First Article by Ross A. Hull
New Technical Editor

THE SIGNAL BOX
FOUR VALVE RECEIVER

FURTHER NOTES
ON MODEL 'PLANE
BUILDING
The SIGNAL BOX Four
SHORT WAVE INCORPORATES
RADIOKES COMPONENTS

The Technical Editor, in this excellent little short waver, uses and recommends Radiokes parts as being the most suitable, efficient and economical.

Radiokes Midget Condensers are acknowledged as being the most precise job yet produced in this line.

They are small, efficient, and are very accurately made. Have arrow Bakelite knob, nickelled fittings, screw terminals, and specially treated plates. All sizes, from 3 plates to 23 plates, selling at moderate prices, from 4/3 to 8/6 each.

This famous little Radiokes R.F. Choke hardly calls for any description, as same is so well-known. Suffice it to say that all those who "know" regard this as the "finest job they have ever handled." Adopted by manufacturers, custom builders and experimenters alike. Price is 8/6 ea.

Radiokes Collapsible Box shields have proved a boon to home constructors, who are now building the modern, full shielded, receivers. These Shield Boxes are beautifully finished and accurately constructed, and add that professional appearance to your finished job. They can be assembled after your wiring is completed and are simply dismantled to allow you to make inspections or alterations to your set at any subsequent time. Price 15/- each.

EVERYBODY KNOWS that
RADIOKES
SHORT-WAVE
COIL KITS are
The Best that can be used in Any Receiver

The best known Short Wave Coil Kits in this portion of the world are the excellent lines put up by Radiokes. Their popularity is gained through their own High Excellence. All the best short wave receivers offered throughout Australia have incorporated and specified Radiokes Short Wave Coil Kits. This because the various technical men throughout the States have tried out all and arrived at the unanimous decision that Radiokes Coils are the finest procurable. You may use them in your signal box with the assurance that complete satisfaction will result. Price of Standard S.W. Kit is 5/- and price of Screen Grid Short Wave Coil Kit is 7/6 per kit. Both kits cover a range of 15 to 120 metres approx.

OBTAINABLE FROM ALL HIGH-CLASS DEALERS OR DIRECT FROM
METROPOLITAN ELECTRIC CO. LTD. Radiokes House, 126-130 SUSSEX STREET, SYDNEY
The Proof of the Pudding is—in these extracts

"—2YA Wellington, N.Z. comes in at good Loudspeaker strength any time after 3.30 p.m., in fact it sounds more like an interstate station. I have twice picked up WGY Schenectady, N.Y. Daylight reception on this set is marvellous." —A dealer in the Far North.

"—In addition to all Australian stations, the four Japanese stations, JOBK, JOAK, JOCK, JODK, were received by a client of mine." —A dealer in Far North West.

"—I listened to 5CL Adelaide during the test on the Loud Speaker, no other six valve set has yet done that here—" —A Braidwood dealer.

"—The Standard Astor Neutrodyne gives wonderful results at night time. It is the sweetest set that I have ever heard—" —A dealer in the South.

"—We have no trouble in bringing in all interstate New Zealand and Japanese stations. Daylight Reception is really remarkable. We have handled Radio sets for over three years and we find that Astor stands superior to any set we have heard or handled—" —A large Radio House in Victoria.

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**ASTOR Radio**

**PRICED FROM £5 TO £125**

Dealers—Write for Attractive Proposition

AMPLION A/SIA LTD., 53 YORK ST., SYDNEY.
Always the latest

at HARRINGTONS

THE G. E. PHONOGRAPH MOTORS

Motor. It is a slow-speed motor of induction disc type, giving direct drive to turntable. There are no belts to slip or commutator to cause interference and noise. Absolutely silent running is assured.

PRICE ..... £7'10'.

Turntable and Speed Control, 15/- extra.

... newest triumph of R.C.A.

MODEL 33

SIX VALVES--ALL ELECTRIC

It takes something right out of the ordinary these days to create enthusiasm to any marked degree. And already the R.C.A. 33 has created something more than a mild sensation.

It is different to any Radio Set that has appeared before—different in appearance, performance, and price. Just fancy being able to buy a 6 Valve R.C.A., which operates directly from your house lighting or power supply, for £45, and the magnificent 100B Loudspeaker for £7'10/-.

HARRINGTONS WILL ARRANGE VERY CONVENIENT TERMS

£45
R.C.A. Model 33 Receiver

£7'10'
R.C.A. Model 100B Loudspeaker

386 GEORGE STREET
Branches all States and New Zealand

Open Friday Nights. 'Phone, MA600L
Automotive Traffic Signal. A recently installed automotive traffic device, which operates by sound waves. Light stays red until driver signals with horn that he is ready to cross. The impulse of the signal changes the light to green for 30 seconds. Pedestrians operate the signal by button.

Miss B. Gaucher is demonstrating a marvelous new model train, which can be made to stop and go and directed into the "station" by giving orders over the attached telephone.
WELL, BLESS our hearts! We'll be BLOWED! And what DO you know about THAT? Good HEAVENS! Good GRACIOUS! Good GODDAMN! Take out the flute, dear friends, together with the saxophone, violin, banjo, and harp; test the strings of the old planner for primary inducements; and wind the telephone on a double-dotted crotchet. Bring forth the violas also, and the 'cellos and double basses. Tootie the cornets, harmonium, and clarinets. Let the piccolo hover over the noise; and if you have a test tray, bring it with you. You men of the choir. Are you ready? Are you ready? Are you ready? Are you ready? Bring the violas also, and the 'cellos dotted crotchet. HEAVENS! We'll see how we do.

We wish them long life, eternal happiness, good artists, and gorgeous programmes. We hope they may never receive a rough letter from anyone. We hope that their service to the public will be all the public expects.

We hope? We are past hoping, dear friends. We know. Indeed, we have reason to believe, because we are given to understand that it is rumored that there has been suggested that the future of the programmes is in good hands; that, in fact, the new company's choice of executive could not have been bettered. Oh, how does WIRELESS WEEKLY know that which everyone is wondering about at the present moment? WIRELESS WEEKLY has every reason to know better than anyone else, as will soon be divulged.

MIRRORS. Mirrors are horrible things. We see ourselves as others see us. A New Zealand paper sums up the new arrangements. "From the point of view of the programme. It creates an authority or body outside the State, against which will be directed all the complaints which may arise concerning the programmes made available. In the event of dissatisfaction, it will be open for the Government authorities to retort that they are not directly responsible, and use popular agitation as the occasion for public outrage against the programme organisation." We chuck this mirror in free, with this threepenny copy of WIRELESS WEEKLY, for the benefit of anyone who cares to see himself in it.

MISTER ORRIN E. DUNLAP, of America, has added to the glories of his name by writing a book on "Advertising by Radio." One American critic doesn't think much of it, because Miste Dunlap hasn't answered the question, "Does Broadcasting Actually Influence Sales?" Well, if it don't, 23,000,000 of the vast is going to waste on two broadcasting chains alone; which sounds about as American as Prohibition. At any rate, the answer of our own fair land to the question is, that broadcast advertising may influence Sales, but not of Radio sets—not in the right direction, we mean.

A JOURNAL, wishing to show how television has progressed, features the latest televised photograph. It is of a married couple descending the church steps. What we mean to say is, even if television is a lot while coming, there's no reason on earth why the future should be painted so miserably as all that.

"THE Goodey? We think so WIRELESS WEEKLY already knows its ABC fairly well."
Next month Broadcasting in Australia enters upon a new period of development. The successful tenderers, the Australian Broadcasting Company, promise many innovations and excellent programmes in the next three years.

Mr. Stuart F. Doyle

O-DAY is the day of quick, fast work, and meritorious rise. The philosopher may sit back and enjoy life in his own way, but it is the dynamic, fighting, hard-working man who makes life possible. The prices of living still go to the creative mentalities—to men who make accomplishments from possibilities, and to men who can organise the work of other men for the benefit of the community.

In the early 'nineties an ingenious small boy rigged up a shadowgraph show in a disused room in the home of his parents, and sought to collect pennies from his brothers, relations, and friends. It was a sign; but moving pictures weren't moving very much in those days: He was to study law. At an early age, he entered the office of a prominent firm of Sydney solicitors.

But he still remembered his shadowgraph show. He didn't want to delve into the business affairs and loves and hates and pockets of a lawyer's clients. He wanted to amuse people, and to amuse them better than anyone else could amuse them; he wanted to study their capacity for amusement and to fill that capacity to its uttermost.

In 1911 he joined the Greater J. D. Williams Amusement Co., Ltd., where, from a comparatively small position, he worked his way towards becoming the dominant personality of Union Theatres, Limited.

At forty-one, Mr. Stuart F. Doyle is all of that, and more. As head man of Union Theatres, Limited, he controls motion picture houses throughout Australia and New Zealand. The capital of his company is over three million pounds; its ramifications are spread throughout the world, and it has associate connections in every principal city of the world. Mr. Doyle's activities are not centred in the motion picture industry alone, but are distributed through commercial, sporting, and other spheres. He is known and respected in England, on the Continent, and in America, and his theatre enterprises in Australia, and the efficiency and advancement shown in the construction of his theatres, have placed him on a level where men of constructive thought win admiration, even from America, land of mighty theatres and original ideas.

"Service above all things," says Mr. Doyle.

"To give service, accept your responsibilities seriously, and reasonable profits will automatically accrue."

Now this comparatively young man is chairman of directors of the Australian Broadcasting Company, Limited, the successful tenderer for the supply of Australia's first national broadcasting service. His ideas of service and of public amusement are now to be translated into radio broadcasting, and his life-long study of the psychology of the public, and of its recreative requirements, is to be tested through a new medium. He succeeds to an interesting situation.

Broadcasting in Australia is pioneered. In each capital city, services are established, and, during five years, the industry has progressed to enormous dimensions. The Government has made its regulations for control of the industry, and the individual companies, by a series of test-and-elimination experiments, have brought forward a kind of programme, which, according to their experience, best serves the public demand. What remains to be done is to unify the opinions of the scattered companies into a complete knowledge of what the public wants, and to organise broadcasting on a national scale, so that the public will get what it wants. To Mr. Stuart Doyle the man to do this.

In his own business he is reputed to give lightning decisions on the greatest of matters, and has impressed all his undertakings with the stamp of his own personality. He has surrounded himself with a loyal and efficient organisation of clever young men, because he believes that modern business is for youth, and youth alone. He sets a tremendous pace for his subordinates, and has found that youth alone can follow him. From such a man we may expect creative schemes and efficient methods, a constant driving after original ideas and living programmes, and quick appreciation of the worth of performers before the public.

He has many revolutionary ideas, he says, which, in his opinion, will lift broadcasting out from the rut of the commonplace. As a hard-working, hard-thinking, hard-driving business organiser, he will strain every nerve to put broadcasting on a satisfactory footing.

So, whether listeners will agree with Mr. Doyle in the future, or whether they won't, they will know that broadcasting in Australia has at last found its personality.

Sir Benjamin Fuller

Sir Benjamin Fuller is probably one of the best-known figures in the theatrical business of Australia.

From a very small beginning, he and his brother, Mr. John Fuller, have built up an enormous theatrical and vaudeville business, which covers all New Zealand and every principal city in Australia. The company's activities run from vaudeville and revue to grand opera, and it has a circuit of excellent theatres, as good as, if not better than, anything of its kind in the Southern Hemisphere.
LISTENERS-in are promised the benefit of the company's various theatrical presentations. Artists under their control who are suitable for broadcasting will be readily available.

Sir Benjamin Puller has no intention of pushing his own artists down the throats of listeners-in, as he puts it. He wishes to serve the public from his sense of national responsibility and will forgo nothing in the broadcasting Company's activities which will not elevate the standard of broadcasting service.

Sir Benjamin Puller's great interest in educational matters is well known. He has endowed a bursary in perpetuity, and is ever taking an active part in the educational affairs of the community.

Mr. Frank Albert

Mr. FRANK ALBERT is a man whose great wealth and business acumen have resulted from a lifelong association with the music publishing business. He has made a phenomenal success of everything connected with music, and his musical knowledge is admitted on all sides.

He is prominent in sport, and is well known as the owner of the yachts Bona, Rawwitt, and Norn, which last he bought for his son from Lord Forster.

Mr. Albert is prominently associated with the Australian Copyright Owners' Association, and will thus be the link between the Australian Broadcasting Company, Limited, and the copyright people, so important to the broadcasting world.

Mr. Albert wishes to dispel any doubts that, because he is associated with the new broadcasting company, the music which he controls may dominate the company's programmes. On the contrary, arrangements will be made with the Australian Copyright Owners' Association to obtain the best music from every country for the new programmes.

INTERNATIONAL TIME CHART FOR S.W. LISTENERS

Comparison of Time.

Behind New South Wales, etc.

Time

To New South Wales

Sydney, Melbourne, Brisbane, Adelaide, Wellington, Christchurch, Auckland, Sydney, Melbourne, Brisbane, Adelaide, Wellington, Christchurch, Auckland

By

Time

Sydney, Melbourne, Brisbane, Adelaide, Wellington, Christchurch, Auckland

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Sydney, Melbourne, Brisbane, Adelaide, Wellington, Christchurch, Auckland

The above chart is published for the benefit of those short-wave listeners who are sometimes at a loss to figure out the times of transmission of foreign stations. The table above shown at a glance how many hours behind N.W., other countries are.
A BRIGHT FUTURE

FOR AUSTRALIAN BROADCASTING

Because we are in a position to benefit from British, Continental, and American development, Mr. Hull believes Australia's radio future is a brilliant one.

By ROSS A. HULL

I HAVE sworn off the business of giving expression to my first impressions. A halfway house, before I had the opportunity of amended after mature observation. That this reaction try is destined to be a brilliant one.

The few Australian programmes I have received all these conventional first impressions.

You know, first impressions can be so internally thin and one-sided. The writings of travelers in criticism or comment on other countries, their peoples, and their institutions provide ample evidence of this fact. One reads the brilliant and searching findings of some writer abroad concerning the judicial system of, say, Los Angeles. The whole thing, he will tell you in a series of "Smart Alec" phrases, is a criminal farce, reeking, all the way through, with filthy graft. This masterful summing-up of the unfortunate judiciary, however, was the result, in all probability of a 24-hour stop-over in the city, a half-hour coach with a taxi-driver, and two profound ten-minute discussions with hotel porters. Maybe the subject is New York night life. In this case our hero will spend an evening in the only night club he can find (where the use cover charge is far too hot and he cannot afford it) and then write back with the story that New York Night Life is a disgusting tangle. But this is solely for the benefit of pleasure-seeking tourists, and that everyone has a devil of a job trying to look as though they were enjoying themselves.

When one has gone to a foreign country, received all these conventional first impressions, and then stayed on long enough to see through the surface and to get right into the heart, one starts to appreciate these first impressions as a particularly pitiful brand of prejudice.

The few Australian programmes I have heard since my return, compared to the American broadcasting in which I have been associated as Technical Editor, seem so tame, uninteresting, and amateurish. Australian broadcasting, however, is running under such different conditions and serving such different people, that this reaction would undoubtedly be amortized after mature observation.

The one conviction that has gained weight after a few years of contact with broadcasting, is that the future of broadcasting in this country is destined to be a brilliant one. At one time, when I had the opportunity of getting an inside view of American broadcasting, I had the idea that worth-while progress would never be made on account of the limitations imposed by the conditions under which we had to operate. Now I can see that these limitations are quite insignificant, and that they are completely offset by advantages with which even the most successful broadcasting systems in other countries have not been blessed.

There is, for instance, the enormous advantage of a reasonable limit on the number of broadcasting stations. In America, with some 600 broadcasting stations in operation (a great many of them mediocre ones) an enormous problem has had to be faced in the control of their operations for the avoidance of interference. Then, it has meant that the American receiver must always be a relatively complex and costly affair, of five, six, or seven valves, if it is to provide the reception of one station at a time.

Conditions in England or in Europe are somewhat similar. In Australia, fortunately, the distribution of the few stations throughout the frequency spectrum is really not a problem at all and interference between stations need never be tolerated, even with relatively simple receiving equipment of a type available to almost everyone. At the same time it must be said that this favorable condition has been imposed upon us in this country. A great many receivers have been simplified to such an extent that even under our almost ideal frequency channel distribution they fail to serve effectively.

A further enormous advantage possessed by Australia is that it is a veritable paradise as far as atmospheric conditions are concerned. A few hundred nights of experience in listening on the broadcast frequencies in various parts of America has convinced me that the American receiver must always be a veritable paradise.

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ABOVE three years ago Ross A. Hull, then Federal Secretary of the Wireless Institute of Australia, and with an unusually creative spirit as an amateur experimenter, left Australia to tour America.

In that country he joined the headquarters of the A.R.R.L., where he became Associate Technical Editor of QST, well known to radio experimenters the world over, and Director of the Headquarters laboratory. During the last year he conducted a Technical Development Programme in that laboratory on problems pertaining to short-wave transmission and reception. The results attained in this work are considered outstanding. Already they have resulted in what could be termed a revolution in experimental short-wave technique throughout the world.

In addition to this work, Mr. Hull, who is a member of the Institute of Radio Engineers, shared the authorship of The Radio Amateur's Handbook, regarded as the most authoritative text-book of its kind.

In America he found time to visit almost all the worthwhile radio laboratories and manufacturing plants, so acquiring a valuable knowledge of modern practices and trends. Mr. Hull was obliged by the United States immigration authorities to return to Australia last month, when "Wireless Weekly" was fortunate enough to secure his services as Technical Editor.

Australia's atmospheric conditions make it a veritable radio paradise. In the Northern Hemisphere, and particularly in America, people find the atmosphere are a definite handicap.
the unique opportunity which exists for the exploitation of methods and practices found all over the world, as well as America. Lagging somewhat behind those countries, it is possible to create a structure (if only we are willing to be shown) which will work just as well as the others by reason of the better foundation on which we are able to build.

WIRELESS WEEKLY

It must be a poor customer, indeed, who is attached to his individual radio, or one who has become sure on radio just due to this state of affairs, and not let you install a pair of good modern all audio-frequency transformers after your explaining how the engineered in an impression at the time of his original purchase (and is not up to the latest), but the present transformers, which may not be vastly improved for a long time, are so much better than his old. In that there is no comparison. He was getting one or two harmonics in the voice train where three or more were coming to his set. In losing some of the harmonics you do lose the effect of speech or music, but you do not get rid of harmonics.

Transformer coupling was the first method used for audio amplification, but, due to the increased demand for radios, transformer developments came thick and fast. The next practical means for coupling the two circuits, output and input, was with resistance coupling. This method has its good points, and also its bad points, and, although in a very small minority in the field, it has its supporters.

We know that a plate circuit is a closed circuit, across tube electrons from plate to filament, no place to go. Also that a grid circuit is separate and distinct, although of open circuits at the grid, filaments, public, etc. When resistance coupling is used, you have some resistance or inductance medium to filter these out.

The action that is necessary for some medium to change the charge of electrons on the grid in conjunction with the amplitudes of audio frequencies in the preceding parts. To do this with resistance coupling a resistor, generally of 600 microfarad capacity, connects the plate and grid circuits.

A grid is always negative, and a plate to positive polarity.

One side of the condenser being connected to the positive plate has a positive charge associated with that side. This positive side attracts negative electrons to the opposite side, or in all resistance action, drawing them from any conductor attached to the opposite side.

It is seen that this condenser's other end is fastened to the grid, and, as the grid does not become positive in the condenser, it is a case of merely drawing the negative electrons from the grid to the condenser. From this we can see capable of being a negative state, or nearly positive.

The action that takes place is, the plate side of the condenser becomes more or less positively charged as more or less positive current flows in the plate circuit, which is governed by the previous grid. Then draws more or less negative electrons to the opposite side of the condenser, which grid fluctuates in unison with the plate circuit.

The grid conductor, in its state of having a strong negative end, but not a correspondingly strong positive end, is susceptible to both positive and negative plate current. The reason grid is held positive, the reason grid is stable, the reason grid is not affected by atmospheric conditions, and is not too much resistance as that volume can do.

The action of the leaks in the plate circuit is similar to a high resistance variable volume control. The leak is the resistance, you add the less plate current can pass, and as you take out resistance the more plate current can be pulled through up to the point where a tube will break down and oscillate, due to heavy plate current impressed on the plate. Therefore, the value of the leak, say 150,000 ohms is sufficient to keep the 6L4 type tubes from oscillating and is not too much resistance so that volume can do.

The action of the leaks in the grid circuit is more critical, and needs service. As the changing in value of leaks from atmospheric conditions and other conditions causes the whole action of the audio coupling to be upper, and, as there are large quantities of old type tube leak resistances in the sets now in use, the rule of non-changeable metallic leaks is a service point.

