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REVIEWING THE B.B.C.

CHOOSING THE RIGHT VALVE

By ROSS A. HULL

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Mr. Arthur Benjamin, whose recital at the Conservatorium on Friday night will be broadcast by 2FC, thinks so. In this interview he talks of modern music and tells of plans to write an opera.

**SANE EXPONENT of modern music** is found in Mr. Arthur Benjamin, the young Australian composer, who will give a recital of his own compositions at the Conservatorium on Friday.

"Australia musically," says Mr. Benjamin, "is living in the 1890's. This is because we don't hear enough modern music; and consequently, what seems strange out here is already accepted where people grow up among modern composition. With many people there seems to be an idea that music stopped growing of music or of any other art than of modern composition. People always want to know how the buzzing sound in this song is created."

**Write Opera**

We met Mr. Benjamin while he was in the company of a certain Mr. Nolan; and the talk was upon musical matters of high importance. Most of the English critics, said Mr. Benjamin, were not taking too kindly to modern composition. He instanced several new works (among them the charming English opera, "Hugh, the Drover," by Vaughan Williams), which, he said, had been adversely criticized at their first appearances. "I feel I should like to write an opera myself," he said, "and I have begun a study of dramatic composition, because I feel it only will perform the solo and grouped works. Things we should listen specially for are the String Quartet, which won the Carnegie prize in 1922, a sonatina for violin and piano, which has three movements, the last of which is notable for rather jazzy rhythms, and a Suite for piano alone, which will be played by Mr. Benjamin.

An interesting group of songs, three impressions, will be sung by Mr. Spencer Thomas to a string quartet accompaniment. The first of these is of a cold winter's day with snow falling, the words by a man who wrote in England under the name of Sharp, and in Ireland under the name of Fiona McLeod. The second is an impression of the misty sea; and the third is quite a novelty, being an impression of a wasp, the buzzing of the wasp being heard in the strings until finally he swoops to sting. People always want to know how the buzzing sound in this song is created.

**Brief Compositions**

The two compositions for two pianos were composed some time ago in Australia expressly for Mr. Lindsay Evans and Mr. Frank Hutchens. One of these has a marching theme which, on account of a rather humorous treatment, made its first audience laugh and demand an encore.

And that's that and Mr. Benjamin, by the way, says he never prolongs a composition beyond its own merits, so that none of his work may incur the blasphemy of "telescopic." The sonatina, which has three movements, takes only 16 or 17 minutes.

Mr. Benjamin was born in Sydney in 1911, and was educated in Brisbane. In 1911 he went to England, where he won an open music scholarship and continued his musical studies. During the war he served with the Infantry, and later with the R.A.F., with whom he had the bad luck to be shot down and taken prisoner. When these troubles had subsided he returned to Australia, and for two years gave lessons in the pianoforte as a member of the staff of the Sydney Conservatorium. Then he returned to England, and appeared with success at the Queen's Hall under Sir Henry Wood. Since then his name, both as a composer and as a pianist, has become more and more widely known.

Several of his compositions have recently been performed in Germany, where he expects to make a tour of the next German spring. Thus does he heap coals of fire upon the ears of his former captors!
A Vulgar Quarrel, or Great Thoughts From Small Beginnings

We had an argument the other day with the man who does the drawings for this page. He said it was time we gave him some public recognition for his work. We said we couldn't think of doing such a thing. He said he'd be damned if he'd remain anonymous any longer. We said he'd achieve the same result, any way. We being a gentleman, and he being a common artist, there was no friction; but he simply refused duty. So we were forced to do the heading on top all by ourselves. But we have a soft heart. It is in the right place. Therefore, for no other reason than that we couldn't do without him we allowed him to return to his duties on the one condition that his name—his baptismal name—John should be mentioned whenever we could find space for it. He said he'd be damned if he'd refuse duty. But this is all really nonsense. We don't know why it is nonsense; but it is nonsense; and, any how, we have made the first sentence so long and complicated that no one can possibly understand what we are saying is nonsense, and contradict us.

Yet, seriously, it is nonsense; because even if a great man doesn't quarrel with another great man, he is bound to be quarrelled with by some little-minded man for the very reasons which make his greatness. Thus is the great man brought to earth by the little man.
SEVERAL years ago, when there were only a few dozen different types of valves available on the market, it was a relatively simple matter to sit down with a few valve specifications and select the right type numbers. Then, after a few weeks of experimenting with different valves and a study of the characteristics of each type, it was possible to have a more or less permanent mental list of the various make characteristics and its suitability for operation in some particular role. At the present time, however, this sort of procedure is no longer practical. So great has been the valve development work throughout the world, and so extensive has the variety of valve types become, that the individual who can memorize them all these days must surely be a mental contortionist.

During the last three years we personally have been rather out of touch with the English and European valve developments, and as a result we have had a devil of a time trying to grasp all the new type numbers and to gain a picture of the valves they symbolize. From our own confusion we have gathered some idea of just how difficult it must be for the beginner to make head or tail of all the valves which he has faced. In the valve booklets and leaflets he finds virtually hundreds of different types, each with its own unique type number, and each having some particular values of Plate Impedance, Amplification Factor, or Mutual Conductance. In much of the manufacturer's literature the valves are grouped into some sort of classification; but even with that aid the valve selection business must be a most difficult one. Judging from the constant influx of inquiries on the matter, it would appear that there are many enthusiasts who have not the slightest idea of the process of deciding whether a valve is suited for a given set of conditions or not.

First, it would be well to endeavor to clear up a couple of quite serious and common misconceptions about valves. "I always use XY-347-G valves all the way through my set," is a statement often heard. "They have such a marvellous tone." The idea that valves have a tone all their own is, of course, quite an absurd one. There are many things which can be said about the characteristics of valves, but the perception of their tonal qualities is not one of them. Another false but quite common idea about valves is that they can be described as good, bad, or indifferent, just as valves, without reference to the work for which they were designed or the constants of the apparatus with which they are to be associated. Some beginners have the notion that, just because one type of valve works better than another in the first socket of their receiver, it is therefore a better valve. The business of condemning a certain type of valve just because it does not operate well in one of the sockets of a receiver is just about as sane as slamming a motion picture projector machine because the show it provided was a "Wild West" story instead of a sentimental love tale. The valve, like the movie projector, is a useless piece of apparatus by itself. The valve with suitable associated circuit constants, and the projector with a satisfactory film, both can turn out a worthwhile performance.

There are not many different roles that the valve is asked to perform in a receiver. The two latter are somewhat involved, but at least the filament rating offers no terrors. The complications of the multitudinous type numbers are simplified to some extent when it is realized that they are readily subdivided into groups with different filament ratings. The valve, like the movie projector, is a useless piece of apparatus by itself. The valve with suitable associated circuit constants, and the projector with a satisfactory film, both can turn out a worthwhile performance.

First there are the three basic groups into which the valves may be placed—the direct-current filament valves, the directly-heated alternating current valves, and the directly-heated a.c. valves. The d.c. valves, for instance, may be subdivided into groups according to the filament voltage. There is the two-volt family, of which there is a whole range of valves suited for all ordinary purposes, and all having a filament designed to be operated from two volts. Then there is the four-volt family in which can be found tubes similar to the two-volt types in all respects except filament voltage. Further, there is the six-volt group in which a full range is again to be found. In the a.c. filament group a similar variety of types is in evidence, and there are to be found d.c. and a.c. valves in which the only important difference is in the voltage and type of filament.

With the type of filament supply decided upon, it is therefore possible to narrow down the possible valves to a reasonable number and to give particular consideration to their other characteristics—the plate impedance and the amplification factor. The plate impedance of a valve is really the resistance inside the valve to the flow of electrons between the filament and plate. It is an important consideration in the valve, since its ability to put energy into the circuit connected to its plate is greatly dependent on the relationship of the valve impedance to the impedance of the external circuit. The plate impedance of a valve is almost invariably given by the manufacturer, and for a start the enthusiast need not worry very much about the manner in which it is obtained. However, it can be mentioned that the plate impedance is found by changing the plate voltage on the valve, noting the resulting change in plate current, and then dividing the plate voltage change by the plate current change. From this it can be seen that, in a low impedance valve, if the plate voltage is changed there will be a considerable change in plate current, while in the high impedance valve the plate voltage can be varied to the tune of slight variation in plate current.

The valve, like the movie projector, is a useless piece of apparatus by itself. The valve with suitable associated circuit constants, and the projector with a satisfactory film, both can turn out a worthwhile performance.

The set-builder who follows closely a magazine description of some receiver usually manages to have the right type of valve doing the right work. Just as soon as enthusiasts start to use their own judgment, however, they frequently get off the track.

Modern valves are highly specialized and if they are to operate well they must be doing their own particular job under the correct conditions. The factors influencing the choice of valves for any radio receiver are given consideration in this article by Ross A. Hull.
The other important characteristic, the amplification factor, is really a measure of the controlling influence of the grid over the electron stream. It is the relationship between the change of grid voltage and the change of plate voltage necessary to give the same change in plate current. When the plate is neutralized by a resistance-coupled amplifier, the amplification factor we get a result which can be considered as a figure of merit for the valve. It is the mutual conductance of the valve, and it is by its ability to amplify before the grid voltage is admitted to the plate that the grid control is exhibited. Sometimes it is expressed in micro-ohms, but more generally in milli-amperes per volt. It is a measure of the effectiveness of changes in grid voltage in causing changes in plate current. These terms and their approximate definitions may sound awkward, but even a superficial knowledge of them will help greatly in understanding the possibilities of valves which are fundamentally unsuited for the work they are to do.

FUNDAMENTAL REQUIREMENTS.

Let us first consider the valves which are particularly suited for use in the radio-frequency amplifier, and let us limit the discussion to the three-electrode valve and the not the screen-grid type. The radio-frequency amplifier valves are situated between two tuned radio-frequency circuits, and it is the grid voltages from one of these which amplify the voltages, and hand them on to the second tuned circuit. At the same time, it must be so arranged that the amplified output of the valve must not be able to get back to the input or grid circuit. This back coupling is avoided by some means of neutralising in most cases, an arrangement being provided in the grid-plate circuit to balance out the capacity between the grid and plate of the valve, which usually is responsible for the trouble.

In circuits where no neutralising is used it is important that the grid to plate capacity be kept down to the minimum. In any case, this capacity is an important consideration. Unfortunately, the information on this point is usually missing from the valve-makers' literature, and no practical advantage can usually be had from a study of the inter-electrode capacity problem. Aside from this point, the factor of merit of a radio-frequency amplifier valve can be stated as the amplification factor divided by the square root of the plate impedance. For a given value of amplification factor, this is the best radio-frequency amplifier will be the valve with the lowest plate impedance and incidentally the lowest grid to plate capacity.

In practice it has been found that the maximum useful amplification factor for a neutralised three-electrode radio-frequency valve is of the order of 30. The lower limit is usually considered to be about 12. Beyond these limits, the useful radio amplifiers are therefore valves with amplification factors, and also three types of available, both with the same amplification factor, the type with the lower plate impedance probably will be the most effective radio-frequency amplifier. Of course, in stating this it is presupposed that the inter-valve coupling transformer is to have a primary suited for the value of plate impedance chosen—a supposition which unfortunately involves many complex considerations, which will have to be discussed at some other time.

WIRELESS WEEKLY

Friday, 20th September, 1928

THE SCREEN-GRID VALVE

The case of the screen-grid valve as a radio-frequency amplifier, the same factor of merit holds good. In these valves the grid to plate capacity has been reduced to such a low point that much higher amplification is possible without introducing troubles into the three-element valves.

Nevertheless, the grid to plate capacity is still the greatest limitation. This capacity in many of the valves is of the order of 4000 micro-microfarads, and in some cases it is decreased to 600 as is the case in one recent valve not yet on the Australian market. The possible amplification without neutralisation is more than doubled. On account of their high mutual conductance, their high amplification factor, their high plate impedance, and their very low grid to plate capacity, the screen-grid valves are quite on their own as radio-frequency amplifiers. However, the design of the coupling transformer used with them is of great importance, and the most disappointing results can be had if it is not given careful attention.

DETECTOR VALVES.

There are two types of detectors in general use. One is the grid leak and grid condenser type of detector, in which the rectification takes place in the grid circuit, and the other is the plate circuit's detector, which operates with a high negative grid bias, which causes the valve to operate on the lower bend of its grid voltage-plate current curve. Valves particularly suited for use as grid detectors are not necessarily satisfactory as plate detectors. The plate detector valve should have a high amplification factor to give high sensitivity with the lowest possible plate impedance. The valves suitable for the work have amplification factors of 40 or more, and usually their grid impedance happens to run above about 40,000 ohms. The screen-grid valve is, therefore, a splendid valve for plate detection work. Since these detectors have such a high plate impedance they rarely can be used successfully with an ordinary audio-frequency transformer following them. A very high inductance choke or a resistance coupling arrangement is almost essential for feeding the output of such valves to the audio grid circuit. Valves of this type—with an amplification factor above 40—are also well suited for use in an audio-frequency amplifier.

For the grid detector, to be used in conjunction with an ordinary audio-frequency transformer, its amplification factor is desirable, providing the plate impedance is not much above 10,000 ohms. Hence the good detector valves have amplification factors between about 15 and 24, and grid impedances varying between about 6000 and 9000 ohms.

Valves used in the first audio-frequency amplifier stage should have plate impedances of this order, but it is desirable that the amplification factor be not much in excess of about 15. Higher amplification factors result in greater gain, but they mean an unavoidable loss of high audio-frequencies.

FOR THE LAST AUDIO AMPLIFIER.

The three-electrode power amplifiers, as distinct from the pentode series, are all valves of very low plate impedance and low amplification factors. Such valves are usually well defined in the valve-makers' data sheets, and there is therefore little chance of the enthusiast using the one for the wrong purpose. The power valves in general use in the output amplifier, however, is still a very confusing subject, and for this reason the sub- ject deserves some discussion. The primary requirement in the three-electrode power valve is of course that it should have a plate voltage above that of 5000 and an output transformer designed to work with whatever plate impedance the valve has. The power valves have plate impedances of 2000 ohms, and, as most magnetic speakers and many output transformers are designed for this figure, it may be said that this rating is obtained for valves where grid current begins to flow at zero grid volts. By multiplying the square of the grid bias by the square of the amplification factor, and dividing the result by eight times the plate impedance, it can be seen that for valves of the same amplification factor the high grid bias rating is indicative of high undistorted output power. As far as we can discover, not one of the European valve manufacturers gives the output rating of their power valves, but it can be obtained from the construction of the valve.

For truly high quality musical reproduction, a rating of at least one watt is desirable when a magnetic speaker is used, and three or more watts when a moving-roller speaker is to be fed.

THE PENTODES

The pentodes, of course, are in a group all by themselves, since their peculiar characteristics permit them to operate effectively as output valves, even though their amplification factors and plate impedances are very high. The number of types at present available is so small that there is little need to spend a great deal of picking and choosing to be done.

It is fully appreciated that this treatment of the subject is extremely superficial, and possibly unintelligible to the quite non-technical reader. The idea, however, was just to present in general terms what can be performed by the valves in the receiver, and the more important valve characteristics required. With a knowledge of these fundamental requirements, and a knowledge of the various types of valves and their characteristics, there is every reason to expect that the set-builder will be able to use available valves for the job right from the start.
The B.B.C. REVIEWED

How the Famous British Institution is Influencing Australian Broadcasting

John Benson, who has attracted considerable attention through his articles constructively broadcasting presentation methods in general, and 2FC-2BL programmes here deals with the B.B.C.

The BBC's sources of the civilised world at its disposal, the British Broadcasting Corporation has organised to serve the public best of its ability as a respectable civil servant should. Every part of its activities reveals amazing industry; and is probably the most complete catalogue of the most complete broadcasts in radio broadcasting problems in the world. It also shows what efforts are being made to improve the standard of the broadcast programmes. There is a special committee to deal with broadcasting pronunciation; another which considers radio educational and so on, so that in almost every sphere of its activities the British Broadcasting Corporation is guided by the advice of experts. Everything broadcast from the BBC, therefore, has the backing of some authority which has weighed it in respect to prevailing high standards of taste, artistic merit, truth or utility. The Corporation has achieved in its great enterprise in its musical undertakings, and recently trained instrumental and vocal combinations of all kinds are retained for studio performances of complete operas, musical comedies and revues either from the studios or from theatres are frequent. Perhaps the most successful of the BBC's musical broadcasts is the number of programs of musical compositions transmitted, some of these being the first public performances in England.

The BBC has also given close attention to the radio drama, which it has developed to a considerable extent; and also to poetry. "Electra," done into English verse by Gilbert Murray, was put over on English air...with what effect I don't know.

Since its inception, the BBC has championed the cause of broadcast controversies, and has been granted permission some time ago to conduct them, using due circumstances. Many of Australia's best men have now argued over the air—H. G. Wells, G. K. Chesterton, Bernard Shaw, and so on—and a recent debate was between Commen Mackenzie and Beverly Nichols on the merits of Town and Country.

Educational broadcasts embracing the whole possible variety of subjects, from illustrated lectures on music and poetry to discussions on the Mendel's law of inheritance, are given weekly; listening clubs have been formed all over the kingdom to hear lectures and discussions afterwards; while receptions have been established at many of the schools so that advanced brilliant pupils in various subjects may receive instruction and food for thought from the expert minds of youth, and speaks as representative of a very important body.

The B.B.C. programs are aired on a broadcast station at 1 Cardiz.
Swansea, Bournemouth, Plymouth, Manchester, Newcastle upon Tyne, Aberdeen and Belfast. The regional stations supply local programmes by local artists, at various times throughout the day, making up their transmission time with relays from London. At night, the chief London features are relayed, which has become known as Simultaneous Broadcasting. These regional stations are the models on which Australia's Relay Stations will ultimately be operated.

Central Programme Department

An alternative programme is supplied from GB, Daventry. The standard of programmes is the same, and the main object of this station is to supply a programme which will appeal to listeners who are not interested in the main (LZO-5XX) broadcast.

English Radio programmes are arranged in London, by an enormous programme department, for the whole of England. The regional stations, of course, make certain arrangements as to local broadcasts; but the main control of all English broadcasting is from the famous "Savoy Hill." Thus, it would seem, beyond the necessity for having local broadcasts from its regional stations, the British Broadcasting Corporation sees very little reason for its stations to have separate individualities, and prefers to maintain the uniformity of its programmes. This does not set out to do so. Whether the effacing of a station's or announcer's personality benefits the presentations in any way at all is highly debatable; but after all, the B.B.C. understands all the requirements of its public quite as fully as most broadcasting companies. It does not have to gain attention at any price, as the American stations must, and it does not set out to do so. Its main conception of its duty as a public service is that it must blend amusement with instruction, attempting all the time to raise the English standard of musical, literary and artistic appreciation, and to use radio in every practicable way towards the enlightenment of the English people.

