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Tells a Tale on Your Accumulator.
3/6
DEVELOPMENTS PENDING

An interview with the new Superintendent of Broadcasting Stations, in which programme presentation ideas are discussed.

Under Mr. Marden’s direction a number of changes are to take place in the transmissions of 2FC and 2BL.

O
over four months have passed since the Australian Broadcasting Company took over its first station, and with the passing of time it continues to develop its organisation. On January 14, SCL, Adelaide comes under the company’s control, and on January 30, 4QG, Brisbane, which will give the company two stations in Sydney, two in Melbourne, and one each in Brisbane and in Adelaide and in Perth. These seven stations, so widely separated, have been placed under the superintendence of Mr. C. F. Marden, whose duties will be to provide for a close co-ordination between the stations, and generally to establish and supervise a standard of broadcasting transmissions throughout Australia.

Mr. Marden is a quiet, soft-spoken young man, with over twenty years’ experience in theatrical and “entertainment” undertakings, horn-rimmed glasses, and a bland and tactful air. He was appointed Victorian manager for the Australian Broadcasting Co. when it took over 3LO and 3AR, and it is in his work as Victorian manager for the Australian Broadcasting Company that the New South Wales listener will be interested, since he has said that everything possible will be done to popularise the programmes along the lines adopted recently in Victoria.

During October the number of listeners’ licences in Victoria increased by 3986, making a total of 144,295, and this increase, it is generally claimed, has been due to Mr. Marden’s technique of programme presentation. The trend of the Victorian programmes has been away from the stiff, item-after-item, concert style, and towards originality, towards the presentation conceived as a unit of entertainment.

For instance, when a Nautical Hour is planned, it is not simply allowed to go over as a collection of nautical songs. A running dialogue is carefully prepared, which links the songs together into a kind of sketch, so as to hold listeners’ interest from beginning to end. This kind of presentation has proved very popular.

Another successful departure from old methods was the sketch written round Beethoven’s “Moonlight” sonata by Mr. Gordon Ireland, who is perhaps remembered in Sydney. Two clever men have been briefed to devise anything novel and worth while, are now finding their way into the Victorian programmes.

“The is purely and simply entertainment.”

said Mr. Marden. “All gates are catered for—news and utility services are maintained at a high standard (one of the highest in the world), and listeners who desire ‘classical’ music find it well provided for in each week’s programmes. The field of radio as pure amusement, however, has only been slightly scratched. Many ideas have been tried before, but have failed because there was not sufficient understanding of the technical requirements of radio. The future of radio will be a future of development, and of the overcoming of technical difficulties. In this respect we have a great deal to learn, both from the British Broadcasting Corporation and the Americans, whose progress in the technique of different kinds of presentation is remarkable. The British radio play, ‘The White Chateau,’ which was put on from 3LO recently, was a revelation of what can be done with radio plays. In the actual business of broadcasting—in the broadcasting of large choirs, for instance—there will have to be constant development, so that the listeners may hear their performances as composers meant them to be heard in concert halls. For radio has passed the stage where mechanical success can be made for any loss of artistic effect; it stands on its feet, without the props of novelty which held it up so long, and it has to justify itself to the public as a perfect and satisfactory instrument.

“In England, on the Continent, and in America talks, plays, debates, and sketches are gaining the public’s appreciation over simple musical broadcasts. This is perhaps a natural result of the development of the mechanical side of radio, which has made the transmission of speech almost perfect; it is also a sign that broadcasting is taking a greater part in the interest of the public; besides, as practical entertainment, music has less power to sustain interest than, say, the talk, the play, the debate, or the revue. However this may be, the desire for more talks and plays, and so on, is increasing in Australia, and the Australian Broadcasting Company is doing all in its power to provide the best and most original entertainments of this nature.

This reorganisation began in Victoria, and will be continued throughout the Commonwealth, with, it is hoped, the same satisfactory results. The process, of course, will be a gradual one—such changes as we wish to make cannot be made in a day, or even a month. In Sydney, we begin from December 19 by installing a permanent orchestra and a permanent jazz orchestra. From December 19 onwards the programmes will show many new and original presentations, which, we feel sure, will meet with the approval of New South Wales listeners.”
It's not the Heat—

IT'S the humidity we can't stand. Yes.
and bring us a few more bottles of coconut oil, and that cold cream you said you had. We know we said we wouldn't have anything to do with cold cream; but then all the other chaps were here. You don't expect a real man to know anything about cold cream before all the other chaps, do you? No. Well, go on, Anthea, be a sport; you don't know what we're suffering; every time we try to get it chokes our faces even more so.

Anan... Annaaaah!

Ooohhhooooooh!

Oh! You might have known better than to rub it in with your finger-nails, Anthea. That's better. Now for heaven's sake, Anthea, go away! You don't expect we can write a microphone page with you to distract us, do you?

Yes, we love you. Yes. We love you! Damnation! We LOVE you! Is that enough?

Well. Sorry we have kept you waiting, gentle reader. Fact is, we've just come back from the surf—got very burnt. It always gets us like this at the beginning of the season, and it hurts us even more at first than the average chaps, because we never put anything else but coconut oil on. Some chaps insist in using cold cream, but that takes all the brown out—we believe in getting absolutely brown once and for the whole season. We went down early this morning, and stayed the whole day.

John went down with us. You should see John in swimming togs. We don't make any comment, but you should see John in swimming togs. After doing a few shots, just to get in practice again, we strolled along the beach, noticing how beautiful were the backless bathing costumes—the costumes—worn by so many charming young things. (It was one of the beaches where these are allowed.) We asked John didn't he think they were very nice. John said he didn't see much in them. We said we didn't know about that, but the girls seemed to get a good deal out of them. John said that was so, and how soon did we think lunch time would be, because he felt hungry. Just at this moment a cry of "Help! Help! Help!" was heard, and without saying a word to anyone we dashed in the direction of the sound, which seemed to come from over New Zealand way. Bravely we struck out through the thundering surf, and, battling against the breakers and overwhelming odds, we overwhelmed them, and in a few minutes were beside the weakly struggling young thing. Grasping her firmly by the hair, and putting forth every ounce of our energy, we began the return journey, fighting every inch of the way against an irresistible undertow, until at last we were swept in on a tremendous dumper to the shallows, where many willing hands dragged us to the dry sands, while thousands cheered and cheered and cheered. John said, "Come and get wet again. James, you'll get sunstroke if you sleep there much longer."

We went in, and were shooting the breakers for a little while—so on, Anthea, be a sport; you don't know all the other chaps, do you?

"March of the Campbell Men"; so we said to John. "This is too much like hard work," and started off towards the dressing sheds. John said, "I think of seeing you here!" and there were two very pretty creatures, with figures like that girl you admired in the street last week until you saw her face. John introduced us, and we talked for a while; then we arranged to meet outside the dressing sheds when we had taken off our swimming togs.

We were horribly burnt, and had a good deal of trouble working ourselves into our shirts. Our editor told us beforehand to wear a coastshirt like him but we didn't do this, so it hurt us very much. And then John couldn't find his trousers. Naturally John was very annoyed. He said if he could find his trousers he'd twist his head off. Then he walked majestically round the shed in his shirt-tails, looking at everyone else's trousers to see if they were his; but a mere glance round the shed was sufficient—you could tell John's trousers miles away—we never say anything like this for design. Then John began to curse the attendant, who said it was all very sad; but he couldn't do anything, and next time, perhaps, the gentleman would hire a locker (price 1/-) to put his trousers in. Then John sat down and said, "Well, what am I going to do about it? How am I going to get home? And there's two girls waiting for us outside, James; and I can't take them home in my shirt tails, can I?"

We said, no, it wasn't usually done; and a young man came up and offered to run down to his home and get John a pair of trousers, which he did, and John put them on; but the girls had gone, and it was just as well, because the young man was a votary of the piscatorial inducations; and he was very sad when his lady friends returned while John's about the better.

However, it was a pleasant sort of day—one of those days you look back on and laugh; just as one of these days we suppose we shall look back on all our days spent in eagerness and unremitting till for the benefit of the community, and gain as much from any other thing.
WIRELESS WEEKLY

How radio-equipped flying squads of London police are used to control traffic. Every important station has its radio telephone and a vast network surrounds London.

While wireless for police purposes has been in use in Sydney and Melbourne for a number of years, Scotland Yard claims to have the most efficient police wireless system in the world, although they acknowledge the fact that the German police authorities have wireless sets in greater numbers than those owned by the British police forces. Not only have the Yard engineers evolved sets and schemes far in advance of those of general practice at the present time, but the Scotland Yard radio equipment is in constant use for twenty-four hours every day.

The Yard engineers are no amateurs at applying wireless methods to police work; experiments in wireless transmission, it seems, have been in progress beginning with the year 1921, and sets of varying power, mostly between 100 and 500 watts, have been used at various times.

Used First on Derby Day

Among the earliest experiments in the use of wireless for police purposes was, not the catching of criminals but the controlling of traffic on Derby day. This was accomplished by seaplanes giving wireless instructions from above. In the year 1921 and the following years the R-30 and later seaplanes were used to survey roads and report traffic jams by wireless to listening posts on the ground or to the Yard wireless vans on the roads. These experiments proved entirely satisfactory but were not continued in view of the fact that the planes proved entirely too fast and expensive. In 1924 a stationary kite balloon was tried for the same pendent for effectiveness upon the so-called flying squads, for entirely too fast and expensive.

In view of the fact that the 'planes proved entirely satisfactory but were not con,m,ined on the ground or to the Yard wireless vans.

Traffic on the Embankment, during the general strike. When a jam occurs, the radio calls the nearest flying squad to unjam the traffic.

The flying squad handling a pressing crowd.

Traffic jams by wireless, the radio call to the nearest flying squad to unjam the traffic.

The flying squad handling a pressing crowd.

Effective wireless methods for police purposes were not used until 1921. The Yard engineers have evolved sets and schemes far in advance of those of almost all countries, although they acknowledge the fact that the police wireless application has been highly encouraging.

The detection of criminals by a series of police radio stations on the outskirts of West Riding (York) enables a ring to be drawn round any fugitive or band "wanted." These radio posts have their own individual call letters, and are staffed by expert operators.

At Wakefield, the headquarters of the West Riding police, there is a combined receiver and transmitter that has a radius of approximately one hundred miles. Messages can be transmitted to the south of England and Wales. These sets are easily installed for utilization by flying squads, and can receive or transmit instructions en route within an effective radius of about fifty to seventy miles. These sets are working from storage batteries.

Sets Concealed in Vans

The flying squad sets are concealed within the police vans. The seaplanes are built into the van roof and the entire apparatus is shielded against interference from the auto's electrical and ignition systems. Needless to say, the flying squad vans are not marked "D.D.," or "Scotland Yard," but have fictitious tradesmen's names and camouflage numbers; they traverse all crowded thoroughfares and are in constant touch with headquarters, receiving instructions and acknowledging signals. The operator receiving the signal need not leave his seat in order to convey the message to the chief officer. The flying squads are constantly in touch with headquarters, and are enabled to communicate with one another through the Yard. To make radio policing more effective there are a number of land operators, unknown to the public, who assist in keeping and maintaining the Scotland Yard wireless police methods entirely satisfactory for the purpose they are intended for.

Scotland Yard, however, is not the only British police organisation to recognize the value of radio for police work. The activities of the radio department of the West Riding police were brought to the attention of the world when the King and Queen visited Bolton Abbey some time in 1928. The radio results obtained by the West Riding police have been highly encouraging. The detection of criminals by a series of police radio stations on the outskirts of West Riding (York) enables a ring to be drawn round any fugitive or band "wanted." These radio posts have their own individual call letters, and are staffed by expert operators.

At Wakefield, the headquarters of the West Riding police, there is a combined receiver and transmitter that has a radius of approximately one hundred miles. Messages can be transmitted to the south of England and Wales. These sets are easily installed for utilization by flying squads, and can receive or transmit instructions en route within an effective radius of about fifty to seventy miles. These sets are working from storage batteries.

By the aid of wireless an important message can be sent out at headquarters or sent by microphone to the stations equipped, and within a minute twenty-one divisions of the West Riding police, with a force of 1,500 men and who cover 1,634.621 acres, are in possession of the information and instructions which are put into operation at once.

Traffic on the Embankment, during the general strike. When a jam occurs, the radio calls the nearest flying squad to unjam the traffic.

The flying squad handling a pressing crowd.

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of rum-runners by the Federal Prohibition Agents of the United States.

About six months ago an unidentified radio station was heard operating on the Atlantic coast, in the band of wave-lengths around eighty metres, which is reserved for amateurs and ships. The operator of the station, who was using two false call letters, was remaining at the key at times for segments of eighteen hours or more. This naturally caused suspicion, and, though the nature of the messages was suspected, their real purpose was not definitely known.

There was no record of any licence for the call letters used, and as it is part of the duty of radio inspectors to pass upon the qualifications of all radio operators, amateurs and otherwise, inspect stations applying for licences, and monitor the ether channels, the signals caused efforts at location.

A young operator, Forest Redfern, was put to discovering the source and nature of the signals. As Redfern was a former Army operator, and during the war had been a non-commissioned officer in charge of intercepting messages from enemy radio stations in the military operations along the Marne, "intercept duty," as this is known in radio parlance, was not new to him. It was easy to take down the code of the station, but it was a difficult task to decipher the messages, but with a relatively easy, however, by taking bearings on the signals from different points, and using the "triangulation" method of direction finding, to place the exact location of the station.

Further effort revealed that the messages were despatches by the rum-runners to their liquor-carrying vessels. When the prohibition agents and troopers swooped down upon the radio shack, which was situated only a short distance from the run-rung's base of operation, Redfern was with them. They round the radio operator busily pounding away at his key. Redfern could now read and transmit the code message, and, as the operator was handcuffed, he sat down at the key and continued sending.

The orders he despatched to the run vessels led to a point, where a Coast Guard vessel was lying in wait. Thirty-two men were finally arrested, and large quantities of liquor seized.

Short-Wave Notes

By R. N. Shaw

ON November 9 I again heard a foreign station just above RA97, time 9.45 p.m. Music was being broadcast, but static was very bad.

Two stations in Siam were heard during the week, one around the 17 metre band and another around 37. HSIPJ was heard testing shortly before 8 on Monday morning, when he announced that he would again be testing between 11 on Tuesday night and 1 a.m. Wednesday.

A strong foreign station was heard at 10.5 p.m. on November 22, but I did not get his call sign. He repeated a number of times, "Hall-o, Hall-o." in broad foreign accent, followed by a flute solo, and solo by a lady in foreign accent.

LONDON AND AMERICAN TESTS

The distant overseas stations appear to be coming in strongly between 6 and 7 p.m., and for several hours during the early morning.

On Friday, November 22, GBX was heard, but static was very bad at 6 p.m., and had risen to excellent speaker strength towards the close of the test at 6.15. I have not heard GBX at better strength. Earlier in the week, at 6 p.m., GBX was only fair "phone.

At 5.45 a.m. on Saturday, November 23, an excellent test was heard through an American network, apparently directed from W2XX. Although I did not hear 2ME's call given, the station was apparently taking part, as the Christian name of one of the staff of 2ME was frequently addressed to the other speaker. Several wavelengths between 22 and 28 were used, the test continuing until 7.15 a.m.

Shortly after 8 a.m. on Sunday, November 24, WX2AD was busy engaged on similar tests with Australia. Very good volume.

Shortly afterwards a New York station was responsible for a conversation between father and daughter, the latter replying to a paternal instruction with "All right, father."
The performance of the receiver is primarily limited by the effectiveness of the transmitter. Progress in transmission methods must therefore be of vital interest to the listener. The article below, dealing with the influences that limit the performance of the receiver and with recent advances in transmission methods in other parts of the world is likely to draw widespread comment.