After the collection of negative electrons occurs at the condenser during a wave train and between the interests of wave trains, these electrons must properly leak some where, so a resistance leak is provided. If an leak was used, most of the electrons would rush to the positive filament at all times. In the presence of any action on the condenser, the leak becomes able to control the electrons to keep the electrons back on the condenser to which the leak is connected. In this leak has too small a value, or not enough resistance, the electrons leave the grid condenser prematurely.

The action of the leaks in the grid circuit is very sensitive, and needs the condenser. The grid leak is not in the same way as the other leaks, but it is not affected by atmospheric conditions, and is not too much resistance, as that volume can do.

The eighth article of the series on Servicing Radio by an experienced business man in radio.

Of course, quite the best method of continuing the effort to improve broadcasting to the point where there can be no denying the fact. With the new, or at least, greatly re-vamped transmitters of the immediate future, and the programme service generally, there is at least a magnificent opportunity of doing so. Just as soon as the quality of the transmitter (from an electrical standpoint) has made the necessary advances, all that remain is that the vast number of receivers in present operation are too antiquated to do justice to them. As in England and America, the radio receiver will then have every chance of coming into its own as a musical instrument of genuine charm.

Surely there is enormous scope for improvement, and a brilliant future for Australian broadcasting!
The 2BL Boy Scouts' Association session opened with loud shoutings, on Tuesday, June 11. The 1st Chatswood troop was present in the studio to give its war-cry. Mr. H. R. Lee, Honorary Deputy-Commissioner of the Association, spoke to his legions all over New South Wales, and introduced Sir Kelso King, chairman of the association. Sir Kelso King gave an interesting talk, and introduced the Governor, His Excellency, Sir Dudley de Chair, who opened the session officially from Government House.

The association's executives are most enthusiastic about the new season, and have instructed scouts (patrol masters) throughout New South Wales to arrange for the establishment of listening posts, so that their patrols may get the latest advance information of the association's activities.

It has been arranged that "WIRELESS WEEKLY" shall print weekly the latest information as to the future activities of the New South Wales Boy Scouts' Association.

Next trip of Radio Club

The Atlantic Oil Company's Deltel-electric oil tanker will be in Sydney on June 22. Mr. Norman will take a party of boys over her on that day. The Atlantic Oil Company has placed at Mr. Norman's disposal a special ferry steamer, which will leave Fort Macquarie for the Brunswick.

Executive officers of the company will be aboard the Brunswick and at the works, to explain facilities to the boys. The party will be divided up into squads of fifty.

No boy should miss this opportunity of seeing and having explained to him the intricate cases of this electrically-operated ship, whose capacity is 4,000,000 gallons of gasoline.

There will be no need for boys to bring their lunches, as the company is generously providing all kinds of light refreshments.

Miss Varley's Session

The annual elections of the 2BL Women's Sports Association are arranged for 2.30 p.m. on Monday, June 24, at the offices of the New South Wales Broadcasting Company, Limited, Market Street, when each club will be represented by its two voting delegates. All office-holders will retire, as a matter of course, but will all be eligible for re-election. Nominations will be submitted Voting will be by secret ballot.

Judging by the very happy feelings between members of the association and the committee as to the satisfactory work of the officers during the past year's activities, there is little likelihood of much change in the committee's personnel.

Clubs will also have the opportunity of nominating new club delegates for the incoming year.

Annual General Meeting

Once more we draw the attention of members and their friends to the annual general meeting of the 2BL Women's Sports Association, which will be held on Wednesday, June 26, at David Jones' private dining-hall. All club members and their friends are invited to be present. The cost will be 1/6.

This meeting will mark the close of the first year of the association's activities.

"WIRELESS WEEKLY" takes this opportunity of congratulating Miss Varley on the splendid work of the association she has organised. We doubt whether there is another such association in the world. We are sure there is no more popular women's session in Australia.

Reading Session

On Saturday morning Captain Stevens' talk will be concerned with "Temperament," a subject raised lately in "WIRELESS WEEKLY" by Mr. Barnett and Mr. Chapple.

On Sunday the Woodbine Willie sermon can be on "Lies, and the Love of God." This sermon is specially for the edification of those people who say God is a cruel God, otherwise He wouldn't let people suffer so much. The radio church service this Sunday will be a full choral service, with prayers and responses, drawn from recordings of the greatest choirs in the world.

During the week Captain Stevens' readings will be of short romances based on great historical events. Next Thursday, in the evening, he will probably interview another celebrity. And we almost forgot to mention that to-day (Friday) he will talk on "Big Game Shooting in India."

A few Sundays ago, the captain tells us, he put on his surplice and marched down the aisle of St. Barnabas' Church, Chatswood, with the choir. Rev. C. E. Adams, who often assists him during his midday Children's Session, as Uncle Bill, asked him to read the lessons. "I read the story of Ruth," said the captain, "and I made it very dramatic. I'm afraid." We said the story of Ruth was very beautiful, because it was a story of eternal youth. (We still aren't sure about this, but it seemed a safe punt.) Anyhow, the captain said he wasn't too sure about the youth part; he thought the girl was quite out of fashion—she had an absurd, old-fashioned preference for Boas.

Cooking Session

Next Saturday Mrs. Cranfield will talk on Scene-making. Mrs. Cranfield will talk about all kinds of scones, and the morning should prove very instructive indeed.

On Wednesday Mrs. Cranfield will talk on Gas Stove Cooking; and in view of the non-prevailing gas shortage the talk should not be without a certain useful charm.

On Tuesday, which should have come in a paragraph earlier, there will be instructions on how to make Wooden Crochet Slippers for the very cold weather.

One must also remember that Nurse May speaks from 2BL during Mrs. Cranfield's session on Infant Welfare, every Monday and Friday, and that Nurse Parry, of the St. John Ambulance, speaks on First Aid every Tuesday.
WIRELESS WEEKLY

THE IMPROVED COUNTRYMAN'S ONE-VALVE PICK-UP

A one-valve set under the heading, "The Countryman's One-valve," recently appeared in "WIRELESS WEEKLY," and it has been very popular, not only with country listen-
ers, but with city listeners also. Reports show that the set is a very good distance-giver.

However, there is one bugbear to the arrangement, and this lies in the fact that the receiving coil is made variable with regard to the secondary by means of a spider. It becomes extremely difficult to adjust reception with the fingers of the receiver requires adjusting on a distant station, more especially if the set is housed in a cabinet.

Therefore, the following improvement will no doubt be appreciated.

The new circuit.

WIND coils as shown in circuit diagram, all coils on the one former, which should be about one inch in di-

The old circuit.

meter. Since the 30 and the 60 turn 1 inch. Here, instead of taking the

A415, and a

coil to the fixed plates of a variable condenser. The mov-

A415

ing plates of the condenser should connect to the moving plates of the main tuning condenser.

This adjustment can be made in a few moments, and is well worth while. In fact, the improvement in-

space the 50

creased volume on distant stations is so显著 those who are reciev-

A1

ing New Zealand, Japanese, and other long distance stations (as advised by letter) should see how much further this little set will carry them.

The Dudley Cup tournament will start on Saturday, June 29, on which day the final

match of the Australasian Polo Cup will be played, and the tournament will be carried

throughout the week ending July 6.

The new circuit.

The descriptions will alternate through 2BL and 2FC throughout the week.

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However, there is one bugbear to the arrangement, and this lies in the fact that the receiving coil is made variable with regard to the secondary by means of a spider. It becomes extremely difficult to adjust reception with the fingers of the receiver requires adjusting on a distant station, more especially if the set is housed in a cabinet. Therefore, the following improvement will no doubt be appreciated.

The new circuit.

WIND coils as shown in circuit diagram, all coils on the one former, which should be about one inch in diameter. Since the 30 and the 60 turn 1 inch. Here, instead of taking the plate of the valve to one end of the coil, carry it to the fixed plates of a variable condenser. The moving plates of the condenser should connect to the moving plates of the main tuning condenser.

This adjustment can be made in a few moments, and is well worth while. In fact, the improvement increased volume on distant stations enormously so those who are receiving New Zealand, Japanese, and other long distance stations (as advised by letter) should see how much further this little set will carry them.

The Dudley Cup tournament will start on Saturday, June 29, on which day the final match of the Australasian Polo Cup will be played, and the tournament will be carried throughout the week ending July 6.

The descriptions will alternate through 2BL and 2FC throughout the week.

British Marching Songs

ALFRED CUNNINGHAM, the noted Eng-

lish baritone, has included in his pro-

grammes for the evening of July 2 a group of British Marching Songs, which he will sing with the accompaniment of the Metrop-

tolian Band. The band will play the first

verse, he will sing the second, with the drummer beating time, conveying the sugges-

tion of troops marching, then gradually

working up to the band playing full accom-

paniment. An unusual idea, which should find favor with patriotic souls. The songs are: "Tommy Atkins," "No Man's Land," "The British Grenadiers," and "The Saucy Are-

kers."
How to Make Your R.O.G. LOOP

Improvements for the model 'plane described last week. How to make it fly as you desire.

By THE PILOT

MODEL aviators who have embarked with "Wireless Weekly" on a career of model 'plane building, can have a second chance with their Baby R.O.G.'s—the 'plane they learned to build last week—if they will follow the suggestions in this article. The longer you work with the R.O.G. the more amazed you will be at its flying qualities.

The first step is to build a 'plane that will give you the longest possible flight. Any well-built R.O.G. should do 30 seconds, and the best of them will exceed 50. If the 'plane you built last week won't equal the first of these marks, let's take it back to your work-bench and see if we can't improve it. If, by any chance, you haven't built the R.O.G., you can get a kit, containing the necessary wood, metal parts, tissue, cement, etc., by getting in touch with Boy Scouts' Association Shop, 285 Pitt Street, Sydney. The directions appeared in last issue.

Most beginners make their propellers too heavy. If your ship has a tendency to nose-down, no matter how far forward you set the motor stick so that there's no danger of the two striking. Notice, too, how the thrust bearing is bent. Compare your 'plane with the drawing, and see what corrections you can make.

Many beginners make the error of powering their ships with a single-strand rubber motor. This isn't strong enough to pull the ship satisfactorily. You can make yourself a double-strand motor by taking a length of rubber a little more than twice as long as the distance from your front hook to your rear hook, and winding the loose ends in a square knot. This knot should be at the rear end of the 'plane—not the front! If it's at the front, it will strike the fuselage stick when it's turning.

Perhaps your motor catches on the "can," and won't unwind. The "can," you'll remember, is the little piano wire loop on the middle of the motor stick. Its purpose is to prevent the motor from bending the stick into a bow. If your rubber catches on it, in unwinding, your "can" isn't high enough. Bend another one, a little larger, and your motor troubles will be over.

One great reason for short flights is the weight of the 'plane. Perhaps, throughout, you have made your parts too heavy. In that case, there's just one thing to do—build another Baby R.O.G., following the dimensions in the drawing exactly. The wing spars should be just 3-32 inch wide by 1-32 thick. The motor stick should be just 1-16 inch across the top and 1-8 inch from top to bottom. Your bamboo ribs and tips should be just 3-32 inch square. Build your parts to these sizes, and your whole plane will weigh more than an ounce or so. And it will give you a long flight.

Some builders have difficulty getting the proper "set" to their wings. Both halves of the wing should form exactly the same angle with the tail surface. You can readily see that if the wings are tilting off at an angle, your plane is going to fly erratically.

MODEL AVIATION SESSION

At 6.20 every Wednesday the Pilot broadcasts from 2BL. All listeners interested in model aviation are invited to tune in. Questions and problems in construction of models are broadcast.
This drawing pictures the wing as you would see it from a point directly behind it. The heavy edge is the trailing edge. At the left, you'll notice, the leading edge is bent up. That's called "washout." Washout gives the left half of the wing more lift, because it allows the rush of air to strike under-neath the wing. And, with the left side of the wing lifting more, your 'plane will no longer have the tendency to tilt to the left.

Now notice the right half of the wing. The leading edge is depressed. This is called "washup." Washup reduces the lift on that side of the wing. This further helps correct the tendency of your plane to tilt to the left.

Experiment with washin and washout. You can give the wing washin and washout just by twisting it in your hands, so that one leading edge will be lifted up and the other depressed. By this means, and by bending your rudder, you can make your ship fly in a straight line, turn in a large circle either right or left, or turn almost on a penny. It's great fun, and it teaches you some of the principles of aerodynamics embodied in the flying of big ships.

Getting your R.O.G. to loop the loop is an art. Set your wing forward, so that the plane will climb rapidly. Then wind up your motor. You'll see a double row of loops. (You'll need lots of power for this maneuver.) Release your plane. If your wings are set correctly, your R.O.G. will loop once, turn over on its back, swoop down, and start to climb again. Perhaps it will do two loops. Get a handful of the other flyers, and you'll want to have all the model-building experience you can acquire.

More fun is the altitude contest. Set your wings to climb, wind up your motor, and see how fast your ship can reach the ceiling. Time each flight with a stop watch. The best climber wins!

Even old-time model aviators enjoy working on the Baby R.O.G. It's such a willing performer that they're continually making new ones and experimenting with them. (You'll need lots of power for this.)

Stick with your R.O.G. Next week, you're going to learn to construct the indoor pusher, a ship with the propeller BEHIND the wings, and you'll want to have all the model-building experience you can acquire.

PROBLEMS

PUZZLING out your own aeronautical problems has a certain fascination, but it is not always that you can answer your own questions.

In that case, get your best friend to jumble out your problems with you, or ask your father to help. If he can't help, read every authoritative piece of aviation literature you can get your hands on.

But should all your usual sources of information fail you, don't be discouraged. Write out your question, and send it to "The Pilot," c/o W.B.L., and it will be answered over the air or in the columns of "WIRELESS WEEKLY." A selection of the questions likely to crop up are printed below:

Q. What is the S hook for?
A. The S hook is used for fastening the rubber motor of the model airplane to the rear hook when the motor is being wound with a mechanical winch. It is not needed when the motor is wound by hand.

Q. Should I cover the bottom of my wing as well as the top, or should I cover one side or the other?
A. The wings of the Baby R.O.G., and later models, are divided into two halves, the top half being covered on the top side only, and the lower half being covered on the bottom side only. The sides should be covered on the top side only. American jeanquilts, Japanese jeanquilts, or the Japanese sash cloth with the side facing the bottom surface would not give enough additional lift.

Q. Do you cover the tail surfaces of the Baby R.O.G.?
A. The tail surfaces of both the Baby R.O.G. and the Bellanca are covered on the top side only, and the sides are flat with the fuselage.

Q. When side of the fin should be covered?
A. Should both sides be covered?

Q. Should both sides of the fin be covered?
A. Should both sides of the fin be covered when performing the loop of the plane? Side of the fin is covered. The fin gives directional control only, so it would be of no use to cover both sides.

Q. How many turns should be given to the Baby R.O.G. motor?
A. The number of turns is variable, but probably you will find 30 turns is about right for the Baby R.O.G. at first. If you go over that, you may mess you up, although it should be able to stand 40 turns without stretching, or you may break your motor shaft, which is vital.

An Aeronautical Dictionary


Everyone is out to read a book on aviation, unless it's written particularly for the beginner, finds himself asking questions like this. The words crop up everywhere—they're even beginning to crop up in everyday reading—but it's hard to tire clear and simple definitions for them.

The reason is that the science of aeronautics is a young science. Man's knowledge about heavier-than-air craft is still too new to be well organized. There are books and books, but some of them are too far behind the swiftly-advancing science to be valuable, and most of them are far too technical for the beginner.

Some of this confusion in the literature of aviation, we are printing definitions of terms used widely in flying and in aero-plane design.

Here are the first definitions. Follow them weekly in "Wireless Weekly." Learn them and try them on your friends.

Aerodynamics: The science and art pertaining to the flight of aircraft. Aeronautics is the general term that applies both to heavier-than-air and lighter-than-air craft. Which leads us to—

Aviation: The science and art of operating heavier-than-air craft, such as balloons and dirigibles.

Aircraft: A mechanically-driven heavier-than-air craft fitted with fixed wings. The airplane can thus pull the craft straight up in the air, and can thus be given a vertical rise. Suitable propellers do—by means of a vertical propeller.

Ornithopter: A form of aircraft, heavier-than-air, which flies by means of flapping wings. It is really a mechanical bird. So far no experimenter has been able to build one successfully, because of mechanical difficulties. Man isn't a bird yet.

Land Plane: An airplane fitted with landing gear, which enables it to take off from and alight on the ground. It is not adapted to rising from or alighting on the water.

Seaplane: An airplane equipped to take off from and alight on the surface of the water. It can not land on the ground and cannot land on dry ground without danger.

Amphibian: An airplane designed to alight from the surface of either the land or the water. It is a combination of the landplane and the seaplane. Note: At first blush it looks strange that aeroplanes are classified according to their landing gear, but on second thought it is natural enough. What could be more common, and an airplane must depend upon its landing gear for survival, and to get back down on the ground safely?

Another of the "flying sticks" to be described next week by WIRELESS WEEKLY. This is called a "pusher," because the propeller is behind the ship, pushing the plane forward. It flies with the small end to the front, and has made records of 150 seconds.
**NEW PROGRAMME FEATURES**

**Coming Items Which are Worth Watching For**

**Government House Musicale**

ARRANGEMENTS have been made with Lady de Chair for the New South Wales Broadcasting Company, Limited, to prepare a programme to be broadcast from Government House on the evening of Friday, June 28, through 2FC.

The artists contributing are Madame Sonya Michell—the first appearance in Australia of this Continental pianist—who is making a short stay in Sydney. Madame Michell, a pupil of Emil Sauer, has given many successful recitals on the Continent and in America, and her work is of a high standard.

Elise Steele, the noted Australian violinist, and Ernest McKinlay, well-known New Zealander, who has just returned to Australia after four years abroad with the Westminster Glee Singers, will also be associated with this programme.

DOROTHY HELMIRICH will sing from 2FC on the evening of July 3. Please don’t miss this recital. Miss Helmrich is one of the greatest artists we have heard in Sydney. She has a fine voice, but, more than that, it is her interpretation that matters. With a certainty seemingly born of intuition, Miss Helmrich renders every song as the composer intended it to be rendered, and impresses her audience with its meaning—too often an entirely new meaning for Sydney people. We believe that Miss Helmrich will follow the arranagement of her last Sydney broadcast—first, an old English and Italian group; second, German Lieder; then modern Russian; ending with several modern songs, mostly English, including several fantastic settings of old English nursery rhymes.

Regent Theatre Organ Recitals

STANLEY WALLACE, the Regent Theatre organist, will make his debut on the air on Sunday evening, June 23, when 2FC listeners will have an opportunity of enjoying an hour’s music by this well-known artist. Mr. Wallace is very keen to get acquainted with the microphone, and is busy preparing an interesting programme for the occasion of his introduction. The second recital will be broadcast through 2FL on Sunday evening, June 30.

Young Violinist

VINCENT ASPEY, the young English violinist who is rapidly coming to the fore in Sydney’s musical circles, gave a programme of big things at an early age. When he was 11 years old, he had the honor to play before the Governor-General of New Zealand (Lord Jellicoe). He has been asked to include in his programme for June 20 the same item which was so enthusiastically received on the occasion of the Governor’s reception—Vieuxtemps’ arrangement of “White Doodle.” His appearance on June 20 will be from 2FL studio.

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**WIRELESS WEEKLY**

**Page Thirteen**

**On the day Stony won at Canterbury, Mr. Ferry's rooster was crowing vigorously. So he announced a competition in which all his listeners who heard the crowing were to send in letters remarking the feat; the letters would be placed in a hat, from which Mr. Oswald Anderson, Manager of the N.S.W. Broadcasting Company, Limited, would draw the winner. The prize was the above photograph of Stony's race, including a photograph of the famous rooster, and the still more famous Mr. Ferry. The result of the competition will appear next week.**
Jack Barty at 3LO

JACK BARTY, the hale and hearty English comedian, who has created a favorable impression at the Tivoli, and is now on the air from 3LO, tells a funny story which concerns a "trick cigar" that he always carries about with him. Once when he was travelling by train to the north of England, he met a gentleman, who, hearing that he was a professional comedian, challenged Mr. Barty to make him laugh. Rather nettled by the patronizing tone of his companion, Jack told all his best yarns, but failed to raise the veilage of a smile. Finally, he put his hand in his pocket, brought out his cigar, and said, "Well, if you can't laugh at any dirty jokes, try a cigar," at the same time thrusting the "trick cigar" in his tormentor's face. One bite, and the victim knew he had been tricked, and the situation so appealed to his sense of humor that he laughed heartily, and expressed his desire to own a similar cigar so that he could play the trick on his own friends.

William G. James Talks

ONE of the most appreciated talks in the Education Hour at 3LO is that given by the distinguished Australian composer-pianist, William G. James, who will give a third disc the following Sunday, June 22. People living in the country cannot always fully realize the value of these talks to country students, who, however clever and enthusiastic they may be, often find it difficult, in the absence of a highly qualified teacher, to make any marked progress. The reason why the talks given by Mr. James have a great interest. They are brimful of helpful hints, both with regard to the theoretical and practical side of music, and when illustrated with well selected records leave nothing to be desired.

