

Complete Broadcast Programmes a Week in Advance

Wireless Weekly 3^d

INCORPORATING "RADIO IN AUSTRALIA & NEW ZEALAND"

VOL. 14. NO. 6.

FRIDAY, AUGUST 2, 1929

(Registered at the G.P.O., Sydney, for transmission by post as a newspaper.)

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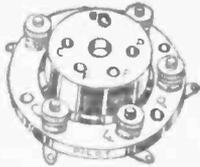
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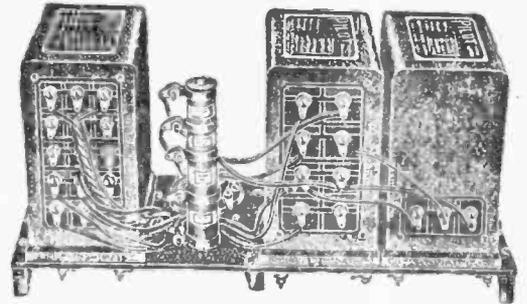
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The GRAMAPHONE GRADUATES

(By EWART CHAPPLE)

The extraordinary improvement in the gramophone is well illustrated by the two models pictured here. The old fashioned horn type of a decade ago is contrasted with the modern all electric model, complete with self changing record device.

NOT so many years ago the gramophone was considered to be a toy, and very often a nuisance, especially by many good musicians, for it was a very poor medium of artistic reproduction. All recordings were made through a horn immediately on to the wax, and there was thus a mighty sacrifice of clarity. Sometimes you could hardly tell what instruments were playing, or distinguish low notes and high notes, so that you missed a great deal of many performances. Relatively few instruments recorded well. The pianoforte and the organ, to say nothing of symphony orchestras, gave one horrible pains which were not so easily forgotten.

But with the advent of electric recording musicians began to sit up and take notice. The voice and the violin were reproduced better than ever before; while organ recordings, taken from some of the more famous organs—Kingsway Hall, London, St. Margaret's, Westminster, Liverpool Cathedral, and the Lyons Cathedral, to mention only a few—became almost perfect. This is because electric recording made it possible to place microphones at different parts of the halls in which performances were given, to regulate the volume of sound recorded, and to guard against blurring and other defects.

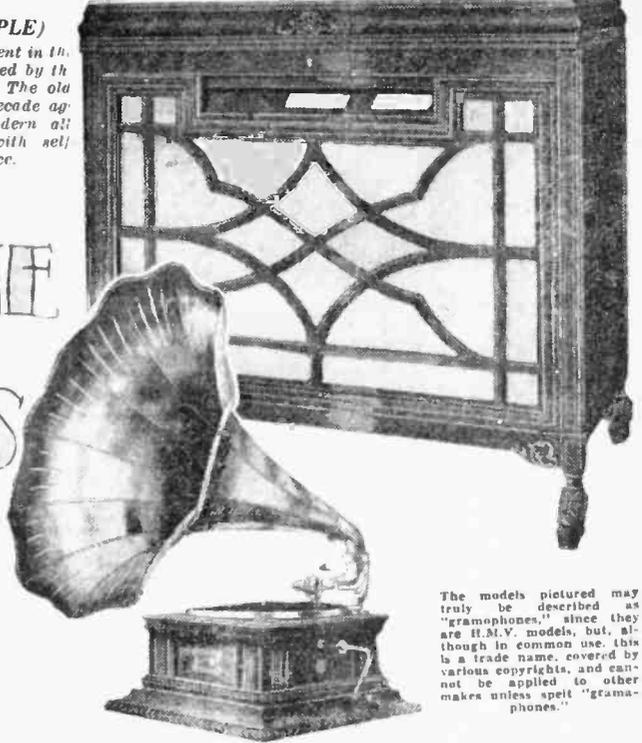
In the same way, with the pianoforte—always an awkward recording instrument—the microphone has done wonders. Latest advice from America has it that during Levitzki's recording of "La Campanella" six microphones were used. These were placed along the front of the piano, so that the whole range of notes from high to low was covered. Each microphone had its separate control, and, if necessary, adjustments could be made of the different pitches to get the correct effect on the finished record. Then a tent was built round the piano. Levitzki went in; the flap was closed—and Levitzki played "La Campanella." The idea of the tent was to prevent echoes reaching the microphones. It is said that this record of Levitzki's is the greatest pianoforte record yet made.

For the same reason, that electric recording makes it possible to control the volumes of sound coming through the microphones, and to bring in the sound from several parts of an auditorium; the symphony orchestra record is now a really marvellous

production. Before, orchestras were limited in number, and placed very carefully to get the maximum of effect then available; but now the performances of full symphony orchestras can be recorded with scarcely

any change in the grouping, and so clear, that one might imagine oneself in the very hall from which they are playing.

For illustration, I have only to cite the Philadelphia Symphony Orchestra's amazing recording of Bach's Toccata and Fugue, one of the nearest perfect reproductions of a fine performance I have yet heard. The whole fabric of this composition seems to weave itself in mistral; and it is as though we bring not only the orchestra, but the hall itself, a space of unlimited dimensions, a warp of infinite silence for a weft of finite music, into our homes. The Philadelphia Symphony Orchestra is undoubtedly the greatest orchestra yet recorded for the gramophone. Others of its performances are Scheherazade, a Symphonic Suite, and the Brahms Symphony in C minor. The Chicago Symphony Orchestra plays more popular numbers, among them being the "Flight of a Bumble Bee," by Rimsky Korsakov; and the Detroit Symphony Orchestra's recording of Chabrier's "Spant-Rhapsody" is also very fine. On the Continent, Columbia has a travelling recording set, and has recorded such great combinations as the Milan Symphony Orchestra, the Madrid Symphony Orchestra—the Spaniard, Arbos, conducting his own compositions; the Lucerne Symphony Orchestra, Basle Symphony Orchestra, the Parisien Orchestre Symphonique, the Garde Republicain Band, and the Vienna State Opera Orchestra and Choir. Records of the Bayreuth Wagner Festival:



The models pictured may truly be described as "gramophones," since they are H.M.V. models, but, although in common use, this is a trade name, covered by various copyrights, and cannot be applied to other makes unless spelt "gramaphones."

are of the highest quality, and it is interesting to notice that all these records were made while the operas were in progress. Many operas are now recorded, and full sets are for sale; and these are mostly very fine recordings of fine performances. The "Prologue" to "Pagliacci," as sung by Tibbett, is an outstanding example of what opera recordings can be.

And then, gramophone recordings have a definite educational value. There are recorded lectures on musical instruments; lectures on the languages; the speeches of great men and women—the King, the Queen, the Prince of Wales, Presidents Roosevelt, Harding, and Woodrow Wilson, Count Leo Tolstol, Bernard Shaw, Ellen Terry ("Merchant of Venice") and Venezuelan. Among the curiosities are a recording of Grieg, the composer, playing his own "To the Spring" in 1903; and one of Joachim, the violinist, made in 1907. One of my own curiosities is a record of a gas shell bombardment, made during the war.

So much for modern recordings. Their complement is modern reproduction. The old horn speaker is vanished, and the newest of reproducers, the electric pick-up coupled with the dynamic speaker, has almost eliminated surface noise, and made possible reproduction of such fullness, clarity, and exactitude as was never possible with the acoustic sound box; so that one may say, with greater surety than



BETWEEN YOU and ME and the MICROPHONE



Sorry, dear readers. We forgot ourself for a moment. But what do you think of an Editor who—anyhow, that's all over now. We went down to 2BL on the Saturday night before the Sunday on which they closed down under the old company. A glorious evening. Basil Kirke, Jack Barnett, Vern Barnett, Captain Stevens, Ray Allsop, Eric Bessemer, all the old brigade, in fact; and Miss Bassham, who has always operated the switch; and Miss Kathleen Roe, who plays the piano; and Dulcie Blair, and Nea Hallett—everyone was there; and they acted in a rotten sort of sketch, and sang old long swine. Very touching. Mr. Ray Allsop wasn't there to

We Grind Our Little Chopper

THE Poet's Eye, in a fine frenzy rolling, glances from Heaven to Earth, and vice versa; and, as the Imagination bodies forth the forms of Things Unknown the Poet's pen turns them to Shapes, and gives a Local Habitation and a Name to Airy Nothing. Yes, indeed! And after all that the Editor FORGETS TO PRINT IT!

There's no getting out of it, Mr. Editor. You said you'd like a bit of verse for the next issue. We said "Good-oh; will ten or twenty lines meet the case?" You said, "Make it twenty-five"—you had just enough room for twenty-five. So we went out on the Tuesday night 2FC closed down under the N.S.W. Broadcasting Co. and we listened to Mr. Wright making his farewell speech; and we went home, and at midnight we sat down and wrote that beautiful poem, "The Pioneers." Then we brought it in to you, and you looked at it and said "We'd better change a line here and there," and we changed them, and you said "Right!" You said, "Well, I suppose we MUST print some verse this week." And then you forgot to put it in!

The fact is, Mr. Editor, this is a very serious matter. We have our artistic conscience to consider. We do not write for filthy lucre, but because our muse—our inspiration directs our pen. You didn't know this, of course; but now you do know, you'd better NOT forget it in the future. You saved WIRELESS WEEKLY from very serious consequences only by promising to put our poem in this week.

(THE POEM.)
THE PIONEERS

"These things will pass," said Mr. Wright.
"The Pioneers go out to-night,
Yet have no fears,
We'll shed no tears—
But don't forget the Pioneers!"

The Reverend Canon Howard Lee
Said: "This is very sad to see!
Well, well, me dears,
The parting tears—
We won't forget the Pioneers!"

"As Shakespeare said," said Brunton Gibb
(And then he quoted, very glibly,
"A sad sigh bleats,
The Artists' ears
We won't forget the Pioneers!"

We sighed a horribly sorrowful sigh,
And wiped the teardrop from our eye,
And said "Three cheers!
Throughout the years,
We won't forget the Pioneers!"

So then we wrote this lovely poem,
Which shall be read in every home,
That he who hears
What here appears
May ne'er forget the Pioneers.

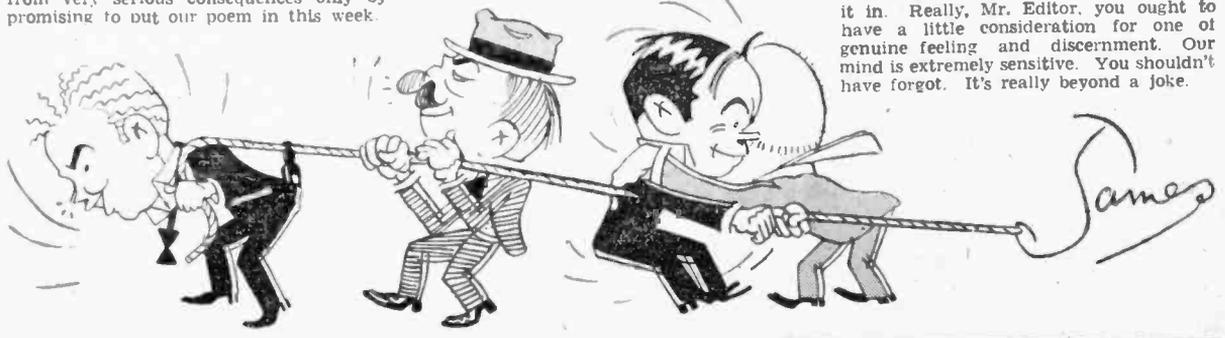
act in the sketch, so Mr. Norman Hamilton, a very charming friend of Mr. Vern Barnett and everyone else, contrived to imitate his voice so that you'd hardly know the difference.

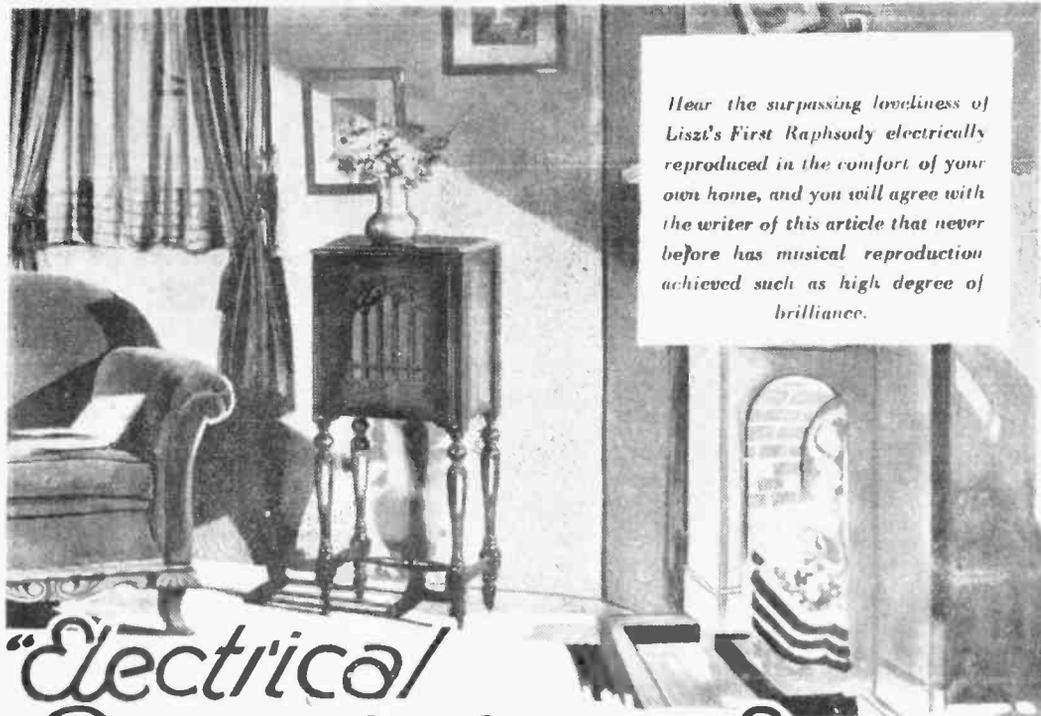
After the night's business had been concluded there was a little impromptu party. Mr. Ray Allsop had brought along several bottles of ginger beer (?—Ed.); and Captain Stevens thoughtfully provided some lemonade (?—Ed.). Mr. Allsop made a nice little speech about two Irishmen—good old Ray Allsop; we shan't see him any more at 2BL. He was THE oldest member of the staff and THE man behind the guns. Then Mr. Kirke made a speech

about two Fijians, which was loudly applauded. Captain Stevens gave a short but snappy address about two Englishmen; and Mr. Vern Barnett capped it all with a lecture on two Frenchmen. There were other speeches. Somewhere about half-past eleven leading members of the staff gave voluntary exhibitions of Old English folk dances, in which everyone joined. When Romano's Orchestra began there was also a little dancing in the modern style; but it was all very restrained and dignified. At twelve someone noticed traces of moisture on the floor and the cause of this was ultimately ascertained to be a fire extinguisher which had dropped from its socket. Just one of these unaccountable coincidences that WILL happen. At twelve-thirty Captain Stevens was getting everyone's signature on the back of an old mandolin, the belly of which, by some strange circumstance, had been removed. Last time the Captain was seen that night he was walking down Bligh Street, walking-stick in one hand, mandolin under the other arm, waving good-bye.

