chemical Co. Ltd., 31 Hay Street, Sydney, N.S.W. Agency: Arthur Smyth & Sons Ltd. 2GZ.

Hunter, John & Son Ltd., Castlereagh Street, Redfern, N.S.W. (Footwear). Agency: Goldberg Advertising Agency Ltd. 2AY, 2GZ, 2MO, 2TM, 2XN, 4MB.

PROMINENT ADVERTISERS IN BROADCASTING.—(Continued)

I

Inglis Ltd., Boundary Street, Petrie Bight, Brisbane, Q. (Tea). 2UE, 4BC.

International Correspondence Schools (A/sia) Ltd., 140 Elizabeth Street, Sydney, N.S.W. Agency: Beresford Kingsbury & Co. Ltd. 2GZ.

J

Jantzen (Aust.) Ltd., 77 York Street, Sydney, N.S.W. (Swim Suits). Agency: J. Walter Thompson Co. 2GZ, 2KO, 3KZ.

Johnson & Johnson Ltd., 200 York St., Sydney, N.S.W. (Tek tooth brushes, toilet preparations). Agencies: Amalgamated Wireless (A/sia) Ltd., Willmott's Advertising Agency Ltd. 2AD, 2AY, 2CH, 2GF, 2GN, 2GZ, 2HD, 2MO, 4BC, 4RO.

Joyce Biscuits Ltd., 4 Lyons Rd., Camperdown, N.S.W. Agency: F. P. Leonard. 2CH, 2GZ, 2KO, 4AY.

Jusfrute Ltd. Agency: Amalgamated Wireless (A/sia) Ltd. 2AY, 2BH, 2GF, 2GN, 3BO, 3TR.

K

Kayser, Julius (Aust.) Pty. Ltd., 238 Flinders Lane, Melbourne, Vic. (Stockings and gloves). 3TR, 6PR.

Kitchens, J. & Sons Pty. Ltd., Inglis Street, Port Melbourne, Vic. Agency: Lintas (Aust.) Ltd. 2UE, 3BA, 3KZ.

Kiwi Polish Co. Pty. Ltd., Burnley Street, Richmond, E1, Melbourne, Vic. (Boot polish). 2AY, 3DB, 4TO, 5KA.

Kleeners Ltd., 42 Harbour Street, Sydney, N.S.W. (Kleen Bath, Kleenshine). Agency: Amalgamated Wireless (A/sia) Ltd. 2GF, 2GN, 2HD, 2SM, 2TM, 2XN, 5KA.

Knox Company, 811 West Seventh Street, Los Angeles, Calif., U.S.A. (Cystex). Agencies: Harold S. Darke Organisation Ltd., Dillon & Kirk. 3KZ, 4RO.

Kolynos Inc., 45 Brougham Street, Darlinghurst, N.S.W. (Kolynos Dental and Shaving Creams). 2KA, 3AW.

L

Lambert Pharmacal Co. (Aust.), 33 Mountain Street, Sydney, N.S.W. (Listerine). Agency: Weston Co. Ltd. 2GB, 2HD, 2UE, 3KZ, 4AK, 4BK, 4AY, 5KA.

Lands, Sam, 91 Liverpool Street, Sydney, N.S.W. (Jewellery). 2KY, 2MO.

Law Somner Pty. Ltd., 21 Elizabeth Street, Melbourne, Vic. 3BO, 3DB, 3TR.

Laxette Manufacturing Co., 366 Swanston Street, Melbourne, Vic. Agency: Samson Clark, Price-Berry Pty. Ltd. 2HD, 6IX, 6ML.

Laycock, Son & Co., 179 Normanby Road, South Melbourne, SC5, Vic. 2GB, 3DB, 4RO, 6ML.

Lea & Perrins (Aust.) Ltd., 96 White Street, Leichhardt, N.S.W. Agency: Fox Advertising Service, 2GZ, 4MB.

Lever Bros. Ltd., Balmain, N.S.W. (Rinso, Lux Soap, etc.). Agency: Lintas (Aust.) Ltd. 2BH, 2GB, 2GF, 2HD, 2KO, 2MO, 2UE, 2XN, 3BA, 3KZ, 3WR, 4AK, 4BK, 4RO, 6ML.

Life Savers (Aust.) Ltd. 479 Adelaide Street, Brisbane, Q'land. (Confectionery). Agency: Broadcast Services. 2AY, 2HD, 2SM, 3BA, 4AK, 4BK, 5KA.

Lipton Ltd., 145 Little Bourke Street, Melbourne, Vic. (Tea). Agency: Lintas (Aust.) Ltd. 3BA, 3KZ, 3HA, 3SH, 3TR, 3WR.

Love, Clifford & Co. Ltd., 75-77 Clarence Street, Sydney, N.S.W. Agency: Arthur Smyth & Sons Ltd. 2KO, 3BA, 3BO, 3HA, 4AK, 4BC, 4BK, 5KA.

Love, J. R. & Co. Ltd., 97 Bathurst Street, Sydney, N.S.W. Agency: Catts-Patterson Co. Ltd. 2CH, 2KO.

Lustre Hosiery Ltd., Boundary Street, Sydney, N.S.W. Agency: Geo. Patterson Pty. Ltd., Amalgamated Wireless (A/sia) Ltd. 2AD, 2CH, 2GF, 2GZ, 2MO, 2TM, 2UE, 2XN, 3BO, 3HA, 4AK, 4AY, 4BC, 4BK, 4MB, 4RO, 5RM.

M

Maize Products Pty. Ltd., Maribyrnong Street, Melbourne, W11, Vic. Agency: Paton Advertising Service Pty. Ltd. 2GB, 2KO, 3AW, 3BA, 3HA, 3TR, 6ML.

Major Bros. & Co. Ltd., Phillip Street, Concord, N.S.W. (Majora Paints). Agency: Geo. Patterson Pty. Ltd. 2GZ, 3SH.

Manufacturers' Mutual Insurance Ltd., 14 O'Connell Street, Sydney, N.S.W. 2GZ.

Maples', 181 Chapel Street, Prahran, S1, Melbourne, Vic. (Furniture). 3WR.

Marco Elasta Strap Co. (Elasta Strap Trousers). Agency: Geo. R. Hyam. 2KA, 2KO, 2XN.

PROMINENT ADVERTISERS IN BROADCASTING.—(Continued)

Marcus Clarke & Co. Ltd., Central Square, Sydney, N.S.W. 2CH, 2HD, 2TM, 2XN.

Matthews, Thompson & Co. Ltd., King Street, Newtown, N.S.W. Agency: Weston Co. Ltd. 2GZ, 2SM, 3BO.

Mauri Bros. & Thompson Ltd., 61 York Street, Sydney, N.S.W. 4MB, 4RO.

Meadow Lea Margarine Co., 34 Wellington Street, Newtown, N.S.W. 2KO, 2KY.

Meccano Ltd. Agency: Catts-Patterson Pty. Ltd. 2KO, 3AW, 4AK, 4BC, 4BK, 6ML.

Medicated Oils Co., 20 Victoria Street, Arncliffe, N.S.W. 2GZ.

Mick Simmons Ltd., Haymarket, Sydney, N.S.W. 2GB, 2HD, 2KA.

Mitchell, D. & Co., 95-135 Forbes Street, Sydney, N.S.W. 4RO.

Modern (Non-Licensed) Hotels Ltd., 8 Spring Street, Sydney, N.S.W. 2GF, 2GZ, 2MO, 2TM, 2XN.

Moffat-Virtue Ltd., 11 Palmer Street, East Sydney, N.S.W. Agency: Annivitti-Schey Ltd. 2GZ.

Mont de Piete D. & I. Co. Ltd. (N.S.W.), 74 Castlereagh Street, Sydney, N.S.W. Agency: Weston Co. Ltd. 2HD, 2KO, 3BA.

Moran & Cato Ltd., 122 Cleveland Street, Chippendale, N.S.W. (Groceries). 2CH, 2SM.

Morrison, Jas. & Co. Ltd., 251 George Street, Sydney, N.S.W. Agency: Athol Tier Radio Advertising Service. 2GZ, 2MO.

Moseley, David & Sons Ltd., 105 Bathurst Street, Sydney, N.S.W. Agency: Weston Co. Ltd. 2GZ, 2KO.

Murdoch's Ltd., Park Street, Sydney, N.S.W. Agency: Amalgamated Wireless (A/sia) Ltd. 2GF, 2GN, 2MO, 4MB.

Murray, D. & W. Ltd., 111 York Street, Sydney, N.S.W. Agency: F. P. Leonard. 2GZ, 3DB, 4AK, 4BK.

Mc

MacDonald Hamilton & Co., 247 George Street, Sydney, N.S.W. (P. & O. Steamships). Agency: Beresford Kingsbury Co. Ltd. 2CH, 3AW, 4AK, 4BK, 4RO, 4TO, 6PR.

McRobertson Ltd., 140 Cleveland Street, Chippendale, N.S.W. (Confectionery). 2AY, 2HD, 3AW, 3BA, 3BO, 3DB, 3HA, 3TR, 3WR, 5KA, 6PR.

McWilliams Wines Ltd., 15 Alberta Street, Sydney, N.S.W. Agencies: Weston Co. Ltd. Forster Advertising Co. 2GZ, 2HD, 2SM, 2UE, 4BC.

N

Neptune Oil Co. Ltd., 77 York Street, Sydney, N.S.W. Agencies: Amalgamated Wireless (A/sia) Ltd., Griffiths-Huse. 2KO, 2GZ, 2XN, 3BA, 3BO, 3HA, 3KZ, 3TR.

Nestle & Anglo-Swiss Condensed Milk (A/sia) Ltd., 17 Foveaux Street, Sydney, N.S.W. (Confectionery, etc.). Agencies: Amalgamated Wireless (A/sia) Ltd., Goldberg Advertising Agency Ltd. 2BH, 2GF, 2GN, 2KO, 2MO, 2SM, 2TM, 2UE, 3AW, 3BA, 3BO, 3KZ, 4AK, 4BC, 4BK, 4MB, 4RO, 5KA, 6IX, 6ML, 6PR.

New System Telephones Pty. Ltd., 276-278 Castlereagh Street, Sydney, N.S.W. Agency: George Patterson Pty. Ltd. 2GZ.

Nicholas Pty. Ltd., 10 City Road, Princes Bridge, SC4, Melbourne, Vic. (Aspro). 2BH, 2SM, 5KA.

Nightingale Supply Co. Ltd., Allen Street, Waterloo, N.S.W. (Ping). 2GB, 2SM.

Nugget Polish Pty. Ltd., 16 Morris Street, Melbourne, W16, Vic. Agency: Gordon & Gotch ,A/sia) Ltd. 2SM, 3AW, 4AK, 4BK, 4RO, 4TO, 5KA.

Nut Foods Ltd., 74 Edinburgh Road, Marrickville, N.S.W. (Eta Peanut Butter, Marmite). Agencies: Weston Co. Ltd., Willmott's Advertising Agency Ltd. 2MO, 2UE, 3KZ, 3TR, 6PR.

O

Oppenheiner, Son & Co. Ltd., London. (Roboleine). Agency: T. B. Browne Ltd. 4AY, 4AK, 4BK, 4RO, 5KA.

Orchard's Ltd., Railway Square, Sydney, N.S.W. (Jewellery). 2KA.

Orient Steam Navigation Co. Ltd., 2 Spring Street, Sydney, N.S.W. Agency: Geo. R. Hyam. 2AD, 2CH, 2GZ, 2HD, 2MO, 3HA, 6PR.

PROMINENT ADVERTISERS IN BROADCASTING.—(Continued)

P

Paget Manufacturing Co. Ltd., 109 Regent Street, Sydney, N.S.W. Agency: Hansen-Rubensohn Co. 2GB, 2KO, 3AW, 3KZ.

Parke, Davis & Co., 50 Rothschild Avenue, Rosebery, N.S.W. 2AY, 2GF, 2SM, 3BO.

Parsons Bros. & Co. Pty. Ltd., 562 Flinders Lane, Melbourne, C1, Vic. 3AW, 3BA, 3BO, 3HA.

Patson's & Baldwin's Ltd., 181 Clarence Street, Sydney, N.S.W. (Knitting Wool). Agency: Amalgamated Wireless (A/sia) Ltd. 2GN, 4BC, 6ML.

Peck, H. & Co. (Chick cubes, etc.). Agency: T. B. Browne Ltd. 2AY, 2BH, 2GF, 2GN, 2KO, 2TM, 2XN, 3BO, 3BA, 3HA, 3TR, 4AK, 4AY, 4BK, 4RO, 5KA, 6ML.

Pelaco Ltd. (Shirts). 2AY, 2HD, 3BA, 3SH.

Peters' American Delicacy Co. Ltd., 140 George Street, Redfern, N.S.W. (Ice Cream). Agency: Arthur Smyth & Sons Ltd.) 2AY, 2CH, 2GF, 2GN, 2GZ, 2KA, 2KO, 2SM, 2TM, 2UE, 2XN, 4IP, 4RO, 4TO.

Phoenix Biscuit Co. Pty. Ltd., 42 Grosvenor Street, Abbotsford, N9, Melbourne, Vic. 3BO, 3HA.

Pick-Me-Up Condiment Co. Ltd., 60 Alice Street, Newtown, N.S.W. Agency: Weston Co. Ltd. 2GZ, 2HD, 2KO, 2MO, 2TM, 3BA, 3BO, 3DB, 4AK, 4AY, 4BK, 4MB, 4RO.

Pie, Bruce & Co., Qutexco House, 8 McLachlan Street, Valley, Brisbane, Q'land. 4BH, 4MB, 4RO, 4TO.

Preservene Pty. Ltd. 59 Stawell Street, Burnley, E1, Melbourne, Vic. 2AY, 3BA, 3BO, 3HA, 3TR, 3WR, 5KA.

Prestige Ltd., 257 Donald Street, East Brunswick, N11, Melbourne, Vic. (Stockings). Agency: Catts-Patterson Co. Ltd. 2KO, 3AW, 3DB, 3BA, 4AK, 4BC, 4BK.

Prudential Assurance Co. Ltd., 66 Pitt Street, Sydney, N.S.W. Agency: Country Press Co-op. Co. Ltd. 2GZ, 3BA, 3HA, 4BC, 6PR.

Q

Qualcast (Aust.) Pty. Ltd., Sunbury Road, West Melbourne, W12, Vic. Agency: Richards Advertising Service. 3AW, 4AK, 4BK, 4TO.

R

Reckitts (Overseas) Ltd., 145 Bourke Street, Redfern, N.S.W. Agencies: Amalgamated Wireless (A/sia) Ltd., George Patterson Pty. Ltd., A. N. White Ltd. 2GN, 2HD, 3AW, 3KZ, 4BC, 5KA, 6ML, 6PR.

Reid, John & Sons, 350 George Street, Sydney, N.S.W. 2MO, 4RO.

Richmond Brewing Co. (N.S.W.) Ltd., 129 Sussex St., Sydney, N.S.W. Agency: Canny Advertising Service. 3BA.

Riverstone Meat Co. Ltd., 7 Hay Street, Sydney, N.S.W. 2GZ.

Robur Tea Company Ltd., 28 Clarendon Street, S. Melbourne, SC5, Vic. 2AY, 3TR, 5KA.

Rocke Tompsitte & Co. Ltd., 292 Flinders Street, Melbourne, C1, Vic. Agency: Gordon & Gotch (A/sia) Ltd. 2SM, 3DB, 3HA, 4AK, 4BK, 4RO, 6ML.

Rolfe & Co. Ltd., 300 King Street, Melbourne, C1, Vic. 3AW, 3BA, 3BO, 3HA, 3TR.

Rosella Preserving Co., Morley Avenue, Rosebery, N.S.W. (Rosella Products). 3AW, 3DB, 3TR.

Rural Bank of N.S.W., 14 Castlereagh Street, Sydney, N.S.W. 2GZ.

R.K.O. Radio Pictures (A/sia) Ltd., 490 Bourke Street, Melbourne, C1, Vic., 2UE, 3BO, 3CH, 3HA.

S

Sandy, Jas. & Co. Ltd., 268 George Street, Sydney, N.S.W. Agency: T. B. Browne Ltd. 2GZ, 2HD.

Sanitarium Health Food Co, 216 Sussex Street, Sydney, N.S.W. Agency: Catts-Patterson. 2AY, 2KO, 2GB, 3HA, 4AY, 4BC, 4BK, 4IP, 4MB, 4RO, 4TO, 6ML.

Saunders, W. & Son Pty. Ltd., 159 Clarence Street, Sydney, N.S.W. (Malt Extract). Agency: Amalgamated Wireless (A/sia) Ltd.

Schumann's Salts Agency, 16 Albion Street, Sydney, N.S.W. (Schumann's Salts). 5KA.

Seppelt B. & Sons Ltd., 281 Sussex Street, Sydney, N.S.W. (Wines). Agency: Country Press Co-op. Co. Ltd. 2BH, 2GZ, 2KO, 2SM, 2UE, 3BA, 3BO, 3DB, 3AW, 3TR.

Sheldon Drug Co. Ltd., 131 Clarence Street, Sydney, N.S.W. 2GZ, 2KO, 2SM, 2TM.

Shell Co. of Australia Ltd., Grace Building, 77 York Street, Sydney, N.S.W. (Motor oil and spirit). 2AY, 2BH, 2GF, 2GN, 2GZ, 2HD, 2KA, 2KO, 2MO, 2SM, 2TM, 2XN, 3AW, 3BA, 3BO, 3DB, 3HA, 3SH, 3TR, 3WR, 4AK, 4BC, 4BK, 4IP, 4MB, 4RO, 4TO, 5KA, 5RM, 6PR.

Sherwin-Williams Co. (Aust.), 11c Castlereagh Street, Sydney, N.S.W. Agency: Weston Co. Ltd. 3BA, 3KZ, 3TR, 5KA, 6ML.

Simplex Baltic Machinery Co., Harris Street, Ultimo, Sydney, N.S.W. Agency: George Patterson Pty. Ltd. 2GZ.

Small, Bruce Pty. Ltd., 10 Oxford Street, Sydney, N.S.W. 2KO, 3WR, 6PR.

Small, H. & Co. Ltd., Bridge Road, Stanmore, N.S.W. (Chocolates). 2CH, 2HD, 2KA, 2SM.

Smith, Copeland & Co. Ltd., 33 Regent Street, Sydney, N.S.W. 2GZ.

Solomon, David & Sons Ltd., 4-14 Buckingham Street, Sydney, N.S.W. Agency: Harold S. Darke Organization Ltd. 2AY, 2GF, 2GZ, 2KO, 2TM, 2XN, 3BO, 3HA, 3SH, 3TR, 4AK, 4BK.

Standard Telephones & Cables (A/sia) Ltd., 71 York Street, Sydney, N.S.W. Agency: George Patterson Pty. Ltd. 3KZ, 6ML, 6PR.

Stedman, Henderson Sweets Ltd., Rothschild Avenue, Rosebery, N.S.W. (Confectionery). 2CH, 2MO, 2TM, 2UE, 2XN, 3BA.

PROMINENT ADVERTISERS IN BROADCASTING.—(Continued)

Stott & Underwood Ltd., 16 Hunter Street, Sydney, N.S.W. (Typewriters). 2GZ.

Stromberg-Carlson (A/sia) Ltd., 118 Bourke Rd., Alexandria, N.S.W. Agency: Gordon & Gotch A/sia Ltd. 2GZ, 2TM, 3TR.

Sun Newspapers Ltd., 60-66 Elizabeth Street, Sydney, N.S.W. 2GF, 2GZ, 2MO, 2XN.

Sunshine Biscuit Co. Pty. Ltd., 488 Collins Street, Melbourne, C1, Vic. (Biscuits). 3BO, 3WR.

Swallow & Ariell Ltd., Rouse Street, Melbourne, Vic. Agency: O'Brien Publicity. 3AW, 3BA, 3BO, 3HA, 3SH, 4BC, 5KA.

T

Tallerman & Co. Ltd., 17 York Street, Sydney, N.S.W. Agency: Unsted, Jackson, Haines Ltd. 3KZ.

Taubman's Pty. Ltd., Mary Street, St. Peters, N.S.W. (Paints, varnishes, lacquers). Agency: J. Walter Thompson Co. 2KO, 2GB, 2MO, 3DB, 4AK, 4BK.

Taylor, Samuel, 426 Cleveland Street, Sydney, N.S.W. Agency: Hansen-Rubensohn Co. 2HD, 2KO, 3KZ, 4BC, 6PR.

Taylor, Williams & Halliday, 195 Canterbury Road, Belmore, N.S.W. Agency: Harold S. Darke Organization Ltd. 2GZ, 3KZ.

Taylors, Elliott's & Australian Drug Pty. Ltd., 154 Charlotte Street, Brisbane, Q'land. Agency: Queensland Country Press Ltd. 4AK, 4BC, 4BK, 4RO.

Tea Market Exp. Bureau, 31 Macquarie Street, Sydney, N.S.W. Agency: Samson-Clark, Price-Berry Pty. Ltd. 2KO, 2SM, 3DB, 3AW, 3KZ.

Texaco Company (A/sia) Ltd., Cnr. George & Margaret Streets, Sydney, N.S.W. Agencies: Amalgamated Wireless (A/sia) Ltd., Catts-Patterson Co. Ltd. 2CH, 2GF, 2GN, 2GZ, 2KO, 2MO, 2SM, 2TM, 2XN, 3AW, 3BA, 3HA, 3TR, 4AK, 4BK, 4BC, 4RO, 5KA, 6IX, 6ML, 6PR.

Toohey's Ltd., 300 Elizabeth Street, Sydney, N.S.W. Agency: Fox Adv. Service. 2HD.

Tooth & Co., 26 George Street West, Sydney, N.S.W. Agency: Goldberg Advertising Agency Ltd. 2KO.

Trufood of Australia Ltd., 363 Sussex Street, Sydney, N.S.W. 3SH, 6ML.

Truth and Sportsman Ltd., 61 Kippax Street, Sydney, N.S.W. 2UE, 4RO.

Tucker & Co. Ltd., 335 Kent Street, Sydney, N.S.W. (Chateau Tanunda). Agency: Austral Press & Advertising Ltd. 2GF, 2GN, 2GZ, 2HD, 2SM, 2MO, 2TM, 2XN.

Turf Life, 178 Castlereagh Street, Sydney, N.S.W. (Newspaper). 2GN, 2SM.

U

United Australia Party of N.S.W., 30 Ash Street, Sydney, N.S.W. Agency: Amalgamated Wireless (A/sia) Ltd. 2GN, 2MO.

United Chemists Alliance Ltd., 485 Bourke Street, Melbourne, Vic. 3BO.

United Distillers Pty. Ltd., Byrne Street, S. Melbourne, Vic. 3BO.

V

Vacuum Oil Co. Pty. Ltd., 29 Market Street, Melbourne, Vic. Agency: Paton Advertising Service Pty. Ltd. 2AD, 2AY, 2BH, 2GB, 2GF, 2GN, 2GZ, 2HD, 2KO, 2MO, 2SM, 2UE, 3BA, 3BO, 3HA, 3SH, 3TR, 3WR, 4AK, 4AY, 4BC, 4BK, 4MB, 4RO, 4TO, 5KA, 5RM, 6ML, 6PR.

Victoria Palace, 221 Little Collins Street, Melbourne, Vic. Agency: N. V. Nixon & Co. 2AY, 2GN, 3BO, 3DB, 3HA, 3SH, 3TR.

Vick Chemical Co., Philadelphia, N.Y. (Vicks). Agency: T. B. Browne Ltd. 6ML.

Victorian Railways, Melbourne, Vic. 2AY, 3BO, 3SH, 3TR.

Vincent Chemical Co. Ltd., 30 Market Street, Sydney, N.S.W. (A.P.C. Powders). Agency: Marsh Brown Ltd. 2GB, 2GZ, 2KA, 2KO, 3AW.

Vita-Lick Ltd., 107-109 Kent Street, Sydney, N.S.W. Agency: Country Press Co-op. Co. Ltd. 2GZ.

PROMINENT ADVERTISERS IN BROADCASTING.—(Continued)

W

Wakefield, C. C. & Co., 3 Spring Street, Sydney, N.S.W. (Castrol). Agency: O'Brien Publicity. 2CH, 3BA.

Walton, F. S. & Co., Spinner House, Kent Street, Sydney, N.S.W. (Summer Breeze). 2GB, 2GF, 2MO, 2XN, 3BO, 3BK, 3BA, 3HA, 4AK, 4BK.

Warren & Strang Ltd., 111 Elizabeth Street, Brisbane, Queensland. Agency: O'Brien Publicity Co. 4BC, 4RO.

Washington H. Soul, Pattinson & Co. Ltd., 160 Pitt Street, Sydney, N.S.W. (Chemical products) Agency: Weston Co. Ltd. 2HD, 2KO, 2SM.

Watch Tower Bible & Tract Society, 7 Beresford Rd., Strathfield, N.S.W. Agency: Amalgamated Wireless (A/sia) Ltd. 2AY, 2BH, 2GF, 2GN, 2HD, 2TM, 2XN, 3BA, 3BO, 3HA, 3SH.

Waugh & Josephson Ltd., Unwin's Bridge Road, St. Peters, N.S.W. 2MO, 2TM.

Wawn's Laboratories Ltd., 283 Elizabeth Street, Sydney, N.S.W. (Wawn's Wonder Wool). Agency: Weston Co. Ltd. 2GZ, 3DB, 4AK, 4BK.

Wearproof Hosiery Ltd., Eveleigh Street, Redfern, N.S.W. (Hosiery). Agency: Amalgamated Wireless (A/sia) Ltd. 2AY, 2MO.

Wertheim (Hugo) Pty. Ltd., 250 Collins Street, Melbourne, C.1., Vic. 3BA, 3DB, 3TR.

Whiteloid Products Ltd., Primrose Avenue, Rosebery, N.S.W. (Shu-Milk). Agency: Harold S. Darke Organisation Ltd. 3KZ, 4AK, 4BK.

Widdis-Diamond Dry Cells Pty. Ltd., 119 Hawke St., W. Melbourne, C.3, Vic. Agency: O'Brien Publicity Co. 2AY, 2GF, 2GZ, 2MO, 2XN, 3HA, 3MB, 3SH, 3WR, 4MB, 4RO, 5KA.

Williams the Shoemen Pty. Ltd., 96 Flinders Street, Melbourne, Vic. 3BO, 3HA, 3TR.

Wills, W. D. & H. O. (Aust.) Ltd., 511 Kent Street, Sydney, N.S.W. (Tobacco and cigarettes). Agency: Amalgamated Wireless (A/sia) Ltd. 2CH, 2KA, 2SM, 3AW, 3DB, 4BC, 4AK, 4BK, 5KA, 6ML, 6PR.

Winn's Ltd., 18 Oxford Street, Sydney, N.S.W. 2GB, 2HD.

Woods, W. E. Ltd., 38 Collins Street, Surry Hills, N.S.W. (Woods Great Peppermint Cure). Agency: Country Press Co-op. Co. Ltd. 2AD, 2AY, 2GB, 2GF, 2GZ, 2KO, 2XN, 3HA, 4BC, 6PR.

Woodward, W. Ltd. (Woodwards Gripe-Water). Agency: T. B. Browne Ltd. 4AY, 4RO.

Wrigley's (A/sia) Ltd., Crewes Place, Rosebery, N.S.W. (Chewing Sweets). Agency: Amalgamated Wireless (A/sia) Ltd.; J. Walter Thompson Co. 2AY, 2GB, 2GF, 2GN, 2KO, 2MO, 2TM, 2XN, 3BA, 3BO, 3HA, 3TR, 3WR.

Y

York Motors Pty. Ltd., 101-111 William Street, Sydney, N.S.W. Agency: Amalgamated Wireless (A/sia) Ltd.; Arthur Smyth & Sons Ltd. 2GF, 2GN, 2KO, 2TM.

Z

Zebra Polish. 3TR, 3HA.

Zelita, Anna Ltd., Hosking Place, Sydney, N.S.W. (Cosmetics). 2GZ, 3KZ.

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 omission or inaccuracies. Any alteration desired in the next Year Book should be forwarded.