Popular Jazz Band

AN opportunity will be given to listeners on June 27 to become acquainted with the talented individual members of the Radio New South Wales "Jazz Band," who will be heard on the air from 3LO. At 3LO they have been included in the programme. B. Hall, whose clever work at the Green Mill, Elgin's, and with the "Ten Locomotives," has made him an artist of outstanding ability, will be heard in a saxophone solo. Peter Kelly of "Jazz Band," who will give a piano selection ("The Waltz of the Military") and Bob Brookshaw, who is already most popular as a pianist, will contribute "Lopezhana." In addition to their solos, the Revelers will give their customary light and attractive dance programme.

3LO SPORTING NOTES

Friday, 21st June, 1929.

WOODS, Wireless licensees in force in the Commonwealth at the end of May were as follows:

** Return of Pat MacLean **

PAT MACLEAN, who is always sure of a warm welcome from her audiences, will broadcast from 3LO on June 25, and give a new series of chat imperfections. Miss MacLean, who is a versatile little artist, has just completed a successful season at Adelaide, where she proved a great favorite.

CANON FROM THE CLASSICS

A SERIES of talks, which will be greatly appreciated by all lovers of literature, will commence from 3LO on June 27, when J. Howett Ross will be heard in "Canon From The Classics." Each talk will deal with an individual writer, and the idea is to give a brief survey of the author's life, and a reading from one of his works of an animated narrative, dramatic discourse, or beautiful lyric. Scott, Longfellow, Shakespeare, Milton, and Tennyson are numbered among the chosen and those who take the opportunity of listening will vastly improve their literary knowledge in a very pleasing manner.

OLD TIME DANCE NIGHT

FROM time to time the New South Wales Broadcasting Company receives various requests from listeners who would like to hear "better class" music; another would like steel guitar solos, a third thinks there are not quite enough sketches, a fourth complains "let us have more jazz." But there are listeners of the old school, who seldom if ever voice their wants. They appreciate the entertainment which is offered them; but to them it is not like "the old days." So now the company is giving these people an "Old Time Night." Old time dances, old time songs, bringing back memories of days gone by, when entertainment was not so easily obtainable. Saturday night, June 23, is 2FC's big "Old Time Dance Night." There will be low dance groups. Willis Shigo will supply humorous numbers, Norman Janson, Alf Lawrence and Neil Crane are singing old favorite songs. A unique feature of the programme is the space devoted to the "Grandmas" of the good old days. Throughout the evening there will be the gay cross patte of "The Old" versus "The New"—1900 and 1929. The younger generation will not like the music of the past and present, but audiences of 1900 retires gracefully, and the modern music of 1929 will conclude the programme.

THROUGHOUT the winter there are very few mid-week race meetings in the country, so that lamp lighting is relatively popular in the metropolitan area. There is a good deal of interest in the provincial meetings, but the winter meetings in the metropolitan area are of some importance, and it is expected that a great deal of interest will be taken in the broadcast descriptions of the races at the Flemington Turf Club's meeting on Wednesday June 29, by Eric Welsh, for 3LO Melbourne. Selections for the meeting by Eric Welsh will be broadcast with the news session on the night preceding the meeting. This week marks the end of the season, and the audience will be interested in reviewing the form of the candidates and giving his final selections.

** Girls' Sunday Service **

A SERVICE of great interest will be given from Scots' Church on Sunday night, June 23, and broadcast by 3LO. This will take the form of a special "Girls' Sunday Service," and will be conducted by Dr. Barrow, with an adjutant, Miss Marjorie Black, headmistress of "Fintona," who will speak on "The Girl of To-day." Thousands of Australian girls will be listening to the service, which should be well worth attention.
In the brief span of half a decade, broadcasting has grown from a diffident, friendless infant to a powerful, commanding adult.

The period of adolescence has been extraordinarily interesting, and much is to be said for those who nursed it to its present position. A short review of the development of Australian broadcasting in comparison with other countries is given below.

The next twelve months showed a remarkable increase, for by the end of December, months later the figures increased to 85,130.

The potential future for new licenses lies with the Mother-State. Assuming that of the stations may be erected by the Commonwealth four of these will be erected in New South Wales, by virtue of the geographical situation of N.S.W., the adjoining States—Queensland, South Australia, and Victoria—will come intimately under the influence of the radio programmes transmitted from New South Wales.

The Mother State's Big Factor.

The position in New South Wales was due to the large number of crystal set receivers operating in N.S.W. The ratio of one to 30 was found to be possible in Melbourne to satisfactorily receive the two "A" class stations, one in the suburbs and the other two work from the city. It has been stated that within twelve months of the operation of these high-powered "B" class stations in the suburbs of Sydney from 10,000 to 20,000 licenses lapses New South Wales one year alone. This was reflected in the licenses, for it is found that between July, 1925, and July, 1926, only 2000 increase in licenses was made. Since July, 1926, however, there has been a steady and gradual increase, in which every month shows an advance. It is interesting to compare the New South Wales yearly increases from that date:

- May, 1926, to May, 1927: 20,000
- May, 1927, to May, 1928: 21,000
- May, 1928, to May, 1929: 22,000

Crystal Sets Are Vanishing.

Three years ago the percentage of crystal sets operating in N.S.W. was about 70 per cent, the reduction from 70 per cent. to 25 per cent. its present proportion, has been effected by slow and easy stages. In Victoria, however, the large percentage to-day of crystal set receivers, estimated at 60 per cent., is explained by the fact that local interference has not played a big part in reception of programmes by listeners, and it is still possible in Melbourne to satisfactorily receive the “A” class stations’ programmes with the very simple crystal set.

As to the future of the influence of radio programmes as regards New South Wales, Victoria’s Remarkable Progress.

When the licence position in New South Wales is compared with Victoria it is realised that in the southern State has been very remarkable. The ratio to the population in Victoria is 8.07 per cent, and careful critics of the wireless situation claim that the tremendous rush of licenses in Victoria was due to the large number of crystal set receivers operating during the years 1926-27.

In twenty-four months 100,000 licenses were put on, and although no actual figures are available, it is believed that over 50 per cent. of the licensed receivers in Victoria to-day are crystal sets, whereas in New South Wales it is stated that no more than 25 per cent. of license receivers are crystal sets.

Interference Retarded Progress.

If these proportions are correct there is an explanation for it. Melbourne is happy in the present transmitting stations in the same area about 10 miles from the city, with the result that crystal reception over a distance of fifteen miles is an easy matter. There are only two “B” class stations that have any power at all operating in Melbourne, and both of these are erected right in the heart of the city. On the other hand, one “A” class transmitting station in N.S.W. is operating from one of the most populous suburbs in Sydney. In addition to this there are four “B” class stations operating in Sydney, two of which are on high power, are in the suburbs and the other two work from the city. It has been stated that within twelve months of the operation of these high-powered “B” class stations in the suburbs of Sydney from 10,000 to 20,000 licenses lapses New South Wales one year alone. This was reflected in the licenses, for it is found that between July, 1925, and July, 1926, only 2000 increase in licenses was made. Since July, 1926, however, there has been a steady and gradual increase, in which every month shows an advance. It is interesting to compare the New South Wales yearly increases from that date:

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The two factors,” says the report, “of good programmes and satisfactory reception are the basis of the new policy approved by the Government for the establishment of a National Broadcasting Service throughout the different States. The programme services from all the national stations (the Class A (National) will be provided by an organisation with the requisite experience and facilities, under contract to the Postmaster-General, who will arrange for competent and constant supervision of the programmes. In this way it may reasonably be anticipated that the services will be considerably improved in regard to items of education, information, and entertainment, all of which will be given a fair share in the programmes. The technical side will be established and maintained by the Postmaster-General’s Department.”

THE development of broadcasting in Australia during the past five years must be regarded as very satisfactory when it is realised the Commonwealth now has a ratio of 120 to 1 of population of 4,731 licenses in force.

Taking into consideration Australia’s remoteness from the older countries, its enormous area, and sparsity of population, a comparison with the ratios in other countries may be very interesting. The following figures are compiled from various sources:

<table>
<thead>
<tr>
<th>Country</th>
<th>Licenses</th>
<th>Ratio to In force. Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>238,317</td>
<td>4.78</td>
</tr>
<tr>
<td>United States</td>
<td>Unknown</td>
<td>6.50</td>
</tr>
<tr>
<td>England and Wales</td>
<td>2,450,000</td>
<td>6.35</td>
</tr>
<tr>
<td>Scotland</td>
<td>183,000</td>
<td>2.71</td>
</tr>
<tr>
<td>Germany</td>
<td>Unknown</td>
<td>4.65</td>
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<tr>
<td>Ireland</td>
<td>50,000</td>
<td>3.07</td>
</tr>
<tr>
<td>New Zealand</td>
<td>43,000</td>
<td>3.05</td>
</tr>
<tr>
<td>South Africa</td>
<td>17,000</td>
<td>1.00</td>
</tr>
</tbody>
</table>

How the Licenses Increased.

Coming to the development of licensed receivers in Australia, the following is taken from a report issued by the Postmaster-General’s Department:

"Development in Australia, of course, did not come all at once—the increase was gradual, with a certain hesitancy in the early stages.

"Taking July, 1924, as the commencing month—that is, the month when the present system of payment by listeners for services rendered was first introduced, we find at the end of that month there were 1,306 licenses in the Commonwealth. Six months later the total increased to 38,336; twelve months later the figures rose to 80,120.

The next twelve months showed a remarkable increase, for by the end of December, 1926, the Commonwealth figures totalled 187,328, with a density of 3.9 per cent. of the population of the Commonwealth. At the end of that month there were 1,306 licenses in the Commonwealth. Six months later the total increased to 38,336; twelve months later the figures rose to 80,120.

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The potential future for new licenses lies with the Mother-State. Assuming that of the stations may be erected by the Commonwealth four of these will be erected in New South Wales, by virtue of the geographical situation of N.S.W., the adjoining States—Queensland, South Australia, and Victoria—will come intimately under the influence of the radio programmes transmitted from New South Wales.

The density of licenses in Australia compares more than favorably with that of other countries. It is anticipated that 300,000 licenses will be in operation by the end of this month.

The Position in New South Wales.

Regarding licenses in New South Wales, it is interesting to note that that State (having overcome the initial difficulties in the early stages) has shown during the past two years a remarkable and steady increase in licenses not equalled by any other State in the Commonwealth. We find since May, 1927, over 40,000 new licenses have been added. It seems safe to assume that the increase in New South Wales during the remaining months of this year should reach a total of 110,000 licenses.

Relay Stations Will Increase Licenses.

As to the future, it is anticipated that one of the first relay stations to be built by the Commonwealth Government under the National Broadcasting Service will be in the Newcastle district, where there is a population of over 200,000 people who will come directly under the influence of radio. Newcastle at the present time suffers from certain disabilities in respect to its reception of programmes from Sydney. The night programmes are affected to a certain extent by distortion, and it is to the relay station that listeners in that district look for relief. It may be anticipated that within twelve months of the establishment of a relay station in the Newcastle district 20,000 new licenses will go towards swelling the total for New South Wales.

The Following is Taken

The following is taken from the departmental report previously referred to in dealing with relay stations and programmes under the National Broadcasting Service.

"The two factors," says the report, "of good programmes and satisfactory reception are the basis of the new policy approved by the Government for the establishment of a National Broadcasting Service throughout the different States. The programme services from all the national stations (the Class A (National) will be provided by an organisation with the requisite experience and facilities, under contract to the Postmaster-General, who will arrange for competent and constant supervision of the programmes. In this way it may reasonably be anticipated that the services will be considerably improved in regard to items of education, information, and entertainment, all of which will be given a fair share in the programmes. The technical side will be established and maintained by the Postmaster-General’s Department."
IS BROADCASTING SERVICE USEFUL TO FARMERS?

One occasionally hears opinions expressed about the broadcasting services that indicate a certain selfishness or else a superficial examination of the purpose of the service. Some of these opinions are directed to the market reports and other information broadcast for persons on the land. Sir James Barrett, president of the Melbourne Listeners' League, is reported to have said recently that the ideal programme should exclude these.

It is generally the city man who objects to having to hear market reports. Such criticism bears on the surface of it evidence of two kinds of selfishness. First it is unreasonable to object to items which may be interesting or valuable to others, and, also, it is presumptuous to think that every listener can find items satisfying to him at all times. If the broadcasting company satisfies any one man all the time it is failing in its service, because it cannot and does not attempt to cater for only one taste or type of listeners all the time. There must be something for everybody—for every type of listener some time or other, and it is but reasonable that there must be some sort of allotment of programme time to different tastes and interests.

Thus the market reports find a place in the programme. Stations like 3LO and 2PC have wisely made a feature of a regular service of news and information of the character more appreciated by and useful to the man on the land. And there is no doubt, either, of its usefulness or of its appreciation by the people for whom it is intended.

Many congratulatory letters are received by 3LO from country districts indicating that any reduction of the market reports service would be a distinct loss to farming interests. And, some months ago, when it was suggested in some quarters that the market reports should be curtailed, there were vigorous and numerous protests voiced by country listeners.

City dwellers are apt to forget the condition of the man on the land, and, indeed, many of them have no conception of what those conditions are. The prices of commodities produced on the farm and sold in the markets must necessarily be known by the primary producers. And, manifestly, it is added value to know what those prices are as quickly as possible after the market sales. Broadcasting is the quickest and surest means of conveying that information to the interested people far distant from the markets and well had it served the purpose.

There are very many narratives of actual experiences of farmers and others who have been able to profit by a sudden rise in market prices, which information came to them from the loud speaker. And any delay in or curtailment of that service to particular listeners would be a most unreasonable and retrograde step.

BUILDING A SET . . . No. 6

Before Working On A Set, It's A Good Idea To

Remove The Tubes

I Gotta Have A Big Book To Keep A List
Of All The Tuning Grits! Want I?

I Will Speak Through On Cuts When I Have Listened Enough To Be Sure

Why-fa' The Reason Your Set Won't Work
Is Because Your Valves
Are Burned Out—See Fa'!
Dear Sir,-For a few weeks past I have been dissatisfied with the programmes on the A. W. A., and I think it is high time that something was done about a better service. In the first place, the programmes are marred by the frequent interruptions by news bulletins and announcements. I think it is a pity that a 

2UW Modulation

Dear Sir,-Isn't it a curious fact that one of our B class stations—2UW to be exact—has the best modulation in Australia? Considering the fact that the apparatus is all A.W.A., it is not a surprising fact that this station has 100 per cent modulation, but there are other stations using the same apparatus, and their modulation is—(speak the epithet for yourself).

How can it be explained? Have not the A stations mechanics with years of practical experience, or is this all so much bunk? Of what use are these radioelectricians if they cannot give us the service for which we pay?

In addition, I consider that 2UW has the best programme. Certainly there is no variety, but this is a point in its favor, for the programmes are all alike. If we asked to pay our license fee to any particular station I wished, the station I should choose should be 2UW. If we were asked to pay our license fee to any particular station I wished, the station I should choose should be the one which is the most popular.

Yet B stations get nothing from the license. We listeners pay for the programmes only remaining on the air, I should plump for the same station.

Merit Modern Items

Dear Sir,—It would give "radio fans," especially those of the northern districts, great pleasure if a little more modern and popular items were broadcast. As the cows have come home, there are so necessary. Bad modulation is worse than a flat piano and a sharp cornet playing a duet at 3 o'clock in the morning. Yours, etc.

Sydney.

W. HEARN.

600 Metre Band

Dear Sir,—In reference to Mr. R. E. Ab- bott's remarks ("Safety Valve," 31/5/29) re-

receiving reception on 600 metres, the under-

mentioned stations were logged here during the last month:—Daylight Reception: Sydney, Melbourne, Adelaide, Hobart, Brisbane, Townsville. Night Reception: As above, plus Perth Broome, Wyndham, Cootamundra, Wellington, Awanu, Auckland, Suva, Apta, Villa, Rabaul, Madang, VQB Sandakan, VSB Nukualofa, VWB Bombay, VPB Colombo, KEP San Francisco, VPW Singapore. These were logged either on daylight or between 0100 and 0900 Sydney time, there being too much gmr and gnr on this band for DX work. The receiver uses two stages of R.F. and two stages audio.

The station mentioned by Mr. Abbott, viz., KPI, is the R.C.A. Station at Bolinas, California. This station also works on 1019 K.C. to K.A.S. Manila. For those who can read Morse, the 600-metre band has a real kick, and quite an interesting hour can be spent. Let's hear from anybody else interested in 600-metre traffic.

Yours, etc.

A. E. BILLSON.

More Modern Items

Dear Sir,—It would give "radio fans," especially those of the northern districts, great pleasure if a little more modern and popular items were broadcast. Ninety per cent. of the musical items given from the station are as ancient as the sun, and make "fans" wonder. If there is a competition among the artists to sing or play the most uncommon item, the public should put into their hands the 20th century ideal and vote for the Puritan age.

Yours, etc.

Cardiff.

"RADIO FAN."

Dismal Programmes

Dear Sir,—I quite agree with "Something to Cry Over," of Campsie. In what he has to say about tuning in 4QO, I am a country listener, and on Sunday—the only day in the week we get to ourselves—we have nothing else to listen to but a dismal church service in the morning, and during the afternoon we hear nothing until 3:15, when a few band numbers are broadcast. As the cows have to be milked at that hour, we don't hear much of it.

If the Government hands the southern stations anything like 4QO, then the southerners will find they have something to squall about.

Yours, etc.

Amamoor.

COUNTRY LISTENER.

S.W. Experiments

Dear Sir,—The following may be of interest to those of your readers who listen on short waves.

I made a short-wave receiver and a detector, and reception was everything claimed by the leader. However, having an experimental nature, I tried several little adaptations, with the result that the set is now equal to one using an R.F. stage of 2UW.

First of all, I placed a 500 fixed condenser across the primary of the first transformer. This, I found, cut the received noise considerably, and enabled me to boost up weak stations. However, some telephony stations were rather mushy, so after playing around for some time, I eventually found that a 500 fixed condenser gave the best results.

I next turned my attention to fringe fr.-a, which would present itself on different occasions. One often reads that a 100,000 ohm variable resistance across the secondary of the last transformer will do the trick. I tried this, and it was certainly an improvement, but an idea I do not understand the technical side of reception, and therefore cannot explain what made me do it, made me place the resistance at the opposite end of the circuit, i.e., between plate and B plus of the first audio transformer. The result was magical.

I found that I could receive 5SW (set is detector and two audio) from 6 a.m. till 8.30 a.m. at full speaker strength. They were perfectly clear.

At night time, RPN could be heard at fair speaker volume, so I experimented with various grid leaks, and eventually found that a 5 meg. leak in the 100-1000 was a great help. This lead suggested, boosted up the signals considerably, and absolutely removed all tendency of the set to go out of oscillation with a plop.

Perhaps these points may be useful to others.

Yours, etc.,

O. FRANKMAN.

Amateur Aviators

Dear Sir,—It was with feelings of interest and delight that I read your article on the proposed Model Air Club in to-day's "Wireless Weekly." I feel quite sure that your efforts in this direction will be highly successful. For, in myself, there are many young Australians keenly alive to the possibilities of aviation and most anxious to dabble in such an interesting and scientific hobby as model "planes building."

Unfortunately civil aviation authorities are sadly lacking in "push" and "pep," and perhaps in the new field of experiment the "ham" will again demonstrate his leadership, as he did in the wireless game. I hope soon to see that section of "Wireless Weekly" known as "Amateur Aviators." EBL and "Wireless Weekly" are to be congratulated on this "Will Do More," and may I wish you all the success you desire. Anxi-
Which Would U. Prefer?
To Chance a Set Which “Might” Work or—
Build One that has Already Proved Itself

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The 3-valve Set with the 5-valve Performance.
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**WIRELESS WEEKLY**

**Page Nineteen**

Friday, 21st June, 1929.

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### A short-wave receiver for the amateur experimenter

**THIS set is designed primarily for use in Australian experimental short-wave transmitting stations. Drastic changes have taken place in short-wave receiver design during the last year. It is now one thing for the experimenter to knock some form of old-fashioned "low loser" together in the space of an hour or two, and quite another thing to produce something that will meet present-day requirements. Not only has the number of amateur stations on the air increased considerably, but severe restrictions have been imposed on the frequencies reserved for the work of the amateur.

With the SIGNAL BOX FOUR the reader is able to set his receiver to the "all clear" position for the station he wants, whether he be short-wave broadcast listener or amateur transmitter.

Really designed for short-wave reception, yet with a good performance on the normal broadcasting channels the SIGNAL BOX FOUR should have a wide appeal. There have been many super short-wave receivers described in WIRELESS WEEKLY, such as the ALL EMPIRE and the AIR KING, and in those days primary attention was given to the requirements of the international broadcast listener, with little or no consideration to the amateur transmitter.