Somehow or other, everyone arrived home safely.

But imagine our Editor forgetting our poem! We hope he won't forget next week. He'd better not. We have written an Epic Poem to celebrate the beginning of the New Era in Broadcasting. It is called "Radiona's Banquet," and will include all the names of all the people prominently associated with the new company in New South Wales. Read it, next week. That is, if our Editor doesn't forget to put it in. Really, Mr. Editor, you ought to have a little consideration for one of genuine feeling and discernment. Our mind is extremely sensitive. You shouldn't have forgot. It's really beyond a joke.





Hear the surpassing loveliness of Liszt's First Rhapsody electrically reproduced in the comfort of your own home, and you will agree with the writer of this article that never before has musical reproduction achieved such a high degree of brilliance.

"Electrical Reproduction is Supreme!"

THE purpose of the following lines is to try and lay before the reader the immense advantages to be obtained from the electrical reproduction of gramophone records as distinct from ordinary sound-box, or acoustic, reproduction. This is in no sense a technical article, but merely an effort on my part to convince the reader of the utter superiority of the electric method over the old.

Perhaps it will be necessary to point out the elementary fact that in the new system a magnetic device, called a "pick-up," is substituted for the usual gramophone sound box, and operating with a needle as usual. However, that is all they have in common, the pick-up differing from the sound-box in that the musical vibrations on the record are taken up and magnified through radio valves and then reproduced on a loud-speaker. The improvement in quality is simply staggering richness of tone being the outstanding feature, besides which immense volume can be used—and, what is more important, enjoyed.

Really large volume on any gramophone, no matter how good, is at best rather a painful matter to listen to, stridency, inseparable from their construction, being the drawback. This latter point cannot be stressed too much, because it proves the quality of electric reproduction, and this ability to use large volume enables us to capture that sense of realism, alas, all too often lacking. I can already see the owner of some fifty to seventy pound gramophone equipped with the last word in exponential horns, smiling in a superior way at what he considers my ravings.

Never mind, rest assured I have been

By G. A. THOMSON

Through the mill, my experience of gramophones covers some twenty years, and is completely au fait with modern practice, including much specialised gear for gramophone connoisseurs that never finds its way out to Australasia. Moreover, having not the faintest connection with the trade, I have no axe to grind, and can consequently afford to pick the eyes out of what is to be had.

Modern gramophones are good—very, very good indeed, and one has only to compare an up-to-date exponential horn type with the short, shallow kind in use up to about four years ago to realise the immense strides made in improved tone. Even the high-class modern portable runs rings around the best of the heavy artillery of four years ago. That can be demonstrated easily, and it can be just as easily demonstrated by direct comparison that a reasonably decent amplifier will give results far superior to any commercial gramophone.

A really high-class amplifier in conjunction with a moving coil speaker need not cost more than seventy pounds at the outside, speaker included, and its performance will be such as to make comparison with the gramophone quite futile. In fact, I will say that this result can be achieved with a plain, good magnetic cone speaker even, but the moving coil is, in my opinion, the Rolls Royce of speakers, and is to be preferred for its almost living breathing realism, and is well worth the extra money. By the way, the well-known Magnavox moving coil speaker has been recently reduced to such a low figure that the worst bogey, high price, has been at last removed.

My first introduction to electric reproduction was in 1926, when I first heard the Brunswick Panatrope, and I will never forget the thrill; there was something different, compelling, gripping, and I stood entranced. Needless to say, the crowd around me in

Messrs. Davis and Co. kept swelling, and stayed as long as records were being played—and crowds don't do that unless it's something good. It's always the same with electric reproducers; they draw the people, where the ordinary gramophone only excites perfunctory interest. Well, I went home green with envy and couldn't forget the throb of that Panatrope for days—much as I loved my H.M.V. machine. I had realised after a few seconds' listening to the Panatrope that the death-

knell of the ordinary gramophone had been sounded.

Of course, the price of the Panatrope was then extremely high as compared with a gramophone, and as it was the machine which blazed the trail for electric reproducers out here, it commanded its price. However, several years have passed since then, and radio gear has reached a high state of perfection

combined with lower prices, so it is in anybody's power to build a fine amplifier for quite a reasonable figure.

A word of warning must be sounded—I am speaking of just a good amplifier, not necessarily a super one, but make no mistake. It must be good, likewise the speaker. Otherwise, stick to your up-to-date gramophone; you will enjoy it far better than listening to a bad distorted amplifier.

For the enthusiast, however, a good amplifier makes him possessed of a golden key, and as he goes through his records, known so well, one by one, he will realise, unless he is quite lone deaf, that he has never truly heard them before. Some records are recorded rather too lightly—presto!—turn up the wick and make it as loud as is pleasant for your ears. Or turn it down almost to an inaudible whisper late at night, the vibrant, rich tone



On the other hand, the loud forte passages are also heard without a trace of distortion.



With electrical reproduction the softest double piano passages are heard clearly and delightfully.

still remains, whereas the same liberties taken with a gramophone by closing the exit of the horn merely make it reedy, thin, and strangled, all quality being lost.

Of course, no rose is without its thorn, and electrical reproduction is far from sheer perfection, but I do maintain that it is miles and miles nearer to it than ever the air column method can give us. The diehards say the bass is accentuated unduly sometimes; it does seem rather prominent, but even that is a moot point—rather, I think, it is that we are not used to hearing it reproduced from the record properly in gramophones because the sound-box is physically unable to respond to the very low frequencies.



This is the treble clef against whom much has been said when using a dynamic speaker, but the listener should rest assured that the high notes come through with the same clarity and power as the low notes.

It's quite certain that far more goes into a record than is ever extracted from it by acoustic means, and, after all, to get back to this question of bass, if it is a fault at all it is a good one. What is a more serious fault however, and one calling for careful amplifier assembling, is a tendency for the higher frequencies to go west, particularly with moving coil speakers. This is a fault more of the past, however, and the latest productions should leave little to cavil at. Anyhow, taking an all-round view of electrical reproduction, it leaves the old system stone cold, level what criticisms you like at it.

Concrete proof of this was shown a few nights ago when I was playing Columbia's record of Liszt's First Rhapsody (Budapest Philharmonic Orchestra) a record of surpassing loveliness. This record is transformed by electric reproduction, and during a particularly rich passage I switched off the pick-up and simultaneously played it over with the sound-box, ordinary gramophone style. Heavens!—the result was really ludicrous by comparison; one moment there was a symphony orchestra in the room, sonorous and vibrant, next it sounded like a penny whistle somewhere down the street, and this, mind you, was a first-class gramophone, no cheap

trash. Mr. Hull was a most interested listener, and derived much amusement from the experiment!

Need I say more? This was the acid test of direct comparison, and the amplifier dwarfed it almost unbelievably. So colossal was the tonal improvement and grandeur that when you start to think of the outrageous prices charged for some good gramophones which at best are only wooden cases, horn and sound-box, and realise what an amount of first-class radio gear can be purchased for the same sum, it seems quite obvious that you are getting far, far more for your money in the latter case than in the former.

Electric reproduction is SUPREME. Study the matter, purchase quality parts, and it won't fail you.

Suitable Recordings for Electric Reproduction

Supplied by Ewart Chapple

Tocatta and Fugue (Bach), Philadelphia Symphony Orchestra (H.M.V.).

Nutcracker Suite (Tchaikovsky), Philadelphia Symphony Orchestra (H.M.V.).

Scheherazade, Symphonic Suite, Rimsky Korsakov, Philadelphia Symphony Orchestra (H.M.V.).

Grieg Concerto, Arthur de Greef, pianoforte, with the Royal Albert Hall Orchestra (H.M.V.).

Kreutzer Sonata (Beethoven), Iside Menges-volin, Arthur de Greef pianoforte (H.M.V.).

Trio in B Flat (Schubert), Trio in G Major (Haydn), Trio in D Minor (Mendelssohn) Casals—Thebaud—Cortot (H.M.V.).

Symphony in D Minor (Caesar Franck), Philadelphia Symphony Orchestra (H.M.V.).

Brabus Concerto, Kreisler, with the Berlin State Orchestra (H.M.V.).

Enigma Variations (Elgar), Sir Edward Elgar conducting the Royal Albert Hall Symphony Orchestra (H.M.V.). Also the recordings of the Flonzaley Quartette, and of the Elman Quartette.

Concerto for Two Violins (Bach) (Col.). Septet (Saint-Saens) (Col.).

Preludes and Fugues (Bach), played by Harriet Cohen (Col.).

"The Three-Cornered Hat" Suite (de Falla), Madrid Symphony Orchestra (Col.).

Carnival of Animals (Saint-Saens), Paris Symphony Orchestra (Col.).

Bayreuth Recordings: "Tristan and Isolde," the complete opera. Selections from the "Valkyrie." Overtures: "Tannhauser," "Parsifal," "Rheingold," etc. (Col.).

"L'Apprenti Sorcier," Scherzo (Dukas), Paris Conservatoire Orchestra (Col.).

Mengelburg, conducting his Concertgebouw Orchestra, Amsterdam (Col.). Lener String Quartette (Col.).

Recordings of Ignaz Friedman, Percy Grainger (Col.).

VOCAL RECORDINGS.

H.M.V. recordings by Galli Curci, Giannini, Dal Monte, Essie Ackland, Browning Mummery, John Brownlee, Evelyn Scotney. Chorus: Canterbury Cathedral, Temple Church, Chorus of British National Opera Company, H.M. Chapels Royal Chorus, Leeds, Festival Chorus, La Scala (Milan) Chorus.

Columbia recordings by Francesco Merli, Aorangi Lombardi, Alfred O'Shea, Charles Hackett, Elsa Aisen, Borgioli, Georges Thill de Lelio, Klip's. Schubert songs sung by Elena Gerhardt (world's greatest lieder singer), Don Cossacks Chorus.

LIGHTER MUSIC. All Gilbert and Sullivan electrical recordings: The Fireside Minstrels, Nursery Rhymes, in special arrangements, Music Comedy records—"Rio Rita," "Lilac Time," "Desert Song," "Merry Widow," "Show Boat," etc.

Syncopated Novelties (H.M.V.): "The Selfish Giant," "Rhapsody in Blue" (Gershwin), Paul Whiteman; "I Kiss Your Hand, Madam," from "The Five O'Clock Girl," "Metropolis" (Grove), Paul Whiteman, "Round the World Medley," Savoy Orpheans.

DANCE NUMBERS. "Wedding of the Painted Doll" (H.M.V.), "Broadway Melody" (Brunswick), "Deep River" (H.M.V.), "The Stop Trot" (Col.), "My Man" (H.M.V.), "The Sun is at My Window" (Col.), "Glad Rag Doll" (H.M.V.), "Vaniteaser" (Col.), "Jumping Jack" (novelty, piano and orchestra) (H.M.V.).

A BAN ON BEETHOVEN and CHOPIN

MADAME SONYA MICHELL, the well-known pianiste now visiting Australia who will broadcast piano numbers from the studio of 2FC on August 5, has original opinions concerning the place which some of the great classical composers should occupy in concert programmes.

"I am thoroughly convinced," she says "that all musicians should agree, in the interest of both artists and audiences, to omit from their programmes for at least two years all compositions of Beethoven, and probably of Chopin as well. The world, including all musicians who are not too timid to admit the fact, is fed up with Beethoven. Beethoven has become a fetish, before which musicians have prostrated themselves so long that they have even lost the faculty of bringing out such beauty as exists in his compositions. When I was studying in Vienna I had to play at least one sonata of Beethoven and from two to ten etudes of Chopin every day. Is not that enough to destroy the beauty in anything? I have known five different musicians within five days to include the 'Appassionata' Sonata of Beethoven in concert programmes in New York City—and this sort of thing happens everywhere. Only superstitious and unreasoning hero-worship can account

for the unceasing riding of certain aged 'war-horses.' I have heard all the symphonies, the sonatas, the quartets, the trios of Beethoven from one to ten times every year since I can remember. They are so overdone as to become positively revolting!

"Imagine how refreshing it would be," continued Madame Michell, "if we could all go for two years without having to listen to one of these venerables. Then, after a holiday we could listen to them with pleasure, and discover new beauties which are now hidden by constant, often meaningless, repetition. Eager crowds would attend the playing of a Beethoven programme—but now empty chairs and plenty of yawns are much in evidence. The Metropolitan Opera omitted 'Carmen' from its repertoire for four or five years when it was revived there was a rush for seats, and a queue stood for hours along Broadway before each performance.

"Why should we be so asleep? Some people have simply got the Beethoven habit, as others have the opium habit. It prevents them from hearing the wonderful new harmonies of which the air is full. A great modern school of composers is at work to-day. Some of them will outlive Beethoven. Why should we cram Beethoven down the throats of our students when we can give them Stravinsky, Prokofiev, Schonberg, and Ravel? It is like teaching a modern soldier to shoot with a crossbow. The world must be

aroused to the beauties of the new compositions, to the great works of to-day. I am amazed to find that my friend Ildebrando Pizzetti is practically unknown, and certainly unheard, in Australia. Yet he has composed a great Requiem Mass, which was commissioned by the King of Italy for performance at the Pantheon, in Rome, a violin sonata which is recognised as being the equal of that by Cesar Franck, a cello sonata which is admitted to be one of the finest compositions in the world for that instrument, and five operas, all of which have been presented at La Scala, Milan under Toscanini. Two of his operas have been performed at the Metropolitan Opera, New York, this season.

"People look at me in amazement when I tell them that I hear with keen enjoyment and admiration such compositions as Honegger's 'Pacific 231,' Varese's 'Ameriques,' and Stravinski's 'Sacre de Printemps.' And I play all the moderns I can lay my hands on—I love them!"



MADAME SONYA MITCHELL.

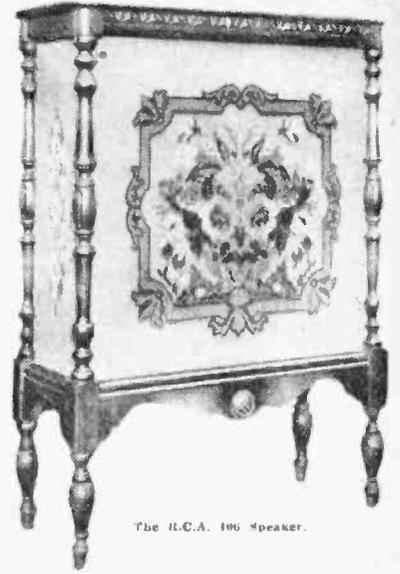
the noted pianist, who advocates two years' holiday from the works of the most popular of the famous composers.