A

Abbott, J. P., Director 2GZ, Central N.S.W.
Abramowski, O. W., Salesman, 3UZ, Melbourne.
Afford, M., Production Manager, 5DN, Adelaide.
Agassiz, C. Announcer, 2UE, Sydney.
Albert, M. F., Director, 2UW, Sydney.
Albert, A. F., Director, 2UW, Sydney.
Aldridge, H., Sales Manager and Chief Engineer, 3MB Birchip, Vic.
Allan, F. H., Director, 3AW, Melbourne.
Allen, H. F., Engineer, 2CH, Sydney.
Allen, R., General Manager and Chief Engineer, 2BH, Broken Hill, N.S.W.
Anderson, A., Sporting Announcer, 2UW, Sydney.
Anderson, V., Chief Announcer, 6ML, Perth.
Anderson, J., Racing Announcer, 4BC, Brisbane.
Anderson, F. H., General Manager, 2GZ, Central N.S.W.
Andrews, K., Announcer, 7UV, Ulverstone, Tas.
Andrews, A., Studio Director, 3TR, Sale, Vic.
Armistead, K., Studio Director, 2HD, Newcastle, N.S.W.
Armitage, J., Sales Manager, 2GB, Sydney.
Arnold, C., Production Dept., 2UW, Sydney.
Atkinson, C., Salesman, 3SH, Swan Hill, Vic.
Austen, Janet, Announcer, 2CH, Sydney.
Austin, June, Announcer, 6AM, Northam, W.A.

B

Badnenoch, Joy, Announcer, 5DN, Adelaide.
Baeyertz, C. N., Salesman, 2UE, Sydney.
Bairnsfather, Capt. T. D., Announcer, 2KY, Sydney.
Baldry, H. N., Salesman, 2UW, Sydney.
Balmer, N. E., Programme Manager, 3KZ, Melbourne.
Banks, N., Chief Announcer, 3KZ, Melbourne.
Banney, J. P., Programme Manager and Chief Engineer, 3BO, Bendigo, Vic.
Barbour, R. J., Director, 3MB, Birchip, Vic.
Barlee, R., Chief Announcer, 3AK, Melbourne.
Barlin, G., Chief Announcer, 2CA, Canberra.
Barrington, L. H., General Manager, 3AK Melb. and 7UV, Ulverstone.
Barwick, E., Engineer, 3KZ, Melbourne.
Basden, F. M., Chief Engineer and Chief Announcer, 4CA, Cairns, Q.
Bassett, G. H. Chairman of Directors, 2BH, Broken Hill, N.S.W.
Baume, S. E., Sales Manager, 2UE, Sydney.
Baxter, G. S., Director, 3MA, Mildura, Vic.
Bayley, H. M., Secretary, 4BK, Brisbane.
Beames, V., Secretary, 6KG, Kalgoorlie, W.A.
Beaney, W. S., Engineer, 4RO Rockhampton, Q.
Beatson, R. J., Chief Engineer, 4MB, Maryborough, Q.
Beattie, R., Announcer, 4GR, Toowoomba, Q.
Beaver, H. E., General Manager, 2KY, Sydney.
Bennett, A. E., Managing Director, 2GB, Sydney, Director 3AW, Melb. and 5DN, Adelaide.
Bennett, G. B., Elec. Recording Manager, 2GB, Sydney.
Bennett, R. E., Director, 2GB, Sydney.
Bennett, P. C., Engineer, 3HA, Hamilton, Vic.
Bennetts, W., Chief Announcer, 3YB, Warrnambool, Vic.
Bennetts, W. F., Announcer, 6KG, Kalgoorlie, W.A.
Benson, Miss E., Acting Programme Manager, 5DN, Adelaide.
Berryman, Miss L., Announcer, 6ML, Perth.
Bessemer, E., Announcer, 4BC, Brisbane.
Bills-Thompson, G., Chief Announcer, 3AW, Melbourne.
Bilton, H., Secretary, 7UV, Ulverstone, Tas.
Binns, R., Announcer, 5AD, Adelaide.
Binns, C., Engineer, 2CH, Sydney.
Bishop, N., Engineer, 4GR, Toowoomba, Q.
Blake, R. L., Secretary, 2AD and 2LV, Armidale, N.S.W.
Blakeney, K., Programme Manager, 2UW, Sydney.
Blandford, R., Musical Director, 2CH, Sydney.
Blanshard, F., Salesman, 3KZ, Melbourne.
Blee, N. J., Programme Manager, 3SH, Swan Hill, Vic.
Bleechmore, R. C., Announcer, 4TO, Townsville, Q.
Boast, H., Engineer, 3DB, Melbourne.
Bohm, V., Secretary and Programme Manager, 4AY,
Bond, C., Advertising Executive, 6KG, Kalgoorlie, W.A.
Bonser, Miss M., Announcer, 7LA, Launceston, Tas.
Boreham, L. G., Salesman, 3BA, Ballarat, Vic.
Borrett, F., Announcer, 6AM, Northam, W.A.
Ayr, Q.
Bradley, C., Announcer, 3UZ, Melbourne.
Bray, Miss B., Publicity Manager, 3GZ, Central N.S.W
Bray, G., Salesman, 2HD, Newcastle, N.S.W.
Brearley, R. C., Chief Announcer, 7UV, Ulverstone, Tas.
Brewin, D., Salesman, 3DB, Melbourne.
Briggs, L., Announcer, 2GZ, Central N.S.W.
Broadbent, J., Chief Announcer and Studio Manager, 7HO, Hobart, Tas.
Brown, Miss A., Saleswoman and Announcer, 3DB, Melbourne.
Brown, J. H., Chief Engineer, 2KY, Sydney.
Browne, B., Announcer, 4IP, Ipswich, Q.
Bryant, E. E., Director, 3MB, Birchip, Vic.
Buchan, F., Announcer, 6PR, Perth.
Buchan, F. W., Announcer, 6KG, Kalgoorlie, W.A.
Buckeridge, G., Engineer, 6IX and 6ML, Perth.
Bunton, C., Announcer, 2AY, Albury, N.S.W.
Burgess, J., Chief Announcer, 5AD, Adelaide.
Buring, R., B.Sc., Engineer, 3BA, Ballarat, Vic.
Burmester, O. C., Engineer 4BC, Brisbane.
Burrows, R., Programme Manager, 3HA, Hamilton, Vic.

COMMERCIAL BROADCASTING PERSONNEL.—(Continued).

Butt, F., Engineer, 2HD, Newcastle, N.S.W.
Butterfield, G., Engineer, 6IX, Perth.
Buzacott, H., Engineer, 4GR, Toowoomba, Q.
Buzacott, R. N., Engineer, 2UW, Sydney.

C

Callander, W., Director, 3WR, Shepparton, Vic.
Callard, M., Announcer, 3DB, Melbourne.
Campbell, A., Announcer, 2AY, Albury, N.S.W.
Carroll, W. H., Salesman, 4BC, Brisbane.
Carson, C. R., Programme Manager, 4BC, Brisbane.
Carter, N., Programme Manager and Chief Announcer, 4GR, Toowoomba, Q.
Carter, C., Chief Announcer, 5RM, Murray Heights, S.A.
Carvosso, A. J., Secretary, 5DN, Adelaide.
Casos, Dean, Announcer (tennis), 4BC, Brisbane.
Cayley, F., Announcer, 2GZ, Central N.S.W.
Cazabon, J., Junr., Programme Manager, 4BH, Brisbane.
Chance, J., Announcer, 4GR, Toowoomba, Q.
Chandler, J. B., Managing Director 4BC, Brisbane and 4BM, Maryborough, Q.
Chapman, M., Sales and Production Manager, 5AD, Adelaide.
Chisholm, G., Engineer, 4VL, Charleville, Q.
Christensen, A. J., Director, 4BU, Bundaberg, Q.
Churchward, E. C., Sales Manager, 6IX, 6ML, 6WB, W.A.
Clark, Miss F. M., Director, 3BA, Ballarat, Vic.
Clark, S., Manager Record Dept., 3DB, Melbourne.
Clark, S. W. G., Director, 3BA, Ballarat, Vic.
Clark, S. O., Specialty Salesman, 2CH, Sydney.
Clay, G., Salesman, 4BH, Brisbane.
Cleeland, M., Secretary, 2HD, Newcastle, N.S.W.
Cochrane, A.S., Chief Announcer, 2CH, Sydney.
Coffey, I., Announcer, 3UZ Melbourne.
Coldwell-Smith, C. E., Chief Engineer and Chief Announcer, 2GF, Grafton, N.S.W.
Collibee, E., Announcer, 2UW, Sydney.
Collick, W., Engineer, 2KY, Sydney.
Colman, E., Chief Announcer, 2GB, Sydney.
Cook, B., Announcer (Cricket), 4BC, Brisbane.
Coombs, T., Announcer, 3HA, Hamilton, Vic.
Coombs, General Manager, 3TR, Sale, Vic.
Cooper, A., Announcer, 3DB, Melbourne.
Cooper, E., Chief Engineer and Announcer, 7UV, Ulverstone, Tas.
Corby, P., Announcer, 3KZ, Melbourne.
Cornish, W., Director and General Manager, 3SH, Swan Hill, Vic.
Cottrell, W., Engineer, 2CH, Sydney.
Cottrell, E. L., Secretary, 3UZ, Melbourne.
Cousens, C., Announcer, 2GB, Sydney.
Cox, H. E., Chief Engineer, Sales and Programme Manager, 4TO, Townsville, Q.
Cowen, J., Engineer, 2KO, Newcastle, N.S.W.
Crago, G., Salesman, 5KA, Adelaide.
Crago, J. C., Chief Announcer, 2HD, Newcastle, N.S.W.
Craig, O., Announcer (Markets), 4BC, Brisbane.
Crawcour, J. A., Pastoral Dept., 2UW, Sydney.
Creighton, A. R. Programme Manager, 3MB, Birchip, Vic.
Creighton, J. L. F., Manager, 2AD, Armidale, Announcer and Copyrighter, 2GB and 2CH, Sydney.
Crichton, C., Sales Manager, 2KO, Newcastle, N.S.W.
Cromie, C. T., Director, 3UZ, Melbourne.
Crosby, A. F., Director, 3YB, Warrnambool, Vic.
Cross, C. J. P., Announcer, 7HO, Hobart, Tas.
Crouch, E. C., Chief Engineer, 2GZ, Central, N.S.W.
Crow, D., Announcer, 4RO, Rockhampton, Q.
Crozier, Miss T., Announcer 3TR, Sale, Vic.
Cruickshank, N. W., Chief Engineer, 4BH, Brisbane.
Curtis, R. G., Director, 4BU, Bundaberg, Q.

D

Dahl, N. L., Managing Director, 4AY, Ayr, Q.
Daly, P., Chief Announcer, 6IX, Perth.
Davey, J. H., Managing Director and General Manager, 3BA, Ballarat, Vic.
Davey, J., Announcer, 2GB, Sydney.
Davies, E. W., Announcer, 7LA, Launceston, Tas.
Davis, G., Continuity Dept., 2UW, Sydney.
Dawson, P., Announcer, 2KA, Katoomba, N.S.W.
Day, D., Announcer, 2KY, Sydney.
Dear, A., Announcer, 3KZ, Melbourne.
Dearth, H., Announcer, 2GB, Sydney.
Dease, C. J., Announcer and Copyrighting Manager, 2GB, Sydney.
Dempsey, L. A., Announcer, 2KY, Sydney.
Dennis, H., Director, 5RM, Murray Heights, S.A.
Derriman, B., Chief Announcer, 4TO, Townsville, Q.
Devine, J., Announcer and Manager, Transcription Dept., 3DB, Melbourne.
Diamond, W. G., Sales Manager and Chief Announcer, 4MB, Maryborough, Q.
Digby-Bennett, J., Salesman, 2SM, Sydney.
Dinney, V. M., Director and General Manager, 3YB, Warrnambool, Vic.
Dixon, A. L., Chief Engineer, 4BK, Brisbane and 4AK, Oakey, Q.
Dixon, N. F., Salesman, 3HA, Hamilton, Vic.
Dodds, J. S., Assistant Engineer, 7HO Hobart, Tas.
Dower, J., General Manager and Chief Announcer, 2AY, Albury, N.S.W.
Doyle, Stuart F., Managing Director, 2UW, Sydney.
Drummond, Hon. D. H., M.L.A., Director, 2AD, Armidale, N.S.W.
Duff, D., Salesman, 3AW, Melbourne.
Dunbar, D. W., Sales Manager, 4RO, Rockhampton, Q.
Duncan, W. G., Secretary, 4BC, Brisbane, 4GR, Toowoomba, and 4MB, Maryborough, Q.
Duncan, Miss R., Record Dept., 4BC, Brisbane.
Dunne, J. S., Programme Manager, 2SM, Sydney.
Dunstan, W., Chairman of Directors, 3DB, Melbourne.
Dyball, H. J., Announcer and Secretary, 2TM, Tamworth, N.S.W.
Dye, S., Announcer, 6ML, Perth.

COMMERCIAL BROADCASTING PERSONNEL.—(Continued)

E

Ebrall, H., Announcer, 2HD, Newcastle, N.S.W.
Eden, K., Announcer, 3DB, Melbourne.
Edwards, H., Engineer, 2KY, Sydney.
Edwards, S., Announcer, 5KA, Adelaide.
Edwards, Miss D., Announcer, 5AD, Adelaide.
Egan, P. J. Secretary, 2SM, Sydney.
Eisdell, M. A. M., Announcer, 7HO, Hobart, Tas.
Elliott, R. D., Director, 3MA, Mildura, Vic.
Elliott, F. E., Engineer, 4BC, Brisbane.
Elliott, Miss E., Announcer, 7BU, Burnie, Tas.
England, Miss L., Announcer, 5AD, Adelaide .
English, G., Programme Manager, 3UZ, Melbourne.
Everett, S., Announcer, 4BH, Brisbane.
Exton, G. W., Managing Director and Chief Engineer, 2XN, Lismore, N.S.W.
Exton, W. G., General Manager and Programme Manager, 2XN, Lismore, N.S.W.

F

Faber, W., Chief Engineer, 4AY, Ayr, Q.
Fagan, R., Director, 2SM, Sydney.
Fair, R., Manager, 3BO, Bendigo, Vic.
Fair, R., Announcer, 2SM, Sydney.
Fairhall, A., Managing Director, 2KO, Newcastle, N.S.W.
Fairhall, E., Director, 2KO, Newcastle, N.S.W.
Fairweather, K., Engineer, 4IP, Ipswich, Q.
Fardell, F. W., Accountant, 3DB, Melbourne.
Farrelly, J., Announcer, 2KY, Sydney.
Farrelly, Miss, Announcer, 6PR, Perth.
Farris, E. C., Salesman, 2SM, Sydney.
Fawcett, G. S., Salesman, 3UZ, Melbourne.
Ferrie, R., Engineer, 2GB, Sydney.
Field, Miss E., Announcer, 2GB, Sydney.
Filmer, Mrs. M., Announcer, 2UE, Sydney.
Findlay, S. H., General Manager, 7HO, Hobart, Tas.
Findlay, A. P., Managing Director, 7BU, Burnie, Director, 7LA, Launceston.
Findlay, N. M., Director, 7LA, Launceston, Tas.
Fink, T. Director, 3DB, Melbourne, Vic.
Firth, P. A., Secretary, 7BU, Burnie, Tas.
Fitts, R. A., General Manager and Chief Engineer, 3HA, Hamilton, Vic.
Fitzgerald, Miss M., Announcer and Secretary, 3SH, Swan Hill, Vic.
Fleming, F. B., Director, 2GZ, Central N.S.W.
Fletcher, R., Engineer, 4BH, Brisbane.
Folie, M., Chief Engineer, 3MA, Mildura, Vic.
Foott, Miss R., Service Dept., 2UW, Sydney.
Forsyth, A. K., Sales Manager, 4BC, Brisbane.
Forsythe, G., Salesman, 4BH, Brisbane.
Foster, D., Announcer, 3UZ, Melbourne.
Fowles, K., Announcer, 2CH, Sydney.
Fox, J., Announcer, 2KY, Sydney.
Frank, K. T., General Manager and Chief Engineer, 4PM, Port Moresby, Papua.
Fraser, A., Director, 3MB, Birchip, Vic.
Freeman, E., Announcer, 3CH, Swan Hill, Vic.
Freeman, C. A., Announcer, 5KA and 5DN, Adelaide.
Fremlin, R. A., Advertising Manager, 4BK, Brisbane.

G

Gainford, R., Production Manager and Chief Announcer, 4BK, Brisbane.
Gallaway, L. G., Secretary, 3YB, Warrnambool,, Vic.
Galley, W., Accountant, 2GB, Sydney.
Garden, H. M., Programme Manager, 2KY, Sydney.
Garden, I., Announcer, 2KY, Sydney.
Garland, F., Announcer, 2KY, Sydney.
Garrott, A. E., Secretary, 7LA, Launceston, Tas.
Gibbson, A. E., Engineer, 2GB, Sydney.
Gibbs, E., Announcer, 2KO, Newcastle, N.S.W.
Gilchrist, A., Managing Director, 3TR, Sale, Vic.
Gilchrist, G., Secretary, 3TR, Sale, Vic.
Gilchrist, Miss E., Director, 3TR, Sale, Vic.
Gill, R., Engineer, 2CH, Sydney.
Gilligan, D. J., Director, 2GZ, Central, N.S.W.
Gledhill, R., Announcer, 6IX, Perth.
Glew, L. G. Chief Engineer, 3UZ, Melbourne.
Glover, A. G., Chief Engineer, 3YB, Warrnambool, Vic.
Goddard, H. W., Director, 2MO, Gunnedah, N.S.W.
Godfrey, K., Announcer, 4RO, Rockhampton, Q.
Gold, E. E., General Manager, 4GR, Toowoomba, Q.
Gooding, D. M., Chief Engineer, 5AD, Adelaide.
Gough, J. T., General Manager and Chief Announcer, 7LA, Launceston, Tas.
Gower, E. L. Salesman, 6IX and 6ML, Perth.
Grace, A., Chief Engineer, 3KZ, Melbourne.
Graham, A., Announcer, 4BH, Brisbane.
Graham, R. M., Salesman, 4BC, Brisbane.
Graham, J., Announcer, 2KA, Katoomba, N.S.W.
Grant, W., Engineer, 2KY, Sydney.
Grant, J., Programme Manager, 6PR, Perth.
Gray, A., Salesman, 3KZ, Melbourne.
Gray, Miss I., Announcer, 7BU, Burnie, Tas.
Greenhalgh, K. N., Chief Engineer, 2KO, Newcastle, N.S.W.
Greenham, Miss I., Announcer, 3KZ, Melbourne.
Gregory, H., Announcer, 2UW, Sydney.
Greig, H., Director, 6IX, 6ML and 6WB, Perth.
Grey, Mrs. Announcer, 2KY, Sydney.
Griffiths, S., Chief Announcer, 3BO, Bendigo, Vic.
Grist, S., Salesman, 3DB, Melbourne.
Grose, F., Announcer, 2GB, Sydney.

H

Hahn, A., Announcer, 2GB, Sydney.
Ham, G., Engineer, 4RO, Rockhampton, Q.
Hanna, F., Engineer, 2GZ, Central N.S.W.
Hannam, H., Engineer, 2GZ, Central N.S.W.
Hardman, C., Announcer, 2MO, Gunnedah, N.S.W.
Hardman, G., Chief Announcer, 4BH, Brisbane.
Hardy, W., Salesman, 2UW, Sydney.
Hare, D., Engineer, 4BH, Brisbane.
Harland, W., Engineer in Charge, 4AK, Oakey, Q.
Harnett, D., Chief Announcer, 2SM, Sydney.
Harper, J., Chief Announcer, 2KY, Sydney.
Harrington, G. R., Sales Manager, 4GR, Toowoomba, Q.
Harris, A. C., Managing Director, 3MB, Birchip, Vic.
Harris, H., Secretary, 3AW, Melbourne.
Harrison, E., General Manager, 4BH Brisbane.
Hart, B., Engineer, 4BH, Brisbane.
Hartwig, L., Salesman, 2HD, Newcastle, N.S.W.

COMMERCIAL BROADCASTING PERSONNEL.—(Continued)

Harty, F., Announcer, 2UE Sydney.
Harvey, W. J., Chairman of Directors, 4BU, Bundaberg, Q.
Healy, C., Announcer, 2SM, Sydney.
Heath, H., Engineer, 2HD, Newcastle, N.S.W.
Heath, L. R. Sales Manager, 3HA, Hamilton Vic.
Hele, J. A., Director, 5DN, Adelaide.
Hellier, L. J. Managing Director, 3WR, Shepparton, Vic.
Hibbert, C. T., Engineer, 2GB, Sydney, N.S.W.
Hicks, F. B., Director, 6KG, Kalgoorlie, W.A.
Higgenbotham, E., Engineer, 3UZ, Melbourne.
Higgenbotham, E., Managing Director 2TM, Tamworth, N.S.W.
Higgins, A., Sporting Announcer, 6AM, Northam, W.A.
Hill, F., Engineer, 5DN, Adelaide.
Hill, D., Announcer, 2CH, Sydney.
Hinneberg, M., Announcer, 3HS, Horsham, Vic.
Hoad, A., Announcer and Engineer, 3BO, Bendigo, Vic.
Hodgkins, Mrs. J., Announcer, 2GZ, Central N.S.W.
Hoe, F., Junr., Chief Engineer, 4IP, Ipswich, Q.
Holland, C., Announcer, 2UE, Sydney.
Holland, G., Engineer, 7LA, Launceston, Tas.
Holloway, E., General Manager and Chief Announcer, 3MA, Mildura, Vic.
Holmes, D. E., Managing Director, 2DU, Dubbo, N.S.W.
Holt, T., Managing Director, 3XY, Melbourne.
Holtze, A. L., General Manager, 5AD, Adelaide.
Homfrey, L., Announcer, 3UZ, Melbourne.
Honeyfield, C., Announcer, 2UE, Sydney.
Hood, F. A., Salesman, 3YB, Warrnambool, Vic.
Hooper, M., Chief Engineer, 3DB, Melbourne.
Hopton, A. T., Manager and Engineer, 3HS, Horsham, Vic.
Houstone, F. W., Director, 2GB, Sydney.
Howie, C., Engineer, 5DN, Adelaide.
Howell, E., Announcer, 2CH, Sydney.
Hudson, K., Announcer, 3KZ, Melbourne.
Hudons, R., Merchandising Dept., 2HD, Newcastle, N.S.W.

Hughes, R., Announcer, 2GB, Sydney.
Hugill, P., Announcer, 2TM, Tamworth, N.S.W.
Hume, E. J., Chief Engineer (Acting), 5DN, Adelaide.
Humphry, J. L., Director, 4AY, Ayr, Q.
Hungerford, H. T. Sales Manager, 2KY, Sydney.
Huntley, H., Announcer and Engineer, 4TO, Townsville, Q.

Hurley, W., Director, 2SM, Sydney.
Hurrey, E., Announcer, 3MA, Mildura, Vic.
Hutchinson, V. L., Announcer and Engineer, 7UV, Ulverstone, Tas.

I

Innes, A., Announcer, 4AY, Ayr, Q.
Innes, T. H., Engineer, 2GB, Sydney.
Isaacson, A , Assistant Manager, 3KZ, Melbourne.

J

Jack, J. P., Chief Engineer, 5RM, Murray Heights, S.A.
Jackson, H. B., K.C., Chairman of Directors, 6IX and 6ML and Director 6WB, Perth.
Jackson, B., Secretary, 3KZ, Melbourne.
Jacomb, T. H., Salesman, 2TM, Tamworth, N.S.W.
Jacques, V. A., Programme Continuity Supervisor, 5AD, Adelaide.
James, H., Engineer, 3MA, Mildura, Vic.
James, D., Announcer, 3HA, Hamilton, Vic.
James, C., Programme Manager, 2UE, Sydney.
Jameson, J. K., Advertising Manager, 5KA, Adelaide.
Jameson, Miss J., Saleswoman, 5KA, Adelaide.
Jebb, Miss B., Announcer, 7LA, Launceston, Tas.
Jenkin, F., Announcer, 3UZ, Melbourne.
Jenkin, E., Salesman, 3CH, Swan Hill, Vic.
Johnson, W. J. Director and Sales Manager, 4IP, Ipswich, Q.
Johnson, S., Chief Engineer, 3TR, Sale, Vic.
Johnson, E. B., Director, 4IP, Ipswich, Q.
Johnston, M., Announcer and Copywrighting Dept., 2HD, Newcastle, N.S.W.
Johnston, W. W., Publicity Manager, 2HD, Newcastle, N.S.W.
Jones, Miss M., Announcer, 3BA, Ballarat, Vic.
Jordan, J., Chief Engineer, 4BU, Bundaberg, Q.
Jordan, Mrs. Dorothy, Announcer, 2GB, Sydney.
Jordan, Miss K., Announcer, 2GB, Sydney.
Joyce, W., Chief Announcer, 2BH, Broken Hill, N.S.W.
Joyce, D., Announcer and Continuity Writer, 3KZ, Melbourne.
Joynsen-Powell, M., Announcer, 6AM, Northam, W.A.
Judd, N., Announcer, 2GB, Sydney.

K

Keir, G., Announcer, 4RO, Rockhampton, Q.
Kemsley, A. N., General Manager, 3UZ, Melbourne.
Kennedy, R. D., Director, 4BH, Brisbane.
Kerr, A. D., Joint Chief Engineer, 3BA, Ballarat, Vic.
King, R. A., M.L.C., Secretary, 2KY, Sydney.
King, T., Announcer 2KO, Newsastle, N.S.W.
Kingston, F. C., Director, 6IX, 6ML and 6WB, Perth.
Kitto, T. C., Chief Engineer, 2HD, Newcastle, N.S.W.
Knapton, Director, 2AD, Armidale, N.S.W.
Kurtz, A., Announcer, 6PR, Perth.

L

Lake, Miss L., Announcer, 3BA, Ballarat, Vic.
Lamb, R. G. Managing Director, 2KA, Katoomba and Director, 2BH, Broken Hill, N.S.W.
Lambart, T., Announcer, 4BC, Brisbane.
Lammas, Miss G., Programme Manager, 2UW, Sydney.
Lamond, Miss K., Announcer, 2GZ, Central N.S.W.
Landon, Miss M., Announcer, 4BC, Brisbane.
Lane, R. E. Advertising Manager, 2CH, Sydney.
Lanyon, C. D., Director and Secretary, 3MA, Mildura, Vic.
Larkin, J. S., Sales Manager, 3UZ, Melbourne.
Lawrence, C., Announcer, 2UW, Sydney.
Lawrence, A. E., Station and Sales Manager, 4WK, Warwick, Q.
Lawson, O., Announcer, 2GB, Sydney.

COMMERCIAL BROADCASTING PERSONNEL.—(Continued)

Layton, F., Announcer, 2UW, Sydney.
Lelliott, T., Announcer and Chief Engineer, 3AK, Melbourne.
Le Pla, V., Engineer, 4GR, Toowoomba, Q.
L'Estrange, M., Director, 2SM, Sydney.
Levy, F. E., Sales Manager, 2UW, Sydney.
Lewis, H. J., Manager and Chief Announcer, 2GN, Goulburn, N.S.W.
Lincoln, R., General Manager, 5KA, Adelaide.
Lindgren, Miss K., Announcer, 3AW, Melbourne.
Lindo-Taylor, Announcer and Chief Engineer, 2AD, Armidale, N.S.W.
Linke, E., Programme Manager, 5KA, Adelaide.
Linsley-Freeman, S. C., Salesman, 2SM, Sydney.
Lisle, V., Announcer, 2KO, Newcastle, N.S.W.
Littleton, E., Continuity Dept., 4BC, Brisbane.
Lloyd, W., Salesman, 7UV, Ulverstone, Tas.
Loneragan, W. H., Announcer, 6KG, Kalgoorlie, W.A.
Louer, C. K., Engineer, 2GB, Sydney.
Low, R. D., Director, 4AY, Ayr, Q.
Lowe, J. K. S., Announcer and Chief Engineer, 2GN, Goulburn, N.S.W.
Lumsdaine, J., Announcer, 2GB, Sydney.
Lunn, L., Announcer, 2KY, Sydney.
Lyons, N. J., Studio Supervisor, 2UW, Sydney.