True, in 1928 either of those preceding receivers would have met his requirements reasonably well. But in 1929 it is a far different story. There are a lot of new factors to be taken into consideration, and the amateur knows just what is needed in the way of short-wave reception in 1929, owing to very different operating conditions. Over in America Ross A. Hull, from the Laboratory of the American Radio Relay League, made known these necessities, which included tuning to cover only the required frequency band, peaked audio amplification to help along selectivity, and many other refinements. It was certainly an extreme necessity in America, owing to the huge number of amateur stations in constant operation, and the idea naturally spread over the rest of the world.

Probably in Australasia the amateur transmitter is a little more fortunate; he is somewhat isolated from the congestion in the rest of the world. He needs selective tuning just the same, however, for the reason that high-frequency communication does cover the world to his fireside. The SIGNAL BOX FOUR is a receiver that fulfils immediately the amateur requirements without any detriment to the man who wants to roam over much wider frequencies in search of such stations as GS5SW, RKO, or PCJ.

The receiver was designed around the now well-known Lewcos short-wave coils, of which there are two to one kit. These coils are of a particularly robust design, and arranged with a six-pin base mounting, which is standard practice in England. They are, respectively, in the A.M.S.4 and the A.M.S.9. When tuned with a .0025 mfd. variable condenser the tuning range of the A.M.S.4 is from 20 to 45 metres, and the A.M.S.9 from 45 to 90 metres.

Many will say, "But that capacity is really too large for ease of tuning," and the "ham" will say, "What earthly use are two coils when tuned with such a high capacity?" That is where the difference comes in with the Signal Box Four. The writer reviewed his descriptions of the All Empire and the Air King receivers, and thought that whilst no trouble would be experienced in locating the distant telephony stations with these receivers as they stood, the tuning would be hopelessly "sudden" for the man who didn't care a rap about those phone stations and wanted to keep within those narrow confines of the "ham" bands.

How to cater for both without offending either one or the other? It was decided to test out the Lewcos coils in the first place with a somewhat lower tuning capacity, as used in the former receivers mentioned, namely, .0015 mfd. A temporary detector circuit was rigged up, using a Formo short-wave De Luxe, .0015 mfd. variable condenser, and the Lewcos six-pin mounting, and it was found that with the two Lewcos short-wave coils the whole of the useful ranges for the short-wave broadcast listener and the transmitter were well included.

This is quite all right for the first listener, but what about the second? By the introduction of a simple expedient in the form of a very small capacity tuning condenser in shunt with the main variable condenser, the transmitting amateur may spread his two most important frequencies over the world.**

---

### List of Parts for the Signal Box Four

1. Diaceto Bakelite panel, 20 by 8 by ½ inches.
2. Sheet 14 gauge aluminium, 20 by 6 inches.
4. Airzone sub-panel bracket.
5. Radiokes standard screening boxes.
6. Lewcos short wave coil kits, with two standard 6-pin base mountings.
7. Lewcos radio frequency choke.
8. Radiokes RF choke.
9. Radiokes 5-plate midget variable condensers.
11. Double circuit jack.
13. Switch arm and two contact studs.
14. TUC 91 fixed condensers.
15. Ferranti OP1 feed grid condenser.
17. Ferranti .006 feed condenser.
18. Mullard 5 meg grid resistors and holders.
19. Mullard or Ferranti 20,000 ohms fixed resistance.
20. Ormonde baby vernier dials.
21. Ford spark coil secondary winding or equivalent impedance (for peaked audio).
22. Six terminals.
23. 7-way battery plug.
24. Wiring used, Lewcos stranded insulated flex wire.
25. TCC 1 mfd feed condenser.
26. Values used, Sio-Stats 6014S (screen grid), 8819HP (detector), 8819HP 1st audio and 8819HP 2nd audio.
the whole tuning scale of a vernier dial driving this small condenser.

Looking at the circuit diagram we see that it is very little different, except for certain innovations, from the receiver the writer has described previously. A screen-grid R.F. amplifier is, of course, used, tuned as before. All the valves in this receiver are of the four-volt variety, and the screen-grid R.F. valve is one of the new Six-Sixty 8041B types, one or two samples of which have just reached Sydney. The characteristics of this valve are similar to the well-known A442 or PM11, so that no detailed description is needed here.

On each Lewcos short-wave coil unit an aerial coupling coil is included in the form of a separate winding (like the rest of the coils, of copper strip with blue silk insulation) with the filament end of the grid coil and one end of the aerial coupling coil connected together. There is, therefore, no need to make this connection on the base mounting, and in the case of the detector unit the aerial coil is, of course, not used.

There are two alternative aerial couplings to the R.F. stage, one being through the aerial coupling coil provided, and the other through a Radiokes three-plate midget variable condenser marked C6. This connects direct to the grid of the R.F. valve. It has often been found, when looking over the queries from readers who have built foregraphs and the drawings.

Passing on to the detector circuit, we find again a Lewcos coil tuned by a Formo 60015 mfd. S.W. De Luxe variable condenser, but with a small midget variable in shunt, marked C8. This midget variable is also one of the Radiokes productions, and to start with should be of the three-plate variety. The idea of this is so that the amateur transmitter may set the tuning dial of the main control at the bottom of his allocated 20 or 40 metre band, and lock it there, afterwards removing plates from the small midget until the band he requires is spread over the tuning range of the shunted vernier dial. At the filament end of the grid coil is placed a .002 Electro isolated condenser in series with the return to the variable condensers, so that the plate voltage to the R.F. valve may be passed through the grid coil to the plate of the screen-grid valve.

In series with the B positive R.F. supply is a Lewcos R.F. choke, which may be seen in the detector compartment. A .001 mfd. grid condenser is used with a 5 meg. Mullard grid leak, and the return taken down to a 400 ohm potentiometer shunted across the filament supply. The valve used as detector is a Six-Sixty BS6075HP, which performs especially well in this position.

Reaction is controlled by the variable capacity method, the condenser used being a Formo 60035 mfd. Normally 60035 is a sample with the Lewcos reaction winding, however, the connections to the Lewcos cap base mountings may be seen from the drawings. In the last screening box is placed the reaction control condenser and the free audio stage.

This audio stage is different from anything the broadcast listener has been used to, and is designed to suit either class of user, as mentioned before. It consists of a choke and resistance coupling, but with a switch to throw from the iron core choke to an open impedance winding. The iron core choke is the case of the original receiver is one of very small dimensions that the writer had by him, but this may be any of the usual audio chokes on the market, such as Ferranti.

The open winding for "peaked" audio amplification is the secondary winding of an old Ford spark coil, taken off the primary and iron wire core, and mounted vertically on a

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<table>
<thead>
<tr>
<th>R.F. Stage</th>
<th>Detector Stage</th>
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<tr>
<td>C6</td>
<td>C8</td>
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<td>C5</td>
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<td>C2</td>
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![Circuit Diagram](image-url)
the valves are of the 4 volt type, with a 4 - primary circuit. 

AF4 audio transformer.

...to C negative with a 5 megohm grid leak connected down audio coupling condenser is a T.C.C. .01 mfd.. 

'SS410SP super-power valve in the last stage.

...ohm potentiometer shunted across the secondary of the AF4. with the moving contact type.

The peaked audio amplifier will be found invaluable to the "ham," and when telephony is wanted at its best it is only a matter of a flick of the two-way switch from one to the other. By means of the 400 ohm potentiometer in the detector grid circuit, oscillation may be set for beautiful smoothly operation, and this state of affairs is essential for all parties.

In any short-wave receiver there is not the slightest excuse for "overlap," "fringe-bowl," and audio howling, and the elimination of these troubles is just a natural sequence of events. The normal performance of the SIGNAL BOX FOUR is to "pull them in as fast as you twist the dial."

WIRELESS WEEKLY

Page Twenty-One

More Wallpaper

OWNERS of undermentioned QSL cards please forward stamped addressed envelope large enough to hold the card.

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In the "SIGNAL BOX 4"
—these famous "Lewcos" products

In this issue, the Technical Editor describes the construction of a remarkably efficient short wave receiver which has given excellent results. Because of their undoubted efficiency and their compact, easy mounting, "Lewcos" Short Wave Coils and the "Lewcos" High Frequency Choke were selected for the "Signal Box Four."

"Lewcos" radio products are modern. Their design and construction are strictly in accordance with the latest improved scientific methods. Be sure to specify "Lewcos" products. It's your guarantee of perfect radio reception.

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Constructed on low loss principles. Rugged to withstand rough handling. To reduce losses its secondary is wound with with silk-insulated copper wire, giving rigidity and ultra fine tuning.
A.M. 30 10-15 metres
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"LEWCOS" GLAZITE CONNECTING WIRE, as used in the "Signal Box Four."

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SINCE we have found how an oscillating current (such as a radio signal) is rectified, we must pass on to the next stage. This is called amplification. This means that the signal is increased in electrical strength, so that when the resultant current actuates the electromagnet of a loud-speaker, there will be a great attraction of the diaphragm, and consequently, increased volume.

Probably the most frequent query met with is, "Can you tell me how to add a stage of audio to my receiver?" or "How can I increase the volume of my crystal or one-valve set, so as to work a loud-speaker?"

This has been answered many times throughout the query columns, where circuit diagrams have appeared. There are, however, many who require additional details regarding amplifiers, so that these "Proving Radio" notes should be of great interest to them, also.

Every subject referred to in this lesson has been previously treated in detail, so that there is no excuse for the reader who says "I cannot understand."

Amplifiers have many uses. Besides being capable of stepping up weak signals so that they are loud enough to work a speaker, an amplifier can (if made as a separate unit) be used to amplify a gramophone pick-up, and can be attached to any existing one-valve or crystal set.

An amplifier makes use of special stages, which vary with the system to be followed. There are two types of amplification used, distortion will result.

For best all-around results, it is generally admitted that transformer coupling is best, though a slight increase in volume may be had by using three stages of resistance coupling. However, two stages of transformer coupling constitute a maximum unit. If more than two step-up transformers are used, distortion will result.

There are other types of amplification, but these are slightly more complicated, so they will not be treated here.

There are two types of amplification used in radio. The first is termed "radio-frequency amplification," and this is used to step-up the signal before it has been rectified, i.e., before it has passed through the detector stage, and made audible. Once past the detector (i.e., the rectifier), the resultant signal can be heard, or, in other words, is audible. If we desire to increase the volume, we must add a different type of amplifier, termed an audio amplifier.

If you have a galvanometer (you can make one for a few pence, as recently described in "Proving Radio" experimental, connect this up to a coil; then, by placing another coil by the side of it, in circuit with a battery, you will find that every time the contact is made on the coil containing the battery, the galvanometer needle will swing away, and sharply rise on a line same happens when the contact is broken. This experiment is explained in detail in "Proving Radio," Part 6.

Now, you will notice that, though the current from the filament may be left on, the needle will not be deflected from its normal position until the circuit is "made" or "broken." This is because magnetic lines of force are caused to spread out from the primary, and the iron core is made or broken, and these lines of force are intercepted by the outer coil, containing the galvanometer. (This is known as the secondary.) That proves, then, that, if the current does not cause the secondary to receive any power from the primary, this can be proved by rapidly making and breaking the primary circuit, when the galvanometer needle will keep moving.

Now, if we utilise a circuit in our primary that alternates, it will readily be seem that a large current will be taken by the secondary, and that resistance current need not necessarily be A.C., for we have just proved that D.C. (direct current) from our battery will operate the galvanometer if the D.C. is made intermittent. This proves that pulsing D.C. can be used to operate the galvanometer.

It is rapidly pulsing D.C. that operates a transformer. The transformer consists merely of a primary and a secondary, as just explained, with an iron core in the centre of the windings. The reason for the inclusion of this core (which consists of a number of strips of magnetically iron) is that the magnetic lines of force are assisted in their travel from primary to secondary, as iron is the best possible conductor of magnetic lines of force. If you hold a magnet over some iron filings, or over some iron wood screws, you will see this for yourself. Try the same experiment with brass, lead, aluminium, and other metals, and you will appreciate this point even further.

Now on to construction. You will find it very easy. We shall use a one-valve transformer coupled amplifier first.

No panel will be required. Rheostats are unnecessary on a simple audio amplifier, and if the valves used take a filament voltage equal to that available at the source, filament ballasts need not be used either. A filament ballast is a fixed resistance used to break the filament voltage. For a one-valve amplifier, first mount components as shown. To the left of the base-board (which should measure six inches by six inches) mount the "input" battery strip. This is made by cutting the piece of existent 3 inches by 2 inches, and mounting two terminals upon it, i inch from the ends and 1 inch from the bottom of the strip. The base-board layout will show this clearly.

The transformer should next be mounted. See that the primary of the transformer is turned towards the input terminals. If the primary is not so marked, you will know that the primary consists of the terminals marked P and B, or Plate and B plus. If an English type transformer is used, these terminals will be marked OP and IP respectively. OP meaning output primary, which is plate, and IP, input primary, meaning B plus.

Next mount the valve socket, on which you will find four terminals. These will be marked P (plate), G (grid), and F (filament). There are two filament terminals. Keep the G terminal of the valve socket as near as possible to the G terminal of the transformer. This latter terminal will be on the secondary of the transformer. There will be two terminals, one marked G (or grid) and the other F (or filament). Sometimes this latter terminal is marked "G.B." meaning grid bias. In the English type transformer, IS (input secondary) will represent the grid, and OB (output secondary) will represent the filament.

On the right hand side of the baseboard mount another battery strip similar to the input terminals. These two latter terminals are for "output," and the loud-speaker should be connected here when the amplifier is to be used.

At the back of the panel mount another strip of enamel, this one to be of equal width, but six inches long. On this strip mount four terminals, marked A plus, A minus, B plus, and B minus.

The wiring will only take a few minutes. Start off by connecting (on the rear battery strip) A minus to B minus. Now turn in the input terminals, and connect one to the plate of the transformer, and the other to the plus of the transformer. Next connect the short wire from the grid of the transformer to the grid terminal of the valve socket, then carry a wire from the filament terminal of the transformer to the negative filament terminal of the valve socket, and then to B minus on the rear battery strip. Then connect A plus on the rear battery strip to the remaining filament terminal on the valve socket. The only connections left are the output terminals and the plate terminal of the valve socket. Connect this latter to one of the output terminals, and the other output terminal to B plus on the battery strip.

This is termed a "schematic diagram." The circuit is that of the one-valve amplifier being discussed in this week's lesson. Symbols were treated recently.
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Sole Agents: Norman Bell and Co., Ltd., 403 Adelaide Street, Brisbane; Electrical Agencies (Prop., A. G. Webster and Sons, Ltd.), 130 Collins Street, Hobart.
Connect up the "A" battery, and see if the filament is O.K. Then connect up the "B" battery, and, if everything is in order, you are ready to test out the amplifier.

This is simplicity itself. The input terminals have merely to be connected in place of the telephones on your previous set. Take a little care, however, to see that the output terminals are correct. As explained previously, the plate of the transformer is connected to that telephone terminal on your original set that is connected to the plate terminal of the previous valve. If this is not done, the amplifier will probably howl, as the primary winding is reversed.

If the set is a crystal, the above precaution does not apply.

The ratio of the transformer to be used in constructing this amplifier depends on the position it is to occupy. If already one transformer is being used in the set, the ratio of that to be used in connecting the amplifier described here should be 31:1. If, however, the existing set is not making use of transformers, the ratio can be 5:1.

Sometimes it will be found that the tone of reproduction can be improved by placing a 0.003 fixed condenser across the secondary of the transformer. If the set will not oscillate properly, this amplifier is connected, a 0.001 fixed condenser across the primary of the transformer will usually do the trick. If, however, the set whirls, there are three things that should be looked for. The first is that the primary windings of the transformer connections may be reversed. This may be done accidentally when using two transformers of different makes (one already existent in the set). The remedy is to reverse the primary connections on the amplifier.

The next is that plate and grid leads may be too close, causing interaction. The remedy is to keep these leads as far apart as possible.

Finally, the fault may be that R.F. radio frequency) is getting into the audio side of the receiver. The remedy is to place an R.F. choke in series with the plate of the detector valve. As its name implies, an R.F. choke prevents radio frequency impulses from reaching the audio side of the receiver, or in other words, stops the unrectified signal from mixing with the rectified signal.

For a two-valve amplifier, the procedure is exactly the same. Another transformer and valve socket will be required. This transformer should be connected in a ratio of 31:1. The only alteration will be to the size of the panel, and the battery strip. The plate should be 6 inches. The battery strip should have another terminal placed upon it, marked B plus maximum. To distinguish the two B plus terminals from one another, the first is usually marked B plus detector, as it supplies a positive potential to the plate of the detector valve.

After mounting all components (in the second amplifier the procedure is exactly the same as in the first) connect up the first amplifier as explained at the commencement of this article, only instead of using output terminals at the end of the first stage, take the two leads to the primary of the second transformer, remembering that the plate of the valve must go to the plate of the transformer. The other lead (which is B plus) will connect to the B plus maximum terminal, and also to one of the output terminals. The remaining output terminal will connect to the plate of the second valve socket.

The two P terminals of the transformers should be connected. As explained previously, a lead is taken from here to the negative terminal of the first valve socket.

If it is desired to use grid bias (and it is advisable for reasons which appear hereunder) leave out the connection from the P of the transformer to the valve socket, and instead take this lead to another terminal on the battery strip which should be marked C minus. This lead connects to the negative terminal of a 41 volt "C" battery. The positive terminal of this battery should connect to the negative terminal of the "A" battery, i.e., the battery which supplies the filament current. If transformers of different makes are used, the same rules for prevention of whistling will apply.

The advantages of using grid bias are:

1. Less "B" battery consumption;
2. Improvement in tone of receiver.

The disadvantages of using grid bias are:

1. (less "B" battery consumption; 2) Improvement in tone of receiver.

If already one transformer is in operation, it shows that the primary of the transformer is in operation. The advantages of using grid bias are:-

1. Less "B" battery consumption;
2. Improvement in tone of receiver.

This lead should then be taken from B negative to A negative. If, on connecting up, the "A" battery leads get hot or start to burn, quickly disconnect the lead from the "A" battery to the negative on the amplifier, then remove the lead which connects A negative to B negative. This lead should then be taken from B negative to A positive. If you take a glance at your existing receiver, you will see to which lead of the "A" battery the B negative terminal should connect.

If there is a crackling sound when the amplifier is in operation, it shows that the transformer is faulty. Probably the primary of the transformer has become burnt out. Sometimes a 100,000 ohm fixed resistor across the primary terminals of the faulty transformer will fix this.

Approximately 60 volts should be used on the amplifier, depending on the valves used. The detector should be supplied with about 221 volts, or, in any case, considerably less than the voltage used when the set was operated as a one-valve set. Unless this voltage is reduced when the amplifier is being used, the set will oscillate.

PROVING RADIO CLUB NEWS

Mr. Huey, VK2HU, has informed the Executive that he will give Morse tests on 230 metres at 8 p.m. every Sunday. Members should take full advantage of these tests. VK2HU will start on phone, so that members will be able to locate him.

The secretary reports that although all tickets have not been returned indications are that the dance held on June 6 at the Palais Royale was a success.

The Botany Group will hold its initial meeting on June 13, at the home of Mr. Judd, Botany Road, Botany. The group is still open for new members.

The Eastern Suburbs Group is now faced with the problem of finding a new meeting place. Would any person who has the room to accommodate the group please get in touch with Mr. Hoy, 29 Blairgowrie Street, Dulwich Hill (phone, Pet. 3727)?

The Auburn Group reports that the initial meeting was a great success. The subject of the meeting was the atomic and electronic theory. This group meets on Friday nights at the residence of Mr. W. R. Clark, Albert Road, Auburn, and is still open for members.

EASTERN SUBURBS.—The subject at the last meeting of this group was simple and secondary cells.

SILVEX.—This group also attacked the subject of simple and secondary cells.

WIRELESS WEEKLY

Don't send your "A" Battery away to be charged.

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PRICE £4/15/-

The FERRANTI BRITISH MADE TRICKLE CHARGER

(Incorporating the Westinghouse Metal Rectifier and a Ferranti Transformer)

Simple and safe in operation the Ferranti Trickle Charger will pay for itself over and over again. Your A Battery will be kept fully charged and in perfect condition without any trouble.

Buy a Ferranti Trickle Charger and charge your A Battery at home. May also be used to excite the Field Magnets of Moving Coil Speakers requiring half an amperc at six volts.

Obtainable from every Radio Dealer in Australia.
THE BIGGEST VALUE EVER OFFERED IN RADIO SETS

SINGER ALL ELECTRIC VI

COMPLETE WITH SPEAKER AND AERIAL

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EXQUISITE TONE
EXCEPTIONAL RANGE
UNFAILING POWER
UNLIMITED VOLUME
COSTS ONLY 3d PER DAY

COMPLETE EQUIPMENT INCLUDES: SIX VALVES
Baldwin Five Guinea Speaker, A.B.C. Power Pack, Aerial, ETC.