The Coil-Driven ELECTRO-DYNAMIC Speaker

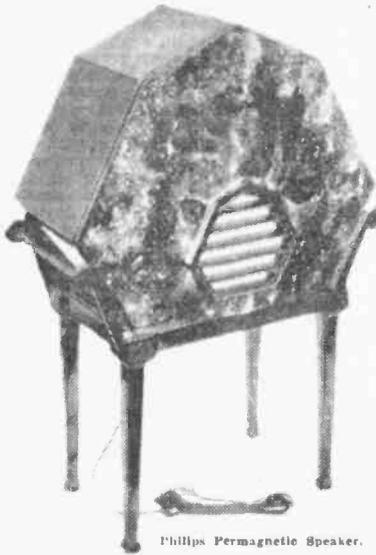
By T. P. WATSON

It is rather unfortunate that the stock of superlatives has been exhausted in describing the minor developments of the last few years. So many "new," "extraordinary," and "revolutionary" gadgets have appeared that listeners have become somewhat immune to the terms with which they were described. The trouble is that, now that we have something truly revolutionary to talk about, we are stuck for words.

The moving-coil speaker is that thing. Our aim is to explain just what it is, and what it does, and to endeavor to impress the reader with the fact that it is not just another of those "marvellous" gadgets—that it is a sound development, responsible for more definite recent progress in musical reproduction than any other factor.



The R.C.A. 100 Speaker.



Philips Permagentic Speaker.

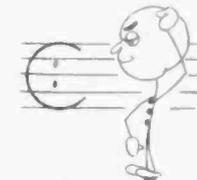
The vibrations are set up by a small metal diaphragm, usually clamped at the edges. Only the centre position can move, and this movement is impeded by the natural resilience of the metal. The diaphragm could vibrate quite well at all frequencies which did not require any great movement, but on the low notes it is quite useless. Sound, of course, is heard when a low note is being played, but the sound only represents the harmonic of the note proper. Lastly, the diaphragm, being of metal, had a natural period of vibration of its own, and this, coupled with the usual resonance of the horn, introduces exaggerated effects on certain notes of the register.

To overcome the resonance effect of the horn the cone speaker was devised, and this in effect, is a means of vibrating the air in a room directly instead of a small column of air, as in the former case. The average cone gives a truer and more lifelike reproduction than the early horn type, and as the diaphragm is of considerably greater size it reproduces the low notes somewhat better.

In the average cone speaker a small coil is surrounded by a permanent magnet, and through its centre passes an armature terminating between two poles. The apex of the paper cone is joined to the top of this armature by a fine rod. Varying currents passing through the coil disturb the magnetic field and cause the armature or reed to vibrate; this, in turn, actuating the cone from its centre.

The earlier types of cone were clamped securely around the outer edge, and, as in the case of the telephone, complete freedom of movement was impossible. Only the centre-part of the cone could be vibrated, and thus the requirements for bass reproduction were still missing. Next came the free edge cone, which was a distinct improvement. The cone edge was attached to the supporting ring by means of soft leather, which allowed the whole of the cone to vibrate backwards and forwards.

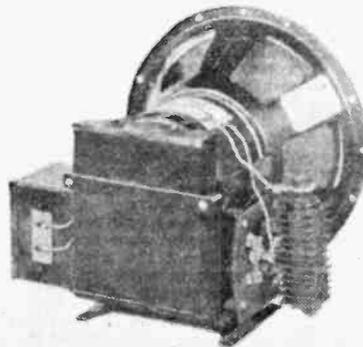
Limitations, however, were still evident. In order to make the speaker sensitive the pole pieces had to be placed very close together, allowing very small clearance for the armature. In most cases this clearance is no more than one thirty-second of an inch, meaning that the armature and the cone attached to it could not vibrate over a greater distance without hitting the pole pieces, and consequently causing rattle. Remembering that the reproduction of the bass note required a much greater mechanical motion to give the same intensity as the higher ones, it is now seen why even the best of armature-driven cones fall far short of the ideal. Obviously what is required is a cone capable of free movement back and forth and with such latitude as would effectively create sound waves conforming to the bass notes. Theoretically our requirements could be met by giving the armature plenty of room in which to vibrate, but this of course would not be practical, as the magnetic field would be considerably weakened on account of the distance from armature to pole pieces. Were the pole pieces of an ordinary good cone filed down to present a larger gap, and the cone itself freely suspended, bass notes could be reproduced, but the sensitivity would be extremely low.



This is supposed to be the Bass Clef, who is greatly pleased at the new speakers which pay him very high respect.

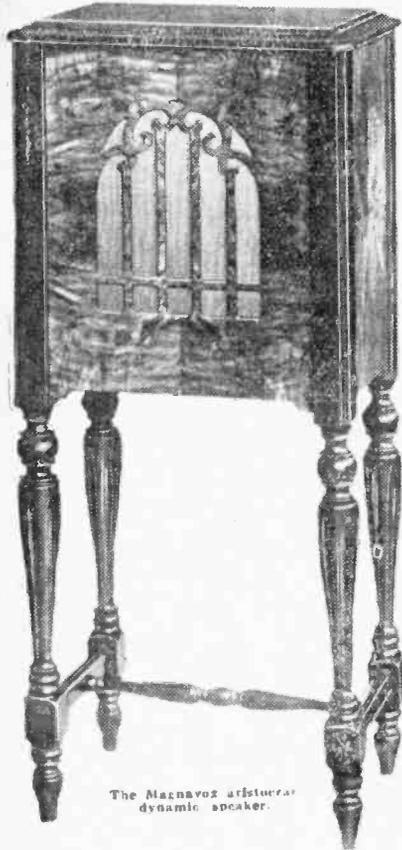
The solution of all these difficulties lies in the coil-driven speaker, of which until recently we heard so much and knew so little.

Figure 1 shows a sectional view of a typical moving-coil speaker. A fairly large steel pot contains a field winding through the centre of which passes an iron rod. This rod projects out of the front portion of the pot, and, fitting neatly over its end, but not touching it, is a small cylinder, upon which



The Sterling Dynamic Unit.

ONE of the first sound-receiving devices, as we all know, was the head 'phone. To enable sound to be heard without the necessity of wearing this instrument upon the head it was placed at the end of a straight horn. After the signals had been amplified to a greater extent than usual they were thrown into the room through this horn. Now, despite vast progress in most other branches of radio, manufacturers adhered to the loud speaker, which, even years later, was still only a glorified telephone unit with an improved horn. This type of speaker cannot possibly reproduce all musical frequencies with fidelity. Sound is really the effect on the ear of air vibrations. The lower the musical note the slower the vibration. In order to reproduce the entire scale, with the same amplitude, or strength, the diaphragm, which drives a column of air, must move backwards and forwards a much greater distance on the lower frequencies than on the higher ones. It is here that the horn speaker fails



The Magnavox aristocrat dynamic speaker.

In some speakers a permanent magnet serves the same purpose, and eliminates the necessity for any field excitation current. Another feature of most moving-coil speakers is that a filter circuit is incorporated. Whilst the range of the speaker is from about 50 cycles to 12,000 cycles, it is deemed advisable, by means of this filter, deliberately to cut off reproduction above about 5000 cycles, justification being that the amount of extraneous noises eliminated compensate for loss of musical frequencies above this figure.

(In our opinion this filter business was badly overdone in most of the early moving-coil speakers. Even in some modern types the high frequencies are cut to the point where any real crispness and brilliance is impossible.—Technical Editor.)

The magnetic field of these speakers is of great strength, and the forces acting on the moving coil to produce sound are dependent only upon the current in the coil, and not upon its position in the field. This results in almost complete freedom from distorting harmonics introduced by the speaker itself. As an indication of its freedom of movement, one may blow upon the cone and cause it to move over an eighth of an inch. The deep fundamental tones are actually present, and not merely represented by their harmonics, as in the case with more rigid types of cone. On account of the low resistance, the impedance is nearly constant over the complete range of frequencies, whilst this cannot be said of any other type.

The field current in some models is obtained from the power unit used or the amplifier. The field winding of the speaker is connected in series with the rectifier output, thus acting in place of one of the two chokes usually used. The rectified current passing through the field gives it sufficient excitation and at the same time the coil aids in filtering out the current for use in the receiver itself. Other units are available which can be energized by the accumulator, from which about half an amp. is drawn. With three modern valves consuming, say, half an amp. between them, and the speaker taking half an amp., the total consumption is no greater than an ordinary four valve set using UX201A valves. In other models a transformer and metal rectifier are built into the unit, so that all that is necessary is to plug into the 240 volt mains. This model seems the most practical to the average man, although if he owns a charger the accumulator type should be entirely satisfactory. The permanent magnet type, of course, requires no field current.

It is generally wondered why such a small cone is used in the dynamic speaker. Although from theory it would seem that the larger the cone the better the bass notes, actual practice has proved that large cones perform very peculiarly on the bass register. The exact action is difficult to understand, and cannot be discussed at length, but it is sufficient to say that the designers of these speakers found a small stiff cone gave better results than the larger ones, in so far as it could stand a powerful vibration without sagging or turning back on itself. A baffle-board is however, essential. When high notes are being reproduced sound waves are thrown directly out from the cone but when the low frequencies are created the waves radiate in wider circles, and are able to meet similar waves emanating from the back of the cone, if no baffle-board is used. Thus the whole effect is cancelled, and a great loss of

volume and bass is apparent. Obviously if a large board surrounds the cone there can be little interference between the waves created in front and behind the cone. In actual practice the moving-coil cone, without baffle, produces a thin tone. If, whilst in operation, a baffle-board is placed in front of it, the volume jumps up surprisingly, and the bass register makes itself heard. The size of the baffle determines the lowest note to which the speaker will respond. For ideal results, it should be about 3ft. x 3ft., but if desired can take the form of a cabinet, the sides, top, and bottom really acting the same way as a large upright baffle. The back of this cabinet must not, however, be enclosed, or a booming resonant effect will be caused. It is advisable to line the inside of the cabinet with ordinary floor felt to prevent undue vibration of the timber.

The ordinary cheap type of receiver, using medium power valves in its amplifier, and a normal plate voltage, would probably fall down badly as a driving agent for a coil-driven speaker, but even the most ordinary set could be treated at little expense to fit it for the job. A power valve is required in the last stage, and no less than 150 volts should be used on its plate. For this purpose an Osram P625A, a Philips C603, Mullard PM256, Cossor Stentor 6 or UX171 can be recommended. The valve should be supplied with its plate potential by a different tapping to that of the first audio amplifier, which as a rule will require no more than 100 volts. C bias battery is most important, and anything up to 25 volts negative will be required on the grid of the final valve. High-grade transformers, of course, are highly desirable, whilst those preferring resistance coupling should use two stages before the final valve, which should be coupled by a transformer.

Where limited voltages are available the finest means of driving the dynamic core is the push-pull amplifier. Experts say that the output valve for use with a coil driven speaker should have an impedance from between 3000 and 5000 ohms. Two C603 valves



A semidemi-semiquaver has given many a set the toothache. But not with a dynamic speaker.



Even a demi-semiquaver deserves high respect. Does your receiver miss them sometimes?

is wound a coil of very fine wire. The coil is suspended in its central position by a couple of fibre strips coming into it from the framework, and attached securely to the coil former is the cone, which of course is freely suspended at its outer edge by soft leather. Now this small coil is so beautifully mounted that it can slide a relatively great distance backwards and forwards along the length of the field magnet. We now have a means of driving the cone back and forth through a sufficient distance to produce the bass notes which we are searching for. The output of the amplifier passes through this small coil, and the varying impulses cause it to vibrate to and fro on the magnet just as would a piston rod on a steam engine. The input wires are taken to the outer edge of the cone, and from there a very fine wire runs back along the paper to the coil.



Lots of receivers treat the studio semiquaver just as lightly as this.

The moving-coil speaker is really a very simple arrangement, and far less complicated than is the average armature-driven cone. The armature, of course, has been dispensed with, and the only moving part is the cone itself, with its small coil at its apex. There is no permanent magnet to deteriorate, no armature to flex or introduce rattles, or resonance, and, above all, little restriction to free movement. However, to keep the weight and inertia of the moving coil as small as possible, and for other reasons, comparatively few turns of wire are placed upon it, thus giving it very low resistance. In order to feed this winding efficiently a step-down transformer must be used between the speaker and receiver. In most speakers the transformer is built in. The field winding is used, of course, to provide a magnetic field.

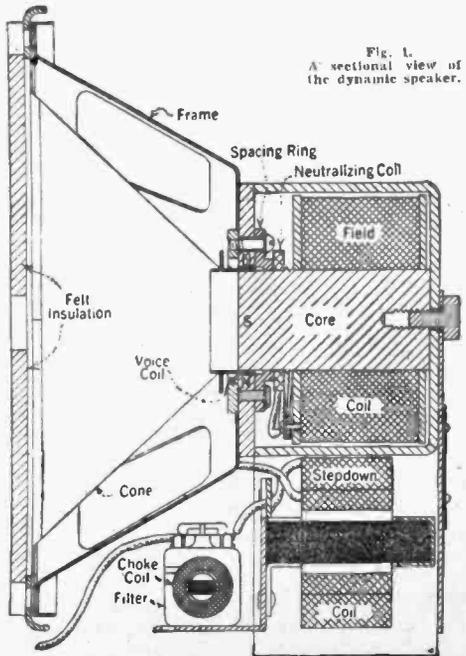


Fig. 1. A sectional view of the dynamic speaker.

(Continued on Page 64.)

30 MINUTE RECORD IS NEXT ELECTRICAL DEVELOPMENT

Radio research has made possible the much desired long-playing record for electrical reproduction.

THE exhaustive research which has gone into all forms of mechanical reproduction of music in recent years as a result of broadcasting development has made possible the long-playing record. Not only will this allow complete, unbroken performances for gramophones, but it will also eliminate the tiresome record playing at small stations by enabling them to transmit long programmes of high calibre or records of broadcasting programmes from other countries with nothing to indicate that they do not originate from the studio.

HOURS ENTERTAINMENT

Developed in the Edison laboratories the new record carries a full thirty-minute programme on each side, the twelve-inch disc furnishing an hour of entertainment. At present, of course, the record is of especial interest to the radio public and the broadcaster, and it has not been released commercially for any purpose, yet there are many possibilities in its future, although officials of the Edison laboratories do not care to enter into that phase of the question.

Since the long-playing record itself is basically the same as the Edison disc played on countless phonographs every day, differing only in detail from other records, we may be excused if we go back over some ancient history to explain a trifle more clearly the refinements which make the new record possible.

"HILL AND DALE" METHOD

Every phonograph record is made on one of two principles, the "lateral" or the "hill-and-dale" of reproduction. In the former the walls of each groove on the record bear a varying impression, a series of thick and thin faces on the wall of the groove. This varying thickness is graven in the record when it is made, the moving stylus or needle impressing each varying sound of instrument or voice. This system, used by practically every phonograph manufacturer, will be seen to require a certain space between each groove, and should the grooves be placed too close together, the walls would naturally break down under the cutting.