M

McAlister, C., Announcer, 2GZ, Central N.S.W.
MacAndrew, K. R. V., Programme Manager, 2WL, Wollongong, N.S.W.
MacArthur, A. H., Director, 2AD, Armidale, N.S.W.
McCarthy, J., Director, 6KG, Kalgoorlie, W.A.
McConnell, J. R. Salesman, 2UW, Sydney.
McCormack, N., Programme Manager and Announcer, 4MB, Maryborough.
McDonald, S., Announcer, 3KZ, Melbourne.
MacDonald, J., Announcer, 2GN, Goulburn, N.S.W.
McDonnell, K., Accountant, 4MB, Maryborough, Q.
MacGregor, P., Announcer 2AD, Armidale, N.S.W.
McGregor, T., Studio Technical Adviser, 4BC, Brisbane.
Mackay, J., Director, 2GB, Sydney.
McKay, Miss D. Announcer, 2SM, Sydney.
McKenzie, R., Announcer, 2SM, Sydney.
MacKinnon, R., Publicity Dept., 2UW, Sydney.
McLaren, S., Gippsland Sales Manager, 3TR, Sale, Vic.
McLean, H., Secretary, 2KA, Katoomba, N.S.W.
McLennan, Miss J. Announcer, 4BC, Brisbane.
MacLeod, I., Engineer, 3DB, Melbourne.
McNaught, J., Announcer, 2GN, Goulburn, N.S.W.
McNeill, T. A. E., Chief Engineere, 2CH, Sydney.
McPherson, R., Director, 3WR, Shepparton, Vic.
Mair, J., Chief Engineer, 3SH, Swan Hill, Vic.
Major, Miss K., Announcer, 3BO, Bendigo, Vic.
Malone, O., Staff Superintendent, 2SM, Sydney.
Mamouney, J., Announcer, 3BO Bendigo, Vic.
Manchee, A. F., Chairman of Directors, 2GZ, Central N.S.W.
Manning, M., Announcer, 3UZ, Melbourne.
Marcus, R., General Manager, 4IP, Ipswich, Q.
Marden, C. F., General Manager, 2UW, Sydney.
Marris, A., Engineer, 3AK, Melbourne.
Marsh, G. W., General Manager, 5DN, Adelaide.
Marshall, H. A. Chief Engineer, 2UW, Sydney.
Marshall, D., Engineer, 2CH, Sydney.
Martin, G., Announcer, 7LA, Launceston, Tas.
Mason-Wood, E., Programme Manager, 2GB, Sydney.
Massey, G., Announcer and Studio Manager, 3AW, Melbourne.
Masters, J., Announcer, 3AW, Melbourne.
Mather, W., Engineer, 3BA, Ballarat, Vic.
Mathers, A. Continuity Writer and Sporting Commentator, 3TR Sale, Vic.
Matthews, R., Announcer, 4BC, Brisbane.
Maughan, F., Engineer, 3DB, Melbourne.
Maurice, L., Announcer, 2UW, Sydney.
Meacham, F. J., Chairman of Directors, 4IP, Ipswich, Q.
Meakes, R. F., Engineer, 2GB, Sydney.
Meakins, S., Engineer, 2HD, Newcastle, N.S.W.
Meaney, J., Managing Director, 2SM, Sydney.
Merchant, W. J., Announcer, 2XM, Lismore, N.S.W.
Meredith, S., Announcer, 2UE, Sydney.
Middleton, J. H., Director, 2GZ, Central N.S.W.
Miles, G., Engineer, 3AW, Melbourne.
Millar, C. K., Secretary, 2GZ, Central N.S.W.
Millar, R., Chief Announcer, 3DB, Melbourne.
Millar, G., Director and Secretary, 2GB, Sydney.
Millard, H, Announcer, 2SM, Sydney.
Millen, Senator, J. D., Chairman of Directors, 7LA Launceston, Tas.
Miller, Miss C., Announcer, 4WK, Warwick, Q.
Minto, J., Salesman, 2CH, Sydney.
Mitchell, V. F., Director, 4BH, Brisbane and 4MB, Maryborough, Q.
Moller, P., Secretary, 4BU, Bundaberg, Q.
Molyneaux, R., Announcer, 3AW, Melbourne.
Monaghan, V., Engineer, 3HA, Hamilton, Vic.
Moran, C., Engineer, 4BH, Brisbane.
Morgan, S., Managing Director, 3KZ, Melbourne.
Morgan, W. V., Director and Sales Manager, 3KZ, Melbourne.
Morgan, R., Musical Entertainer, 2GB, Sydney.
Morrow, J., Engineer, 2GB, Sydney.
Morton, H., Director, 2GB, Sydney.
Moss, W., Salesman, 2HD, Newcastle, N.S.W.
Murdoch, Sir Keith A., Director, 3DB, Melbourne.
Murray, T. G., Director, 2SM, Sydney.
Murray, J., Announcer, 2UW, Sydney.
Musgrove, M. D'O., Director, 6IX, 6ML, 6WB, Perth.

N

Nestrum, O., Engineer, 5KA, Adelaide.
Neville, J., Announcer, 3BA, Ballarat, Vic.
Nicholas, W. R., Chief Engineer, 7HO, Hobart, Tas
Nicholls, C., Announcer, 3AW, Melbourne.
Nicholls, Miss L., Announcer, 7LA, Launceston, Tas.
Nicholson, D., Announcer, 5DN, Adelaide.
Nicholson, R. M., Manager and Engineer, 4LG, Longreach, Q.
Nilsen, O. V., Director, 3UZ, Melbourne.

COMMERCIAL BROADCASTING PERSONNEL.—(Continued)

Nilsen, O. J., Governing Director, 3UZ, Melbourne.
Nolte, G., Engineer, 3AW, Melbourne.
Noonan, Miss M., Announcer, 2GF, Grafton, N.S.W.
Norgrove, N., Announcer, 2CA, Canberra.
Norton, A. E., Director, 2BH, Broken Hill and 2TM, Tamworth, N.S.W.
Nunn, L., Salesman, 2UE, Sydney.
Nutt, J., Announcer, 2KA, Katoomba, N.S.W.

O

Oakley, R., Engineer, 2HD, Newcastle, N.S.W.
O'Brien, B., Programme Manager and Announcer, 3AK, Melbourne.
O'Hagan, J., Announcer and Salesman, 3AW, Melbourne.
O'Halloran, M., Sales Manager, 5KA, Adelaide.
O'Keefe, A., Announcer, 2GZ, Central N.S.W.
O'Keefe, C., Announcer, 2UE, Sydney.
Oliver, L. M., Managing Director, 2MO, Gunnedah, N.S.W.
Oliver, M. J., Director, 2MO, Gunnedah, N.S.W.
Oliver, Mrs. L. M., Announcer, 2MO, Gunnedah, N.S.W.
O'Neill, M., Director, 2SM, Sydney.
Orloff, Miss N., Announcer and Secretary, 3HS, Horsham, Vic.
Osmond, Miss M., Announcer, 3DB, Melbourne.
O'Sullivan, N., Director, 4BH, Brisbane.

P

Paice, H., Engineer, 3MB, Birchip, Vic.
Paine, D. W., Secretary, 3MB, Birchip, Vic.
Palmer, G. F., Managing Director, 3AK, Melbourne and 7UV Ulverstone, Tas.
Palmer, G., Announcer, 3DB, Melbourne.
Palmer, D., Announcer, 2MO, Gunnedah, N.S.W.
Parish, C., Programme Manager and Chief Engineer, 7BU, Burnie, Tas.
Parker, N. A., Engineer, 6IX, Perth.
Parkinson, W., Director, 4IP, Ipswich, Q.
Pearson, A. H., Director, 3MB, Birchip, Vic.
Peaston, H., Announcer and Technician, 4WK, Warwick, Q.
Penny, W. Langford, Sales Manager and Announcer, 2TM, Tamworth, N.S.W.
Penny, Mrs. Langford, Announcer, 2TM, Tamworth, N.S.W.
Penny, W., Announcer, 2CH, Sydney.
Percy, H., Chief Announcer, 3UZ, Melbourne.
Perry, D., Announcer and Salesman, 2CH, Sydney.
Petters, H. D., Salesman, 2UE, Sydney.
Pfeil, R. Announcer and Salesman, 5RM, Murray Heights, S.A.
Phillips, J., Engineer, 2UW, Sydney.
Phillips, S., General Sports Announcer, 4BC, Brisbane.
Phillips, P., Engineer, 2UW, Sydney.
Phillips, P., Announcer, 2GZ, Central N.S.W.
Pickhover, H., General Manager, 2KO, Newcastle, N.S.W.
Pieremont, N., Engineer, 2UE, Sydney.
Pieremont, R. M., Engineer, 2UE, Sydney.
Pinkerton, H. R., Director, 5DN and Managing Director, 5RM, Adelaide.
Pither, Mrs. H., Announcer, 3HA, Hamilton, Vic.
Potter, F., Engineer, 2TM, Tamworth, N.S.W.
Prentice, J., Announcer, 2UW, Sydney.
Price, E. A., Director, 3DB, Melbourne.
Prince, W., Engineer, 2AD, Armidale, N.S.W.
Proust, J., Announcer, 2GF, Grafton, N.S.W.
Pullman, Mrs. E., Announcer, 5DN, Adelaide.
Purbrick, G. I., Director, 3YB, Warrnambool, Vic.

Q

Queale, W., Chairman of Directors, 5DN and Director 5RM, Adelaide.
Quirk, L. P., Sales Manager, 2SM, Sydney.

R

Reid, Miss M., Announcer, 3KZ, Melbourne.
Rheuben, E. J., General Manager, 4RO, Rockhampton, Q.
Riches, S., Engineer, 3UZ, Melbourne.
Ridley, J. E., Sales & Programme Manager, 2GZ, Central N.S.W.
Robb, F., Programme Manager, 5DN, Adelaide.
Robertson, A., General Manager, 4BK, Brisbane, and 4AK, Oakey, Q.
Roberts, R. F., General Manager, 4BC, Brisbane.
Roberts, R., Announcer, 4BH, Brisbane.
Robinson, W., Assistant Engineer, 2UE, Sydney.
Rosman, E. H., Secretary, 6IX, Perth.
Rowe, E. W., Programme Manager, 2HD, Newcastle, N.S.W.
Russell, A., Musical Entertainer, 2GB, Sydney.
Russell, R. McC., Assistant Manager, 3DB, Melbourne.
Russell, F., Salesman, 3KZ, Melbourne.
Russell, Miss K., Announcer, 4BU, Bundaberg, Q.
Ruston, C. S., Director, 5RM, Murray Heights, S.A.
Rutherford, Miss R., Announcer, 4BC, Brisbane.
Ryan, A. J., Managing Director & Chief Engineer, 2CA, Canberra.
Ryan, J., Chief Engineer, 3AW, Melbourne.
Rycroft, Miss E. G., Advertising Agent, 7HO, Hobart, Tas.
Ryrie, W., Engineer, 5KA, Adelaide.

S

Samuel, B., General Manager, 6IX, 6ML, 6WB, Perth.
Sarah, D., Announcer, 3MA, Mildura, Vic.
Saunders, B. F. B., Programme Manager, 6IX and 6ML, Perth.
Saunders, G., Announcer, 2GB, Sydney.
Sayle, W., Secretary, 2UW, Sydney.
Scales, T., Announcer, 3AW, Melbourne.
Scarlett, H. J., Engineer, 2GZ, Central N.S.W.
Scetrine, B., Announcer, 2CA, Canberra.
Schneider, W. K., Secretary, 5KA, Adelaide.
Schneider, B., Announcer, 2AY, Albury.
Schneider, Mrs. W. K., Announcer, 5KA, Adelaide.
Schmidt, R., Engineer, 3TR, Sale, Vic.

COMMERCIAL BROADCASTING PERSONNEL.—(Continued).

Scholes, N., Announcer & Production Mgr., 2HD, Newcastle, N.S.W.
Schultz, L., Chief Engineer, 2GB, Sydney.
Scott, R. J. H., Engineer, 2GZ, Central N.S.W.
Scott, E., Announcer, 2UW, Sydney.
Searle, C. E., Announcer, 4PM, Port Moresby, Papua.
Seward, —., Director, 2AD, Armidale, N.S.W.
Shaw, R. A., Musical Director, 2UE, Sydney.
Shaw, E., Publicity Manager, 2SM, Sydney.
Shaw, Miss G., Announcer, 2UE, Sydney.
Sheffer, H. M., Director, 2TM, Tamworth, N.S.W.
Shortell, R., Announcer & Chief Engineer, 3WR, Shepparton, Vic.
Shortell, Mrs. T., Announcer, 3WR, Shepparton, Vic.
Sibary, H., Station Manager, 6PR, Perth.
Simmons, H. T., Chief Engineer, 6IX, 6ML, 6WB, Perth.
Simmons, N. W., Managing Director, 6KG, Kalgoorlie, W.A.
Sirl, C., Engineer, 5RM, Murray Heights, S.A.
Sleath, H., Musical Director, 4BC, Brisbane.
Sloman, M. G., Director, 3KZ, Melbourne.
Smith, C. P., Director, 6IX, 6ML, 6WB, Perth.
Smith, S., Engineer, 4BC, Brisbane.
Sommerland, Hon. E. C., Managing Director, 2AD, Armidale, N.S.W.
Sparkes, R. C., Sales Manager, 2HD, Newcastle, N.S.W.
Sparkes, E., Announcer, 2HD, Newcastle, N.S.W.
Spinner, L., Engineer, 2KY, Sydney.
Spitzkowsky, M., Engineer, 2KO, Newcastle, N.S.W.
Stanley, C., Announcer, 2CH, Sydney.
Stapleton, B. B., Salesman, 2SM, Sydney.
Stelling, L., Salesman, 3DB, Melbourne.
Stelzer, Mrs. W. J., Announcer, 2GB, Sydney.
Stephens, K. G., Chief Announcer and Programme Manager, 2KA, Katoomba, N.S.W.
Stevenson, B., Engineer, 2UW, Sydney.
Stevenson, M. H., Chief Engineer, 2UE, Sydney.
Stevenson, C. V., Managing Director, 2UE, Sydney.
Stevenson, N., Studio Manager, 2UE, Sydney.
Stewart, K., Engineer, 2CH, Sydney.
Stirk, F., Engineer, 2GB, Sydney.
Stirk, Miss B., Announcer, 5AD, Adelaide.
Stokes, G., Salesman, 2UE, Sydney.
Stuart, J., Announcer, 3DB, Melbourne.
Sullivan, R., Announcer, 5DN, Adelaide.
Sutherland, G., Director, 3AW, Melbourne.
Sutherland, W., Chief Engineer, 4BC, Brisbane.
Suttor, Miss H., Announcer, 2CH, Sydney.
Sydes, V., Chief Engineer, 7LA, Launceston, Tas.
Syme, G., Director, 3AW, Melbourne.
Syme, J. H. Director, 3AW, Melbourne.

T

Tait, F. S., Director, 3AW, Melbourne.
Tait, J. H., Director, 3AW, Melbourne.
Tait, G. L., Programme Manager, 3AW, Melbourne.
Talbot, H., Statistical Dept., 4BC, Brisbane.
Tapper, J., Engineer, 6ML, Perth.
Tareha, C., Chief Engineer, 5KA, Adelaide.
Taylor, B., Chief Announcer, 2GZ, Central N.S.W.
Taylor, N., Announcer, 6ML, Perth.
Taylor, G., Director, 3DB, Melbourne.
Taylor, C. P. A., Director, 3BA, Ballarat, Vic.
Taylor, J. T., General Manager 3AW, Melbourne.
Thomas, P. V., Secretary, 4WK, Warwick, Q.
Thomas, H. K. R., Engineer, 2GB, Sydney.
Thompson, M., Engineer, 3AW, Melbourne.
Thorn, A., Chief Announcer, 5KA, Adelaide.
Thurling, S., Engineer, 3KZ, Melbourne.
Tonge, A., Engineer, 4BH, Brisbane.
Tonkin, S., Engineer, 2UW, Sydney.
Towner, A. D., General Manager, 7BU, Burnie, Tas.
Tozer, J., Advertising Manager, 6AM, Northam, W.A.
Tredrea, F., Engineer in Charge, 6AM, Northam, W.A.
Trethewie, J., Announcer, 7BU, Burnie, Tas.
Trotman, E. V., Programme Mgr. & Chief Announcer, 3BA, Ballarat, Vic.
Tupper, F., Announcer, 3AW, Melbourne.
Turnbull, Miss I., Announcer, 3DB, Melbourne.
Tuttell, J., Announcer, 2SM, Sydney.

U

Underhill, Miss B., Programme Manager, 5RM, Murray Heights, S.A.
Urquhart, M., Engineer, 6ML, Perth.

V

Vale, L., Engineer, 3MA, Mildura, Vic.
Valli, Miss M., Announcer, 2GB, Sydney.
Van Dyke, J., Salesman, 3KZ, Melbourne.
Varley, Miss G., Announcer, 3AW, Melbourne.
Vaude, C., Announcer, 3DB, Melbourne.
Vautier, Miss D., Announcer, 2GB, Sydney.
Virgona, W., Engineer, 3UZ, Melbourne.
Voigt, R., Announcer, 2KY, Sydney.

W

Walker, E., Announcer, 2KY, Sydney.
Wallis, J. P., Official Accompanist, 4BC, Brisbane.
Walls, Miss J., Secretary, 3HA, Hamilton, Vic.
Walsh, E., Chief Announcer, 2UE, Sydney.
Walters, Miss M., Programme Manager, 4IP, Ipswich, Q.
Ward, J. V. S., Managing Director, 3HS, Horsham, Vic.
Ward, Mrs. A. L., Director, 3HS, Horsham, Vic.
Wardle, T. R., Salesman, 3AW, Melbourne.
Watson, R. D., Engineer, 2GB, Sydney.
Watts, C. F., Salesman, 4BH, Brisbane.
Webber, A., Announcer, 2KO, Newcastle, N.S.W.
Webster, E., Announcer, 4BC, Brisbane.
Weedon, T., Announcer, 4MB, Maryborough, Q.
Welch, E., Announcer, 3DB, Melbourne.
Wells, F., Engineer 5DN, Adelaide.
Wendel, E., Managing Director, 3SH, Swan Hill. Vic.
Whale, N. O., Director, 2KO, Newcastle, N.S.W.
Wharf, H., Announcer, 2MO, Gunnedah, N.S.W.
Wheeler, J. S., Announcer, 2UW, Sydney.
Wheeler, D., Programme Manager, 2CH, Sydney.

COMMERCIAL BROADCASTING PERSONNEL.—(Continued).

Whitcomb, T., Director and Chief Engineer, 2TM, Tamworth, N.S.W.
White, G. N., Director, 5RM, Murray Heights, S.A.
White, D., Secretary, 6AM, Northam, W.A.
White, R. M., Sales Manager, 5DN, Adelaide.
White, S., Engineer, 3AW, Melbourne.
Whitford, A., Director, 6AM, Northam, W.A.
Whitford, F. R., Director, 6AM, Northam, W.A.
Whitmore, J., Programme Manager, 2TM, Tamworth, N.S.W.
Whykes, E. J. W., Sales Manager and Secretary, 3BA, Ballarat, Vic.
Whyte, A. S., Director, 3DB, Melbourne.
Wilcox, J. M., Secretary, 2BH, Broken Hill, N.S.W.
Wilde, R., Announcer, 2HD, Newcastle, N.S.W.
Wilkie, W., Chief Engineer and Announcer, 2KA, Katoomba, N.S.W.
Williams, W., Director and Secretary, 3AK, Melbourne; Director, 7UV, Ulverstone, Tas.
Williams, Miss E., Publicity Officer, 2KY, Sydney.
Wilson, H., Announcer, 3UZ, Melbourne.
Wilson, H. B., Maintenance Engineer, 5AD, Adelaide.
Wilson, W. A., Joint Chief Engineer, 3BA, Ballarat, Vic.
Wilson, G., Announcer, 2CH, Sydney.
Wishart, A. P., Director, 5RM, Murray Heights, S.A.
Witt, F., Assistant Musical Director, 2KY, Sydney.
Wolff, R. H. H., Secretary, 2UE, Sydney.
Wood, I., Announcer, 2HD, Newcastle, N.S.W.
Wood, E. A., 2HD, Newcastle, N.S.W.
Woodhouse, M. B., Announcer, 2KA, Katoomba, N.S.W.
Woodland, C. V., Manager-Announcer, 4BU, Bundaberg, Q.
Woods, J., Announcer, 3YB, Warrnambool, Vic.
Woolley, H. P., Chief Announcer, 5DN, Adelaide.
Worrall, D. T., Manager and Secretary, 3DB, Melbourne.
Wright, Miss I., Announcer, 7LA, Launceston, Tas.
Wynne, A. P., Director and General Manager, 4MB, Maryborough, Q.
Yeldon, R. A., Manager, 2WL, Wollongong, N.S.W.
Young, J. A., General Manager, 5RM, Murray Heights, S.A.
Young, J., Announcer, 5AD, Adelaide.

P.M.G.'s 25th ANNUAL REPORT

For period July 1st, 1934 — June 30th, 1935

THE Annual Report of the Postmaster-General covering period July, 1934 to June, 1935, was not issued until May, 1936.

The report discloses that £114,240 was expended and charged to capital account on behalf of wireless equipment.

It also shows that there was a surplus of £162,343 for the period under consideration, as compared with a surplus of £87,235 for 1933-34. The earnings for 1934-35 were £371,604, an increase of £101,964, or 37.81 per cent. The expenditure, including interest charges was £209,261, an increase of £26,856 or 14.72 per cent.

National Stations

The Report says:—

The construction of the National Broadcasting System is proceeding according to plan, and so far six new regional stations have been brought into service. Five further regional stations are under construction and will be brought into operation at the earliest possible date. In addition, a site has been acquired and a contract for the equipment has been let for the regional station to serve Kalgoorlie, W.A., and surrounding districts.

A new form of transmitting aerial for broadcasting purposes has been invented and developed in the Department's Research Laboratories and will be used in certain of the new broadcasting stations. This form of aerial makes it possible to achieve with masts from 500 to 600 feet in height, results similar to those that could only be obtained with masts of from 800 to 1,000 feet in height.

Commercial Broadcasting Stations

THERE are now 57 commercial broadcasting stations in operation, four additional stations having commenced service during the year. Twenty-one stations are located in the capital cities and 36 in the country areas; the aerial power of the metropolitan stations varies from 100 to 1,000 watts, and the country stations from 50 to 2,000 watts.

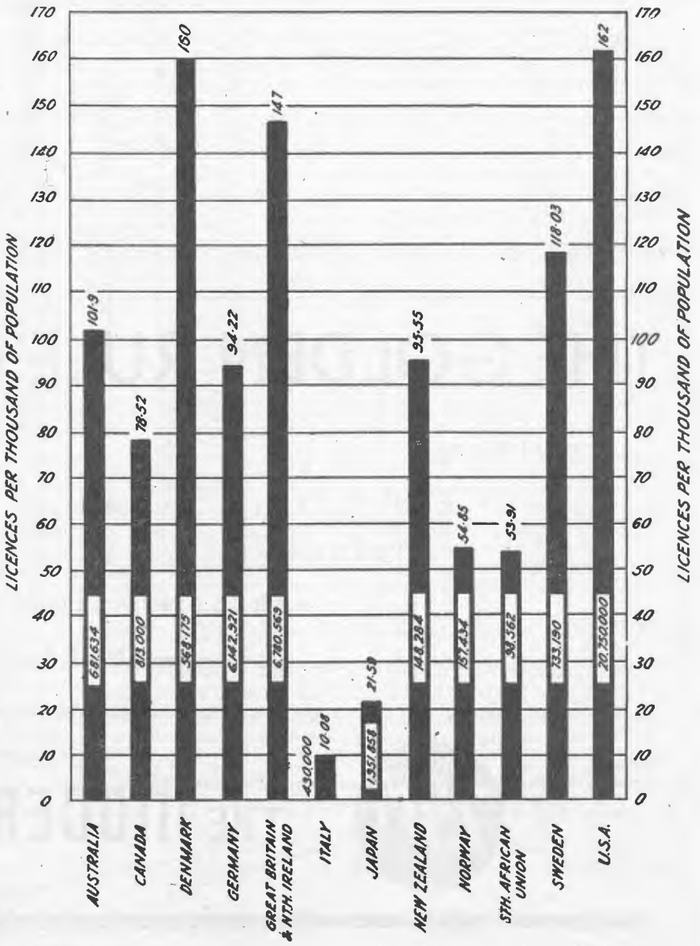
The aggregate weekly programme hours exceeds 3,000.

Licenses have been granted for the establishment of 22 additional stations to be put into operation during the next few months.

Use of Trunk Lines for Broadcasting Purposes

During 1934-35 unprecedented calls were made on the Department by the Australian Broadcasting Commission and licensed broadcasting organisations for the use of trunk line channels to permit programmes to be relayed for simultaneous radiation by two or more stations. This increased demand coincided with a period during which there has been a marked upward trend in normal trunk line business and special measures have been necessary to meet the broadcasting needs.

DENSITY OF LICENSES IN ALL COUNTRIES AT Dec. 31, 1934



NOTES: 1. The figures inset represent the number of licenses in force, the figures at the top of each bar indicating the number of licenses per thousand of population. 2. In the case of U.S.A. the figures indicate the estimated number of receivers in operation, there being no wireless license system in that country.

P.M.G.'s REPORT. —(Cont.)

Telephone trunk line channels are normally designed for two-way telephone speech but when required for broadcasting the characteristics of these circuits must be completely changed to permit of the highest quality transmission in one direction only of both speech and music. To make these circuit changes for each hook-up, expert staff must be provided at several points along the route where the delicate repeater apparatus has to be suitably adjusted and, where control must be exercised at suitable "zone control" stations, experienced technical officers are located.

The Department has put forward exceptional efforts to meet the wishes of broadcasting authorities in the provision of the required facilities, as it realises to the full that the value and interest of broadcasting are enhanced considerably by the concentration of programme resources at convenient points from which the programmes can be transmitted simultaneously to any number of stations desired. Moreover, the frequent linking together of stations in this way is essential if happenings of national interest are to be broadcast to listeners over wide areas in a convenient and economical manner. From this standpoint, the nation-wide telephone system operated by the Post Office, with its associated highly-skilled technical staffs available at almost every town and village throughout the Commonwealth, has contributed very materially to the efficient operation of the broadcasting service and its increasing popularity.

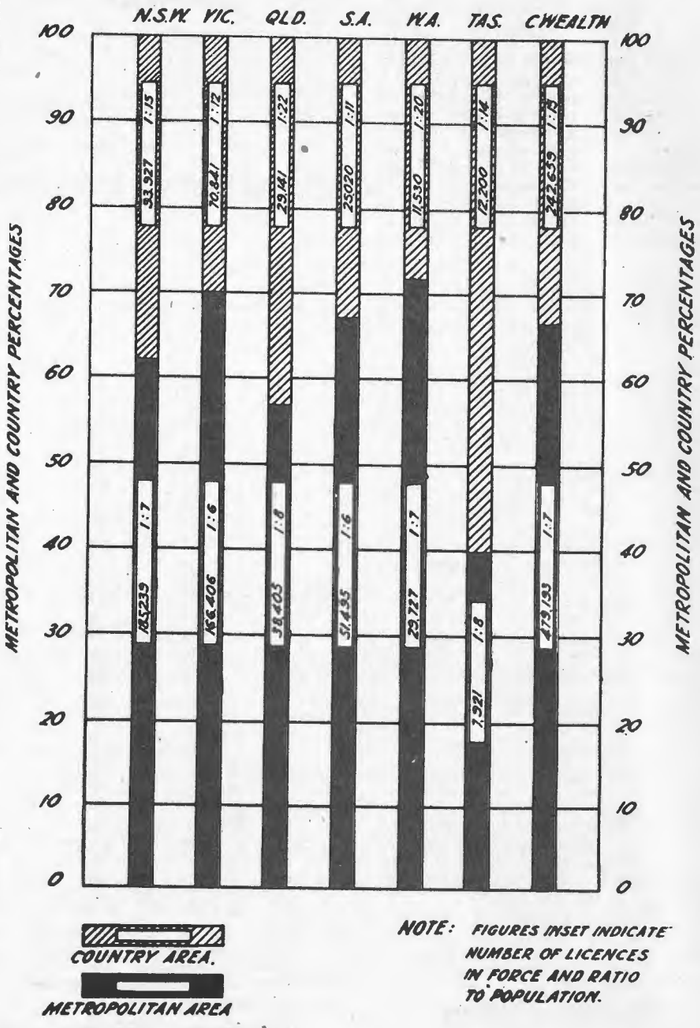
Trunk line channels were used during the year for broadcasting purposes for an aggregate period of 16,654 hours, an increase of nearly 70 per cent. on the corresponding figures for the preceding year. The channels were used on 4,115 occasions by the Australian Broadcasting Commission and on 5,282 occasions on behalf of licensed stations.

The interstate channels were used by the Australian Broadcasting Commission on 2,349 occasions, while licensed stations were provided with 1,336 interstate relays. Of the total relays which took place, 356 extended to five States, 573 to four States, 769 to three States, and 1,987 to two States.

The diversity of the broadcast items relayed over trunk lines is shown by the following statement which relates to National service programmes transmitted over interstate channels during 1934-35—

Item	No. of Relays
Race descriptions	965
Musical programmes	382
Talks and speeches	296
Cricket descriptions	171
News sessions	127
Operas, plays, etc.	119
Overseas programmes	103
Aeroplane flights	48
Sporting descriptions	32
Concerts	20
Miscellaneous items	86
	2,349

Listeners' Licenses in Force in Metropolitan and Country Areas of the Commonwealth at June 30th, 1935



A specific illustration of the vital part played by the Post Office in linking up broadcasting stations by means of the comprehensive trunk line system, and the magnitude of the task involved, was the linking together for a simultaneous broadcast on one occasion during the year of 67 stations scattered throughout the Commonwealth, necessitating the use of approximately 12,000 miles of trunk line channels.