By ROSS A. HULL

Expecting Too Much

So much has been said of the wonders of radio that the uninitiated enthusiast who buys a complete radio for the family is likely to have even more grossly absurd expectations. Should the heavy grind of a power leak form a background for all his reception he will lose no time in slamming the receiver; should the signals from another station be marred with crackles, or fade away at intervals, he is almost certain to make a bee-line for the radio dealer on the very next morning.

If we thought about it long enough we could probably list a half dozen reasons for this unfortunate state of affairs. Undoubtedly they would all be derived from the fact that since the earliest days of radio most enthusiasts who have built or sold sets have been cursed with an imagination far too vivid and active. To repeat the hackneyed words of some famous statistician, "If all radio dealers and set-builders who make tall or unqualified claims for their apparatus were placed end to end—-it would be a damned good thing."

We may be exaggerating a bit, perhaps, but we cannot see how an student of radio development can fail to admit that there is a very general feeling among non-technical enthusiasts to the effect that there is no limit to the things a radio receiver can do; that if there is a limit, it is obviously the fault of the set itself.

Receiver Has a Big Task

By no means do we plan to say that the modern radio set is not a wonderful piece of apparatus, nor do we suggest saying that it is not often capable of a truly wondrous performance. Rather the reverse. We have the idea that if more people really appreciated or attempted to appreciate the inconceivable amplification that a receiver must provide and the positively amazing manner in which it performs the work they would be better able to understand why its capabilities must be definitely limited, and why they should really wonder at the results that are possible.

When it is operating from a signal coming over a distance of say, 1,000 miles, the radio receiver does not have much energy to work with. It has so little, indeed, that it could not possibly be measured directly with the most delicate instruments available. Conclusions made from indirect measurement lead us to believe that if the energy from such a station were received continuously, and stored up for about 30 years, it would only amount to the energy that a fly would expend in walking one inch up a vertical wall. We have made that statement before, but it is surely deserving of re-statement.

Even in the reception of comparatively near-by stations the received energy to be had is inconceivably minute, and when it is remembered that the receiver must not only amplify these inputs to fill the room with music, but must also separate dozens of other feeble currents of different frequencies, it must be realised that the modern receiver is certainly doing some mighty fine work in providing the radio music that it does.

Limitations of Transmission

Let us give the receiver a rest this time, and turn instead to the process of transmission, in order to see just why it is that the capabilities of the receiver must be definitely limited, even if it be the finest collection of apparatus in the whole wide world.

Just as soon as we get away from the receiver, and leave it as merely a means of making radio waves audible in the loud-speaker, we are faced with the fact that not all radio waves are produced by transmitting stations.

For this reason we at once see that not all noises made in the speaker will have originated at man-made transmitters. Faulty contacts in the house wiring, leaky insulation in the power wiring on the street, and all electrically-driven machines are capable of producing radio waves, and all these may be picked up and reproduced by any radio set. They constitute one very important limiting factor in the performance of the receiver.

Should they be stronger than the broadcast radio wave they will make more noise, and the much-desired music will be irremediably buried. Unlike the radio waves send out by the broadcast stations, these waves are very broadly tuned. For this reason the business of tuning them out as one
A transmitting station which we sometimes use to describe as modern. Garden Island navy station is responsible for most annoying interference with broadcasting.

would interference from an unwanted station be at present impractical. At the moment there are only two possible cures for the trouble. One is to have the power leaks or faulty contacts attended to, and the other (possibly the most practicable at the moment) is to move the entire (family) household, and radio set to a location where such interference is not to be found.

Getting still farther away from the receiver, we run into considerations of the atmosphere itself—the transmitting medium between the broadcast station and the receiver. It is the atmosphere, the ether, or space which is responsible for the fact that we can hear signals and they in turn cause noises in the speaker—distortion into the music we receive—a fact which is quite beyond the control of the unfortunate listener.

Troubles in the Atmosphere

One reason why the atmosphere always limits the range of reception is that in it there are always some electrical discharges in progress. These discharges create radio waves, and in turn cause noises in the speaker which compete with those arriving from the broadcast station. Sometimes they are louder even than the signals from near-by stations, and never are they entirely absent. The more sensitive the receiver is the louder they will be. Only on rare occasions is the atmosphere in any one part of the world so free from discharges that long-distance signals may be heard without an accompaniment of their tiresome crackles. If we could eliminate the atmosphere in some way it would by no means help us out of the difficulty, however. Without the atmosphere we would have no long-distance broadcasting at all! The upper reaches of the atmosphere are actually the medium via which our long-distance signals arrive.

When the radio waves are created at the aerial of the broadcasting station they spread out in all directions—not only in all directions in a horizontal plane, but at all angles to the horizontal as well. If our receiver is ten, twenty, or perhaps sixty miles from the transmitter, the waves that set up currents in our aerials arrive by the ground route. That is, they travel over the ground and close to it. The waves which did not start off in a horizontal direction are by this time well up in the upper atmosphere, to return at a later date.

The waves that hit our aerial after traveling over the ground have been quite heavily absorbed and attenuated in their progress, and they now represent but an infinitesimal fraction of the energy which left the transmitter. If our receiver is about 70 miles from the transmitter, however, the illusion would be similarly effective on all night signals. This region is termed the "Kennelly-Heaviside Layer." It is not really a layer, however, but an enormous ocean of ionized gas molecules, extending all over the earth's atmosphere and possibly a few hundred miles high. If this ocean were of constant depth and of constant consistency long-distance transmission would be similarly effective on all night signals, and there would be no fading.

Causes of Fading

Unfortunately this is not so. The layer is in a constant state of turbulence. Signals which are bent down at one angle one moment are caused off in another immediately after. And from night to night and month to month the entire characteristics of the layer change. It is this which gives us our nights of good and bad reception, and the fading which accompanies it. All of these mighty forces, of course, are entirely beyond our control, and no means at our disposal to-day are completely effective in overcoming their effects.

And still further, when crackling noises mar reception, when reception over long distances becomes impossible in the daytime, when the music fades in and out or becomes distorted, and when distant signals fail to arrive with the same gusto that they had the night before, do not be too hastily blaming the receiver, or even the transmitter, but call down curses on that very necessary radio evil—the upper atmosphere.

Of course, a tremendous responsibility rests on the transmitting stations. For instance, there are the stations engaged in communication on wavelengths outside the broadcast band, which should not, do, splatter their signals on territory which is not their own. The Navy station at Garden Island is one striking example. Though the station is operated far outside the broadcast band, it nevertheless causes drastic interference to broadcasting which is quite beyond the control of the unfortunate listener. This, of course, is greatly to be regretted. Though the station is operated by the Navy for possibly most important purposes, there is no apparent reason why modern technique should not be applied in the elimination of interference.

Where Broadcasters Fall Down

Possibly the greatest responsibility of all rests on the broadcasting stations. These transmitters have the work of creating a carrier wave modulated by the frequencies generated by the desired sounds in the studio, and these modulation frequencies must be so nearly a faithful copy of those in the studio as is possible. Once the signals leave the transmitter a host of factors upset them to some degree.

Consequently the received and reproduced signals never can be better than the transmitted ones. The broadcast stations, therefore, are primarily responsible for the limitations of our reception. This sounds a moody and obvious sort of statement, but it is strangely the number of listeners who would not appeal to have any appreciation of the fact. Should their reception become distorted, or should it be accompanied by a low drone, a continuous whistle, or all manner ofizzling noises, they are quick to suspect their receiver. They will be justified in doing so on some occasions, but they will be off the track on many others.

The essential to the operation of a broadcast station is to make a big stir in the ether. The bigger the stir the better will reception be over any but the shortest distances—other things being equal. The amplitude or strength of the carrier wave is the thing which controls the amount of "stir." Many of our broadcasting stations are high powered, however, they have a powerfully useful carrier wave, but they are ineffective because the modulation introduced by the musical tone is so slight. Should these stations reduce their carrier output by four, or in
To be Broadcast for the First Time in Australia

"MACBETH"

The majestic Shakespearean Tragedy with incidental music by Locke

**Other Features of the Week include...**

The Messiah
Newcastle Revellists...
and "Gonna Gilly."
Rita Coonan completed her vocal studies in Town Hall, whilst on Thursday, December 19, cast a programme from the new Town Hall service, to be broadcast from 6 p.m. till 6.40 p.m.

Christmas motor picnic will be held on Friday, December 13, to Cronulla, when all members of the A.B.C. Women’s Association and 3L0 will meet at 11 a.m. with picnic baskets, to depart in service cars to Cronulla, where they will spend the day surfing and picnicking.

A special entertainment programme is being arranged by a sub-committee, consisting of Miss Dorothy Panter, Miss Dulcie Sproule, Mrs. Bannister, and Miss Gwen Varley. Prizes are being donated by the members of the Kingsley Club, and this picnic has been chosen by the A.B.C. Committee in place of the usual Christmas afternoon tea party at David Jones’. The approximate fee for the cars will be 3/- each return, and lunch will be brought by each one present.

A MUSICAL programme will be given from 3L0 on December 11, when, for the first time in the Southern Hemisphere, an abridged version of the Oberammergau’s “Tales of Hoffmann” will be broadcast, under the direction of William G. James, by the Bartleman Male Choir and the Melbourne Choral Union, with full orchestral accompaniment by the National Broadcasting Orchestra. Soloists include Miss Winifred Mitchel and Mr. A. C. Bartleman, and Mr. Alan Mitchell. “The Tales of Hoffmann” is a bel canto opera and achieved an unusual success when it was produced, and this version, which has been specially written for the use of musical societies, should be greatly appreciated by musical listeners.

The opening of the Grand Radio Choral Contest, organised by the Australian Broadcasting Company in conjunction with the Choristers Choral Union, took place at 3L0 on Tuesday evening, December 3. The conditions of this contest provide that each competing choir will provide a half-hour programme for broadcasting by 3L0, but they will be judged only upon the rendition of the test selection. The competition will be concluded on Friday night, December 6, when the second competing choir will be heard.

Miss Vera Spaul, requires no introduction to listeners. She is one of Australia’s best-known comedians, not only on the stage, but on the air. She will be heard from 2FC on Tuesday, December 16.

There was a time when Miss Spaul made three appearances a day on 3L0 for one whole month. She thought perhaps the listening public would tire of her. They never did. Miss Spaul did only one number at each performance, but never once during that whole month did she repeat a song.
GLIDING

This article, by a young Australian aviation student and experimenter, is a preliminary to the publication of complete details for the construction of a man-carrying glider to appear in the next issue of "Wireless Weekly." Inexhaustible, not only to build, and highly exciting to fly, the glider is the first real step of the aviation enthusiast on the way to true flight.

By J. BALL

Looking back over the years we notice that there are authentic accounts of attempts at flight in the history of every nation, and behind history are many legends of men who flew. Egypt, Assyria, China, India, and Greece furnish myths which almost certainly had some foundation in attempted flight.

Probably you have read of the myth of Dardalus and Icarus, and perhaps you have never stopped to pause and think, but just regarded it as a myth, but more than probable it is based on the truth, and is evidently a fanciful account of the first two human beings who attempted to fly, and paid the cost with their lives.

First Attempts to Fly

Man's first attempts to fly were by means of artificial wings fastened to the limbs. The dusty pages of history are crammed with the daring efforts of brilliant men, though held in ridicule by their fellows, who girded themselves with crude wings, worked by levers, and moved by their own muscular efforts, raised their lives, that they might prove to an unbelieving world that man could fly.

Early in the 16th century there appeared Leonardo da Vinci, a man of undoubted genius, who, in addition to being artist, engineer, and architect, made a study of the problems of flight, and especially of the flight of birds; for he considered that if the flight of birds were perfectly understood it would go a long way towards solving the problem of human flight.

The genius of the man is shown in his "Treatise on the Flight of Birds," a work which showed that his ideas were far in advance of his time. It was he who first found by experiment that the power and the duration of lift of air, by observing how some birds would at times rise into the air with immovable wings, and soar for hours on end.

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The genius of the man is shown in his "Treatise on the Flight of Birds," a work which showed that his ideas were far in advance of his time. It was he who first found by experiment that the power and the duration of lift of air, by observing how some birds would at times rise into the air with immovable wings, and soar for hours on end.

The time-worn desire to fly like the birds became the inheritance of all men, of all nations, and the struggle to conquer the air went on year after year. It was not until late in the 19th century that a successful heavier-than-air and man-carrying machine was built.

To Otto Lilienthal, a German, goes the honor of constructing the first glider capable of sustained a man while in flight. Lilienthal's glider did not possess inherent stability, for it was devoid of the present-day ailerons, elevators, etc. Stability and balance were maintained by the movements of his own body while in flight. In this machine Lilienthal made over 2000 successful glides up till the time of his death.

Glider Becomes Plane

But Lilienthal's death was not in vain, for his experiments had attracted the attention of the Wright brothers in America. By using Lilienthal's glider as a foundation, but improved in many respects, the Wrights built a successful glider, in which many glides were accomplished at Kitty Hawk. To their glider they later applied a motor, and on December 17, 1903, man's dream of the ages became no longer a dream, but a reality.

For Orville Wright made the first power flight in the history of the world. Flying 540 feet in 12 seconds.

It may be observed that the foremost thinkers of the times as the years went by realised that the success of human flight depended not on a wing-flapping device, and worked by man's own muscular effort, but on the glider. Lifted with a suitable motor to impart forward motion, and this was clearly demonstrated in the successful experiments of the Wright brothers. Until 1910, the glider was regarded as a stepping-stone in the development of the powered aeroplane.

In this year a new impetus was given to the development of the glider. Prevailed by the Treaty of Versailles from any extensive aeroplane production, Germany turned her attention to the development of the glider. The progress that Germany has made in this new and fascinating sport has astonished the world. Progress in this art has been so rapid, and modern scientific construction and meteorological knowledge have enabled them to set a record of 14 hours' duration flight, and to obtain an altitude record of 2500 feet. While just a few weeks back the newspapers informed us that a glider had flown the amazing distance of 105 miles.

What is Gliding?

Having gone far over the early history of the glider, we might halt for a time, and take up the question as to what gliding actually is. Gliding is comparatively simple, and consists solely of sailing down hill, using the force of gravity to impart forward motion, while the wind in this case is used to balance the glider in its flight from a high level to a lower level. This form of gliding is termed "static" gliding, and a "primary glider" is generally used in this case. In "primary" gliders the fuselage consists of a few braced spars, with the pilot exposed to the wind. Due to their simplicity of construction and cheapness of manufacture, these gliders are used solely for training purposes.

Soaring is accomplished by manipulating the controls of the craft so as to cause it to ride the winds and gain altitude. This form of gliding is known as "dynamic" gliding, and it is this phase of motorless aircraft activity that offers the greatest sport, and is of the most scientific value.

For this form of gliding a "secondary" glider is used, and in this case the fuselage is similar to the usual aeroplane fuselage. But it may certainly be constructed on fine lines, to afford less drag, and weight proportionately less.

Gliding is not dangerous. Providing that the student will accept the proven theories and facts, there is no reason why he should...
Old Promises

What has happened to the plans for a wider broadcasting service, including the proposed relay station scheme?

Listeners, in their attempts to justify that question, months ago they were promised a vastly improved broadcasting scheme embodying local and relayed programmes for country centres. New and more powerful transmitting plants were to be erected, and thousands of pounds of listeners' money was to be spent on general improvements.

With this end in view, the Government re-shuffled the division of licence revenue. Of the 24/- paid by each listener 12/- was to go to the Broadcasting Company, 3/- to Amalgamated Wireless for patent rights, and the remaining 9/- was to be held by the Government partly for the upkeep of the present stations and partly to provide for future developments.

Obviously, the whole of this sum has not been required for upkeep and a large amount must now be held in reserve. But to no apparent effect. No new transmitters have been installed. No relay stations have been erected and the service has gone on very much as it always did.

What has happened or what is happening to this growing reserve fund? Listeners have every right to know. The reduction (8/-) in the revenue paid to the Broadcasting Company is having its effect on the programmes. This was expected to some extent and the service has gone on very much as it always did.

Of course, the reduction (8/-) in the revenue paid to the Broadcasting Company is having its effect on the programmes. This was expected to some extent and the service has gone on very much as it always did.