In the other type of record, the "hill-and-dale" type, the impression is made on the bottom of the groove. This, the Edison method, naturally requires no especial wall between the grooves, since the walls are not touched by the needles. Having explained we hope, the difference between the two methods of recording, it will be seen why the newly-perfected records are capable of holding on their surface an indefinite and theoretically unlimited number of grooves to the inch. At present there are 300 grooves to the inch, as against 100 grooves to the inch on other makes, which figure it is practically impossible to exceed, due to the previously explained lateral method of cutting.

Another refinement in this new record makes it possible to record and reproduce the desired music, speech, or other sounds on the record while it is turning at a speed of but 30 revolutions per minute, while the other types are impressed and reproduced at a speed of from 70 to 80 revolutions per minute. The exact method of recording, being a trade secret which has cost the patent owners some hundreds of thousands of pounds to perfect, is naturally not to be explained here, but an extremely fine diamond point is the instrument through which the



EDISON.

impressions on the groove are converted into sound when the record is played.

When Thomas Edison first conceived and patented the phonograph he had in the back of his mind the thought that some day it might be possible to record on a single record, not merely three or four or five minutes of entertainment, but a much longer period, and this thought has been with him ever since. As far back as 1807 Thomas Young described a method of recording the vibrations of a tuning fork on the surface of a drum; his method was fully carried out by Wilhelm Wertheim in 1842. In 1857, Leon Scott recorded the vibrations of a membrane by means of his "phonograph," which may be regarded as the father of the phonograph. To explain the various experiments and the long years of work by various experimenters which preceded Mr. Edison's first phonograph patent, which was granted February 19, 1878, would require much more time and space than offers itself at the moment, but infinite pain and many disappointments naturally were met with before the first wax cylinder phonograph was perfected.

OLD CYLINDER TYPE

Early phonographs of the cylinder type utilised a sheet of soft tinfoil as a recording medium. As the cylinder was rotated the sharp edge of the stylus indented the tinfoil into a spiral groove on the cylinder and when the membrane to which the stylus was attached was caused to vibrate by sounds thrown into the short cylinder which held it, variations of pressure on the membrane caused the stylus to make indentations on the tinfoil in the bottom of the groove. When the record was played, of course, these same indentations on the bottom of the groove caused a somewhat similar membrane to vibrate and thus reproduce the sounds which had been impressed upon the tinfoil.

The tinfoil phonograph was an imperfect instrument, both as to the medium on which the imprints were taken and the mechanical points of the instrument. Mr. Edison worked

on the details of the wax-cylinder from 1877 to 1888; A. G. Bell and S. Tainter in 1885 patented the "graphophone," and in 1887 Emile Berliner patented the "gramophone." Mr. Edison's improvements included the substitution of cylinders or discs made of a waxy substance for the less durable tinfoil. This wax in turn gave way to the present disc material which is a phenol compound, the formula for which is also a trade secret.

YEARS OF EXPERIMENT

In detailing the above we have digressed to a certain extent from the inventor's long-cherished dream for a longer-playing record. While most of the development in phonographic reproduction has been along old lines, as far as the public knows, much time and thought has been given the original idea in Mr. Edison's laboratories. The inventor's younger son, Theodore, himself an engineer and a graduate of M.I.T., has for the past few years been devoting himself to the new record, and it is through his work the record has been brought to its present state of development, and that the broadcast tests were so successfully carried out.

FOR STUDIO USE

When a record is made, studio routine is much the same as that of a broadcasting studio while a programme is being put on the air. Microphones are provided for the artists and musicians, the sound impulses are electrically carried to the apparatus, which, by means of a moving marker or needle, impresses them on a specially prepared disc. From this original "master" or "matrix" the records to be played are made. Here again a secret process is involved. Suffice it to say that while at present the records carry 300 grooves to the inch, the matter of impressing a much greater number on their face is merely a matter of manufacturing refinement and technique, so that records of the future may without undue optimism be expected to carry on each side a full hour or more of speech, music, or entertainment. In fact it is understood that a three-hour programme on one side of a 12-inch record is not only conceivable, but that this is at present being worked upon so much for the minutiae of the record.

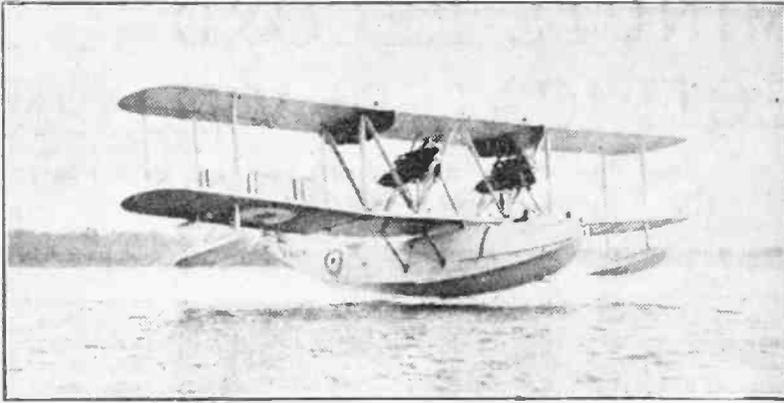
Broadcasts which have their origin on phonograph records are only too common, and while many of them have enabled minor broadcasters to give their public better programmes than they would be able to do they depend upon what talent they could afford to employ, many of them, through poor recording, faulty pickup or other causes, have been rather boring to say the least. Then, too, the ordinary phonograph record playing for only a few moments must be changed, station announcements and advertising talks fill the time between records.

The new record plays continuously for thirty minutes. At the end of fifteen minutes an announcement on the record states, "there will now be a brief pause for station announcements," a remark every broadcast fan is familiar with. Following this, the record is silent for fifteen seconds, ample time for the station announcer to identify his particular station.

The physical vibrations of the needle on the record being played are transformed into electrical vibrations in the magnetic pick-up mounted on a pick-up arm. These vibrations are then carried to the amplifier and from then on go through the same circuit as would an ordinary radio broadcast programme being modulated and transmitted from a station.

As has been said, the new record is played at a speed of thirty revolutions per minute. In the new apparatus designed to properly reproduce these records a new type of motor is used which revolves at this speed, the disc support or turntable being rotated by the motor directly, with no reduction gears used. At the back of the cabinet is a large indicator wheel graduated in minutes. This, synchronised through a micrometer gear with the motor and turntable disc, indicates just how much of the record has been played and how much yet remains to be played.

The microphone referred to above is a special type, actuated by a small extremely fine diamond point which rests on the



A Supermarine-Napier Southampton, with metal hull. Aviation enthusiasts should not omit to tune in to the aero sessions at 2BL on Wednesday, at 6.30.

record. Two wires are carried from this to the amplifier panel, or in case of purely local reproduction to a small audio amplifier and then to a loud speaker.

The writer heard one of these records played in the laboratory. The artists in this particular case chanced to be two very popular broadcasters, and their songs and "patter" heard through a loud speaker directly from the record were not to be distinguished from an actual broadcast.

The broadcast was purely an experimental one, and as yet no attempt to market the new device commercially has been made. Certain added refinements and improvements must inevitably follow the development of each new device, and it is upon such refinements and improvements, minor ones it is true, that the laboratory staff under Theodore Edison's direction are now concentrating.

Chain broadcasting is expensive. Wire charges make it prohibitive to all save a few of the larger broadcasting stations. By use of this new record, however, since countless records may be made from one recording, practically every broadcast station in the country will be able to record programmes of the highest character. Many developments in sound reproduction have taken place within the past year, including the much-discussed "talkie," but it seems hard to imagine any development promising more along these lines than the new long-playing phonograph record.

Where are the Broadcast Listeners?

By H. W. JOHNSON

WHEN broadcasting was first launched in Australia it was expected that its greatest benefits would be given to "the man on the land." While the attraction it would offer to city dwellers was not doubted, the people who encouraged the new enterprise held out a promise that broadcasting would bring to the country listener the attractions of the city; the news as quickly as it would be read in the suburban train or tram; the benefits of lectures, etc., by outstanding city authorities and the services of the principal churches of the State. Thus the isolation and comparative monotony of country life would be dispelled, and, in short, the farm would be brought nearer the city.

To a certain extent that ideal has been realised. The promises of the Government and other authorities have not been fulfilled however; there are still too many country farms and other rural homes where no listening sets are to be found. Wireless has not proved to be as attractive as it was expected to be, and the farmer is still waiting until "the noises are cut out of broadcasting," or until some further inventions are made which will result in the receiving equipments being much less expensive. Whatever the season is, we must admit that there are not as many listeners outside the capital cities as there should be. Or, at least as many as the advantages of broadcasting to country listeners would justify.

COST AND UPKEEP.

It does not require much thought to ascertain why there are more homes fitted with radio sets in the suburbs than in the country. The first element is cost; a suburban listener can have much more enjoyment with a thirty-shilling crystal set every night throughout the year than his country cousin can obtain on a sixty-pound valve

set. During some months of the year the valve set will reproduce the music clearly and pleasingly; but there are other months when the atmospherics take charge, and the output from the loud-speaker is more noise than music. The vagaries of fading also tend to make the reliability of the country set very low as far as a means of obtaining entertainment is concerned. A further element of cost is the necessity for taking the accumulators a considerable distance to be charged. And the cost of such battery attention is no small matter.

COUNTRY LICENCES.

Crystal sets cannot be used satisfactorily beyond a distance of about twenty miles or so from the station; there are cases well known of good reception on crystal sets beyond that distance, but they must be regarded as exceptional instances. Specially constructed sets, ideally located aerial systems, and topographical conditions tending to assist radiation in that particular direction from the station, often account for unusual results. The country listener is thus compelled to invest in an expensive valve set, with the costs and uncertainties already mentioned. And if the conditions are such that battery charging is not to be obtained, unless at great expense, the result is that no set is installed at all. There does not appear to be a satisfactory set on the market which will operate on primary batteries that have long lives; primary batteries, being incapable of renewal, must have long periods of service for such purposes.

Notwithstanding these handicaps for the country listener, it seems that broadcasting has caught on in the rural areas fairly well. If not on the farms, at least in the country towns broadcast listeners can now be counted

in the thousands. In a statement of the Government authorities responsible for the licences some time ago, it was shown that the listeners were distributed in the capital cities (including the suburbs) and in the country districts in the order of about 75 per cent. city to 25 per cent. country. Having regard to the clustering of population around the capital cities, such a preponderance of city listeners is not surprising. Taking New South Wales, for instance, it was shown that the capital city listeners amounted to 72 per cent. of the State total of listeners. In Victoria the country proportion was relatively greater, being about 30 per cent. In Tasmania it was not surprising to find the number of listeners in and near Hobart to be only about half of the State total; the population in the north of the State, particularly in Launceston, is not only greater than in a similar area in the south, but they receive a better broadcast service. The stations in Melbourne can be heard satisfactorily in the northern parts of Tasmania just as well as, if not better than, the Hobart station.

PROMISES.

Country listeners are now promised better things by the Government. The new scheme of Government broadcast service is to include some new stations, and it is expected that they will be mainly in the country towns. If the station energy is brought nearer to the country listener in that way he will be able to overcome the disadvantages of atmospherics and other noises, and thus be able to obtain more enjoyment from the service. What the country man wants to know now is—when? The guarded statements of the Postmaster-General do not give us much to work upon, but we are promised a good deal of improvement.

A.B.C. Continues to Organise

Recent announcements state the appointment of Mr. Basil Kirke to take charge of 6WF, a new programme committee, and the personal attention of the directors at auditions.

Mr. Kirke for Perth

MR. BASIL KIRKE has been appointed studio manager and chief announcer of 6WF, Perth. He goes to Perth immediately. Captain Stevens takes his position as studio supervisor to 2BL and lecturer organiser. Mr. Conrad Charlton, of whom there is a short notice below, has been appointed announcer to fill the gap caused by Mr. Kirke's departure.

Thus ends the long period of Mr. Kirke's association with 2BL. He began with Broadcasters Limited as outside sporting announcer, and graduated through all branches of the business to the position of chief announcer and studio manager. As an organiser he proved his abilities in many directions—his Children's Session was one of the most popular in Australia; and he had 27,000 children enrolled in his birthday book—also his broadcasts of sporting events, the Stadium, the football, etc., achieved for him great popularity. And everyone remembers his great efforts during the trans-Pacific flight of the "Southern Cross," when he stood at the microphone for more than a day, describing the course of the flight. The directors of the Australian Broadcasting Company have chosen a very energetic man to build up their West Australian licence receipts.

In a message of farewell, Mr. Kirke says: "I shall be very sorry to leave New South Wales. During my association with broadcasting in this State I have made many friends, both in the broadcasting world and among the listening public, from whom I shall be sorry to go so far away.

"I shall miss especially my little friends of the Children's Session. I suppose they may very soon forget their foolish old uncle and his moral talks and his stories. But I shall never forget the attention I have received from them, which I have always regarded as a great trust not to be treated lightly.

"I can do no more, in saying good-bye to New South Wales listeners, than to say that if I shall receive as much consideration at the hands of West Australian listeners as I have received here, I shall be satisfied.

"Good-bye Children.

"Good-bye Everyone."

Preparation of Programmes

FOLLOWING out the practice of better preparation of programmes, the Australian Broadcasting Company, Limited, has constituted a programme committee in New South Wales. The personnel of this body will be Messrs. Oswald Anderson (management), H. P. Williams (education, sporting, and news services), Horace Keats, Vern Barnett, and Ewart Chapple (musical direction), Madame

N.S.W. PROGRAMME COMMITTEE



OSWALD ANDERSON



H. P. WILLIAMS



VERN BARNETT



EWART CHAPPLE



HORACE KEATS



LAURENCE HALBERT



MME. EVELYN GRIEG



MISS G. GIBSON

The newly-formed committee to confer on programme arrangements.

Evelyn Grieg (bureau of musical advice), Laurence Halbert (production department), and Miss Gwen Gibson (programme department).

The duties of this body, as with that of the British Broadcasting Corporation, will be to discuss at a conference each Tuesday arrangements for programmes for the next three weeks ahead. After this conference the detailed machinery for programme building in each section of the Australian Broadcasting Company will be put into effect. Subsequently the programme in its final form will be returned to the programme committee for survey and comment.

In the case of music, productions, educational matter, talks and sporting items, the survey will take the form of, firstly, a check of any detail with which that section is concerned, and secondly, general comments on any subject in connection with the programmes on which the representative of each section may be assumed to speak with authority.

The full committee will then examine the programmes from the point of view of balance and their general construction, and will finally decide the manner in which they are to be presented through each station.

A.B.C. Directors Listen

FOLLOWING the very satisfactory response to their invitations for new talent, the directors of the Australian Broadcasting Company, Limited, have decided to listen to auditions.

They feel that every effort should be made to try out the new talent that is offering for broadcasting, and with this end in view auditions will in future be held on Mondays, Wednesdays, and Fridays, between 2.30 and 4.30 p.m., at 251a Pitt Street, Sydney.