Viewed from this angle, the British Broadcasting Corporation fades away, and one sees the British Broadcasting St. George-eye, slaying countless dragons of ignorance; rescuing countless distressed doomed labelled respectively juvenile, reformative, artistic appreciation, social and domestic enlightenment, and above all, children's thought. There is no doubt that the B.B.C. is this St. George in all his glory. Its ideals are quite St. George-eye—it instructs because it is its duty to instruct—it amuses because it must make some compromise with the flesh.

Essentially English Presentations

Finally, its methods of presentation are St. George-eye. Precise words, exact pronunciation, the British announcer's accent, and no Americanisms. ROSS HULL'S 9.30 Superheterodyne Next Week (Order Your Copy Now)

Announcements are clothed in the shining uniformity of unvaried formality. The public is addressed as "Ladies and Gentlemen," and every announcement is stereotyped for every occasion.

DAY SESSIONS


THIS WEEK'S FEATURES

THREE of the foremost artists of the week's programmes are from Russia — Mischa Dobrinski, Senia Chostiakoff, and Sigmund Menchinsky. They also shared the privilege of leaving Red Russia in a hurry, and have all adventured in strange countries before coming to our own fair and peaceful land.

The main features of the week are the Arthur Benjamin concert on Friday, the Male Voice Choir concert on Saturday, the Dobrinski and Cazabon concerts on Sunday from 2FC and the St. Andrew's Cathedral broadcast and the Litigow Trades Hall concert on Sunday from 2BL. Senia Chostiakoff sings from 2FC, and the wrestling goes over from 2BL on Monday. Tuesday is 2FC's old-time dance night and 2BL's classical night.

Senia Chostiakoff sings from 2FC, and the wrestling goes over from 2BL on Monday. Tuesday is 2FC's old-time dance night and 2BL's classical night.

Wednesday presents H. W. Varna's play, "Jiggery Pokery," and on Thursday you will hear some two-piano duets from 2FC and an historical play, "Governor Bligh Deposed," played by Francis Jackson and company, from 2BL.

Purple and Fine Linen

THE great seafaring nation, Phoenicia, which controlled the Mediterranean when Rome was a fishing village, and its rise to greatness and ultimate decay, will be the subject of Dr. Harold Norrie's lecture from 2BL on September 24. The names, Tyre and Sidon, seem to have a unique charm, not only for the archaeological, but for the ordinary person who feels the ordinary human curiosity in the antiquity of our race. The development of a civilization more ancient than that of Greece and no less worthy of study will be discussed, and an outline given of the quest of the purple mollusc, the source of the famous Tyrian dye which made Phoenicia a great commercial nation. Dr. Norrie knows how to hold the listener's attention, and what aspects of his subject will be of greatest interest.

"Jiggery Pokery"

H. W. Varna Company will broadcast "Jiggery Pokery" from 2FC on September 25. A cautious city man takes what he considers insane advice in a last faint hope of making a little money. This apparently foolish action brings astonishing results, which furnish the plot.

The Hopcroft Series

IT has been suggested many times when recounting the stories and experiences of his father that Mr. Bert Gilbert, the well-known comedian, should write a book on this interesting and distinctly humorous personality. This may be done, but in the meantime there are many incidents that Mr. Gilbert has written up expressly for 2BL commencing September 23, and extending over a period of seven weeks under the title of "The Adventures of Hopcroft." "Hopcroft" is just an "Aitograph" of Gilbert's brain, suggested by his father. Really a caricature.

Beatrice White, Contralto

MISS BEATRICE WHITE, contralto, will make her first broadcast appearance through 2BL on Tuesday, September 24. Miss White possesses a deep rich contralto voice of more than usual promise, and for her debut on the air she will sing a group of simple ballads. Miss White won the University Conservatorium Scholarship at Melbourne, and is a pupil of Madame Goschen-Viceroy and Miss Cecile Atkins, of the State Conservatorium of Sydney.
THE HOME-BUILT RECEIVER

For some time now there has been evident a growing alienation among radio dealers that the home-built receiver business is on a decline, and it will very soon cease to be a factor in radio merchandising.

There are a number of tenable reasons for such a belief, and, because of this, a danger that this conviction may adversely affect both the interests of the radio enthusiast and the radio trade. First, there is the evidence of other countries, generally accepted to be in advance of Australia in radio methods, where the home-built receiver has almost disappeared. Secondly, there is the stabilisation of set design, which has made possible the production in mass of cheap, standardised receivers and given the set manufacturing industry a chance to recover from the rapid development work of a few years ago. Then there is mixed up with this the supposed growing complacency of the radio fan in the face of the "wonders" of radio and his refusal to be moved by its novelty and "mystery."

But, sound as these reasons are, they cannot be accepted as complete evidence of the passing of the home constructor to other countries. Of course, the inexpensive hobby of throwing together junk apparatus in the form of a receiver, which occupied so many radio fans a few years ago, has necessarily disappeared with the appearance of more intricately designed, and, therefore, more expensive apparatus.

But the experimenter himself has not disappeared, although he may not be so frequent a visitor to the radio store. Every now and again, as a new development arrives, he builds himself or his friends another set in advance of the manufacturers. Sometimes he has developed into a custom set builder, for peculiarity of operation and situation often require a receiver to be specially built for a location.

While the tables have been turned in set-making, inasmuch as the manufacturers’ set is now generally better value in efficiency than the home-built receiver, the home constructor will always have two advantages over the manufactured set when cheapness is not a consideration—the advantage of later development in design and the advantage of overcoming location peculiarities.

ALTERATION OF 2FC’S WAVELENGTH.

Owing to the wavelength of 6WF, Perth, being reduced to 435 metres, a change has been made in the wavelength of 2FC, Sydney.

In future to get 2FC listeners are asked to tune in to 451 metres, instead of 442 metres.

It is hoped, by this slight alteration, to make it possible for 6WF to be more easily picked up in the eastern States without interference from 2FC.
Location a Factor in DX Reception

Lake District and Newcastle

Dear Sir,—Re those long distance one-valve sets, probably the sets all are cracked up to be, but locality of reception is a factor to be reckoned with, and, whilst residing in the Lake district, I was able to tune in most Sydney and Inter-State stations, and other sets, with great numbers on the furniture. They, incidentally, form a beautiful color scheme if arranged with an artistic eye, creating a beautiful effect that will delight the eyes of a connoisseur. If you will allow me a complete list of your paper, it will afford me great pleasure to enumerate a few of the above sets. I refer you, Sir, to the above-mentioned oscillator circuit which was designed before the order of Annanias. I do not want to appear boastful when I claim to be the champion high speed logger of this or any other State, my best test, up to date, being 1631 stations in 17 1/2 minutes.

My set is equipped with water cooled condensers which are an invention of my own. In my opinion, the humble crystal is a factor to be reckoned with, and, whilst residing in the Lake district, I was able to tune in most Sydney and Inter-State stations, and other sets, with great numbers on the furniture. They, incidentally, form a beautiful color scheme if arranged with an artistic eye, creating a beautiful effect that will delight the eyes of a connoisseur. If you will allow me a complete list of your paper, it will afford me great pleasure to enumerate a few of the above sets. I refer you, Sir, to the above-mentioned oscillator circuit which was designed before the order of Annanias. I do not want to appear boastful when I claim to be the champion high speed logger of this or any other State, my best test, up to date, being 1631 stations in 17 1/2 minutes.

My set is equipped with water cooled condensers which are an invention of my own. I firmly believe much better results would be obtained.

Now a word or two about my circuit. It is merely a one-valve set of my own construction, the plate and grid being removed, and a special oscillator crystal being inserted in its place. The secret of its prowess is in this crystal, which possesses the peculiar property of transforming a carrier wave into the backslash of an oscillating current. Please do not ask for this circuit as, at present, it is a close secret jealously guarded. Trusting that this little treatise will cause some of the D.X. hounds to grasp their eyebrows in envy—Yours etc.

Crown Nest.

N. W. DANSLOW.

South Coast Reception

Dear Sir,—Clashing through my "Safety Valve" page to-night, I happened across a short pointed note over the name of "Wayback." Before further, I might be pardoned for saying that his non-de-plume evidently suits him. If he listens to 2FC, he should know better. It would not do for him to write the names this station is called on the air. I refer you, Sir, to the above-mentioned oscillator circuit which was designed before the order of Annanias. I do not want to appear boastful when I claim to be the champion high speed logger of this or any other State, my best test, up to date, being 1631 stations in 17 1/2 minutes.

Why am I pleased? Because I find the "Safety Valve" set distorts sound waves by dragging them in by force instead of allowing them to flow in like a crystal set does. Also, I think it is up to WIRELESS WEEKLY to give some of the circuits of these machines. Hoping to hear more about this interesting topic from other crystal users—Yours etc.

HERBERT E. WISE.

Extraordinary Reception

Dear Sir,—If not too late allow me the privilege of entering the arena to show my prowess in the D.X. weight for age, One Valley Stakes, to convict the claim of the few super artists who have been crowing so loudly through the Safety Valve. I am not a show artist, and it has only been through moral suasion of my friends and that special reception feeling that I have been forced into publicity. To begin, my cottage is lined throughout with D.X. cards from every country in the world, and I have been forced, through lack of time, to paste great numbers on the furniture. They, incidentally, form a beautiful color scheme if arranged with an artistic eye, creating a beautiful effect that will delight the eyes of a connoisseur. If you will allow me a complete list of your paper, it will afford me great pleasure to enumerate a few of the above sets. I refer you, Sir, to the above-mentioned oscillator circuit which was designed before the order of Annanias. I do not want to appear boastful when I claim to be the champion high speed logger of this or any other State, my best test, up to date, being 1631 stations in 17 1/2 minutes.

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Gladesville.

2FC Transmission

Dear Sir,—I would like to express my disgust, to put it mildly, of the transmission from 2FC. I have some doubt as to what meta programmes, as it is a herculean task, admitted, to please all, for a considerable time 2FC's transmission has been, and still is, a close secret—hum, whistle, and distortion being very evident. Certainly one can tune to other stations, but sometimes items from 2FC are welcome.

It seems as if something is radically wrong with the transmitting system, and that maybe interaction is caused from leads of switchboard, or some new valves are required. For an "A" class station, 2FC seems badly located. One can often hear singing as a background to items, also honking of motor cars. If more tune was given to the transmission more sets would be installed. I pity the dealers trying to sell a set tuned in to 2FC—Yours etc.

Moss Vale.

A. L. LONG.

Pleased

Dear Sir,—Pleased to read in "The Safety Valve" that some radio set owners (probably all of them) are getting a lot of buzz, hunt.—Yours etc.

7ZL have a studio orchestra as the other stations do. It would be an improvement, especially for dance programmes from 2FC.

Dear Sir,—With regard to the time of closing down at Station 2ZL, Tamworth, at 10 p.m., I think it is far too early. Why can't they close down at 11 p.m. on their dance nights, and 10.45 p.m. on other nights, or give a dance programme on gramophone records from 10 p.m. to 10.45 p.m. I am sure this would be an improvement, especially for us country listeners who can't get the main stations. Another point. Why can't 2ZL have a studio orchestra as the other stations have? I think 2ZL should cater for the country listeners better than they do. The third point. I would like to suggest that 2ZL have their news sessions at 7.45 and give the talks from 7.15. Hoping to see an improvement in their news programmes as some Melbourne friends of mine call Hobart "Blowout," and, if they are referring to broadcasting they are not far out as I think it is very poor at times when they have only three artists for a studio concert—Yours etc.
At last radio valves that are fully guaranteed by their makers—perfect satisfaction or your money back—a policy others have not dared institute!

Valves that build confidence by their excellent performance and durability—valves that take gamble and guess out of radio set buying. After all "a chain is no stronger than its weakest link"—the performance of the best radio set made is entirely dependent upon good valves.

It costs no more to have the finest guaranteed Valves.

So perfectly do Champion Radio Valves live up to the highest standards of reception that dealers are using them to demonstrate sets in the store, and are selling them widely as standard equipment with sets they sell.

The manufacturer stands squarely behind them with a complete guarantee—the first one of its kind ever made by a Valve manufacturer. A guarantee to replace any valve found defective or to refund the purchaser's money, without red tape.

Besides being sold singly, Champion Radio Valves are obtainable in the new Champion Standard Equipment Packages. Correct combinations for all popular makes of radio sets—in factory-sealed packages, ready to put in your set without intermediate handling.

Any of the dealers listed below will gladly show you this standard Valve, and give you full information regarding the different types in which it is made.

Investigate Champion Valves now—for your radio satisfaction and protection.

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Champion

RADIO

VALVES

Satisfaction Guaranteed
The Super-Het Stages a Comeback

AST week, in the "Curves Ahead" department, we used enthusiastic over the promise of building a truly modern super-heterodyne. At the time, our only justification in being enthusiastic was the thought that modern valves and modern methods should enable us to rig up a super-lative sort of receiver if only they could be incorporated satisfactorily in a super-heterodyne arrangement.

This week we have far more cause to be enthusiastic since we have built up such a "super," carried it through the experimental stages, and discovered to our satisfaction just what potentialities such a receiver is to possess. In case we should be misunderstood we wish to put the soft pedal on all statements.

Mr. Hull's Superheterodyne to be described next week is a truly revolutionary advance in Australian receiver design. Although many excellent receivers have resulted from the development and employment of the new screen-grid valves, we have not yet heard or handled anywhere a receiver of such fine sensitivity and selectivity, and of such excellent general performance. Although the modest designer refrains from saying so, stations anywhere within a thousand miles or so have been tuned in clearly at good volume with just three feet of aerial. Indeed, this week, we have so enjoyed reception—the added variety which range gives, the full tone which you get when there is always something to spare, and the convenience of easy tuning—that we contemplate annexing the superhet ourselves. This new receiver, has made such an impression on us that we believe readers will become as enthusiastic as we are over it, and the demand thus created will make it the pattern of all 1930 models.

The new 1930 Superheterodyne in experimental form, with speaker and portable pack.

Reasonably sensitive receiver just so long as its selectivity characteristics permit it to eliminate interference from neighboring stations. The advantages of a multi-valve receiver lie in its improved selectivity and in its ability to receive any signals above the level of the background without the necessity for a large aerial system, and without the need for the critical and delicate tuning adjustment so essential in sets of one, two, or three valves. A useful parallel could be drawn between the radio set and the automobile. The low-powered car possibly can travel just as fast and as far on a rough road as can some highly-expensive and elaborate "straight eight." The low-powered machine, however, would be "all out," or, more correctly, "all in," when the big car was just starting to enjoy itself. The reserve power of the "straight eight" would be permitting it to do the same work as the lower-powered automobile with less effort, and the result would be more satisfactory in general.

We have been in two-cylinder cars traveling over long distances at relatively high speeds, and we have found the performance just about as painful as listening to a two-valve receiver accomplishing some extraordinary long-distance reception.

One of the problems involved in presenting a highly complex or highly sensitive receiver is in making a satisfactory statement concerning its performance. Many enthusiasts have the idea that because a two-valve receiver can bring in 3LO a four-valve set should be able to bring in 3YA. Then they consider that if the set has six valves it should be able to draw in at least 6WF and possibly other stations farther afield. One of the workmen engaged in assembling this building caught a glimpse of the super in its Anal stages the engrossing properties of a receiver do not necessarily have anything to do with the number of valves used. Even a single-valve receiver with a pair of head 'phones is often capable of receiving over the same distances as the most complex multi-valve set yet built. The factor which limits distant reception is the level of the "background" noise—other words, the strength of the disturbances caused by atmospheres, induction, and interference from power leaks and electrical machinery. If the strength of the distant signal is less than that of the "background" noise, then no receiver of any conceivable type would ever provide satisfactory reception. If, however, the signal is above the level of the background then it can be received by any reasonably sensitive receiver just so long as its selectivity characteristics permit it to eliminate interference from neighboring stations. The advantages of a multi-valve receiver lie in its improved selectivity and in its ability to receive any signals above the level of the background without the necessity for a large aerial system, and without the need for the critical and delicate tuning adjustment so essential in sets of one, two, or three valves. A useful parallel could be drawn between the radio set and the automobile. The low-powered car possibly can travel just as fast and as far on a rough road as can some highly-expensive and elaborate "straight eight." The low-powered machine, however, would be "all out," or, more correctly, "all in," when the big car was just starting to enjoy itself. The reserve power of the "straight eight" would be permitting it to do the same work as the lower-powered automobile with less effort, and the result would be more satisfactory in general.

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RAISE THE STANDARD
OF RECEPTION

D.E.P.
410
Osram Valve

A Power Valve which Increases Tonal Purity

This valve in the power socket of your set gives increased tonal purity of reproduction.
Osram D.E.P. 410 is a highly efficient 4-volt power valve which will handle volume without distortion.
For better results change to Osram, and fit this power valve.

Ask for It by Number—and Say OSRAM
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ROSS HULL'S 1930 Super-auditory Receiver

Next Week

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from this there will be the problems of over-occluding. With the three electrode valves there will be the necessity for neutralising—a process which is brimming with difficulties. The screen-grid valve will obviate neutralising if not more than two truly effective stages are used and if the shielding is given due attention, but neither the radio frequency gain of these stages nor the selectivity of the second detector is a very high order in the average home-built receiver. Three screen-grid stages are used in several of our very high order receivers. Some considerable loss of signal strength is inevitable in the receiver to 1000. The stage gain is introduced by this wave-changing process, but it is usually more than made up for by the high amplification which is possible in a fixed amplifier operating on some relatively short wavelength.

In order to gain a high degree of amplification with the ordinary straight radio frequency type of receiver it is necessary to use two, three, or four stages of radio frequency amplification. In most of the stages must be tuned (with the possible exception of the first), and the output of four separate dial stages are not to be used the consumers must be "ganged" on one shaft. This procedure, of course, introduces many complications for the home-set builder, for the greatest difficulties will be experienced in adjusting the various circuits so that they keep in step all the way across the broadcast band. Aside

Possible "B" Station for Perth

The fifth annual exhibition of the W.A. Division of the Wireless Institute, held at Perth on September 2 and 3, proved an unparalleled success, completely eclipsing anything yet held in the Western State. The exhibition was made to coincide with the opening of 6WF under the management of the Australian Broadcasting Company, and the opening ceremony was performed from the platform at the exhibition at the first session. Frank H. Goldsmith (K6F0), chief radio engineer for the Commonwealth, the latter declared the exhibition open, and gave the assemblage of 1500 a short review of the growth of wireless.