Unfortunately for Mr. Doyle it is the Broadcasting Company which is receiving the kicks, and not the Government, which, not having been responsible for the plans, is not volunteering an explanation. Why then does not the Broadcasting Company demand some satisfactory account for its listeners' and for its own defence?

The authorities make very definite promises. A.B.C. exhausted the alphabet in declaring what wonderful programmes it would put on the air. But the listener-in still sighs for even a tithe of the pleasures that were to follow the change of control.

Wireless Weekly

Incorporating "Radio in Australia and New Zealand.

Friday, December 6, 1929.

Three Radio Plays

Although "Caste," which will be broadcast on December 12 through 2PC, has been played all over the world since its first appearance in 1897, it still holds its attraction for the theatre-going public. The reason for this is that the problem of marriage between people of different social stations is just as vital now as fifty years ago, whatever may be said concerning class-emancipation and the new post-war freedom. The difficulties which confront Esther, whose innate gentility makes her more than a match for the aristocratic D'Alroy, are worked out to a final happy solution, but the environment of the home of the Eccles is shown in all its pitiful squalor.

It may be objected that the characters lose in realism because their creator endeavored to make them "types," but there is a great opportunity for an actor in the interpretation of any of the principal parts. In the hands of the late Dion Boucicault, for instance, the drunken Eccles became a very lovable old ruffian indeed. Sam Gerridge, Polly Eccles' slow, devoted lover, is a never-failing source of amusement in his wordy encounters with his vivacious sweetheart. There is an instructive contrast between George D'Alroy and his friend Hawtree, the correct man-about-town, who so guiltily hides his good actions. No ruffian indeed, Sam Gerridge, Polly Eccles' slow, devoted lover, is a never-falling source of amusement in his wordy encounters with his vivacious sweetheart. There is an instructive contrast between George D'Alroy and his friend Hawtree, the correct man-about-town, who so guiltily hides his good actions.

Secrets of the Radio Industry—7

Ridding the wireless waves of summer static
Outback Listener Asks for Short-Wave Transmissions

Dear Sir,—To those of us who live in the country and “outback” districts of Australia radio has now become an essential part of our life, and wireless receivers are now to be found in nearly every farmhouse and homestead throughout the Commonwealth.

Unfortunately for us, however, atmospheric conditions are so bad during the hot summer months that there are very few nights between the months of November and March on which we can use our sets at all—at least, for the reception of stations on the broadcast band.

Short-waves, on the other hand, are not so much affected by static, and during the last few evenings I have been listening to “Super-Six” testing with GDX. Even on hot, sultry nights, when local stations on the b.c. band are quite inaudible through the static, 2MES transmission comes through perfectly.

Would it not be possible for the A.B.C. to arrange simultaneous transmissions on both broadcast and short-waves from one or more of the “A” stations during the summer months at least? Such transmissions would be of inestimable value to us “outback,” and I would like to hear the views of others on the subject. Perhaps, if a sufficient number could get together, we could place a petition for such a service before the authorities.

During the last few weeks I have noticed many complaints in the “Safety Valve” with regard to the programmes from 2FC. Even on hot, sultry nights, when local stations on the b.c. band are quite inaudible through the static, 2MES transmission comes through perfectly.

Dear Sir,—The case of “L.B.R. Strathfield” (“W.W.”, 22/11/29) is exactly similar to mine. Occasionally I can pick up all the States, even New Zealand, but generally it is impossible to hear owing to static which is almost deafening: nothing else comes through the machine being useless for days, with the exception of 2FC. The situation, of course, is different to that of “L.B.R.”, as I am on the Blue Mountains, so there may be a different cause; but I thought I wrote in too it might help to influence the power companies to clear up leaks, etc.

Yours, etc.,
X.W.M.

Leura.

Dear Sir,—Like “Super-Six,” I too have recently purchased a wireless set, and would like to give him my support. I could probably add a little more to what he said about the Diner Quartette, only I am afraid the censor would not allow it. If you should ask me, it would be “Din” without the “er.” Just at this moment from 2UE they are giving the Children’s Hour, and there is playing from that station a juvenile orchestra which puts 2KY to cut its own throat. I also agree with “Super-Six” in his idea that because too much rot is sold as a technical paper, but what do we find—an old story on animal stories—well, I think it’s time the A.B.C. censured him; page 3, on model “plane building,” will not be amiss, and page 21, comparing DX notes—well, I think that takes the bun. If the subjects were what one could call “cultural” it would be a different thing. Many readers like myself think that because too much rot is printed in “Wireless Weekly” it is going to cut its own throat. I have to buy the above paper so as to know what is going on in 2UE, 2YF, and 20B, as the machine is so bad for DX.

Yours, etc.
J. BULL

Page Thirteen

Readers are urged to express their opinions on matters pertaining to broadcasting, if they have some grievance, or if they have some constructive criticism to offer, here is your chance of expressing safety valve. The editor assumes no responsibility for statements made by readers and published on this page. Anonymous letters are not considered.

WIRELESS WEEKLY

Outback Safety Valve

Dear Sir,—Reviewing “Super-Six’s” letter, it is obvious that there are scores of places that dispense “Super-Six’s” favorite amusements, although he appears to be completely ignorant of the fact. In short, all his condemnations of “Disappointed” can be equally applied to himself. Let me remind “Super-Six” that the term “amusement” is relative. Probably 999 out of 1000 people would in all probability be bored to death with what would amuse “Super-Six.”

My own view is this, that, pick up four issues of “Wireless Weekly” and it will be found, on studying the programmes, that the authorities have catered for each and every one’s taste in an efficient and unbiased manner.

Yours, etc.,
Double Bay.

POWERS LOOKS

Dear Sir,—The “A” stations (issue of 22/11/29) more like a comic book. I wrote to the “A” stations (issue of 22/11/29) more like a comic book. I wrote to the “A” stations a few months ago regarding some of the “B” stations and I can fully endorse all that “Microwatt” wrote. Expect me to regard 2KY, as he says, 2KY is very broadly tuned indeed, and interferes with so much wireless and 2UB that I can hardly tune them in all during the week when 2KY is on, but have no trouble at all on Sundays, when 2KY is not on the air. In separating all the stations, I think a little publicity and criticism of the foregoing facts will not be amiss, and will assist in putting things right at 2KY.

Yours, etc.
A. L. S.

Without the “Nor”

Dear Sir,—I have recently purchased a wireless set, and would like to give him my support. I could probably add a little more to what he said about the Diner Quartette, only I am afraid the censor would not allow it. If you should ask me, it would be “Din” without the “er.” Just at this moment from 2UE they are giving the Children’s Hour, and there is playing from that station a juvenile orchestra which puts 2KY to cut its own throat. I also agree with “Super-Six” in his idea that because too much rot is sold as a technical paper, but what do we find—an old story on animal stories—well, I think it’s time the A.B.C. censured him; page 3, on model “plane building,” will not be amiss, and page 21, comparing DX notes—well, I think that takes the bun. If the subjects were what one could call “cultural” it would be a different thing. Many readers like myself think that because too much rot is printed in “Wireless Weekly” it is going to cut its own throat. I have to buy the above paper so as to know what is going on in 2UE, 2YF, and 20B, as the machine is so bad for DX.

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FRANKLY!

ARE YOU SATISFIED
WITH THE RESULTS FROM YOUR SET?

We leave the answer to you—but:
READ THESE LETTERS BEFORE YOU ANSWER
They are from Customers we have helped

3L0 AS GOOD AS 2BL
(Extract from Letter.)
Cremona, N.S.W.,
24/8/29.

Economic Radio Stores,
126A Pitt Street Sydney.

Dear Sirs,—I wish to congratulate you on the “RE-
NOWN THREE,” which is simple to build and simple to
operate.
The results are, as you say, equal to a five-valve set.
3L0, Melbourne, can be tuned in to give as good
volume quite as 2BL, Sydney.
My aerial is not good, only 40ft., and very close to the
roof. As far as clarity is concerned, we cannot wish for
anything better.
Yours faithfully.
C.K.P.

WHAT DO YOU THINK OF THIS
PERFORMANCE?

Toongabbie, N.S.W.,
24/7/29.

Economic Radio Stores.

Dear Sirs,—What do you think of this performance on
one of your “3 VALVE RENOWN SETS”?
I have got the following stations, and have brought
them all in on our “OPERADIO SPEAKER.”
N.S.W.: 2FC, 2BL, 2GF, 2UE, 2KY, 2GW, 2AD, 2AR,
2ZN, 2JO, 2AY, 2JR. Victoria: 3L0, 3AR, 3BY, 3MI, 3FR,
3KX. Queensland: 4QG. New Zealand: 2YA. South Aus-
tralia: 5CL. Tasmania: 7ZL

Yours truly
C.G.W.

SEE OUR NEW
SUPER RENOWN 4
IT’S A WORLD-BEATER!
HEAR IT—AND YOU’LL WANT ONE!
REMODEL YOURS

25 TO 50 PER CENT. IMPROVEMENT GUARANTEED
SEE SPECIAL WINDOW DISPLAYS

You Too Can Obtain Wonderful Results
IF YOU ASK FOR OUR FREE ADVICE AND ASSISTANCE
WE WILL HELP YOU WITH PLEASURE
REGARDLESS OF WHERE YOU BUY

“Yours for Lower Prices and Service that Satisfies”

The Economic Radio Stores
Address Mail Orders, 492 GEORGE STREET.
The PILOT "SUPER-WASP"

A New Receiver Kit Designed for the Amateur Experimenter

T HE Pilot Radio and Tube Corporation represented here by Messrs. Harrington, Ltd., has produced a new receiver kit, which is particularly designed for the amateur experimenter.

The new set, called the "Super-Wasp," has the following features:

1. It uses a tuned screen-grid radio-frequency stage that is not just a blocking valve.
2. It will tune down to 14 metres and up to 500. Two sets of plug-in coils (ten coils in all) are supplied with it. Thus it is an all-round receiver, and can always be depended on to produce some signals on some wavelengths. On the regular broadcast band it is the equivalent, electrically, of the well-known Browning-Drake.
3. The increased sensitivity and selectivity provided by the r.f. stage make the reception of short-wave broadcasting stations easier than with a highly critical straight regenerator.
4. It is double-shielded, there being no interaction between the r.f. and the detector stages.
5. There is no hand capacity effect.

By means of this arrangement the aerial is coupled to the tuning coils of the four short-wave inductors through the grid-condenser C10. This condenser is too small for the 200-500 metre region, so when the largest coil is plugged in it is automatically cut out of the circuit, and the aerial coupled to the grid coil by means of the more adequate primary winding. There are no switches to be thrown or wires to disturb.

The plate current for the 222 valve is fed right through the detector grid coil, being kept off the grid of the detector, V2, by the grid-condenser, C9. As the rotor of the tuning-condenser, C2, is grounded to the aluminium chassis of the set, the L2-C2 tuning circuit is completed by a .01 mfd. condenser, C5. This condenser, in series with the .00016 mfd. of C2, is too large to have any appreciable effect on the tuning, but prevents the B positive 135 from short-circuiting against the framework. A similar blocking-condenser, C4, is used in the r.f. stage, to allow the grid of the 222 to be biased by the voltage drop across the tapped filament resistor, R2.

The detector coils, L2, each contain two windings, the usual grid and tickler coils. These also are plug-in coils, which fit in a five-prong valve socket.

The detector is made regenerative by the tickler of L2, the action being controlled by...
The mechanical layout of the parts in the Supra-Wasp is the result of many trials with different experimental models. The front and sub-panels are of metal, accurately drilled for all parts. The components of the antenna and the detector stages, respectively, are enclosed within aluminium shield cans of unique design. These cans slot down the centre, and are very easy to assemble.

The two audio stages fit neatly along the back of the sub-panel. The under side of the latter supports the .01 mfd. by-pass condensers, C6, C7, and C8, and the 222 filament resistor, R2.

The only long leads in the set are filament wires, which do not count much, anyway. There is so little wire, because one side of practically all the parts is grounded directly to the aluminium framework.

Battery connections are made to a row of insulated binding posts, along the back edge of the sub-panel. Separate "B" and "C" posts are provided for each of the audio stages, so that any combination of tubes may be used.

A filament rheostat is wired in series with the fixed resistors, so that a man not owning a storage battery can run his outfit on dry cells. As the cells weaken, the rheostat can be turned up to keep the valves working properly. The instrument also acts as a switch for the entire set.

A full-size working blue print is furnished with the kit, along with a pamphlet containing detailed assembly instructions.

**A.B.C. Women's Association Session**

Programme for week commencing Friday, December 6, to Thursday, December 12 — SPEAKERS AND THEIR SUBJECTS.

**FRIDAY, DECEMBER 6.**

10.40 a.m.: "Madame, Do You Know?" by Miss Gwen Varley. Miss Varley will continue her exclusive hints on unique information regarding homecraft. She will point out the many uses of the electric fan, the value of the electric iron, how to hang pictures, clean suede coats and shoes, to get a professional touch to the home-made garments, etc.

10.50 a.m.: "Hone Confectionery," by "Priscilla" (Mrs. L. C. Norton). As Christmas approaches, many women are writing in to "Priscilla" for further recipes for Christmas festivities. Every Friday afternoon throughout the winter season of her followers met to receive tuition in needlecraft, and seldom an afternoon passed without beautiful boxes of home-made sweets being proudly displayed by the members.

**MONDAY, DECEMBER 9.**

10.40 a.m.: "Suitable Clothes for Holiday Wear," by Miss Gwen Varley. Miss Varley will help the would-be holiday-maker to select suitable clothes for her holiday, and advise her against the folly of taking too many dresses away with her. She will also advise economy by choice of colors.

10.50 a.m.: "Humorous Side of the Fight for Women's Freedom," by Mrs. Albert Littlejohn. This brilliant speaker, and vice-president of the A.B.C. Women's Association, Mrs. Albert Littlejohn, will sketch some humorous incidents in the fight for women's freedom.

**TUESDAY, DECEMBER 10.**

10.40 a.m.: "Our Health Bureau," talk by Miss Gwen Varley. Hundreds of women are writing in to Miss Varley for exercises that will reduce the double chin. Many mothers write in, too, for advice to strengthen their growing boys and girls. This session is proving a boon to many women.

10.50 a.m.: "Come With Me to Africa," by Mrs. Edith Glandville. Mrs. Glandville will give the second of her series of travel talks. She is one of our most vivid and cultured speakers.

Younger Set Session.

6.45-7 p.m.: "Junior Red Cross Session," by Mrs. MacKinnon. Mrs. MacKinnon, whose name rings far and wide in the Junior Red Cross world, speaks every alternate Tuesday on the work of this association. It bands together several thousand young people throughout New South Wales, who work to help others.

**WEDNESDAY, DECEMBER 11.**

10.40 a.m.: "Tennis Coaching," by Miss Gwen Varley. Miss Varley is doing extensive work in tennis coaching through the medium of the air, and each week new Radio Tennis Clube crop up as a result of her enthusiastic talks.

10.50 a.m.: "An Introduction to an Outstanding Personality," by Miss Varley. Miss Varley hopes to be able to introduce to her many hundreds of listeners someone whose name cannot yet be divulged. If permission is given, it will be a very red letter ten minutes to every listener.

**THURSDAY, DECEMBER 12.**

10.40 a.m.: "Holiday Resorts for Christmas Time," by Miss Gwen Varley. Miss Varley will suggest numerous holiday resorts, and give their special qualifications. Having personally visited most holiday towns, she can speak with knowledge and assurance.

10.50 a.m.: "Thrifty," shopping economically for Christmas, by Miss Janet Mitchell. Miss Janet Mitchell is a regular speaker during the Women's Session, and her advice in spending money wisely has helped hundreds of women to make their income considerably farther.

Younger Set Session.

6.45 p.m.: "Girls' Radio Club," by Miss Gwen Varley. Miss Varley will continue to tell the members of the Girls' Radio Club about the many activities of the club.