Mr. Stuart F. Doyle, Sir Benjamin Fuller, Messrs. Frank Albert, Gordon Balcombe, and John Fuller will arrange a roster by which at least one member of the directorate will be present each day to hear those desiring to make appearances under the new company

New Day Announcer

THE new day announcer from 2FC is Mr. Conrad Charlton. Mr. Charlton is best known as an actor. He has been connected with J. C. Williamson, Limited, for some time. His most recent appearance in musical comedy was in the revival of "The Student Prince" in Melbourne a short time ago, when he played the role of Captain Tarnitz. Mr. Charlton also had an important part in "Madame Pompadour" and "The Vagabond King."

His actual stage debut in Australia was under the management of Sir Benjamin and Mr. John Fuller when he joined the Water George Revue Company and later played the demon king in the pantomime "Dick Whittington."

Mr. Charlton is a New Zealander and saw three years' active service abroad and was badly wounded.

Charles Zoli

CHARLES ZOLI is an English comedian who has been in Australia about eighteen years. He has played with J. C. Williamson's and Fullers', and also toured the Commonwealth with his own enterprises. He has just returned from Perth after having a well-earned rest and will be broadcasting through Station 2FC on Tuesday, August 6. He has been on the air quite a number of times from 2FC under the old regime.

Gabriel Joffe

GABRIEL JOFFE, the pianist who will appear over 2FC on Thursday, August 8, is a Lithuanian, and has been in Australia for twelve months. He likes our country very much and intends to stay here. Mr. Joffe is no stranger to listeners as he was broadcast from 2FC a few times last year. He has travelled all over Europe as an accompanist to Marie Kuronko and other well-known artists. In 1925 he played for the President of Finland in his castle there.



Jack Lumsdaine

WHISPERING baritones, of course, are whispering all over the world these days. Whenever one child is born with a tendency to holla a little softer than the neighbors', he is marked down by an indulgent father to be a whispering baritone. Indeed, so much marked attention has been paid to the whispering artist that we shall not be surprised if, in two hundred years' time, in a History of the World, we see a passage something like this:—

"The history of Art in these troubled times is a history of craziness succeeding lunacy, which was followed by psychoanalysis, and culminated in the famous School of Idiots. Graduates were all notably loud-mouthed during their respective periods; yelling their various opposing formulas at each other in magazines and music reviews. However there was one praiseworthy movement in this howling wilderness: that initiated by the sect of Whispering Baritones, which imposed artistic restraint on all its members, and preserved intact for many years the sacred dignity of Art."

That, we say, is what may be said in some future History of the World. Don't get the impression that we said it. We wouldn't say things like that—ever. We would be afraid of what Mr. Chapple might say to us; or Mr. Roy Agnew; or Mr. Oswald Anderson. No! All we quoted this passage for was to show the debt some future historian MIGHT see fit to think he owed to men of the calibre of Mr. Jack Lumsdaine, the pioneer of Australian Whispering Baritones.

We went round to the Tivoli to see Mr. Lumsdaine; and then we went with Mr. Lumsdaine into a Place Nearby. He wore a heavy coat, and shivered, and shivered, and shivered. He explained that he had influenza—badly. It is a peculiar thing, this influenza. First we interviewed Fred Scholl. A few days after, he got influenza. Then we interviewed Ted Henkel. He was just getting influenza. Then we interviewed Jack Lumsdaine. He has influenza—badly. We don't know what other combinations are possible; but we are wondering whom we shall interview next.

In spite of influenza, Mr. Lumsdaine was exceptionally charming. He speaks in a smooth, clear voice; and tells you the secrets of his life frankly; not as some others, but as though they really didn't matter. He began serious life as a bank clerk; but left it to take up music and entertaining. He travelled all through Australia. Then he spent four years at the war.

When he came back, Mr. Lumsdaine became manager of the professional department of Chappell and Co.; and of J. Albert and Son

Just-a Whisper About Jack

PROGRAMME PERSONALITIES

He left Alberts to go for a short trip to New Zealand; but he was so well received there that he stayed for five months.

He made the trip to New Zealand in the Marama, which was sixteen hours late, and didn't get in till eleven at night. And he had been billed to appear at the Majestic that night; and his act was to have gone over the air from 1YA. When the Marama was thirty minutes out from Auckland, the stewards called him in to listen to the wireless; and he heard himself singing "Bye-Bye, Blackbird"; for, of course, the Show Must Go On; and the broadcasting people just took the liberty of substituting a record by Jack Lumsdaine for the Man Himself.

During this same tour of New Zealand, Mr. Lumsdaine found himself in a little country town called Morrinsville. He went into a hotel, opened the piano, and sat down to strum a melody of his own composition. "Dear, dear!" said a friendly waitress. "what are you playing?"

"One of my own compositions," answered Mr. Lumsdaine, carelessly.

"Oh, I see. You must save a lot of money by writing your own stuff—you don't have to buy so much, I suppose," said the charming young waitress.

Tut, tut! Since his New Zealand trip, Mr. Lumsdaine has stuck to the stage and broadcasting. For the past two years he has been doing Whispering Baritone and Radio Rascal stuff under J.C.W. management; and has made two record appearances; one of eight weeks in Sydney Tivoli; the other of seven weeks in the Melbourne Tivoli. He began broadcasting when broadcasting began; and has broadcast from every A Class Station in Australia, 4QG, 2FC, 2BL, 3LO (where he did an extended season of one month), 3AR, 5CL (an extended season of two weeks), and 6WF. In New Zealand he has broadcast from 1YA and 2YA.

"Broadcasting work is very similar to recording for the gramophone," said he; "and as I have had considerable experience of gramophone recording, I was soon able to make a success of broadcasting."

The Whispering Baritone stunt was originally started by an American gent, by the name of Smith; but it was Mr. Lumsdaine who first introduced it to Australians. It is a method of singing which everyone doubtless knows very well; but which we shall describe for our own benefit, in the following formula:—

Sing softly and croonily.

Speak the important words.

The particular charm of this manner lies

- Its originality.
- Its emphasis of the story-part of the song.

"It is surprising," said Mr. Lumsdaine, "how well this whispering song goes over, even in great theatres. It seems to penetrate and to carry where even a heavy voice will not. And of course, it is excellent in the studio; because it just suits the microphone. You can come right up to the microphone when you sing softly; and the reproduction is in no way

spoiled by blasting or studio echoes—things often to be feared from loud voices singing well away from the microphone."

Mr. Lumsdaine always plays his own accompaniments; and has his studio accompaniments down to a fine art. "It was very hard at first to make the piano soft enough when you were singing so close to the microphone." Besides, he specialises in Novelty Piano work; and often adds to the charm of his vocal renditions with some apt keyboard embellishments. Of what the Public Wants, he says, "People are suffering from a surfeit of talkies and novelties, which have taught them always to look for something different. The straight song sung by the straight singer won't go down as it used to. The Public wants something different—something original. Original material—self-conceived ideas—variations on standard songs, such as, for instance, my variations on "Annie Laurie"—appeal to the public more nowadays, than the stereotyped published song." Which is what they've all been telling us.

We have reserved the usual sensation WIRELESS WEEKLY always has in store for its devoted readers unto this last! In a few months Mr. Jack Lumsdaine is going over to America, to try his luck and his talent there. His records here have sold quite well; and he hopes to make a success in America with further recordings and broadcast appearances; and he even hopes to do a few talkie shorts; "for," says Mr. Lumsdaine, "what was good for records was good for broadcasting; and what was good for broadcasting will be as certainly good for talkies."

But don't get influenza in America, Mr. Lumsdaine. They're a lot of unprincipled prohibitionists in America.

Miss Lucille Bruntnell

AN interesting person, who will be heard from 2BL in the "Magic Carpet" series of daily travelogues, is Miss Lucille Bruntnell, daughter of the late Chief Secretary.

Miss Bruntnell possesses a radio voice of charm and distinction. She only recently returned from abroad, where she went to study dramatic art at the Royal Academy. Miss Bruntnell was also selected by Rosa Philippi for special lessons. Miss Bruntnell specialised in A. A. Milne's works, and was just about to go into a Du Maurier production when her parents recalled her to Australia. Mrs. Pat Campbell, a famous English beauty in her day and still one of England's greatest actresses, took a liking to Miss Bruntnell, and coached her in her work. Miss Bruntnell will talk on "The Production of Modern Drama" over 2FC on August 8.



:: IN THE AIR AND ON THE AIR ::

Barbara and Will James

THIS clever pair has appeared with success all over Australia. Will and Barbara James are an interesting pair of instrumentalists, who are also devoted father and daughter. Will James is just as proud of Barbara as Barbara is of father. Will says Barbara as a saxophonist is unbeatable. That's what Barbara says of Will as a banjoist. They play from 2FC on August 7.

Simon Philippoff

SIMON PHILIPPOFF, Russian virtuoso of the balalaika, arrived from Java recently, where he had given concert recitals on the national Russian instrument for over 18 months. He has been engaged by the Australian Broadcasting Company for an appearance over 2FC on August 3. Mr. Philippoff learned his art from Andrioff, the first balalaika teacher in the world. He is to the balalaika what Professor Auer is to the violin, and will only take pupils who show unusual signs of brilliance. Mr. Philippoff declared that the instrument he plays embodies the best qualities of the violin and the guitar. He plays the highest classical music on it. Composers such as Bach, Kreisler, Liszt, Chopin, Schubert, and Beethoven are said to lose none of their brilliance when transferred to the balalaika.

Aussie and Pom

A CLEVER act to go over 2BL on August 3 will be that to be provided by "Aussie and Pom," two versatile entertainers who write their own radio scenes. Aussie is none other than Fred McDonald, the original "Dave" of "On Our Selection" fame. "Aussie" says he played that part over 3000 times in his career, and he can never tire of it. Brett Randall is the other half of the act, known as "Pom." He first came into prominence in Sydney in the play "The Sport of Kings." His most recent stage appearance was in "No. 17," in Melbourne.

Will Prior's Broadcasting Ensemble

MR. WILL PRIOR, orchestral conductor, will arrange the evening concert for Sunday, August 4, from 2FC, for listeners. This will be relayed to 3AR, Melbourne. Mr. Prior has formed an ensemble of artists, all of whom are soloists of the highest order. Messrs. Lionel Lawson (violinist), Bryce Carter (cellist), Harry Whyte (pianist), Sam Barbleca (saxophonist), and the original Tom Katz (band leader) are names that are sufficient to assure listeners all over Australia of the quality of the programmes to be offered. The orchestral items will be featured, as well as solos by the various members of the ensemble. There will also be a string quartet, chamber music, organ solos by Mr. Price Dunlavy, and vocal numbers by well-known Sydney artists. Mr. Prior stresses the fact that popular numbers of the more melodious type will be included whenever possible in the programme without lowering the standard which he hopes to set, and at the same time maintaining the class of music at a standard which will be suitable for Sunday concerts.

Frank Leonard

FRANK LEONARD, entertainer at the piano, who will be heard through 2FC on Friday, August 2, is an Englishman who has been in Australia for seven years, having come out here for J. C. Williamson. He has also played on the Tivoli circuit. Mr. Leonard has broadcast a number of times from 2LO, London, in its early days, and also from 2FC a few years ago, so he is not quite a stranger to the microphone.

NEW FEATURES IN THE PROGRAMMES

The Mankey Trio

THE Mankey Trio are known all over New South Wales. They are instrumentalists who play the violin, piano, and cello. They have always taken an active interest in charities of all kinds and have played numerous recitals for that purpose. On their opening programme from 2FC on Thursday, August 8, they will play "Love Dreams," selections from "Merry England," and then some shorter classical and piano solos.

Aids to Personality

WOMEN who take a pride in their appearance will be very interested in the talks which Goodie Reeve will give over the air from 2BL at the luncheon hour every Wednesday. Under the heading "Aids to Personality," Miss Reeve will give women all sorts of little hints about the care of their skin, hair, etc., which she has culled during varied experiences with leading personalities on the stage and screen. As no advertising is permitted on A Class Stations, either direct or indirect, women should welcome this opportunity of gaining really genuine advice free from so interesting an authority.

:: VICTORIAN PROGRAMMES ::

3LO Community Singing

SIR BENJAMIN FULLER, one of the directors of the Australian Broadcasting Company, who is directing the organisation of the community singing for the Lord Mayor's 3LO Hospital Radio Fund, is enthusiastic over the prospects of the movement and has expressed his satisfaction with the widespread interest that is being evinced throughout Victoria and also in the Riverina and Tasmania.

"We want everyone, everywhere, to join in the singing so that the community spirit may be spread throughout the land," said Sir Benjamin, "and we want everyone to do his or her best for the Lord Mayor's 3LO Hospital Radio Fund."

The Lord Mayor (Mr. Harold Luxton) hopes that the 3LO community singing collections and donations will provide sufficient funds to equip every hospital within six months. The directors of the Australian Broadcasting Company—Mr. Stuart F. Doyle (chairman), Sir Benjamin Fuller, and Mr. Frank Albert—have each contributed £10 to the fund.

The first community singing will take place at the Town Hall on Thursday, August 3, when Mr. Frank Hatherley will conduct, and several novelties will be introduced under the direction of Mr. Hugh Huxham, the 3LO producer.

3LO Christy Minstrels

A VERSATILE band of entertainers, "The 3LO Christy Minstrels," will make their bow before the new 3LO microphone on August 7, when a programme to suit all tastes will be presented. Their concerted items, especially the quartet arrangements of popular minstrel numbers, are gems of melody.

Boy Xylophonist

"WINKS" Shmith, the popular xylophonist, is broadcasting from the new 3LO Studio on August 10. "Winks" Shmith, who is just fourteen, commenced to play the xylophone at the age of five, when, on seeing a xylophone for the first time, he successfully picked out a tune. He has appeared with the Melbourne Symphony Orchestra.

Bob Molyneux Broadcasts

BOB MOLYNEUX, a breezy baritone, will be singing from 3AR on August 9 for the benefit of listeners who enjoy the latest in vocal fox-trots and popular ballads.

Sunny South Programmes

A COLORFUL programme of Spanish music will be broadcast from the new 3LO Studio on August 8, when vocal and instrumental items suggestive of the "Sunny South" will be given. Miss Gaby du Valle, who starred with the San Carlos and Californian Opera Company, will contribute some Spanish melodies which have been specially written for her, and "The Castillians," Spanish and steel guitar duettists, will be heard in numbers from their repertoire. The baritone, J. Alexander Browne, will sing "The Toreador," and some instrumental selections will be given by the Studio Orchestra.

Conservatorium Professor to Broadcast

INTEREST will attach to the cello recital to be given by Professor Louis Hattenbach from the new 3LO studio on August 8, when several of his own compositions will be included. Professor Hattenbach received his early musical education in Germany, afterwards joining the staff of the Leipzig Conservatorium. He is known throughout Australia as a cellist of outstanding artistry, and has given successful recitals in every State. He has also been associated with leading Australian and visiting artists, when his cello solos have been an outstanding feature of the programmes.

New Broadcasting Tenor

HARRY KITTS, a fine tenor voice, is making his debut from the new 3LO Studio on August 5. Mr. Kitts has had considerable stage experience, and has sustained principal parts in such successful musical productions as "Rose Marie."