In view of the progressive increase that is taking place in the use of the trunk lines for the transmission of broadcast programmes, the Department has made appropriate provision in connection with the expansion of the long distance system so that service of the highest possible quality will be available when needed.

In designing the submarine cable for connection of the Mainland with Tasmania, provision was made for a high quality broadcast programme channel to enable the interchange of programmes between the two States.

(Continued on next page)

P.M.G.'s REPORT—(Continued)—

Broadcast Listeners' Licenses

Listeners' licenses increased during the year by 122,693 or 21 per cent., compared with 129,682 or 28 per cent. for the previous year; the total for the Commonwealth at 30th June, 1935, being 721,852. This number represents 46 per cent. of the total dwellings. The greatest percentage increase was recorded in Western Australia, where the number of licenses increased by 9,781 or 31 per cent., bringing the total in that State to 41,257, representing 38 per cent. of the dwellings.

The greatest density exists in South Australia (including Northern Territory), where 76,515 homes or 54 per cent. of the total dwellings are equipped with licensed receivers.

The corresponding totals and percentages for the other States, in order of density, are—

Victoria, 237,247 (54 per cent.); New South Wales (inc. F.C.T.), 279,166 (45 per cent.); Tasmania, 20,121 (38 per cent.); Queensland, 67,546 (30 per cent.).

Of the total licenses in the Commonwealth, 66 per cent. are in the metropolitan areas. Published herewith are graphs showing—

(a) the number and percentage of licenses in the metropolitan areas,
(b) the density of listeners' licenses in Australia and other countries.

The fees payable in respect of broadcast listeners' licenses were reduced on 6th August, 1934, as follows—

For Zone 1 (within 250 miles of a station of the National Broadcasting Service), from 24/- to 21/- p.a.

For Zone 2 (territory beyond Zone 1), from 17/6 to 15/- p.a.

Unlicensed Listeners

Prosecutions during the year, in connection with the use of unlicensed broadcast receivers, numbered 2,190, the total amount of fines and costs inflicted totalling £5,190. Up to 30th June, 1935, 10,176 persons were convicted for this offence, the fines and costs aggregating £24,456.

Radio Inductive Interference

During 1934-1935, 7,431 cases of interference were reported for treatment, including 973 cases carried over from the previous year. In 5,000 of these the interference was eliminated as a result of the departmental efforts, while 748 cases were not cleared because of failure to secure co-operation of the responsible party or the existence of causes for which there is yet no economic remedy, etc.

In the course of their investigations, the officers engaged on this useful work travelled more than 50,000 miles and made 8,159 inspections. As a result of the purchase of motor cars and up-to-date equipment for the use of investigating officers, the Department is well equipped for this service to broadcast listeners and is achieving considerable success in diminishing the nuisance.

Proficiency Certificates

During the year, 529 candidates were examined for Operators' Certificates of Proficiency. The number of certificates issued during the year was—

Commercial—	
First Class	37
Second Class	28
Limited—	
Radiotelegraphy	9
Radiotelephony	48
Amateur	175
Total	297

Profit and Loss Account of Wireless Branch—for Year Ended 30th June, 1935

EXPENDITURE	Percentages of Net Income	£ s. d.
Upkeep and Operation of Broadcasting Stations	12.16	45,185 13 7
Upkeep and Operation of Broadcasting Studios	7.36	27,351 4 3
General Supervision and Cost of Issuing Licenses	16.79	62,400 18 3
Telephone Circuits used for Broadcasting and Miscellaneous Expenditure	8.50	31,582 8 0
	44.81	166,520 4 1
Proportion of Administration Expenses	.87	3,217 0 0
Depreciation	5.06	18,809 18 3
Proportion of Superannuation Liability and Pensions	1.33	4,960 0 0
Surplus, exclusive of Interest, carried down	52.07	193,507 2 4
	47.93	178,097 3 3
	100.00	371,604 5 7
Interest and Exchange charges	4.24	15,754 0 0
Surplus, inclusive of Interest, transferred to General Profit and Loss Account	43.69	162,343 3 3
	47.93	178,097 3 3

REVENUE	£ s. d.	Percentage of Net Income	£ s. d.
Gross Revenue	776,653 4 7		
Less—			
Payments to Australian Broadcasting Commission	405,048 19 0		
Net Revenue: License Fees, Fines, etc.		100.00	371,604 5 7
Surplus, exclusive of Interest, brought down		47.93	178,097 3 3

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, 1935, was 280, compared with 234 at the end of the previous year. The comparative figures for the various classes are—

	Number at June 30 1935	June 30 1934
Coast Stations	21	21
Ship Stations	105	100
Aircraft Stations	12	..
Land Stations	67	33
Portable Stations	28	32
Special Stations	47	48
	280	234

The increase in the number of Land Stations (most of which are established in the far outback regions) is indicative of the growing use which is being made of wireless for communication purposes in the remote areas.

(Continued on next page)

P.M.G.'s REPORT.—(Cont.)

Stations in the Mandated Territory of New Guinea at 30th June, 1935, numbered 25.

Experimental Stations increased during the year from 1,170 to 1,319.

The Balance Sheet shows on the liabilities side, wireless fees paid in advance, £406,813/4/6.

On the assets side, fixed assets and plant for wireless equipment is shown at £268,779/6/9.

Profit and Loss

Expenditure — Wireless, £193,507/2/4 (1.36 per cent.); Surplus — Wireless, £178,097/3/3 (1.26 per cent.); Interest and Exchange — Wireless, £15,754 (0.11 per cent.); Surplus after charging interest —Wireless, £162,343/3/3 (1.15 per cent.).

Revenue

Wireless, £371,604/5/7 (2.62 per cent.).

Summary of Depreciation in Profit and Loss (Wireless Branch)

Depreciation of Stores in stock and miscellaneous plant £214
Depreciation reserve £18,596

Depreciation Reserve (Wireless Branch)

N.S.W.: £6,150; Vic.: £1,917; Qld.: £3,319; S.A.: £4,196; W.A.: £1,764; Tas.: £883. Total: £18,229.

DETAILS OF FIXED ASSETS
Wireless Plant

Description	Value on July 1, 1934	Expenditure 1934-35	Gross Value on June 30, 1935	Dismantled Assets Depreciation written off, and Assets Transferred 1934-35	Nett Value on June 30, 1935
	£	£	£	£	£
National Station Equipment	110,531	103,917	214,448	403	214,045
National Studio Equipment	33,768	8,646	42,414	190	42,224
National Miscellaneous Assets	1,283	662	1,945	190	1,755
National Studio Furniture	525	50	575	10	565
Other Broadcasting & Wireless Assets	9,283	965	10,248	58	10,190
Total Wireless Plant	155,390	114,240	269,630	851	268,779

The results of working the Wireless Branch are as follows

State	1934-35 Deficit	1934-35 Surplus	1933-34 Deficit	1933-34 Surplus
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
N.S.W.	..	66,407 14 11	..	36,442 15 2
Victoria	..	74,556 14 9	..	55,427 4 10
Queensland	..	5,983 18 3	5,181 16 10	..
South Australia	..	12,755 6 1	..	3,405 0 1
Western Australia	..	3,064 19 10	683 11 6	..
Tasmania	425 10 7	..	2,174 11 0	..
	425 10 7	162,768 13 10	8,039 19 4	95,275 0 1
Total Net Surplus, 1934-35				£162,343 3 3
Total Net Surplus, 1933-34				£87,235 0 9

Summary of Financial Results —— Wireless Branch

	N.S.W.	Vic.	Q'ld.	S.A.	W.A.	Tas.	Total 1934-35	C'wealth 1933-34
	£	£	£	£	£	£	£	£
Earnings	142,233	127,600	31,838	39,769	19,897	10,267	371,604	269,640
Working Expenses (exclusive of Interest)	70,944	49,742	23,155	24,787	15,222	9,657	193,507	170,711
Earnings compared with Working Expenses—								
Surplus	71,289	77,858	8,683	14,982	4,675	610	178,097	98,929
Deficit	—	—	—	—	—	—	—	—
Interest on Capital including Exchange thereon	4,881	3,301	2,699	2,227	1,610	1,036	15,754	11,694
Result, after providing for Working Expenses and Interest—								
Surplus	66,408	74,557	5,984	12,755	3,065	—	162,343	87,235
Deficit	—	—	—	—	—	426	—	—
Percentage of Working Expenses to Earnings	49.88	38.98	72.73	62.33	76.50	94.06	52.07	63.31

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 are more than two stations involved in the relay or re-broadcast, a split amplifier has to be utilised, and the Department's charge for the station utilising the split amplifier is 2/6 for 5 minutes, with a minimum of 10/- and a maximum of 20/-. The Department usually charges the station originating the broadcast, and leaves it to that station to make is own charges to the other stations.

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

Technical Description of Transmitter and Studio Equipment of some Commercial Stations

The following information, supplied by the respective stations, does not by any means represent an adequate technical description of all the commercial stations in Australia. Many stations are apparently too modest, others apparently too apathetic, to supply the data requested. Nevertheless, it will serve as an indication of what was wanted, and it is to be hoped that the next year's "Year Book" will be more representative.

2AD ARMIDALE

Standard 100 watt, made by Standard Telephones & Cables Ltd., Sydney. 100 watts in aerial, 100% modulated. T type aerial, length 120ft., height 120ft.

2AY ALBURY

5 stage A.W.A. transmitter, crystal control, Heising modulation. Operator's control desk fader system, 6 stage audio channel, turn tables—78 and 33 1-3 R.P.M. Facilities for outside broadcasts through 6 permanent lines to various points in the town, viz., Town Hall, Plaza Theatre, Ritz Ballroom, St. Patrick's Hall, Wool Exchange Building, Town Studio.

2CA CANBERRA, F.C.T.

Heat controlled crystal oscillator, two buffer amplifiers, modulated amplifier, two linear amplifiers, 3 stage mixer and speech amplifier, remote equipment. 500 watts in aerial.

2CH SYDNEY

High fidelity A.W.A. transmitter and studio equipment. Aerial power, 1,000 watts. One of the leading stations in Australia.

2GF GRAFTON

The transmitter and studio are housed under same roof, at 118 Turf Street, Grafton. The studio is 21 x 24 feet, furnished in tonings of brown with Masonite walls and felt floor. The 8A Western Electric studio amplifier is situated beside the announcer's desk.

The control room adjoins the studio and is about 12 x 12 feet in dimension, and is in the same colourings as the studio. The control room houses the new A.W.A. Frequency Control equipment, which comprises two separate crystal units, complete with oscillators, buffer amplifiers and heaters. Also a type C transmitter and studio power supply and charging back. The power of the station is 100 watts in the aerial, and the transmitter incorporates Series Modulation.

The aerial system consists of two tubular 160ft. steel masts, 485ft. apart. The aerial is half wave vertical Marconi, which is coupled to the transmitter with an untuned transmission line of about 75ft. This aerial system also incorporates a reflector which acts as a shield to the radio waves radiating in a N.E. direction.

2GN GOULBURN

200 watt transmitter, and studio equipment A.W.A. throughout.

2GZ CENTRAL N.S.W.

Transmitter: Aerial power 2 k.w.; series modulation; crystal control; cathode-ray and aural monitoring. Aerial is of half-wave neutralised-top type supported by two 180ft. insulated masts.

Studio Equipment: Velocity and dynamic microphones, usual turntable, mixing and monitoring equipment.

2HD NEWCASTLE

The 2HD transmitter supplies 500 watts unmodulated power to a quarter wave Marconi antenna and is capable of modulating this carrier 100%. The carrier frequency is controlled by precision frequency control equipment manufactured by A.W.A. This equipment consists of duplicate crystal oscillator and buffer amplifier units. Since September 1 a rigid frequency monitoring schedule has been on operation and the greatest deviation over that period has been five cycles. Frequency stability during modulation is further ensured by use of two screen grid buffer amplifiers in addition to the buffer amplifier incorporated in the A.W.A. equipment. Heising modulation is used, the modulated amplifier being a 250 watt tube, modulated by one 500 watt tube. The power amplifier consists of two 600 watt air cooled tubes. All stages of this transmitter are individually shielded. The two main power supplies are three phase mercury vapour rectifiers. Grid bias voltages are supplied by a three phase full wave mercury vapour rectifier. Filament current for all tubes in the transmitter is provided by a special three phase full wave mercury vapour rectifier of 100 amp. capacity. Studio equipment consists of two of the latest type velocity microphones for general use. Crystal and condenser microphones are in use for various purposes. The pick-ups are R.C.A. transcription pick-ups of latest type, and turntables are arranged for either 78 r.p.m. or 33 1-3 r.p.m. recordings. All programmes are controlled and fed to the speech input equipment by means of a special ten channel mixer which provides for audition of programmes to proceed while the current programme is on the air. Two studios are in use, while an additional studio is in course of construction in Newcastle City. Listening facilities are afforded by means of loud speakers in all offices and audition rooms fed from a central system.

TECHNICAL DESCRIPTION OF SOME COMMERCIAL STATIONS.—(Continued).

2KA KATOOMBA

Transmitter 100 watt crystal controlled, 4 stages. Studio latest type G.E., two speed motors, Marconiphone pick-ups, mixing panel on announcer's desk, with incoming and outgoing lines. Modern appointments in furnishings and decoration. Grand piano.

2KO NEWCASTLE

Transmitter is crystal and temperature controlled. Uses water cooled valves, supplies 500 watts of fully modulated power to the antenna but is capable of doubling that power without overload. Uses crystal oscillator, three buffer amplifier stages. Modulated amplifier and linear amplifier. Studio equipment consists of complete control room installation, two record turntables in each studio. Equipped for 33 1-3 rev. transcriptions, fully equalising equipment for relayed programmes. Response overall, including transmitter, is flat from 45 to 9,000 cycles.

2SM SYDNEY

Transmitter: 2 k.w. A.W.A.; series modulated; crystal-controlled. Uses half-wave vertical radiator located at Pennant Hills, N.S.W., on ground 375 feet above sea level. Considered a very efficient station.

Studio Equipment: High-fidelity amplifier system, installed by A.W.A. Velocity microphones. Two-speed turntables. Cathode-ray monitoring system used. Provision for mixing eight channels. All equipment A.C. operated with provision for operation from independent power supply.

2TM TAMWORTH

The transmitter has 50 watts in the aerial, capable of being fully modulated with reasonably high fidelity. Studio equipment consists of four turntables and four separate microphone channels. Control board and amplifiers for receiving and relaying programmes to and from outside points. (New 2000 watt transmitter being planned.)

2UW SYDNEY

No. 1: 2 k.w. A.W.A. transmitter. Primary power supply 3 phase. A.C., 415-240 volts—50 cycle, from motor alternator driven by 480 volts D.C. Twin crystal controlled to 10 cycles. 100% modulation monitored by oscillograph.

No. 2: Transmitter manufactured by C.B.C. Ltd. Capacity 750 watts in aerial. Primary power supply from D.C. motor generators for both H.T. and L.T. driven by 480 volts D.C. Crystal controlled 50 cycles —80% modulation, monitored by oscillograph.

Studio equipment supplied by A.W.A., includes electro-dynamic pick-ups, velocity and Reiss microphones, two five channel mixer panels, 108 point patching board, recording apparatus and beat-frequency oscillator. A four channel "OB" amplifier is also used, together with the "'Wandaphone" portable transmitter. All equipment is A.C. operated. Station is operated for 24 hours every day of the year.

3AK MELBOURNE

Transmitter is crystal controlled, giving 100% modulation, three stages, crystal oscillator, buffer and class C modulated final amplifier. Needle armature type pickups and piezo microphones are used in the studio. Separate pre-amplifier on each mike, which with pick-ups are fed through the usual mixing arrangements to the main speech amplifier of three stages using 42 in push-pull as triodes in final stage, the output of which is fed through landline to transmitter situated seven miles away.

3BA BALLARAT

Complete transmitter is of modern design and has just been put into service. Is of low power modulation type and employs a 1 k.w. water cooled valve as final amplifier. For frequency control two Bliley 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 value in push pull should power requirements demand it. A vertical steel tube radiator 195 feet high is used as slightly over one quarter wave length antenna and is coupled to the transmitter by transmission line 200 feet long. A circular pattern 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 pick-ups. Each studio has two turntables and announcers' switching panel on desk. Two other turntables for 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—one contains the incoming and outgoing lines, telephone equipment, two six key attenuators, and line monitoring speaker. The second bay includes low level equipment such as pre amplifiers, four channel mixing panel, patching panel, control switches and signal lights, and relays. The third bay contains the high level emplifiers including main studio amplifier, two channel bridging amplifier, decibel meter, and radio or audio monitoring panel. Power supplies for the amplifiers are mounted on the fourth bay. In the control room is also a complete 50 watt transmitter in readiness as a standby plant.

3BO BENDIGO

The transmitter uses low power Heising modulation, and is capable of 100% modulation. A class B linear amplifier is used as the final stage to bring the unmodulated carrier power up to the licenses rating of 200 watts. 3BO last August installed the latest A.W.A. frequency control rack, which keeps the frequency stable within 10 cycles. The latest velocity microphone equipment is used. The transmitting and studio amplifying equipment was all designed and built by A.W.A. and possesses remarkably fine audio frequency characteristics.

3DB MELBOURNE

Transmitter: 600 watt. Low power class A push-pull modulation. Located at the Melbourne "Herald," where large and modern studios and an up-to-date transmitter permits of excellent broadcasts.

TECHNICAL DESCRIPTION OF SOME COMMERCIAL STATIONS—(Cont.)

3HA HAMILTON

Built by A.W.A. throughout. 300 watts.

3HS HORSHAM

Crystal controlled. Heising system of modulation on power amplifier. 50 watts.

3MA MILDURA

Four stage crystal control with high power modulation. Two turntables for 78 r.p.m., one for 33 1-3 transcriptions. 3 Riess, 1 ribbon microphone. 100 watts.

3MB BIRCHIP

Thermostatic crystal control with "B" class high power modulation. Philips valves are used throughout. Crystal microphones and B.T.H. pick-ups, with dual-speed motors, 33 1-3 and 78 r.p.m. 100 watts.

3SH SWAN HILL

The transmitter uses the TC 1/75 type tube as a final R.F. amplifier to obtain an output of 100 watts. This is modulated by two MC 1/50's, operated in class AB, which have a total output of over 100 watts audio frequency if driven. A penthode crystal oscillator is used to drive two buffer stages before the final modulated amplifier. This transmitter has only been in operation since 21st January, 1936. The aerial used is an Umbrella type, 120 feet high, in conjunction with a counterpoise. The station consists of the studio, lined with celotex, 18ft. x 30ft., a transmitter and control room, and a reception room. The office is separate, being situated right in the town of Swan Hill. The studio equipment consists of the usual two turntables for gramo-pick-ups, and a condenser microphone for speech and general studio broadcasts. Two Philips carbon microphones are used on occasions.

3TR GIPPSLAND

Transmitter crystal controlled. Three buffer stages and power amplifier, audio section is push-pull throughout. High power Class B modulation. Amplifier up to high fidelity standard. Six channel electronic mixer on announcer's table. 20 channel panel for lines from exchange and local churches and halls. Two B.T.H. pick-ups and turntables at 78 r.p.m. speed. One Wintle 33 1-3 r.p.m. turntable at Myrtlebank. 500 watts in aerial.

3UZ MELBOURNE

The whole of the transmitting equipment, studios, etc., are located in the one building at 45-47 Bourke Street (near Spring Street), at one of the highest points in the City of Melbourne. Three phase high tension power supply is used for the transmitter which embodies air-cooled valves. The most modern ideas in audio panels enables great flexibility in handling relays inwards or outwards, with special attention being provided for reproducers mixing panel and elaborate speaker system throughout the executive offices and studios. All vulnerable parts of the transmitter, such as the Mullard modulating tube, final stage, etc., are duplicated in the panels, and the spare part is so wired into the circuit that it can be brought into operation in a matter of seconds, merely by throwing a switch. In addition a special complete stand-by transmitter of 300 watts, together with small studio, etc., is located at Oliver J. Nilsen & Co.'s workshop in Fitzroy, approximately one mile from the transmitter proper.

4AY AYR

4 stage crystal controlled transmitter by Colville Wireless Equipment Co., 2-speed turntables. Brush-crystal and Reisz microphones, cathode-ray oscilloscope, etc. 300 watts in aerial.

4BC BRISBANE

A.W.A. standard equipment. Aerial power 1,000 watts.

4BU BUNDABERG

The transmitter, arranged in four panels, has been designed for 200 watts, but at present only half this power is being used. In the first panel is the power supply, the input to which is taken from the town 3-phase supply. The R.F. portion is a four-stage crystal transmitter, using a T.C. 2/250 in the final amplifier. Heising modulation by two M.C. 2/200 in push-pull. The aerial is a vertical mast, 160 feet high. A cathode-ray oscilloscope is used for checking. The studio equipment consists of two Reisz microphones and one velocity is used for outside broadcasts.

4CA CAIRNS

A.W.A. standard equipment. 100 watts.

4IP IPSWICH

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 TC 1/75 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 an aperiodic 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

TECHNICAL DESCRIPTION OF SOME COMMERCIAL STATIONS—(Cont.)

third uses four mercury-vapour 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 supplies. 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-Astatic crystal pick-ups, two G.E. two-speed gramo-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.

4LG LONGREACH

S.T.C. transmitter. 300 watts.

4MB MARYBOROUGH

Transmitter: Crystal oscillator stage with temperature controlled A.T. crystal, two pentode buffer stages, low level modulated amplifier, 100 watt linear output stage.

Studio: Two carbon microphones, 2 twin speed (33 1-3 and 78 r.p.m.) A.C. turntables, low impedance fader panel, A.C. operated studio amplifier with push-pull output stage.

4PM PORT MORESBY

A.W.A. standard transmitter, and standard A.W.A. studio equipment. 100 watts.

4TO TOWNSVILLE

A.W.A. standard unit low power modualtion. Studio fitted turntables, 33 1-3 and 78, all facilities for production of radio plays, equipped player piano and organ. 200 watts.

4VL CHARLEVILLE

Transmitter is a modern 3-stage crystal controlled set input 100 watts input using high level modulation by 4-250's in parallel push-pull Class AB. As the town supply is D.C. the station utilizes a 3 h.p. D.C. motor driving a 1¼ alternator for power supply.

The studio is furnished with a radio for monitor, piano, announcer's desk, table and four easy chairs. The announcer's table comprises turntables, control panel, and 'phone. A private line is installed from the exchange for use of relays. Crystal mikes and pickups are used throughout for high fidelity. 50 watts in aerial.

4WK WARWICK

Transmitter 50 watt, A.W.A. manufactured, series modulated with linear characteristic over apparatus of 90%. Latest type table control in studio, instrument panel and faders in front of announcer, automatic cut out monitoring speaker, also remote control tuning of receiver.

5KA ADELAIDE

The microphones consist of a combination of the crystal and velocity type, ensuring fidelity of reproduction of all types of programmes under any condition.

Two stages of resistance coupled amplification is used in all the mike preamplifiers and the power switches are operated by the control operator from the transmitter room. "Audak" pick-ups are used in the "Sunshine Studio," and the Western Electric Oil-damped type in the "Melody Studio," and both lines are equalized to give a frequency response within 2 D B's from 30 to 6,000 cycles with a sharp cut off at 6,000. The faders used for mixing the programmes are of the 600 ohms constant impedance type and the output of the mixer controlled by a constant impedance master fader. To keep frequency distortion down to a minimum the three stages of the speech amplifiers are all-resistance coupled and the final is a power tube with an undistorted output sufficient to drive the 400 watt modulator to full power for 100% modulation. A.W.A. frequency control equipment. To completely isolate the crystal stage from the modulated amplifier, there are three R.F. buffer stages, the first a 42 driving a 210 which in turn drives an MC 1/50 with a TB 2/250 acting as modulated amplifier. A D.C. generator supplies filament current to R.F. stages and modulator, and a three phase metal rectifier used for supplying filament current to speech amplifiers. The plate supply for the last stage and modulator is obtained from three hot cathode mercury vapour tubes 872 A in a 3 phase circuit and the voltage is varied by means of an inductor regulator. Plate supply for intermediate R.F. stages from two 866 A's connected in single phase full wave circuit, and metal rectifiers with single phase full wave rectification. The licensed power input is 900 watts and this is obtained by using two Philips MA 4/600 air-cooled tubes in parallel, and the output inductively coupled to radiating system. Two 100ft. masts on top of Richards Buildings support the inverted L type aerial.

7UV ULVERSTONE

All A.C. in operation, crystal controlled, giving 100 per cent. modulation, and uses two linear R.F. stages following modulators. Unmodulated aerial power 300 watts. Frequency 1460 K.C. Location, Gawler, Tasmania. Studio located at Town Hall Chambers, Ulverstone, fitted with several microphones and turntables, also comprehensive record rack. Control panel enables simultaneous mixing of several different inputs.

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.

Acoustic 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 of a 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, "ω", or a small Greek rho "ρ."

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."

DICTIONARY OF RADIO DEFINITIONS.—

(Continued from page 141)

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 micro-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, anti-noise." A muting system arranged to suppress noise during breaks in carrier. Specially developed for communications services.

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, capacitative, 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.

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, and having a specific inductive capacity usually greater than unity.

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.

Facsimile Transmission. The electrical transmission of a graphic record having a limited number of shade values.

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 as 10,000 Gauss.

DICTIONARY OF RADIO DEFINITIONS.—

(Continued from page 142)

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.

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.

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 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.

Kilocycles 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 wave-length 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," so that flux density (B) in magnetic material will be μ H lines per sq. cm. (where "μ" is the permeability of the material).

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 a small change in plate current to the small 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.

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 large 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 definitions of all terms used in cathode-ray oscillograph operation).

DICTIONARY OF RADIO DEFINITIONS.—

(Continued from page 143)

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 values.

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 loud-speaker 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 the interference of 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 the 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.

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 feed-back. 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.

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 focussing 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.

Static. See atmospherics.

Strays. Electro-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.

DICTIONARY OF RADIO DEFINITIONS.—

(Continued from page 194)

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.

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.

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.

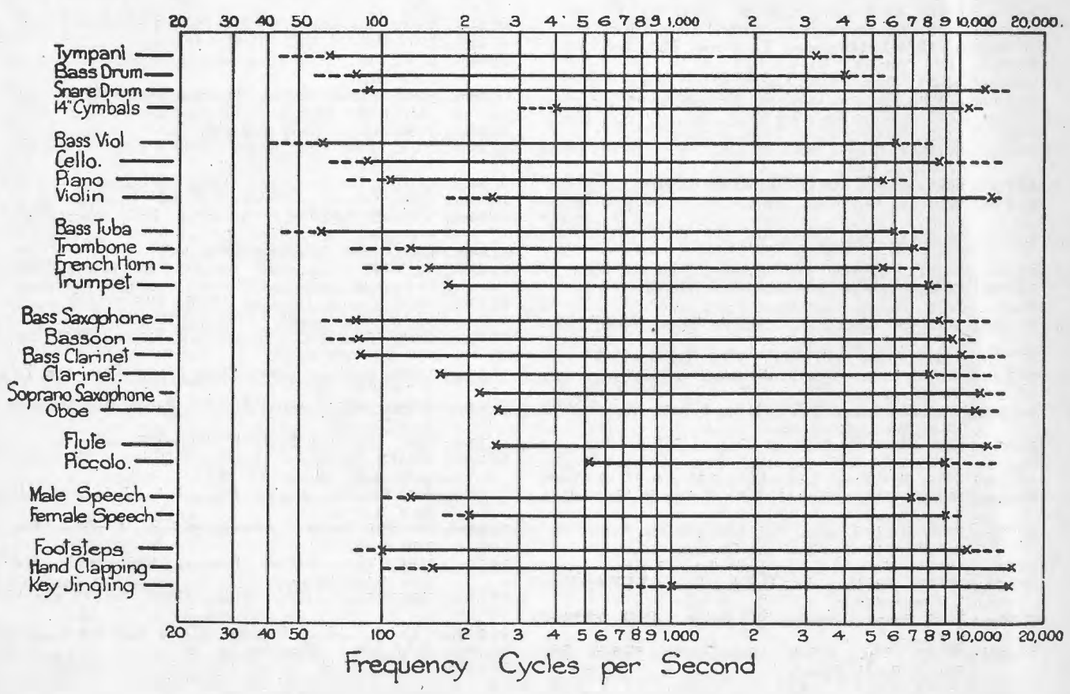
Wattage, Dissipation, Anode. The difference between input and output wattages in the plate circuit of a valve, the maximum permissible figure usually being stated by the manufacturer.

Wave Form. The shape of a curve representing an alternating current.

Wave-length. The distance between two successive peaks in any periodic wave-train.

FREQUENCY SPECTRA

The diagram shown below will be of interest of all acoustic engineers as it shows the full range of frequencies which must be reproduced for complete recognition of the various musical instruments.