6.55 p.m.: "Horse Riding for Beginners," by Miss Mollie McWilliam. Miss McWilliam the well-known horse-woman, will give a talk one night a week for the beginners in riding. This will encourage members of the Younger Set to take up riding during their holiday time. Miss McWilliam will answer any questions pertaining to horse riding, so keen is she on this sport.
COLVILLE MOORE
A.C. THREE RECEIVER
A TRIUMPH IN TONE AND MECHANICAL PERFECTION.

100% ALL ELECTRIC
RIGHT OFF YOUR POWER OR ELECTRIC LIGHT SOCKET.
PLUG IN—TUNE IN
No Aerial or other loose wires. Solves your entertainment problem.

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Ducored Maple Cabinet, of unique and pleasing design. Power equipment and valves totally Philips. Super selectivity obtained with special wave trap. Tonal reproduction unequalled by any other receiver. Twelve months' guarantee and service. Imposing and binding warranty issued with every receiver.

LET US SHOW YOU ALL OUR LATEST MODELS AT No. 4 ROWE STREET.
AC THREE. Console Model, complete with speaker. CASH PRICE. £34. Deposit, £7. Monthly, £2/10/1.

DEMONSTRATIONS IN YOUR OWN HOME WITHOUT OBLIGATION
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Incredible! Yet Absolutely True
MILLIONS MILLIONS MILLIONS
of Emmco Transformers in Use
in Australia To-day

CHEAPER AND BETTER IN EVERY WAY

Emmco Radio Products have proved themselves to be the finest and most efficient complete line in Australia to-day. The largest Australian Radio Factory employing the largest number of specialised workers under the most efficient conditions.

Australian made in every way; and proving their satisfactory performance every day.

ALL UP-TO-DATE RADIO DEALERS
STOCK EMMCO RADIO PRODUCTS
ASK FOR THEM! DEMAND THEM!

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Sole Factory Representatives:
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A New Method of Describing Selectivity

CONSIDERABLE difficulty has always been experienced when attempting to specify the selectivity of a receiver. For many years, receivers were spoken of as "as sharp as a razor," or "as broad as a beetle's back." These terms, of course, are no more useful than would be the expression "my car goes a long way to the gallon." Various methods have been devised for describing the selectivity in terms which could be readily appreciated, and in America a standard procedure has been adopted. As we mentioned recently on this page, the scheme is to take curves at various points on the broadcast band of the input necessary to give a standard output of 50 milliwatts with the receiver tuned 10, 20, and 30 kilocycles off resonance. Families of such curves provide a splendid idea of the selectivity characteristics of the receiver across the band and make comparisons between the performance of various receivers a simple matter.

In England a new scheme has been suggested. It is described by R. T. Beatty M.A., B.E. D.Sc., in the issue of the "Wireless World" for October 16. Describing the new system, the writer says:

A set consisting essentially of a single tuned circuit such as the crystal set, is equivalent from the H.F. point of view to a circuit in which the resistive loads due to the aerial, the crystal and the 'phones are incorporated as an equivalent series resistance.

"The shape of the resonance curve of this circuit depends solely on the ratio of the reactance of the coil to the series resistance. This ratio is called the coil magnification. If it is large the curve is steep; if small, the curve is flat. All these differently-shaped curves can, however, be reduced to a single curve by the simple device of plotting them on logarithmic paper. In Fig. 1 the curve corresponding to a single tuned circuit is shown. If now, the value of the coil magnification m be changed, the shape of this curve is unaltered; it is merely shifted bodily in a horizontal direction (to the right if m be decreased to the left if m be increased).

"Accordingly, if we copy the curve on a piece of tracing paper and slide the paper horizontally by the requisite amount in any particular case, we can obtain immediately the resonance curve for any single tuned circuit.

THE SELECTIVITY NUMBER

"In order to decide where to put the tracing paper, we must fix on some reference point on the resonance curve; this point will take to be the intersection of the curve with the cross-hatched horizontal line in Fig. 1, that is, the number of kilocycles by which the circuit must be detuned in order that the ordinate of the curve may fall to 0.1 of its value at resonance. In Fig. 1 this value is 5 kilocycles for all the curves. The position of this reference point can be found by giving to the single tuned circuit in question a number, called the selectivity number and this proposal is the kernel of the present article, so chosen that the following statement is true:

"The number of kilocycles by which a single tuned circuit must be detuned to cause the ordinate of the resonance curve to fall to 0.1 of its value at resonance, is obtained by dividing the frequency of the carrier wave in kilocycles by the selectivity number. Thus, if the frequency or the incoming signal is 1000 k.c., and the selectivity number is 200, the resonance curve will cut the cross-hatched line in Fig. 1 at 1000/200=5 k.c.; this is the position actually shown.

"It has already been stated that the position of this intersection depends only on the coil magnification m, so that the selectivity number must depend on m. "Add the number of H.F. valves to the number of H.F. tuned circuits, and multiply this sum by 0.2 times the geometric mean product of the coil magnifications. The result is the selectivity number." This extract contains the substance of the new proposal, though it does not, of course, provide a very clear picture of it. Technically inclined students will find the complete article of considerable interest.
LEVENSON’S RADIO
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“Quam” Variable Condensers, with 4in. Dial. Pyrex Glass Ends, 35/- Now 9/- .0005, .00035, 6/- Excellent and Modern.


Dresser Fancy Metal Vernier Dials, 5/- list price. Now 2/6. Midget Coil Kits, 3 coils for 5-valve sets, 13/6. Now 5/-.

Magnus 3-valve Sockets with Terminals, 10/- Now 3/6.

Remler 3-gang Resistance Coupled Amplifiers, 18/- (12/- each). Worth three times as much.

Large Bakelite Arrow Knobs, with pointers, 1/-, small 9d.

Large 8in. Bakellite Dials, 1/6, 3in., 6d and 9d.; 2in., 1/-.

Walbert Dials, Vernier, large aluminium knob control, 10/- Now 5/-.

Midget Kit of Pancake Coils for 5-valve sets, 3/6.

Just arrived. Safe, new model Record Bell Ringing Transformers, 7/-: Approved Type.

Like-a-Flash UX 201A Valves, 6/-; UX 199 Valves, 8/-; Special power or detector, 21/-; New 10/-.

Build your own “B” Battery Eliminator. Levenson’s full kit for 3-valve sets costs £2.6.6. Everything needed, and simple circuit.

Magnus Lightning Arrestors, for in or out-door use, 5/-; New 2/-.

Send for Illustrated General Catalogue.


Bremer Tully High-grade Variable Condensers, 17/- Now 8/6. .0005, .00035, 7/6.

High-grade Hard Rubber Case Accumulators, 1 unit, 4 volts, 50/- value. 30-6 volts, 70/- value, 50/-.

English .001 Reaction Condensers, Midget, 1-hole mount, 5/-.


Cleartron High-grade English Valves, UX base, special detector and power, 22/- Now 10/-.

German Fringe Aerials, exceptional quality, £10. Now 40/-; Come and see them. Swivel compass plate, collapsible.


200,000 ohms ...... 8/-
500,000 ohms ...... 8/-

Magnum 200 and 400 ohms Potentiometers, 5/6. Now 4/-.

Build Levenson’s “A” Battery Chargers. Everything cost 50/-; Simple chart included. Anyone could build it.

Build Levenson’s All-station Crystal Set. The Wonder Crystal Set. All parts and chart cost £2/8/6.

Amplion AR 19 Loud Speakers, £5/10/- list price. My Price, 50/-

Amplion AR 88 Loud Speaker, 80/- My Price, Just Half, 45/-.

Lissen Speaker Units, 13/6; Reeds for building Cone Speaker, 1/-, Cones, 1/3; Cone Paper, 1/9 and 2/9.

Lissen 100-volt “B” Batteries, 22/6; 60-volt, 13/6; 9-volt “C” Batteries, 2/6.

Lissen Transformers, Bakelite Case, 12/-; Listen Super Transformer, 24/-.

Lissen Gramophone Pick-up, 15/-; De Jur Pick-up, Now £2/12/6; Tone Arm, 12/6 extra. Blue Spot Pick-up, 55/-; De Jur Tone Control Box, 12/6.


Renown Coil Kits, 10/6; Reinaarts Coils, 4/9; De Jur 1930 Browning Drake Coil Kit, 22/-; De Jur 3-coil Tuner, 15/-.


Marco Components, single or double jack, 1/-. On-off Filament Switch, non-solder, 8/9. Now 2/-.


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You can Build it in less than 1 hour.

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3-VALVE Portable Radio

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200,000 ohms ...... 8/-
500,000 ohms ...... 8/-

Magnum 200 and 400 ohms Potentiometers, 5/6. Now 4/-.

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Special attention to Country Orders. Please add Freight, as Prices are cut to the Quick. Satisfaction Assured.

Friday, 6th December, 1929
Modern Broadcast Transmission

(Continued from page 8.)

crease the percentage of modulation by four times, their effectiveness would remain the same. Alternatively, should they leave their carrier power as it is, and increase the percentage of modulation, a big improvement would be obtained as when the carrier power was quadrupled, the percentage of modulation remaining the same.

Modern broadcast practice is not only to use a high carrier power, but a high percentage of modulation. In other parts of the world, for instance, we find a host of stations with a carrier output of 50 kilowatts, which can be completely modulated by the music from the studio. This represents a useful output or "stir" probably a couple of hundred times greater than the average Australian station.

Obviously, modern stations of that type are much more effective in forcing their music through atmospheric and power leak interferences than those typified by the equipment at present manufacturing our radio signals.

As a matter of fact, in low-power and high-power carrier, the broadcasting stations have some decidedly formidable work to do. Their first problem is to assemble the means of making or re-creating some effective music, or of converting the music into a wave which will be transmitted to a metal element.

This may be the diagram of a microphone, or of the signal from a telephone or the reed of a gramophone pick-up, but in either case its duties are similar. It must transform the musical vibrations into a faithful copy in the form of electrical impulses. Most of the pick-ups and many of the microphones are capable of handling music of twice the height of the hill.

From these amplifiers the impulses must convert the musical vibrations into a high-power carrier, the troadcasting stations or "stir" probably a couple of hundred times greater than the average Australian station.

The technique and methods necessary for very definite improvement are available. Some of them have yet been riddled with problems, and no all of them are not in use at all. Rotation introduced. Usually both the higher and the lower musical frequencies are cut off for a start, while bands of frequencies through the audible range are either accentuated or attenuated. Aside even from this, the microphone introduces further troubles. If it is not placed so that the sounder of the musical instrument is making the music it can still pick up too much of some sounds and not enough of others.

One common attention to any of our broadcast transmissions to hear in which they may have an effect. One example in Australia is that the microphone is getting too much of the music and too little of others. The technique of picking-up music with microphones has been given exhaustive study in many parts of the world, both in connection with broadcasting and gramophone recording. So far it has progressed in some instances that the reproduction provided by the multiplicity of ears that the microphones can simulate is even more effective than the performance as heard by any one listener right alongside the performers. Unfortunately, we can by no means say this of the technique as applied in Australia.

From the microphones the electrical impulses pass through a device known as a "mixer," in which the output of several microphones, placed in various parts of a hall or studio, may be combined in the correct quantities. From this the impulses pass through amplifiers, which in some of the larger studios are capable of handling music of twice the height of the hill. From these amplifiers the impulses may travel over a few miles or a few hundred miles, or even to distant parts of the world. For this reason the production process much difficult and unnecessary distortion may be introduced unless careful supervision is at all costs to be avoided. Along these wires and at the studio end there will be equalizers, with which the musical frequencies lost in transit. The content of these equalizers is such that it will within reach a host of further amplifiers, including meters, and monitoring devices.

Used usually is obliged to keep at least one hand in the neighborhood of what is sometimes termed a "gain control"-a gadget with which he can swing even the most passionate opposition down to a whisper, or even to the point where he should be ever considerate enough to think it necessary.

When the very greatly amplified impulses have left the control-room, bound for the transmitting station, they have a gloriously rough time ahead of them. At the station they must be amplified tremendously, and eventually injected into the transmitter in such a manner that they will modulate the carrier wave. At all stages of this process distortion can occur and troubles can arise. Sound engineering, precise adjustment, and constant expert operation are necessary to avoid them.

Should the equipment be antiquated or incorrectly adjusted it is quite certain that serious distortion will occur, that a generator grovel or "a.c. hum" will be transmitted with the music and that the carrier wave of the transmitter will not only be modulated in amplitude but in frequency. Modern broadcast technique demands that modulation of the carrier frequency be avoided, and because they fail in this respect many of our stations would fail to attain the classification of "modern." In the up-to-date transmitter the carrier frequency is modulated by an oscillator-usually controlled by an oscillating quartz crystal-which is electrically isolated from those portions of the transmitter in which the modulation takes place. Consequently, the carrier frequency or wavelength is constant.

When this precaution is not taken the carrier wavelength varies back and forth in accordance with the musical frequencies, and the transmitter gives the effect of being broadly tuned. This is, it causes much greater interference to stations on a next-by-wave length than is justified. Aside even from this result, the frequency modulation greatly increases the problems of fading.

All in all, one of the important transmission systems are riddled with problems, and not all of them have yet been overcome by any means. The technique and methods necessary for very definite improvement are now in use. However, this result is justified in anticipation some very pleasant changes in the immediate future.

The REV. R. PIPPER, who is in charge of the Methodist Church, Haberfield, was a missionary in Fiji for 18 years. He recently returned from a holiday trip to the South Seas, and will be speaking from 2FC on December 6, at 9.2 p.m.

On one occasion, by special request from Fiji, Mr. Piper spoke in Fiji over the air to a large assembly of Fijian natives in an isolated island. A wireless receiver, operated by a visiting magistrate, they heard a broadcast programme. On that occasion, too, a grand champion of the old can nibal King of Fiji spoke into the same microphone, and delivered an address of goodwill to these wondering natives.

Wins £3-3-0 Prize

The winner of the recent competition held by Price's Radio Service for a letter in connection with broadcasting is Mr. F. McLaughlin. If Mr. McLaughlin will call at Mr. Price's store in Ingelshill, he will receive a cheque for £3-3-0.

"International Goodwill"

Mr. B. R. GELLING, president of the League of Nations Union, New South Wales Branch, also past president of the Rotary Club of Sydney, and on the executive committee of the Boy Scouts' Association, will be the guest of honour for Sunday, December 8, from 6.30 to 6.50 p.m. from 2FC. He will speak on "International Goodwill."

The League of Nations is the greatest system in the world to-day for the settlement of disputes. Disputes will continue to arise among the nations as they do among ourselves. The whole problem is that they be settled on the basis of law and justice, or by insincere appeal to war.

The objects of the League of Nations are to promote international co-operation and to achieve international peace and security. Mr. Gelling proposes to indicate the methods that the League adopts to fulfil these things. He will then show that the differences which divide mankind into races and nations are minute in importance compared to the compelling unities which bind them together as members of the great human family.

"The Two Jesters" will be at 3LO on December 9 in a bright and original programme of witty topicalities, with a date version of Shakespeare and other classics. A breezy note.

GLIDING

(Continued from page 11.)

not enjoy this new and fascinating pastime in comparative safety.

Modern gliders are inherently stable, and balance and control are maintained with the usual ailerons, elevators, and rudder, as in a power airplane. Easily the most important part of a glider is the wings, and in constructing the wing ribs, every care must be taken to ensure that the outline of the aerofoil be true to 1:32 in. of the dimensions shown of the aerofoil in the drawings. Whether the aeroplane is a glider or an aeroplane, things must not be done by halves. They should be exact, and not allow the slightest variance from any specified plan.