Sir Benjamin Fuller, speaking of the possibilities of the "B" class station, the company noted that a "B" class station might shortly be established in W.A. The Deputy Director, Post and Telegraphs (Col. S. R. Roberts), officially opened the new station, which now operates on a wavelength of 430 metres instead of 1230.

Jack O'Hagan as 3AR

Jack O'Hagan, who has always proved a favorite with listeners, will be heard from 3AR on September 24, in some of the latest programs from the studio. Success as a vocalist, Mr. O'Hagan is well known to all. His war work, and his score heavily with such numbers as "Qwanita," "The Rose of Flanders," and many other successful compositions. Success in making his own songs in his broadcasting programs and these are always rendered with perfect artistry and understanding.

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REVIEWING THE ASTOR ALADDIN ELECTRIC RECEIVER

By ROSS A. HULL

A very popular type of receiver in Australia to-day is one employing three valves—a detector and two audio frequency amplifiers. Such a receiver is simple and selective, but has satisfactory general capabilities so long as good reception from other States is not expected from localities in the neighborhood of local stations. It is likely to be very effective in cases of interference, both of construction and of control, and ample output is usually available from the receiver stations to operate the speaker at full blast, should that be necessary. The receiver is of such a type that the opportunity of turning the "plate" detector into an example of a grid valve, and of adding a screen-grid stage, is available. A good deal of the general apparatus is contained in a single valve.

In the present-day manner the apparatus is announced as "a new type". The power supply for the transformer, the grid control, and the plate control, are contained in a shielded compartment extending across the rear of the receiver. The remainder of the face is covered by a black card, giving an impression of a three-valve type, which is a true reflection of the total value of the receiver. All wiring is carried out in the manner of the coaxial system, so that the internal appearance is pleasing. Next to sunlight and the sun, the ideal form of illumination is a single plate, or a single window. A similar receiver should accept the type of old-fashioned plate, which is simply a label of the number of radio frequency amplifiers.

Solid radio frequency gain of the sort available with these three valves makes it possible to do away with one of the audio frequency amplifiers, still retaining the ability to have a room full of music when the necessity arises. The elimination of one stage, which is usually more than made up for by the difference of the distortion common to the usual amplifier, providing the detector feeding the audio stage is suitably designed. The trouble with most single audio stages is that the detector overloads long before the audio valve gets into its stride. It has been overcome by the development of "power" detectors which, operated at high plate voltage, are capable of putting out sufficient undistorted output to drive the audio valve to its limit.

The screen-grid valve has also helped along the detector, since it has permitted the use of "plate" detector and has eliminated much of the loss of signal strength by a tuner. The super-audible or "B" detector, and so with the screen-valve and the screen-grid valve quite indispensable in any receiver of the "B" class type. The actual super-auditory on which we have been spending much of our thoughts and much of our time is nothing but a modern receiver. It employs a straight screen-grid radio frequency frequency amplifier, ahead of the first detector (which is a screen-grid valve), and the detector output feeds into a two-oscillation stage irrespective of the frequency amplifier of terrific amplifying ability. Fed by this amplifier is the second screen-grid valve amplifier, or an amplifying means of a choke coupling arrangement, feeds the output valve. Almost all of the amplification in the set is at radio frequency, and this, together with the use of "plate" detector, provides musical reproduction which is of a very high standard. Like most super-auditories the set is extremely sensitive.

Unlike the detector, however, it is essentially a musical instrument.
Uniform Long Service

RADIOTRON lasts so long, gives such perfect reception, that you are naturally sorry when it finally gives out.

There's satisfaction, however, in knowing that by replacing it with another Radiotron the new valve will give you equally long service.

41 different inspections and tests ensure that every two Radiotrons of the same type number are absolutely uniform. Durability, tone, volume and all round quality are as dependable in one Radiotron as in another and barring accidental damage their service will be equally long.

Therefore—Buy Radiotrons and always replace a Radiotron with a Radiotron.—No other valves enjoy the same uniform characteristics.

—Look for Uniformity in Valves.

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AUSTRALIAN General Electric Company Ltd.

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16 King St., Newcastle.

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601 Dean St., Albury.

Keen Street, Launceston.

RCA Radiotron
The LICENCE POSITION

The Popularity of Radio—How Australia Compares with the Old World

The figures just issued covering the wireless licences in force in the Commonwealth of Australia for the month of August, 1929, make interesting reading. They show that Australia, with its sparse population and difficulties in reception, is in a healthy condition, and can more than bear comparison with other great countries.

WORLD RATIOS.

From the latest sources of information it is possible to ascertain what world ratios in wireless licences exist, and the following information will be of value to the reader.

<table>
<thead>
<tr>
<th>Country</th>
<th>Licences per every 1000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commonwealth</td>
<td>12.3</td>
</tr>
<tr>
<td>United States</td>
<td>140.5</td>
</tr>
<tr>
<td>Germany</td>
<td>86.6</td>
</tr>
<tr>
<td>Austria</td>
<td>85.8</td>
</tr>
<tr>
<td>Hungary</td>
<td>63.7</td>
</tr>
<tr>
<td>Czechoslovakia</td>
<td>42.3</td>
</tr>
<tr>
<td>New Zealand</td>
<td>42.3</td>
</tr>
<tr>
<td>South Africa</td>
<td>24.9</td>
</tr>
<tr>
<td>Western Australia</td>
<td>23.7</td>
</tr>
</tbody>
</table>

The ratio for Australia is 12.3 licences per every 1000 population. It is of interest to note that the radio licences in Australia are far more popular than in any country in the Old World, with the exception of Germany and Austria.

COMMONWEALTH RATIOS.

Of more interest to Australians will be the ratios existing in each of the various States of the Commonwealth, as set out in the following table:

<table>
<thead>
<tr>
<th>State</th>
<th>Licences per every 1000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victoria</td>
<td>12.4</td>
</tr>
<tr>
<td>New South Wales</td>
<td>14.8</td>
</tr>
<tr>
<td>South Australia</td>
<td>6.9</td>
</tr>
<tr>
<td>Queensland</td>
<td>6.9</td>
</tr>
<tr>
<td>Tasmania</td>
<td>5.1</td>
</tr>
<tr>
<td>Western Australia</td>
<td>7.7</td>
</tr>
<tr>
<td>Commonwealth</td>
<td>12.3</td>
</tr>
</tbody>
</table>

Looking back over the past five years it is interesting to trace the growth of wireless popularity in the Commonwealth. The first programmes were not transmitted until the end of 1923, but the wireless regulations covering a fee for use of a receiving set did not come into operation until 1924. Consequently it is not possible to set any workable figures as to growth in the earlier days, and the figures shown are from August, 1924, at which date there were 8688 licences in force in the Commonwealth. The yearly increases are as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Commonwealth Licences in thousands</th>
<th>Increase for the year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1924</td>
<td>8,688</td>
<td></td>
</tr>
<tr>
<td>1925</td>
<td>11,682</td>
<td>3,094</td>
</tr>
<tr>
<td>1926</td>
<td>18,424</td>
<td>16,732</td>
</tr>
<tr>
<td>1927</td>
<td>24,284</td>
<td>5,860</td>
</tr>
<tr>
<td>1928</td>
<td>30,344</td>
<td>6,060</td>
</tr>
<tr>
<td>1929</td>
<td>36,000</td>
<td>5,656</td>
</tr>
</tbody>
</table>

Taking into consideration the various factors which now are being experienced it may be assumed that each State should show an increase from now on.

In Victoria it may not be possible to expect too much for some while, as it may be some months before the change-over from crystal to valve sets will be effected. It is reasonably thought that there are over 90 per cent. of crystal set owners in Victoria against a probable 15 per cent. in New South Wales. It seems inevitable that as the licence fee for crystal set receivers falls due the owner of such a set will have to decide whether it is worth while renewing the fee for another 12 months with indifferent reception, or make the change-over for a better set. This decision invariably means that a number will decide not to renew primarily on the grounds of expense. New South Wales went through this three years ago, with the result that the percentage of crystal set licence holders in this State has since then dropped from approximately 70 per cent. to 15 per cent.

South Australia and Tasmania, who are moving along well now, will fall back at all and with the improved conditions in Western Australia a steady increase should be noticed there also.

Summing up we can assume that the licences for the whole Commonwealth, which have increased at the rate of 25,000 a year for the last two years, should show this increase in future, and it would not be too much to expect that by August, 1930, there should be 250,000 in the Commonwealth, a ratio per thousand of population which would make more than a favorable showing with the position in the Old World.

The illustration on page seven shows the wonderful increase in Victoria of 54,600. New South Wales, having overcome most of the difficulties of the previous year, put on 21,800 licences for the year.

The population of Australia in 1921 was 5,903,000 and of New South Wales alone 3,426,000. Thus the licence owners in New South Wales, at 24,474 licences, are practically the same proportion of the population as in the United States, where the licence owners are 303,562. This shows that wireless occupies a more favorable position than either Germany or Hungary.

Looking back over the past five years it is of interest to note that in the first three years, which forward move was a very remarkable result, the increase continued, although, of course, not so much as during those three years. The only licence reductions shown in the larger States. Victoria from 60,000 in 1927 to 36,000 in 1929 and New South Wales in the same period reduced the gap between itself and Victoria from 60,000 to 32,000, a result that is not expected that much progress would be shown prior to August, 1924, at which date the licences in Western Australia had 4003 licences. Since that time the increase in the northern State has been no more than 1700 licences.
TWO CERTAINTIES!!

1

THIS WILL SAVE YOU POUNDS

It is the Simplest and Cheapest Satisfactory Method of Replacing Dry "B" Batteries

IT is approved by the Electricity Department.
IT is absolutely fool-proof.
IT can be built by anyone in a few minutes.
IT entails no alterations to your set.
IT works from any electric light socket or power point.
IT is fitted with a specially designed transformer.
IT works with a specially selected Philips valve.
IT connects to your set in exactly the same way as "B" Batteries.
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IT IS THE NEW IMPROVED ECONOMIC B’LIMINATOR KIT

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THE FAMOUS RENOWN SPECIAL THREE—the three valve set with five valve performance. So simple that anyone can build it. So efficient that it gives you ALL stations. No receiver ever designed approaches the Renown in efficiency. The kit of parts and book of instructions costs £6/12/8. Call and see the Renown—then build or have us make you one and enjoy real Radio.

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COUNTRY CLIENTS.—Our Mail Order Service reaches every corner of the Commonwealth. Send your orders in so conditionally that your money is refunded if you are not satisfied with goods. Returns must be made within ten days of receipt. We pay carriage on all orders of 10/- and over, except on Batteries, Cabinets, and Loud Speakers. Articles specially procured cannot be exchanged. Terms Cash or Cash on Delivery. No Discounts.

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PHONE. NEW. 1662.

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SYDNEY.

CORNER CHURCH &
MACQUARIE STS.,
PARRAMATTA.
PHONE, UW9601.

25 ROYAL ARCADE,
SYDNEY
(near Palace Theatre).
PHONE. M6138.
A Screen Grid Booster Unit for Small Sets

By R. W. M.

The one, two, or three-valve receivers, in addition to the service they give from nearby stations, often manage to pull in stations from other States under good conditions. As a general rule, however, they are able to accomplish such work only if they are tuned to give the last ounce of amplification that the receiver possesses. This necessitates extremely critical tuning, and causes a lack of stability which takes most of the pleasure from long distance reception. The radio frequency amplifier unit to be described is designed to be attached to any existing receiver in order to give it considerable additional radio frequency amplification. When correctly built and adjusted, it is capable of greatly improving the selectivity and sensitivity of any of the simpler receivers.

Most of our readers will know that amplifiers are divided into two types. That most generally known is "audio frequency," and this method increases the output of signals generally known is "audio frequency." and in this we increase the input to the detector or rectifying valve. This method is termed "radio frequency amplification." and in this we increase the input to the detector or rectifying valve. This method is termed "radio frequency amplification." and in this we increase the input to the detector or rectifying valve. This method is termed "radio frequency amplification.

The valve used is as yet little known, because it is of new type. It was not chosen because of this, but because its characteristics were most suited to the purpose.

Adding a stage of r.f. is relatively a difficult matter for several reasons. It must not be supposed that the construction of the stage is difficult, for it will take only a few hours to build. The most difficult part is in deciding which way the stage will be connected up, owing to the fact that there are so many types of receivers, and one method of adding the stage might be quite suitable for one type of receiver, whilst if it is connected up in the same manner to another existing receiver, results will be inferior. However, this will be discussed later.

It is usually impossible to include the additional stage inside the cabinet itself without re-arranging apparatus, so that the r.f. stage pictured here has been built as a separate unit, and as such, may be connected up, or removed from any existing receiver in a few moments.

The apparatus is totally screened. The r.f. stage itself is enclosed in a Radiokes Screening Box of the new type, whilst a small aluminium cup obtained from Woolworths for a few pence, was used to screen the choke and condenser unit, and as such, may be connected up, or removed from any existing receiver in a few moments.

The screen grid r.f. valve is used because it gives us very high amplification and is remarkably efficient. The valve used is as yet little known, because it is of new type. It was not chosen because of this, but because its characteristics were most suited to the purpose.

Construction is quite simple. If the reader follows instructions he will find that working in a confined space will not be at all difficult. The sides, back, front, and top of the screen are removable, and any of them will stand in place without support from the others.

On the front of the screen drill a hole large enough to permit entrance of the condenser shaft. Mount the condenser C1 on the aluminium side of the screen, and do not insulate the condenser from it. The rotor plates of the condenser (which are always connected to the metal frame of the condenser) will make contact with the shield, and will thus be indirectly earthed. In cheaper types of condensers, bakelite frames are used, and in such cases, the rotor plates of the condenser should be connected to the aluminium shield. The condenser has a capacity of .0005mfd. The condenser used here was an "Advance," which suited admirably, as the space inside the shield is limited, and the rotor plates, when all out, do not overlap the edge of the fixed plates, as is the case with some a.f. types, which later, however, are quite suitable where space allows their use.

Immediately behind the condenser (see photograph) the coil is mounted. Here an attention has been paid to space available. The coil is from the Radiokes Neutrodine Kit, and is termed the Neutrodine "serial coil, L2." This coil is of very small dimensions, and is suited eminently to our purpose. It has an aerial coil (L1), conveniently tapped in the centre, and a secondary coil (L2). When connecting up the aerial terminal of the coil, you will notice that there are two. The one to use is that which is connected (look inside the coil), to the extreme end of the primary. In any case, if the reader is in doubt, he can try both terminals in a few moments and will soon find which one should be used.

Behind the coil a shock-absorbing Benjamin valve socket is mounted. The socket is of the usual UX type, but particular note should be taken of the fact that as the
screen-grid valve is particularly made to fit the socket, and is also made to be as efficient as possible. The plate terminal of the valve socket becomes the screen-grid connection.

The grid terminal of the socket remains the same. The plate connection is at the top of the valve socket. Do not forget this, otherwise the amplifier will not function. It will mean that the screen-grid is being heavily overloaded, and the plate of the valve is not receiving enough voltage.

To the left of the socket is mounted a 5 mfd. (.00005mfd) fixed condenser, whilst to the right of the socket a 200hm fixed resistor (R.1) is mounted. If any difficulty in procuring this resistor is experienced, a 200hm rheostat can be used.

We are imagining the unit to be facing us ready for tuning, i.e., with the condenser dial facing us. On the right-hand side of the shield should be mounted three terminals equi-distant. Care must be taken to insulate each of these terminals from the shield, by making the hole larger than necessary, mounting a piece of oonote over the hole, then mounting the terminals in the oonote. If this is not done, a direct short will result.

Before mounting the choke, connect the condenser (C.3) (.00025mfd.) to one side of it, as shown in the drawing. Now arrange the choke so that the plates lie snugly inside the aluminium cup, without touching. When the best position has been found, the choke and condenser can be mounted on the back (outside) of the shield, and the cup temporarily mounted over it. This is best done by flattening out the rolled edge of the cup in two places, and holes drilled to make metal thread screws. These pass through the cup and the shield, and the cup is held firmly by tightening up nuts in the moment. However, there is no need to tighten the nuts.

On the left-hand shield, one terminal is mounted to facilitate this terminal also. This is for the aerial connection.

The wiring is very simple. Before it is commenced the sides and back are left off to facilitate wiring. It becomes necessary to wire to the shields, they should be placed on.

Commence by taking a lead from the aerial terminal of the S.G. valve, and connect it further from the earth terminal of L.1 to the terminal on the left side of the shield. This terminal is the aerial connection of the unit, and to it the aerial should be connected when the unit is to be used.

No connection is made to the other aerial terminal, but the earth terminal of L.1 should be connected to the shield at the nearest point. Now connect the G terminal of L.2 to the grid terminal of the valve socket, and also to the fixed plates of the variable condenser (C.1). The rotor plates of the condenser should be connected to the P terminal of the coil, L.2 thence to one of the filament terminals of the valve socket, to one side of the resistor (R.1). The other side of the resistor should be connected to one of the terminals on the side of the screen. It is the A negative terminal.

Now arrange the choke and condenser in position. The choke is made of a piece of obonite over the hole. As shown in the drawing. This resistor should be connected to one of the terminals of the valve socket, to one side of the resistor (R.1). The other side of the resistor should be connected to one of the terminals on the side of the screen. It is the A negative terminal.

Note here that the resistor, R.1, the valve used, and the A voltage have a very definite relation. The valve used in the original receiver was an Osram S410. This requires a negative grid bias of about two volts, and is obtained by using a six-volt accumulator (or dry battery) for ‘A’ supply, through a 200hm resistor. This resistor drops the filament voltage to four, and places the requisite bias on the grid. If it is desired to use a four-volt accumulator, a two-volt screen grid valve should be used. Either the Mullard PM12 or the Osram 4215 will be suitable here.

Now connect the next terminal on the side of the screen to the remaining filament terminal of the valve socket. The plate of the valve socket, which, with the screen-grid valve, becomes the screen-grid connection, should then be connected to one side of C.2 (the 5mfd. condenser, and therefore to the third terminal on the side of the screen (B plus 67 volts). The remaining side of C.2 should be connected to the screen at any near point.

Remove the cup from the back of the shield, and drill a hole on the bottom of it, and another in the side of it. A flexible lead should be pushed through the hole, and connected to one side of the r.f. choke (R.P.C.). The other end of this wire eventually connects to B plus 135 volts. The other terminal of the choke should already be connected (for instructions were followed in mounting) to one side of C.3 (.00005mfd.), and a lead should also be taken from the same terminal of the choke through a hole drilled in the back shield to the top, i.e., the plate of the valve. A flexible insulated lead should be used here. Keep the lead short and solder a lug to the end of it so that good contact may be made to the plate of the S.G. valve.