"Cherry Blossom Time in Old Japan"

"CHERRY Blossom Time in Old Japan," a musical playlet which is just as fascinating as it sounds, is to be produced at 3AR on August 8. Mirth and melody play an equal part in this musical trifle, the concerted vocal items being an outstanding feature. The play has been specially adapted for the Radio by Mr. Hugh Huxham, who has charge of the production.

Wireless Weekly

Incorporating "Radio in Australia and New Zealand."

FRIDAY, AUGUST 2, 1929.

RADIO AND THE GRAMAPHONE

It is a far cry from "Mary Had a Little Lamb" to, say, the "Fifth Symphony" or the colorful "Scheherazade," but it is just this contrast which epitomises the advance made in the mechanical reproduction of sound in the last fifty years. One day in 1887, Thomas Alva Edison shouted the words of the immortal lyric down the funnel of a queer contraption he had made, and reversing the process a few minutes later, heard his own words faintly repeated by the machine. That was the first successful recording of speech and marks the beginning of the commercial development of the gramophone. To-day we can hear the greatest music played by the finest orchestras in the world with a realism which approaches perfection so closely that none but a highly-trained ear can detect the difference.

But, although we think of the gramophone as a development of the last fifty years, the history of the true reproduction of music by mechanical methods goes back as far as the history of radio itself. Edison's gramophone these days seems rather a simple mechanical device, produced perhaps a little ahead of its time; it was not until the mechanical ingenuity of the inventor and his followers were united with the highly technical brains of the physicists that anything like true reproduction of music was achieved.

That achievement (the culmination of hundreds of years of experiment) is not altogether a few years old, for not until the gramophone manufacturers were able to make use of the knowledge resulting from the intensive, world-wide study of sound properties and electrical phenomena which produced broadcasting did the gramophone cease to be inefficient. Evidence of this is seen not only in the application of electric amplifiers, sound boxes and dynamic speakers to record reproducing, but in the ordinary horn. In the last two years new models, each showing an improvement in speaker design, have followed one another until the best gramophones now use the exponential horn originally designed for radio.

The electric gramophone itself embodies the principles of the radio receiver. It can, indeed, be used as a radio receiver or vice versa, and it is this which inseparably links radio with the new gramophone movement to the mutual advantage of both.

"ELECTRIC EYES" May Control Traffic

"TRAFFIC EYES," which automatically control traffic lights when they "see" automobiles, are in service in Pittsburgh, U.S.A.

The purpose of the new system is to eliminate unnecessary traffic delays by giving the right of way continuously to traffic on a main street, interrupting the main traffic flow only when cars are actually waiting on the side street to cross the intersection.

Motorists on one street are given a green, or "go," signal continuously until a car on the cross street comes within a short distance of the intersection, at which time the traffic signal mechanism starts to operate, and the lights go through one complete cycle, allow traffic on the one street to pass through, and then stop again with the green light on the other street. The lights then allow traffic to proceed uninterruptedly on the one street until the presence of cars on the other street justifies another change.

CALLED TIME SAVER.

Since operation of the signals is regulated entirely by the actual necessities of the traffic flow, it is expected that a considerable saving of time will result, especially at night, when delays for which there is no necessity occur. The purpose of the installation, which is the first in the world, is to determine the practicality of the invention. Simple instructions for operating the lights are given on signs maintained by the Pittsburgh Traffic Planning Department. The signs read, "To get the green light, pull up to the line."

NEW SYSTEM USED.

The automatic feature of the system is made possible by a new application of the photo-electric cell, or "electric eye," which literally "sees" automobiles, and regulates

the signals accordingly. It is an automobile's shadow, falling on an "electric eye" from an overhead lamp, assuring a sufficiently dense shadow, night and day. Traffic is routed through this beam of light.

The new system is designed to set automatically right any unusual situation that might present itself. For instance, if an unusually large number of cars on one street threatens to hold up traffic on the other street inordinately long, the signals operate on a definite pre-arranged programme, giving each line of traffic a fair share of time.

If the automatic control feature should break down for any reason, the signals would operate on the normal programme.

The Light Fantastic

ON August 6, listeners will be introduced to the Stephens brothers, when these versatile musicians will broadcast from 3LO. These artists are well known in English and Australian dancing circles, and the surprising feature of their performance is that each individual artist plays from ear and cannot read music. Apart from the musical interest attaching to their items, they will provide some excellent dance music.

Popular Talks

DON'T miss the short Thursday talks to be given by Dr. Loftus Hills from the new 3LO Studio, when he will speak briefly of the outstanding event or personality of the week. This series has been specially arranged with the idea of helping the busy listener to keep abreast of the times.

THE RADIO BUG DOES BITE



THE SAFETY VALVE



Readers are urged to express their opinions on matters pertaining to broadcasting. If you have some grievance, if you have some constructive criticism to offer, here is your chance for expression—your safety valve. The

editor assumes no responsibility for statements made by readers and published on this page, as opinions of correspondents do not necessarily represent our editorial policies. Anonymous letters are not considered.

Detailed Programmes Wanted

Dear Sir,—Following your excellent article in this week's edition of "Wireless Weekly," dealing with the subject of programme presentations, may I also express the earnest hope that under the new management we are not to be deprived of the detailed programmes with which your paper has supplied us in the past?

The presentation programme, while it may have much to commend it, will lose a great deal of its savour if the listener is never to know what is coming next, or what he may be missing from 3LO while he is tuned in all night to 2FC.

Every listener has his favorite items, and much of the charm of listening-in lies in the ability to pick one's own way through the various programmes broadcast each night. I am sure that the carefully time-tabled programmes supplied by the late management were universally appreciated, and their discontinuance strongly points to the unwillingness of the Australian Broadcasting Company to undertake the trouble involved in preparing them. I can only point out that a probable loss of interest in broadcasting generally would result from the lack of a detailed and time-tabled programme. I trust every endeavor will be made to induce the new management to follow, at least in this direction, the example set by its predecessors and sacrifice perhaps some small part of the effect of its presentations to the individuality of the listener.

Yours, etc.,

A. C. CALDWELL.

Orange.

The Man On the Land

Dear Sir,—The details of programme from 2FC, as proposed by the new Broadcasting Company, and appearing in this week's issue of WIRELESS WEEKLY, must be a great disappointment to many country listeners.

The items of most interest to country listeners—especially the man on the land—are:—Weather forecast and rainfall, late news and markets (live stock, wheat, wool, etc.), and I venture to say that the knowledge that these items would be broadcast induced 50 per cent. of wireless owners amongst men on the land to buy their sets. And what do we find in the proposed programme from 2FC?—Weather mentioned once at 7 a.m., a time when "cockies" are out working, and have done what to the city dweller would be half a day's work; at 12.20 market reports—no mention made of what markets; and, as for news, there is no mention, except breakfast news at 7.40, which, as mentioned before, is not a suitable time.

The old company did try to cater for our needs, and I never failed to listen-in at 1 p.m. for weather and news. Surely the country listener is entitled to a couple of hours a week out of the eighty-four for the most important items as mentioned.

Why not give us fifteen minutes between 12.30 and 1 p.m. for weather and news, and again between 7.30 and 8 p.m. for markets—Flemington sales, wool and wheat—and news? These times would suit the "man on the land," and I'm sure the town and city

listeners wouldn't object when they know that many of their fellow-listeners in the "out back" only get a mail and paper three times a week, so they look forward to getting information through the radio.

I have only referred to the programme from 2FC, as this is the best station for most country districts.

I think that if this matter were brought before the new company they would endeavor to rectify it, as they appear to want to cater for all classes of listeners.—Yours, etc.,

Forbes.

"COCKIE"

Rabbits

Dear Sir,—Will you please allow me space in your valuable paper to express my opinion on the Sydney stations?

Now, it is a peculiar thing that, for all the rabbit-skins sold and their value, 2FC and 2BL do not give the people in the country, who are interested in this industry, more particulars of the sales and announce them more often. The skin sales are held every Wednesday during the winter months, so why don't these two stations give out the marketing of rabbit-skins? What is there to stop them from giving out the prices per pound for each grade, and whether they rose or fell in price, and on Thursday night just stating whether the sales on Wednesday improved or declined, and by how much? At the present time you think you are lucky if you get the prices on Wednesday night. Why is this? Now that 2FC is to go under new management it would be a good idea for them to consider this little bit of criticism, and help a large number of listeners.

Yours, etc.,

FK

Mount David.

Good Luck and Prosperity

Dear Sir,—As I pen this letter we are on the eve of a big improvement as to wireless. The old firms are going, and the new ones are starting out to give the people their wants, something the old firms never considered. Too much advertising and bad programmes have been their downfall. Another deciding factor is the music put over by our B class stations—2UE in particular. Now it is up to the new company to pass over the money obtained by advertisements to these stations. They have pioneered the broadcasting in Australia, and their only profits are made by advertising, and the firms who paid the old company for its advertisement could hand over the said items to these small stations who have the majority of listeners. Then both firms would be helping each other.

No doubt it will be a great relief to many of us not to have to tolerate a lot of second-rate artists, as we have been compelled to these last few years. I only hope Captain A. A. C. Stevens, of 2BL, will have lost to him those records of his church turnover and his King's health. I certainly like these records, but they have been hashed up too often for us.

Putting all growls aside, I wish the old firm good luck, and the new one all prosperity.

Yours, etc.,

FISHY.

BULL.

Soviet Stations

Dear Sir,—May I point out that the Russian station heard around 70 metres is RFL, and not RFN. My verification from the USSR gives the following particulars.

The Soviet welcome reports, and will QBL them. Station RA97, formerly RFM, operates on 70.2 metres every day, except Wednesday, from 900 G.M.T., and is crystal controlled. Another station, RA19, can be heard before 5 p.m. S.M.T. around 37.00 metres.—Yours, etc.,

S.W. FIEND

Pascoe Vale.

Permanent S.W. Station

Dear Sir,—I would like to suggest that "Wireless Weekly" and its readers advocate a SHORT-WAVE station for Australia which is on a regular schedule, such as 5SW and all the others. Australia needs advertising, and there is no easier or cheaper way, to my idea, than a good short-wave station which will get to all parts of the world.

I do hope you do not intend to cut out your page which was used for short-wave broadcast stations, and which was so interesting. I could forward you reports if you were needing them, as I am a regular listener to telephony on short waves.

Yours, etc.,

T. A. EVERETT.

Guyra

2UW Transmission Defended

Dear Sir,—I read a letter from Mr. Hearn, published in this journal a week or so ago, about Station 2UW. I certainly agree with him in what he says—it's a splendid little station, and it certainly gives a good programme. I also see a letter from "73's" in a recent issue, saying 2UW is a punk station and that 2UE is very good. Well, I for one don't agree with that "73's" also says 2UW's programme is punk. Well, if 2UW's programme is punk, what must the other stations be like?

I see "73's" says we don't get much variety in our programmes. Well, I have heard a record played from one of the A class at least three times in one day, why, at 2UW they wouldn't think of doing that. I live at Hornsby, and one can see Pennant Hills aerial where 2FC is, and yet I can pick up 2UW as loud and far clearer, while 2UE hardly comes in at all. It is not the set I have, because I am using the 2UE circuit, and inter-State come in like local.

A couple of months ago, while I was in Melbourne, I had my set down there, and 2UW came in loud and clear, so I suggest that "73's" get a new set, as his present seven doesn't seem to bring in 2UW too well. I should suggest he use the 2UE circuit, as I have heard inter-State at loud-speaker strength on a room aerial. Perhaps it is his valves that are the cause of 2UW not coming in too well. I would suggest he try Mullard or Cosor—they are what I use; and then he might hear some good music from 2UW.

Yours, etc.,

H. P. TOM.

Hornaby.

NOW—YOU CAN BUILD AN ALL ELECTRIC “RENOVN”

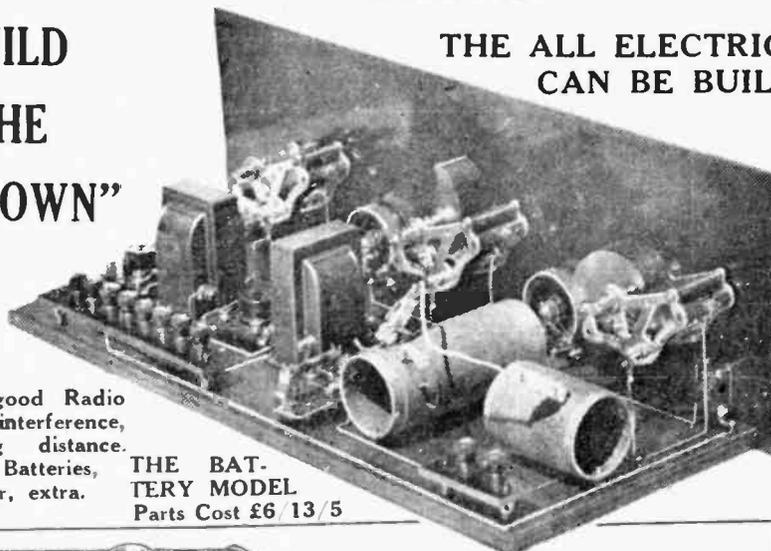
Everybody Knows “The Renown 3”

“The 3 Valve Set with the 5 Valve performance”—MANY HAVE ALREADY BUILT IT AND KNOW WHAT A MASTER SET IT IS

THE “ALL ELECTRIC RENOVN” WILL GIVE AN EVEN BETTER PERFORMANCE—AND WONDERFUL TONE. JUST IMAGINE—NO BATTERIES WHATEVER—YOU JUST PLUG IN, AND—YOU CAN BUILD IT.

BUILD THE “RENOVN”

THE ALL ELECTRIC RENOVN 3 CAN BE BUILT BY ANYONE



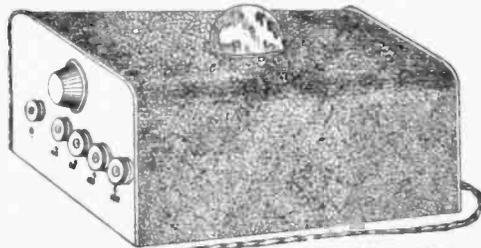
And get good Radio without interference, plus long distance.

Valves, Batteries, Speaker, extra.

THE BATTERY MODEL
Parts Cost £6/13/5

Complete Kit of Quality Parts, including Philips A.C. Valve, “Ampl” B. and C. Eliminator, Filament Transformer. Easy picturised Wiring Sheet, supplied FREE with KIT.

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AND NOW—
AN AMPLO B and C ELIMINATOR

4B plus Voltages £6/5/-
2C minus Voltages

Amplo B Eliminator £5/15/-

YOU HAVE BEEN WAITING FOR AN AMPLO

THE NEW PHILIPS B. and C. ELIMINATOR. HAVE YOU SEEN IT?