SHORT WAVE RECEPTION

List of Stations

It should not be thought that all the stations listed in the accompanying list will always be audible in Australia. It is only during periods of good conditions that it will be possible to hear the majority of them, and during the periods of bad conditions which are bound to occur it is sometimes impossible to hear with good strength more than three or four stations transmitting speech. In addition to the stations listed, numerous amateur 'phone stations in Australia and New Zealand can be heard between 71 and 82 metres (4000-3500 k.c.) at night, particularly in the winter months. In addition, on some evenings and during the week-ends, amateur 'phones may be heard on the so-called 40-metre band (41-42.8 metres, 7300-7000 k.c.). The third popular amateur band runs from 20.83 to 21.43 metres (14,400-14,000 k.c.), but is mainly used for Morse Code work.

Short Wave Broadcasting Bands

IT should be particularly noted that there are definite frequencies around which the short wave broadcasters are located. These are:—

16,000 k.c.	....	19 metres
12,000 „	....	25 „
9,500 „	....	31 „
6,000 „	....	49 „
4,300 „	....	70 „

Standard Times

Referred to Greenwich Time

Great Britain, France, Portugal, Belgium, Spain, Ireland	Greenwich time.
Austria, Denmark, Germany, Italy, Norway, Switzerland	1 hour fast.
British South Africa, Egypt, Turkey	1½ or 2 hours fast.
Japan	9 hours fast.
Australia	8, 9½ or 10 hours fast.
New Zealand	11½ hours fast.
Canada and United States	4, 5, 6, 7 or 8 hours slow.

Short Wave Stations

Wave length and operating times of major overseas stations audible in Australia. All times given are Eastern Australian Standard Time.

75.00m.; CT2AJ, Azores. Thurs. and Sun. 8-10 a.m.
70.2 m.; RV15, Khabarovsk, U.S.S.R. Daily 6-11.15 p.m.
67.11m.; YDB, Sourabaya, Java. Daily 1.30-4.30 p.m.
51.28m.; YV5RMO, Maracaibo, Venezuela. Daily 8-10 a.m.
50.27m.; HVJ, Vatican. Daily 5-5.30 a.m.
50.00m.; XEBT, Mexico City, Mexico. Daily 10 a.m.-7 p.m.
50.00m.; RW59, Moscow, U.S.S.R. Daily 6-9 a.m.
49.83m.; DJC, Berlin. Daily 3-8 a.m.
49.83m.; CQN, Macao, China. Daily, evenings.
49.67m.; W1XAL, Boston, Mass., U.S.A. Sun. 8-10 a.m., Wed. Fri. 10-12 a.m.
49.59m.; GSA, Empire Station, Daventry, England.
49.5 m.; W8XAL, Cincinnati, Ohio, U.S.A. Daily 10 p.m.-4 a.m.
49.5 m.; W3XAU, Philadelphia, Pa., U.S.A. Relays WCAU. Daily 11 a.m.-3 p.m.
49.5 m.; VQ7LO, Nairobi, Kenya, Africa. Daily 1-6 a.m.
49.42m.; OER2, Vienna, Austria. Daily midnight- 8 a.m.
49.35m.; DJM, Zeesen, Germany.
49.33m.; W9XAA, Chicago, Ill., U.S.A. Relays WCLF, Mon. 5-7 a.m.
49.3 m.; 12RO, Rome, Italy. Mon., Wed., Fri. 9 a.m.-3 p.m.
49.2 m.; ZTJ, Johannesburg, South Africa. Daily.
49.18m.; W9XF, Chicago, Ill., U.S.A. Daily 7 a.m.-5 p.m.
49.18m.; W3XAL, Bound Brook, N.Y., U.S.A. Relays WJZ. Mon., Wed., Sat. 8-9 a.m.
49.10m.; GSL, Daventry, England. Empire Broadcasting.
49.10m.; VUC, Calcutta, India. Daily from 10.30 p.m.
49.02m.; YDA, Bandoeng, Java. Daily 8.30 p.m. to 12.40 a.m.
49.02m.; W2XE, Wayne, N.J., U.S.A. Relays WABC. Daily 1-2 p.m.
48.92m.; ZGE, Kuala Lumpur, Fed. Malay State. Sun., Tues., Fri., 9.40-11.40 p.m.
48.92m.; COCD, Havana, Cuba. Daily 9 a.m.-3 p.m.
48.86m.; W8XK, Pittsburg, Pa., U.S.A. Relays KDKA. Daily 7.30 a.m.-4 p.m.
47.50m.; HIZ, Santo Domingo, W. Indies. Daily 7.45-8.45 a.m.
46.69m.; W3XL, N.J., U.S.A. Experimental Service from Bound Brook Station.
46.52m.; HJ1ABB, Barranquilla, Colombia. Daily 7.30 a.m.-1.30 p.m.
45.38m.; RV72, Mancow, U.S.S.R. Daily 3 a.m.-8 a.m.
44.44m.; JPT, Nazaki, Japan. Daily 5-10 p.m.
42.86m. to 41.10m.; Band of wavelengths allotted to amateur transmitters.
38.48m.; HBP, Radio Nations, Prangins, Switzerland. Sun. only 8.30-9.30 a.m.
38.07m.; JVR, Japan. Daily 6-10 p.m.
34.29m.; ZCK, Hong Kong, China. Daily 8 p.m. to midnight. Relays ZBW.
31.8m.; COCH, Havana, Cuba. Daily from 2 a.m.
31.55m.; GSB, Daventry, England. Empire broadcasting.
31.54m.; VK3ME, Melbourne, Australia. Daily except Sun., 8-10 p.m.
31.48m.; LKJ1, Jeloy, Norway. Relays Oslo. Daily 8-11 p.m.
31.48m.; W2XAF, Schenectady, N.Y., U.S.A. Relays WGY. Daily 7.40 a.m.-noon.
31.45m.; DJN, Zeesen, Germany. Daily 6.35-10.15 p.m., 11 p.m.-2.30 a.m. and 8.15 a.m.-1.30 p.m.
31.38m.; DJA, Zeesen, Germany. Daily 11 p.m.-2.30 a.m. and 8.30 a.m.-noon.
31.36m.; VUB, Bombay, India. Daily except Tues. and Fri. 10.30-11.30 p.m.
31.35m.; W1XK, Millis, Mass., U.S.A. Relays WBZ. Daily from 10 p.m.
31.32m.; GSC, Daventry, England. Empire Broadcasting.
31.32m.; VK3LR, Lyndhurst, Australia. Daily ex. Sun. 6.15-10.30 p.m.
31.28m.; W3XAU, Philadelphia, Pa., U.S.A. Relays WCAU. Daily 3-10 a.m.
31.28m.; VK2ME, Sydney, Australia. Sun., 4 p.m.—Mon., 2.30 a.m.
31.27m.; HBL, Radio Nations, Prangins, Switzerland. Sun. only, 8.30-9.30 a.m.
31.13m.; I2RO, Rome, Italy. Tues., Thurs., Sat., 8 a.m.-10 a.m.
31.09m.; CT1AA, Lisbon, Portugal. Daily 6.30-9 a.m.
30.49m.; JYM, Japan. Irregular.
30.43m.; EAQ, Madrid, Spain. Daily, 8.15 a.m.-midday.

(Continued on page 148)

WORLD TIME CHART

Hawaiian Islands	U.S.A. Pacific S.T.	U.S.A. Mountain S.T.	U.S.A. Central S.T.	U.S.A. New York, Washington E.S.T.	Halifax, Buenos Aires	Rio de Janiero, Brazil	London, Paris, Madrid	G.M.T. or G.C.T.	Sweden, Germany, Switzerland, Italy	Petrograd, Constantinople, Capetown	Bagdad, Persia	India	Borneo, Java, Dutch E.I.	P.I., China, Western Australia	Tokyo	Adelaide, South Aust	Sydney, Melbourne, Eastern Aust.	New Zealand	Samoa
1.30	4.00	5.00	6.00	7.00	8.00	9.00	Midn.	0000	1.00	2.00	3.00	5.00	6.00	8.00	9.00	9.30	10.00	11.30	Noon
2.30	5.00	6.00	7.00	8.00	9.00	10.00	1.00	0100	2.00	3.00	4.00	6.00	7.00	9.00	10.00	10.30	11.00	12.30	1.00
3.30	6.00	7.00	8.00	9.00	10.00	11.00	2.00	0200	3.00	4.00	5.00	7.00	8.00	10.00	11.00	11.30	Midn.	1.30	2.00
4.30	7.00	8.00	9.00	10.00	11.00	Midn.	3.00	0300	4.00	5.00	6.00	8.00	9.00	11.00	Midn.	12.30	1.00	2.30	3.00
5.30	8.00	9.00	10.00	11.00	Midn.	1.00	4.00	0400	5.00	6.00	7.00	9.00	10.00	12.00	1.00	1.30	2.00	2.30	3.00
6.30	9.00	10.00	11.00	Midn.	1.00	2.00	5.00	0500	6.00	7.00	8.00	10.00	11.00	1.00	2.00	2.30	3.00	3.30	4.00
7.30	10.00	11.00	Midn.	1.00	2.00	3.00	6.00	0600	7.00	8.00	9.00	11.00	Midn.	2.00	3.00	3.30	4.00	4.30	5.00
8.30	11.00	Midn.	1.00	2.00	3.00	4.00	7.00	0700	8.00	9.00	10.00	Midn.	1.00	3.00	4.00	4.30	5.00	5.30	6.00
9.30	Midn.	1.00	2.00	3.00	4.00	5.00	8.00	0800	9.00	10.00	11.00	1.00	2.00	4.00	5.00	5.30	6.00	6.30	7.00
10.30	1.00	2.00	3.00	4.00	5.00	6.00	9.00	0900	10.00	11.00	Midn.	1.00	2.00	5.00	6.00	6.30	7.00	7.30	8.00
11.30	2.00	3.00	4.00	5.00	6.00	7.00	10.00	1000	11.00	Midn.	1.00	2.00	3.00	6.00	7.00	7.30	8.00	8.30	9.00
12.30	3.00	4.00	5.00	6.00	7.00	8.00	11.00	1100	Midn.	1.00	2.00	3.00	4.00	7.00	8.00	8.30	9.00	9.30	10.00
1.30	4.00	5.00	6.00	7.00	8.00	9.00	Noon	1200	1.00	2.00	3.00	4.00	5.00	8.00	9.00	9.30	10.00	10.30	11.00
2.30	5.00	6.00	7.00	8.00	9.00	10.00	1.00	1300	2.00	3.00	4.00	5.00	6.00	9.00	10.00	10.30	11.00	11.30	Midn.
3.30	6.00	7.00	8.00	9.00	10.00	11.00	2.00	1400	3.00	4.00	5.00	6.00	7.00	10.00	11.00	11.30	Midn.	12.30	1.00
4.30	7.00	8.00	9.00	10.00	11.00	Noon	3.00	1500	4.00	5.00	6.00	7.00	8.00	11.00	Midn.	12.30	1.00	1.30	2.00
5.30	8.00	9.00	10.00	11.00	Noon	1.00	4.00	1600	5.00	6.00	7.00	8.00	9.00	Midn.	1.00	1.30	2.00	2.30	3.00
6.30	9.00	10.00	11.00	Noon	1.00	2.00	5.00	1700	6.00	7.00	8.00	9.00	10.00	1.00	2.00	2.30	3.00	3.30	4.00
7.30	10.00	11.00	Noon	1.00	2.00	3.00	6.00	1800	7.00	8.00	9.00	10.00	11.00	2.00	3.00	3.30	4.00	4.30	5.00
8.30	11.00	Noon	1.00	2.00	3.00	4.00	7.00	1900	8.00	9.00	10.00	11.00	Midn.	3.00	4.00	4.30	5.00	5.30	6.00
9.30	Noon	1.00	2.00	3.00	4.00	5.00	8.00	2000	9.00	10.00	11.00	Midn.	1.00	4.00	5.00	5.30	6.00	6.30	7.00
10.30	1.00	2.00	3.00	4.00	5.00	6.00	9.00	2100	10.00	11.00	Midn.	1.00	2.00	5.00	6.00	6.30	7.00	7.30	8.00
11.30	2.00	3.00	4.00	5.00	6.00	7.00	10.00	2200	11.00	Midn.	1.00	3.00	4.00	6.00	7.00	7.30	8.00	8.30	9.00
12.30	3.00	4.00	5.00	6.00	7.00	8.00	11.00	2300	Midn.	1.00	2.00	4.00	5.00	7.00	8.00	8.30	9.00	9.30	10.00

NOTE.—Crossing the midnight line from dark to light area and vice versa.—Crossing from LEFT to RIGHT indicates following day. Crossing from RIGHT to LEFT indicates preceding day.

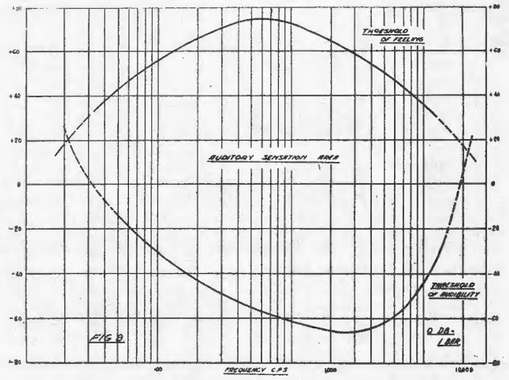
E.g.—Wednesday 2 p.m. in Sydney is Tuesday 11 p.m. in New York. Wednesday 11 p.m. in Sydney is Thursday 12.30 a.m. in Auckland. Wednesday 11 p.m. in Sydney is Wednesday 2.30 a.m. in Honolulu. Thursday 12.30 a.m. in Auckland. Wednesday 11 p.m. in Sydney is Thursday 3 a.m. in Samoa.

SHORT WAVE STATION—(Continued page 146)

29.24m.; **PMN**, Bandoeng, Java. Daily from 8 p.m.
28.01m.; **JVM**, Tokio, Japan. Tues., Fri., 5-10.30 p.m.
25.6m.; **FYA**, Radio Colonial, Paris, France. Daily 7-9 a.m.
25.6m.; **CJRX**, Winnipeg, Canada. Daily 10 a.m.-3 p.m.
25.57m.; **PHI**, Huizen, Holland. Daily ex. Tues., Wed., 11 p.m.-1.30 a.m.
25.53m.; **GSD**, Daventry, England. Empire Broadcasting.
25.49m.; **DJD**, Zeesen, Germany. Daily, 1-5 a.m.
25.45m.; **W1XAL**, Boston, Mass., U.S.A. Daily, 5 a.m.-1 p.m.
25.4m.; **I2RO**, Rome, Italy. Sun., Wed., Fri., 6.30-8.30 a.m.
25.38m.; **GSM**, Daventry, England. Empire Broadcasting
25.36m.; **W2XE**, Wayne, N.J., U.S.A. Relays WABC. Daily from 6 a.m.-1 p.m.
25.29m; **GSE**, Daventry, England Empire Broadcasting.
25.27m.; **W8XK**, Pittsburg, Pa., U.S.A. Relays KDKA. Daily, 7.30 a.m.-1 p.m.
25.23m.; **FYA**, Radio Colonial, Paris, France. Daily, 2-6 a.m.
25.09m.; **ETA**, Addis Ababa, Abyssinia.
25.0m.; **RW59**, Moscow, U.S.S.R. Daily 8 p.m.-6 a.m.
21.42m. to 20.48m.; Band of wavelengths allotted to amateur transmitters.
20.55m.; **JVH**, Nazaki, Japan. Daily from 6 p.m.
19.84m.; **HVJ**, Vatican City. Daily 8 p.m.-midnight.
19.82m.; **GSF**, Daventry, England. Empire Broadcasting.
19.76m.; **GSO**, Daventry, England. Empire Broadcasting.
19.74m.; **DJB**, Zeesen, Germany. Daily, 6.45-10.15.
19.72m.; **W8XK**, Pittsburg, U.S.A. Relays KDKA. Daily, 11 p.m.-7 a.m.
19.71m.; **PCJ**, Eindhoven, Holland. Tues., Wed., experimental service.
19.68m.; **FYA**, Radio Colonial, Paris, France. Daily, 9 p.m.-1 a.m.
19.67m.; **W1XAL**, Boston, Mass., U.S.A. Daily, 1.30-4.30 a.m.
19.66m.; **GSI**, Daventry, England. Empire Broadcasting.
19.64m.; **W2XE**, Wayne, N.J., U.S.A. Relays WABC. Daily 1-7 a.m.
19.63m.; **WJQ**, Zeesen, Germany. Daily 3.30-5.30 p.m., 10.30 p.m.-midnight.
19.60m.; **GSP**, Daventry, England. Empire Broadcasting.
19.56m.; **W2XAD**, Schenectady, N.Y., U.S.A. Daily, 5-6 a.m.
17.33m.; **W3XL**, Bound Brook, N.J., U.S.A. Daily 2-6 a.m.
16.89m.; **DJE**, Zeesen, Germany. Daily 11 p.m.-2.30 p.m.
16.89m.; **W2XE**, Wayne, N.J., U.S.A. Relays WABC. Daily 2-4 a.m.
16.87m.; **W3XAL**, Bound Brook, N.J., U.S.A. Relays WJZ. Daily, ex. Sun., Midnight-2 a.m.
16.88m.; **PHI**, Huizen, Holland. Daily, 10 p.m.-1 a.m.
16.86m.; **GSG**, Daventry, England. Empire Broadcasting.
13.97m.; **GSH**, Daventry, England. Empire Broadcasting.
13.94m.; **W2XE**, Wayne, N.J., U.S.A. Relays WABC. Daily, 10.30 p.m.-2 a.m.
13.93m.; **GSJ**, Daventry, England. Empire Broadcasting.
13.92m.; **W8XK**, Pittsburg, Pa., U.S.A. Daily, 10 p.m.-midnight.

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.



Experiment has shown that the ear is most sensitive to notes of a pitch between 1,500 and 4,000. An average sensitivity curve shows that the energy ratio of just audible sounds of pitch 100 and 2,000 respectively is around 1,000.

The average energy ratio of just audible sounds of 2,000 and 8,000 cycles is about 3. Some people even find it hard to hear sounds of a frequency above 5,000.

Aerial Systems

IT is sometimes argued that, with the increasing sensitivity of modern receivers, it is unnecessary to pay much attention to the aerial system. This argument is entirely fallacious, particularly in the case of receivers equipped with efficient automatic volume control. The greater the signal strength collected by the aerial, the lower the sensitivity of the receiver (due to the A.V.C. action) and the lower the noise level. However, there are limitations, due to the apparent loss of selectivity when an exceptionally large aerial system is used, and it is this factor only which should govern the physical dimensions of the installation.

The main essentials of an efficient aerial are height, good insulation and a location clear of all nearby obstructions—particularly iron roofs and gutterings, structural steel formations, telephone and power wires, and trees.

In country districts where inter-station interference is negligible the antenna may be of considerable length to give increased sensitivity for daylight reception. The flat top in this case may be made up to one hundred feet long. Longer spans than this will not give very much gain in sensitivity.

The lead-in should be run to the receiver by as direct a route as possible. It should be kept well clear of the building—a distance of one foot will be sufficient. The earth lead should also be as short as possible and connected by a good ground clamp to a water-pipe near where it enters the ground. A gas-pipe should not be used, as the red lead and packing at the joints usually constitute quite a high resistance. Where water-piping is not readily available, an inch pipe should be driven several feet into moist ground. Alternatively solder a stout copper wire to a kerosene tin and bury the tin, well below the surface. If necessary a short pipe should be driven into the ground at this point so that the earth may be kept moist. Do not use an existing earth to which power or telephone systems are already connected. Apart from the possibility of introducing hum and electrical noises this practice can be definitely dangerous under certain conditions.

For the aerial itself, insulated wire should be used, either enamelled or rubber- and braid-covered. The lead-in should be made in one piece with the flat top by passing through the insulator, fastening and continuing down. It is desirable to use at least three insulators of the small egg type. It is also preferable to use an insulated earth wire to prevent intermittent contact with any metallic objects and consequent irritating crackles from the speaker. This applies particularly to short-wave reception. In fact, any two metallic objects or wires rubbing together will produce bad noises when listening on the short waves.

Other Arrangements

In locations where a long lead-in is necessary, and where the lead-in itself is likely to pick up interference on its way to the receiver, a special installation using a shielded transmission line is desirable. The primary of a special transformer is joined to one end of the aerial proper, the other side of the winding being grounded. The winding is untuned, and has characteristics such that its impedance is practically constant at broadcast frequencies. The secondary comprises a very few turns, indicating a very low impedance winding. To this secondary is attached the special transmission line, consisting of a twisted pair of wires shielded with copper braid which may be earthed. At the receiver end there is a similar transformer in reverse, the line being joined to the low-impedance primary while the high-impedance secondary is connected to the aerial-earth circuit of the receiver.

As long as the correct impedance ratios are maintained, the transmission line may be of any length and may take any route, being immune from external disturbances. **Neither this nor any other aerial system will prevent the reproduction of interference of any description collected by the aerial itself.**

The point is emphasised, however, that the better the aerial (as regards height and placement) the more likely is the signal to over-ride the noise level.

Short Wave Reception

A system such as the one just detailed is usually suitable for broadcast operation, and correct matching of the line to the aerial and receiver will ensure that there is practically no transmission loss. On short-waves, however, the capacity between the twisted leads and the earthed braiding will introduce serious losses and it is usually found advisable to make use of a "transposed" open wire lead-in.

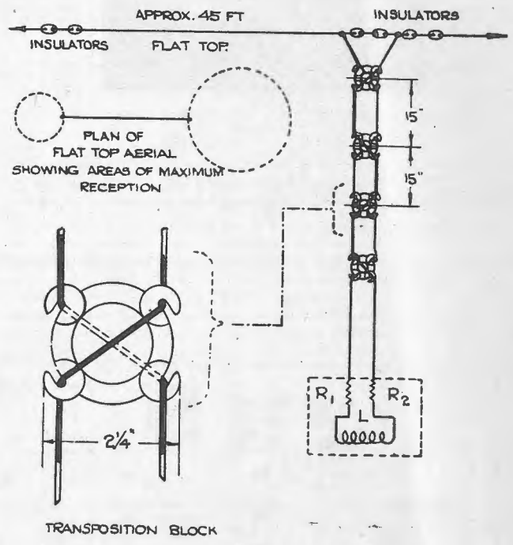


Fig. 1.

In a lead-in of this type the lead-in proper is brought down to the receiver in company with another lead which ends at the aerial, but is insulated from it. These two leads are spaced apart by special insulators and a change-over of position effected at each insulator. By this means, equal amounts of interference are picked up by the two down leads. A special matching transformer is fitted at the receiver end of the lead and all signals (noise or otherwise) are balanced out. The signal from the aerial is not interfered with (as there is no out-of-phase component to balance it) and it is passed on to the receiver. The diagram of fig. 1 will serve to show the method of attaching the lead-in to the aerial and the transposition of the two leads. Fig. 2 gives details of a suitable matching transformer with switching to change over between broadcast and short wave reception. The switch may be an ordinary D.P.D.T. type.

"Doublet" aerials are fairly popular when good short wave reception is required. The "doublet," in its simplest form, consists of a "half-wave" top, split into two (i.e., two quarter-wave sections) with a transposed lead-in connecting the two sections to the receiver. The general arrangement is shown in fig. 3. Neutralisation of the noise impulses and signals picked up by the lead-in occurs in a similar manner to that in the simple transposed lead-in. The signals picked up by the two halves of the aerial do not neutralise each other as they are "in-phase" and become additive when fed into the receiver through the matching transformer. Theoretically, an aerial of this type is "tuned" and will only respond to the frequency which it is de-

(Continued on next page)

AERIAL SYSTEMS—(Continued)

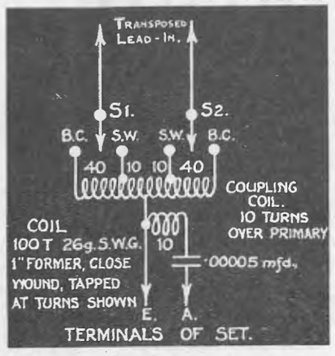


Fig. 2

signed for. However, there is always an appreciable amount of R.F. resistance present and this broadens out the response curve sufficiently to enable reception over a wide band of frequencies.

At frequencies very far from resonance the device functions as a plain "T" type aerial. The "peaking" effect comes in handy as a signal booster on the short-wave band, particularly at the resonant frequency or thereabouts. The directional characteristics of such an aerial can sometimes be used to advantage and arrangement of the aerial so that one of the dotted areas shown in the diagram points to a wanted station will often result in considerably improved reception from that station. Conversely, pointing one end of the aerial towards a troublesome source of interference will often result in a marked diminution of pick-up from that direction.

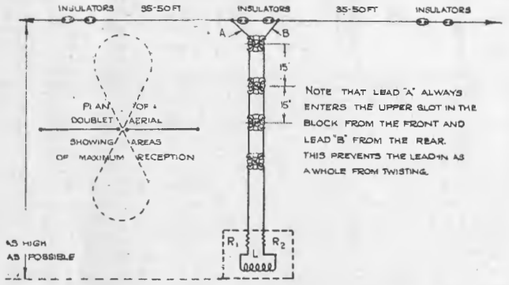


Fig. 3

A doublet aerial may be used with a twisted pair, instead of an open transposed, lead-in and, providing the length of the lead-in is correctly proportioned with relation to the length of the aerial, no transmission loss will result. The twisted pair used is rubber-covered and weather-proofed but is not shielded.

Correct proportioning of the lead-in length is necessary in this case so that none of the harmonies of the lead-in resonant frequency fall on the resonant frequency of the aerial. Should this occur, a large impedance would be presented to signals at, or near, the resonant frequency of the aerial and transmission losses would be increased enormously. Having determined a minimum length for the lead-in it is also necessary to increase its length, if such is necessary, in multiples. A minimum length of 110 feet is usually used for a 40 or 31 metre half-wave (two quarters) doublet. Should the lead-in length required not be as long as this it is necessary to coil up the unused wire but on no account must it be cut. Actually in practice, it is often found that a properly proportioned twisted pair lead-in will give a definite voltage gain at some frequencies.

Double-doublets

A variant of the "doublet" aerial is found in the "double-doublet." In this type of aerial two doublets of unequal length are crossed at their lead-in points and connection made between one side of one and the opposite side of the other. The reverse applies, so that, in effect, the entire arrangement is like two uneven "T" aerials crossed at their leading-in points.

The effect of this is to give the aerial two resonant frequencies and, if these are arranged so that they fall in the upper and lower parts of any desired frequency band, a fairly even response over that band is obtained. In practice the 16-50 metre band is covered by arranging the doublets so that they peak at about 20 and 40 metres. Should better reception be required at, say, 31 metres, the 40 metre doublet may be shortened until it peaks at 31 metres. This will cause a slight fall in response at 40 metres, but the gain at 31 metres may be worth it.

A transformer is usually required to match a double-doublet to the "transmission line" (lead-in) and, by careful design, this transformer may be peaked so that it helps to fill in the spaces between the peaks caused by the resonances of the aerial sections.

An alternative method of matching the line to the aerial is found in the "V" doublet. This type of aerial is an ordinary single-doublet with the two halves separated by insulators and a length of wire. The twisted pair transmission line is terminated at some distance below the flat-top and the two wires spread out in the form of a "V" until they reach the aerial wires. As the impedance of a transmission line increases with the spacing of its component wires it can be seen that a gradual change of impedance is effected by this means and very effective matching of the line to the aerial accomplished.

While many claims are made for the "noise reducing" properties of various aerial types, it cannot be emphasised too much that no aerial will reduce noise unless it is placed outside the field of interference. This can only be done by placing the aerial well above, or away from, buildings or electric power lines.

The lead-in, if properly neutralised (by transposition or twisting) will be "dead" as far as effective pick-up goes, and that is nearly all that can be claimed for "noise-reducing" systems.

It must be added, however, that the directional properties of a doublet may sometimes be used to advantage, and also that, provided reception is only required on one or two frequency bands of limited width, the aerial may be "peaked" so that it favours the sharply tuned signal instead of the flatly tuned noise or electrical interference.

Lightning Arresters

An efficient lighting arrester should be installed, meaning one with close contacts which will not move together or apart and will not be bridged over by a deposit of dust. From this point of view the vacuum type of guard is more desirable. For short-wave reception the capacity from aerial to ground (within the guard) should be as low as possible, consistent with reasonable protection.

In the case of shielded or transposed lead-ins as previously described, it will be desirable to fit a guard to each wire of the pair in the usual manner.

A lightning arrester provides a definite safeguard against the possibility of a surge from a nearby flash burning out the aerial coil. It is, of course, of no avail in the case of a direct hit, but, contrary to popular opinion, an aerial presents no hazard in this respect. A lightning arrester is particularly valuable in open locations or in the country, where the energy radiated from a nearby flash is not so quickly dissipated by inducing surges in power and telephone wires and metal structures.