The other side of C.3 should be connected by means of a flexible lead to the existing receiver. This may be the original aerial terminal of the set, though in some cases it may be found that the grid terminals of the valve will give better results.

The following is very important. Read carefully. The negative ‘A’ terminal of the booster unit is connected to earth through the resistor R.1. If the other “A” terminal is also earthed the battery will be short-circuited. Therefore, there must be no earth connection on the receiver itself. Further, the shield of the booster is connected with one side of the primary of the receiver proper.

If this primary is connected with the filament of a plate battery, as is often the case, trouble will result. The remedy in such a case is to use a fixed condenser in series with the lead connecting the shield of the booster to the receiver.

This condenser can be of any capacity over about .001 mfd.

Connect the aerial next, then tune the receiver, and the unit. Keep the unit in step with the receiver. It will be found that readings will be almost the same. There is no need to keep readings exactly alike. As soon as you strike a carrier wave reduce this to its lowest pitch on the detector tuning condenser, then adjust the R.P.U. unit condenser.

You will find that there is one point where the signal will be greatly amplified.

The booster unit should certainly be a worthwhile addition to any receiver in which not more than one radio frequency amplifier is already in use.

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NEXT WEEK

The 1930 Super-heterodyne described by Ross A. Hull—the latest word in receiver design, and the finest ever published in WIRELESS WEEKLY

---
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This latest product of Radiokes factory should prove of especial interest.
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The finish is the latest two-tone bronze wrinkle lacquer, and is supplied in several beautiful metallic colour schemes which will blend in with any possible mode of room decoration.
These cabinets are supplied in two standard sizes drilled, punched, and bushed for the famous 3.33 type screen grid receivers.

A.C. 3.33 type, size 19 in. x 12 in., price, £2 2s 6d each.
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Any other sizes and drillings to suit your special job at a slight variation in cost.
You can now build your receiver, and house same in this beautiful fireproof cabinet, with the assurance that the finished job will look superior to any factory built receiver on the market to-day.
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These units consist of a main panel, beautifully finished in two-tone bronze wrinkle lacquer, mounted upon a specially built sub-panel, and braced with the new RADIOKES sub-panel brackets.
The entire assembly is carried out in hard drawn, heavy gauge aluminium, excellently finished and bronzed.
This is the ideal foundation unit upon which to construct your new receiver. The trend is now for all metal construction, which is strong, fireproof, rigid, permanent, and efficient.
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Matching Valve Impedance

S is so often stated, there should be some definite relationship between the impedance of the audio frequency transformer and the valve feeding it in order to obtain some required operating condition. Discussion is often heard concerning the fact that since the impedance of the transformer primary changes with varying frequency, and the impedance of the valve does not, any given relationship between the impedance can exist only at one frequency. This, of course, is true, but the correctly-designed transformer gives a reasonably that frequency characteristic, nevertheless. A very simple and direct explanation of the why and wherefore appears in a recent issue of "Radio." We reprint it.

"Why the Impedance of an audio transformer's primary winding should match that of its associated vacuum tube's plate circuit for the greatest audio frequency to be reproduced, rather than at some higher frequency, is not generally understood. That maximum energy transfer occurs when the impedances of the two coupling units are equal, is a well-known rule of thumb. The impedance of the tube is about the same for all audio frequencies. The impedances of the primary increases as the frequency increases, and so the curve of energy transfer from tube to primary drops for increasing frequencies. On the other hand, the curve of energy transfer from primary to secondary rises as the frequency increases. These opposite tendencies result in each other so that their resultant curve approximates to a straight line. Which is to say that the energy transfer from tube to secondary is nearly uniform for all frequencies received from a broadcast station if the tube impedance matches that of the transformer primary at the lowest audio frequency."

Some Thoughts on Screen-grid Valves

D. KARL J. FISCHER, of Brisbane, discussing further the subject of neutralizing mentioned in a recent issue of WIRELESS WEEKLY writes:

"The tendency towards oscillation caused by the feed-back of amplified currents depends on two characteristics of the valve—first, the capacity between control-grid and plate; and second, the amplification factor.

Now, as there are screen grid valves, the grid-plate capacity could be decreased as far as 0.1 m of connecting the screen grid inside the valve with the magnesium foiling of the glass, and by placing the plate tap on top of the valve. Consequently the amplification factor could be increased enormously without causing oscillation in the usual amplifier. But there is a fundamental rule in electronic techniques that the internal resistance of any generator must equal approximately the external resistance, or in this special case the resistance of the tuned anode circuit. The best coils and condensers used for receivers in trade cannot give a greater external resistance than about two hundred thousand ohms. Most screen-grid valves are built with a higher value of internal resistance than this, and consequently their full effectiveness cannot be taken advantage of. "The tendency towards oscillation in a screen-grid stage is usually caused by wild capacitances in the wiring and by induction troubles. In building a screen-grid valve stage, it must be pointed out that a tuning coil has a live end and a dead end, the live end being very sensitive against any capacitive influence. Liberal uses of by-pass condensers and radio frequency choke coils is the right way to avoid oscillation, and a clear conception of the magnetic lines of force produced by tuning coils and choke is most essential.

Mounting the Pick-up

I is well known that in order to obtain the best reproduction together with a minimum of record wear, the needle of the pick-up, or rather its pivot axis, should lie in a plane tangential to the record groove at the point of contact, and should therefore be free to move at right angles to the groove. It is relatively easy to mount the tone-arm in such a manner that this condition holds at one place on the record, but it is almost impossible to provide for the most satisfactory possible alignment all the way across the record merely by judging the position of things by eye.

The usual method of estimating the correct arrangement of the pick-up and tone-arm is to swing the pick-up across until the needle touches the turn-table drive shaft at the centre position. It can be shown easily however, that this method is quite incorrect, and surely results in serious errors in alignment. In the "Wireless World" for August 7th, the subject is given detail treatment and a formula is presented by which the correct distance from the tone-arm pivot to the turn-table shaft can be determined for a tone-arm of any given length. The article would make interesting reading for any pick-up enthusiast, but for those to whom it is not available we reprint the concluding paragraph.

In brief, and by way of summary, one should first determine the distance between the tone-arm pivot and the turn-table shaft. To do this, square the length of the tone-arm as measured between pivot and needle, subtract 12, and take the square root of the result. Making use of the distance thus found, move the position of the tone-arm pivot until the needle points in the direction of a tangent to the groove. Then at a point about 1in. from the centre spindle, should the pick-up pass the "pink line" free of the record. The correct distance of the pivot to the turn-table is then maintained, and in due circumstances the pick-up will need to be swivelled to the tangential position when the needle is 1in. from the centre spindle."

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Positively the first 7-valve All Electric Set to be offered at this astonishingly low price—now as cheap as a battery operated receiver.

Operates direct from your light socket. Has an illuminated dial; is completely shielded; startlingly clear, with full round volume.

The set is highly selective and sensitive. One dial makes it absurdly simple to tune in to any station.

Included in the price are valves and type D "Musicone" Loudspeaker.

In circuit, the "Gembox" has three stages of GENUINE NEUTRODYNE radio-frequency amplification, detector, and two stages of audio-frequency amplification, the last stage utilising the famous 171-A power tube with approximately 135 volts on the plate. It also uses a No. 280 rectifier tube, making a total of seven vacuum tubes, as follows: 4-UX226, 1-UY227, 1-UX171A, and 1-UX280.

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YOUR LOCAL DEALER IS ENTITLED TO YOUR TRADE
Treating Various Forms of Inductance

When a circuit is made, part of the voltage is employed in overcoming the e.m.f. of self-induction, and part in driving the current through the ohmic resistance (similar to the friction of a wheel on an axle and ground). While the former lasts, energy is being given to the circuit and is being stored in the magnetic field. Finally, by the time the current reaches its maximum value, the induced e.m.f. has fallen to zero, and the applied voltage is solely devoted to driving the current through the resistance.

When the circuit is broken, the electrical inertia or inductance of the circuit, objects to a decrease of current, and before the current can be reduced or stopped, this energy must be partly or wholly removed in the form of heat, "convection current," at the break (switch) or the circuit. In D.C. circuits, the inductive effects are in operation only when switching on and off, but in A.C. circuits, where the current is continually rising and falling, the inductive effects are continually present. This explains to some extent why we are always advised to run A.C. valve filaments leads in twin flex, since the magnetic fields will, to some extent, be cancelled, and will not affect so greatly other parts of a radio circuit and cause induction.

Inductance of Wire

The inductance of a length of wire depends upon the form it takes, how it is arranged or wound.

If left "single," so that the lines of force from one end to the other interlink with another part, its inductance will be small, because the amount of cutting or interlinking other part, its inductance will be small, being from one part of it do not interlink with another.

If the wire is carried back on itself in a spiral, so that the lines of force from one end to the other, normal in the form of head, "convection current," at the break (switch) or the circuit, is arranged in a spiral so that the lines of force from the two coils is a minimum. When the moving coil is rotated through 180 degrees from one position, the fields produced by the two coils assist one another and the inductance is at a maximum value. Thus a variometer affords a variation of inductance.

As previously remarked, inductances in series are treated the same as resistances in series, i.e., the total inductance of three coils in series will be L1 plus L2 plus L3, whilst inductances in parallel are also calculated by the same method as resistance in parallel, i.e., L equals 1 over L1 plus 1 over L2 plus 1 over L3.

Their joint effect in opposing the rise or fall of current is decreased in the same way that the joint resistance of several resistances joined in parallel is decreased.

These notes should be used in conjunction with remarks given in "Proving Radio.

A circuit containing a powerful electro-magnet is termed "highly inductive." Such a circuit would be the field circuit of an electric dynamo.

"Self-Inductance"

The constant "L" is called the "self-inductance" or co-efficient of self-induction of the coil. It is usual and permissible to say "inductance" when self-inductance is meant, but it is very important to avoid confusion between the two words induction and inductance. Induction varies with the rate of change of the linkages as explained previously, but inductance is a fixed invariable quantity depending on the shape and number of turns of the coil, and independent of the current passing through the coil, provided there is no iron present.

The unit of self-inductance is the henry. It is equal to the induced e.m.f. divided by the rate of change in current. A coil is said to have unit self-inductance if the e.m.f. induced across it is one volt when the current is changing at the rate of one ampere per second.

Four Forms of Inductance

Various subdivisions of the henry are—

1. Millihenry, or thousandth part of a henry, symbol mh. Microhenry (abbreviated "mic") or millionth part of a henry, symbol uh.

2. Centimillihenry, thousandth part of a millihenry, symbol cm.

When a magnetic field is created round an inductance, a certain expenditure of energy is necessary over and above the energy expended in forcing current through the resistance of the coil. When the magnetic field collapses on the current falling in value this energy is restored to the circuit again, causing the current to continue for a longer time than it otherwise would have done. This energy is therefore stored in the magnetic field round the inductance.

There are various forms of inductance used in wireless telegraphy and telephony. These may be classified as under—

(a) Inductances having a maximum of inductance of the order of henries, in a minimum of space and a large current carrying capacity. These will have large iron cores. Such are armatures and field coils of electric motors, dynamos, and alternators. transformers, induction coils, etc.

(b) Inductances of a very small value, having very low resistance, very large current carrying capacity, and less insulation between adjacent turns. Such are primaries of spark oscillators.

(c) Inductances of a much larger value, slightly more resistance, and less insulation between adjacent turns than (b). Such are the aerial coils of C.W. (continuous wave) transmitters.

(d) Inductances of large value of the order of mica, of smaller diameter wire and low insulation between turns, adjustable in steps. Such are the inductances used in radio receivers.

A variometer inductance is composed of two coils joined in series. One is fixed, and the other can be rotated inside the fixed one.

When in one position the direction of the windings of the two coils is such that the field produced by one annuls nearly all the field due to the other, and the inductance of the two coils is a minimum. When the moving coil is rotated through 180 degrees from this position, the field produced by the two coils assist one another and the inductance is at a maximum value. Thus a variometer affords a variation of inductance.

As previously remarked, inductances in series are treated the same as resistances in series, i.e., the total inductance of three coils in series will be L1 plus L2 plus L3, whilst inductances in parallel are also calculated by the same method as resistance in parallel, i.e., L equals 1 over L1 plus 1 over L2 plus 1 over L3.

Their joint effect in opposing the rise or fall of current is decreased in the same way that the joint resistance of several resistances joined in parallel is decreased.

These notes should be used in conjunction with remarks given in "Proving Radio.

If a second circuit containing inductance be brought near a circuit carrying a current (see Gallivancitermometer experiment—"Proving Radio") the flux due to the current in the first circuit will cut the second. Any change in the current of the first circuit will produce a change in the flux linkage with the second circuit, and therefore an e.m.f. will be set up in this circuit. This phenomenon is known as "mutual induction." Any two circuits between which there is mutual induction are said to be magnetically or inductively coupled.

"Mutual Inductance"

The closer the two coils are together, the better will be the magnetic path for the lines of force, and the greater will be the induced e.m.f. for any change of current. A pair of circuits are said to have mutual inductance or a co-efficient of mutual in-duction of one henry when current changing in one circuit at the rate of one ampere per second produces in the other an e.m.f. of one volt. This "mutual" inductance is measured in henrys, millihenrys, mics, etc., just as inductance. It is denoted by the letter "M" and is a measure of the lines of force linked by the two circuits for a given current in one.
This is a dull emitter special detector valve of great sensitivity. It can also be used in first stage of audio amplification, and is an indirectly heated AC valve with UX base.

Max. Heater Voltage .... 2.5 volts
Heater Current .......... 1.5 amp.
Max. Anode Voltage .... 180 volts

Impedance ... 6650 ohms.
Amplification factor ... 10

PRICE 27/6

Also the AC3 for Radio and first audio stage directly heated 1.5 volts 1.1 amps., and the AC4 Super Power Valve directly heated 5 volts 1.25 amps. Both with UX base.

The 102T is a more “detective” detector than any other AC 2.5 volt 1.5 amp. UX Valve. TRY IT AND SEE FOR YOURSELF.

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Concluding the details for the construction of the first model outdoor 'plane described less well—Do not forget to tune in the Model Aero Club Session on Monday.

Your front hook—shown in the apex of A—is made of 16 gauge piano wire and is bent around the front of the frame to form a yoke with an eye on each side. These hooks do not need to be large since 8 books are used to fasten the rubber to them. The yoke should be bound with silk and cemented.

Your next job—making the elevator—is not at all difficult, but it does require care. Study Figs. 5 and 6. Notice that the tip of the elevator is 3 inches high and the tip at the leading edge is 1-1/4 inches high. This gives your 'plane its lift. Note that the elevator is simply a bamboo frame covered with tissue.

Elevator Frame
First of all, make a full-size drawing of the elevator to work to. For the frame, split off a piece of bamboo 1-1/2 by 1-1/2, as long as your stock. Bind this to the shape of the tip, and when it's bent, split it down the middle. This will form nearly your entire two halves of the elevator. Short straight pieces will have to be fitted and cemented to the leading and trailing edges to complete the frame.

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Local Programmes, Friday, September 20

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SUNDAY, SEPTEMBER 22
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**WIRELESS WEEKLY**

**Friday, 28th September, 1929**

**EVENING SESSION.**
7.0: Musical interlude. 7.15: Birthday calls.
7.15: Sporting feature, turf topics, review of candidates and prospects for to-morrow. Mr. George A. Davis. 7.45: Request numbers. 8.00: Hawaiian steel guitar selections. 8.15: Women's information service. Mrs. Gray. 8.30: Music and vocal items from the Studio. 9.10: Sporting feature, presented by Tofd and Co., Ltd., Kent Brewery, from ringside of M'Hugh's Lochinvar's Stadium. Full description of main 15 rounds event. 10.00: Closing announcements.

**2UE**
Broadcasting Studios (2UE, Everett St., Sansouci, Sydney [Wavelength, 256 Metres]).

**EARLY MORNING SESSION.**

**MIDDAY SESSION**
11.30: Old-time orchestral selections. 12.30: Close down.

**AFTERNOON SESSION.**
1.0: Vocal and instrumental items. 1.45: Organ recital. 2.0: Orchestral and vocal music. 2.30: Close down.

**EVENING SESSION.**

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**CHILDREN'S SESSION.**
9.00: Weather report.
9.10: Music and request numbers.
9.15: Hawaiian steel guitar selections.
9.35: Mr. Jack Wait and Mr. Heath Burdock, humor.
10.0: From the Studio, V. C. Bell will speak from 'The Public Forum'.
10.15: An illustrated talk on music. 10.25: Late news from the 'Sun' and late auction forecasts.
10.30: Close down.

**MIDDAY SESSION.**
10.25: Late news from the "Sun" and late auction forecasts.
10.30: Women's ses- sion.
11.0: A few laughs. 11.5: Piano- recital.
11.30: Old-time orchestral selections. 12.30: Close down.

**AFTERNOON SESSION.**
1.0: Vocal and instrumental items. 1.45: Organ recital. 2.0: Orchestral and vocal music. 2.30: Close down.

**EVENING SESSION.**

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**2GB**
Broadcasting Station 2UE. Everett St., Marrickville. (Wavelength, 256 Metres).

**EARLY MORNING SESSION.**
7.0: Musical interlude. 7.15: Birthday calls.
7.15: Sporting feature, turf topics, review of candidates and prospects for to-morrow. Mr. George A. Davis. 7.45: Request numbers. 8.00: Hawaiian steel guitar selections. 8.15: Women's information service. Mrs. Gray. 8.30: Music and vocal items from the Studio. 9.10: Sporting feature, presented by Tofd and Co., Ltd., Kent Brewery, from ringside of M'Hugh's Lochinvar's Stadium. Full description of main 15 rounds event. 10.00: Closing announcements.

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**2KY**
Broadcasting Station 2UE. Everett St., Marrickville. (Wavelength, 256 Metres).

**EARLY MORNING SESSION.**
7.0: Musical interlude. 7.15: Birthday calls.
7.15: Sporting feature, turf topics, review of candidates and prospects for to-morrow. Mr. George A. Davis. 7.45: Request numbers. 8.00: Hawaiian steel guitar selections. 8.15: Women's information service. Mrs. Gray. 8.30: Music and vocal items from the Studio. 9.10: Sporting feature, presented by Tofd and Co., Ltd., Kent Brewery, from ringside of M'Hugh's Lochinvar's Stadium. Full description of main 15 rounds event. 10.00: Closing announcements.