A PHILIPS B. and C. ELIMINATOR AT A LOWER PRICE:

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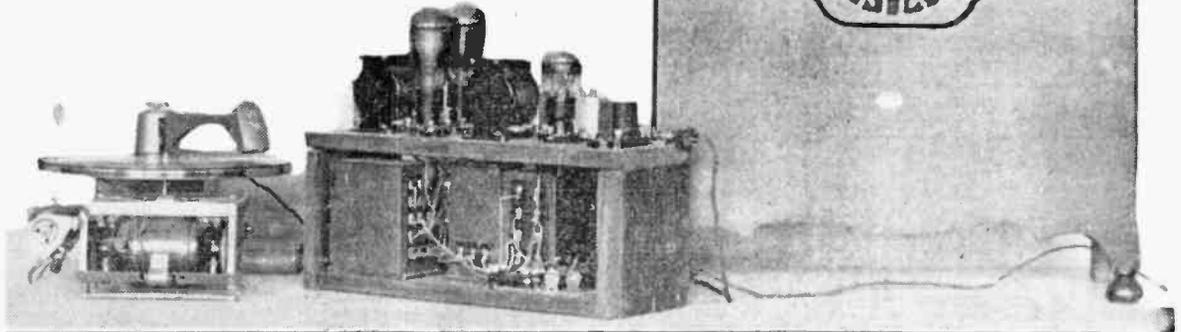
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An All Electric Amplifier for ELECTRICAL REPRODUCTION

By ROSS A. HULL



WE have never actually counted them ourselves, personally, but we have it on good authority that there are just 24,000 nerve endings in the ear membrane which have the job of reporting impressions to the brain. These nerves, we understand, have the ability to become habituated to the sounds they are obliged to handle frequently, and the listener is then only conscious of deviations from the normal sounds or noises.

The trouble is that the number of impressions of which we are made conscious by these aural nerves are only a minute fraction of the total number of impressions which the brain actually receives. We are able to tell, for instance, whether there is a harsh rattle on a high note or bad distortion over the whole range, but the rattle or the distortion was made known to the brain long before it became sufficiently serious to be heard consciously.

The point is that any of us may be able to get used to a wretched radio set or a poor gramophone amplifier if we are able to listen to it over a long enough period, but that all the time we are receiving millions of subconscious impressions. These subconscious impressions are hammering on the brain long after we have reached the stage where we consciously consider the reproduction to be satisfactory, and, we are told, constitute the reason why such reproduction is tiresome. In short, this means that any sort of reproduction can be considered fine if we are fed on it long enough, but it will always be tiresome and unpleasant in actuality if it is not good.

It is no wonder, then, that most Australians, though they consider their radio sets produce music, are rarely content to listen attentively to a whole evening's programme—

that they must continually seek the diversion of distance hunting or the re-arrangement of their outfit to give it more "power."

All this may not appear to have much to do with the building of an amplifier, but in reality it has. Australian radio enthusiasts are just the same creatures of habit as those on any other part of this globe. Without the slightest question of a doubt they have become accustomed to the persistent and consistent distortion typical of almost all our broadcasting and broadcast reception. Broadcast reception has come to be considered as an "all right but sort of tiresome" thing, and one of the chief reasons for this condition re-

sults from those characteristics of our aural systems about which we have been talking. By some means or other listeners must be made to realise that radio reception need not be tiresome; that the present junk which their receivers are turning out is not music; that the pressing need of the moment is a drastic revision of ideas on audio frequency amplifiers and speakers, and intense activity in the rearrangement and rebuilding of them.

Of course, it must be admitted that the best amplifier-speaker combination available would not produce satisfactory musical reproduction from any of our existing stations. If we wish to have some of it without waiting for the installation of the new stations we must turn to electrically recorded gramophone records. The apparatus to be described is an amplifier capable of entirely satisfactory musical reproduction when used with a high-grade speaker. It is arranged primarily for use with a gramophone pick-up, but it is also completely suited for use as an amplifier to be hitched on to the radio frequency amplifier and detector of any existing receiver. When used with a single detector valve it will provide a "local" receiver capable of a splendid performance.

From the illustrations and the diagrams it can be seen that the unit comprises a power supply arranged on a base-board, with the three valves and transformers of the amplifier mounted on a shelf up above. The power supply is identical with that described for use with the Standard A.C. Four, but since use is made of some of the windings on the transformer not mentioned in the article on the power supply it will be roughly detailed again. The amplifier section includes an input transformer into which the detector of a radio receiver would feed; an indirectly heated, or A.C. type, first amplifier valve; a coupling transformer between this valve and the two directly heated valves arranged "push-pull" and an output device. This apparatus, together with the bias resistors and by-pass condensers, is all on the upper board.

Now let's see just what the outfit is all about.

In the circuit diagram the input transformer is shown at the upper left side. It is marked T2. Its "P" and "B plus" terminals are ordinarily connected to the output of the detector valve when the amplifier is used for radio reception. Its secondary winding connects with the grid and cathode of V2—an indirectly heated or A.C. type valve. The "C" terminal of the secondary, of course, connects with the valve grid. The resistor R5 is incorporated to provide a suitable grid bias for this first valve. It can be seen that the plate current of the valve must flow through this resistor on its way to the cathode of the valve. The voltage drop across the resistor resulting from this flow of current through it provides the grid bias. The condenser C1 is

Next week the use of this amplifier in conjunction with a detector valve for radio reception will be treated by Mr. Hull.

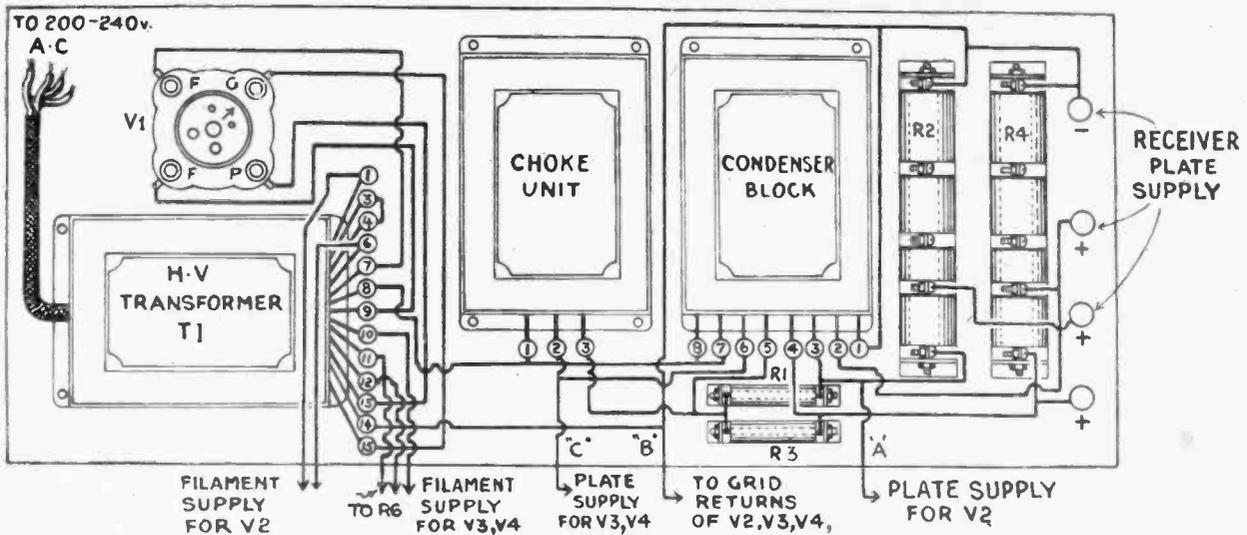


Lots of amplifiers look askance at odd crochets, which somehow or other seem to drop out here and there. But not the one described in this article.



So would you look at astonishment at a breve which came through the aid loud-speaker like this, after having heard the new electrical reproduction.

DETAILING AMPLIFIER FOR HIGH



a combined by-pass and filter condenser of 1 mfd. The filament of valve V2 is, of course, heated with alternating current. In this particular amplified V2 is a Philips E424, which has a filament rating of four volts. Since there is no four-volt winding on the power transformer the two windings "1,2,3" and "4,5,6" (rated at 1.5 and 2.25 volts respectively) are connected in series. In operation, four volts are obtained from these two windings in series, and filament supply for V2 is thus made available. Care must be taken to see that the windings are connected so that they aid and not oppose one another. In the transformer used the connection of terminal "1" to terminal "4" and the use of terminals "3 and 6" for the filament supply was correct. It is possible, however, that other transformers of the same make will have to be arranged in the opposite manner. If a meter is not available with which to check the voltage, the leads from the terminals may be connected roughly, first one way and then the other, in order to determine the connection which gives the better operation. This would be done after the amplifier is in other respects complete.

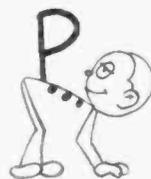
The plate of V2 connects with the "P" terminal of the primary of the "push-pull" transformer T3, while its "B plus" terminal is connected with the high-voltage supply system. The two "G" terminals of the centre-tapped secondary of T3 connect with the grids of the two "super-power" valves V3 and V4. The centre-tap of this secondary runs to R6, which serves in a similar fashion to R5 in providing grid bias. C2, the condenser across it, serves the same purpose as C1.

The valves V3 and V4 are the Osram F625A type, with a filament rating of 6 volts. There is no winding rated at this voltage on the power transformer, but terminals "10,11,12" at the low current required for the two valves are capable of putting out almost six volts when the primary transformer tapplings are adjusted to give four volts from "1,3" and "4,6" in series. The terminal "11" on the transformer is the centre-tap connection



Even a quaver quivers when it is distorted, as it frequently is on a poor receiver. Quality and completeness is a feature of this amplifier.

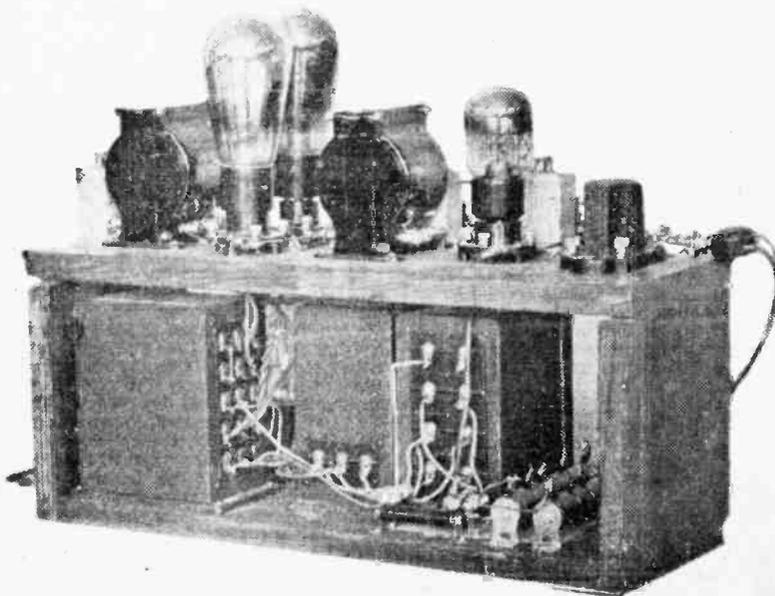
The plates of V3 and V4 connect to the two "P" terminals of the centre-tapped choke "Ch.1." which is actually the primary winding of a Ferranti type OP9c output transformer. When using the amplifier with an ordinary magnetic type of cone speaker the secondary of this transformer is used to feed it. When a moving-coil speaker is used, in which an output transformer is already provided, the primary winding serves as a double choke in the plate circuits, the output transformer in the speaker being fed directly from the plates of the valves through the stopping condenser C3. This output device problem is, however, quite a complex one, and a great many considerations are involved about which we hope to write at some length in the future. For the moment we can say that the centre-tapped primary may be used successfully as a choke when there is an output transformer in the speaker, while the OP9c may be used as a transformer when it is to feed a magnetic type cone. A further possible arrangement is the use of the primary as a choke, with the magnetic type of speaker connected just as the primary of the moving-coil transformer would be connected. If by any chance the moving-coil speaker used has no transformer built into it, a special high ratio output transformer will be necessary in place of the OP9c.



This has no reference to the "P" terminals mentioned in this column, but merely to the soft (plano) passages which come through the dynamic with perfect balance.

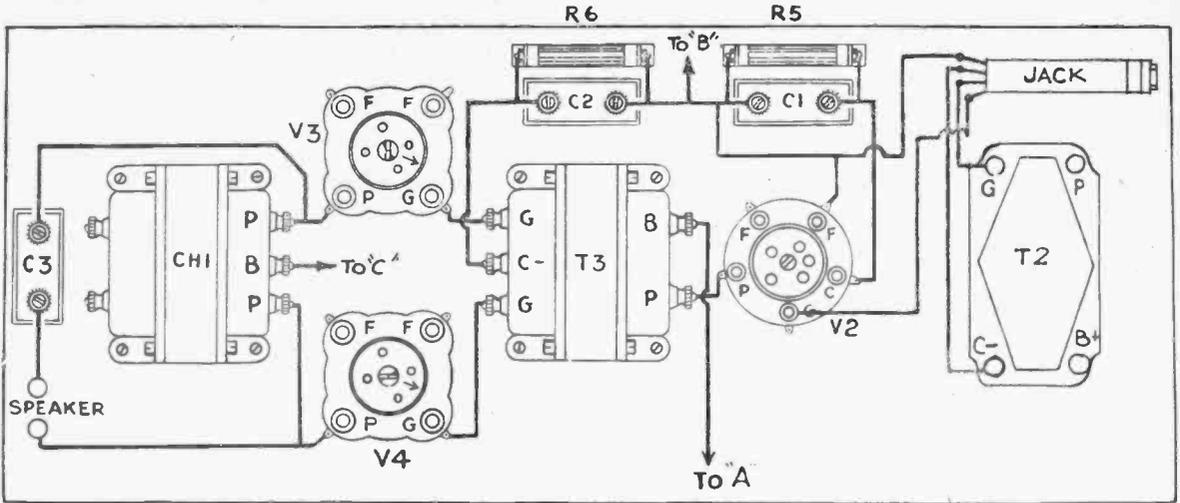
The positive plate supply lead for V3 and V4 connects with the centre-tap of Ch.1. In the power supply unit it connects with the centre-tap of the double filter choke, and not with the output end of the filter choke, as is usually the case. The idea of this arrangement is to eliminate the voltage drop in the second section of the filter choke, and also to separate the plate supply of the first and second stages, as far as audio frequencies are concerned. The filtering of the first section of the choke and the first two condenser sections is quite sufficient for the supply to the output valves, since any remaining ripple is not subject to amplification, as would be the case in the plate supply to the first amplifier. The arrangement is very useful in aiding in the elimination of "motor-boating" and audio frequency regeneration.

Returning to the input of the amplifier, we



Returning to the input of the amplifier, we

QUALITY MUSICAL REPRODUCTION



see that with the output of the pick-up plugged into the jack the secondary of the input transformer is disconnected. The output of the pick-up then feeds directly across the grid and cathode of V2. The two amplifier stages which follow serve to provide sufficient amplification for normal volume reproduction: in a fairly large room from "soft" records with the heavier records—such as those of dance bands—the volume control on the pick-up usually must be brought into play. That is, on the assumption that the pick-up is one of the types giving a high output. It is obviously possible that an extra valve would be required if one of the very low-output pick-ups were used.