A Demonstration Will Convince

M.P. STERLING DYNAMIC SPEAKERS

The M.P. Sterling 80 Dynamic reproduces every tone frequency of the musical scale with wonderful fidelity that it must appeal to the most sensitive ear of the music critic. Works direct from the A.C. mains, and has very low consumption. Equipped with Hum Eliminator, which silences any A.C. hum.

Made for 200/220 volts and 220/240 volts A.C. Price, chassis £10/10/;
M.P. Sterling 6, which can be used either from your "A" Battery or "A" Socket Power Supply. Price, chassis £7/15/;

The Sterling Dynamic Units are also supplied in exquisite Walnut Cabinets, in three different designs. Prices on application.

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The Baldwin Speakers are renowned for their perfect tone quality and true reproduction. No blurring or distortion.

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A FEW years ago, when the potentialities of radio were just beginning to be understood and the future seemed like a hazy, half-formed picture, the energies of those connected with the radio industry were mainly directed towards the vacuum tube or valve, and trying to use more and more of them in these circuits, with a view to making radio available to everyone, regardless of locality or distance.

POWER IN REPRODUCTION

As we all know, this goal was achieved. The receiving set of today is not greatly influenced by distance, and now radio progress is branching out into other channels, that exceeds in scope that of its predecessor. This new trend is the development, not of power in distance reception, but of power in the reproduction of the received signal.

The same individuals and organisations who previously contended with the problem of receiving the signal are now devoting their energies to the perfection of the received signal. The problems encountered in this field of audio-frequency reproduction, although they have been great, have been vanquished just as were the problems of radio-frequency reception. There are, of course, artificial means of making the output of a radio receiver equipped with inferior transformers, the result is often disguised by using a loud-speaker that will dull or mute the high notes, which undoubtedly makes the output more pleasing; yet a critical musical ear invariably detects the fact that the entire range is not being reproduced faithfully but is simply disguised by the over-emphasised booming of the lower frequencies and the stunting of the high notes.

INPUT INTERFERENCE

In a well-designed assembly the input impedance of the amplifier is carefully matched to the source that feeds it while the output is likewise regulated to meet the requirements of the loud-speaker that is to be used. This is true not only with the input of a radio set, but with any source that may be operating the amplifier, be it microphone or phonograph pick-up. An interesting illustration of this fact is shown in the accompanying diagram. Here we have taken one of the amplifiers that was not adjusted to suit any particular pick-up, tried it out in conjunction with five different phonograph pick-ups of good manufacture, and plotted curves of the frequency response of each pick-up. As may be seen, the results were erratic, to say the least. Some pick-ups gave terrific response at frequencies where they should practically nothing at other spots where they were most needed. We then adjusted the amplifier to meet the requirements of each pick-up, and it was found that they all gave the very excellent results shown by curve No. 6. It is a simply a matter of regulating the amplifier to compensate and reinforce any deficiencies present in the phonograph pick-up employed.

PLENTY OF "LEEWAY"

Another feature of flawless reproduction at great volume is the rating of an audio frequency amplifier. An amplifier, like any other instrument, must have plenty of "lee-way." Just as a resistance manufacturer will rate a resistor at, for instance, 2 watts, when it will really stand up to 8 or 10 watts, so the master of great power, and, with the general acceptance of the "talkie," the need is becoming greater every day for amplifiers designed to meet this purpose. The ball park, the prize fight ring, or the outdoor stadium all require amplifiers to carry the full volume of the sound to the farthermost corners. Industrial uses increase also, as the value and importance of this service becomes more appreciated. Hospitals, for instance, are using moderate power amplifiers to notify the personnel of the positions of doctors and interns at all times, just as large factories use their amplifiers to keep in touch with departments and personnel.

FOR ADVERTISING

The possibilities of employing these amplifiers for advertising purposes have been appreciated, particularly in stores, restaurants, ballrooms, etc., where the amplifier generally works in conjunction with a phonograph pick-up and a microphone pick-up that may be cut in to announce numbers, prices, menus, prices, in fact, whatever the owner may be featuring. Music and speech amplified to terrific volume have poured over the city from aeroplanes. The possibilities are unlimited.

So, in closing, we may say that, although radio etiquette dictates "do not annoy the neighbors," there are many uses for tremendous power which, quite paradoxically, sometimes gives enjoyment to the neighbors, and to everyone who may not be near enough to the source of the sound to hear clearly.

POWER and SUPER POWER

How we are now able to handle power in great quantities by overcoming the problems of amplification and distortion.
FOR ONE MONTH ONLY
PERLIN RADIO BATTERIES
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6 VOLT, 7-PLATE
60 AMP. HOURS
ACTUAL CAPACITY

USUAL PRICE
£5'10'.

ONE MONTH ONLY
£2'10'

Perlin Radio Batteries need no advertising superlatives. Their qualities are known to every experienced radio user.

The wonderful opportunity extended above will only be available while stocks last.

NOTE THE COMPARISON

The Perlin straight line of Discharge which means Uniformly Perfect Reception
EVERY DAY THE SAME

This line shows why reception is good on full charge, but rapidly passes through various stages of reduced efficiency
EVERY DAY A LITTLE WORSE

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BOYD EDKINS LTD.
109-119 PHILLIP STREET - - SYDNEY
Local Programmes, Friday, June 21

**2FC**

**EARLY MORNING SESSION**
7.0: "Big Ben" and announcements. 7.05: Weather news. 7.30: Pirates. 7.45: Popular music. 8.05: "Big Ben" Close-down. 8.15: Popular music. 8.20: Symphony Orchestra. 9.0: Popular music. 9.20: Miss Gwen Selva, soprano. 9.30: Popular music. 10.0: "Big Ben" Close-down. 10.15: Popular music.

**MORNING SESSION**
10.0: "Big Ben" and announcements. 10.20: Pianoforte reproduction. 10.10: "Sydney Morning Herald" weather report. 10.30: Studio music. 10.45: A talk on Home Cooking and Recipes by Miss Ruth Furst. 11.0: John Boult and Reg Mitchell. 11.15: "Big Ben", A.P.A. and Heuter's cable services.

**MID-SSESSION**
Announcer: A. S. Cochranre.

**EARLY EVENING SESSION**
Announcer: A. S. Cochranre.
5.0: "Big Ben" and announcements. 5.30: The Children's Session, conducted by the "Hello Man" and characters, Mr. X. and Miss M. "The Friendly Five from Kookaburra Gully." 6.30: Dairy market report and stock. 6.40: Fruit and vegetable markets. 6.45: Stock Exchange. 6.50: Radio news. 6.55: Late sporting news by the 2FC racing commissioner. 7.0: "Big Ben"; late news service. 7.10: From Farmer's Restaurant. Items by the dance band.

**EVENING SESSION**
Announcer: Laurence Halbert.
Note: Favorite Item Week - Tonight the Popular music. 3.30: Programme announcements. 3.35: "Big Ben", popular music. 4.10: Romano's Cafe Dance Orchestra. 7.0: "Big Ben"; late news service. 7.30: From Farmer's Restaurant. Items by the dance band.

**2BL**

**MORNING SESSION**
Announcer: A. C. C. Stevens.

**MID-DAY SESSION**
Announcer: A. C. C. Stevens.
11.0: G.P.O. chimes; 2BL Women's Service. 11.45: Close down.

**AFTERNOON SESSION**
Announcer: A. C. C. Stevens.
12.30: "Big Ben" Close-down. 12.45: Run mid-day news service. 1.30: Talk to children and special entertainment for children in hospital by Uncle Steve. 2.0: G.P.O. chimes. Closed down.

**APPOH SESSION**
Announcer: A. C. C. Stevens.
1.30: "Big Ben" Close-down. 1.45: Popular music.

**2GB**

10.0: Music. 10.30: Talk by A. E. Bennett. 11.0: Women's Session, conducted by Miss Helen J. Beegling. 11.15: Close down. 11.30: Music. 12.0: Women's Radio Service, conducted by Mrs. Dorothy Jordan. 12.15: Close down. 2.0: From Sydney University, Union Hall. 2.15: Close down. 2.30: From Sydney University, Union Hall. 2.30: Popular music.

**2UV**

13.00: MID-DAY SESSION.
13.30: Request numbers. 1.0: G.P.O. clock and chimes. 2.0: Talk on Homecraft, by Pandorina. 2.40: Musical request numbers. 3.00: Close down. 3.30: Musical programmes.

**EVENING SESSION**
13.30: Children's session, conducted by Uncle Jack. 6.30: Close down. 7.00: G.P.O. clock and chimes. 7.15: Request numbers. 8.0: G.P.O. clock and chimes. Comments on Foreign Affairs by Mr. W. W. Paterson. 8.15: "Big Ben". Music and request numbers. 9.00: Close down.
INTERSTATE PROGRAMMES, FRIDAY, JUNE 21

3LO

EARLY MORNING SESSION:
1.30 Morning melodies.
2.00 Morning exercises.
3.00 Morning songs.
3.30 Morning news.
4.00 Morning information.
4.15 Morning melodies.
5.45 Answers to letters and birthdays greetings by Mrs. E. N. Leonard.
6.00 Captain Donald Macleay will continue his series.

EVENING SESSION:
6.00 Midsummar, "French Without Tears.
6.15 Arthur Douglas (Scotch comedian) - "With My Honey end Me" (Tobias).
6.44 Harold Williams (baritone) - "Mate o' Mine" (Elliott).
7.15 Anon (haritone) - "Becky".
7.45 Anon - "There's a Rainbow Round My Shoulder" (Pye).
8.15 Frank Waters (Radio pianist) - "Sonata Against the World" (Grieg).
8.45 Harold Williams (baritone) - "The Old Refrain" (Brandt-Krelski).
9.15 John Harcourt Bailey (entertainer) - "Now Sleeps the Crimson Petal" (Quilter).
9.45 J. Harcourt Bailey - "The Steam Roller Man's Song" (Holman).
10.15 Arthur Douglas (Scotch comedian) - "Loch Lyon" (Quiller). Time 10.30 Close down.

NIGHT SESSION:
11.00 God Save the King.
11.15 The Station Orchestra - "The Old Refrain" (Brandt-Krelski).
11.45 Selection. Time 12.00 Close down.

3AR

MORNING SESSION:
10.00: O.P.O. clock says "Ten."
10.11: "Age" market reports; news and prices, fruit, and vegetables.
10.23: "Age" shipping reports; open information.
10.35: "Age" news service, exclusive to 3AR. 10.50: Weather forecast.

MORNING MUSICAL SESSION:
10.10: He will present a famous Australian, Percy Grainger, piano "Inflammatus" sung by Florence Austral "Prelude in C Sharp Minor" (Menotti).
10.20: "Age" market reports; news and prices, fruit.
10.30: "Age" news service, exclusive to 3AR.
10.35: Weather forecast.

3GQ

EARLY MORNING SESSION:
7.45: Time signals. 7.45: News service. 7.50: Records. 8.00: Market reports; news and prices, fruit.

MORNING SESSION:
11.00: Music. 11.10: Social news. 11.15: Weather forecast.

MIDDAY SESSION:
1.00: Market reports; weather information. 1.00: From the Paris Cafe: Lunch-hour music. 2.00: Close down.

EVENING SESSION:
4.00: Mail train running times; market information; shopping information; lunch-hour music. 4.30: Commercial announcements.

NIGHT SESSION:
7.00: The Children's Hour.
7.30: "The Story of Christmas" (Quiller). Time 8.00 Close down.

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NIGHT SESSION
9.10: To-night's programme will be relayed from the Alice Gardens, Australian Hotel, Queen Street, Brisbane, and include suspense stories by Miss Eda Wright and "Vigil Sea" and "Dillies" by Victor Malan, and songs by the Anglo-Saxon Quartettes.

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FRIDAY, JUNE 21

3LO, 3AR, 4QG, 5CL, 6FW, TEL.... 30
6WF

10.50: Tune in; gramophone and phonograph records from the studio. 11.0: Close down. 12.35: Mercury news, etc. 1.0: Time signal. 1.15: Weather bulletin, supplied by the Meteorological Bureau of West Australia. 1.2: Music by the Radio Trio from the studio. 2.0: Close down.

3.30: Tune in. 4.05: Bedroom stories by Uncle Duff. 6.5: Light music by the Peer Piano Trio.
7.35: Commercial and general information. 7.40: Talk on "Rustic" by the sporting editor of the "Truth" Newspaper Co., Ltd. 8.0: Time signal. 8.1: First weather bulletin. 8.3: Musical programme; items by Mr. Figlioli, baritone; the "Karoola" Instrumental Duo, and pianoforte solos by Mrs. Audrey Dean. 8.50: Late news items, by courtesy of the "Daily News" Newspaper Co., Ltd. Station announcements.

9.50: Early news items. 10.45: Late news items, by courtesy of the "Daily News" Newspaper Co., Ltd. Station announcements.


7ZL

NIGHT SESSION.


AFTERNOON SESSION.


EARLY EVENING SESSION.

4.15: Answers to letters and birthday greetings from "Ducks Etc." and "The Merry Lady." 5.0: Time signal. 5.05: Tune in. 5.30: Readings from the "Weekly Couriers," etc. 6.30: Close down.

EVENING SESSION.


Organ Recital at 3 AR

An organ recital will be given at St. Peter's Church, Eastern Hill, by Mr. E. Monteith, P.R.O., and transmitted by 3 AR on June 22.

Description of Baseball

On Saturday, June 22, Percy Steele will describe the baseball match between Melbourne and Carlton at the Melbourne Cricket Ground, commencing at 1.30 p.m. These two teams have always occupied a leading position on the baseball premiership table, and the game should be full of interest to lovers of the game.

More Restrictions

An English county has passed a bylaw which prohibits the use of loud-speakers in such a way as to create a nuisance to residents or to passers-by. The same care should be taken with the use of artists and sopranos—it's all their fault.
Here's the complete range of Philips Speakers, which give "free speech" to your radio. With any one of them you may have music as the microphone hears it, and not only that but each is an ornament for the finest home, modern in design and delightful in colouring.

Philips "Permagnetic" Speaker, requiring no external batteries for operation. Price, £19/10/-

Philips "Peter Pan" Speaker with three position tone control switch. Price, £7/10/-

Philips "Baby Grand" Speaker, with large full-floating parchment cone. Price, £3/15/-
Ask your dealer to let you hear the new Permagnetic "Moving Coil," which is positively the finest speaker yet produced. It is the de-luxe model of the Philips range, the result of concentrated re-search by the Philips laboratories over a long period of experi-mentation. It is, in fact, a musical instrument and one which the connoisseur immediately stamps as ideal for radio and phonograph reproduction in the home.

*Philips "PCJJ" Speaker, a smaller edition of the "Peter Pan."*  
Price, £6/10/-

*Philips "Junior" Speaker, a popular Philips model finished in rich maroon.*  
Price, £4/10/-
Local Programmes, Saturday, June 22

2FC

EARLY MORNING SESSION. Announcer: A. G. Cochran. 7.0: "The Ben" and announcements. 7.2: Official weather forecast, rainfall, river reports, temperatures, astronomical memorandum. 7.12: Shipping intelligence, mail services. 7.16: Investment market, mining shares, market quotations, wool sales, broadcasts, inter-State markets, produce markets. 7.49: Studio music. 8: "Big Ben"; close.

MORNING SESSION. Announcer: Eric Bessemer. 10.0: "Big Ben" and announcements. 10.2: Piano forte reproduction. 10.10: "Sydney Morning Herald" news service. 10.15: Studio music. 10.30: Last-minute sporting information by the 2FC racing commissioneer. 10.46: Studio music. 10.49: A talk on Gardening conducted by the Hon. L. H. Lockley ("Redgum"). 11.0: "Big Ben"; A.P.A. Rafael; wireless cable services. 11.5: Close down.


EARLY EVENING SESSION. Announcer, Laurence Halbert. 5.54: The chimes of 2FC. 5.55: The Operetta Programme conducted by the "Hello Girls." 6.00: Radio music. 6.47: Rugby union news. 6.52: Late sport-reports.

Note: Favorite Item Week: Final Night, 8.0: "Big Ben"; late news service. 8.2: "Big Ben"; late news service. 8.7: The J.P. Dinner Quartette, conducted by Mr. Ronald Morgan; "The Swingin' String" (Caanahon); (b) "My Mother's Eyes" (Baer); (c) "Sweet Belle Mahone." 8.30: "Big Ben"; close. 8.54: To-morrow's programme.


STROMBERG CARLSON

New Bakelite Rheostat
Compact size Rheo, 1½in. Diameter, moisture-proof, very smooth action. 6, 10, 20, and 30 ohms.
PRICE 4/6

Puratone Transformer
PRICE 15/6

A.C. Transformer
An A.C. or Power Pack Transformer in All-metal Case. Four types, with tappings for various valves.
PRICES 30/- and 35/-

Trickle Charger
New Type Charger. Dry plate system. Rate, ½ amp. to ½ amp. Guaranteed 5000 hours.
PRICE £3/10/-
2½ amp. Charger, £4/10/-

Super Strat Condenser
PRICE .0005 12/6
PRICE .00025 and .00035 12-

Balanced Socket
PERFECTED PUSH-TYPE SOCKET.
Positive Contact.
Natural Balance.
PRICE 2/6
Sub-panel Socket, 2/-
State Interstate Programs, Saturday, June 22

3L0

EASY EARLY MORNING SESSION.

10:0 The Radio Revellers—You'reoubt in hear. [Ludicrous Sound of Baby Crying].

10:10 The Station Orchestra. Selections.

10:30 The Station Revellers—Junior Radio—Chorus, Selections.

10:38 The Station Orchestra—Bassoon and Guitar.

10:40 The Station Orchestra—Unison.

EVENING SESSION.


8.15 The Station Orchestra—Selections.

9.00 The Station Orchestra—Unison. (More Bawdy Music). By Request.

9.30 The Station Orchestra—Bassoon and Guitar.


9.40 The Station Orchestra—Selections.

WIRELESS WEEKLY

THURSDAY, JUNE 21

DEMO SESSION.

11:0 The Radio Revellers—"You're Out in Hear. [Ludicrous Sound of Baby Crying].

11:10 The Station Orchestra—Selections.

11:28 The Station Orchestra—Unison.

11:38 The Station Orchestra—Bassoon and Guitar.


11:45 The Station Orchestra—Selections.

3AR

MORNING NEWS SESSION.

10.16 to 10.50, see Friday.

MORNING MUSIC SESSION.

10.6 The Station Orchestra, "Three Preludes" by Debussy.

10.7 The Station Orchestra—Unison.

10.8 The Station Orchestra—Bassoon and Guitar.

10.9 The Station Orchestra—Unison. (More Bawdy Music). By Request.

10.10 The Station Orchestra—Selections.

10.15 The Station Orchestra—Selections.

10.20 The Station Orchestra—Unison.

10.28 The Station Orchestra—Bassoon and Guitar.


10.38 The Station Orchestra—Selections.

11.00 The Station Orchestra—Selections.

11.30 The Station Orchestra—Unison.

11.38 The Station Orchestra—Bassoon and Guitar.


11.45 The Station Orchestra—Selections.

EVENING SESSION.

18.00 The Station Orchestra—Unison. (More Bawdy Music). By Request.

18.10 The Station Orchestra—Selections.

18.28 The Station Orchestra—Bassoon and Guitar.

18.30 The Station Orchestra—Unison. (More Bawdy Music). By Request.

18.38 The Station Orchestra—Selections.

19.00 The Station Orchestra—Unison.

19.10 The Station Orchestra—Bassoon and Guitar.


19.28 The Station Orchestra—Selections.


19.38 The Station Orchestra—Selections.

20.00 The Station Orchestra—Unison. (More Bawdy Music). By Request.

20.10 The Station Orchestra—Selections.

20.18 The Station Orchestra—Bassoon and Guitar.

20.28 The Station Orchestra—Unison. (More Bawdy Music). By Request.

20.30 The Station Orchestra—Selections.


20.45 The Station Orchestra—Selections.

4QG

MORNING SESSION.

1.0 The Station Orchestra—Unison.

1.10 The Station Orchestra—Selections.

1.20 The Station Orchestra—Bassoon and Guitar.

1.28 The Station Orchestra—Unison. (More Bawdy Music). By Request.

1.30 The Station Orchestra—Selections.
Oval, football match, League Second 18 v. Huon, described by Sid Jones.

News session.

Prince of Wales and the Empire.

Lening.

report: announcements.

David.

sporting results to hand.

Caulfield, 3.30: Steeplechase, field, Victoria.

Freelam Hurdle, two miles, run at. Caulfield Racecourse, Caulfield, Victoria. 2.20: Close down.