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**NEWSPAPER ADVERTISEMENT FOR ELECTRAC CERTIFIED MICROFUSION.**

**THE RESISTANCE ELEMENT IS THE FINEST MATERIAL KNOWN.**
Its value is guaranteed within 3 per cent.

**ELECTRAC** Certified Mica Fixed Condensers.

---

**WIRELESS WEEKLY**

**Page Twenty-Nine**
WIRELESS WEEKLY

Friday, 20th September, 1929

Interstate Programme, Friday, September 20

3AR
Australian Broadcasting Co., 120 Russell St., Melbourne (Wavelength, 344 Metres).

MORNING SESSION

MORNING SESSION

AFTERNOON SESSION

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AFTERNOON SESSION

MORNING SESSION

MORNING SESSION

MORNING SESSION
BUILD YOUR OWN RECEIVER

Come and see us! Without obligation we will be delighted to show you how simply and how cheaply you can build a most efficient Radio Receiver for yourself. You require no great knowledge. We gladly offer you every assistance. With our extensive experience in Wireless matters behind you, success is assured, without the slightest risk of failure. Absolute satisfaction guaranteed.

BOOSTER UNIT

Below is a list of Parts for Building the Booster Unit, as described IN THIS ISSUE.

<table>
<thead>
<tr>
<th>Description</th>
<th>Cash Price</th>
<th>Deposit</th>
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<td>Osram Valve, $410</td>
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<td>Radiokens Standard Shield Box</td>
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Improve Your Reception

90 per cent of Bad Reception is due to faulty Batteries or Speaker. Eliminate these troubles, and have good Reception ALWAYS.

Hydra

Always Leads!

THE NEW

Non-Inductively Wound Type

in Bakelite Cases

are the LAST WORD in PAPER ELECTRIC CONDENSERS.

Test Voltage 500 D.C.
Working Voltage 240 v. D.C. or 160 A.C.


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351 Clarence Street, Little Collins Street,
Kensington, Sydney.
Phone, 9251-A.

Always Leads!

THE NEW

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EASTERN TRADING CO.

Aberdeen House: M'Gowen House,
351 Clarence Street, Little Collins Street,
Kensington, Sydney.
Phone, 9251-A.

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Cash Price | Deposit
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Philips 3009 Eliminator | 8 15 0 | 17/6, and 19 Weekly Payments of 8 9
Philips 3002 Eliminator | 9 15 0 | 19/6, and 19 Weekly Payments of 9 9
Philips 3002 B & C Eliminator | 10 15 0 | 21/6, and 19 Weekly Payments of 10 10
Emmco Super B Eliminator | 12 12 0 | 26/6, and 19 Weekly Payments of 12 12
Emmco Maxum B Eliminator | 8 15 0 | 17/6, and 19 Weekly Payments of 8 6
Philips A.C. Power Pack | 12 0 0 | 24/6, and 19 Weekly Payments of 12
Emmco Power Pack | 12 0 0 | 24/6, and 19 Weekly Payments of 12
Emmco Trickle Charger | 3 10 0 | 7/6, and 19 Weekly Payments of 3
Philips Trickle Charger | 3 10 0 | 7/6, and 19 Weekly Payments of 3
Colmox A Charger | 5 10 0 | 11/6, and 19 Weekly Payments of 5
Colmox A, B Charger | 6 10 0 | 13/6, and 19 Weekly Payments of 6
R.C.A. 1008 | 7 10 0 | 15/6, and 19 Weekly Payments of 7
Philips P.C.J.J. Speaker | 6 10 0 | 13/6, and 19 Weekly Payments of 6
Philips P.C.J.J. Junior Speaker | 5 10 0 | 11/6, and 19 Weekly Payments of 5
Philips Baby Grand Speaker | 3 15 0 | 7/6, and 19 Weekly Payments of 3
Magnetox Belvedere A.C., D60 | 11 10 0 | 23/6, and 19 Weekly Payments of 11
Magnetox Beverley A.C., D80 | 11 10 0 | 22/6, and 19 Weekly Payments of 11
Magnetox A.C., D80 Unit | 7 15 0 | 15/6, and 19 Weekly Payments of 7/6

TERMS FOR COUNTRY—25 per cent. Deposit and Balance in Five Monthly Payments.

COUNTRY CUSTOMERS—Orders over £10, inclusive of f.o.b. charges. If not received and returned within two days, money will be refunded.

Colville-Moore Wireless Supplies Ltd.

10 ROWE STREET (Next Hotel Australia), SYDNEY

PHONE, B2261.
Local Programmes, Saturday, September 21

2FC
Australian Broadcasting Company, Ltd. Market St., Sydney (Wavelength 45 Metres).

EARLY SESSION—7 to 8.15 a.m.
7.0: "Big Ben" and meteorological information for the man on the land.
7.3: This morning's news from "Daily Telegraph.
7.37:?! SPECIAL COUNTRY SESSION.
6.45: The National Broadcasting Orchestra
5.45: Kiddies' Good night stories told by "Bella and Her Umbrella" (Lindsay).
4.45: Close.

MORNING AND AFTERNOON SESSION.
10.30: Announcements.
10.45: Studio music.
11.0: Household Helps—Week-ends suggestions by Miss Ruth Furst.
11.10: Children's Birthday Calls.
12.0: "Big Ben": Stock Exchange and market quotations.
12.30: Studio music.
12.50: Program from Rosehill—Description of the races in the running. During intervals from the Studio, vocal items by Royal Boy and instrumental music by the Kiranda Trio.
4.35: Complete sporting and racing resume.
4.45: Close.

EARLY EVENING SESSION—5.45 to 7.15 p.m.
5.45: Kiddles "good-night" stories told by "Fada and Her Umbrella_counted by Aunt Willa.
6.45: The National Broadcasting Orchestra
5.45: "What's on to-day?"
7.0: "Hello Man." assisted by Aunt Willa.
7.48: What's on to-day?
7.50: Children's Birthday Calls.
8.0: Music from the Studio.
8.15: Close.

2BL

OPENING SESSION—8.15 a.m. to 11 a.m.
8.15: O.P.O. chimes.
Music for every mood.
8.40: Meteorological data for the country.
8.50: Australian official wireless news.
9.00: New music.
10.5: News from the "Daily Telegraph Pic- torial."
10.10: Talk on "Gardening" by Mr. G. Cooper, Park Superintendent, City Council.
10.30: Austradio musical reproduction
11.0: O.P.O. chimes.

MIDDAY SESSION—12 noon to 2.30 p.m.
12.0: O.P.O. chimes.
Announcements.
12.15: The National Broadcasting Orchestra
12.30: Children's Programme conducted by Uncle Bert.
12.50: Musical session.
1.2: "What's in the air to-day?"
1.30: Closedown.

AFTERNOON ENTERTAINMENT—2.30 p.m. to 5.15 p.m.
2.30: The Harlequins:
2.45: Gertrude Gray, mezzo-soprano.
(a) "The Arrow and the Song" (Childe).
(b) "Big Lady Moon" (Doty-Thomas).
2.52: Mildred Hill pianist.
(a) "Pierres Pieces No 1 Lento" (Cyril Scott).
(b) "Island Spell" (Ireland).
(c) "Refrain of Bereau" (Palmen)."n
(b) "Noel" (Balfour-Gardiner).
3.0: The Harlequins:
3.15: Stanley Clark, clarinet bass.
3.22: Doris Lindsay, Scottish comedian.
(a) "Scotland and Jenny" (Lindsey).
(b) "Valse to Me" (Weston and Lee).
3.59: The Harlequins.
3.41: Gertrude Gray, mezzo-soprano.
(a) "Bird Lullaby" (Sanderson).
(b) "Blind Ploughman" (Clarke).
3.51: Mildred Hill pianist.
(a) "Auroom" (Childe).
(b) "Shapenote No. 11" (Listz).
4.0: Stanley Clark, clarinet bass.
4.6: The Harlequins.
4.52: Doris Lindsay, Scottish comedian.
(a) "A Good New Year" (Lindsey).
(b) "Bela and Her Umbrella" (Lindsey).
(c) "The latest dance music.
4.59: Complete sporting resume.
5.15: Close.

THE DINNER HOUR—6.15 P.M. to 7.05 P.M.
6.45: The A.B.C. "Younger Set" Session—The Captain to his Comrades.
7.0: The A.B.C. Sporting Service.
7.15: Studio music.
7.30: The National Broadcasting Orchestra.
7.45: Austradio musical reproduction.
7.55: What's on the air to-night?

TO-NIGHT'S PRESENTATION—8 to 12 p.m.
2BL's programme to-night is arranged on popular lines in contrast to the choral offer- ing by the Sydney Male Voice Choir through 2FC. Jack Kinson is singing well-known songs, with orchestral accompaniment. Charlie Lawrence, who has a brand-new set of stories, and the South Seas transported for the benefit of 2BL listeners by the Kalia Trio, in creating Hawaiian melodies. Humorous sketches by Edith Cowley.

8.0: The National Broadcasting Orchestra.
8.15: Children's Entertainment.
8.22: Jack Kinson, basso.
(a) "Deadly ABC's" (Tote), with orchestral accompaniment.
(b) "Brendel's Mine" (Sanderson), with orchestral accompaniment.
8.29: Kalia Trio, in Hawaiian melodies.
8.35: Musical session.
9.0: "This Morning's News from "World." (Brahms), with orchestral accompaniment.
9.17: Kalua Trio.
(a) "A Spirit in Me" (Hindemith).
(b) "The latest dance music.
9.30: "Time's In the Air" (Eaton).
10.0: The National Broadcasting Orchestra.
10.30: Late news from the "Sun," and late official weather forecast.
11.00: The Australian Broadcasting Dance Orchestra.
11.30: Roma's Cafe Dance Orchestra, conducted by Benny Hill.
12.0: Close. National Anthem.

MIDNIGHT SESSION—12 midnight to 4.30 a.m.
1.0: O.P.O. chimes.
Announcements.
2.0: Children's Programme conducted by Uncle Gorge.
3.0: Request numbers.
4.30: Close.

WIRRELLESS WEEKLY
Friday, 20th September, 1929

2GB
Theosophical Broadcasting Station, 9 High St., Sydney (Wavelength 23 Metres).

CHILDREN'S SESSION.
6.0: Birthdays calls, request numbers.
7.0: "Kiddies' Entertainer." 8.0: Musical programme by Roma's Dance Orches- tera.
10.30: Close down.

2UW

3.50: P.M.: Children's Programme conducted by Uncle Jack. 6.30 Close down.
7.0: Musical programme and request numbers.
10.30: Close down.

2KY
Broadcasting Station 5LY, Everton St., Mesarahe. Wave-length, 180 Metres.

EVENING SESSION.
7.0: Musical interlude. 7.05: Birthdays calls.
7.15: Spotting feature, topic songs. 7.55: Birthday calls. 8.0: Clock and chimes.

SPECIAL FAJA
Built-in Dynamic Speakers
Radio
The Fada All Electric Receivers out-distance out-perform, out-quality any other standard Re- ceiver. Call for a demonstration of the Fada, and let your hearing be your guide. Built-in Fada Dynamic Speakers.—Push-pull Power Amplifiers—Radio Phonog- raphic Combination.

WINKWORTH'S
337 GEORGE STREET SYDNEY.
Next to News, Market Place.
And at 149-161 Parramatta Rd., Annandale.


OPEN FRIDAYS TILL 9 P.M.
READY for instant use—if you use the popular combination of Philips Units for supplying “A,” “B” and “C” power for your radio. The Philips Trickle Charger and “B” and “C” Power Unit will make your old set as modern as the latest power socket operated model.

A turn of the switch on the Trickle Charger and your set is either operating or completely cut off. At the same time the “A” accumulator is controlled either to supply the valves in the set or to be re-charged with just the right amount of current to restore it again.

Ask your dealer about this wonderful combination.

PHILIPS

for better radio
3LO

Australian Broadcasting Co., (3BA Russell St., Melbourne. (48535 02.)

EARLY MORNING SESSION 1 to 8 a.m.


EARLY MORNING SESSION 11 to 8 a.m.


WIRELESS WEEKLY

Friday, 20th September, 1929

Interstate Programmes, Saturday, September 21

3LO

Australian Broadcasting Co., (3BA Russell St., Melbourne. (48535 02.)

EARLY MORNING SESSION 1 to 8 a.m.


EARLY MORNING SESSION 11 to 8 a.m.


3DE

The "Herald" Broadcasting Station, Flinders St., Melbourne (Wavelength: 515 Metres).

EARLY MORNING SESSION 10 to 11 a.m.

MORNING SESSION 11.0: Melbourne Racing Club, 11.5: "Listeners' Choice" (Sinden).

11.20 End of broadcast.
HOW TO CHOOSE YOUR "EVER-READY" RADIO "B" BATTERY

EFFICIENCY OF SERVICE and ECONOMY in running costs are obtained only by choosing the right size and type of "EVER-READY" H.T. "B" Battery, together with an "EVER-READY" Bias (No. 126C) Battery. The result—a perfect combination of QUALITY, QUANTITY, and LONG SERVICE.

Get yours to-day from any radio dealer

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<th>Voltage</th>
<th>&quot;Ever-Ready&quot; Battery</th>
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<td>18 to 42</td>
<td>15 Volt or 18 Volt</td>
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<td>2 Valves</td>
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There's an interesting folio in colors about these great batteries, with much useful information for radio enthusiasts. Write us for your copy to-day!

WHOLESALE DISTRIBUTORS
THE EVER-READY CO. (Gt. Britain) LTD.,
183 Pitt Street, Sydney.

NEWLY "EXELTRON"

"EXELTRON"

B ELIMINATORS £3 15 0
A CHARGERS £2 0 0
A.B.C. POWER PACKS 3 10 0

Usually sold 25 to 250 Hold direct from factory or through your local agents, guaranteed 3 months. Installed Free. Easy terms. Mail Order and Cables: EXELTRON ELECTRIC 5 Oxford Street, Sydney.
Local Programmes, Sunday, September 29

2FC


CHURCH HOUR—4.15 a.m. to 12.30 p.m.


12.15: From the studio—Studio Music.

10.30: This morning's news from "Sunday Times." 10.5: Studio Music. 10.0: Announcements. CHURCH HOUR—10.0 a.m. to 12.30 p.m.

10.0: Meditation music. 10.15: Music. 10.30: Close.

MIDDAY SESSION—10.55 a.m. to 3 p.m.


EVENING SESSION—4 to 10.30 p.m.

The 1930 Super-heterodyne described by Ross A. Hall — the latest word in receiver design, and the finest ever published in WIRELESS WEEKLY.

EVENING SESSION.

7.0: The complete evening service will be relayed from St. Barnabas' Church, London. Children's Service: Choral. Macy, Commander. Children's chorus singing, Conductor: Trevor M. Morgan. 10.0: Ode Save the King.

AUSTRALIAN BROADCASTING COMPANY, Ltd., Wellington St., Parramatta (Warragamba, 555 Metres).

WIRELESS WEEKLY

30B

BRITISH MADE

\[ \text{VARIALE CONDENSER} \]

Is the SMALLEST, LIGHTEST, MOST EFFICIENT OIL COOLER

\[ \text{SPAN FULLY OPEN} \]

CONSTRUCTION AND PERFORMANCE

\[ \text{SECOND TO NONE} \]

THE PRICE IS RIGHT

\[ \text{.0005-9/6; .0005-8/6; .0005-8/} \]

COMBINATION L.F. UNITS

\[ \text{TRUE SCALE} \]

\[ \text{(Dual Impedance)} \]

\[ \text{.52/6} \]

\[ \text{(Resistance Transformer)} \]

\[ \text{TRANFORMER} \]

\[ \text{Output Films Choice} \]

45/-

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ELECTRIC SUPPLY CO.,

617 George Street

Factory Representative

WHITEHALL AND WOOD PTY., LTD., CATHCART HOUSE, 11c Castlereagh St., Sydney 321 Flinders St., MELBOURNE.
Local Programmes, Monday, September 23

2FC
Australian Broadcasting Company, Ltd. Market St., Sydney (Wave-length 43 Metres)

EARLY SESSION—7 to 8.15 a.m.
7.0 "Big Ben and Meteorological information for the man on the move.
7.15 "The morning news, from the "Daily Guardian.
7.25 "Australio musical reproduction.
7.35 "Mail and shipping.
7.45 "What's on this day?"
7.50 Children's birthday calls.
8.0 Music from the Studio.
8.15 Close.

MORNING SESSION—10.30 a.m. to 12.30 p.m.
10.30 Announcements.
10.32 A.B.C. Racing Observer.
10.45 Horse Racing at the Grand Organ.
10.50 "Housewives' Hits: Cooking, by Miss Fannyke." (M.V.C. Bell).
11.15 "Morning devotion.
11.30 "Australio musical reproduction.
11.55 "Big Ben: Stock Exchange and metal quotations.
12.00 V. C. Bell, B.A., will speak from the "Public Forum.
12.30 Midday weather forecast and weather synopses. Special produce market session for the man on the land, supplied by the S. H. Marketing Board.
12.30 Close.

THE LUNCH HOUR—1 to 2.30 p.m.
12.30 Lunch to music with the National Broadcasting Orchestra.
12.45 "Stock Exchange, second call.
1.20 A plane at the afternoon news.
1.30 "Popular Education: W. S. Reay will speak on "Literary Personalities."
1.40 Announcement.
1.50 Telephone call.
2.00 The Radio Matinee—2.30 to 4.20 p.m.
2.30 The Warwick Strollers.
2.35 "Across the Diamond, soprano.
2.45 Florence Luber, pianist—"Bird of Love Divine" (Wood).
2.50 "Across the Blue Sea" (Bomorset).
3.00 "Songs of My Mother Taught Me" (Dvorak).
3.05 Florence Luber, pianist—"Scarf Dance" (Chaminade).
3.20 "False Suite" (Taylor) No. 6.
3.25 "Ira Thirty-Eight" (Taylor) No. 5.
3.30 "June" from "Montius" Series (Cowen).
3.35 "Valjak Suite" (Taylor) No. 5.
3.40 "June" from "Montius" Series (Cowen).
3.45 The Warwick Strollers.
3.50 "This Afternoon's Story.
3.55 The Warwick Strollers.
4.00 Stock Exchange, third call.
4.05 Close.

EARLY EVENING SESSION—5.35 to 7.35 p.m.
5.35 "Kiddies' 'Good-night' Stories, told by the "Hello Man" assisted by Aunt Elly.
6.40 The National Broadcasting Orchestra will play Dinner Music.
7.00 A.B.C. Sporting Service.
8.00 To-night's programme.