In order to rise with a motorless craft it is necessary to use the air currents which move vertically, because these winds are themselves rising, and are capable of exerting a lifting force upon the aerofoil. The winds which arise over a hill, or down the wind, form a hill, or headlands wind, and can be used to advantage. The gliders in such conditions are used to rise, and find the air for a distance of about twice the height of the hill.
INDEX
To Local Programmes
FRIDAY, DECEMBER 6—12 to 2.30 p.m.
7.0: BIG Ben" and Meteorological Information—ANNOUNCEMENT OF THE MAN ON THE LAND.
7.15: This morning's news, from "Sydney Morning Herald.
7.45: MALLS AND SHIPPING.
8.0: "Big Ben" and Meteorological Information—ANNOUNCEMENT OF THE MAN ON THE LAND.
8.15: CLOSE.
8.30: MUSIC FROM THE STUDIO.
7.50: CHILDREN'S BIRTHDAY COLTS.
7.58:TONIGHT'S PROGRAMME.
8.30: FROM FULLERTON POINT—(a) "Sonata in C Minor" (Beethoven). (Conducted by Horace Keats.)
9.0: THE COUNTRY MAN'S WEATHER SESSION.
9.0: THE COUNTRY MAN'S WEATHER SESSION.
9.10: ROMANO'S CAFE DANCE ORCHESTRA, conducted by Bennie Abrams.
9.15: RELAY FROM 3LO MELBOURNE.
10.0: LATE OFFICIAL WEATHER FORECAST.
10.0: THE NATIONAL BROADCASTING ORCHESTRA, conducted by Bennie Abrams.
10.30: FROM THE SYDNEY CRICKET GROUND—Description of the Trial Match.
11.00: FROM THE SYDNEY CRICKET GROUND—Description of the Trial Match.
11.30: OPENING SESSION—8.15 to 11.30 a.m.
12.0: FROM THE SYDNEY CRICKET GROUND: A Description of the Trial Match.
MONDAY, DECEMBER 9—12 to 2.30 p.m.
7.0: "Big Ben" and Meteorological Information—ANNOUNCEMENT OF THE MAN ON THE LAND.
7.45: MALLS AND SHIPPING.
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11.30: OPENING SESSION—8.15 to 11.30 a.m.
WIRELESS WEEKLY

Friday, 6th December, 1929

Scene: The Inventor's Laboratory.

8.58: LILY PRICE, Pianoforte Recital, with

forecast by C. N. BAYLEY.
(a) "Fur Elise" in D Flat, No. 15 (Raindrops)
(b) "Impromptu in F Sharp Minor"
(c) "Sheep and Goat Walking to Pasture"

9:00: FRASER COSS, Baritone—
(a) "The Lake Player" (Aldebert)
(b) "Song of the Soul" (Bohn).

9:30: Weather Information for the Man on the "Land.

9:32: A Talk on "General Sporting," by CLAIRE CORBETT.

9:50: ORCHESTRA—
(a) "Spanish Dance No. 5" (Moszkowski).
(b) "Spanish Dance No. 14" (Aubert).
(c) "Song from "Madame Butterfly" (Puccini).

10.00: FRASER COSS, Baritone —
(b) "Echoes of the Past" (Lindgren).

10.05: Symphony Orchestra.
(b) "Spanish Dance No. 5" (Moszkowski).

10.10: Symphony Orchestra.
(b) "Russian Dance" (Sporano).

10.20: Symphony Orchestra.

10.25: Late News from "The Sun" and "The

Late Weather Forecast.

MORNING SESSION.

7:00: Music.
7:45: Feature Story.
8:00: All Russian Programme.
9:00: Musical programme.
10:00: All Russian Programme.
11:00: A few laughs.
12:00: Calls and announcements.
11:50: Pianoforte selections.
11:20: Final call and announcements.
11:30: Request numbers.
12:00: Music and vocal items.
11:55: Where to go to-night.
12:00: Closing announcements.

WOMEN'S SESSION.

6:00: Birthday calls, request numbers, and

Kiddies' Entertainment. UNCLE BERT

AND UNCLE MAC

EVENING SESSION.

7:00: Musical Interlude.
7:30: Birthday calls.
7:30: SPORTING FEATURE. Forti topics

Review of Candidates and their prospects

for to-morrow. Mr. GEO. A. DAVIS

7:40: Request numbers.
8:00: Hawaiian steel guitar selections.
8:10: Women's Information Service Mrs.

GRAY.
8:30: Music and vocal items from the studio.
9:10: Full description of main 15-round event.
10:00: Closing announcements.

2UE

Broadcasting Station 2UE, Everett Street, Miranda

Woolloomooloo, Sydney (Wavelength, 200 Metres).

EARLY MORNING SESSION

7:15: Breakfast Time Hour Orchestral

Music. 8:00: Clock and Chimes. 8:15: Musical

Items. 8:30: Weather Forecast. Close down

MORNING SESSION.

10:00: Women's Session conducted by Miss

Dorothy Vautier. 11:30: Orchestral and

Vocal Music. 12:00: Close down.

AFTERNOON SESSION.

1:00: Orchestral and Vocal Music. 1:15: Or-

chestral Recital. 2:00: Close down.

EVENING SESSION.

6:30: Wendy's Hour with the Children, and

Birthday Greetings. 7:30: Orchestral Items.
7:30: Health Talk by Mr. T. Gordon Marsden.
7:30: Orchestral Dinner Music. 7:45: Pro-

gramme Announcements, and news from the

"Sun." 8:00: Clock and Chimes. 8:15: Overture,

"Bohemian Girl" Selections. 9:00: Weather

Report. 9:15: Request numbers, and

Kiddies' Entertainment. UNCLE BERT

AND UNCLE MAC.

CLOSED DOWN.

WIRELESS WEEKLY

"WIRELESS WEEKLY" gives you the complete

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station in Australia a week in advance in addition
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structive article by a qualified radio man.

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FOR ONE YEAR

52 ISSUES

DELIVERED POST FREE
**WIRELESS WEEKLY**
Friday, 6th December, 1929

**3LO**
Australian Broadcasting Co., Ltd., 1264 Russell St., Melbourne (Wavemeter, 510 Mts.)

**MORNING SESSION.**
10.00: Current news, by Eric Wrench, 10.45: Music reproduction. 11.00: Fish market reports. 11.30: Monty Diamond, 11.15: Melbourne Delta, 11.00: Melbourne Stakes, Melbourne Horse Exchange, metal prices. 12.00: James Constance. 12.00: Daily broadcast service.

**SUNDAY SESSION.**
10.00: Current news, by Eric Wrench. 10.45: Music reproduction. 11.00: Fish market reports. 11.30: Monty Diamond. 11.15: Melbourne Delta. 11.00: Melbourne Stakes, Melbourne Horse Exchange. Metal prices. 12.00: James Constance. 12.00: Daily broadcast service.

**EDUCATIONAL SESSION.**
10.00: The Recent Development of the World—Mr. H. O. McLeod, 10.15: Musical interlude. 10.30: O. G. Barrett, 10.45: Melbourne Observer time signal.

**THE RADIO NATIVE.**
3.1: The Studio Light Orchestra—Three Irish Dances (Aldous, Carol, and The Lark—also songs, "Das Wagen in Schonberg" (Kohler), "My Beloved is Beautiful", "Werde ich du Kleine Orren" (Richard), "Well—Wart" (Endarch Marcks). 3.45: Guitar, Max Rosen. 3.59: Accompanist, Mr. Reg. Minnesott. 4.06: String quartet, "Manfred" (Schubert), "Co. 90" (Alberici), "Brizdance": 4.1: R. A. Allen, piano accompaniment. 4.13: Ernest Wilson, baritone. 4.15: A Man's Life (Hugo). 4.28: The Studio Light Orchestra—selection from the musical comedy "Strawberry Hill" (Dolton Coleman).

**THE CHILDREN'S HOUR.**
5.45: "Plain Peter" and Following Rites are en- tertainment for children. 5.54: News. 6.00: Over the years goodbye signal used to march up! 6.30: Announcement of 5 CL radio vocal championships. 6.30: "Plain Peter" and Following Rites.

**TENNIS-TENNIS.**
6.30: Tennis—some advice to young players, Miss Peggy Bowles. 6.50: Dance by the Tabloid Theatre, arranged by Gregory Truscott. 7.00: Adelaide Observer time signal. 7.15: Countryman's sports news and information. 7.30: Alluvial platform, shop and savings. 7.30: The latest news in cricket. 7.30: Announcements. 7.30: Tennis—some advice to young players.

**EVENING SESSION.**
CONSIDER any Philips Valve of the moment. Compare it with the leaders of years ago. The D4 is now forgotten — but in the early days of radio it was without a rival.

And just as the Philips tubes of yesterday were supreme, so they are today — but going further and further AHEAD with a lead which, backed by the tremendous resources of Philips Laboratories, cannot be reduced.

GIVE "FREE SPEECH" TO YOUR RADIO—WITH A PHILIPS SPEAKER
Local Programmes, Saturday, December 7

2FC


EARLY SESSION—7 a.m. to 7:15 a.m.

7.30: "Big Ben" and Meteorological Information (for the Man on the Land).

7.40: Children's "Good Night" Story.


7.50: Mails and Shipping Information.

8.0: What's On Today?

8.05: Children's Birthday Message.

8.10: Mails and Shipping Information.


8.20: "The Australian Broadcasting Service" Station Reports.

8.30: "The Australian Broadcasting Service" Station Reports.

8.45: Children's "Good Night" Story.


9.10: Children's Birthday Message.


9.20: "The Australian Broadcasting Service" Station Reports.

9.30: "The Australian Broadcasting Service" Station Reports.

9.45: Children's Birthday Message.

10.00: CLOSE DOWN.

10.10: Austradios Musical Reproduction.

10.15: Children's Birthday Message.


10.25: "The Australian Broadcasting Service" Station Reports.

10.30: "The Australian Broadcasting Service" Station Reports.

10.45: Children's Birthday Message.


11.05: British Official Wireless Press Conference.

11.10: Children's Birthday Message.


11.20: "The Australian Broadcasting Service" Station Reports.

11.25: "The Australian Broadcasting Service" Station Reports.

11.30: Children's Birthday Message.

11.40: "The Australian Broadcasting Service" Station Reports.

11.45: Children's Birthday Message.

12.00: CLOSE DOWN.


12.15: Children's Birthday Message.


12.25: "The Australian Broadcasting Service" Station Reports.

12.30: "The Australian Broadcasting Service" Station Reports.

12.40: Children's Birthday Message.


12.50: "The Australian Broadcasting Service" Station Reports.

12.55: Children's Birthday Message.

1.00: FROM THE STUDIO—The Country Man's Weather Session.

1.05: British Official Wireless Press Conference.

1.10: Children's Birthday Message.

1.15: Austradios Musical Reproduction.

1.20: "The Australian Broadcasting Service" Station Reports.

1.25: "The Australian Broadcasting Service" Station Reports.

1.30: Children's Birthday Message.

1.35: Austradios Musical Reproduction.

1.40: "The Australian Broadcasting Service" Station Reports.

1.45: Children's Birthday Message.

2.00: FROM THE STUDIO—The Country Man's Weather Session.

2.05: British Official Wireless Press Conference.

2.10: Children's Birthday Message.

2.15: Austradios Musical Reproduction.

2.20: "The Australian Broadcasting Service" Station Reports.

2.25: "The Australian Broadcasting Service" Station Reports.

2.30: Children's Birthday Message.

2.35: Austradios Musical Reproduction.

2.40: "The Australian Broadcasting Service" Station Reports.

2.45: Children's Birthday Message.


3.05: British Official Wireless Press Conference.

3.10: Children's Birthday Message.


3.20: "The Australian Broadcasting Service" Station Reports.

3.25: "The Australian Broadcasting Service" Station Reports.

3.30: Children's Birthday Message.

3.35: Austradios Musical Reproduction.

3.40: "The Australian Broadcasting Service" Station Reports.

3.45: Children's Birthday Message.


4.05: British Official Wireless Press Conference.

4.10: Children's Birthday Message.


4.20: "The Australian Broadcasting Service" Station Reports.

4.25: "The Australian Broadcasting Service" Station Reports.

4.30: Children's Birthday Message.

4.35: Austradios Musical Reproduction.

4.40: "The Australian Broadcasting Service" Station Reports.

4.45: Children's Birthday Message.

5.00: FROM THE STUDIO—The Country Man's Weather Session.

5.05: British Official Wireless Press Conference.

5.10: Children's Birthday Message.

5.15: Austradios Musical Reproduction.

5.20: "The Australian Broadcasting Service" Station Reports.

5.25: "The Australian Broadcasting Service" Station Reports.

5.30: Children's Birthday Message.

5.35: Austradios Musical Reproduction.

5.40: "The Australian Broadcasting Service" Station Reports.

5.45: Children's Birthday Message.


6.05: British Official Wireless Press Conference.

6.10: Children's Birthday Message.


6.20: "The Australian Broadcasting Service" Station Reports.

6.25: "The Australian Broadcasting Service" Station Reports.

6.30: Children's Birthday Message.


6.40: "The Australian Broadcasting Service" Station Reports.

6.45: "The Captain" to His Commandos.

7.00: "The Australian Broadcasting Service" Station Reports.

7.05: Children's Birthday Message.


7.15: "The Australian Broadcasting Service" Station Reports.

7.20: Children's Birthday Message.


7.30: "The Australian Broadcasting Service" Station Reports.

7.35: Children's Birthday Message.

8.00: FROM THE STUDIO—The Country Man's Weather Session.

8.05: British Official Wireless Press Conference.

8.10: Children's Birthday Message.


8.20: "The Australian Broadcasting Service" Station Reports.

8.25: "The Australian Broadcasting Service" Station Reports.

8.30: Children's Birthday Message.

8.35: Austradios Musical Reproduction.

8.40: "The Australian Broadcasting Service" Station Reports.

8.45: Children's Birthday Message.


9.10: Children's Birthday Message.


9.20: "The Australian Broadcasting Service" Station Reports.

9.25: "The Australian Broadcasting Service" Station Reports.

9.30: Children's Birthday Message.


9.40: "The Australian Broadcasting Service" Station Reports.

9.45: Children's Birthday Message.


10.05: British Official Wireless Press Conference.

10.10: Children's Birthday Message.


10.20: "The Australian Broadcasting Service" Station Reports.

10.25: "The Australian Broadcasting Service" Station Reports.

10.30: Children's Birthday Message.
Interstate Programmes, Saturday, December 7

3LO
Australian Broadcasting Co., Ltd., 1828 Russell St., Melbourne, Victoria.

EARLY EVENING SESSION.

EARLY MORNING SESSION.

MORNING SESSION.

3AR
Australian Broadcasting Co., Ltd., 1828 Russell St., Melbourne, Victoria.

EARLY EVENING SESSION.

6WF
Australian Broadcasting Co., Ltd., Wellington Street, Perth (Wheatland, 450 Metres).

EARLY EVENING SESSION.

VAR-LAC
Multi-Way Battery Cable is Sold by the Yard.
Only Two Valves

BUT IT'S ALL-ELECTRIC

HERE'S a receiver that answers your inquiry for a set that is economical in price and upkeep—that is all-electric—and that will give you local broadcasting with surprising fidelity of reproduction.

THE ALPINE TWO-VALVE RECEIVER operates direct from your power point or light socket—there are no batteries to worry you. Two controls only, giving you selectivity and the full enjoyment of programmes at loud-sounder strength. Volume is controlled to any desired pitch by a single control only, giving you selectivity and power point or light socket—there are no batteries to worry you.

The Alpine All-Electric Two is only 9in. x 11in. x 4in., enabling it to be fitted unobtrusively into the smallest room. beautifully finished in black crystaline lacquer.

PRICE COMPLETE WITH VALVES.

£15/10/.

See our Display at the Radio Exhibition, State Shopping Block.

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ALL-ELECTRIC TWO-VALVE RECEIVER.

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S. E. Tatham & Co.

160 CASTLELARGEH ST.

SYDNEY

'PHONES: M4151-2

WIRELESS WEEKLY

Friday, 6th December, 1929

Local Programmes, Sun., Dec. 8

2FC

Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength. 352 Metres). Time—9 a.m. to 10.30 p.m.

10:00 Announcements.