Diaphragm Shape

Cone Distortion Eliminated by New Diaphragm Shape

Followino an exhaustive study into the cause of distortion in cone speakers, it is now known that the motor or driving unit has been responsible for some of the distortion heretofore encountered. The studies of engineers reveal that the structure of the diaphragm is an important factor in this connection.

As a result of these studies, prominent engineers have evolved a novel and ingenious diaphragm whose walls are formed in accordance with some of the more complex curves encountered in higher mathematics. This new diaphragm, which is made from a special alloy, is capable of eliminating cone distortion altogether or of at least reducing it to negligible proportions. Distortionless loud-speaker rendition has at last been realised in devices employing this diaphragm.

The new diaphragm shape will probably be extensively employed in the loud-speaker of the coming season.

MAGNAVOX DYNAMIC POWER LOUD SPEAKER

With the Magnavox Dynamic Speaker radio approaches perfection. Reproduction is now so faithful in sound and spirit, that broadcasting reaches new heights in entertainment and educational value.

THE MAGNAVOX BELVEDERE

A very beautiful floor screen model, of two-tone mahogany.

For "A" Battery Operation 

For A.C. Power Point Operation

The enjoyment of any radio set depends entirely on the speaker, and the finest set is infinitely better with a Magnavox Dynamic.

THE MANUFACTURERS

MAGNAVOX BROADCASTING CO., LTD.

Headquarters: Haymarket, Sydney.
BUILD A 3 VALVE SET FOR £2/18/9

3-tap Tuner
3 TX Valve Sockets, at 1/4
25 ohm Rheostat
5/9
2 Reel-to-Elm
2 Push-Push Taps, at 1/8
1 Terminal strip
1 Grid Lead Connector
Half Yzn. Cond. with Dial
1 Fixed Cond.
1 Filament Socket
1 RCA Socket
1 Knob

Total 2 18 9

The above parts are Guaranteed to build a
Filament Switch
S.C. Jack
30 -ohm Rheostat
3 UX Valve Sockets, at 1/3
3 -Coil Tuner

BUILD A 3 VALVE SET FOR

VICTOR E. CROMER
WIRELESS TALKS
Page Thirty-Eight
9 TO 10 O'CLOCK A.M.

SUNDAY MORNING WIRELESS TALKS
BY VICTOR E. CROMER ON HEALTH AND MARY RIVETT ON PSYCHOLOGY

Local Programmes, Sunday, June 23

2FC

MORNING SESSION.
Announcer: A. S. Ochreman.
10.0: "Big Ben" and announcements.
10.2: News service.
10.25: The Captain to His Command.
10.35: "The Violinists' Bookshelf.
10.40: Programme.
Hymn. Exhortation.
Resolution. Invocation and Lord's Prayer.
Responses (Tails).
Vehicle (Crotch).
Psalm 84 (Heywood).
First Lesson. To Deum (Jackson in F).
Second Lesson. Jubilate (Jackson in F).
Prayers. Anthem. "I Was Glad" (Elvey).
Prayers. Hymn.
Sermon, Rev. A. G. Rix.
Soprano, Rev. O. Divine Redeemer (Gound) Miss Vinia de Loffle.
Hymn. Benediction.
12.15: Afternoon session.

AFTERNOON SESSION.
Announcer: Eric Bessemer.
2.30: "Big Ben" and announcements.
2.32: Children's session, conducted by the "Hello Man."
3.0: From Christ Church, St. Laurence, an organ recital and vocal items. The programme arranged by Christian Rehseman.
3.30: From the studio, W. F. Kay will speak on "The History of Cobb's Coaches."
4.45: Popular Items.
5.0: "Big Ben." close.

EVENING SESSION.
Announcer: Laurence Halbert.
6.0: "Big Ben." programme announcements.
6.2: B. H. Bowden will speak on "Wells and Wonders of the Cathedral."
6.20: From Petersham Congregational Church, an organ recital by Ambrose TITLE.
(a) "Light Cavalry" (Suppe).
(b) "Serenade" (Schubert).
(c) "March of Venice," suite by Rossini.
(d) "Negro Spirituals."
7.0: The evening service, conducted by Rev. A. P. Doran.
Invocation and Lords Prayer.
Hymn. "Eternal God."
Responsory and Reading.
8th Psalm. Hymn. "Break Thou the Bread of Life for Me.
Lesson, Luke VI.
Hymn, "Lord, when We Bend before Thy Throne."
Prayer. Anthem.
Hymn, "Lead, Kindly Light."
Benediction.
8.35: Organ recital from Regent Theatre.
8.50: From the studio, Madame Emily Marks, soprano.
(a) "I Was Glad" (Elvey).
(b) "Hymn of the Sea" (Schubert).
(c) "Rain" (Curran).
8.57: Organ recital from Regent Theatre.
9.17: From the studio, Stanley Clarkson, basso.
(a) "O, Pure and Tender, O Star of Eve" (Wagner).
(b) "Te Deum" (Redman).
9.27: Organ recital from Regent Theatre.
9.47: From the studio, Madame Emily Marks, soprano.
(a) "To Be in the Center of the Water." (Schubert).
(b) Three Chinese Tond-poems.

1. "The Odalisque" (Carpenter).
2. "The Nightingale" (Carpenter).
3. "To a Young Gentleman" (Carpenter).
9.51: Stanley Clarkson, basso.
(a) "Shepherd, How Smile the Horse's Pooming Mane" (Korbay).
(b) "Break, Break, Break" (Lawrence).
(c) "Verrall," Betrayal (Brahms).
10.28: Late weather and to-morrow's programme.
10.30: National Anthem, close.

2BL

MORNING SESSION.
Announcer: A. C. C. Stevens.
11.0: G.P.O. chimes. From Burton Street Baptist Church. Morning service, conducted by Rev. H. O. Hucles.
11.15: Approx. from the Studio: "Sun" news at 11.15.
12.30: Studio music.
2.0: G.P.O. chimes; close down.

AFTERNOON SESSION.
Announcer: Basil Kirke.
3.0: G.P.O. chimes; studio music.
4.0: From the studio, La Trobe Church—Men's Meeting.
4.15: An Address by the Prime Minister (Mr. Bruce).
4.45: From the Studio: Studio music.
5.0: G.P.O. chimes; close down.

EVENING SESSION. 
6.0: G.P.O. chimes.
6.1: Birthday rally.
6.5: A programme supplied by the members of the Choir-up Society.
7.15: From Chalmers Street Presbyterian Church. The Evening Service, conducted by Rev. D. F. Brandt.
8.30: From the Studio: Cari Budden Morris, pianist.
(a) "Alcalde de Gluck" (St. Saens).
(b) "Wedding March" (Budden Morris).
8.42: The Sydney Harmonic Choir.
8.52: Ziitla Kalmkoff, cellist.
(a) "Alt" (Bach).
(b) "Gavotte" (Bach).
8.59: Amy Firth, soprano.
9.2: Sydney Harmonic Choir.
9.18: Ziitla Kalmkoff, cellist.
(a) "Barcarole" (Chopin).
(b) "An Den Abendstern" (Sauer).
(c) "Break, Break, Break" (Lavater).
9.32: Cari Budden Morris, pianist.
9.45: By the Beautiful Dawn" (Straus), transcribed by Schuhl-Eyler.
9.54: Sydney Harmonic Choir.
10.0: "The Odalisque" (Carpenter).
10.0: National Anthem; close.

2GB

9.0: Address by Miss Mary Rivett. 9.20: Address by Mr. Victor E. Cromer. 10.15: Organ music from St. Angelo's Church, Regent St., Sydney. 11.30: G.P.O. chimes.
12.0: Close down. 3.0: Children's session. 5.30: Lecture from Mr. Bruce. 7.0: Music from Studio. 8.15: Concert arranged by courtesy of Messrs. Winkworth and Sons. Ueble Lechleiter.
8.42: The Sydney Harmonic Choir.
8.52: Ziitla Kalmkoff, cellist.
(a) "Alt" (Bach).
(b) "Gavotte" (Bach).
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9.54: Sydney Harmonic Choir.
10.0: "The Odalisque" (Carpenter).
10.0: National Anthem; close.

2UW

10.30 a.m.: Music and request numbers. 1 p.m.: Close down. 3.30: "Hello Man." conducted by Uncle Jack. 6.30: Close down.
7.0: Musical programme. 10.30: Close down.
DETERIORATION LOSSES ARE QUOTED
THE "PERTRIX"

Long life battery

Patent dry battery is made according to a new process and does not employ sub-mercurial as an electrolyte. It does not deteriorate in store, it gives 60 per cent. more capacity for a given size of cell. It is silent to the end of the discharge.

4½ Volt, 1/-; 9 Volt, 4/-; 45 Volt, 12/-; 60 Volt, 16/-.

RIGHT OUT ON ITS OWN
THE WORLD FAMOUS
BALKITE "B" ELIMINATOR

Announcing the new BALKITE "B," the noiseless, tubeless, permanent, light socket "B" power supply.

Now
£7/17/6
£10/10/6

DILECTO BAKELITE
The ORIGINAL Genuine Bakelite Panel Material

Panels
Any size cut to order.
Edges smooth and square.

Sole Agent: O. H. O'BRIEN (Sydney)
There is a certain fascination in being able to listen to a program from some distant station, hundreds of miles away, and not be worried by an incessant background of local interference. We have made a special study of the areas where interference has caused so much trouble, and we are able to definitely cut out the local station. Let us advise you if you are experiencing the interference bugbear; it costs you nothing.

We are specialists in remodelling any type of set—Battery or Electric. Let Us Quote You

The Resco Radio Supply Co.
38A Pitt Street, SYDNEY.

'Phone, B1817.

WIRELESS WEEKLY

Interstate Programmes, Sunday, June 23

MORNING SESSION


Midday Prayer. 1.30: Choral Service from Scots' Church. 1.45: Peaceful Sunday Afternoon, from Central Street. 1.59: Job...: Only the Righteous Shall Succeed...: Selections from his 'Ave Maria' (Schubert). 2.0: Close down.

NIGHT SESSION.

5.45: Shipping information. 5.47: Answers to letters and Sunday greetings, by Abody Bungeum. 5.50: "Brother Bills" talk this week is entitled "Love that Let Me Go." Prayer. 6.15: Address, "Abide in Thy Tabernacle?" Chants; Old Testament lesson; prose Psalms. 6.45: Close down.

5CL

10.45: Cartilege of bells from Adelaide Town Hall.
11.0: Chimes. 11.4: Divine service from St Paul's Memorial Church, Pinners Street. 12.10: British official wireless a.m. 12.15: Close down.

AFTERNOON SESSION.

3.0: Chimes. 3.25: From the Albert Street Methodist Church. 3.45: Murray Murphy League in aid of the Tuberculosis Orphanage. 4.0: Close down.

EVENING SESSION.


AFTERNOON SESSION.

11.0: Morning service from St. Paul's Cathedral. 11.15: Evening service from Scots' Church. 11.28: Choral Service from Scots' Church. 11.38: "The Child Arose in Thee, Tabor!" Sermon; Old Testament lesson; prose Psalms. 11.58: Close down.

EVENING SESSION.

3.0: Pleasant Sunday Afternoon, from Central Street. 3.15: Neapolitan Trio, instrumentalists. 3.30: "Addio a Napoli." Farewell to Naples. 3.45: "Menuett." 4.0: Close down.

4:30: Close down.

WIRELESS WEEKLY

3AR

MORNING SESSION

11.0: Morning service from St. Paul's Cathedral. 11.15: Choral Service from Scots' Church. 11.28: Choral Service from Scots' Church. 11.38: "The Child Arose in Thee, Tabor!" Sermon; Old Testament lesson; prose Psalms. 11.58: Close down.

EVENING SESSION.

5.30: Close down.

MORNING SESSION

11.0: Morning service from St. Paul's Cathedral.

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5.30: Close down.
The Salonola
All Electric Wireless
eliminates batteries, and you simply "Just Plug-in" to a wall plug or lamp socket. You can have these sets now as our terms are made to suit every purse.

Open Friday Night Until 9 p.m.

YOU'LL get a red hot thrill as you listen to the Wireless tell the story, how the race is being run, how the fighter fights his fight, and how the wrestlers strain and strive for mastery 'midst the yells of delight from the ringside, and then you know immediately "Who's Won!" Our Plug-in Wireless will give you a new root in life. (No Batteries.)

5-Valve All Electric Wireless
small deposit and 11/- weekly.
3-Valve All Electric Wireless, small deposit and 8/- weekly.

The owner of any Salonola Radio can have their Set made All Electric, and thus eliminate batteries.

WE ARE STILL OPEN TO APPOINT COUNTRY AGENTS WHERE NOT REPRESENTED. WRITE FOR PARTICULARS.

HOME RECREATIONS (Aust.) LTD.
388 GEORGE ST., SYDNEY (Opposite Beard Watson's)
Local Programmes, Monday, June 24

2FC

EASY MORNING SESSION.

Announcer: A. S. Cochrane.


8.0: "Big Ben," close.

EVENING SESSION.

Announcer: Laurence Halbert.


9.0: "Big Ben" and announcements. 9.10: Coast Cables report. 9.15: "Home Cooking and Recipes" by Miss Ruth Smith, reproductions.

10.0: "Big Ben," close.

2BL

MORNING SESSION.

Announcer: A. C. C. Stevens.

8.0: G.P.O. chimes; weather report, State and Metropolitan; 8.3: Studio music. 8.15: News and information service from the Daily Telegraph Pictorial. 8.30: G.P.O. chimes; 2BL Women's Sports Service, by Mrs. Dorothy Lane. 9.0: Weather report. 9.10: Debate by the Sydney School of Arts Drama Society. 9.17: Cyril Monk, violinist. 9.27: Brunton Gibbs continues his series of "Daily Teasels Talk," "Oh, by the Way."

9.39: Hilda Lane and Dorothy Benbow.

10.0: "Life's Dream Is Love" (Auchter). 10.10: "Venetian Boat Song" (Blumen- thal). 10.45: "La Belle" (Schumann). 11.00: National Anthem; close.

AFTERNOON SESSION.

Announcer: Laurence Halbert.

2.0: Music. 2.5: Request numbers.

3.0: The chimes of 2FC. 3.15: The children's series "Swinging the Kids"

5.30: The Sydney Little Theatre: the "Mis- sionary Boys" by A. S. Cochrane, letters and stories, music and entertainment.

6.30: Delegates market reports (wheat, wool and stock).

6.45: Stock Exchange information.

6.50: Weather and shipping news.

6.55: Rugby wireless news.

6.58: Late sporting news. 7.00: "Big Ben," late news service. 7.10: The 2FC Dinner Quartet, conducted by Horace Rees. 7.20: "Cheerio" (Pinoe), (b) "Cherubim and Seraphim" (Drigo), (c) "Tango" (Handel), (d) "Full Moon" (Woodrow). (e) "Tambourine and Drum." (Pinoe).

EVENING SESSION.

Announcer: Laurence Halbert.

7.40: Popular music.

7.45: Programme announcements.

7.48: A Record recital.

8.0: "The King's Cross Theatre — The King's Cross Theatre Orchestra, con- ducted by Romano's Cafe Dance Orchestra, assisted by Mrs. Dorothy Lane, and Finance Co.'s report; weather report by courtesy of Govern- ment Meteorologist; Producers' Distributing Society's fruit and vegetable market report; grain and fodder report ("Sun"); daily pro- duce report ("Sun"). 7.30: Men and Miss Paul in Advertising Talks. 8.30: "The King's Cross Theatre Orchestra, conducted by Bennie Abrahams. 8.0: "Chalita" (Schertinger).

2GB

MORNING SESSION.

Announcer: A. C. C. Stevens.

8.0: G.P.O. chimes; weather report, State and Metropolitan. 8.3: Studio music. 8.15: News and information service from the "Evening News" midday reproductions. 9.0: "Big Ben;" weather report. 9.10: Popular studio music.


10.0: "Life's Dream Is Love" (Auchter). 10.10: "Venetian Boat Song" (Blumen- thal). 10.45: "La Belle" (Schumann). 11.00: National Anthem; close.

AFTERNOON SESSION.

Announcer: A. C. C. Stevens.

2.0: Music. 2.5: Request numbers.

3.0: The chimes of 2GB. 3.15: The children's series "Swinging the Kids"

5.30: The Sydney Little Theatre: the "Mis- sionary Boys" by A. S. Cochrane, letters and stories, music and entertainment.

6.30: Delegates market reports (wheat, wool and stock).

6.45: Stock Exchange information.

6.50: Weather and shipping news.

6.55: Rugby wireless news.

6.58: Late sporting news. 7.00: "Big Ben," late news service. 7.10: The 2GB Dinner Quartet, conducted by Horace Rees. 7.20: "Cheerio" (Pinoe), (b) "Cherubim and Seraphim" (Drigo), (c) "Tango" (Handel), (d) "Full Moon" (Woodrow). (e) "Tambourine and Drum." (Pinoe).

EVENING SESSION.

Announcer: A. C. C. Stevens.

7.40: Popular music.

7.45: Programme announcements.

7.48: A Record recital.

8.0: "The King's Cross Theatre — The King's Cross Theatre Orchestra, con-ducted by Romano's Cafe Dance Orchestra, assisted by Mrs. Dorothy Lane, and Finance Co.'s report; weather report by courtesy of Govern- ment Meteorologist; Producers' Distributing Society's fruit and vegetable market report; grain and fodder report ("Sun"); daily pro- duce report ("Sun"). 7.30: Men and Miss Paul in Advertising Talks. 8.30: "The King's Cross Theatre Orchestra, conducted by Bennie Abrahams. 8.0: "Chalita" (Schertinger).
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### InterState Programmes, Monday, June 24

#### 3LO

**EARLY MORNING SESSION**
- 7.15 to 8.00: See Previous.

**MORNING SESSION**
- 8.00: The Station Orchestra - Selection of songs.
- 8.05: Australian Children’s Symphony Orchestra and Chorus - "The Three Little Pigs" (Humperdinck).
- 9.00: The Station Orchestra - Selection of songs.
- 9.05: Australian Children’s Symphony Orchestra and Chorus - "The Three Little Pigs" (Humperdinck).

**HOLIDAY NEWS SESSION**
- 12.15: British Official Wireless news from Regular, Beulah, and Wollongong.
- 12.15: Weather service.

**AFTERNOON SESSION**
- 3.15: General program.
- 3.30: The Station Orchestra - Selection of songs.
- 3.35: Australian Children’s Symphony Orchestra and Chorus - "The Three Little Pigs" (Humperdinck).
- 4.00: The Station Orchestra - Selection of songs.

**EVENING SESSION**
- 6.10: Selection, "The Lightening Switch" (Ludovico Einaudi).
- 6.20: Selection, "The Lightening Switch" (Ludovico Einaudi).
- 7.20: Selection, "The Lightening Switch" (Ludovico Einaudi).

### 3AR

**MORNING NEWS SESSION**
- 10.00 to 10.30: See Previous.

**MORNING MEDICAL SESSION**

**AFTERNOON SESSION**
- 2.30: Short stories.
- 2.35: Falls Weathergauge. Selection, "The Three Little Pigs" (Humperdinck).
- 3.00: The Studio Orchestra - "The Three Little Pigs" (Humperdinck).

**EVENING SESSION**
- 4.00: Strains from the Symphony.
- 4.05: News Service.
- 4.10: News Service.

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### 5CL

**MORNING SESSION**
- 11.00 to 12.00: Morning news and announcements.

**AFTERNOON SESSION**
- 12.00: Morning news and announcements.

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### 6WF

**MORNING SESSION**
- 10.00: News from Melbourne, Sydney, and Adelaide.

**EVENING SESSION**
- 6.50: News from Melbourne, Sydney, and Adelaide.

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### 7ZL

**MIDNIGHT SESSION**
- 11.30 to 1.30: See Previous.

**EARLY EVENING SESSION**
- 4.10 to 5.10: See Previous.
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Clarence Street.
Local Programmes, Tuesday, June 25

2FC

EARLY MORNING SESSION. Announcer: A. S. Cochrane. 0.00: "Big Ben" and announcements. 0.02: Phonautograph reproduction. 0.10: "Sydney Morning Herald" news service. 0.12: Studio music. 0.13: Popular music. 0.18: "Big Ben." Close.

MIDNIGHT SESSION. Announcer: A. S. Cochrane. Note: Race results from Menangle will be given as received. 12.00: "Big Ben" and announcements. 12.12: Official weather forecast. 12.18: Official weather forecast. 12.30: "Big Ben." Close.


EARLY EVENING SESSION. Announcer: A. S. Cochrane. 5.30: The chimes of 2FC. 5.35: The Children's Session, conducted by the "Hello Man." 5.40: Fruit and vegetable markets. 5.43: Stock Exchange, by J. G. Lockley. 5.48: Weather intelligence. 6.00: "Big Ben." Close.

2BL


2UR


MIDMORNING SESSION. Announcer: Basil Kikte. 10.00: G.P.O. chimes. 10.05: "Big Ben." Close.