THE EVENING PRESENTATION—8 to 11.30.
8.15 P.M. G.P.O. Chimes.
8.25 Meteorological data for the country.
8.30 Austradio Musical Reproduction.
8.35 British official wireless news.
8.39 New music.
8.45 "The Trade Hour"—Demonstration Music.
8.47 Weather information.
8.50 Irish Potato Auction.
9.00 Address by Tom Gurr.
9.10 Announcement of the official weather forecast.
9.20 From the Oriental Cafe—Sydney Simpson's Syncopaters in Dance Music.

2BL
Australian Broadcasting Company, Ltd. Market St., Sydney (Wave-length 43 Metres)

OPENING SESSION—8.15 a.m. to 11 a.m.
8.15 a.m. G.P.O. Chimes.
9.00 Weather from the "Daily Guardian.
9.15 Announcements.
9.25 British official wireless news.
9.29 "Ruy Bias" (Mendelssohn).
9.35 "Morning devotion.
9.40 "Overture to "The Magic Carpet" (Crocodile, Price Conlin).
9.45 The National Broadcasting Orchestra.
9.50 "Of the Moon" (S. C. E. Wood).
9.55 "Three Lads" (Newart).
10.00 "Sweetheart on Parade" (Newart).
10.05 "The National Broadcasting Orchestra.
10.10 "On the Beach" (Dowling).
10.15 "Tango" (Prior).
10.20 "Overture to "The Magic Carpet" (Crocodile, Price Conlin).
10.25 The National Broadcasting Orchestra.
10.30 "On the Beach" (Dowling).
10.35 "Tango" (Prior).
10.40 "Overture to "The Magic Carpet" (Crocodile, Price Conlin).
10.45 "On the Beach" (Dowling).
11.00 G.P.O. Chimes. Close.

MIDDAY SESSION—12 noon to 2.30 p.m.
12.00 G.P.O. Chimes.
12.15 Announcements.
12.20 The National Broadcasting Orchestra.
12.30 "On the Beach" (Dowling).
12.35 "Tango" (Prior).
12.40 "Overture to "The Magic Carpet" (Crocodile, Price Conlin).
12.45 "On the Beach" (Dowling).

AFTEBNOW ENTERTAINMENT—2.30 to 3.45 p.m.
3.00 From the Studio—"Admiral Gulf." (Brown).
3.05 "The Orange Grove" (Monaco).
**2GB**

Theosophical Broadcasting Station, 29 High St.,
Sydney (Wavelength, 390 Metres).

10.0: Music. 10.10: Happiness talk by A. E.
Bennett. 10.20: Music. 10.30: Women’s ses-
sion by Miss Helen J. Beechling. 11.30:
Address by Mary Riwet. 11.45: Close
down. 2.0: Music. 2.5: Women’s Radio
Service by Mrs. Dorothy Jordan. 2.15: 
Movie News All. 3.0: Music. 3.15:
Address. 3.30: Close down. 3.15: Child-
ren’s session, by Uncle George. 7.0:
Music. 7.15: Feature story. 8.0: Miss
Lily Davies, contralto. 8.7: Instrumental
Trio. 8.15: Mr. Leslie Herford, baritone. 8.22:
Symphony Orchestra. 8.30: Mr. Jack
Win and Mr. Heath Burdock, humor. 8.35: Miss
Dorothy Stacey, soprano. 8.45: Address. 9.0:
Weather report. 9.1: Instrumental Trio. 9.10:
Miss Lily Davies, contralto. 9.20: Symphony
Orchestra. 9.30: Mr. Jack Win and Mr. Heath
Burdock, humor. 9.35: Mr. Leslie Her-
ford, baritone. 9.45: Cello solo. 9.50: Miss
Dorothy Stacey, soprano. 10.0: Instrumental
Trio. 10.30: Close down.

**2UW**

Radio Broadcasting, Ltd., Palis’ Building, 3ab St.
Sydney (Wavelength, 217 Metres).

**MONDAY SESSION.**

12.30: Request numbers. 1.0: G.P.O. clock
and chimes; request numbers. 2.0: Close
down. 4.30: Musical pro-
gramme.

**TUESDAY SESSION.**

5.30: Children’s Hour, conducted by Uncle
Jack. 6.30: Close down. 7.0: G.P.O. clock
and chimes; request numbers. 7.45: Radio
talk by Mr. E. Honfray. 8.0: Wagnerean re-
cital. 9.0: G.P.O. clock and chimes; com-
ments on foreign affairs by Mr. J. M.
Fen-
tice. 9.10: Music and request numbers. 10.30:
Close down.

**2KY**

Trade and Labor Council, Goeburn St., Sydney
(Wavelength, 390 Metres).

**MORNING SESSION.**

10.0: Tune in to the ticking of the clock.
10.3: Popular fox tunes. 10.15: Hawaiian steel
guitar selections. 10.30: Women’s session;
home hints and information, conducted by
Mrs. Gray. 11.0: A few quicks. 11.5: Pianof-
forte selections. 11.15: Calls and announce-
ments. 11.30: Musical interlude. 11.35:
Re-
qust numbers. 11.40: Music and vocal items
11.45: Where to go to-night. 12.0 (noon):
Closing announcements.

**CHILDREN’S SESSION.**

6.9: Birthday calls, request numbers, and
Kiddies’ Entertainment, Aunt Janums and
Uncle Bert.

**EVENING SESSION.**

7.0: Musical interlude. 7.15: Dance music
7.45: Militant Women’s Group. 8.0: Overture.
8.6: Tenor solo. Mr. A. Hillman. 8.15: Dance
music. 8.30: Request numbers. 8.45:
soirées solo. Miss Wright. 9.0: Novella
Interlude. 9.10: Request numbers. 9.30:
Selection of latest Brunswick, Columbia,
Parlophone, Real and Golden Tongue re-
cords. 10.0: Closing announcements.

**2UE**

Broadcasting Station (2E. Everett St., Maroob-
ra, Sydney (Wavelength, 390 Metres).

**EARLY MORNING SESSION.**

7.15: Breakfast-time orchestral music. 8.0:
Clock and chimes. 8.1: Music. 8.30: Weather
forecast. Close down.

---

Everyone will want the Harlie Wave Selector!

Don’t despair if you can’t get
rid of local stations. You can
increase the selectivity of your
set almost magically by fitting the
HARLIE Wave Selector. No
matter what type of set you are
using, the Harlie will improve it
evertheless. And here is an-
other important feature—be-
cause the Harlie increases selec-
tivity it also increases range and
volume. This new in-
vation means actual re-
juvenation of an old set, and
greater efficiency in a new one.
Easy to fit, strong and hand-
some, Harlie has amazed the
radio world.

**Instructions For Use**

First tune in the interfering sta-
tion to its loudest reception on
your Set before connecting the
Harlie Wave Selector.

Disconnect aerial terminal
from Set, and connect to
No. 1 socket on Wave Se-
lector. Slowly rote dial on
Wave Selector, until interfering
station disappears. If desired
results are not obtained, remove
aerial lead from No. 4 socket
to No. 3, and, if still unsatisfac-
tory, to No. 2. After tuning out
interfering station, your Set is
ready to re-tune for other sta-
tions. NOTE.—The Dial on
Wave Selector must be rotated
slowly, otherwise the tuning out
point will be missed. Range from
200 to 700 metres.

**Price 25/- each**
INTERSTATE PROGRAMMES, Monday, September 23

3LO

Australian Broadcasting Co., Ltd., Russell St., Melbourne (Wavelength, 231 Metres).

EARLY MORN. SESSION

10.30: The *Rex* Special Band.
11.30: God Save the King.

3AR

Australian Broadcasting Co., Ltd., Russell St., Melbourne (Wavelength, 244 Metres).

MORN. SESSION

12.0: Chimes.
12.1: Food and Cookery. Cheryl Dicks, Miss Kathleen Bridson.
12.15: Fifteen minutes interval.
12.30: Lunchtime music supplied by the National Broadcasting Orchestra. 26 Chimes.

AFT. SESSION

1.20: pantry Band. 2.15: You Coffee. Miss M. Mithen.
2.45: Garden.
3.50: Met. Information. 5.00: Chimes.

OLD-TIME DANCE NIGHT

3DB

The *Rex* Broadcasting Saloon, Flinders St., Melbourne (Wavelength, 225 Metres).

MORN. SESSION

11.0: British Official Wireless News. Items of Interest. 11.30: Paul Whiteman and his Orchestra.
11.55: God Save the King.

AFT. SESSION

1.15: Orchestra and a special program by the 'March of the Plundered Indians.' 2.30: Jimmy Rodgers. 'Treasurer Dundee.' 2.45: Great Australian Sports, sponsored by A. O. Healing, Ltd., and E. T. Muir.
4.6: Close down.

4QG


For day session, see Friday.

NIGHT SESSION

8.15: Ben Colebrow. "Blower On." (Jack-son)
8.25: E. S. Campbell and his Mouth Organ.
8.30: British Official Wireless News. 8.40: "Let All My Life Be Music." (Pygmalion)
8.45: E. S. Campbell and his Mouth Organ.
8.50: The Studio Orchestra. Ten minutes' dance music.
9.0: Metropolitan Weather Forecast.
9.2: Mrs. Robert Bell (soprano). "Sometimes When I'm Dreaming." (Unicorn)
9.12: Monumental and Harrow. Another argument.
9.25: Foster and Davison (Entertainers).
7.50: Metropolitan Weather Forecast.
8.0: Mrs. Robert Bell (soprano) "M'Alister's Night." 8.15: Metropolitan Weather Forecast.
8.40: Sydney Opera. Middles (soprano). "Sometimes When I'm Dreaming." (Unicorn)
8.40: Foster, Davison. 8.45: Metropolitan Weather Forecast.
8.50: The Studio Orchestra. Ten minutes' dance music.
9.00: News supplied by the Metropolitan Dally Weather Information. Close down.

6WF


EARLY MORN. SESSION

7.30: Town Hall chimes. 7.35: Metropolitan Information. 7.35: A.M. Australia's morning news.
8.0: J. F. Foster and Dawson (Entertainers).
8.12: Monumental and Harrow. Another argument.
8.25: Town Hall chimes.
9.0: Metropolitan Weather Forecast.
9.12: Monumental and Harrow. Another argument.
9.25: Foster and Davison (Entertainers).
5.30: Metropolitan Weather Forecast.
5.45: The Studio Orchestra. Ten minutes' dance music.
6.0: News supplied by the Metropolitan Dally Weather Information. Close down.

8.0: A.M. Australia, A.M. Australia's morning news.
8.12: Monumental and Harrow. Another argument.
8.25: Foster and Davison (Entertainers).
5.30: Metropolitan Weather Forecast.
5.45: The Studio Orchestra. Ten minutes' dance music.
6.0: News supplied by the Metropolitan Dally Weather Information. Close down.

7ZL

Tasmanian Broadcasters Pty., Builders Buildings, Elizabeth St., Hobart (Wavelength, 306 Metres).

EARLY MORN. SESSION

7.00: Olympic Information. 7.10: Metropolitan Information. 7.15: A.M. Australia's morning news.
7.20: Metropolitan Weather Forecast.
7.25: Metropolitan Information. 7.30: Olympic Information.
7.35: A.M. Australia's morning news.
7.40: Metropolitan Weather Forecast.
7.45: Metropolitan Information. 7.50: Olympic Information.
7.55: A.M. Australia's morning news.
8.05: Metropolitan Weather Forecast.
8.10: Metropolitan Information. 8.15: A.M. Australia's morning news.
8.20: Metropolitan Weather Forecast.
8.25: Metropolitan Information. 8.30: A.M. Australia's morning news.
8.35: Metropolitan Weather Forecast.
8.40: Metropolitan Information. 8.45: A.M. Australia's morning news.
8.50: Metropolitan Weather Forecast.
9.00: Metropolitan Information. 9.05: A.M. Australia's morning news.
9.10: Metropolitan Weather Forecast.
9.15: Metropolitan Information. 9.20: A.M. Australia's morning news.
9.30: Metropolitan Information. 9.35: A.M. Australia's morning news.
9.45: Metropolitan Information. 9.50: A.M. Australia's morning news.
10.00: Metropolitan Information. 10.05: A.M. Australia's morning news.
10.10: Metropolitan Weather Forecast.
10.15: Metropolitan Information. 10.20: A.M. Australia's morning news.
10.25: Metropolitan Weather Forecast.
10.30: Metropolitan Information. 10.35: A.M. Australia's morning news.
10.40: Metropolitan Weather Forecast.
10.45: Metropolitan Information. 10.50: A.M. Australia's morning news.
10.55: Metropolitan Weather Forecast.
11.00: Metropolitan Information. 11.05: A.M. Australia's morning news.
11.10: Metropolitan Weather Forecast.
11.15: Metropolitan Information. 11.20: A.M. Australia's morning news.
11.25: Metropolitan Weather Forecast.
11.30: Metropolitan Information. 11.35: A.M. Australia's morning news.
11.40: Metropolitan Weather Forecast.
11.45: Metropolitan Information. 11.50: A.M. Australia's morning news.
11.55: Metropolitan Weather Forecast.
12.00: Metropolitan Information. 12.05: A.M. Australia's morning news.
12.10: Metropolitan Weather Forecast.
12.15: Metropolitan Information. 12.20: A.M. Australia's morning news.
12.25: Metropolitan Weather Forecast.
12.30: Metropolitan Information. 12.35: A.M. Australia's morning news.
12.40: Metropolitan Weather Forecast.
12.45: Metropolitan Information. 12.50: A.M. Australia's morning news.
1.00: Metropolitan Information. 1.05: A.M. Australia's morning news.
1.10: Metropolitan Weather Forecast.
1.15: Metropolitan Information. 1.20: A.M. Australia's morning news.
1.25: Metropolitan Weather Forecast.
1.30: Metropolitan Information. 1.35: A.M. Australia's morning news.
1.40: Metropolitan Weather Forecast.
1.45: Metropolitan Information. 1.50: A.M. Australia's morning news.
1.55: Metropolitan Weather Forecast.
2.00: Metropolitan Information. 2.05: A.M. Australia's morning news.
2.10: Metropolitan Weather Forecast.
2.15: Metropolitan Information. 2.20: A.M. Australia's morning news.
2.25: Metropolitan Weather Forecast.
2.30: Metropolitan Information. 2.35: A.M. Australia's morning news.
2.40: Metropolitan Weather Forecast.
2.45: Metropolitan Information. 2.50: A.M. Australia's morning news.
2.55: Metropolitan Weather Forecast.
3.00: Metropolitan Information. 3.05: A.M. Australia's morning news.
3.10: Metropolitan Weather Forecast.
3.15: Metropolitan Information. 3.20: A.M. Australia's morning news.
3.25: Metropolitan Weather Forecast.
3.30: Metropolitan Information. 3.35: A.M. Australia's morning news.
3.40: Metropolitan Weather Forecast.
3.45: Metropolitan Information. 3.50: A.M. Australia's morning news.
3.55: Metropolitan Weather Forecast.
With a “Four-Fifteen” or “Six-Fifteen” you will hear many stations that you have never heard before. What has seemed like a void is now filled with voices as the dial of your radio creeps slowly round the scale.

SUPER-SENSITIVITY—that is the secret of these distance-getting detectors, one for four-volt and one for six-volt sets.

Today the price of the A415 or A615 is 13.6—no more than the ordinary type.

There is only one Valve that can replace a Philips—Another Philips
Local Programmes, Tuesday, September 24

**2FC**

**Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 330 Metres).**

**OPENING SESSION—8.15 a.m. to 11 a.m.**

8.15: G.P.O. Chimes.
8.20: Music from the Free Press Hall.
8.25: Meteoroic data for the country.
8.30: Australian Musical Reproduction.
8.35: New music.
8.55: Announcements.

**MIDDAY SESSION—12 noon to 2.30 p.m.**

12.00: G.P.O. Chimes. Announcements.
12.15: The National Broadcasting Orchestra.
1.00: Afternoon news from the "Evening News." 1.05: Studio music.
1.15: Women's "Interest Talk," Sister Parry "General characteristics of good and bad food."
1.30: Australian Musical Reproduction.
2.0: Knight Barnett at the Wurlitzer organ.
2.12: Studio music.

**EVENING ENTERTAINMENT—5.45 to 6.45 p.m.**

5.45: "Great Night" Stories told by Aunt Wills, assisted by Cousins Owen and Clarence.
5.50: "The National Broadcasting Orchestra will play dinner music."
6.0. A.B.C. "Theatrical" service.

**THE EVENING PRESENTATION—**8.0 to 11.00 p.m.

8.45: From the Studio: Len Maurice, popular vocalists.
9.00: "If you Want the Rainbow." Dixon.
10.30: From the Studio: Charlton Fay, entertainers.
11.05: "The Australian Cafe Dance Orchestra, conducted by Bunnie Abrahams.
11.20: From the Studio: Charlton Fay, entertainers.
11.35: "The Australian Cafe Dance Orchestra, conducted by Bunnie Abrahams.

**2BL**

**Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 330 Metres).**

**OPENING SESSION—8.15 a.m. to 11 a.m.**

8.15: G.P.O. Chimes.
8.20: Music from the Free Press Hall.
8.25: Meteoroic data for the country.
8.30: Australian Musical Reproduction.
8.35: New music.
8.55: Announcements.

**MIDDAY SESSION—12 noon to 2.30 p.m.**

12.00: G.P.O. Chimes. Announcements.
12.15: The National Broadcasting Orchestra.
1.00: Afternoon news from the "Evening News." 1.05: Studio music.
1.15: Women's "Interest Talk," Sister Parry "General characteristics of good and bad food."
1.30: Australian Musical Reproduction.
2.0: Knight Barnett at the Wurlitzer organ.
2.12: Studio music.

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11.20: From the Studio: Charlton Fay, entertainers.
11.35: "The Australian Cafe Dance Orchestra, conducted by Bunnie Abrahams.

**2GB**

**Theosophical Broadcasting Station, 78 High St., Warrnambool (Wavelength, 316 Metres).**

10.00: "Happiness Talks" by A. E. Bennett. 10.20: Music. 10.30: Women's sessions by Miss Helen J. Breslau. 11.10: Music. 11.15: Close down. 12.00: Music. 12.05: "Happiness Talks" by A. E. Bennett. 12.30: Movie Night All. 1.00: Music. 1.30: "Children's session by Uncle George. 7.0: Music. 7.30: "Service Talks by Sydney's Radio Station. 8.0: "Paradise" from Theosophy. 8.15: Symphony Orchestra. 8.30: "Rahms's Feature style orchestra. 9.00: "Rahms's Feature style orchestra. 9.15: Symphony Orchestra. 9.25: "Rahms's Feature style orchestra.
DAVID JONES' RADIO SECTION

is being moved!

SALE OF RADIO PARTS

Many Half Price!