S.A.A. Wiring Rules

It should be remembered that there are sections of the S.A.A. Wiring Rules and Radio Code which apply specifically to the installation and erection of aerials for radio receivers. These rules also cover the connection of earthing systems and should be followed carefully to ensure that the installation conforms with the requirements in every way.

FREQUENCY/WAVELENGTH CONVERSION CHART

M.	KC.	M.	KC.	M.	KC.	M.	KC.	M.	KC.	M.	KC.	M.	KC.	M.	KC.	M.	KC.
10.1	29,690	20.1	14,920	30.1	9,961	40.1	7,477	50.1	5,984	60.1	4,989	70.1	4,277	80.1	3,743	90.1	3,328
10.2	29,390	20.2	14,840	30.2	9,928	40.2	7,458	50.2	5,973	60.2	4,980	70.2	4,271	80.2	3,738	90.2	3,324
10.3	29,110	20.3	14,770	30.3	9,895	40.3	7,440	50.3	5,961	60.3	4,972	70.3	4,265	80.3	3,734	90.3	3,320
10.4	28,830	20.4	14,700	30.4	9,862	40.4	7,421	50.4	5,949	60.4	4,964	70.4	4,259	80.4	3,729	90.4	3,317
10.5	28,550	20.5	14,630	30.5	9,830	40.5	7,403	50.5	5,937	60.5	4,956	70.5	4,253	80.5	3,724	90.5	3,313
10.6	28,280	20.6	14,550	30.6	9,798	40.6	7,385	50.6	5,925	60.6	4,948	70.6	4,247	80.6	3,720	90.6	3,309
10.7	28,020	20.7	14,480	30.7	9,766	40.7	7,367	50.7	5,913	60.7	4,939	70.7	4,241	80.7	3,715	90.7	3,306
10.8	27,760	20.8	14,410	30.8	9,734	40.8	7,349	50.8	5,902	60.8	4,931	70.8	4,235	80.8	3,711	90.8	3,302
10.9	27,510	20.9	14,350	30.9	9,703	40.9	7,331	50.9	5,890	60.9	4,923	70.9	4,229	80.9	3,706	90.9	3,298
11.0	27,260	21.0	14,280	31.0	9,672	41.0	7,313	51.0	5,879	61.0	4,915	71.0	4,223	81.0	3,701	91.0	3,295
11.1	27,010	21.1	14,210	31.1	9,641	41.1	7,295	51.1	5,867	61.1	4,907	71.1	4,217	81.1	3,697	91.1	3,291
11.2	26,770	21.2	14,140	31.2	9,610	41.2	7,277	51.2	5,856	61.2	4,899	71.2	4,211	81.2	3,692	91.2	3,288
11.3	26,530	21.3	14,080	31.3	9,579	41.3	7,260	51.3	5,844	61.3	4,891	71.3	4,205	81.3	3,688	91.3	3,284
11.4	26,300	21.4	14,010	31.4	9,548	41.4	7,242	51.4	5,833	61.4	4,883	71.4	4,199	81.4	3,683	91.4	3,280
11.5	26,070	21.5	13,950	31.5	9,518	41.5	7,225	51.5	5,822	61.5	4,875	71.5	4,193	81.5	3,679	91.5	3,277
11.6	25,850	21.6	13,880	31.6	9,488	41.6	7,207	51.6	5,810	61.6	4,867	71.6	4,187	81.6	3,674	91.6	3,273
11.7	25,630	21.7	13,810	31.7	9,458	41.7	7,190	51.7	5,799	61.7	4,859	71.7	4,182	81.7	3,670	91.7	3,270
11.8	25,410	21.8	13,750	31.8	9,428	41.8	7,173	51.8	5,788	61.8	4,851	71.8	4,176	81.8	3,665	91.8	3,266
11.9	25,200	21.9	13,690	31.9	9,399	41.9	7,156	51.9	5,777	61.9	4,844	71.9	4,170	81.9	3,661	91.9	3,262
12.0	24,990	22.0	13,630	32.0	9,369	42.0	7,139	52.0	5,766	62.0	4,836	72.0	4,164	82.0	3,656	92.0	3,259
12.1	24,780	22.1	13,570	32.1	9,340	42.1	7,122	52.1	5,755	62.1	4,828	72.1	4,158	82.1	3,652	92.1	3,255
12.2	24,580	22.2	13,510	32.2	9,311	42.2	7,105	52.2	5,744	62.2	4,820	72.2	4,153	82.2	3,647	92.2	3,252
12.3	24,380	22.3	13,440	32.3	9,282	42.3	7,088	52.3	5,733	62.3	4,813	72.3	4,147	82.3	3,643	92.3	3,248
12.4	24,180	22.4	13,380	32.4	9,254	42.4	7,071	52.4	5,722	62.4	4,805	72.4	4,141	82.4	3,639	92.4	3,245
12.5	23,990	22.5	13,330	32.5	9,225	42.5	7,055	52.5	5,711	62.5	4,797	72.5	4,135	82.5	3,634	92.5	3,241
12.6	23,800	22.6	13,270	32.6	9,197	42.6	7,038	52.6	5,700	62.6	4,789	72.6	4,130	82.6	3,630	92.6	3,238
12.7	23,610	22.7	13,210	32.7	9,169	42.7	7,022	52.7	5,689	62.7	4,782	72.7	4,124	82.7	3,625	92.7	3,234
12.8	23,420	22.8	13,150	32.8	9,141	42.8	7,005	52.8	5,678	62.8	4,774	72.8	4,118	82.8	3,621	92.8	3,231
12.9	23,240	22.9	13,090	32.9	9,113	42.9	6,989	52.9	5,668	62.9	4,767	72.9	4,113	82.9	3,617	92.9	3,227
13.0	23,060	23.0	13,040	33.0	9,086	43.0	6,973	53.0	5,657	63.0	4,759	73.0	4,107	83.0	3,612	93.0	3,224
13.1	22,890	23.1	12,980	33.1	9,058	43.1	6,956	53.1	5,646	63.1	4,752	73.1	4,102	83.1	3,608	93.1	3,220
13.2	22,710	23.2	12,920	33.2	9,031	43.2	6,940	53.2	5,636	63.2	4,744	73.2	4,096	83.2	3,604	93.2	3,217
13.3	22,540	23.3	12,870	33.3	9,004	43.3	6,924	53.3	5,625	63.3	4,736	73.3	4,090	83.3	3,599	93.3	3,214
13.4	22,370	23.4	12,810	33.4	8,977	43.4	6,908	53.4	5,615	63.4	4,729	73.4	4,085	83.4	3,595	93.4	3,210
13.5	22,210	23.5	12,760	33.5	8,950	43.5	6,892	53.5	5,604	63.5	4,722	73.5	4,079	83.5	3,591	93.5	3,207
13.6	22,040	23.6	12,700	33.6	8,923	43.6	6,877	53.6	5,594	63.6	4,714	73.6	4,074	83.6	3,586	93.6	3,203
13.7	21,880	23.7	12,650	33.7	8,897	43.7	6,861	53.7	5,583	63.7	4,707	73.7	4,068	83.7	3,582	93.7	3,200
13.8	21,730	23.8	12,600	33.8	8,870	43.8	6,845	53.8	5,573	63.8	4,699	73.8	4,063	83.8	3,578	93.8	3,196
13.9	21,570	23.9	12,540	33.9	8,844	43.9	6,830	53.9	5,563	63.9	4,692	73.9	4,057	83.9	3,574	93.9	3,193
14.0	21,420	24.0	12,490	34.0	8,818	44.0	6,814	54.0	5,552	64.0	4,685	74.0	4,052	84.0	3,569	94.0	3,190
14.1	21,260	24.1	12,440	34.1	8,792	44.1	6,799	54.1	5,542	64.1	4,677	74.1	4,046	84.1	3,565	94.1	3,186
14.2	21,110	24.2	12,390	34.2	8,767	44.2	6,783	54.2	5,532	64.2	4,670	74.2	4,041	84.2	3,561	94.2	3,183
14.3	20,970	24.3	12,340	34.3	8,741	44.3	6,768	54.3	5,522	64.3	4,663	74.3	4,035	84.3	3,557	94.3	3,179
14.4	20,820	24.4	12,290	34.4	8,716	44.4	6,753	54.4	5,511	64.4	4,656	74.4	4,030	84.4	3,552	94.4	3,176
14.5	20,680	24.5	12,240	34.5	8,690	44.5	6,738	54.5	5,501	64.5	4,648	74.5	4,024	84.5	3,548	94.5	3,173
14.6	20,540	24.6	12,190	34.6	8,665	44.6	6,722	54.6	5,491	64.6	4,641	74.6	4,019	84.6	3,544	94.6	3,169
14.7	20,400	24.7	12,140	34.7	8,640	44.7	6,707	54.7	5,481	64.7	4,634	74.7	4,014	84.7	3,540	94.7	3,166
14.8	20,260	24.8	12,090	34.8	8,616	44.8	6,692	54.8	5,471	64.8	4,627	74.8	4,008	84.8	3,536	94.8	3,163
14.9	20,120	24.9	12,040	34.9	8,591	44.9	6,678	54.9	5,461	64.9	4,620	74.9	4,003	84.9	3,531	94.9	3,159
15.0	19,990	25.0	11,990	35.0	8,566	45.0	6,663	55.0	5,451	65.0	4,613	75.0	3,998	85.0	3,527	95.0	3,156
15.1	19,860	25.1	11,950	35.1	8,542	45.1	6,648	55.1	5,441	65.1	4,606	75.1	3,992	85.1	3,523	95.1	3,153
15.2	19,720	25.2	11,900	35.2	8,518	45.2	6,633	55.2	5,432	65.2	4,598	75.2	3,987	85.2	3,519	95.2	3,149
15.3	19,600	25.3	11,850	35.3	8,494	45.3	6,619	55.3	5,422	65.3	4,591	75.3	3,982	85.3	3,515	95.3	3,146
15.4	19,470	25.4	11,800	35.4	8,470	45.4	6,604	55.4	5,412	65.4	4,584	75.4	3,976	85.4	3,511	95.4	3,143
15.5	19,340	25.5	11,760	35.5	8,446	45.5	6,589	55.5	5,402	65.5	4,577	75.5	3,971	85.5	3,507	95.5	3,139
15.6	19,220	25.6	11,710	35.6	8,422	45.6	6,575	55.6	5,392	65.6	4,570	75.6	3,966	85.6	3,503	95.6	3,136
15.7	19,100	25.7	11,670	35.7	8,398	45.7	6,561	55.7	5,383	65.7	4,563	75.7	3,961	85.7	3,498	95.7	3,133
15.8	18,980	25.8	11,620	35.8	8,375	45.8	6,546	55.8	5,373	65.8	4,557	75.8	3,955	85.8	3,494	95.8	3,130
15.9	18,860	25.9	11,580	35.9	8,352	45.9	6,532	55.9	5,364	65.9	4,550	75.9	3,950	85.9	3,490	95.9	3,126
16.0	18,740	26.0	11,530	36.0	8,328	46.0	6,518	56.0	5,354	66.0	4,543	76.0	3,945	86.0	3,486	96.0	3,123
16.1	18,620	26.1	11,490	36.1	8,305	46.1	6,504	56.1	5,344	66.1	4,536	76.1	3,940	86.1	3,482	96.1	3,120
16.2	18,510	26.2	11,440	36.2	8,282	46.2	6,490	56.2	5,335	66.2	4,529	76.2	3,935	86.2	3,478	96.2	3,117
16.3	18,390	26.3	11,400	36.3	8,260	46.3	6,476	56.3	5,325	66.3	4,522	76.3	3,929	86.3	3,474	96.3	3,113
16.4	18,280	26.4	11,360	36.4	8,237	46.4	6,462	56.4	5,316	66.4	4,515	76.4	3,924	86.4	3,470	96.4	3,110
16.5	18,170	26.5	11,310	36.5	8,214	46.5	6,448	56.5	5,307	66.5	4,509	76.5	3,919	86.5	3,466	96.5	3,107
16.6	18,060	26.6	11,270	36.6	8,192	46.6	6,434	56.6	5,297	66.6	4,502	76.6	3,914	86.6	3,462	96.6	3,104
16.7	17,950	26.7	11,230	36.7	8,170	46.7	6,420	56.7	5,288	66.7	4,495	76.7	3,909	86.7	3,458	96.7	3,101
16.8	17,850	26.8	11,190	36.8	8,147	46.8	6,406	56.8	5,279	66.8	4,488	76.8	3,904	86.8	3,454	96.8	3,097
16.9	17,740	26.9	11,150	36.9	8,125	46.9	6,393	56.9	5,269	66.9	4,482	76.9	3,899	86.9	3,450	96.9	3,094
17.0	17,640	27.0	11,100	37.0	8,103	47.0	6,379	57.0	5,260	67.0	4,475	77.0	3,894	87.0	3,446	97.0	3,091
17.1	17,530	27.1	11,060	37.1	8,081	47.1	6,366	57.1	5,251	67.1	4,468	77.1	3,889	87.1	3,442	97.1	3,088
17.2	17,430	27.2	11,020	37.2	8,060	47.2	6,352	57.2	5,242	67.2	4,462	77.2	3,884	87.2	3,438	97.2	3,085
17.3	17,330	27.3	10,980	37.3	8,038	47.3	6,339	57.3	5,232	67.3	4,455	77.3	3,879	87.3	3,434	97.3	3,081
17.4	17,230	27.4	10,940	37.4	8,017	47.4	6,325	57.4	5,223	67.4	4,448	77.4	3,874	87.4	3,430	97.4	3,078
17.5	17,130	27.5	10,900	37.5	7,995	47.5	6,312	57.5	5,214	67.5	4,442	77.5	3,869	87.5	3,427	97.5	3,075
17.6	17,040	27.6	10,860	37.6	7,974	47.6	6,299	57.6	5,205	67.6	4,435	77.6	3,864	87.6	3,423	97.6	3,072
17.7	16,940	27.7	10,820	37.7	7,953	47.7	6,286	57.7	5,196	67.7	4,429	77.7	3,859	87.7	3,419	97.7	3,069
17.8	16,840	27.8	10,780	37.8	7,932	47.8	6,272	57.8	5,187	67.8	4,422	77.8	3,854	87.8	3,415	97.8	3,066
17.9	16,750	27.9	10,750	37.9	7,911	47.9	6,259	57.9	5,178	67.9	4,416	77.9	3,849	87.9	3,411	97.9	3,063
18.0	16,660	28.0	10,710	38.0	7,890	48.0	6,246	58.0	5,169	68.0	4,409	78.0	3,844	88.0	3,407	98.0	3,059
18.1	16,560	28.1	10,670	38.1	7,869	48.1	6,233	58.1	5,160	68.1	4,403	78.1	3,839	88.1	3,403	98.1	3,056
18.2	16,470	28.2	10,630	38.2	7,849	48.2	6,220	58.2	5,152	68.2	4,396	78.2	3,834	88.2	3,399	98.2	3,053
18.3	16,380	28.3	10,590	38.3	7,828	48.3	6,207	58.3	5,143	68.3	4,390	78.3	3,829	88.3	3,395	98.3	3,050
18.4	16,290	28.4	10,560	38.4	7,808	48.4	6,195	58.4	5,134	68.4	4,383	78.4	3,824	88.4	3,392	98.4	3,047
18.5	16,210	28.5	10,520	38.5	7,788	48.5	6,182	58.5	5,125	68.5	4,377	78.5	3,819	88.5	3,388	98.5	3,044
18.6	16,120	28.6	10,480	38.6	7,767	48.6	6,169	58.6	5,116	68.6	4,371	78.6	3,814	88.6	3,384	98.6	3,041
18.7	16,030	28.7	10,450	38.7	7,747	48.7	6,156	58.7	5,108	68.7	4,364	78.7	3,810	88.7	3,380	98.7	3,038
18.8	15,950	28.8	10,410	38.8	7,727	48.8	6,144	58.8	5,099	68.8	4,358	78.8	3,805	88.8	3,376	98.8	3,035
18.9	15,860	28.9	10,370	38.9	7,707	48.9	6,131	58.9	5,090	68.9	4,352	78.9	3,800	88.9	3,373	98.9	3,032
19.0	15,780	29.0	10,340	39.0	7,688	49.0	6,119	59.0	5,082	69.0	4,345	79.0	3,795	89.0	3,369	99.0	3,028
19.1	15,700	29.1	10,300	39.1	7,668	49.1	6,106	59.1	5,073	69.1	4,339	79.1	3,790	89.1	3,365	99.1	3,025
19.2	15,620	29.2	10,270	39.2	7,648	49.2	6,094	59.2	5,065	69.2	4,333	79.2	3,786	89.2	3,361	99.2	3,022
19.3	15,530	29.3	10,230	39.3	7,629	49.3	6,082	59.3	5,056	69.3	4,326	79.3	3,781	89.3	3,357	99.3	3,019
19.4	15,450	29.4	10,200	39.4	7,610	49.4	6,069	59.4	5,047	69.4	4,320	79.4	3,776	89.4	3,354	99.4	3,016
19.5	15,380	29.5	10,160	39.5	7,590	49.5	6,057	59.5	5,039	69.5	4,314	79.5	3,771	89.5	3,350	99.5	3,013
19.6	15,300	29.6	10,130	39.6	7,571	49.6	6,045	59.6	5,031	69.6	4,308	79.6	3,767	89.6	3,346	99.6	3,010
19.7	15,220	29.7	10,090	39.7	7,552	49.7	6,033	59.7	5,022	69.7	4,302	79.7	3,762	89.7	3,342	99.7	3,007
19.8	15,140	29.8	10,060	39.8	7,533	49.8	6,020	59.8	5,014	69.8	4,295	79.8	3,757	89.8	3,339	99.8	3,004
19.9	15,070	29.9	10,030	39.9	7,514	49.9	6,008	59.9	5,005	69.9	4,289	79.9	3,752	89.9	3,335	99.9	3,001
20.0	14,990	30.0	9,994	40.0	7,496	50.0	5,996	60.0	4,997	70.0	4,283	80.0	3,748	90.0	3,331	100.0	2,998

The Editor invites suggestions from readers regarding the contents of this Year Book in order that the 1937 issue will be still better.

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.

AGASSIZ, Cecil T.: Known on 2UE as "Aggie." Educated Fort Street School. Popular with the "diggers" as he was one of the original 600 who, in August, 1914, camped in Randwick Racecourse. Joined

2UE as early morning man (6 a.m.) and still controls the 6 to 9 breakfast session. Recreations: Hiking, gymnasium. Hobbies, visiting and cheering the sick in hospitals.

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—4½ years service with A.I.F. After war—4 years orchardist, grazier and farmer (Director, Derwent Valley Fruitgrowers' Co-op. Co.

Ltd.); 2 years business agency. 8½ years Assist. General Secretary, the Graziers' Association of N.S.W. Private address—"Hillside," 1 Highlands Ave., Gordon, N.S.W. Born 20/3/97, Hobart, Tas. Member Tattersalls Club. Recreations: Golf, tennis and swimming.

ANDREW, Alfred, Studio Director, Station 3TR Sale. Legal training. 20 years' stage experience as actor, singer and stage manager. Began broadcasting April, 1925, at 3LO; followed with 3UZ, 3DB, 5DN and 2UW. Recognised as one of Australia's outstanding announcers. Born Egerton, Vic.

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. Later appointed Advertising Manager of "The Directory & 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).

BASDEN, Frank Malcolm. Manager, 4CA Cairns (Q.). 8½ years wireless operator A.W.A.; nearly 3 years Western Electric Co., and in charge Victorian country servicing area; Engineering Dept., A.W.A. 12 months; Lecturer Marconi School of Wireless. Private address: 221 Lake Street, Cairns, N.Q. Born 6/5/01, Sydney.

BAUME, Sidney 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 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.

BEATTIE, Stuart. Station Manager, Broadcasting Station 2LV, Inverell. Previously "Good-morning Man" on 2CH, concert baritone, etc. Private address: Andrew Street, Inverell, N.S.W. Born in 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. Claims to be first announcer to broadcast ringside descriptions of boxing matches. 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.

BENNETT, A. E., A.C.A. (Aust.). Managing Director, 2GB, Sydney. Was public accountant by profession before he entered the field of radio entertainment in 1926, since when all his energies have gone to making station 2GB the station it is to-day and building up 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,

BROADBENT, Jack. Studio Manager and Chief Announcer 2HO, Hobart since 1931. Past experience at 7HO Hobart, 3LO Melbourne, 3AR Melbourne and 7ZL Hobart, covering a period of 11 years, during

Who's Who in Commercial Broadcasting in Australia—(Contd.)—

BROADBENT.—(Cont.)

regimes of Tasmanian Broadcasting Co., Australian Broadcasting Co., Dominion Broadcasters and Australian Broadcasting Commission. Private address — "Continental," Macquarie Street, Hobart. Member A.I.F. Club, Royal Yacht Club and Civic Club, Hobart. Recreations: Swimming, boating and old-time dancing. Born 19/6/1898 at Dimboola, Vic.

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.

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., also Manager of 2CH Broadcasting Station now owned by A.W.A. Vice-President of the Australian Federation of Broadcasting Stations. Joined Amalgamated Wireless in 1917. During 1926 was Chief Wireless Officer of s.s. "Jervis Bay," and communicated from

that ship at Tilbury direct to Sydney, and handled traffic for the Prime Minister who was attending the Imperial Conference. This was done on short waves, and constituted a record in long distance commercial traffic transmission. Appointed Manager and Chief Engineer of 7LA Launceston from 1931 to July, 1933. Transferred to present position July, 1933. Private address, 73 Haig Street, Maroubra. Born 11/2/1899.

BUXTON, Herbert M. Sales Representative, 2GB, Sydney. Born at Ballarat, Vic. Sold advertising in Melbourne on a trade paper before the war. On returning to Sydney in 1919, resumed space selling, in turn with "Industrial Australian and Mining Standard," "The Home," "The Referee," "Triad," "Truth," "Telegraph" and "Bulletin." Joined 2GB in February, 1933. Recreation: Gardening.

BROWN, Harold Percival, C.M.G., M.B.E., M.I.E.E.: Director-General, Postmaster-General's Dept.; Commonwealth of Australia, Treasury Gardens, Melbourne. As a youth on the 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 Department. Appointed present position, December 1923.

CAMPBELL, Allan James. Publicity Manager, Queensland Country Press Pty. Ltd., Fellow of Advertising. Representative in Queensland of the Advertising Education Board, Melbourne. Has had a long and varied experience in Agency work and has handled many of the most successful press and radio campaigns in Queensland. Has also specialised in General Publicity, Direct Mail, Colour Printing, etc.

CHANDLER, J. B. — Managing Director (4BC Brisbane). Controls the "Chandler Chain of Broadcasting Stations in Queens-

land (4BC and 4BH Brisbane, 4GR Toowoomba, 4MB Maryborough, 4RO Rockhampton, 4MK Mackay). Recently completed a world tour investigating broadcasting. Proprietor J. B. Chandler & Co., well-known wholesale and retail electrical dealers and radio distributors.

CROUCH, Ernest Casima, A.Inst.R.E. (Aust.). — Chief Engineer Country Broadcasting Services Ltd. Entered P.M.G.'s Dept., Engineering Branch. 1922, resigned 1931. Appointed Asst. Engineer 2GB, 1931. Appointed Chief Engineer 2GZ, 1935. Born 8/5/1908.

CLARK, Stanley. Programme Arranger, 3DB, Melbourne. Previously 6½ years with Christies Music House, Manager Record Dept.; Player Piano and Radio Salesman. Commenced with 3DB 24/6/35. Private address: Block 2, Beverley Hills, 59 Darling Street, South Yarra, Vic. Member Old Melbournians Club. Recreations: Tennis and Music. Born 24/6/1911 at Newmarket, Melbourne.

COCHRANE, Arthur Stanley.—Senior Announcer, Council of Churches Broadcasting Station 2CH, 77 York St., 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 radio burst upon the astounded world, the company secured the first "A" class broadcasting license. Was the first "A" class announcer in Australia, commencing 1923.

COLDWELL-SMITH, Charles Edmund. Manager, Grafton Broadcasting Co. Ltd. (2GF). 3½ years' Marine Service. 8 years Sales Staff of A.W.A. 2½ years Managing 2GF, Grafton. Private address: The Commercial Hotel, Grafton, N.S.W. Born Ballarat, Vic., 1896. Member of Rotary Club, Grafton and Grafton Club. Recreations: fishing and gardening.

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 of film star, Ronald Colman.

COOMBS, Tom Gordon. Manager, Broadcast Entertainments Pty. Ltd. (3TR) Sale, Vic. In advertising business since leaving school. Father late Fred Coombs of Adelaide. Broadcast individual items (humorous) A Class Stations, Melbourne, Adelaide, Sydney. Joined 5KA Adelaide, 1932. Copy, Continuity, Sketches, Announcing. Formed "Cheerio Club." Joined 3HA staff. Head Office: Continuity and Selling. Transferred to Hamilton as Assistant Manager 1936. At present Manager 3TR, Sale. Private address: Criterion Hotel, Sale. Born Adelaide, 27/7/95. Recreations: Swimming, dancing, bridge.

COLVILLE, Sydney: M.Inst. R.E. (Aust.). Proprietor Colville Wireless Equipment Co., 8 Small Street, 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 Advisor to Siamese Government 1928. 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 Engineers' Branch, P.M.G.'s Dept. 1915-1918 Wireless Operator R.A.N. Radio Service (Transport). 1920-1923 special radio duties, Wireless Branch, P.M.G.'s Dept. 1924 appointed Radio Inspector, Grade 1, 1922, Radio Inspector Grade 2. 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.

Who's Who in Commercial Broadcasting in Australia—(Contd.)—

CROSS, Charles James P. Radio Announcer, Commercial Broadcasters Pty. Ltd. (7HO). Previously approximately three years with Goldfield Broadcasters 1933 Ltd. (6KG, Kalgoorlie); Northern Tasmania Broadcasters Pty. Ltd., and 7UV, Ulverstone, Tas. Private address: 17 King Street, Sandy Bay. Born 4/1/1905 at Donald, Vic.

CRAWFORD, W. T. S. Councillor and M.Inst.R.E. Aust. Senior Radio Inspector, Sydney.

Commenced in wireless in 1912. During War was Lieutenant in R.A.N. Radio Service.

COX, Harold Edward, Manager 4TO, Townsville. Has had 25 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.

CREIGHTON, John Leslie F. Manager, 2AD Armidale. Northern Broadcasters Ltd. Pilot in Royal Flying Corps, France, Italy, Greece, Russia, Turkey, Egypt, Palestine, Arabia and India. Was announcer and copywriter, 2GB Sydney, also Chief Announcer and Copywriter, 2CH, Sydney. Private address: "Loombra," Armidale, N.S.W. Born 11/1/1900 at Kingsomborne, Winchester, Hampshire, England. Member of Imperial Service Club. Recreations: Tennis, golf, riding.

DARKE, Harold Stanley. Managing Director, The Harold S. Darke Organisation Ltd., Sydney. Associated with Myer Emporium, Melbourne, 4 years; retail window display. Berlie Ltd., Melbourne, Display Manager, 2 years; Pelaco Ltd., Advertising Manager, 2 years; Holeproof Hosiery Co. Ltd., Advertising and Sales Promotion Manager for 4 years; F. S. Walton & Co. Ltd., Advertising and Sales Promotion Manager, 2 years.

DAHLBERG, Ernest Louis ("Lou"). Joined Sales Staff A.W.A., Melbourne, May 1936. Formerly Melbourne Sales Manager, Station 3TR Sale. Commercial radio pioneer. Former Commercial Manager of 3UZ;

founder and former Managing Director 3KZ; Sporting Commentator with 3UZ and 3KZ. Member Tattersall's, Elsternwick Golf Club. Private address: 675 Inkerman Road, Nth. Caulfield, Vic. Born Richmond, Vic.

DANIELL, Frederick H. W. Radio Liaison Officer, Sun

Newspapers Ltd., also Assistant to the Managing Directors of Broadcasting Service Assocn. Ltd.; well-known for his organisation of feature 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.

DINNEY, V. M. — General Manager, 3YB. For many years associated with Electrical and Automobile business in N.S.W. and Victoria as sales executive; served three years with A.I.F. in France. Responsible for launching 3YB in 1931; was Station Manager and Announcer until May, 1934.

DAHL, NORMAN L.

Managing Director, 4AY, Ayr, Queensland.

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.

DAVIDSON, Edna G. Director, The Harold S. Darke Organisation Ltd. Associated with Berlie Ltd., for 4 years. Fox Films (Miss Movietone, 2UW) 1 year. R. C. Henderson Ltd., Advertising Manager for 2 years.