R.C.A. Model 60

The Radio Corporation of America have after years of intensive research produced an eight valve light socket operated Radio Set using the now famous superheterodyne circuit. The application of this principle to the new R.C.A. Model 60 has marked a definite advance in Radio Broadcast Science, enabling, as it does, wonderful distance reception with absolute knife edge selectivity combined with a naturality of reproduction that at first is unnerving. Further the use of this circuit enables all interstate broadcast stations to be "tuned in" with ease by anyone without the slightest knowledge of radio—only one control is used.

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Type P.M. 5x [6 volts]
Medium impedance "General Purpose" valves particularly suitable for detector and L.F. Stages.

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Ask your nearest dealer for full list of Mullard P.M. Valves.
Intersession Programmes, Tuesday, June 25

3LO

EARLY MORNING SESSION
11.0: 3LO's luncheon dish recipe, toad in a hole.
11.45: Miss E. Noble will speak on "Gas Cookery.'
12.0: "Hunk of Spongecake" (Turk), "That's What You Da' She Mad at Me" (Friend), "High Upon a Hilltop" (Crampton), "Love - Sends a Letter" (Kinkel). 1.23: The Station Orchestra, overture, "Princess Janne" (Saint-saëns).
12.20: The Station Orchestra, overture, "Henry VIII." (Thomson, ballet, "Henry VIII." (Debussy).
12.34: Stock Exchange information; results of the sheep market by the Associated Stock Exchange; report of the Meteorological Bureau of West Australia. 1.42: Announcements.
1.45: Close down.

AFTERNOON SESSION
2.15: The Ramo Revellers, "Dada" (Dore), "Oh. Ia Ia." (Grosset), "Loch Lomond" (Henderson), "I'm On the Crest of a Wave" (Henderson). 2.50: Gwen Hart, soprano, "The Old Sweet Song" (Kreisler). 3.20: Beauties of the Boy's Town, samba, "I Want to Be Your Friend" (Fesl). 3.40: Beautiful Roberta, samba, "That's Where You'll Find Me Tonight" (Wallace). 3.45: The Order of the Star of India, samba, "I Want to Be Your Friend" (Fesl).
4.0: Close down.

EVENING SESSION
5.45: textbox inserted.
6.15: News service; Stock Exchange information. 6.20: Stock Exchange information; weather forecasts; results of the sheep market by the Associated Stock Exchange.
7.0: Chimes.
7.20: Recordings.
7.45: Talk by J. C. Carew, lecturer, on "Shelter Belts.
8.0: Under the auspices of the Royal Automobile Club of Victoria, Mr. P. Hodges will speak on "The Art of Driving - Part 3.
8.50: Late news items, by courtesy of the Associated News. 9.40: Commercial and general information. 9.45: Talk by Dr. Thomas, lecturer, on "Blackbirds are Bluebird,
9.5: Close down.

Night Session
10.0: Tune in; gramophone and phonograph records from the "Waltz Lady.
10.1: God Save the King.
10.3: Close down.

3CL

MORNING SESSION
11.0: "Vikings in a Lestant" (Shelburn), "Waltz in C Minor" (Shelburn). 11.4: Weather information; close down.

AFTERNOON SESSION
2.30: Tune in; 3.30: Musical programmes from the Melbourne and the Sydney stations. 2.30: Stock Exchange information. 3.0: Mouth Dancing, by courtesy of the Associated News.
3.30: Commercial and general information. 3.45: Talk by Dr. Thomas, lecturer, on "Blackbirds are Bluebird,
4.0: Close down.

EVENING SESSION
5.45: textbox inserted.
6.15: News service; Stock Exchange information. 6.20: Stock Exchange information; weather forecasts; results of the sheep market by the Associated Stock Exchange.
7.0: Chimes.
7.20: Recordings.
7.45: Talk by J. C. Carew, lecturer, on "Shelter Belts.
8.0: Under the auspices of the Royal Automobile Club of Victoria, Mr. P. Hodges will speak on "The Art of Driving - Part 3.
8.50: Late news items, by courtesy of the Associated News. 9.40: Commercial and general information. 9.45: Talk by Dr. Thomas, lecturer, on "Blackbirds are Bluebird,
9.5: Close down.

6WF

MORNING SESSION
11.0: "Vikings in a Lestant" (Shelburn), "Waltz in C Minor" (Shelburn). 11.4: Weather information; close down.

AFTERNOON SESSION
2.30: Tune in; 3.30: Musical programmes from the Melbourne and the Sydney stations. 2.30: Stock Exchange information. 3.0: Mouth Dancing, by courtesy of the Associated News.
3.30: Commercial and general information. 3.45: Talk by Dr. Thomas, lecturer, on "Blackbirds are Bluebird,
4.0: Close down.

EVENING SESSION
5.45: textbox inserted.
6.15: News service; Stock Exchange information. 6.20: Stock Exchange information; weather forecasts; results of the sheep market by the Associated Stock Exchange.
7.0: Chimes.
7.20: Recordings.
7.45: Talk by J. C. Carew, lecturer, on "Shelter Belts.
8.0: Under the auspices of the Royal Automobile Club of Victoria, Mr. P. Hodges will speak on "The Art of Driving - Part 3.
8.50: Late news items, by courtesy of the Associated News. 9.40: Commercial and general information. 9.45: Talk by Dr. Thomas, lecturer, on "Blackbirds are Bluebird,
9.5: Close down.

7ZL

EARLY EVENING SESSION
6.15: Selections, 1.30: "The Story Lady" (Koch). 6.30: Selections. 7.0: Announcer will speak on "Who?" 7.30: Recordings.
8.0: Selections, 1.30: "The Story Lady" (Koch). 8.30: Selections. 9.0: Announcer will speak on "Who?" 9.30: Recordings.
9.45: Close down.

NIGHT SESSION
10.0: Announcer will speak on "Who?" 10.30: Close down.
DE JUR 3 COIL INTER-STATE TUNER.
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Local Programmes, Wednesday, June 26

2FC

EARLY MORNING SESSION.
Announcer: A. S. Cochrane.
7.0: "Big Ben" and announcements. 7.2: Official weather forecast, rainfall, river reports, temperatures, astronomical phenomena. 7.7: "Sydney Morning Herald" summary. 7.12: Shipping intelligence, mail services. 7.15: Studio music. 7.25: Investment market, mining sharemarkets, metal quotations, wool sales, breadstuffs markets, inter-State produce market. 8.40: Studio music. 8.6: "Big Ben", close.

MORNING SESSION.
Announcer: A. S. Cochrane.
10.0: "Big Ben" and announcements. 10.3: Piano reproductions. 10.10: "Sydney Morning Herald" news service. 10.25: Studio music. 10.45: A talk on "Home Cocktails and Recipes" by Miss Ruth Furt. 11.0: "Big Ben". A.P.A. and Reuter's cable services. 11.5: Close.

MIDDAY SESSION.
Announcer: A. S. Cochrane.

AFTERNOON SESSION.
Announcer: A. S. Cochrane.
2.30: Programme announcements. 2.35: A record selection. 2.5: "Big Ben", popular music. 3.35: James Walker, pianist. (a) "Prelude and Fugue in B Flat Major," No. 21 (Bach). 3.45: A Reading. 4.10: Radio's Cafe Dance Orchestra, conducted by Benne Abraham. 4:15: Studio items. 4.20: James Walker, pianist. (b) "First Movement from Sonatas in E Major, Op. 38 (Beethoven). 4.30: C. S. Y. Wood will speak on "Beethoven and the Big Ben". 4:35: "Evening News" midday news service. 4:35: "Sun" news. 4:35: Studio music. 4:40: "Big Ben": 4:45: Stock Exchange, third call. 4:45: Cafe Dance Orchestra, conducted by Benne Abraham. 5.0: "Big Ben":

EARLY EVENING SESSION.
Announcer: A. S. Cochrane.
5.30: "Big Ben": 5.35: The Children's Session, conducted by the "Hello Man." 5.37: Popular music. 5.40: Children's letters and stories. Music and entertainment. 5.42: "The Smith Family's" market report (wool, wheat, and stock). 6:0: Fruit and vegetable market report. 6.0: "Sydney Morning Herald" Stock Exchange Information. 6.05: Weather and shipping news. 6.55: Rugby wireless news. 7.0: Late sporting news. 7.0: "Big Ben": late news service. 8:0: The "2FC Dinner Quartette", conducted by Herber Real. Songs by Robert Scott, tenor. (a) "Marche Militaire" (Schubert). (b) "Kracko" (Tune). (c) "The Golden Moth" (Novello). (d) "The Island King" (Garratt). (e) "Humoresque".

EVENING SESSION.
Announcer: Laurence Halbert. Accompanist: Ewart Chapple. 7.40: Popular music. 7.45: Programme announcements. 7.50: A record record. 8.0: Modern plays and music arranged by Ewart Chapple, in conjunction with Don Finley. 8.0: Assisting artists: Ida Turnbull and Julian Van der Klee. 10:00: Late "Evening News" service. 10:10: Late weather and to-night's programme. 10:30: National Anthem; close.

2BL

MORNING SESSION.
Announcer: A. C. C. Stevens.

MIDDAY SESSION.
Announcer: A. C. C. Stevens.

AFTERNOON SESSION.
Announcer: A. C. C. Stevens.
2.45: O.P.O. chimes. Popular music. 3.0: O.P.O. chimes. Nellie Ferguson, songs at the piano. (a) "Nim, Nim, Nimmo" (Weatherby and Monckton). (b) "My Little Chinmay Sweeping" (Greenbank and Monckton). 4.15: Basil Kirke will speak on "Pacific Problems, Fruition and Federation". 4.30: "Iolanthe" (Sullivan), (d) "Iolanthe" (Sullivan). (f) "My Little Chimney Sweep" (Greenbank and Monckton). 5.0: O.P.O. chimes. Close down. Note: Race results from Rosebery will be broadcast by arrangement with the "Sun" newspapers.

EARLY EVENING SESSION.
Announcer: A. C. C. Stevens.
4.45: O.P.O. chimes. Popular music. 4.45: O.P.O. chimes. Nellie Ferguson, songs at the piano. (a) "Marche Militaire" (Schubert). (b) "Kracko". (c) "Little Dance" (Greenbank and Monckton). 5.15: Popular music. 5.22: Dancing resume. 5.27: Features of the evening programme.

2UE

MORNING SESSION.
Announcer: J. P. Kirko.
11.0: Music. 11:00: Programmes announced. 11.10: From the Studio: To-morrow's programme. 11.10: From the Town Hall: Dance music and description of the Fire Brigades Ball. 10:30: From the Studio: To-morrow's programme.

11.30: From the Town Hall: Dance music and description of the Fire Brigades Ball.


2GB

MORNING SESSION.
10.0: Music. 10.10: "Hello Man" talk by A. Bennett. 10.20: Music. 10.20: Women's session, by Miss Helen J. Beegling. 11.00: Close down. 2.0: Music. 2.5: Women's Radio Service, by Mrs. Dorothy Jordan. 2.50: Magic. 3.0: Labor Saving Demonstration, from Rock and Kirby. 4.0: Close down. 5.0: "The New Male Voice party. 8.15: Symphony Orchestra. 11:25: Mr. Jack Win and Miss Nola Windle in a dramatic sketch. 8.35: Miss Gladys Vercey, soprano. 9.0: Weather report. 9.3: Symphony Orchestra. 9.15: The New Male Voice party. 9.30: Humorous interlude by Mr. Jack Win and Mr. Heath Burt. 9.35: Instrumental trio 8.40: Mr. Jack Win and Miss Nola Windle in a humorous sketch. 9.50: Miss Gladys Vercey, soprano. 10.0: Instrumental music. 10.30: Close down.

2UE

MID-DAY SESSION.
12.30: Request numbers. 10.0: O.P.O. clock and chimes. 10:30: Mr. C. O. Stevens' magic. 11:00: Dancing by "Pandora". 13.00: Music and request numbers. 13.30: Close down. 4.30: Close down. 4.50: Popular music.

EVENING SESSION.
11.30: Children's "Hello Man," conducted by Uncle Jack. 11.50: Close down. 7.0: O.P.O. clock and chimes. 7.30: Dancing by "Pandora". 8.0: O.P.O. clock and chimes. Comments on Foreign Affairs, by Mr. J. M. Preston. 8.30: Music and request numbers. 10.30: Close down.

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Local Programmes, Thursday, 27 March, 1929

2FC

EARLY MORNING SESSION.

Announcer: A. S. Cochrane.

7.0: "Big Ben" and announcements.
7.2: Official weather forecast, rainfall, river reports, temperatures, astronomical memoranda.
7.7: "Sydney Morning Herald" summaries.
7.12: Shipping intelligence, mail services.
7.15: Studio music. 7.25: Investment market, metal quotation market, wool sales, bargains, mail prices, inter-State mail services. 7.40: Studio music.
8.0: "Big Ben." Close.

MORNING SESSION.

Announcer: A. S. Cochrane.

10.0: "Big Ben" and announcements.
10.2: Piano selections.
10.10: "Sydney Morning Herald" news service. 10.20: Studio music.
10.30: Last minute sporting information by the 2FC Racing Commissioner.
10.40: Studio music. 11.0: "Big Ben." A.P.A. and Keats's call signals. 11.5: Close down.

MIDDAY SESSION.

Announcer: A. S. Cochrane.

12.0: "Big Ben" and announcements.
12.1: Stock Exchange, first call.
12.3: Official weather forecast, rainfall.
13.00: Popular Studio music. 13.05: Last minute sporting information by the 2FC Racing Commissioner.
13.20: "Big Ben." Close.

AFTERNOON SESSION.

Announcer: Laurence Halbert.

2.30: Programme announcements.
2.32: A Record of Events (2FC). 2.35: Populated postcards.
2.50: "To a Butterfly" (Wolcot). 2.52: "A Bowl of Wreaths" (Leyitski). 2.55: Popular music. 2.59: Gordon Green, soprano.
3.00: "Big Ben." Close.

EARLY EVENING SESSION.

Announcer: A. S. Cochrane.

5.40: "Big Ben." Close.

LATE EVENING SESSION.

Announcer: A. S. Cochrane.

7.20: "Big Ben." Close.

2BL

MORNING SESSION.

Announcer: A. C. C. Stevens.

8.17: "Big Ben." Close.

MIDDAY SESSION.

Announcer: A. C. C. Stevens.

11.0: G.P.O. chimes.
11.20: 2BL Women's Sports Association. Seated, conducted by Miss Gwyn Valentine. 11.30: Advertising hints. 11.40: Women's session, conducted by Miss Cranfield. 11.45: "Big Ben." Close.

AFTERNOON SESSION.

Announcer: A. C. C. Stevens.

2.48: "Big Ben." Close.

EVENING SESSION.

Announcer: A. C. C. Stevens.

5.30: Children's session, conducted by Uncle Jack. Music and entertainment.
5.40: "Big Ben." Close.

2UW

MORNING SESSION.

Announcer: Basil Kirke.

8.0: G.P.O. chimes. The New South Wales Tramway Board.
8.12: Dorothy Jordan, soprano.
8.16: "Big Ben," Close.

MID-DAY SESSION.

Announcer: Basil Kirke.

12.0: Children's Hour, conducted by Uncle Jack. Music and entertainment.

EVENING SESSION.

Announcer: Basil Kirke.

8.0: G.P.O. chimes. The New South Wales Tramway Board.
8.10: "Big Ben," Close.

RADIO CABINETS

Before building your next set come along and inspect our wide variety of ART Combined Radio and Gramophone Cabinets. Address: O. V. Walker, 203 Oxford St., WOOLLAHRA.

WRITE FOR CATALOGUE.

PRIME RADIO MFG. CO. LTD.

26 OXFORD ST., WOOLLAHRA.

FRONT PB 362.
Trade in Your Unsatisfactory Loud Speaker
For the TEFAG Electro Magnetic Super Cone Loud Speaker

Those who are not yet the OWNER of a TEFAG Electro Magnetic Super Cone Speaker do not know what real Radio reception Really is. The Tefag Electro Magnetic Super Cone Speaker brings the Broadcasting Station right into your home.

REAL BROADCASTING
Gives perfect reproduction on either all Electric or Battery operated receivers. The TEFAG Electro Magnetic Super Cone Speaker is solidly constructed and finished in florentine Bronze and designed to match all classes of furnishings and carries our usual 12 months' guarantee against Electrical Defects.

PRICE, £6/10/-

Bring along, or write us, giving all particulars and type of your unsatisfactory Loud Speaker for an estimate of allowance, to

W. HARRY WILES
Radio, Electrical, and Gramophone Supplies,
PITT AND GOULBURN STREETS, SYDNEY

The Famous "1928" Log Model

£1/7/6
Without Dial.

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TRIPLE

"1928" LOG CONDENSER
The SMALLEST, LIGHTEST, and most EFFICIENT obtainable.

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FORMO-SENSOR (Variable-Fixed Condensers)

Catalogue—Ask Your Dealer—Cataloque

Established 25 years

Every Formo NON-MECHANICAL UNIT (Choke, L.F. Transformer, Combination Unit) is GUARANTEED 12 MONTHS. Each box contains its guarantee ticket—see that your dealer completes it at time of purchase. A small charge of 1/6 is made to cover cost of handling on each replacement. Please include this amount when claiming.

WIRELESS WEEKLY

Friday, 21st June, 1929.

GENUINE FORMO PRODUCTS

COMBINATION L.F. UNITS

"TRUE SCALE" ............ 45/-
(Quadruped Impedances).

"TWO STAGE" ............ 32/6
(Resistance-Transformer).

"TRANSFORMER
Output Filter CHOKES" .... 45/-

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for New South Wales:
O. H. O'BRIEN,
37-39 Pitt Street;
MURDOCH'S, LTD.,
Park Street;
ELECTRIC UTILITY
SUPPLY CO.,
617 George Street.

SHROUDED L.F. TRANSFORMER
The First Completely Shrouded Transformer on the English Market.

FORMO-DENSOR
(Variable-Fixed Condensers)

Ref. Max. to Min. Price
F ................. .0001 - .000075 4/6
J ................. .0002 - .000150 4/6
G ................. .0015 - .001000 4/6
H ................. .002 - .001250 6/6

CATHCART HOUSE, 11C CASTLEREAGH ST., SYDNEY

312 FLINDERS ST., MELBOURNE.
Interstate Programmes, Thursday, June 27

3LO

**EARLY MORNING SESSION**
10.30 to 10.55: The Station Orchestra — Selection, "The Atonement of Pan" (Hadley).
11.0: Dr. Lofthouse, M.D., will summarise his four previous talks in the series "Famous Women of History.""Dig for Victory" "(Macaulay)." Will speak on "Infant Welfare.")

**AFTERNOON SESSION**
2.15: The Station Orchestra — Selection, "Trio, Op. 114" (Gluck).
3.13: Dr. Lofthouse, M.D., will summarise his four previous talks in the series "Famous Women of History.""Dig for Victory" "(Macaulay)." Will speak on "Infant Welfare.")

**EVENING SESSION**
7.45: Answers to letters from the studio.
9.0: Recordings.
9.15: The Chairman— Remarks.
11.0: Close down.

3AR

**MORNING NEWS SESSION**
10.0 to 10.30: Miss Bessie Green — Duet, "Send Me Some Sunshine" (Liberman). From the studio.
10.30 to 10.55: The Station Orchestra — Selection, "The Geisha" (Sydney Jones).
11.0: Miss Bessie Green — Duet, "Send Me Some Sunshine" (Liberman). From the studio.

**AFTERNOON SESSION**
2.30: Twinklerite Stan Watson — Baritone selection.
2.45: The Chairman— Remarks.
3.45: The Twinklerite Orchestra — More sweet tunes for the daily dinner service.
3.57: The Station Orchestra — Selection, "Dixie" (Hartman).
4.0: Recordings.
4.15: The Station Orchestra — Selection, "The Atonement of Pan" (Hadley).
4.27: The Station Orchestra — Selection, "The Atonement of Pan" (Hadley).
4.30: Close down.

**EVENING SESSION**
5.45: Answers to letters from the studio.
6.0: Recordings.
6.15: Dr. Deign, secretary, will continue his series of talks on "Infant Welfare.")
6.30: Captain Donald MacLean, some more adventure stories, and a few old friends' letters and letters.

**NIGHT SESSION**
8.0: The Station Orchestra — Selection, "The Atonement of Pan" (Hadley).
8.15: Clarence Webber will speak on "Infant Welfare.")
8.30: The Chairman— Remarks.
9.0: Recordings.
9.15: The Chairman— Remarks.
10.0: Close down.

4QG

**NIGHT SESSION**
8.0: A recital by the Brisbane Municipal Concert Band, from the Baud Room.
8.15: Clarence Webber will speak on "Infant Welfare.")
8.30: The Chairman— Remarks.
9.0: Recordings.
9.15: The Chairman— Remarks.
10.0: Close down.