10:15 FROM THE STUDIO-MUSICAL Programme, conducted by Rev. C. V. E. Foreman, M.A. 11:00 Overture—"The Messiah" (Handel).

2BL

Sydney Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 352 Metres). Time—10.55 a.m. to 11.30 a.m.

10:55 C. N. Beibertz continues his series, "Philosophic Thought from Bacon to Bergson.

4:30 FROM THE STUDIO—MUSICAL Programme, arranged by Madame Evelyn Gries.

2GB

Thomson-Broadcasting Company, Ltd., Bligh St., Sydney (Wavelength. 312 Metres). Time—12.15 p.m. to 1.30 p.m.

11:56 Address by Miss May Craven, Soprano; Rev. W. T. Smith, Vicar of St. Alban's Church. 12:00 Prelude—"Pastoral Symphony." (Dvořák). Selection—"Scherzo," from Dvorak's Quintet. 12:45 From the Lyceum Hall—Choral Society—"Tune Ye Your Harps in Tune.

11.00 CLOSE.

4:30 FROM THE STUDIO—MUSICAL Programme, conducted by REVD. F. E. PAYNT.

2UE

Radio Broadcasting, Ltd., Pakington Building, 8th St., Sydney (Wavelength, 312 Metres). Time—2.30 p.m. to 3.30 p.m.

12:30 CLOSE.

11:00 Two Girls, conducted by Uncle Jack. 12:00 Children's hour, conducted by Uncle John. 12:30 FROM THE STUDIO—MUSICAL Programme, conducted by REVD. F. E. PAYNT.

2UR

Radio Broadcasting, Ltd., Pakington Building, 8th St., Sydney (Wavelength, 312 Metres). Time—7.00 p.m. to 8.00 p.m.

10:30 Announcements.

11:00 FROM THE STUDIO—MUSICAL Programme, conducted by REVD. F. E. PAYNT.

2CV

Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 352 Metres). Time—12.15 p.m. to 1.15 p.m.

11:00 FROM THE STUDIO—MUSICAL Programme, conducted by REVD. F. E. PAYNT.

2UG

Radio Broadcasting, Ltd., Pakington Building, 8th St., Sydney (Wavelength, 352 Metres). Time—2.30 p.m. to 3.30 p.m.

12:00 CLOSE.

11:00 Two Girls, conducted by Uncle Jack. 12:30 FROM THE STUDIO—MUSICAL Programme, conducted by REVD. F. E. PAYNT.
Interstate Programmes, Sun., Dec. 8

3LO

Australian Broadcasting Co., 104A Russell St., Melbourne (Wavelength, 501 Metres).

MORNING SESSION.
10.30: Melbourne Observer's time signal. 10.31: Interludes in C Sharp Minor.

Afternoon Session.

THE CHILDREN'S CORNER.

EVENING SESSION.
7.30: Arvec, violin, and Vassili Siliter, piano ( Gloria in Excelsis Deo, Opus 22).

7.35: The Beauty Spots of Australasia - Mr. L. H. Steven.

8.0: Trio, violin, piano, and flute. "Brahms' Trio in B Minor."


9.0: The Week's Good Cause. Life Saving in Victoria - Your Railways and Safety, Mr. Harold Hocking.

10.0: God Save the King. "Mornig Session." Missionary Address, Rev. Mr. Harold Hocking.

11.30: Close down.

4QC


MORNING SESSION.

AFTERNOON SESSION.
1.0: The celebration of the 125th anniversary of the British and Foreign Bible Society will be relayed from Albert Street Methodist Church: Addresses will be delivered by His Grace Archbishop and prominent citizens.

4.0: Band concert. 4.30: Close down.

EARLY EVENING SESSION.
4.40: From the Studio. A session for little listeners.

NIGHT SESSION.


Lessons, Isaiah, Chapter 30, Verse 1 to 22, to Chapter 31, Verses 1 to 41. Matthew, Chap. 24, Verse 29, to end. Hymn 36: "Great God, What Do I See and Hear.


9.30: Close down.

5CL


MORNING SESSION.

AFTERNOON SESSION.
3.0: A pleasant Sunday afternoon service from St. Margaret's Memorial Church. Minister, Dr. R. Wright. Organist, Mr. Fossett Robinson.

4.0: Morning Session.

NIGHT SESSION.
6.45: Church Choir numbers. 7.1: Service from Royal Masonic Church. Minister. Dr. H. Wright. Organist, Mr. Fossett Robinson.

6.55: Close down.

2UE

Broadcasting Station (UE), Everett Street, Marrickville, Sydney (Wavelength, 99 Metres).

Sunday, December 8

MIDDAY SESSION.
11.0: Mass from St. Mary's Cathedral. 11.25: Studio announcements. 12.30: Orchestral and Vocal Concert. 1.0: Close down.

EVENING SESSION.

"ALREADY
AWASH,
THE
SHIP
ASTERN
WAS
SETTLED
DOWN
QUICKLY,
THE
WATER
AROUND
DOTTED
WITH
HUNDREDS
OF
FLOATING
MEN
AND
SO
THE
CONVOY
MOVED
STEADILY
ON."
2FC

Local Programmes, Monday, December 9

2.0: FROM THE SYDNEY CRICKET GROUND—Description of the Tíe Match.

4.0: FROM THE SYDNEY STUDIO—MARJORIE COLE, Soprano.
   (a) "My Love is a Silent Forest" (Wolff)
   (b) "He Is Tender with the Beast" (Ford)

4.21: MODERN MUSIC.

4.28: Stock Exchange, third call.

4.30: CLOSE.

EARLY EVENING SESSION—4.55 to 7.55 p.m.

5.45: Children's "Good-night" Stories, told by the "Hello Man," assisted by Aunt Eily.

6.0: Dinner Party Music.


7.55: What's on the Air To-night?

7.58: To-night's Programme.

8.15: CLOSE.

THE EVENING PRESENTATION—8 to 11.30 p.m.

Our Classic offering to-night is contributed by Clement, Williams, Dagmar Thomson, Madame Emily Marks, and Enid Hynes. (a) "My Love is a Silent Forest" (Wolff)
   (b) "He is Tender with the Beast" (Ford)

   (a) "The Prize Song" (Beach)
   (b) "Ali, Love, But a Day" (Beach)
   (c) "The Firefly" (Friml)

9.0: THE METROPOLITAN BAND — "H.M.S. Pinafore" (Tschaikowsky).

9.42: MADAME EMILY MARKS and ENID COLE, Soprano — "Sun." (a) "Blackbird's Song" (Cyril Scott)
   (b) "On Wings of Song" (Mendelssohn)
   (c) "Petite Suite" (Chaminade).

10.0: MADAME EMILY MARKS and ENID COLE, Soprano — "Sun." (a) "Petite Suite" (Chaminade)
   (b) "Bon Jour Suzon" (Delibes)
   (c) "The Firefly" (Friml)

11.0: FROM THE STUDIO: News from "The Sun".

11.30: CLOSE.

11.30: CLOSE.

SYDNEY SIMPSON'S SYMPHONETTES in Dance Music.

12.30: FROM THE STUDIO: KATHLEEN TEWKSBURY, Soprano — "Sun." (a) "Blackbird's Song" (Cyril Scott)
   (b) "On Wings of Song" (Mendelssohn)


14.49: THE NATIONAL BROADCASTING ORCHESTRA—(a) "H.M.S. Pinafore" (Sullivan)
   (b) "Three Dances" "Hensy VIII." (German)
   (c) "Tone Portrait" (Mendelssohn)

15.00: THE NATIONAL BROADCASTING ORCHESTRA—(a) "H.M.S. Pinafore" (Sullivan)
   (b) "Three Dances" "Hensy VIII." (German)
   (c) "Tone Portrait" (Mendelssohn)

15.35: THE NATIONAL BROADCASTING ORCHESTRA—(a) "Valse Bluette" (Drigo)
   (b) "Bouquet Of Roses" (Pascal)
   (c) "The Firefly" (Friml)

16.00: MADAME EMILY MARKS and ENID HYNES — in a Recital of American Compositions.
   Songs, Madame Emily Marks—
   (a) "Wood Songs" (Winter-Watts)
   (b) "Three Chinese Tone Poems" (Carpenter)

16.15: MADAME EMILY MARKS and ENID HYNES — in a Recital of American Compositions.
   Songs, Madame Emily Marks—
   (a) "Wood Songs" (Winter-Watts)
   (b) "Three Chinese Tone Poems" (Carpenter)

16.30: MADAME EMILY MARKS and ENID HYNES — in a Recital of American Compositions.
   Songs, Madame Emily Marks—
   (a) "Wood Songs" (Winter-Watts)
   (b) "Three Chinese Tone Poems" (Carpenter)

16.45: THE BOYS' AERO CLUB — "Petite Suite" (Chaminade)

17.00: THE NATIONAL BROADCASTING ORCHESTRA—(a) "Petite Suite" (Chaminade)
   (b) "Merrie England" (German)

17.15: Announcements.

17.30: Late Official Weather Forecast.


18.15: CLOSE.

NATIONAL ANTHEM.

Stromberg-Carlson

Gear Drive

The Stromberg-Carlson Gear Drive is primarily for use with canned gas engines. It is partly meshed gears, truly meshed gears.

The Scale is of heavy celluloid, which is efficiently illuminated from the back by means of a standard 6-volt, 100-watt, lamp, which operates satisfactorily on either 4 or 6 volt circuits. The Escutcheon Plate is of handsome design, finished in old gold, with a knob of pure brown bakelite.

The main features of the Stromberg-Carlson gear drive is its sturdy construction, which, combined with the fact that it has a precision made gear drive, makes it far more satisfactory for driving canned gas engines than any other type of dial.

Type A. 623. Gear Drive. Complete with Escutcheon, Knob, and Lamp — Dimensions, 43 x 33 x 21m. Price, $15.6...

Stromberg-Carlson (A/sia), Ltd., 72-76 William St., Sydney.
8.25: GRACE QUINE, Popular Vocalist—
(a) "That Old Sweetheart of Mine" (Goodwin and Shay).
(b) Impression, Maurice Chevalier singing "Louise" (Robin and Whiting).
8.32: 2BL’S WEEKLY SOUND FILM FEATURE.
9.2: THE METROPOLITAN BAND—
March, "Royal Australian Navy" (Lithgow).
9.33: GRACE QUINE, Popular Vocalist—
(a) "Think of Me Thinking of You" (Abbot).
(b) "Junior" (Donaldson).
9.40: BILLY O’HANLON and ZARA CLINTON in a Radio Sketch:
"Odds and Ends."
9.52: THE METROPOLITAN BAND—
Selections, "Old Memories" (Rimmer).
10.2: NAT HANLEY, Comedian.
10.9: THE METROPOLITAN BAND—
Descriptive Fantasia, "Trooping the Colours" (Holloway).
10.25: Late News from "The Sun." Late Weather Forecast.
10.30: NATIONAL ANTHEM. CLOSE.

2GB
Theosophical Broadcasting Station, 29 Bligh St.,
Sydney (Wavelength, 316 Metres).
Day Sessions as usual.
8.0: Miss Lily Davies, Contralto.
8.7: Symphony Orchestra.
8.15: Mr. Cecil Chaseling, Baritone.
8.30: Mr. Jack Win and Mr. Heath Burdock—Humour.
8.35: Miss Mary Mulconry, Soprano.
9.1: Symphony Orchestra.
9.10: Miss Lily Davies, Contralto.
9.20: 'Cello Solos.
9.30: Mr. Jack Win and Mr. Heath Burdock—Humour.
9.35: Mr. Cecil Chaseling, Baritone.
9.45: Band Selection.
10.0: Novelty numbers.
10.30: Close down.

2UW
Radio Broadcasting, Ltd., Paling’s Building, Ash St.,
Sydney (Wavelength, 317 Metres).
MIDDAY SESSION.
12.30 to 4.30: As usual.
EVENING SESSION.
5.30: Children’s hour.
6.30: The Meccano Club.
6.45: Close.
7.45: Radio Talk, by Mr. E. Homfray.
8.0: Chamber music recital.
8.10: Foreign Affairs by Mr. J. M. Prentice.
8.15: Music.
9.0: Close.

2KY
Trade and Labor Council, Govanhill St., Sydney
(Wavelength, 318 Metres).
MORNING SESSION.
10.0 to noon, as usual.
CHILDREN’S SESSION.
6.0: Birthday calls, request numbers and Kids’ Entertainment. UNCLE BERT AND UNCLE MAC.
EVENING SESSION.
7.0: Musical interlude.
7.15: Dance Music.
7.30: Talk on Gardening. Mr. G. L. GELATLY.
7.45: Millitant Women’s Group.
8.0: Overbury.
8.8: Tenor Solos. Mr. A. HILLMAN.
8.15: Dance Music.
8.30: Request numbers.
8.45: Soprano Solos.
9.0: Novelty numbers.
9.15: Request numbers.
10.0: Closing announcements.

2UE
Broadcasting Station 2UE, Everett St., Maroubra,
Sydney (Wavelength, 319 Metres).
EARLY MORNING SESSION.
7.15 to 8.30, as usual.
(NO EVENING SESSION.)

ECONOMICAL OPERATION

Behind your purchase of an “Ever-Ready” Dry Battery lies the famous “Ever-Ready” guarantee.
“Warranted to give service unexcelled by any other battery of equal size and capacity!”

Wire one in to-night for economy and for the added clarity and volume it gives to your reception. It’s a good investment.

There’s an “Ever-Ready” type for all requirements — Radio, Torches, Doorbells, Buzzers, etc. Ask any radio dealer to show you the one most suited to your need.

N.S.W. Wholesale Distributors:
THE EVER-READY CO.
(Gt. Britain), LTD.,
163 PITT STREET, SYDNEY.
**Interstate Programmes, Monday, December 9**

**3LO**
Australian Broadcasting Co., 121A Russell St., Melbourne (3LO). Daytime and evening hours.

**EDUCATIONAL SESSION.**

**THE RADIO MATINEE.**
12:30: Regal Brass Band March: "The Flying Scarecrow." 1:15: Dr. G. W. Gray, baritone: "Artic. O Sun" (Kerr). (Continued.)

**10.0: How Shall I Know?**

**10.30: Desert Song.**
Men of the Mystic Garden. "Get to Heaven." "Daddy and Boosy:"

**11.0: Brass Band—Selection.**
"Minuet," Loeljan.

**12.0: The King's Message.**
Shakespeare: "The Laurel and the Rose." Raphael—solo pianist: Schumann:

**12.30: The Laurel and the Rose.**
Raphael—solo pianist. Schumann:

**1.0: Brass Band—Selection.**
"Hymn to Youth," Strauss.

**1.30: Children's Corner.**
Ravel—solo pianist: Chopin: "None But the Lonely Heart." "Don't Worry." "On the Dawn" (Kerr).

**1.30: More Children's Corner.**
Ravel—solo pianist: Chopin: "None But the Lonely Heart." "Don't Worry." "On the Dawn" (Kerr).

**2.0: Earth We Live On.**
Mr. W. C. Groves.

**2.10: Brass Band—Selection.**

**3.0: Regal Orchestra.**
Elsie Westcott.

**3.0: Radio Westcott.**
Elsie Westcott—solo pianist. Liszt:

**3.22: Adeline Levey.**

**3.49: George Cowley, baritone.**

**4.00: Brass Band—Selection.**

**4.24: Melbourne Band—Selection.**

**5.45: Close-down.**

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**3AR**
Australian Broadcasting Co., 121A Russell St., Melbourne (3AR). Morning and evening hours.

**EDUCATIONAL SESSION.**

**NIGHT SESSION.**

**11.0: The Master Valve.**
A British Valve and the wonderful Mullard P.M. Filament. Mullard radio valves improve any radio receiver.

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**NEXT WEEK SPECIAL XMAS NUMBER SHORT STORIES ARTICLES ILLUSTRATIONS**

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**4QG**
Queensland Government Radio Service, Brisbane (Favorable, 4QG).