DERRIMAN, B. Second Announcer, Station 4TO, Townsville. Possesses good voice, good radio personality, and has over two years' actual broadcasting.

DEVINE, 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 in London 1894.

DIXON, Arthur Lionel, M. Inst.R.E. (Aust.). — Chief Engineer, Courier-Mail Broadcasting Station, Brisbane. Holder of First Class P.M.G.'s Certificate, Washington and Madrid, 1914. Employed with A.W.A. from 1915 to 1923. 1923-1930 various radio activities. Appointed Chief Engineer, 4BK, Brisbane, 1930. Born 7/7/1897.

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 Rd., Hobart. Born 9/1/06, at Hobart. Recreation: Rowing.

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.

DONNER, W. A., Managing Director, Columbia Graphophone A/sia Ltd., Homebush, N.S.W. Following the amalgamation overseas of Colubia, H.M.V. and Marconiphone, ap-

pointed General Manager in Australia for His Master's Voice, Manager in Australia for Parlophone. Previously Export Manager, Columbia Graphophone Co. Ltd., Clerkenwell Rr., London. Came to Australia as Managing Director Columbia Graphophone A/sia Ltd. in 1929. Married. Private address: Olphert Avenue, Vaucluse. FU7113.

DRAFFIN, James Charles M.Inst.R.E.Aust. — Engineer Broadcasting Dept., 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

Who's Who in Commercial Broadcasting in Australia—(Contd.)—

DRAFFIN, J. C.—(Cont.)

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 Department Philips Lamps (A/sia) Ltd., 69-73 Clarence Street, Sydney. En-

gaged with Royal Navy and Royal Australian Navy 1919-1928. Has been with Philips Lamps since September, 1928. Private address: 52 Portland Street, Rose Bay. Born London, 2nd July 1903.

DUNNE, Peter Edmund Langton, M.Inst.R.E.Aust — Radio Inspector, P.M.G.'s Dept., 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.

DOWER, John Michel. Station Manager 2AY, Albury. Educated New England Grammar School and Armidale College. For some time was connected with a Sydney Coaching School as teacher of Senior Latin and English. Joined A.W.A. in 1924 and served as Radio telegraphist on various vessels controlled by the Company. Appointed Manager at 2AY in 1935.

DYBALL, H. F., L.I.C.A. Secretary, Station 2TM, Tamworth, N.S.W. 8 years in account section of Australian

General Electric Ltd. Joined 2TM May 1st as Secretary to the Company. Age 24.

EISDELL, Michael A. M. Radio Announcer, 7HO Hobart. Previously on London Stock Exchange, then apprentice Tea Brokers, London; then jackeroo in Northern Tasmania. Private address: "Westella," Elizabeth Street, Hobart. Member Harlequins Rugby Football Club, London and Public Schools Club, London. Recreations: Rugby Football and boxing. Born 26/10/11 in London, England.

FAIRHALL, Allen. Managing Director, Newcastle Broadcasting Co. Ltd. Served apprenticeship with electrical trade, graduated into commercial broadcasting through amateur radio. Visiting overseas 1936. Private address: 86 Bruce Street, Cook's Hill. Born 24/11/09, Morpeth. Member of Rotary Club.

FARDELL, Fred. Accountant, 3DB, Melbourne. A.I.F. 1916-1919. With "Herald" Accounts Dept. for 8 years. Private address: 1 Berrima Ave., East Malvern, Vic. Recreation: motoring. Born 27/12/95 in London.

FINDLAY, Selwin Harvey. General Manager, Commercial Broadcasters Pty. Ltd. (7HO) Hobart. 7 years managing 7HO; 18 years managing Findlays Pty. Ltd. Private address: 14 Lord Street, Sandy Bay, Hobart. Member Athanaeum Club and Royal Yacht Club of Tasmania. Born 12/2/1897 at Launceston, Tas.

FLETCHER, Charles A. Advertising Sales Manager 2GB, Sydney. Received early business training in Advertising Dept., Chivers & Sons Ltd., large jam manufacturers in England. Came to Sydney April 1912—first advertising appointment to David Jones Ltd. Eventually took charge of their press publicity. Originated, edited and published first retail store house organ in Australia.

Later appointments were with Ilott's Advertising Agency; Advertising Manager, Overland Sydney Ltd.; Controller of Australian Advertising for Willys Overland Corpn., Toledo, Ohio; Managing Director "Motor Life," 1923-1930. Joined 2GB, and claims to be the only broadcasting station advertising manager in Australia whose sole profession has been advertising.

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. Recommenced 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. Address: 115 Pitt Street, Sydney. Recreations: Polo and golf.

FREEMAN, Haydn. Directs 6KG's musical programme. He is a well known identity in musical circles and is a musician of exceptional ability, being a capable organist, 'cellist, conductor, etc.

FREETH, Vincent H. General Manager, Catts-Patterson Co. Pty. Ltd., Sydney. Has devoted the whole of his business life to advertising and publishing interests. One of a well-known family of journalists, commenced his career as a scribe in 1913, but it was not until 1922 that he stepped, by accident, into the publicity business, where he has been ever since. After a successful experience in advertising agency administration, he joined and helped found Catts-Patterson Company (N.Z.) Ltd., in 1928, being appointed General Manager, and shortly afterwards

Director. Under his stewardship, and in spite of the depression, Catts-Patterson Company (N.Z.) Ltd. went from success to success by making advertising pay the advertiser; a reputation which is the foundation of the proud position the company enjoys to-day. In October 1934, transferred to Sydney office of the Company, where he was appointed a Director and General Manager. Like every successful man he has some very definite ideas and ideals, but he was fortunate in that these coincided pretty generally with those of an organisation which places its requirements of men pretty much in this order—loyalty, ability, efficiency and action. Recreations: Angling and golf.

FISK, Ernest Thomas: Chairman and Managing Director, Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney. F.Inst.R.E., A.M.I.E. (Aust.), F.Inst.R.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 Artic icefields, demonstrated possibilities of wireless with Newfoundland Sealing Fleet. 1910, on board s.s. "Otranto,"

Who's Who in Commercial Broadcasting in Australia—(Contd.)—

Fisk, E. T.—(Contd.)— exchanged messages with H.M.S. "Powerful," in Sydney Harbour, when "Otranto" was 200 miles northwest 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 Wahroonga, 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 Amalgated Wireless as one of the foremost wireless companies of the world is due to the broad vision and high executive ability of Mr. Fisk who, during the past 20 years, has developed wireless in Australia and in the Pacific from a national point of view. Mr. Fisk 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.

FITTS, R. H. — Chief Engineer and General Manager 3HA Hamilton. Associated with radio since 1912. Was with 3LO and 3AR for seven years. Resigned to superintend erection of Station 3HA with which he has been associated as chief engineer ever since. Sport: Fishing.

GILCHRIST, Archibald. 3TR, Sale. Born Melbourne. Educated Sydney High School. Public Library and journalistic experience. Member of W.A. Parliament 1914 to 1917. General Secretary New Settlers League, Victoria, 1922 to 1927. Issued pamphlet on "Outback Wireless," 1925. Broadcast weekly for pioneer tours 1929 to 1932. Manager and afterwards proprietor of 3TR, 1932 to date. Leased programmes and advertising of 3TR to Broadcast Entertainments Pty. Ltd., May 1936, retaining control of the transmitter, which is now operating on 500 watts aerial power. Chairman of Victorian Country Section Federation of Broadcasting Stations, 1936.

GREENHALGH, Kenneth Neal, A.Inst.R.E. (Aust.). — Chief Engineer Commercial Station 2KO (Newcastle Broadcasting Co. Ltd), 1927-29 final two years of apprenticeship in Electrical Branch Government Tramways. 1929 operator experimental Station 2KG. 1932 appointed Chief Engineer Station 2KO. Born 27/2/1909.

HARPER, John. Announcer, 2KY, Sydney. Ten years with J. C. Williamson and Fullers. Two years Paymaster on Government Silos, Temora, 1920-

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 & Microphone Clubs and Y.M.C.A.

HARRISON, Eric. Manager, Broadcaster's (Aust.) Pty. Ltd. (4BH), Brisbane, Q'land. Past experience: Producer and leading man, Hippodrome, Daley's Theatre, Lyric Theatre, New Theatres, London; Producer for Alliance, British Lion, Gaumont-British, Samuelson and

Regal Films, London, Eng. African Theatres Trust Bandmann Opera Co., India and the Far East, Paramount Pictures Hollywood, Calif. For the past 6 years Director of Publicity & Presentation for J. C. Bendrodt Ltd., Palais Royal, Sydney. Relinquished this to take over present position in September, 1935. Private address: Cliveden Mansions, Gregory Terrace, Brisbane, Q'ld. Born, Nottingham, Eng., 17/2/93. Recreations: Motoring and motion pictures.

HARVEY, William James. Chairman of Directors, Bundaberg Broadcasters Pty. Ltd. (4BU) Bundaberg, Q'land. Previously Managing Director, Wyper Bros. Ltd., Bundaberg, and Chairman of Directors Bundaberg Times Newspaper Co. Ltd. Private address: "Dunrobin," Bundaberg, Qd. Born Banff, Scotland, 13/6/78. Came to Queensland 1908. Member of Burnett, Rotary and Bowling Clubs.

HARTY, Frank Sturge, "Radio Adviser," 2UE, Sydney. Conducts "Between Ourselves" Session. Educated Jamaica Col-

lege, 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.

HARRINGTON, Herbert W. M.Inst.R.E. Aust. — Senior Radio Inspector, Adelaide; Vice-President S.A. Branch, I.R.E. (Aust.). Commenced in wireless in 1912, served in transport service 1914-16. Served with Aust. Flying Corps A.I.F., 1917-19, appointed to Adelaide in 1924.

HIGGINBOTHAM, E. Manager 2TM, arrived Australia 1920, 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 14th February, 1935, to open up Station 2TM. Permanent Director and Manager.

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.

HOOPER, Edgar M., A.Inst. R.E. Aust., Assoc. I.R.E. (Amer.), Engineer in Charge, 3DB, 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.

HERTOG, A. den.—Managing Director, Philips Lamps (A/sia) Ltd., 69 Clarence St.,

Sydney. Director Electric Lamp Manufacturers (Australia) Ltd., Clyde Street, Hamilton, N.S.W.

HOOKE, Lionel Alfred.—General Manager, Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney. 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 A.W.A.

Who's Who in Commercial Broadcasting in Australia—(Contd.)—

HOOKE, L. A.—(Cont.)

1925. Appointed General Manager 1936. 1930-32 travelled Europe and America for A.W.A. investigating world's development in radio. Councillor Institution Radio Engineers, Australia. Born 31/12/1894.

HOE, junr., Fred, A.Inst. R.E. (Aust.). — Engineer Commercial Station 4IP Ipswich. Commenced training as Broadcast Engineer at 4BK, February, 1931. Appointed Assistant Engineer 4BK, October, 1931. Assisted in installation of 4AK, Oakey. Appointed Engineer of Ipswich Broadcasting Company, July, 1935. Commenced duties thereat, August 12, 1935. Born 10/11/1913.

HOBBS, L. Newton. City representative Featuradio Sound Productions, Sydney. Commenced in radio 1926, graduating from the Marconi School

of Wireless. Operator on deep sea trawlers. 1928-1933 Control Engineer 2GB. December. 1933, joined Radio Division of Goldberg Advertising Agency. September, 1934, joined Electrical Specialty Mfg. Co., as Melbourne Manager. Born at Lismore, N.S.W. 18/9/1910.

HOPTON, Archibald Thomas, M.Inst.R.E.Aust. Manager and Engineer, Wimmera Broadcasting Co. Pty. Ltd. (3HS) 1915-24 Radio Operator, R.A.N. 1924-28 Engineer Station 3AR Melbourne. 1928-30 P.M.G. Supervisor of Broadcasting in Vic. 1930-33 Engineer-in-charge 3WR, Wangaratta, 1933 joined 3HS Horsham. Private address: Victoria Hotel, Horsham. Born at Beaconsfield, Tas. 5/2/1900. Recreations: Swimming, reading and golf.

HUGHES, Richard. Service Rep. 2GB, Sydney. Prior to coming to Australia was Sales Organiser for North of England and Scotland, and Sales Promotion Executive for Great Britain for Channell Chemical Co. Ltd., Slough, Bucks (O-Cedar Products). On coming to Australia was appointed to Sales Promotion and Organising staff of S.A. Cheney Motors Ltd., Melbourne, Vic., covering sales of Chevrolet cars and trucks in Vic. Then made Sales and Service Inspector for General Motors (Aust.) Pty. Ltd., Brisbane. Later, Departmental Manager (New Sales & Service) Australian Automotive Agencies Ltd., Townsville. Joined 2GB Service Staff in 1933.

HUNGERFORD, Harry Thomas. Advertising Manager, Station 2KY, Sydney. Has been in photography business, sawmilling business, manufactured frocks, glass works, building contracts, case factory, field manager machinery company, and advertising staff 2BL. Private address: Carlingford Rd., Epping. Born N.S.W. 1895. Member of the Millions Club, Sydney.

JAMES, Cyril. Programme Manager, 2UE, 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. At present direct-

ing programmes at 2UE. Sports: All games. Studies: Psychology and Astrology. Hobby: Gardening.

JESSON, R. A. Service Dept., 2GB, Sydney. Had 15 years newspaper experience in N.S.W., Vic., Q'land, and New Zealand, mainly editorial. Positions held include: Chief sub-editor Newcastle "Evening Sun" and Rockhampton "Morning Bulletin"; Proprietor, Liverpool "News"; Special writer, Sydney "Sunday Times"; Editor several country newspapers. Joined 2GB Service Staff.

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 & Sons, motor traders, Ipswich. Private address: 8 Kendall Street, East Ipswich. Born at Ipswich 10/11/93. Member of Rotary and Legacy Clubs. Ardent bowler.

JOHNSTON, William W. Publicity Director and Copywriter at 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.

JONES, Leo Manning, D.Ph. R.A.N. (Emergency List), Managing Director of Irrigation Area Newspapers Ltd., Murrumbidgee Broadcasters Ltd. Private address: Box 388, P.O., Griffith, N.S.W. Born 15/3/99. Member of Naval and Military (Melb.) Club.

KERR, Alfred Dixon. Engineer, 3BA Ballarat. Has held experimental transmitting license since 1926. Was one of the founders of 3BA 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.

KAUPER, Henry Alexis, M. Inst.R.E. (Aust.). — 227 Len-

nox St., Richmond, Vic. 1918-1919 Research Branch, Royal Air Force. 1919-1922 Aircraft Engineer. 1922-1935 various radio activities, including 3 years Chief Engineer of 5CL. Now Consulting Radio Engineer. Born 12/3/1888.

KING, Robert Arthur, M.L.C. Secretary, 2KY, Sydney. 4 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 Llunduff Street, Waverley. Born 10/4/86 in Launceston, Tas. Recreations: Swimming, football and athletics.

KITTO, Thomas. Chief Engineer, 2HD, Newcastle. Born and educated at Launceston, Tasmania, where he was appointed Engineering Instructor at Launceston Technical School. Entered radio as Engineer at 5KA Adelaide and later transferred to 2HD, Newcastle, where he controls the technical end of transmission. Private address: Box 123, P.O., Newcastle. Recreation: Swimming.

LAMB, Roy George. Managing Director, Radio Katoomba Ltd. (2KA) and Director Radio Silver City Ltd. (2BH). Took course in Economics at Sydney University. Four trips abroad.

Who's Who in Commercial Broadcasting in Australia—(Contd.)—

LAMB, R. G.—(Cont.)
Studied broadcasting in relation to business efficiency in every important country in the world. Private address: Katoomba. Born in Sydney 28/1/99. Member of "Lambs" Club, New York and R.A.C.A., Sydney. Recreations: Cricket, golf and tennis.

LANE, Reginald E. Advertising 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.

LAWRENCE, Arnold Egerton, Station Manager, Warwick Broadcasting Co. Pty. Ltd., Station 4WK Warwick, Southern Q'land. 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 & Telegraph, 1st Class. Private address: 57 Percy Street, Warwick.

LEVY, Francis Edward. Sales Manager 2UW, Sydney. Educated Wellington College and Victoria University, N.Z. Studied law in Wellington 1918-20; joined Goldbergs Wellington Office 1920, Manager Auckland Office Jan., 1924, Assistant Manager Wellington, October,

1924, returned to Auckland 1925; appointed a Director 1926; Director of the 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.

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 & 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.

LEWIS, Herbert James. Manager Station 2GN Goulburn Broadcasting Company. Was electrical engineer and joined

Amalgamated Wireless in 1925 as 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 Ave., St. Peters, S.A. Born in London, England, 29/6/1893. Recreation: Golf.

LYONS, Norman. — Studio Supervisor of 2UW, is well-known in connection with his activities with the National Service on external broadcasts and matters of particular interest to

youthful listeners. As Supervisor and special announcer at Station 2UW he has done much to further the special recording work of race descriptions, etc., which play so important a part in 2UW's programmes.

MALONE, James J.—M.Inst.

R.E. Aust. Chief Inspector Wireless Postmaster-General's Department, Treasury Gardens Melbourne. Chairman, Victorian Division, Institution Radio Engineers Australia. Served as Wireless Officer R.A.A.F. in France.

McLAREN, Stanley. Gippsland sales manager for Station 3TR since 1932. A very genial "Uncle Fred" and leader of the Mouth-Organ Band. Born Melbourne.

McNEILL, Thomas A. E. Chief Engineer, 2CH, Sydney. With Marconi Co., London, 1918-1927. Joined 2BL Sydney as Engineer 1927-29. With P.M.G. Dept., Broadcasting Division as Supervisor 1929-31. Joined 2CH at inception October, 1931 as Chief Engineer. Private address: 82 Dover Rd., Rose Bay. Born 13/2/01.

MARCUS, Royston. Manager Station 4IP, Ipswich. Son of the late Martin Marcus, well-known entrepeneur and theatrical manager, from whom he received his early training in showmanship. One of the founders of the Repertory Theatre Movement in Australia. Produced the first 3 act play for broadcasting in November, 1924, from 5DN Adelaide, when that station was privately owned by Mr. & Mrs. E. J. Hume. Joined Station 4BK as announcer in 1932, resigning in 1935 to take up present appointment. Has produced over 250 plays for radio, and has written a series of one-act radio plays "Vignettes of Queen Victoria," which he produced from 4BK in 1935. In addition to theatrical associations has had considerable experience in ordinary commercial pursuits. Possesses a good musical knowledge and is a bass-baritone vocalist. Private address: Walmsley St., Kangaroo Point. Born at Adelaide 15/10/86.

MARDEN, C. F. General Manager, Australian Broadcasting Co. Ltd. Has been engaged

Who's Who in Commercial Broadcasting in Australia—(Contd.)—

MARDEN, C. F.—(Cont.) in the theatrical and picture world for the past 25 years, was General Manager to the Aust. Broadcasting Company during its control of the National Stations; was responsible for the co-ordinating of services and the formation of the National Chain. At present Superintending Manager, Greater Union Theatres Ltd., and General Manager Station 2UW. Private address: 47 Chamberlain Ave., Rose Bay. Born 29/9/88. Member of Tattersall's Club. Recreations: Swimming, golf and tennis.

MATHERS, Arthur. Continuity Writer and Sporting Commentator, Station 3TR, Sale, Vic. Journalistic experience in Melbourne and London. Broadcast from 3KZ, 3BA and 3HA.

MARSHALL, Herbert A. — 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, India, 1888.

Received Primary Education in India and Secondary education in England. Trained as Power Electrical Engineer. Arrived in Australia 1907. Built and installed ½ k.w. Broadcasting Transmitter, 2XC Broken Hill. Private address: 94 Francis St., Bondi.

McDONALD, Arthur Stephen.—Chief Engineer & Assistant Manager, Amalgamated Wireless (A/sia) Ltd., 47 York

Street, Sydney. M.Inst.R.E. (America) and M.Inst.R.E. (Aust.). Councillor of I.R.E. Aust. Born Castle Donnington, now Swan Hill, Vic. Educated at Public School and Melbourne Technical College. Keen yachtsman.

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.

McQUILLAN, Cecil John.—Chief Radio Systems Engineer Standard Telephones & Cables Ltd., 71 York Street, Sydney. 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 being erected at Launceston, Townsville, Grafton, Sale, Dubbo, Murtoa and Katanning.

MEREDITH, Si. 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 9 years ago, and for past 6 years with 2UE as Announcer. Is President of the Microphone Club for 1936. Is fond of all sports, especially fishing and motoring.

MINGAY, Oswald Francis.—M.Inst.R.E. Aust. M.Inst.R.E. (U.S.A.), Managing Director Australian Radio Publication Ltd. Managing Editor and Proprietor, "Radio Retailer of Australia," "Radio Trade Annual," "Radio Review of Aus.,"

"Broadcasting Business," 30 Carrington Street, Sydney. Honorary Secretary Institution Radio Engineers, Australia. Hon Sec. Radio Industry Annual Ball. Served in Signals A.I.F. 1915-1919. Millions Club. Founded Australian Radio Publications, 1930. Principal Australian Radio College, 1930-1933. Private address: 4 Woodside Ave., Linfield, N.S.W. Born 1/7/95.

MORGAN, Sydney. — Managing Director 3KZ Broadcasting Co. Pty. Ltd., 64 Elizabeth Street, Melbourne. Member Victorian Institute of Advertising. Principal in firm of Val Morgan & Sons Pty. Ltd. Associated with advertising activ-

ities in Melbourne since 1917. Dec., 1930, one of founders and Director of 3KZ Station. Appointed Managing Director, June, 1932. Private address: 19 Nirvana Avenue, East Malvern. Born 1900. Recreations: Tennis, swimming.

MONKS, Cuthbert A. Sydney Sales Rep. for 2HD Newcastle and 5KA Adelaide. Business address, 3rd floor, Grace

C. A. Monks

Building, King and York Sts., Sydney. Phone MA7645. Associated with 2HD for 6 years, 5KA for 2 years.

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 16/11/13 at Hobart, Tas.

NIXON, Noel Van-der-Vord. Principal, N. V. Nixon & Co., 20 Queen Street, Melbourne. Born 23/4/08 at Armadale, Vic. Educated Scotch College, Melbourne. With Paton Advertising Service (Melb.) 1926-27; Griffin Shave (Melb.) 1927-28; R. S. Maynard Ltd., Brisbane, 1928; Advertising Manager Rothwell's Outfitting Ltd., Brisbane, 1928; Paton Advertising Service, Direct Mail Division, Melb. 1929; Director Melb. Office Goldberg Advertising Agency, 1930-34; Catts-Patterson, Sydney, 1934-35. Married 12/8/32. Private address: 20 Queen Street, Melbourne. Member Public Schools Club.

OVERDIEP, J. A.—Assitant General Manager of Philips Lamps (A/sja) Ltd. Company address: 69-67 Clarence Street,

Sydney. 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.

Who's Who in Commercial Broadcasting in Australia—(Contd.)—

OVERDIEP, J. A.—(Cont.) Has been connected with the Australian organisation of Philips since 1930. Private address: "Ashcroft," Bogota Avenue, Cremorne. Born 17th October, 1901.

PRINGLE, Albert Yeoman, M.Inst.R.E. (Aust.). — Officer-in-charge Braybrook Radio Centre, Melbourne. Joined A.W.A. in 1919. Associated in all classes of radio work. First Class Ticket 1921. Washington First Class Ticket 1931. Born 5/11/1902.

PENNY, Langford W. — Manager of Sales Division, 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.; 1927-28 A.G.E. Co. Ltd., Queensland

Country Sales; 1928-29, Manager Radio Dept., Aeolian Co., Newcastle; 1931-33 Manager, Radio Dept., J. A. Booth & Co. Ltd., Sydney; 1934-35 own radio business, Northbridge. Joined staff of 2TM February, 1935. Born 4/1/06.

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. Five 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.

PINKERTON, Harold Richard, Managing Director Savery's Pianos Ltd., Managing Director, Radio Wholesalers Ltd., General Manager, Hume Broadcasters Ltd. (5DN). Music and radio business twenty-six years. Broadcasting for past two years.

PETTERS, Harry Danvers, 2UE. — Graduated in Arts at Edinburgh University. Served in Great War with the Royal Scots and 101st Grenadiers (Indian Army) leaving with the rank of Captain (Brevet Major). Entered the advertising field in Australia with the Weston Company, Sydney, and Bulletin Newspaper Co. Transferred to Radio Advertising with Station 2UW, and now on the executive advertising staff of Station 2UE.

RADFORD, J. Arundel. Joined 4BC at inception of station in 1930. Previously connected with 2GB and 3DB. Past nine years in commercial broadcasting. Served as Captain in Imperial forces during war. Recently appointed Melbourne Rep. for J. B. Chandler & Co.

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 present position August, 1935. Private address: 58 Nelson Road, Killara. Born in Sydney 4/9/02. Appointed Asst. Mgr. 2GZ, July, 1936.

ROBERTS, Russell F.—General Manager 4BC Brisbane. Gained Musical Training at Trinity College of Music, London, and at Tobias Matthay Pianoforte School, London. Appointed present position 1930.

ROWE, E. W. Musical Director 2HD Newcastle, known as "Uncle Pete" and very popular. Native of London and received musical education at Bournemouth.

ROBINSON, W. H. R. — Assistant Engineer 2UE Broadcasting Station. A.Inst.R.E. (Aust.). Commenced radio in R.A.N.R., 1920. Joined Electrical Engineers' Branch, PM.G.'s Dept., in 1921. In 1929 transferred to the Broadcasting section (Station 2BL). In 1930 transferred to 1st National Regional Station, 2NC, Newcastle, as officer in charge, of its installation, and subsequently in June, 1934, of its operating staff. In 1934 qualified for transfer to the Radio Research section of P.M.G.'s Research Laboratories, Melbourne. Joined 2UE, June, 1934. Born March 1st, 1905, at Parkes, N.S.W.

RUSSELL, R. McCowan. A.O.A. Assistant Manager 3DB Melbourne. A.I.F. 1916-1919. Joined E. A. Price Advertising 1920—Merged with Paton Advertising Service — Foundation member and senior executive of Price-Berry Pty. Ltd., and Samson Clark, Price-Berry until joining 3DB 6 years ago. Private address: 135 Riversdale Road, East Camberwell, Vic. Member Navel & Military Club (Melb.) and Emerald Country Club. Recreation: Golf. Born at 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. Previous ex-

perience: 7 years Electrical Engineers' Branch P.M.G.'s Dept.; 5 years Municipal Power Supply Management; 8 years radio retailing and broadcasting. Private address: Teuch St., Kingston, Canberra. Member Rotary Club and Royal Canberra Golf Club. Born at 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 the action on November 9, 1914, with the "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 in 1927 transferred to 5CL Adelaide. In 1929 joined 7ZL Hobart as Chief Engineer, and in 1932 joined 3AW in that capacity.

RYCROFT, Ellen G. Advertising agent for Commercial Broadcasting Pty. (7HO). Previously with Tasmanian Broadcasters Co., Dominion Broadcasters Co., Australian Broadcasting Co.; Commercial Broadcasters Pty. Also dress designing, nursing, mixed farming and travelling. Private address: 3 Lynton Ave., South Hobart. Born 13/8/1894 at Vitry, Nilgharry Hill, South India. Member Royal Auto Car Club, Hobart. Recreations: Riding, shooting, gardening, reading, etc.

SAMUEL, Bryn. Station Manager, W.A. Broadcasters Ltd., Perth, W.A. Originally member of commercial staff of "West Australian" Newspapers Ltd., and joined Musgrove's Ltd. in 1924; appointed Station Manager 6ML in 1930; on foundation of W.A. Broadcasters Ltd., in March 1933, appointed Station Manager for the Company, which operates Stations 6ML and 6IX. Private address: 28 McKenzie Street, Wembley, W.A. Born Monmouthshire, South Wales.

SCHULTZ, L. N. — Chief Engineer of 2GB. 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 Engineer. During 1934 supervised the building of a

Who's Who in Commercial Broadcasting in Australia—(Contd.)—

SCHULTZ, L. N.—(Cont.) 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, Rex. Musical Director, 2UE Sydney. Born Rockhampton (Q.). At 13 years of age was articled to the late John Barlow, F.R.I.B.A., Architect. Commenced practice as an

architect in 1909, and carried on this profession until joining 2UE in 1930. Was actively associated with the Petersham Choral Society and the Mosman Musical Society. In conjunction with Mr. Arthur Champion, was the founder of the Roseville Musical Society and the Kuring-gai Operatic Society. Has had several of his works performed on the stage, and broadcast by A and B stations in Sydney and Melbourne. Hobbies: Children and music. Recreation: motoring.

SPARKES, R. C. Assistant Manager 2HD Newcastle, well known in Sydney and Brisbane.

Born at Goulburn 4/7/1876. Entered radio 1932.