Shop soiled Accumulators at . . . Half Price!
Eliminators going for half Usual Prices!
Fixed Condensers reduced to . . . Half Price!
50/- Loud Speakers, now for only . . . 30/-!
Transformers, Usl. 10/6, 13/9, 17/6 & 25/-
Until stocks clear, going at Half Prices!
Neutralising Condensers. Usl. 4/9 Each 2/3
Orientalial dials and drum controls, Half!
Voltimeters, 4/6, 8/6 . . . Now 2/6, 4/3
2/6 Switches reduced to clear, . . . Each 1/3

S.P.D.J. Switches. Usal. 1/3 . . . Each, 7d
Variable resistances. Usl. 9/6 . . . Now, 4/9
V.X. Sockets, Grid leaks, Jacks, Dials, Terminals, Brackets, Screened grid shields, Midget Condensers, lugs, solder, winding wire, hook-up wire. . . All Half Usual Prices!
Numerous other lines reduced to Half Price!

Shop soiled accessories too varied to list actually going for less than . . . Half Price!

Radio Department. Lower Ground Floor, New Store.

DAVID JONES'
**WIRELESS WEEKLY**

Friday, 29th September, 1939

**3LO**

**EARLY MORNING SESSION.**
7.00 to 8.15: Selection

**MORNING SESSION.**
8.10: Talk of interest, by John Prentice.
9.10: Selection

**AFTERNOON SESSION.**
2.00 to 3.15: Selection

**EVENING SESSION.**
7.30: Selection

**EDUCATIONAL SESSION.**
2.00: Stories from the School. The illustrations: John D. Batten, R.A., a well-known illustrator, and William Burney, A.R.C.A., a pastel painter.

**THE RADIO MATINEE.**
2.05: Selection

**CHILDREN'S CORNER.**
5.10: Selection

**NIGHT SESSION.**
8.50: Selection

**3DB**
The "Herald" Broadcasting Station, Flinders St., Melbourne (Wavelength: 555 Metres).

**EARLY MORNING SESSION.**
7.30 to 8.30: Selection

**MIDDAY SESSION.**
12.15: Selection

**AFTERNOON SESSION.**
2.10: Selection

**EVENING SESSION.**
7.30: Selection

**EDUCATIONAL SESSION.**
2.10: Selection

**THE RADIO MATINEE.**
2.15: Selection

**CHILDREN'S CORNER.**
5.15: Selection

**NIGHT SESSION.**
8.55: Selection

**SBS**

**EARLY MORNING SESSION.**
7.30 to 8.30: Selection

**MIDDAY SESSION.**
12.15: Selection

**AFTERNOON SESSION.**
2.15: Selection

**EVENING SESSION.**
7.30: Selection

**EDUCATIONAL SESSION.**
2.15: Selection

**THE RADIO MATINEE.**
2.20: Selection

**CHILDREN'S CORNER.**
5.20: Selection

**NIGHT SESSION.**
8.50: Selection

**4QG**

For day sessions, see Friday

**NIGHT SESSION.**

"WHO IS THE ARTIST?"
In response to many requests from listeners, a third series of the programme "Who Is the Artist?" will be broadcast on 4QG.

"Who is the Artist?" will be provided to well-known artists, who have frequently appeared at 4QG, but who will be referred to under their real name. Listeners will be asked to identify these performers, and to post their lists in 4QG boxes near the envelopes where "Who is the Artist?" will be printed. All lists should reach the station by Friday, September 28.

A prize of £2.00 will be awarded to the listener who sends in the correct list. A further list will be broadcast from the studio, and will make the form of an ordinary competition.

Announcer: Mr. A.

**4QG**

**EARLY MORNING SESSION.**
7.00 to 8.30: Selection

**MIDDAY SESSION.**
12.00: Selection

**AFTERNOON SESSION.**
2.00: Selection

**EVENING SESSION.**
7.30: Selection

**EDUCATIONAL SESSION.**
2.00: Selection

**THE RADIO MATINEE.**
2.05: Selection

**CHILDREN'S CORNER.**
5.10: Selection

**NIGHT SESSION.**
8.50: Selection

**7DL**
Thameside Broadcasters Pty., Bayview Buildings, Elizabeth St., WYNNING, New South Wales. (Wavelength: 545 Metres).

**EARLY MORNING SESSION.**
6.30: Selection

**MIDDAY SESSION.**
12.30: Selection

**AFTERNOON SESSION.**
2.30: Selection

**EVENING SESSION.**
7.30: Selection

**EDUCATIONAL SESSION.**
2.30: Selection

**THE RADIO MATINEE.**
2.35: Selection

**CHILDREN'S CORNER.**
5.40: Selection

**NIGHT SESSION.**
8.55: Selection

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**Ross Hull's**

1930 Super-heterodyne

**Next Week**

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**Queensland Government Radio Service, Brisbane (Wavelength: 355 Metres).**

For day sessions, see Friday

**NIGHT SESSION.**

"WHO IS THE ARTIST?"
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Announcer: Mr. A.

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**Queensland Government Radio Service, Brisbane (Wavelength: 355 Metres).**

For day sessions, see Friday

**NIGHT SESSION.**

"WHO IS THE ARTIST?"
In response to many requests from listeners, a third series of the programme "Who Is the Artist?" will be broadcast on 4QG.

"Who is the Artist?" will be provided to well-known artists, who have frequently appeared at 4QG, but who will be referred to under their real name. Listeners will be asked to identify these performers, and to post their lists in 4QG boxes near the envelopes where "Who is the Artist?" will be printed. All lists should reach the station by Friday, September 28.

A prize of £2.00 will be awarded to the listener who sends in the correct list. A further list will be broadcast from the studio, and will make the form of an ordinary competition.

Announcer: Mr. A.
The Timmons is a revelation in Tone and Volume, and is comparable with the Best Dynamic. It uses no current, and look at the price, which includes a Filter, only incorporated in the Highest Grade Speakers.

TO THE TRADE
This is only one of the many good things which we have to offer you; our policy is strictly wholesale, and we carry

A Complete Range of Radio Requirements

GUARANTEED BY THE AGENTS

32 CLARENCE STREET, SYDNEY  PHONE, B 2002
Local Programmes, Wednesday, September 25

**2EC**
Australian Broadcasting Company Ltd., Market St., Sydney (Wavelength 483 Metres).

**EARLY EVENING SESSION—7 to 5.15 a.m.**
1. 7.0: "Big Ben" and meteoroogical information for the man on the land.
2. 7.05: This morning's news, from the "Dally Guardian.
3. 7.15: Australian musical reproduction.
4. 7.45: Mail and shipping.
5. 7.50: What's on to-day.
6. 8.00: Children's birthdays
7. 8.10: Music from the studio.

**MORNING SESSION—10.20 a.m. to 12.30 p.m.**
1. 10.00: Announcements.
2. 10.30: General sporting talk by Oscar Lind.
3. 10.45: Horace Webe, at the grand organ.
4. 11.00: Housewife helps, cooking by Miss Ruth Furst.
6. 11.55: Morning devotion.
7. 11.30: Australian Musical Reproduction.
8. 12.00: "Big Ben." Stock Exchange and market.
9. 12.15: Special country session.
11. 12.30: Midday weather forecast and evening synopsis. Special produce market synopsis for the man on the land, supplied by the State "Market Board."
12.30: Close.

**THE LUNCH HOUR—1 p.m. to 2.30 p.m.**
1. 1.0: Lunch to music with the National Broadcasting Orchestra.
2. 1.15: Stock Exchange, second call.
3. 1.2: A glance at the afternoon "News."
4. 1.25: Popular music.

**27. 1.27: Announcements.**

**THE RADIO MATINEE—2.20 to 3.40 p.m.**
1. 2.20: Glenn Brady, novelty pianist.
2. 2.25: "Shadow Dance" (Masdoclew).
3. 2.30: "Waltz in A Flat" (Hrahms). 3.0: Delaware.
4. 2.35: Len Nugent, tenor.
5. 2.37: Memory melodies.
6. 3.0: Romano's Cafe Orhestra, conducted by Bennie Abrahams.
7. 3.12: From the Studio. Harry Skinner and Eileen Brady.
8. 3.15: "American Patrol" (Papworth).
9. 3.18: "Dance of the Dervises" (skinner).
10. 3.20: A popular number.
11. 3.25: Romano's Cafe Orchestra, conducted by Bennie Abrahams.
12. 3.30: Rehearsals for a radio play.
13. 4.0: Romano's Cafe Orhestra, conducted by Bennie Abrahams.
14. 4.10: From the Studio. Eileen Brady, novelty pianist.
15. 4.15: "Mediation" (Rim). 4.20: "Feather Fingers" (Cachap Latham).
16. 4.25: Len Nugent, tenor.
17. 4.30: "A popular item.
18. 4.35: Stock Exchange, third call.
19. 4.40: Harry Skinner and His Band.
20. 4.45: "Mexican Ride" (Grimsbaw).
21. 4.50: "You Were Meant For Me" (Brown).
22. 4.55: Radio rhythm.
23. 5.10: Close.

**EARLY EVENING SESSION—5.45 to 7.35 p.m.**
1. 5.45: Kiddies' "good-night" stories, told by Uncle Ted and "Nancy."
2. 5.50: The National Broadcasting Orchestra will play music.
3. 5.52: A B.C. sporting service.
5. 6.15: To-night's programme.

**THE EVENING PRESENTATION—8 p.m. to 11.20 p.m.**
1. 8.00: The studio play to-night is "Jiggy-Pokery," a whimsicality, arranged by H. W. Varna. Band music by the Salvation Army Orchestra. Sings will attract 2BL listeners, and the Wireless Sinners, under the direction of Mr. E. Bennett, will prepare concerted numbers, suitably adapted for broadcasting.
2. 8.45: An hour from the State Theatre.

**THE DINNER HOUR—6.15 p.m. to 7.55 p.m.**
1. 6.15: The National Broadcasting Orchestra.
2. 6.45: The A.B.C. "Younger Set" session.
4. 7.30: The National Broadcasting Orchestra.
5. 7.45: Australian Musical Reproduction.

**TO-NIGHT'S PRESENTATION—10 to 10.30 p.m.**
1. 10.00: H. W. Varna's Whimsical Radio play, "Jiggy-Pokery," will attract 500 listeners tonight. In addition there are song groups by Virginia Bassetti and a pannoforte recital by Joan Fry. 2BL listeners and the programme to-night is supplied by the Salvation Army Congress Band. The programme is conducted by Mr. Norman Lyons.
2. 10.25: "To-night's programme will give us a talk on "Bridge."
5. 11.00: Australian Musical Reproduction.

**Australian Broadcasting Company Ltd., Market St., Sydney (Wavelength 483 Metres).**

**OPENING SESSION—8.15 a.m. to 11 a.m.**
1. 8.15: G.P.O. chimes.
2. 8.20: Music from the "Morning Mood."
3. 8.45: Meteorological Data for the Country.
4. 9.00: Australian Musical Reproduction.
5. 9.15: British Official Wireless News.
6. 9.30: New Music.
7. 9.32: Virginia Bassetti, contralto.
8. 9.35: New Music.

**MIDDAY SESSION—12 Noon to 2.30 p.m.**
1. 12.00: G.P.O. Chimes.
2. 12.15: Announcements.
4. 12.30: Afternoon News from the "Evening News."
6. 1.15: "Woman's Interest Talk" (Goody Reeves). "Aids to Personality."
7. 1.30: Australian Musical Reproduction.
8. 1.45: J. Knight Barnett at the Wurlitzer.
9. 1.50: Studio Music.

**THE AFTERNOON ENTERTAINMENT—2.30 to 5.45 p.m.**
1. 2.30: Dr. Harold Norrie, member of Council of Royal Historical Society, will speak on "Outstanding Personalities of Australian History—Lieut. Dawes." 2.45: "We Two in Paradise" (Melville).
5. 5.15: "My Dear Soul" (Sanderson).
6. 5.20: "The Little Frog" (Gartlan).
7. 5.30: The Salvation Army Congress Band.
8. 5.40: Harry Hickery (Contralto).
9. 5.45: The Wireless Singers—Selected.
10. 5.50: Muriel Lang (Cellist).
11. 6.30: "Good-night. Beloved" (Larson).
8.00: Late news from the "News."
9.00: Late Weather Forecast. 10.30: Close. National Anthem.

**2GB**

**Theromroadcasting Broadcasting Station, 29 High St., Sydney (Wavelength 318 Metres).**

**10.00: Music.** 10.10: Happiness talk by A. E. Bennett. 10.30: Women's Service by Miss Helen J. Beegling. 11.30: Music. 11.45: Close down.

At Last!
A “Rola” within the reach of every pocket

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MODEL FIFTEEN

ROLA Model Fifteen.—Furnishing high quality performance at moderate cost, this speaker is unquestionably the greatest value offered in Radio. The ROLA MODEL FIFTEEN is equipped with the same electro-magnetic unit as the Model Twenty, and its performance is, therefore, almost identical with the more expensive model. It has ample power capacity to take the full power output of any standard radio set, and is exceptionally beautiful in appearance—features never before combined in a speaker at this price. We now have full stocks of the ROLA DYNAMIC and MAGNETIC SPEAKERS and Units. They may be heard at our temporary showrooms, 151 Castlereagh Street.
The 1930 Super-heterodyne described by Ross A. Hall - the latest word in receiver design, and the finest ever published in WIRELESS WEEKLY.

3:30: All. Peake and his Dance Orchestra. "It Wasn't Meant to be" (Stablers).
3:40: Jones (Barton): "Seaside" (Cobb). "My Love Is Like a Red Rose" said Scotts.
4:00: All Peake and her Dance Orchestra. "Jax Waltz; "The Druid's Prayer" (Dawson).
4:15: "A.B.C. Troubadours" (Contralto). "Summer Night" (Stirling-Thomson).
4:50: Foster and Dawson (Entertainers) Movements of Lighthouse Steamer.
5:35: W. Hilton Haslam (Contralto) "If I had a Bird Vera 2" (Stiller).
5:40: Al. Peake and his Dance Orchestra. "Jax Waltz; "Another Kiss" (Schantz).
5:45: Arthur Schlick (Contralto) Popular Numbers.
6:00: News supplied by the Metropolitan Daily. Weather Information.
6:45: Close down.

6WF


MORNING SESSION - 7.25. Town Hall chimes.
7.35. Special radio programme.
8.00: "A.B.C. Troubadours" (Contralto). "Summer Night" (Stirling-Thomson).
8.50: Foster and Dawson (Entertainers) Movements of Lighthouse Steamer.
9.35: W. Hilton Haslam (Contralto) "If I had a Bird Vera 2" (Stiller).
9.40: Al. Peake and his Dance Orchestra. "Jax Waltz; "Another Kiss" (Schantz).
10.00: News supplied by the Metropolitan Daily. Weather Information.
10.15: Al. Peake and his Dance Orchestra. Three quarters of an Hour's Dance Music.
11.45: Close down.
SPECIAL ATTENTION TO MAIL ORDERS.

FOR THE COMMONWEALTH'S LARGEST WIRELESS GOODS DISTRIBUTORS.

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Alumina Plates.

Heavy Duty Audio Transformers.

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4-volt Accumulators, hard rubber cases, 80 volts. 1/4 price 2/-6. 1/2 price 2/-9. Now 2/6 and 2/-9.


Compact...0025 Brass Plate Variable Condensers, 10/9. NOW 7/6.

De Jur Switch and 30 ohm Rheostat combined. 7/6. Magneto Headphones, 1/2. NOW 11/6. 0000 amhs.

De Jur High Grade Variable Load Speakers, for B or A.M.G. eliminators, 1/3. Chokes, 2/4/6.

Heavy Duty Transformers for B or A.M.G. eliminators. 3/1. Chokes, 8/6/9.

English Spring Valve Sockets, 1/6.


Alpha de Luxe Vanoar Dials, 8/6.

Metal Vaneer Dials 2/6. 000 siliconized Crystal Detectors.

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Heavy Duty Transformers for B or A.M.G. eliminators. 3/1. Chokes, 8/6/9.

English Spring Valve Sockets, 1/6.


Alpha de Luxe Vanoar Dials, 8/6.
Local Programmes, Thursday, September 26

2FC

EARLY SESSION—7 to 8.15 a.m.
1. 7:00: Topical feature, by Frank Hutchens and Lindley Evans.
2. 7:30: Romance, by Frank Hutchens and Lindley Evans.
3. 8:00: From the Conservatorium, Two-phonograph recital, by Frank Hutchens and Lindley Evans.
4. 8:30: From the studio, "Camelot of Our City," by C. R. Hall.
5. 8:40: Harry Lindrum and Ida Berridge, in 20 minutes of vaudeville vignettes.
6. 9:00: "The Country Man's Weather Session."
7. 9:40: From the studio, Jack Lingsdale and Goodie Reeves, "Something Different."
8. 10:15: Announcements. Late official weather forecasts.
9. 10:20: From the Hotel: Australia, Cec. Morison's, Dancing and Goodie Reeves.

MORNING SESSION—10.30 a.m. to 12.30 p.m.
10:30: Announcements.
11:00: A.B.C. Racing Observer.
11:30: Recital on the grand organ by Horace Weber.
11:30: Housewife helps; domestic notes by Miss Ruth Furst.
12:00: Lunch to music with the National Anthem.

THE LUNCH-HOUR—1 p.m. to 2.30 p.m.
1. 1:00: Lunch to music with the National Broadcasting Company's Women's Association, conducted by Laurence Macaulay and Ad Cree.
3. 2:30: The Melody Makers.
4. 2:45: From the studio, Ann Melhuish, soprano, will speak on "Gleanings from the East."

EARLY SESSION—7 to 8.15 a.m.
1. 7:00: To-night's programme.
2. 7:08: "A Castilian Lament" (Del Campo).
3. 7:32: "Forest Echoes" (Phillips).
4. 7:45: "The Dove" (Burleigh).
5. 8:00: A.B.C. Sporting Service.
6. 8:15: The National Broadcasting Orchestra.
7. 8:30: "Swing Low, Sweet Chariot" (Burdock).
8. 8:48: "What's on to-day?"

MORNING SESSION—10.30 a.m. to 12.30 p.m.
10:30: Announcements.
11:00: A.B.C. Racing Observer.
11:30: Recital on the grand organ by Horace Weber.
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4. 2:45: From the studio, Ann Melhuish, soprano, will speak on "Gleanings from the East."