**Day Sessions.**
3.0: Adeline Levey (solo pianist). 4.0: John Steele (solo pianist). 5.0: Vera Parker (solo pianist).

**5CL**
Central Broadcasting Ltd., 111 Hindmarsh St., Adelaide (Wavelength, 5CL).

**Programme review and announcements.**
11.0: Walter Barrett and his Matson Masters of Media: "Little Good, Little Bad, You (Green)."

**Night Session.**
11.0: Radio Westcott. Elsie Westcott—solo pianist. Liszt:

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**Be Safe - use a Mullard**
A British Valve and the wonderful Mullard P.M. Filament. Mullard radio valves improve any radio receiver.

**Mullard**
THE MASTER VALVE
Enormous Volume Without Distortion

An economical valve, which has an exceptionally steep slope, and will handle enormous volume without the slightest trace of distortion.

Osram P 625 A is a last stage super power amplifying valve, suitable for use with 6-volt batteries. It is especially recommended for use in gramophone amplifiers, where two of these valves may be used in push pull. Fit P 625 A and note the remarkable improvement.

Osram Valve

(Made in England.)

Ask for it by number, and say Osram.

Your "B" Batteries last longer when used. Ask your dealer for The Osram Valve with "Osram Valves."

Guide, free on request.

Branches at Melbourne, Adelaide, Perth, Newcastle, and New Zealand cities. Sole agents at Brisbane and Hobart.
Friday, 6th December, 1929

WIRELESS WEEKLY

FROM THE STUDIO—
Weather Information for the Man on the Land.

9.37: DES TOOLEY, the Girl with the Unusual Voice.
9.44: DULCIE BLAIR, Violinist—
(a) "The Swan" (Saint-Saëns)
(b) "Serenade" (Moszkowski).
9.51: ALEXANDER HAMELNIK, Pianist—
(a) "Elegie" (Rachmaninoff).
(b) "Valse-Improviste" (Liszt).
10.03: DES TOOLEY, the Girl with the Unusual Voice.
10.10: Australian Musical Reproduction.
10.25: Late News from "The Sun.
Late Weather Forecast.
10.30: NATIONAL ANTHEM. CLOSE

2GB
Theosophical Broadcasting station, 31 High St.,
Sdney (Wavelength, 25 metres).

Day Sessions as usual.
8.0: Miss Mary Neal, Contralto.
8.15: Symphony Orchestra.
8.30: Mr Jack Win and Mr Heath Burdock
Humour.
8.35: Miss Margaret Best, Soprano.
8.42: Band Selections.
9.15: Symphony Orchestra.
9.25: Mr Len Howell, Tenor.
9.35: Mr Jack Win and Mr. Heath Burdock
Humour.
9.40: Violin solo.
9.50: Miss Margaret Best, Soprano.
10.0: Instrumental Music.
10.30: Close down.

2UW
Radio Broadcasting, Ltd., Paling's Building, Ann St.
Sydney (Wavelength, 293 Metres).

EARLY MORNING SESSION.
7.15 to 8.30, as usual.
MIDDAY SESSION.
10.0 to noon, as usual.
AFTERNOON SESSION.
1.0 to 2.0, as usual.
EVENING SESSION.
6.30: Wendy's Hour with the Children, and
Birthday Greetings. 7.15: Instrumental Dinner
Music. 7.55: Programme announcements
from the "Sun." 8.0: Clock and
Chimes. 8.15: Overture, "Selections from
Faust." 8.10: Instrumental and Vocal Pro-
gramme. 10.15: National Anthem. Close
down.

MURDOCH'S RADIO METERS
for every purpose

MURDOCH'S stock of tested and reliable
Radio measuring instruments is un-
equaled. Nowhere else could you find such a
complete range. Write or enquire—our experts
are only too pleased to help you!
Your filament may be overloaded, you may have
excess of high tension; there's scores of functions a
Meter will help you in.

WATES METERS

For Panel Mounting

Volt Meters, in any of these readings,
0-3, 0-5, 0-8, 0-12, 0-120, each ........................................ 7/6
Amp Meters, in any of these readings,
0-1, 0-3, 0-5, 0-10, 0-15, 0-20, each .................................... 7/6
Millamp Meters, in any of these readings,
0-15, 0-30, 0-50, 0-100, 0-250, 0-300, each .................... 10/6

Pocket Meters

Registering 0 to 50 ........................................ 5/6
6-5 and 0-120 volts, moving coil meter .................. 20/6

Postage Paid to Your Door on Meters.
If writing, kindly address your letters to Desk "A.2."

"Specialists in all Radio Matters."
WIRELESS WEEKLY
Friday, 6th December, 1929

Interstate Programmes, Tues., Dec. 10

3LO
Australiaw Broadcasting Co., 120A Russell St., Melbourne (Wireless No. 292 Metres).

EARLY MORNING SESSION
7.0 to 7.15, as usual.

MORNING SESSION
11.30 to 12.30, as usual.

MIDDAY SESSION
1.0 to 1.30, as usual.

EDUCATIONAL SESSION
2.0: Stories from the Opera—Minna Luks Abrah. B.A. 2.15: Musical Interlude. 2.26: Romance of the Skye and Gold Coast—Mr. A. Downs. 2.30: Musical Interlude. 2.40: A Tale from French—Mr. Tr. Heel. 2.50: Musical Interlude. 3.00: Time for Question.

VARIETY MAINLINE
3.0: Paul Joyce and His Band—"Broadway Baby Blues." (Chorus). "I'm a Mathematician." (Chorus). 3.3: Peter Joyce and His Band—"Love Thrice." 3.35: Mary Joyce and His Band—"Mother's Boy." 3.39: Ted Nelson, entertainer—singing and sketches of the past. 3.45: Paul Joyce and His Band—"I'm More Than Satisfied." 4.00: "Fral of Dreams." (Vocal). "When My Dreams Come True." (Ironic). 4.15: "Close down." During the above, persons of the orchestra will be broadcast as they come to hand.

4.54: "Merry Wumpum and Clever Charlie." 4.55: Musical Interlude. 5.05: Teager's, reception. Selection of new set up his sleeve for some time, and has decided to produce it for the special number.


EVENING SESSION


NIGHT SESSION


9.35: "Viva Vizzavona." 10.00: Musical Interlude. 10.05: "Viva Vizzavona." 10.10: [Manchester.]

5CL

Day Sessions as usual.


9.35: "August." 10.00: Programme continued.

11.00: Close down.

TRANSFORMERS
A.B.C. Eliminator Transmitters, 22/6 each.

Circuit Free with each Transmitter.

"B" Eliminator Chokes, 30 Henries, each 5/-.

Special Transformers, wound to any specification.

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The “Aerial Cop” also makes an excellent lead-in insulator.

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PHILIPS
for better radio
Local Programmes, Wednesday, December 11

2FC

EARLY SESSION—7 to 8.15 a.m.
1.30: General Sporting Talk by Oscar Lind.
7.8: Austradio Musical Reproduction.

MIDDAY SESSION—12 to 2.30 p.m.
12.0: FROM THE SYDNEY CRICKET GROUND—A Description of the Trial Match.
AUSTRALIA v. THE REST.
2.0: A Pianoforte Recital.
2.30: ASTRAL QUALITIES.
3.0: ROMANO'S DANCE ORCHESTRA, conducted by Bennie Abrahams.
(a) "Who is Sylvia?" (Schubert).
(b) "A Dream" (Bartlett).
3.12: MALCOLM HANNA, Tenor—"Lover's Garden of Roses" (Haydn Wood).
(b) "At Dawning." (Camden).
3.19: ROMANO'S DANCE ORCHESTRA, under the direction of Bennie Abrahams.
3.31: FROM THE STUDIO: MEMORY MELODIES.
4.0: ROMANO'S DANCE ORCHESTRA, under the direction of Bennie Abrahams.
4.30: ROMANO'S DANCE ORCHESTRA, under the direction of Bennie Abrahams.
5.0: FROM THE STUDIO: DANCE NUMBERS.
5.15: FROM THE SYDNEY CRICKET GROUND—A Description of the Trial Match.
AUSTRALIA v. THE REST.
5.20: Close Down.
5.45: THE DINNER HOUR—6.15 to 7.55 p.m.
6.0: THE BOYS' RADIO CLUB, conducted by Mr. Norman Lotts.
6.5: THE COUNTRY MAN'S SESSION—Wool, Wheat, Stock, Farm Produce, Fruit and Vegetable Markets.
7.0: DINNERS AND SAVOIR FAIRE.
7.55: What's on the air: To-night?
8.0: THE STATION THEATRE—Overture by Will Prior and the State Orchestra, with Price Dunlavy at the Grand Organ.
8.30: FROM THE STUDIO: MARJORIE ALLOWES, Contralto—"To the Forest" (Tchakalowsky).
8.35: ROMANO'S DANCE ORCHESTRA, directed by Bennie Abrahams.
(a) "Someday When Night is Nigh" (Philips).
9.0: C. N. BAEYERTZ will continue his series of humorous stories in Dialect.
9.15: IRIS DE LOS ANGELIS, Pianist—Preludes, Fugues and Variations (Franck).
9.20: "Waltz in A Flat" (Chopin).
9.25: "Arabesque in E" (Debussy).
9.31: "Majorelle" (Paderewski).
9.35: "Orio" (Gardiner).
9.45: MARJORIE ALLOWES, Contralto—"A Moan—Slumber Song" (Fauré) and "Honey Child" (Strickland).
9.50: BRUTON GIBB, Radio Play—"SOMETHING TO TALK ABOUT." (Philips).
10.0: THE STATION THEATRE—Stage Presentation.
10.15: FROM THE STUDIO.
10.30: A Musical Interlude.
10.45: New Music.
10.50: News from "The Daily Telegraph Pictorial."
4.0: FROM THE STUDIO: Roy MacKee, Pianist.
3.19: ROMANO'S DANCE ORCHESTRA, under the direction of Bennie Abrahams.
3.31: FROM THE STUDIO: MEMORY MELODIES.
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9.50: BRUTON GIBB, Radio Play—"SOMETHING TO TALK ABOUT." (Philips).
10.0: THE STATION THEATRE—Stage Presentation.
10.15: FROM THE STUDIO.
The rugged strength of the Clyde gives it the capacity to stand up to heavy demands over a very long period.

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Clyde Batteries for Radio, Car, and Home-lighting are made by The Clyde Engineering Co., Ltd., Granville, N.S.W., largest manufacturers of storage batteries in Australia. Obtainable at all Radio Dealers and Garages throughout the Commonwealth.
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Will cut out any battery of the same size.

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GENUINE BARGAIN. Reduced from $1.0

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Pollock Murray "L", Kit, Enamalized

3 9

Pollock Murray "E", Slk Wound 9 6

Pollock Murray "A", Slk Wound 12 6

Pollock, Heiman Kit, Slk Wound 12 6

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Pollock R.F. Slot Wound 3 9

Pollock R.F. Bellsole 6 0

Radiox 5 9

5 Watt Battery Cables 2 6

2 Watt Battery Cables 2 6

Wht. Speaker Cords 2 3

Mk. Speaker Cords 1 9

E.U. or E.V. Bakelite Sockets 1 0

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24 Volt Terminals, complete 1 9

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THE RELIABLE RADIO HOUSE,
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Under Central Station.
PHONE: MA 3809.

3LO
Australian Broadcasting Co., 128A Russell St., Melbourne (Western Market, 311 Metres).

EARLY MORNING SESSION

1.0 to 1.15 as usual.

MORNING SESSION

10.30 to 12.30 as usual.

AFTERNOON SESSION

1.0 to 2.0.

AFTERNOON SESSION

3.0 - Orchestrant Neo Symphony Orchestra. 1.5 Diet, Doro Muggah and Walter Feh. 2.0 Wurz- linde Kogen. 2.3 Male Voices, Paris Group. 2.10 Orchestra. Ragtime King and His Orchestra. 2.15 Concertina. Paris Group. 2.30 Violin. Prinz Kinsky. 3.0 Orchestra. Diet, Muggah and Walter Feh. 3.15 Band, Band at H. M. Cold- stream Orkiets. 3.47, Soprano, Drumlin. Orkiets.

3.50 Christmas Carols.

MIDDAY SESSION

1.0 to 1.30, as usual. Special Price 3.30. Wednesday.

3LO

Interstate Programmes, Wed., Dec. II

PUBLIC ANNOUNCEMENTS

This Week's Specials

4.4 VOLT "B" Batteries. Special Price 10c
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50,000 Ohms Variable Resistances 5d

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Clyde Hydrometers, 3/6

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Single and Double Circuit Jacks 60c ea.

Amp. Grid Condenser 1.6

T.C.C. 1 Min Condenser 7c

E.R.A. Rheostats. 30 Ohms 7c

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COILS

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Pollock Murray "L", Kit, Enamalized

3 9

Pollock Murray "E", Slk Wound 9 6

Pollock Murray "A", Slk Wound 12 6

Pollock, Heiman Kit, Slk Wound 12 6

CHOSES

Pollock R.F. Slot Wound 3 9

Pollock R.F. Bellsole 6 0

Radiox 5 9

5 Watt Battery Cables 2 6

2 Watt Battery Cables 2 6

Wht. Speaker Cords 2 3

Mk. Speaker Cords 1 9

E.U. or E.V. Bakelite Sockets 1 0

Phillips Cut Valves 3 8

Suitable for Eliminators

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ALL-ELECTRIC THREE

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2-1 "C" Bias resistance ....... 0 13 9
3-3 Kelford or any standard UX socket 0 7 6
4-1 Kelford or any standard UV socket 0 2 6
5-1 .00025 fixed condenser 0 1 6
6-1 1 Meg grid leak 0 1 6
7-3 National centre tap resistances 0 4 6
8-1 Lewbury power transformer
9-1 choice 0 3 10
10-2 1 mfd. fixed condensers, TCC 250 v. 0 8 9
11-2 4 mfd. fixed condensers, TCC 250 v. 0 15 6
12-1 Radio Frequency Choke 0 6 6
13-1 Radiokses All-Electric Tuner 0 11 9
14-1 Amsco or any reliable .0005 condenser 0 10 6
15-1 Saxonay 23-plate midget condenser 0 8 6
16-1 Fixed condenser .0005 0 1 6
Aerial, Earth, Speaker, Pick-up Terminals 0 1 0
Hook-up Wire 0 2 6
1 Vox or standard American AC tube 226 0 12 6
1 Vox or standard American AC tube 227 0 2 6
2 Vox or standard American AC tube 171A 0 15 0
1 Vox or standard American AC tube 280 0 5 0
3 and 3a-2 Kelford Audio Transformers at 17/6 each, or 2 Lewbury at 22/6.

Total Cost - - - £14/3/9

TO RADIO DEALERS
We advise you to get on to the above Simplicity All-Electric, for, owing to their perfect operation, they will be in great demand. Drop us a line and we will be pleased to give you particulars.
LOCAL PROGRAMMES, Thursday, December 12

2FC
Australian Broadcasting Company, Ltd., Market St., Sydney (Wavell St., 213 Metres).

EARLY SESSION—7 to 8.15 A.M.
7.0: "Big Ben" and meteorological information for the man on the land.
7.2: This morning's news, from the "Daily Telegraph Pictorial."
7.4: Australian Musical Reproduction.
7.45: Mail and shipping.
7.50: What's on to-day?
7.55: Children's Birthday Calls.
8.0: Music from the Studio.
8.15: CLOSE.

MORNING SESSION—8.30 A.M. to 12.30 P.M.
8.30: Announcements.
8.32: A.B.C. Racing Observer.
8.49: HORACE WISE at the GRAND ORGAN.
8.57: HOUSEHOLD HELPS—Domestic Notes, by Miss Ruth Preece.
9.15: MORNING DEVOTION
9.30: A minute for the the Reproduction of life.
11.20: Studio Music.
11.30: A.B.C. Sporting Service.
12.30: CLOSE.

THE LUNCH HOUR—1 to 2.30 P.M.
1.0: Lunch Hour Music.
2.0: Stock Exchange, second call.
2.2: A well-chosen afternoon "Sun."
2.7: Studio Music.
2.27: Announcements.