SIMMONS, Norman W. Station Manager and Engineer, Station 6KG Kalgoorlie, W.A. Experimented in wireless before the War. Served in R.A.F. as wireless operator and pilot. Associated with 6KG since its inception.

SUTHERLAND, W.—Chief Engineer 4BC. Previously connected with 6WF and later in radio business in Perth. Served during war on radio in Submarine Decoy Ships. Commenced in radio 1908 in Royal Navy.

STELZER, William J. Advertising Representative, 2GB, Sydney. Formerly Manager H. Grout & Co. (1907)—taken into partnership in 1909. "Bill" Stelzer, as he is familiarly known, came into radio when the industry was just emerging from its swaddling clothes. Since then he has been selling space on 2GB, signing up many of the station's most important contracts. Among the original ideas claimed by "Bill" is Radio Community Singing.

STEVENS, Capt. Alfred Charles Cornwallis. "The World's News" Globetrotter, 2UE, Sydney. Educated at English Public School, Bath,

and Aberdeen University. In 1899 saw service in the Boer War. Received a commission in the R.F.A. Five years in Northern Nigeria, as a Political Resident, followed by 5 years soldiery in India. Then appointed to N.Z. Staff Corps. Became a journalist, serving on the Sydney "Sunday Times" and "Daily Telegraph." Was Editor and Publicity Officer to the N.R.M.A., then organised the memorable £100,000 Cancer Research and Treatment Appeal. In broadcasting he was associated for 8 years with 2FC, A.B.C. and Broadcasting Commission, and at present is with 2UE.

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 radio licenses in Australia (7/11/23) prior to which he held experimental licenses. Opened the first all radio store (Electrical Utilities Ltd., Radio House), now carried on by his sons, was also one of the co-

founders of the first Australian Station (2BS now 2BL) the transmitter for which was built by staff under his supervision.

STEVENSON, Norman. Studio Manager for 2UE. Born

and educated in 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. Recently married and lives at Bexley.

STEVENSON, Murray H. Chief Engineer, 2UE, Sydney.

M.Inst.R.E.Aust. Educated Sydney Technical High School. Construction and maintenance of original 2UE. Appointed present position 1/1/32. Born 17/4/05. Private address: 100 Kurraba Road, Neutral Bay.

TRENAM, Harold C. — Managing Director, Standard Telephones & Cables (A/sia) Ltd., 71 York Street, Sydney. 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 & Cables Ltd., London. To 1932, Managing Director Creed & Co. Ltd., Telegraph Engineers, London. Director Standard Telephones & Cables Ltd., London. Director International Telephone & Telegraph Co. Ltd. 1933, came to Australia in present position. 1936, visited England on business.

TAYLOR, John T. General Manager Vogue Broadcasting

Co. Pty. Ltd., 3AW Melbourne. Joined 2CH (Feb. 1932) as Advertising Manager; appointed General Manager October 1932. Resigned May, 1936 to accept present position. Born 1904. Recreations: Golf and surfing.

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.

Who's Who in Commercial Broadcasting in Australia—(Contd.)—

TATHAM, Sydney Ernest. Manager, Sound Recording Studios Ltd., 160 Castlereagh St., Sydney. Started radio experimenting 1910. Joined A.W.A. 1914. Served 5 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 from A.W.A. 1924 and commenced own business representing American and Continental manufacturers. 1927 designed and built theatre talking picture equipment. Sold and installed in large number of Australian theatres. Travelled extensively overseas, studying latest radio and broadcasting practice. April 1935 established and now operating Sound Recording Studios Ltd., Sydney. Born 4/4/1896. Recreations: Golf, swimming and motoring.

THOMPSON, Wilm. Henry, A.C.A. Building, York & King Streets, Sydney. City Representative 2KO. Previously selling newspaper space in Sydney for years, both for daily and interstate papers. With 2KO for past 2 years, at present looking after their interests in Sydney. Born in Sydney. Recreations: Fishing and races.

THORN, Arthur, Announcer, 5KA Adelaide. A native of Windsor, England, came to Australia 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 4½ 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.

TROTMAN, Ernest V. (Uncle George). Chief Announcer and Programme Director 3BA, Ballarat. Commenced career as elocutionist. Relinquishing elocution for a time, became a baritone soloist, then a term as a character comedian, and from this to humorist at the piano. Did 20 years of concert platform work with costume comedy companies and concert companies of all descriptions—city, suburban and country. Toured Victoria as a member of the Limbless Soldiers' Concert Party. Pioneered with 3LO in 1924. In 1929 joined the staff of 3UZ where he conducted the Children's Session and held the position of Studio Manager and Programme Director for the studios, until in July, 1935 he joined the staff of 3BA as Chief Announcer and Programme Director.

TUPPER, Frederick Cyril. Sporting Commentator, Station 3AW, Latrobe Street, Melbourne. Has done several out-

standing broadcasts in Vic., including Visit of Duke of Gloucester, arrival of Centenary Air Race, Henley Regatta, Junior Cycling Championships. Has broadcast Victorian horse races for 4 years. Visited India 1917, N.Z., 1922, Straits Settlement 1923, America 1924. Joined 3AW 22/2/32. Private address: Pacific Mansions, Barkely St., St. Kilda, Vic. 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.

VAUDE, Charles. Club Director, 3DB, Melbourne. Formerly conducted military band 1902; Auctioneer, W.A., 1905; American Fleet, 1908; Rickards Vaudeville, 1908-1921; in radio ever since. Private address: St. Georges Road, Thornbury, Vic. Member "Smile Away" Club. Recreations: Chess and dirt-track racing. Born in London, 9/6/84.

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.

WALSH, Ernest. Announcer, Station 2UE Sydney. Born and educated in Sydney. Trained as a woolclasser, later in motor car sales, and hotel brokerage.

Started in broadcasting 1931. Has been with 2KY and 2CH as the popular "Good Morning Man," an honorary title conferred by listening public. Was Manager for Radio Division of Goldberg Advertising Agency in Sydney. Joined 2UE and is now announcer in charge of evening sessions. Recreations: Golf and swimming. Hobby: Psychology.

WARD, John Vivian Snaith. Chairman and Managing Director, Wimmera Broadcasting Co. Pty. Ltd., since 1933. Son of George Wm. Ward of Horsham. Born 1898. Educated Scott's College and Stott's Business College. Joined service of Union Bank 1915, resigned 1921, and became Managing Director Horsham Times Ltd. Foundation member and member first directorate Horsham Rotary Club. Recreations: Swimming and tennis.

WARD-AMBLER, C. General Manager in Melbourne for Catts-Patterson Co. Ltd., which

he joined in September, 1926. His outstanding ability was rewarded in June, 1932, when he was offered, and accepted, the position of Director and General Manager in Melbourne. Skilful strategist and planner and gets tremendous satisfaction from seeing his plans come to fruition. The present organisation and clientele of Catts-Patterson Co. (Vic.) Pty. Ltd., bear eloquent testimony to the efficacy of his management. 1935—made a tour of the Continent of Europe, Great Britain and America to broaden his experience and make personal contact with overseas clients. Recreations: Flying, although it is rumoured the combined entreaties of his co-directors and wife have converted him from this somewhat risky pastime, and he may now be seen pacing briskly along Melbourne highways instead.

WATSON, John A. Sales Representative, 2GB, Sydney. Started in New Zealand as insurance officer, later going on the land, then to the motor business, following which he came to Sydney. For 2 years he managed a branch of an Australian motor firm in Vancouver, and was then recalled to Sydney to take up the position of Manager for the Australian head office. Seeing bigger opportunities in radio, he joined 2GB where he is mainly engaged in sales and service work.

WHITCOMB, T. 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 that Company was in Technical Department resigning on the 1st February to construct 2TM's transmitter and is a permanent director and engineer.

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 a Licensed Companies Auditor. In August, 1935, was also appointed Advertising Manager 3BA. Born 6/4/03. Recreation: Bowls.

WOOD, E. A. 2HD Newcastle. Owned and controlled by Airsales Broadcasting Co. Born and educated in Victoria. Commenced broadcasting as manager 5KA Adelaide, and later appointed to 2HD, which has progressed very successfully.

Who's Who in Commercial Broadcasting in Australia—(Contd.)—

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 experiments 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.

WELCH, Eric. — Sporting commentator, 3DB, Melbourne. Was school teacher until he enlisted with the A.I.F. After two years service, returned to take up science course at the Uni-

versity, following which he went to New Guinea with the Commonwealth 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.

WYNNE, A. P. Director and Manager 4MB Maryborough (Q.) President, Eisteddfod Council of Queensland. Past President Maryborough Chamber of Commerce. Formerly 17 years with W. H. Paling & Co.; 17 years conducting own business—Wynne's Music Store, Maryborough, Q'land. Private address: Kent Street, Maryborough. Born Warwick, Q. Member of Maryborough & Wide Bay Clubs, Rotary Club, Round Table Club.

WORRALL, David. Manager 3DB, Melbourne since it was purchased by the "Herald." 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 York for three or four years with an advertising firm representing a group of foreign newspapers. Went on world tour recently to survey broadcasting in America, England and the Continent. Private address: 73 Amerway, Camberwell, Vic. Born in Parramatta, N.S.W., in 1894. Member Eastern Golf Club. Recreations: Golf and squash rackets.

WYLES, David G.—M.Inst. R.E. (Aust.). Manager Technical and Commercial Dept., Philips Lamps (A/sia) Ltd., 69 Clarence Street. Vice President Institution Radio Engineers Australia, Member I.R.E. (U.S.A.).

Joined Amalgamated Wireless 1914. Visited Europe, Great Britain 1922-23, investigating radio on behalf 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 Messrs. Philips Lamps. Private address: 36 Burra Road, Artarmon. Born 20/7/94.

TOO LATE FOR CLASSIFICATION

GENDLE, Charles H. Director and General Manager of Featuradio Sound Production Pty. Ltd. Founder Company. Was previously General Man-

ager of Vocalion Gramophone Co. Ltd. (Aust.) 1926-1933. Secretary and General Manager of Vocalion Gramophone Co. in London, 1921-1926. Arrived in Australia 1926 to establish the factory for recording and production of records.

MARSH, Gordon W. General Manager, Station 5DN, Adelaide, since June, 1935. Prior to that was Chief Announcer 4BK, Brisbane, and before that Manager 3HA, Hamilton. Was associated with Philips Lamps. One of the enterprising young executives in broadcasting circles.

JOYCE, James. Victorian Manager, Featuradio Sound Pro-

JOYCE, J.—(Cont.)

duction Pty. Ltd. Joined the Company early in 1935. Previously in charge of 3YB Mobile Station, and also with 3AW.

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.

MICROPHONE CLUB OF N.S.W.

President: SI MEREDITH, 2UE

Secretary: GEORGE BENNETT, 2GB

Treasurer: OSCAR LIND

The object of the Club is to create good fellowship among the staff of all radio stations, particularly between A.B.C. and commercial stations, who always find it difficult to get to know one another.

Club lunches which take place at least once a month —sometimes twice.

Location for Club Room not yet decided upon.

TRANSCRIPTION PRODUCERS

FEATURADIO SOUND PRODUCTIONS PTY. LTD. Business Addresses: 32 Market Street, Melbourne and 47 York Street, Sydney. Directors: George Sutton, J. M. Sayer, C. H. Gendle. General Manager: C. H. Gendle. Victorian Manager: James Joyce. Location and number of studios: Three (now being increased to five), at above addresses.

Producer: Lee Murray. Chief Engineer: B. F. Israel. Galvanic Department: H. Goody. Salesmen: M. J. Nicholls and L. Newton Hobbs.

Placing business with: 2CH, 2KY, 2SM, 2UW, 3AK, 3AW, 3DB, 3KZ, 3MA, 3UZ, 3XY, 4BC, 4GR, 5AD, 5DN, 5KA. Australian Broadcasting Commission.

SPECIALISTS in the production, direction and/or presentation of features of every description for radio broadcasting either in recorded (transcription) form; live artists or scripts.

ORIGINATORS of recorded "spot" and scatter announcements as used by every "B" Class Station in the Commonwealth.

AN ORGANISATION repelete in detail for effecting commercial and private sound recording of every description, with studios in Melbourne (Victoria) and Sydney (New South Wales) equipped with every modern facility permitting recording in all respects equal to the highest grade overseas product.

TECHNICAL DEPARTMENTS embrace plant and machinery for the processing of master matrices and manufacture of records therefrom in 16, 13¾; 12 and 10 inches diameter.

STUDIOS are connected by direct private landlines to all local Stations, and through P.M.G. Test Panel to all Interstate Stations. Facilities also exist for recording transmissions from any overseas country.

SOUND RECORDING STUDIOS LIMITED. Business Address: 160 Castlereagh Street, Sydney. Directors: A. R. Fox (Chairman), S. E. Tatham, C. M. Guiney. Studios at above address.

Equipment: Dual 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 net-work of stations desired. Talking picture reproducing equipment.

Facilities: Complete broadcasting and recording studios and talking picture theatrette. Broadcasting direct from studio to any outside point; receiving remote broadcasts from any outside point into studio for audition or recording. Recording and reproducing of gramophone records, sound-on-film—in fact, a most complete service where "sound recording and reproducing" is concerned.

Services: Recording, private and commercial, transcriptions, advertising announcements, talks, plays, serials, etc. Reproducing from both disc and films. Production and recording of transcriptions for broadcast purposes. Private and commercial recording for sponsors and advertisers. Broadcasting direct from Sound Recording Studios to any station or net-work of stations in Australia.

COLUMBIA GRAPHOPHONE AUST. LTD., 2 Parramatta Rd., Homebush. Managing Director: W. A. Donner. Columbia Company in association with H.M.V. (The Gramophone Co.), connected with the parent body in England, is associated with various recording organisations throughout the world. As a result of 30 years' experience in the art of recording, they have at the Homebush Works in Sydney, a most up-to-date and complete electrical recording equipment, developed by Columbia and manufactured at Hayes, and used by associated companies all over the world. Every facility is provided, up to three recording can be made at one time if necessary, remote recordings of speeches of any length from all parts of the world, via land line or radio may be handled. From 8in. up to 16in. discs, reproducing at 33 1-3, 78 r.p.m. or other speeds, are possible; the system used being the only one which can satisfactorily handle the range of frequencies encountered in modern sound reproduction. The recording studio is adjacent to the actual record plant, ensuring prompt service, and so far as is known, this is the only factory in Australia that is able to make an unlimited number of pressings from the same record. Columbia has been recording in this country for ten years and it is well to the fore with special records to meet the requirements of broadcasting. Radio plays such as the George Edwards series, of "Westward Ho," "Inspector Scott of Scotland Yard," "Notable British Trials," "The Last 100 Years," "Dust of the Ages," "Darby and Joan," "The Voice of the People," etc., are already available. Any type of recording for advertisers, stations or agencies, is possible, including announcements, musical items or plays. Four turntables are provided for dubbing purposes, and the sole rights for the use of any of the records in the catalogues of Columbia, Regal-Zonophone, "His Master's Voice," Parlophone and associated labels, for this purpose, are held by this Company. In fact, any service connected with recording can be carried out by Columbia.

TRANSCRIPTION SUPPLIERS

Associated Music Publishers Inc. (J. H. Barker Jr.), 62 Pitt Street, Sydney.

Amalgamated Wireless (A/sia) Ltd., 47 York Street, Sydney, BW 2211; and Queen Street Melbourne, F 4161.

Brisbane Broadcasting Pty. Ltd. (4BK), Courier-Mail Building, Queen Street, Brisbane. B 6610.

Broadcasting Station 2CH, Grace Building, 77 York St., Sydney. MA 6008.

3DB Broadcasting Co. Pty. Ltd., 36 Flinders Street, Melbourne. F 2118.

Chandler, J. B., & Co., 43 Adelaide Street, Brisbane, B 2041; Australia House, Carrington Street, Sydney, B 6401.

Columbia Graphophone (Aust.) Ltd., 2 Parramatta Rd., Homebush. UM 6671.

Commonwealth Broadcasting Corp. Ltd. (2UW), State Shopping Block, 49 Market Street, Sydney. M 6686.

Country Broadcasting Services Ltd. (2GZ), 12 Spring Street, Sydney. BW 1428.

Featuradio Sound Productions Pty. Ltd., 32 Market St., Melbourne, C.1., M 5701; 47 York Street, Sydney, BW 2211.

Hoffnung, S., & Co. Ltd., 165 Pitt Street, Sydney, BW 2921; Charlot Street, Brisbane, B 3511; Chesser Street, Adelaide, Central 4170.

Radio 2UE Sydney, Ltd., 296 Pitt Street, Sydney. M 4577.

RecAudio Productions, 1st Floor, A.M.P. Chambers, William Street, Perth. B 9919.

Sound Recording Studios Limited, 160 Castlereagh St., Sydney. MA 4035.

Theosophical Broadcasting Station Ltd. (2GB), 29 Bligh Street, Sydney. B 7876.

Radio Trade and Programme Papers

Published in Australia

AUSTRALIAN RADIO PUBLICATIONS LTD.—Head Office: 30 Carrington Street, Sydney, 'phone B 7188. Branch Office:—Mingay Publishing Company, 422 Little Collins Street, Melbourne, Vic. Interstate Reps.:—C. R. Porter, Esq., C/o Broadcast Services, A.M.P. Buildings, Queen & Edward Streets, Brisbane, Queensland; Ronald M. Catt, Esq., Claridge House, Gawler Place, Adelaide, S.A.; W. E. Coxon, Esq., A.M.P. Chambers, William Street, Perth, W.A. Managing Editor, Oswald F. Mingay, M.Inst.R.E.Aust., M.Inst.R.E.(U.S.A.). Assistant Editor, K. H. M. Denny, M.Inst.R.E.Aust. Technical Editor, J. R. Edwards. Advertising Manager, G. W. Doyle. Melbourne Manager, R. T. Sparkes. Publishers of: "Broadcasting Business" (weekly business paper for commercial broadcasting station activities); "Broadcasting Business Year Book" (containing all reference matter required by those interested in the business of broadcasting); "Radio Retailer of Australia" (weekly trade journal covering the radio industry throughout Australia); "Radio Review" (monthly technical publication incorporating the Proceedings of the Institution of Radio Engineers (Aust.); "Radio Trade Annual" (annual publication of the radio industry).

"BROADCASTING BUSINESS," published by Australian Radio Publications Ltd., 30 Carrington Street, Sydney. 'Phone B 7188 (3 lines). National weekly trade paper covering activities of Commercial "B" Class Broadcasting Stations throughout Australia. Circulating to broadcast advertisers, national advertisers, advertising agencies, broadcasting stations, etc., throughout Australia. Price 1/- per copy or by subscription, 15/- p.a. (52 issues post free) including copy of the "Broadcasting Business Year Book." Melbourne office:—Mingay Publishing Company, 2nd Floor, 422 Little Collins Street, Melbourne ('Phone M 5438). Interstate Reps.:—C. R. Porter, Esq., C/o Broadcast Services, A.M.P. Buildings, Queen & Edward Streets, Brisbane, Queensland; Ronald M. Catt, Esq., Claridge House, Gawler Place, Adelaide, S.A.; W. E. Coxon, Esq., A.M.P. Chambers, William Street, Perth, W.A. Advertising page size, 9 ins. x 7 ins. Three 13 em columns (2 1-6 ins.) per page. Overall size 11 ins. x 8½ ins. Blocks—half-tone, 110 screen.

"BROADCASTING BUSINESS YEAR BOOK."—Published annually by Australian Radio Publications Ltd., 30 Carrington Street, Sydney. 'Phone B 7188 (3 lines). Containing full particulars of all commercial stations in Australia, also "Who's Who in Broadcasting" and various other matters of interest to broadcasting stations, advertising agencies, national advertisers, etc. 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, 9 ins. x 7 ins., two columns 20 ems (3½ ins.) per page. Overall size, 11 ins. x 8½ ins. First published in 1936.

ERDA.—Official organ of the Electrical and Radio Association of N.S.W., The Assembly Buildings, Jamieson & Margaret Streets, Sydney. 'Phone B 7503. Price 6d. per copy, 5/- per annum. Advertising page size, 9 ins. x 7 ins. Column 13 ems. 3 columns per page. Overall size, 11 ins. x 8½ ins. Editorial Committee: Chairman, J. Russell Greenwood; Editor-Secretary, Andrew F. O. Brown: Members—G. K. Dunbar, W. J. Wing, A. E. Pepper, N. H. Woollett. Monthly publication circulating throughout Australia.

"LISTENERS' WEEKLY & SCREEN NEWS."—Published by King Publicity Service, Victory Chambers, 249 Adelaide Street, Brisbane, Queensland. Price 2d., or by subscription, 8/6 p.a. All radio programmes, topical radio and screen articles, competitions, etc. Advertising page size, 9½ ins. x 7 ins., 13-em column, three columns to a page. Distributed by King Publicity Service and Gordon & Gotch Ltd. Official organ of The Queensland Listeners' League.

"RADIO RETAILER OF AUSTRALIA" (Incorporating "Electrical News"). Published by Australian Radio Publications Ltd., 30 Carrington Street, Sydney. 'Phone B 7188 (3 lines). National weekly trade newspaper circulating throughout Australia covering the whole of the radio and electrical industries, dealing chiefly with the merchandising side of all radio and electrical domestic appliances and service problems. Price 1/- per copy, or by subscription 15/- p.a. (52 issues post free) including a copy of the "Radio Trade Annual." Managing Editor, Oswald F. Mingay. Victorian Branch Office:—Mingay Publishing Company, 422 Little Collins Street, Melbourne. 'Phone M 5438. Interstate Reps.:—C. R. Porter, Esq., C/o Broadcast Services, A.M.P. Buildings, Queen & Edward Streets, Brisbane, Queensland; Ronald M. Catt, Esq., Claridge House, Gawler Place, Adelaide, S.A.; W. E. Coxon, Esq., A.M.P. Chambers, William Street, Perth, W.A. Advertising page size, 9 ins. x 7 ins. Three 13 em columns (2 1-6 ins.) per page. Overall size, 11 ins. x 8½ ins. Blocks—half-tone, 110 screen.

"RADIO TRADE ANNUAL OF AUSTRALIA."—Published by Australian Radio Publications Ltd., 30 Carrington Street, Sydney. 'Phone B 7188 (3 lines). A stiff covered cloth bound year book, published for the first time in Australia in March, 1933. Contains over 300 pages covering all subjects allied to radio, including particulars of broadcasting station activities, acts and regulations, patents information, trade association data, company particulars, an extensive technical section, "Who's Who in Radio," a complete directory of the industry throughout Australia and much other essential information. Price 10/- per copy, post free (included in subscription to "Radio Retailer" of 15/- p.a.). Managing Editor, Oswald F. Mingay. Melbourne Office:—Mingay Publishing Company, 422 Little Collins Street, Melbourne. 'Phone M 5438. Interstate Reps.: C. R. Porter, Esq., C/o Broadcast Services, A.M.P. Buildings, Queen & Edward Streets, Brisbane, Queensland; Ronald M. Catt, Esq., Claridge House, Gawler Place, Adelaide, S.A.; W. E. Coxon, Esq., A.M.P. Chambers, William Street, Perth, W.A. Advertising page size, 9 ins. x 7 ins. Two columns, 20 ems (3 1-3 ins.) per page. Overall size, 11 ins. x 8½ ins.

"RADIO REVIEW OF AUSTRALIA."—Published by Australian Radio Publications Ltd., 30 Carrington Street, Sydney. 'Phone B 7188 (3 lines). Monthly technical journal incorporating the proceedings of the Institution of Radio Engineers, Australia, and covering radio technical subjects. Circulating throughout Australia. Price 1/- per copy or by subscription, 10/- per annum post free. Managing Editor, Oswald F. Mingay. Melbourne Office:—Mingay Publishing Company, 422 Little Collins Street, Melbourne. 'Phone M 5438. Interstate Reps.:—C. R. Porter, Esq., C/o Broadcast Services, A.M.P. Buildings, Queen & Edward Streets, Brisbane, Queensland; Ronald M. Catt, Esq., Claridge House, Gawler Place, Adelaide, S.A.; W. E. Coxon, Esq., A.M.P. Chambers, William Street, Perth, W.A. Advertising page size, 9 ins. x 7 ins. Column 20 ems (3 1-3 ins.); 2 columns per page. Overall size, 11 ins. x 8½ ins. Blocks—half tone, 110 screen.

"RADIOPROGRAM PICTORIAL."—Published by Radioprogram Pty. Ltd., 148 Queen Street, Melbourne, Vic. M 2900-M 2041. Dated as published every Sunday. On sale everywhere Thursday evening. A weekly news pictorial tabloid newspaper covering the full programmes of all Victorian country and metropolitan broadcasting stations. "Radioprogram" was recently reorganised as a much larger paper, but still preserves the original features that gave it initial success. Managing Editor, H. Drysdale Bett. 32 pages, selling at 1½d. per copy. Overall size, 16½ ins. x 12 ins. Type size, 15 ins. x 10½ ins. Five columns, 12½ ems. Screen 65. Member of the A.B.C.

RADIO PUBLICATIONS—(Continued)—

"RADIO PICTORIAL OF AUSTRALIA."—Published and edited by W. J. Martin, State Building, Market Street, Sydney. 'Phone MA 7040. Published monthly. A radio pictorial of broadcasting activities especially for listeners. Profusely illustrated. Sold on bookstalls at 6d. per copy. Advertising page size, 9 ins. x 7 ins.

TELERADIO.—Printed and published by The Telegraph Newspaper Co. Ltd., Queen and Elizabeth Streets, Brisbane. 'Phone B 1383. A weekly radio magazine containing technical matter and programmes of all stations throughout Australia. Published on Saturday each week. Price 3d. per copy. Subscription rate, 52 issues, 13/- per year, post free. Advertising page size, 9¾ ins. x 7 ins. Column 13 ems (2 1-6 ins.); three columns per page. Overall size, 11 ins. x 8 ins. N.S.W. Office, Wm. C. Hubble, 15 Castlereagh Street, Sydney. 'Phone B 3141.

"THE BROADCASTER."—Published by West Australian Newspapers Ltd., Newspaper House, St. George's Terrace, Perth, W.A. 'Phone B 8161. Sydney Office:—Warwick House, Hamilton Street. 'Phone B 4802. (Rep., G. Bunstead). Melbourne Office, Newspaper House, Collins Street. (Rep., B. Rieusset). Published weekly every Saturday, containing programmes, technical features, wireless information and sporting. 64 pages, selling at 3d. per copy. Overall size, 12½ x 9 ins. Advertising page size 11 ins. x 7½ ins. Three columns, 15 ems. Blocks—half-tone, 55-65 screen newsprint.

"THE LISTENER-IN."—Published by United Press, Herald Buildings, 62-74 Flinders Street, Melbourne. 'Phone: Central 6853. Published every Saturday, containing technical and programmes. Deals with development of broadcasting, etc. Price 3d. per copy. Advertising page size, 9¼ ins. x 6¾ ins.; column 10 ems, four columns per page. Overall size, 11 ins. x 8 ins. Member Audit Bureau of Circulations. N.S.W. Office, George Snape, Manager, 15 Hamilton Street, Sydney. 'Phone B 4186.

"WEST AUSTRALIAN WIRELESS NEWS."—Published by R. S. Sampson Printing Company, 971-973 Hay Street, Perth, W.A. 'Phone B 4435 and B 7244. Published fortnightly on Fridays, dated Saturday. Containing programmes of principal W.A. stations, children's pages, technical articles and queries service, short-wave section and general features. Subscription, 6/6 p.a. post free, 3d. per single copy. Advertising page size, 9½ ins. x 7 ins. Three columns to a page, 13 ems (2 1-6 ins.). Blocks 85 screen (inside) and 120 screen (covers and insert). Overall size, 11 ins. x 8½ ins. Manager, N. McRae. Editor, J. H. Morrison. Children's pages, Mrs. W. S. Halliday.

WIRELESS WEEKLY.—Published by Wireless Newspapers Ltd., 60-66 Elizabeth Street, Sydney, telephone B 0333. A weekly radio magazine, containing technical and programme matter. Published on Friday of each week. Price 3d. per copy. Advertising page size, 9¾ ins. by 7 ins. Technical page columns 13 ems (2 1-6 ins.) Programme page columns, 10 ems (1 2-3 ins.). Technical pages, 3 columns per page. Programme pages, 4 columns per page. Overall size, 11 ins. by 8 ins. Member of Audit Bureau of Circulations. Advertising Representative, Norman Jeacocke.

See Inside Cover for Complete Contents Table

Printed by F. H. Booth & Son Ltd., 31 Burton Street, Sydney for the Publisher, Oswald F. Mingay, Woodside Avenue, Lindfield, of Australian Radio Publications Ltd., 30-32 Carrington Street, Sydney.

CONTENTS TABLE

TURN BACK TO INSIDE FRONT COVER