TO-NIGHT'S PRESENTATION—8 to 10.30 p.m.
2BL's programme to-night features an hour from the Capitol, with orchestral music by Laurence Macaulay, conducted by Fred Schell. A talkie short will introduce a novel touch. Through 2FC every taste is catered for. Two programmes are sectionalised into 20-minute groups. Classic pianoforte vaudeville, Scottish humor, modern art song, the drama of the "Camelot of Our City," and a mysterious something different to intrigue radio listeners.

2BL

OPENING SESSION—8.15 a.m. to 11 a.m.
8:15: G.P.O. chimes.
8:35: "O Pioneers!"
9:15: Mr. Cecil Little, saxophonist.
10:30: Close.

MIDDAY SESSION—12 noon to 2.30 p.m.
12:00: G.P.O. chimes.
1:30: A.B.C. Sporting Service.
2:00: "Big Ben" and meteorological information for the man on the land, supplied by the A.B.C. "Younger Set" Session; the A.B.C. Grill Radio Club, conducted by Miss Gwen Varley.
3:00: Studio music. The country man's market session—Wool, wheat, stock, farm produce, fruits, vegetables, pig and poultry markets.
6:00: The National Broadcasting Orchestra.
7:45: Australian musical reproduction.

MIDDAY SESSION—2.30 p.m. to 4.30 p.m.
2:30: Open Programme.
3:12: From the studio, Ann Melhuish, soprano, will speak on "Gleanings from the East."
4:45: From the studio, Benie Abrahams.

AFTERNOON ENTERTAINMENT—2.30 p.m.
2:30: Business efficiency talk, Branton Gibb.
2:45: "The Magic Carpet." Jean Armstrong will speak on "Gleanings from the East."
3:00: Romanos Cafe Dance Orchestra, conducted by Bennie Abraham.
3:12: From the studio, Bennie Abraham.
3:15: Studio music.
3:30: Close.

EVENING SESSION—5 to 7.35 p.m.
5:45: "Kiddies' "Good-night" stories. told by Aunt Goodie.
6:00: Broadcasts by the National Broadcasting Company will play dinner music.
7:30: A.B.C. Sporting Service.

THE EVENING PRESENTATION—8 to 11.30 p.m.

2FC's Night of Contrasts. To-night's feature is the two-phonograph recital. by Frank Hutchens and Lindley Evans, to be broadcast from the Conservatorium. In sharp contrast to this, a recital, by Harry Lindrum and Ida Berridge. Laurence Macaulay and Ad Cree will delight Scottish hearts with "Swing Low, Sweet Chariot," and "Oh the Hills."

2GB
Thesopical Broadcasters, Station, 10 High St., Sydney (Wavelength, 316 Metres).

MIDDAY SESSION—11 a.m. to 11.45 a.m.
11:00: "The Cloths of Heaven" (Dunhill).
11:15: "Gavotte" (Gluck-Brahms).
11:24: "Elegie" (Bach).
11:33: "Forest Echoes" (Phillips).
11:40: "Swing Low, Sweet Chariot" (Burdock).

2UW
Radio Broadcasting, Qantas Building, Ann St, Sydney (Wavelength, 267 Metres).

MIDDAY SESSION—11 a.m. to 11.45 a.m.
11:00: "The Dove" (Ronald).
11:15: "Summer Love in Athenby" (Phillips).
11:30: Close. 4:45: "The Trade Hour." Demonstration music.
11:45: "Trade Hour." Demonstration music.

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Sydney: 137 Clarence Street. Phone, BW1328. Melbourne: Sugden Place.
Interstate Programmes, Thursday, September 26

WIRELESS WEEKLY

Friday, 29th September, 1929

3LO
Australian Broadcasting Co. 1208 Russell St., Melbourne (Wavelength, 315 Metres)

EARLY MORNING SESSION.
7.0 to 8.0 Melbourne time.
10.30: Current happening in sport by Eric Welch. 10.40: A.B.C. Troubadours—The "Spaz Jazz" Quartet.

MIDDAY SESSION.

EDUCATIONAL SESSION.
2.0: Norman Broadway (tenor). 2.15: Musical interlude. 2.30: Music explained and illustrated. Musical interface. (Tom C. Long.)

CHAMBER MUSIC.
3.25: The Cons.Dependency orchestra. (Beethoven— "Adagio-Polacca.")

3.35: Lipton tea afternoon tea. ("The Sage")—"O, Lay the Glass on Mine." 3.40: The Cry of the Cross—"Awake and be Watchful." (First movement only.)

INTERRUPTING SESSION.
4.15: "nilai's" (Beechworth) Chimes. 4.15: "nila's" Novelty Session.


NIGHT SESSION.
5.0: National Broadcasting Orchestra. "The Hymn to the Sun" (hymns). 

5.15: "nila's" Novelty Session.

5.30: "nila's" (Beechworth) Chimes. 5.30: "nila's" Novelty Session.

5.45: "nila's" (Beechworth) Chimes. 5.45: "nila's" Novelty Session.

6.0: "nila's" (Beechworth) Chimes. 6.0: "nila's" Novelty Session.

EARLY MORNING SESSION.
7.0 to 8.0 Melbourne time.
10.30: Current happening in sport by Eric Welch. 10.40: A.B.C. Troubadours—The "Jolly Boys" Quartet.

MIDDAY SESSION.

EDUCATIONAL SESSION.
2.0: Norman Broadway (tenor). 2.15: Musical interlude. 2.30: Music explained and illustrated. Musical interface. (Tom C. Long.)

CHAMBER MUSIC.
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5.30: "nila's" (Beechworth) Chimes. 5.30: "nila's" Novelty Session.

5.45: "nila's" (Beechworth) Chimes. 5.45: "nila's" Novelty Session.

6.0: "nila's" (Beechworth) Chimes. 6.0: "nila's" Novelty Session.

10.0: News supplied by the Metropolitan Dailies. Weather Information. Melbourne Town Hall.

6WF
Australian Broadcasting Company, Ltd, Wellington St., Perth (Wavelength, 455 Metres)

EARLY MORNING SESSION.
7.00 to 8.00 Town Hall time.
10.0: "nila's" Novelty Session.

10.10: Close down.

MIDDAY SESSION.

EDUCATIONAL SESSION.
2.00: "nila's" Novelty Session.

3.00: "nila's" Novelty Session.

4.00: "nila's" Novelty Session.

5.00: "nila's" Novelty Session.

6.00: "nila's" Novelty Session.

10.0: News supplied by the Metropolitan Dailies. Weather Information. Melbourne Town Hall.

4QG
Queensland Government Radio Service, Brisbane (Wavelength, 315 Metres)

For day sessions, see Friday.

8.00: To-night's programme will consist of a popula

10.0: News supplied by the Metropolitan Dailies. Weather Information. Melbourne Town Hall.

7ZL
Tasmanian Broadcasters Pty., Burnie Building, Elizabeth St., Hobart (Wavelength, 315 Metres)

11.30: Broadcast. 11.45: Midlands weather forecast.

12.00: "nila's" Novelty Session. 12.30: "nila's" Novelty Session.

1.00: "nila's" Novelty Session. 1.30: "nila's" Novelty Session.

2.00: "nila's" Novelty Session. 2.30: "nila's" Novelty Session.

3.00: "nila's" Novelty Session. 3.30: "nila's" Novelty Session.

4.00: "nila's" Novelty Session. 4.30: "nila's" Novelty Session.

5.00: "nila's" Novelty Session. 5.30: "nila's" Novelty Session.

6.00: "nila's" Novelty Session. 6.30: "nila's" Novelty Session.

7.00: "nila's" Novelty Session. 7.30: "nila's" Novelty Session.

8.00: "nila's" Novelty Session. 8.30: "nila's" Novelty Session.

9.00: "nila's" Novelty Session. 9.30: "nila's" Novelty Session.

10.00: "nila's" Novelty Session. 10.30: "nila's" Novelty Session.

11.00: "nila's" Novelty Session. 11.30: "nila's" Novelty Session.

12.00: "nila's" Novelty Session. 12.30: "nila's" Novelty Session.

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2.00: "nila's" Novelty Session. 2.30: "nila's" Novelty Session.

3.00: "nila's" Novelty Session. 3.30: "nila's" Novelty Session.

4.00: "nila's" Novelty Session. 4.30: "nila's" Novelty Session.

5.00: "nila's" Novelty Session. 5.30: "nila's" Novelty Session.

6.00: "nila's" Novelty Session. 6.30: "nila's" Novelty Session.

7.00: "nila's" Novelty Session. 7.30: "nila's" Novelty Session.

8.00: "nila's" Novelty Session. 8.30: "nila's" Novelty Session.
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The famous "Balkite" Charger and "Balkite" "B"
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<td>POWER RHEOSTATS, 2 OHMS (suitable for A.C.).</td>
<td>SWITCH-ARMS FOR CRYSTAL SETS.</td>
</tr>
<tr>
<td>ROTARY CHANGE-OVER SWITCHES (with Studs).</td>
<td>PUSH-PULL FILAMENT SWITCHES.</td>
</tr>
<tr>
<td>PANEL MOUNTING D.P.D.T. SWITCHES.</td>
<td>HONEYCOMB COIL PLUGS, per pair</td>
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</table>

All at Sixpence. Please add Postage

Let us give you an estimate for that old loud speaker. We will probably allow £1 as a trade-in on a Brandes’ Ellipticon or De Forest Andalion, Modern Cone Speakers, which we are selling at the remarkable price—

No Other Firm Has Ever Made An Offer Like This. [59].

(Less the Trade-in Value of Your Old Speaker.)

EVERYTHING FOR RADIO.

“THE WIRELESS SHOP”

Miss F. V. Wallace, 6 Royal Arcade, Sydney,
THE OLDEST RADIO FIRM IN TOWN

Money Back Guarantee

Established 8 Years.
‘Phone, MA 5543.
Two Doors from George Street, opp. Q.V. Markets.

RADIO
A. B. & C.
BATTERIES

Because more electrical energy is packed into BOND Batteries, they contain more power. Their exceptional recuperative qualities during rest periods restore that electrical energy—and make BOND Batteries Cost less per Radio Hour

3071—45 volts B Upright, extra large cells
3061—45 " B Upright, large cells
3045—45 " B Flat, large cells
5152—221 " B Flat
312—41 " C

For clear, steady volume; for even, uniform reception month in and month out; for enjoyable, less costly radio hours—demand BOND Batteries!

THERE’S A BOND BATTERY FOR EVERY BATTERY NEED

General Australasian Agents:
ATKINS, MACLEAN, Ltd., 119 York Street, Sydney;
BOND ELECTRIC CORPORATION, Jersey City, N.J., U.S.A.

OBTAINABLE AT ALL DEALERS
Changing Over to All-Electric

E.G. (Epina): "Please tell me how to make all receiver electric. At present I am using dry batteries throughout, with 20VA lamps in all stages except the last, where I have a power valve."

Answer: It will be necessary to change all valves but the last. The A.C. type valve should be used. Firstly, remove all soak resistors but the last and disconnect all filament wiring. Place A.C. sockets in place of those removed, and connect grid and plate terminals up as usual. Next connect the cathode terminal of each A.C. type valve socket to the grid returns of each circuit (as would be done if all filament voltages were used). The filaments are then wired up with twin leads, and these leads are taken to the filament terminals. Suitable supply may be a straight-out power pack or a "B" and "C" eliminator and filament transformer. The negative half of the wire 15os., and the weight of the core 2.51bn.

J. W. D. (Miltiad): "I tried to calculate the capacity of some variable condensers. I have a hand book which gives a capacity of 2hr. After trying for an hour or so, I worked out that the "E" condenser gives 1 hr., the "C" does not exceed 1 hr., and a "G" equals AK in "Proving Radio," which means 0.1 hr. I assume each of the above formulas is correct?"

Answer: Both formulas are correct, but there may be an error in the calculation. The method used in "Proving Radio" gives its values in "Jars." The approximate time of receiving this station etc. could give me the correct for this correct?"

INQUIRER (Lainpte): I received a station on a wavelength between that of T.V.A. (San Francisco) and W.K. (Sydney). This could have been an announcement made. This is the approximate time of receiving this station. Could you give me a site for the identity of this station?"

Answer: Possibly COOK (China), on 75 metres."

GENERAL: Can any reader please supply a copy of WIRELESS WEEKLY containing the Schnell Three Valve."

M.G.D. (Fire Due): We have a few copies left, and stand ready for purchase."

F.M. (Exhibitor): I still wish to use General Purpose valves but the A.C. type valve will be wired up to secondary of filament transformer. The approximateresistance of this choke will be 1270 ohms, the weight of the core 2.51bn.

C.P.A. (Boorowa): Does not harm set. We do not have for 3d per copy plus postage."

K.C. (Suttonville): Use aluminium cups which allow about 1/6 inch distance all round."

J.S. (Waterlife): Plates of reaction condenser must be stratified or condenser replaced."

CRIMES (Perth): This is an amateur experiment station in Wellington."

JAMBOREE (No address): No volume will not be forwarded. It will be necessary to alter filament bulbs if these are used."

S.J.T. (Waterlife): Plates of reaction condenser must be stratified or condenser replaced."

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I.K.McK (Parlessaugb): The present receiver uses three stages of audio, and is intended for WIRELESS WEEKLY for March 30, 1929 (Vol 12, No. 14) to the present date, which at your request may be sent by post.

L.E. (Manoe Pando): Copies cannot be forwarded unless your cost and postage is enclosed, or unless you are a subscriber. Letter has been forwarded to L.E."

W.G.C. (Manoos): O.K. See below."

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Radio Cabinets

A.J.B. (Newcastle).—Your article by R.W.M. on "Radiotelegraphy" was very interesting and no doubt will be useful to readers. There is a class of interference, however, that R.W.M. might well to take up, and publish an article on. I refer to interference caused by the carrier wave system (A.R.R.L.). This causes great interference in some areas, for instance, in Railway Stations, etc., where the main street lies in which the post office is situated. Dealers have even removed the premises from this block. Very little seems to be known of this class of interference, and any self-respecting engineers whom I have spoken to say it would be impossible to eliminate it. Any help you could give would be of great benefit to readers.

Answer: The interference is really nothing more than a modulated continuous wave, and is based on such a radio receiver. At the point where the signal is received, and after the signal has been amplified, the result is a modulated wave, which contains the original audio signal. This modulated wave then travels through the air and arrives at the receiver, where it is demodulated and the original audio signal is recovered.

G.L.D. (Brisbane).—Would you please give me through your Technical Information Service full constructive details of any apparatus "you may have on hand." These columns are reserved for answers to queries, but technical articles are invited. Your past several articles in which you dealt with "Proving Radio" in which the matter is given detailed treatment would be appreciated by many. So far as I can see, however, you have devoted articles on this subject. If you had requested particular patent numbers, I might have been able to supply any number for three years back. Readers can have same by paying 6d. postage.

J.C. (Newcastle).—This cannot be done. Readings taken from the grid may be used to draw an approximating curve on chart paper.

C.H. (Anna Bay).—Hard to say, but in the vicinity of two months.

Troubled (Manly).—Valves may have lost their emission or transformer may be faulty. R.T. (Orange).—We do not reply to inquiries by post. You were advised to fit a portable set. No portable set will give you Brisbane, Sydney, and Melbourne, etc., in daylight, and few stations will ever get them at night. The set would handle better if it had a bell of 0.5 stages. You also stated you should purchase an "all-electrical" or battery-operated receiver. Adding that you were a traveller, and desire to use your set at various places. With an all-electrical receiver it is possible to obtain complete interference free sets at all hours of the day and night, and those will not always be available, therefore your set should be battery operated. E.R. (Adelaide).—Rheostat may be used. Connect the rheostat in series. Do not connect the rheostat. C.A. (Dubbo).—Correct in principle. Use an ordinary ammeter where necessary. I.E.M. (Yalgoo).—Do not advise the change. You will pick up even more interference using an outdoor aerial in place of the loop. Remove it to your nearest telephone and do not answer the article on interference elimination recently.

Fuzzed (Taree).—In spite of what you say, we are satisfied that the A battery is the cause of the trouble. After the next charge wait for two or three days, then when the set starts to "fuzz", connect the set to a 220 volt, 100 watt bulb, and the B battery to the filament. Put this on for about 10 minutes, and then resupply any number for three years back. Readers can have same by paying 6d. postage.

E.A.T. (Arta Park).—This was KGO. They were working on 3150 kilocycles, and were also on short waves. You are getting waves where you should not.

T.J. (Rose Bay).—Aerial about 100 foot long, including lead-in. J.C.M. (St. John's Park).—Either make suitable. R.W.M. (Sydney).—Mr. J. G. K. (Roseville).—If you are using a radio receiver, the frequency of the carrier wave will vary with the amplitude of the carrier wave. The set will hardly be worthwhile unless an expert is operating it.

G.H.R. (Sydney).—It may be possible, however, to publish medical articles. These columns are reserved for answers to queries and will not read the same. Some comments will be made on the difference in heard signals of the two stations. G.H.R. (Sydney).—Some comments will be made. These columns are reserved for answers to queries and will not read the same. Some comments will be made on the difference in heard signals of the two stations.

J.G. (Lakeside).—A portable set would be required, and how and what we go about building an I.F. stage to add to my set is urgent.

Answer: An article appears in this issue that will clear your misunderstanding.

J.T. (Rose Bay).—Aerial about 100 foot long, including lead-in.

W.W. (Wollongong).—Use sponge rubber ear-pads. Such ear-pads are obtainable from most radio dealers, and are in a suitable size for an all-electrical receiver with an I.F. stage or stages, and three in a few phonographs.

C.M. (Newcastle).—Do not advise the change. R.W.M. (Sydney).—If you have a portable set, and have difficulty in obtaining a good signal, you will be doing a great deal of good for your country. J.A.H. (Five Dock).—Consider 0K. Yes, good news.

C.M. (Newcastle).—Try O'Reilly Moore, Economic Radio Stores, and Wallace's radio room. We do not reply to queries by post. P.G. (Queensland).—Agent for Parnell batteries is Royal Kingston.

J.C.M. (St. John's Park).—Either make suitable. R.W.M. (Sydney).—No, but a permit to use certain patents must be held.

License (Greenbank).—No, this cannot be done. It is not licensed several years back, but proved to a lie. N.C. (St. George).—If you have difficulty in obtaining a signal, you will be doing a great deal of good for your country. J.A.H. (Five Dock).—Consider 0K. Yes, good news.

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Look for this Seal.

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J. B. CHANDLER & CO.,
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BRISBANE.
The Power Transformer you should use

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Transformers

A last stage power transformer is now offered at a price within the reach of all. Carefully designed and manufactured to the highest degree of electrical and engineering efficiency, Monarch Transformers present the last word in Audio Frequency Amplification.

The illustration shows the actual size, whilst the weight is more than twice that of ordinary transformers.

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