4QF

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8.0: A recital by the Brisbane Municipal Concert Band, from the Baud Room.
8.15: Clarence Webber will speak on "Infant Welfare.")
8.30: The Chairman— Remarks.
9.0: Recordings.
9.15: The Chairman— Remarks.
10.0: Close down.

5CL

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8.30: The Chairman— Remarks.
9.0: Recordings.
9.15: The Chairman— Remarks.
10.0: Close down.

For early morning, morning, midday, afternoon, and evening sessions, please consult the Brisbane Courier (McLeod).
What is Slumber Music?

LISTENERS to 2FC on a recent Monday night were introduced to a new note in radio. At about 10 o'clock Mr. Halbert, who was announcing, spoke somewhat on the lines of the following:

"Now, listeners, the time is just 10 o'clock, and we have half an hour before closing down at 10.30 p.m. Instead of playing the usual programme of dance music, we intend giving you an opportunity of hearing what we choose to call "slumber music." At this time of night, listeners are divided into two classes—those who definitely want lively, bright music (which will be available through 2BL until 11.30 p.m.), and another section of listeners who appreciate music of a soothing nature before they retire for the night.

So, for the next half-hour I am going to play you continuous instrumental music, which we have endeavored to choose, so as to provide you music which will have a satisfying and soothing influence. No announcement will be made until we close down at 10.30 p.m.

"Radio music can be effectively used as a background for whatever you happen to be doing at the present moment. If you are reading, just shut your set down so that it will not come between you and your thoughts. If you are playing cards, the music need not be sufficiently prominent to interfere with your bidding, and if you are of the gentle sex, and are sewing or knitting, there will be no syncope in this music to make you drop a stitch.

"We hope you will enjoy this music, and go to your couch to-night feeling that the worries of the day have, to a certain extent, been soothed away."

Instead of listeners going to bed with their troubles smoothed away, they insisted on ringing the studios, and telling how much they enjoyed the first half-hour of "Slumber Music." As it was so much appreciated, 2FC has decided to include this novelty in its programmes every Sunday evening.

Harringtons' Radio Sale

In the advertisement of Messrs. Harrington Ltd. in our issue of June 14, Emmco, Bal-bie, and Acme Eliminators were advertised at reduced prices. Harringtons Ltd. advise that these were included inadvertently and they cannot accept any contractual obligation, on account of the advertisement, to sell the items specified at less than ruling prices.
FOUR VALVE SET — £5/- ONLY

WITH THE FASCINATION OF MAKING IT YOURSELF

WITH THE WALLACE INSTRUCTION BOOKLET ANYONE CAN BUILD

THIS POPULAR SET. AND IT MAY NOT COST £5/-/- . SEND US

A LIST OF PARTS YOU HAVE AT

HOME, OR IN YOUR OLD SET, TELL YOU WHAT

AND WE WILL ADDITIONAL

REQUIRED.

FULL KIT OF PARTS, ANY PARTS ARE REQUIRED.
£5/-.

EXIDE 4 VOLT ACCUMULATOR, PHILIPS' VALVES, EVER-READY

"B" BATS, £2/10/- SPEAKER

£12/15/- COMPLETE

ANY PARTS SUPPLIED SEPARATELY

KNIFE-EDGE TUNING

FIVE-VALVE VOLUME INTERSTATE

RECEPTION ON OUTFIT

SPEAKER GUARANTEED. EASY TO HANDLE

SAME DAY SERVICE FOR COUNTRY

Write for Booklet, 1/-Posted.

THE COMMUNITY

THREE COSTS NO MORE THAN THAT

NO SOLDIER, FIVE-VALVE VOLUME SET

NO SPECIAL KNOWLEDGE

NO TOOLS

£10/-/6 COMPLETE

FULL KIT OF PARTS, £5/-.

EXIDE 4 VOLT ACCUMULATOR, PHILIPS' VALVES, EVER-READY

"B" BATS, £2/10/- SPEAKER

£12/15/- COMPLETE

ANY PARTS SUPPLIED SEPARATELY

KNIFE-EDGE TUNING

FIVE-VALVE VOLUME INTERSTATE

RECEPTION ON

SPEAKER GUARANTEED. EASY TO HANDLE

Same Day Service for Country

Clients.

Money Back Guarantee.

“THE WIRELESS SHOP” Postage Paid on all goods except

Miss F. V. Wallace Batteries and Speakers.

6 Royal Arcade, Sydney

*Phone, MA 5543—Two doors from George Street, opp. Q.V. Markets. The Oldest Radio Firm in Town.

Diamond Batteries

The Symbol of Quality in Jewels

and also the Symbol of Superiority Among

Batteries

The Seamless Cell

A Battery for every purpose, over 40 different types to choose from. Upright or Flat.

Distributors:

Bloch & Gerber Ltd.

British General Electric Ltd.

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KEMBLA BLDG., MARGARET STREET, SYDNEY

B 3872.
Can any reader please supply Mr. J. Lynch, 9 Mitchell St., Merewether, with a copy of WIRELESS WEEKLY containing the Neutrodyne circuit?

GENERAL.-Can any reader please supply Mr. J. Lynch, 9 Mitchell St., Merewether, with a copy of WIRELESS WEEKLY containing the Neutrodyne circuit?


S.W.B.C.L. (Armidale).-Your letter passed on to your local agent.

L.D. (Stockton).-Sorry; no room for circuit. Same size as No. 2, but it will be necessary to alter wiring.

A.E.C. (Christchurch).-The masnriam is being used.


M.T. (Mt. Brook).-Eighty feet overall—i.e., including leads. Rough work on an amateur set. Does not seem to be very satisfactory lately.

F.S. (Yarram).-Yes. An all-R.F. amplifier, yes.

L.B. (Potts Point).-A.W.A. can supply.

L.E. (Pullin).-Have forwarded letter to HOBart.

R.H.M. (Sorry Hills).-All are Reinert receivers.

A.E.R. (Ashfield).-As the interference from other stations is so great the change to another type may be necessary.

COORABAH (Queensland).-Not enough turns on primary.

L.E. (Pullin).-Have forwarded letter to HOBart.

R.H.M. (Sorry Hills).-All are Reinert receivers.

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EVERY RADIO QUESTION ANSWERED!

For Private Owners, Experimenters, Designers, Service and Repair Men, and Sales Departments

1672 (240 pages) 871 (985 pages)

WHEN you cannot hear an inter-State station, when all the locals come in at once, when the set makes weird noises—what shall you do? Turn to Drake's Radio Cyclopedia.

Success in radio is mostly a matter of having the right answer to a question, the right wiring layout, the right information of any kind needed with no delay. Designing, building, and repairing every type and style of radio receiver since broadcasting began proved the need—also the lack—of practical and workable information in a form allowing instant reference to the one thing wanted without having to look through something else first. All the rules, methods, plans, diagrams, tables, formulas—all the "dope" the practical radio man wants in his work are gathered together in Drake's Radio Cyclopedia—a book in form, but a tool in fact.

Ownership of radio takes on new interest when you have Drake's Radio Cyclopedia. If you like to experiment, Drake's Radio Cyclopedia will open new fields. If you are interested in radio problems, you will find the solution. If you build or rebuild radio sets, you can make them still better. If you sell receivers, you will gain sales annuities. Every item has passed the test of usefulness before being included. If of definite value to radio workers, it has been covered, and with all the space required. If of a technical or theoretical nature, it has been simplified and given more limited space. All long or involved calculations are translated into tables of results; practical formulas are stripped of symbols and written in words; the action of radio parts is shown in easily read graphs.

All subjects, from "A-battery" to "Zero Beat," are alphabetically arranged, with hundreds of cross references. This is just one of the features appealing to the man who wants to know how, why, what, and which—wants to know at once. Everything is in plain English, with each word and term applying to radio reception and radio-electricity clearly explained. Drake's Radio Cyclopedia is not a technical book, yet it contains a world of technical information translated into usable form. The bulk of the material treats of the operation, construction, testing, and design of the sets and allied units, with enough of the fundamentals to make clear the reasons for all operations. Every illustration is especially drawn to show practical details, otherwise impossible to emphasize properly.

There is more text matter in any other book dealing with radio, and there are more illustrations than in any other book on radio. Drake's Radio Cyclopedia brings more satisfaction to radio men than any other invest-ment of like amount or of many times the amount.

FREE EXAMINATION

Address

WIRELESS WEEKLY

Friday, 21st June, 1929.

T.W. (Rahoon Island).—No, your theory is correct. You are correct in your statement that the electrons are focused around the point where the current flows, but it is this line that causes the current to rise to the point of the plate. The reason for the different rise of current flows the reason being that while the kind of capacitance I have used in my experiments is the "Proving Radio," particularly in Part 16.

E.R. (Brisbane).—There are about 300,000 licensed listeners in Australia at the present time. Of these, the Smith-Watts is a very popular type, with 200 of them in the market. Another type is the "Drake," which has a very good reputation. If you cannot give me the other figures. They have not been published, but can be ascertained from the figures given here are approximate. New South Wales is showing a greater increase in listeners than other States. I will look up the figures on the New South Wales list on the 17th when broadcasting in Australia commenced, but turn the information over at the beginning of 1929.

J.R.S. (Wellington).—E.S.F. means straight-line frequency, and is the term applied to a particular type of condenser.

C.W.O. (Brisbane).—Philip Bullock is the name of the man who has been appointed as the first transmitting engineer under the new scheme. He has been appointed after a most careful selection process. He is the man to replace the "Dobbs" who was in charge of the new scheme.
Studio Audiences

(By Ray Djo.)

Broadcasting methods have undergone many changes since 1924, particularly in the studio. The methods of arranging studios for best acoustic effects have not yet reached any standard. Draping the studio walls is still popular in some countries, and complicated methods of mixing or superimposing "effects" are practised in England and Germany.

Australian listeners can feel proud of the fact that experiments and bold attempts in standardising were carried out here before they were begun in other countries. In studio technique, for instance, the heavy drapes and carpets were discarded by BOC, Melbourne, in pursuance of a desire to improve the musical character. Such a radical departure was deprecated by the experts, and frankly deemed to fail by some of them. Nevertheless, the results were very satisfactory, and a more "natural" effect or color was given to the music when some echo was permitted. The subject of reverberation in three in series, constitutes a capacity of 0.0906. Add to this the R.P. stages, as per specification, five or better battery: Approximately three weeks. Accumulation should not be made of it if this impractical, too several banks of cells in parallel. Yes, Oon-Ooster could be made as a 20 volt battery in the usual manner. Varies much. With 12 volts, the battery can be taken by the pump, through it can be done. In the tests at Stations X, we were entitled to a member of the "B.B. Club," and your maud was forwarded to the country organiser, Mr. Smidt. Please shorten your letters.

P.B. (Moonee Ponds)—What detector valve or flat "E" battery.

J.H. (Wollongong)—Distortion may be caused through using too much reaction, which latter can be caused through using too high capacity reaction condenser, too much plate voltage on detector valve, flying detector valve, wrong grid bias, unsuitable valve or valves. But, in the opinion of the experts, the experiments and calaties made in second stage (or, if one's grid condenser is less, the latter can be substituted) should be made before any kind of experiment. The experiment carried before in second stage (well grid condenser or less) can be connected in parallel. B.G. stage. A455. Also air bud. last but not least, B.B. Stage. 445. Observers may speculate excellently on the mentioned calaties, suffig enough current for more than these valves, unless these extra corker must about 13%. Yes, the others condenser would be better.

Insiner (Rahmam)—Standard 110 M.C. far screen and version of the receiver. Auditory made a special kit. When making own cells for B.O. sets, see that the primary cell is a little larger than usual.

W.E. (no address).—You will find that your "A" battery is bad. Dry cells will not last long, as "A" supply with a separator receiver using S45, which draw 33 amp. Such power will draw one amp. Capacity of dry cell you mention is only about 5 volts. Superimposing "effects" is not yet reached any standard. Ranging studios for best acoustic effects have particularly been made.

D.G. (Hetagie)—Reason why your valves blow is that too much plate voltage on detector valve. Eliminator too near set, open grid circuit, or direct filament ballast. This latter annoyance may be caused through having receiver connected to mains. Test 500 volts, in series with the earth lead. When eliminator connected is that one side of mains cannot be used because these carbons must be porous. Perhaps paste has fallen from plates and is shorting to earth lead. When eliminator is made as a S.W. adaptor in the usual manner.

J.F. (Gladesville)—Result of charger has probably lost its emission. Have rectifier tested, and if O.K., have battery examined by competent battery man. Perhaps plate has fallen from plates, and is showing at bottom of cell.

F.H. (Waterloo).—No alterations will be necessary to your detector if you desire to change from the six volt to the 10 volt condenser and the two 10 volt valves. With the exception that it different ballasts must be charged for the oh-volt type.

J.H. (Un)-No the carbon rods from old cells, unless they are used because these carbon rods. Odd flash can be bought from B.B. Stage. A415, will give most satisfactory reception with any type of receiver. This is ranged among the moderately-priced range of speakers, and presents a good whole appearance to harmonise with any surrounding.

The vast range of Brown loud-speakers carried in stock includes models from £2 to £20.00. You are cordially invited to inspect at any time.

Stocked by all Radio Dealers. Write for our new catalogue, "A.W."

Price of "Austral," £4/10/-

Noyes Bros. Limited. (Melbourne), Pty. Limited.

Sydney, 115 Clarence Street. Melbourne, 495 Bourke Street.
Perth, 422 Garden & Co. Launceston, 59 George Street.

Friday, 21st June 1929.

Wireless Weekly.

Page Sixty-Seven.

Famous Speaker’s Pitt

Brown “Austral”

Here is a new model to bring still more fame to the renowned Brown loud-speakers. The "Austral" built specially for the Australian market, will give most satisfactory reception with any type of receiver and will provide excellent results, with daylight reception. The "Austral" is ranged among the moderately-priced range of speakers, and presents a good whole appearance to harmonise with any surrounding.

The vast range of Brown loud-speakers carried in stock includes models from £2 to £20.00. You are cordially invited to inspect at any time.

Stocked by all Radio Dealers. Write for our new catalogue, "A.W."

Price of "Austral," £4/10/-


Sydney, 115 Clarence Street. Melbourne, 495 Bourke Street.
Newcastle, 115Pioe Street. Hobart, 136 Argyle Street.
Perth, 422 Garden & Co. Launceston, 59 George Street.
1000 Ohms Per Volt Meters

The new 1000 ohms per volt meters, Models 301, 489, and 506, are designed primarily for checking the voltage delivered by battery eliminators and similar devices where an ordinary low resistance meter cannot be used. They are also invaluable for use with transmitting sets and other purposes where high accuracy is desired.

Models 301 and 506 are for panel mounting, and Model 489 is a portable instrument in a handsome bakelite case. They are made in double or triple range combinations, and in different instruments the whole range between 0-8 and 0-750 volts is covered. These models and many other radio instruments of lower internal resistance are always obtainable.

Weston instruments are standard where accuracy is essential throughout the electrical world.

Write for booklet W., or ask our traveller to call.

Sold by All Radio Dealers

Distributors:--
WARBURTON, FRANKI, LTD., 307-15 KENT STREET, SYDNEY.

Melbourne, Brisbane

The instant the name of the first horse dashed past the post on the English racecourse to each of the points connected by land line with the Antipodes, of the points connected by land line with the Beam Wireless office with the landlines operated by the Postmaster-General's Department. Connected to that relay were lines proceeding to Sydney, Adelaide, Brisbane, Hobart, and Perth.

As soon as the operator on the racecourse depressed the key the signal was received simultaneously in every capital city in Australia. Although these distances in miles amount to an enormous number, the actual time of the transmission of each signal from the racecourse to each one of the points mentioned above was only about one-thirtieth of a second.

In the Sydney Beam office, which was one of the points connected by land line with Melbourne, the arrangements were fully complete. One official stood by the telegraph sounder, while five others hung on the telephone to each of the big daily papers. The instant the name of the first horse came...
through on the sounding information was passed over the telephone to the paper offices. Allowing the actual few seconds required to write the names of the placed horses, and a further few seconds for the passing of the information over the telephone, this meant that it required less than half a minute for the news of the big race to reach the point of publication. A minute or two after the receipt of the news by telephone Beam Wire- less messengers arrived at each of the newspaper offices to confirm the message which had already gone to press.

It seems almost incredible that a comparatively slight impulse originated on the race-course in England should, without any relays whatever—direct transmission—actuate an ordinary sounder in the telegraph office in Perth, West Australia, and in the other capital cities. It is certainly a triumph of this new and speedy system of communication.

WIRELESS AND AVIATION

The Southern Cross disaster and the subsequent inquiries that are now being carried on have, amongst other things, brought prominently before the public mind the importance of wireless as an adjunct to aviation. And that importance is no less striking in its actual usefulness in the particular instance than it was of great value.

The position of wireless assistance to aviation to-day is something equivalent to that existing in connection with shipping about twenty-five years ago. Then the new method of communication without wires was beginning to prove its efficacy as an aid to navigation, particularly in connection with the safety of life. The wireless authorities and enthusiasts had no doubts as to its value.

Similarly it would appear that the tragedy of the Kookaburra and the accidents of the Southern Cross and the Vickers Yerstone are compelling people to responsible positions to consider the use of wireless on aircraft more seriously. It is being considered whether more reliable arrangements cannot be made for installations of wireless, and for the operating of the equipment. The two things are essential: reliable equipment and reliable operators.

What is likely to happen is the institution of more rigorous procedure for the inspection of the equipment and the operators, so that a pilot will have no doubt as to the importance he may attach to the signalling system. And it is only by a system of Government inspectors that such guarantees can be obtained.

There can be no doubt that some experiment and investigation is still necessary before the full value can be expected from wireless equipment on aircraft. The existing state of the methods of utilizing wireless in the air is not very definite, and experiments are well worth undertaking. Some time ago the broadcasting station SLO, Melbourne assisted in aircraft wireless tests, and a little more assistance of that type would be useful. The Aero Club in Sydney is arranging for tests, and if some officially co-ordinated tests are carried out, there should be a definite promise of developing equipment and methods suitable for the needs of aircraft in Australia.
The Right Valves

The average set constructor invariably sticks to the one type of valve, not because he thinks it is a better type, but because his first receiver (which was so successful) seemed to give good results. He reasons that the same valves should suit other receivers, also.

As an instance, there are countless fans who never, under any circumstances, use anything but an A15 for a detector. Those who build the Air King soon found, however, that a special detector, or even a general purpose valve, would not function properly as a detector in this receiver. It became necessary to experiment (on the original receiver) in order to find the valve that had characteristics most suited to the job. After some varying results, it was eventually found that no other valve than a power amplifier would carry out the job properly.

Again, the constructor, as he progresses, gets his own ideas in connection with audio-frequency amplifiers. If his first receiver was a simple detector with two stages of transformer coupling, he will be satisfied with this for some time, until he desires greater volume or purer output.

Then the trouble starts. The valves he has been using as amplifiers in conjunction with transformers do not seem so satisfactory with a resistance-coupled amplifier. The constructor blames the resistances, or the method of amplification, and reverts back to transformers.

It should be the aim of every constructor to use the resistance-coupled-type valves with resistance-coupled amplifiers, to experiment with different types of valves in each stage until the best combination is obtained.

It will often be found that three general-purpose valves, say the A15A, may give only fair results when first plugged in, but if their positions are changed, there will often be a big improvement. In some cases this may be due to loss of emission in one or more of the valves, but it may also be due to slightly different characteristics in the valves themselves, which make them more suited to certain positions in a receiver.

It is impossible to make all valves—and, in fact, transformers—with characteristics stringently correct. As an instance of this, the man who builds a superheterodyne receiver will sometimes find that, though his transformers were of good make, it is necessary to have them matched after the receiver is built; before anything like perfect results are obtained.

So remember that it is always advisable to try a change of valves if results are not normal in your receiver. If you remember this, often you will be able to bring your receiver up to scratch again after a poor period of reception, merely by changing the valves around.

Broadcast From Melbourne

LISTENERS to 2FC recently experienced what is described as the most remarkable land-line transmission carrying a programme of music that has not yet been heard in New South Wales. The occasion was the eighth concert in the Melbourne Town Hall, by the famous Australians, who are now touring the Commonwealth. William Murdoch, pianist, and Harold Williams, baritone.

At the last moment arrangements were made through Messrs. J. and N. Tait, and 3LO, Melbourne, for a relay of this concert, which was being given in association with the University Symphony Orchestra. The relay commenced at 8.30, when William Murdoch was heard, in association with the orchestra, in Chopin's "Concerto in F Minor." The reception throughout was note perfect. Mr. Harold Williams was heard, in association with the orchestra, in "Star of Eve" (Wagner), "Prelude from Pagliacci," and "Charming Chloe." This brought the concert to a conclusion at 10.30 p.m.

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