THE RADIO MATINEE—2.30 to 4.30 P.M.
2.30: THE HAPPY TRIO
2.30: JAMES WALKER, Pianist—
(a) "Prelude and Fugue in D Minor"
(b) "Gigue in G Major" (Bach).
3.0: THE HAPPY TRIO.
3.0: C.G. BAYERTZ will speak on "Spoken English."
3.15: THE HAPPY TRIO
3.30: JAMES WALKER, Pianist—
(a) "Scherzo in E Minor" (Mendelssohn)
(b) "Arabesque in E Major" (Debussy).
3.45: THE Mias (Varley.
3.55: Mrs. E. HUME—Celebrities I have met on the man on the land, supplied by the State Marketing Board.
4.10: THE HAPPY TRIO.
4.30: Exchange, third call.
4.30: CLOSE.

EARLY EVENING SESSION—5.45 to 7.55 P.M.
5.45: Children's "Good-night" Stories, told by Miss Gwen Varley.
6.45: Dinner Hour Music.
7.20: Stock Exchange Service.
7.30: Latest news from the "Sun" Trunk Bookings.
7.55: To-night's Programme.

THE EVENING PRESENTATION—8 to 11.30 P.M.
2FC offers listeners to-night a complete production of Robertson's famous play, "Caste," produced by Lynwood Roberts. Through 2BL the programme is on popular lines—a bright sketch, humorous nonsense, popular songs, a spate of table, and piano novelties will offer a varied contrast to 2FC's programme.

8.0: FROM THE LITTLE THEATRE: "CASTE" (Robertson),
(Produced by Lynwood Roberts.
8.0: "From the Little Theatre:
8.40: Meteorological data for the country.
8.45: Mail and Shipping Information.
8.50: "This Morning's Story.
8.55: Memory Melodies.
9.30: A Musical Interlude.
9.45: "From the "Daily Telegraph Pictorial."
10.0: News from the "Labour Daily."
10.5: News from the "Daily Telegraph Pictorial."
10.10: Austradio Musical Reproduction.
10.40: THE AUSTRALIAN BROADCASTING COMPANY'S WOMEN'S ASSOCIATION. Conducted by Miss Owen Varley.
10.45: O.P.O. Chimes and Announcements.

MIDDAY SESSION—12 to 2.30 p.m.
12.0: O.P.O. Chimes and Announcements.
12.2: A Pianoforte Recital.
12.30: LUNCH MUSIC.
1.0: Announcements from "The Sun."
1.5: Austradio Musical Reproduction.
2.0: "New Songs.
2.10: Memory Melodies.
2.40: Pianoforte Recital.
3.0: Memory Melodies.

AFTERNOON ENTERTAINMENT—2.30 to 4.50 P.M.
2.30: THE STRING QUARTET—Mills, Preece, Tippet and Varley.
2.40: A Radio Symphony Orchestra under Mr. Henry Ayton.
2.50: "Big Ben," Stock Exchange.
3.15: Studio Music.
3.45: Studio Music.
4.0: "Big Ben," Stock Exchange.
4.0: ANNOUNCEMENTS.
4.10: Studio Music.
4.45: Studio Music.
5.0: Studio Music.
5.15: Studio Music.
5.20: Studio Music.
5.30: Studio Music.
5.45: Studio Music.

CASTE
(If all the Robertson dramas, probably "Caste" took the most decided hold on popular favor. Its sentimental story, its strongly-drawn characters, which allowed to half a dozen actors equally good opportunities in very different lines of business, gave it an instant success. It is doubtful if any other popular play was so many times performed and in so many different theatres within a year as was "Caste." "Caste" has been called by those who wish to put a little contempt on it a "cup and saucer" drama. But as a play it will always remain a model of its kind. It is terse, well constructed, with capital acting opportunities, and absolutely no halt in its movement and interest. If be in any sense really a "cup and saucer" drama it is a pity that some modern writers do not catch the trick.)

10.0: FROM THE HOTEL AUSTRALIA
Cec. Morrison's Dance Band.
10.15: FROM THE STUDIO: Announcements. Late Official Weather Forecast.
10.30: FROM THE HOTEL AUSTRALIA
Cec. Morrison's Dance Band.
11.30: CLOSE. NATIONAL ANTHEM.

2BL
Australian Broadcasting Company, Ltd., Market St., Sydney (Wavell St., 213 Metres). OPENING SESSION—8.15 to 11 A.M.
8.15: O.P.O. Chimes and Announcements.
8.16: Music for every mood.

WHAT DOES SPENDING COST?

How much does it cost you to spend £100? The answer is £100 down and at least £4 per year for life. (a) "Do Something" (Green and Stept). (b) "Memory Melodies." (c) "What's on to-night?"

Keep your money in a Savings Account and earn, not spend, 4 per cent. interest per annum.

Commonwealth Savings Bank of Australia
(Guaranteed by the Commonwealth Government.)
8.31: Weather Information for the Man on the Land.
8.33: ED MERRITT and MAUDE STEW.- ART: in Nonsensical Nonsense:—
(a) "Sun Will Soon be Shining" (Gibson).
(b) "Best Pal of All" (Merritt).
(c) Potte.
(d) "Our Village" (Low).
9.43: HAL STEAD in Piano Novelties—
(a) "Mean To Me" (Ahlert).
(b) "Blue Shadows" (Ayer).
8.50: MAY WEBBSTER and PAUL DALY, Entertainers—
(a) "Gadabout Mama" (Weston and Lee).
(b) "There's a Cradle in Caroline" (Lewis).
(c) "I Must Be Me" (Paul Daly).
10.0: VINCENT ASPEY, Violinist—
(a) "Maud Grues Spanish Dance" (Sara- sate).
(b) "Deep River" (Eisman).
10.7: Austradio Musical Reproduction.
8.0: Clock and news from the "Sun." 8.15: Orchestral Selections.
8.0: instrumental Music.
7.5: Birthday calls.
7.0: Musical interlude.
6.0: Children's Session.
10.0: Close down.
10.30: Close.
10.0: comments on Foreign Affairs. By Mr. J. M. Prentice.
7.45: Garden Talk, by Mr. S. H. Hunt.
8.0: Violin and 'cello recital.
8.15: Mr. William Green, Tenor.
8.22: Instrumental Trio.
8.18: Humorous interlude.
7.45: Humorous interlude.
8.0: Orchestral Selections.
7.30: Hawaiian Steel Guitar Selections.
7.15: Request numbers.
7.5: Birthday calls.
7.0: Musical interlude.
6.0: Children's Session.
10.0: Close down.
10.30: Close down.
10.0: Instrumental Music.
8.10: Tenor Solos. Mr. G. MASON.
8.22: Humorous interlude.
7.45: Programme announcements, and news from the "Sun." 8.0: Clock and Chimes.

STOP BUYING POWER
YOU CAN'T USE!

OLDHAM "ISOLA" built H.T. Accumulators have full rated capacity.
They give you all that you pay for. "Isola" cell construction ends electrical leakage and waste.

Your H.T. Accumulator is a Power Reservoir. If it consists of 10 volt blocks—each made in one piece—it may easily waste a third of the energy it is supposed to store. Its smooth, unbroken top makes an easy path for electrical leakage—leakage which goes on all the time—even when it is idle. With this type of H.T. Accumulator you are buying power you can't use—buying it to waste.

In Oldham "Isola"—built H.T. Accumulators there is no smooth

OLDHAM H.T. ACCUMULATOR

Standard 10-volt
Capacity 2,160 milliamperes

Supplied in the Following Voltages, with FREE OAK CARRIER with Polished Lid.

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<td>£2.10</td>
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<tr>
<td>60 volt</td>
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<td>120 volt</td>
<td>£10.00</td>
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<td>140 volt</td>
<td>£15.00</td>
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Contact with your local agent or manufacturer for more information.

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Perth, J. R. W. Gardam & Co

Page Forty-Three
**WIRELESS WEEKLY**
Friday, 6th December, 1929

**Interstate Programmes, Thurs., Dec. 12**

**3LO**
Australian Broadcasting Co. 1990 Russell St., Melbourne (Waveband, 875 Metres).

**EARLY SESSION.**
7.0 to 7.15, as usual.

**MORNING SESSION.**
9.30 to 11.00, as usual.

**MIDDAY SESSION.**
1.10 to 1.15, as usual.

**THE EDUCATIONAL SESSION.**
2.10: Great Australian—George Coppin, Mr. J. Howlett, as usual.
2.15: How to make and use your own home entertainment F.R.C.O. 2.20: Musical interlude. 2.40: Moments with Mark Twain. 2.55: Musical interlude. 3.0: Time signal.

**THE RAINBOW OF SONG.**

**3AR**
Australian Broadcasting Co. 1990 Russell St., Melbourne (Waveband, 875 Metres).

**MORNING SESSION.**
1.15 to 11.00, as usual.

**MIDDAY SESSION.**
12.0 to 12.15, as usual.

**AFTERNOON SESSION.**
2.1: Orchestral, Minneapolis Symphony Orchestra: 2.15: Tenor, Mario Chereches. 2.20: Piano. 2.30: Orchestral, Minneapolis Symphony Orchestra: 2.30: Entertainers. 2.40: Dance music. 3.0: Portland Dance Orchestra. 3.45: Comedian, Al Jaf

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**4QG**

**Day Sessions as usual.**

**NIGHT SESSION.**

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**5CL**
Central Broadcasters, Ltd., 114 Hindmarsh Square, Adelaide (Waveband, 655 Metres).

Day Sessions as usual. 7.30: Dr. G. H. Wright will give the Bearer of the Tower. 7.35: The Captain Donald Mackay. Time: 7.45: Mr. A. M. Whitehead, "Wings in the Wind".

**NIGHT SESSION.**
5.0: Oboe duet.
5.10: Programme Review and announcements.
5.2: Meteorological information, including overseas stations.
5.5: Overseas grand report.
5.7: Air report.
5.8: Coal. 5.9: Capt. Donald Maclean will continue his talk on "Peaks of the Magnus".
THROW £2/- AWAY

New Duties on Radio Gear Mean that You Throw Away £2—Make a Gift of it to the Federal Revenue—when you buy an Imported "B" Eliminator. And that isn’t all. When you buy a B and C Eliminator you make a similar gift of £2/-/6, and £3 when you invest in an A, B and C Eliminator.

THE REMEDY IS OBVIOUS
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You Can Put REAL VALUE into a Home-made Job.
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Wallace "B" Eliminator Kit (for Sets Up to Three Valves) .......................... 59/6
(For Sets up to Five Valves) .................. 67/6
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Wallace 280, Full-wave "B" and "C" Eliminator (For Any Set) .................. £6/17/6
Add 5/- to Any of These Kits for Additional A.C. Filament Winding, Thus Making Complete ARC or AB POWER PACK.
Plain, Understandable Diagrams Given with Eliminator Kits and Parts, or with "Electrified Radio" (Making Your Set All-Electric), 1/-; Posted, 1/3.

ELIMINATOR PARTS ARE PROCURABLE SEPARATELY, IF DESIRED.
Power Transformers:—300-volt, with filament winding for 4 or 5-volt rectifiers, 25/; Same Transformers, with additional A.C. 4-volt, centre-tapped filament winding, 27/6. UX280 type, 600-volt, centre-tapped, full-wave, with 5-volt centre-tapped filament winding, 30/6. Same, with additional A.C. 4-volt, centre-tapped filament winding, 35/-.
Resistors:—18,000 ohm. tapped voltage dividers, wire-wound, 5/6. Sliding resistors, for grid bias, wire-wound, 3/6. Pilot wire-wound resistors, for grid bias, 4/-. 100,000 ohm variable resistors, for detector or radio tap, 4/6. Centralab power rheostats, 2 and 3 ohm, 3 amp., 1/-. And all other resistances. Chokes:—30 henry power chokes, low D.C. resistance, 10/6. 50 henry chokes, 10/6.
Condensers:—4 mfd., 6/9; 2 mfd., 4/-. 1 mfd., 3/5. 0.25 mfd., 2/-. All 500-volt test.
Rectifying Valves:—UX280, full-wave, guaranteed (will supply over 200 volts, 35 mls. to any set), 25/-. Mullard half-wave rectifiers, 17/6. Philip’s half-wave, 373 rectifiers, 15/6.

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Radio Weekly Service

Under the direction of ROSS A. HULL, M.F.R.E.

PROCEDURE OF RECEPTION

To what extent is your home set up for wireless reception? What devices do you have? Do you have a simple receiver, a set with one valve, or a set with several valves? The answer to these questions will help you in deciding what equipment you should acquire.

THE PRIMARY COIL

The primary coil is the most important part of a short-wave receiver. It is connected directly to the aerial and must be of such a nature that it will allow the maximum amount of energy to be received. The coil is wound with a fine wire, such as No. 28 or 29, and is usually made of copper. The coil is connected to the aerial with a short length of flexible tubing.

THE GRID AMPLIFIER

The grid amplifier is a device that increases the voltage of the signal received by the primary coil. The grid amplifier is connected to the primary coil and is controlled by the grid bias. The grid bias is a voltage that is applied to the grid of the valve. The grid bias is usually controlled by a potentiometer.

THE TUBE VOLTAGE

The tube voltage is the voltage that is applied to the plate of the valve. The tube voltage is usually controlled by a voltage regulator. The regulator is a device that is used to control the voltage of the power supply.

THE TUNING CIRCUIT

The tuning circuit is a device that is used to select the desired broadcast station. The tuning circuit is usually a variable capacitor or a variable inductor. The tuning circuit is connected to the primary coil and is controlled by the tuning control.

THE SPEAKER

The speaker is a device that is used to reproduce the sound of the broadcast station. The speaker is usually connected to the output of the valve.

THE DIRECTION OF WINDING

In winding the coil, it is important to wind in the correct direction. The direction of winding is determined by the type of valve being used. The correct direction of winding will ensure that the coils are wound correctly and that the signal is not distorted.

THE SIZE OF THE COIL

The size of the coil is determined by the power of the broadcast station. The larger the coil, the more power it can handle. A coil that is too small will not be able to handle the power of the broadcast station and will distort the signal.

THE USE OF AVALANCHE TRAPS

Avalanche traps are devices that are used to prevent the valve from overloading. The avalanche traps are connected in series with the valve and they are designed to break down before the valve.

THE USE OF GRID BIAS

Grid bias is a voltage that is applied to the grid of the valve. The grid bias is used to control the grid current and to prevent the valve from overloading.

THE USE OF TUNING CIRCUITS

Tuning circuits are devices that are used to select the desired broadcast station. The tuning circuits are usually a variable capacitor or a variable inductor. The tuning circuits are connected to the primary coil and are controlled by the tuning control.
A short-wave receiver can be used on the broadcast band, however.

"In conclusion, I would like to say that I appreciate "Women's Weekly," which I find most interesting and instructive. I am now in my third year of attendance, and I think it is a well-deserved compliment to the Editor for the work she does."
Radiotrons have an enviable reputation in Australia for long life and consistent performance. This reputation has been built up over a long period of years, and the addition of three new types complete a range of Broadcast Receiving Valves which will meet all requirements.

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For battery operated sets
General Purpose.
Fil. Volts 5.5 to 6
**FIL. CURRENT 0.6 AMPS.**
Plate Volts 45 to 150

**UY. 224**
**A.C. SCREEN GRID**
General Purpose.
Heater Volts 2.5
Heater Cur. 1.75 amp.
Plate Volts 180

**UX. 245**
**FOR A.C. OR D.C. SETS**
Power Amplifier.
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Fil. Current 1.5 amp.
Plate Volts 180-250

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Published by Geoffrey Blunden, of "Reigate House," Hughes St., Darlinghurst, for the proprietors, Messrs Wireless Newspapers Ltd., 60-66 Elizabeth St, Sydney, and printed by Sun Newspapers Ltd., Forbes Street, Sydney, and Morton Ltd., Chalmers Street, Sydney.