When the plug from the pick-up is removed the secondary of the transformer is returned to its normal connection, and the detector were it connected to transformer primary could proceed to keep the amplifier busy with radio signals.

Turning now to the power supply (which was described in detail last week), we see that the power transformer, with its five secondary windings, is supplying the filament voltages for the amplifier valves, the filament supply for the rectifier valve, and the high voltage input to the rectifier valve plates. The output of the rectifier feeds into the double filter choke and the condenser block in the manner shown in the circuit diagram, the output for the final amplifier valves being obtained, as already mentioned, from terminal "2" of the choke unit. The output from the "3" terminal of the choke feeds through separate series resistors to the two separate voltage dividers. One of these serves to provide a variety of voltages for the detector in any radio receiver which may be used in conjunction with the amplifier, while the other divider provides voltages for the first audio amplifier and any radio frequency valves which may be used. Thus the complete unit is not only an amplifier but a plate

and filament supply system for any radio frequency amplifier and detector to which it may be attached.

Since the construction of the power supply unit was so fully detailed, we will not treat it again in this article. The only important change in the arrangement described last week is in the connections to the filament windings of the power transformer. These are made clear in the diagrams.

The amplifier proper is arranged on a board measuring 17 1/4 inches by 6 inches by 3/4-inch thick. It is supported from the baseboard by two end pieces measuring 6 by 7 by 3/4-inch thick. Wood screws are used to hold the elements of this structure together. The arrangement of the components, all of which are held to the board with wood screws, can be seen in the lay-out drawing. First there is the input transformer and the jack for the pick-up; then the first audio valve, with its bias resistor and by-pass condenser at the side. Following this is the push-pull audio

transformer with the bias resistor and condenser for the push-pull valves at its side. Still farther along are the power valves and the output transformer arranged for choke feed in connection with the condenser C3 at the extreme end of the board.

In this particular rig the wiring above the upper board is of 16 gauge solid covered wire, while the connections which run below to the power supply are of heavy rubber covered flexible. It should be understood that the use of flexible wire throughout would be no disadvantage, and that the wires may run all over each other without any serious consequences. In this respect the wiring of an audio-frequency amplifier differs from that of a radio-frequency amplifier.

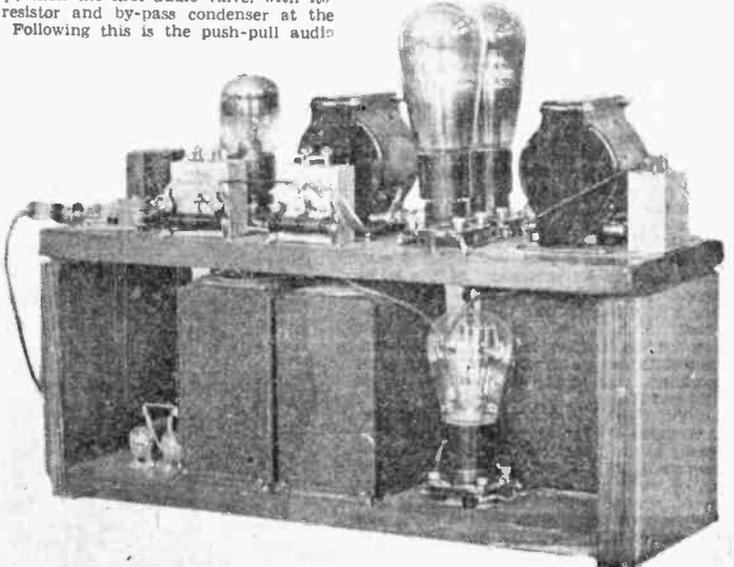
The completed outfit is a clumsy sort of contraption, but that does not appear to be a characteristic which influences its performance. The whole idea was to provide a simple and direct lay-out, but one which would enable the apparatus to be grouped in a reasonably small space. The scheme was to build a unit which could be fitted inside and at the bottom of a gramophone or radio cabinet.

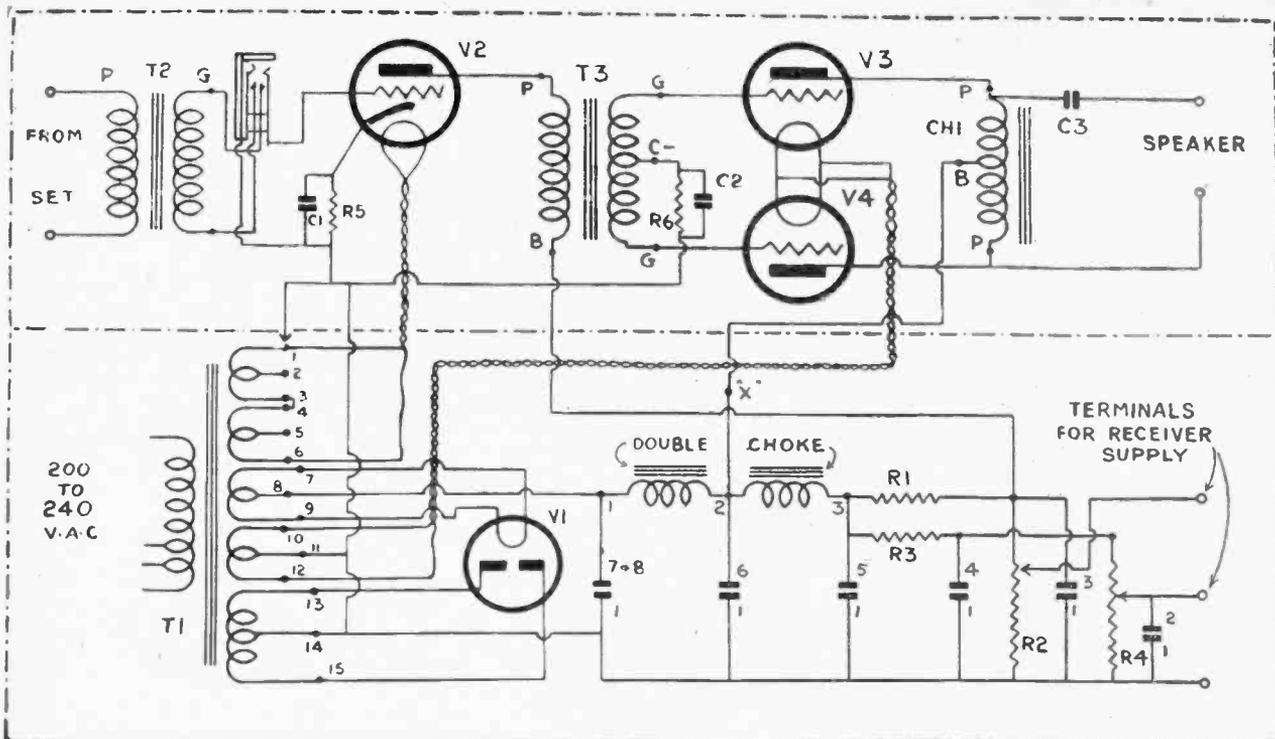


Just a minim—you've missed them frequently on bad amplifiers.



No need to strive to produce semi-braves properly on this big quality amplifier.





The circuit arrangement of the complete amplifier-power supply. The apparatus used in this particular assembly includes:—T1—Type 398C Pilot power transformer; type 396 Pilot double choke; type 398 Pilot condenser block. R2, R4—Two voltage dividers, Pilot, type 960. R1—One 8000 ohm Pilot fixed resistor. R6—One 450 ohm Pilot fixed resistor. R3—One 10,000 ohm Pilot fixed resistor. R5—One 1250 ohm Pilot fixed resistor; three UX type valve sockets; one UX socket. Pilot. T2—Philips audio frequency transformer. T3—Ferranti audio transformer. AF3 (C). CHI—Ferranti output transformer, OP 10 (C). C1, C2, C3—Three Hydra 1 mfd. condensers. V2, V3—Two Osram P825A valves. V5—One Philips E121 valve. V1—One Osram U5 rectifier valve.

net, where it could breathe freely without interfering with the radio frequency and detector, or merely the detector unit of a radio receiver located near the top of the cabinet.

When the apparatus has been completely assembled and wired it is first desirable to check the filament voltages. This cannot be done with the usual battery voltmeter, which will only read direct current. It requires the use of an A.C. type voltmeter. If it is quite impossible to get hold of a meter the amplifier can be run without checking the filament voltages, though the practice is not to be recommended. Fortunately, the ratings of both the amplifier filament windings are slightly lower than the ratings of the valves used.

If the filaments light satisfactorily, the next check is the plate current of the two amplifier stages. This check will demand a D.C. milliammeter reading up to 100 m.a., and preferably one on which a "double-scale" switch enables a current of 5 m.a. to be read comfortably. The plate current of the first valve should be approximately 5 m.a., and the second pair about 60 m.a.

With the meter still in the plate circuit of the push-pull valves (at the point on the circuit marked "X"), the pick-up should now be connected, and a loud record played with a loud needle. No movement of the milliammeter needle should be seen. Should it move it is indication that the grid bias is incorrect. This is unlikely if the constants given for the resistors have been duplicated. The trouble can be corrected, of course, after experiment with different resistance values at R5 and R6.

At this stage the builder of the amplifier is permitted to take a long breath and consciously assure himself that even if his subconscious brain will not be convinced of the fact, he really has an amplifier which is capable of genuine musical reproduction if only the apparatus responsible for the input and the speaker which collects the output are satisfactory.

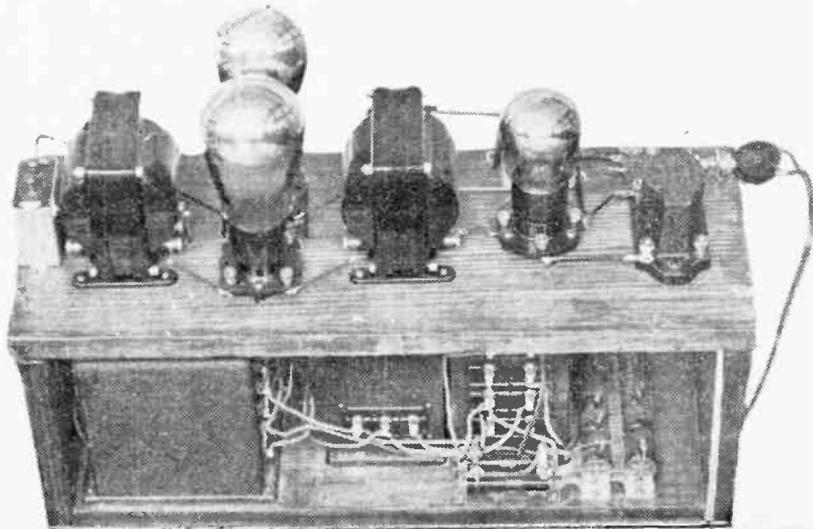
With this amplified two pick-ups were used

during the experimental work done on them. They were the Philips and the Webster. Both of them proved highly satisfactory. This does not mean, of course, that these are the only pick-ups which will work well with the amplifier. Several other excellent types are available.

The speakers used alternatively during the test work were the new R.C.A. Model 106, the Magnavox, and the Philips. We suggest that disappointing results will be had with this or any similar amplifier unless the speaker is one of high quality. Speakers on which a great deal of development and engineering work have been done are certain to be expensive. Even the most expensive of them, however, is well worth the money.

Is Others See Us

MR. NORMAN PEARCE, "lecturer, globe trotter, and poet," gave a lecture from W.P.C.H. America, on "Australia, the Curiosity Shop of the World." Australia is "the land where the birds have no songs; the flowers have no scent; animals lay eggs and hatch and suckle their young. The hot winds blow from the north. The land where stone floats and wood sinks; and swans are black; the lakes are salty, and the rivers flow inland." He journeyed "far into the interior of the continent—where savages roam the wild eucalyptus forests and desert lands"; he watched "their corroborees"; he saw them "in their tribal fights and secret ceremonies." In fact, when we have learnt all there is to learn about Australia in Australia we shall go over to America and take a post-graduate course.



RADIOKES and the Standard A.C. 4.

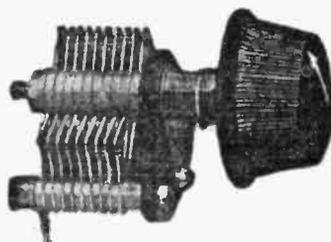
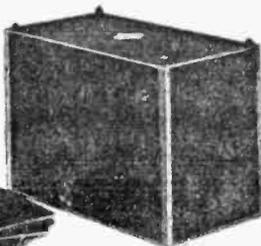
This excellent modern electric receiver depends for a great measure of its success upon the employment of RADIOKES quality components.

The technical editor of this paper, Mr. Ross A. Hull, realises the value of high-grade apparatus, and consequently RADIOKES were his choice.

Below are shown several well-known RADIOKES lines which are incorporated in this splendid receiver, which, if properly constructed and housed in a RADIOKES metal cabinet, has a performance and appearance equal to a high-grade factory-built electric.



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Two RADIOKES collapsible box shields stabilize the Radio-frequency operation of the standard A.C.4.

These shields are accurately constructed from black crystalline finished heavy gauge aluminium, with plated corner posts.

The RF Wiring is completed, THEN this convenient shield is assembled, thus offering maximum ease of assembly and wiring.

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RADIOKES Midget Condensers are made in several sizes, sufficient to cover most requirements.

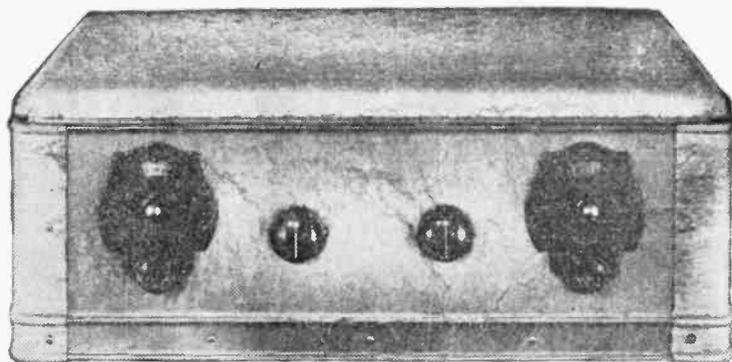
A seven-plate model has been chosen as a reaction control for this receiver, because of the accuracy of construction.

Ask your dealer to show one of these condensers, feel its velvety movement, study the precision of its workmanship, and notice the high-grade finish—RADIOKES thereafter will be your choice.

PRICES FROM 4/3 TO 8/6 EACH.

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have been chosen as the heart of this truly selective and sensitive receiver. These coils represent the latest development in Radio Frequency Coupling for the New Screen Grid Valves. Rugged, permanent, accurate, and highly finished. PRICE, 13/9 EACH.



Give your standard A.C. Four the cabinet it richly deserves. A good receiver is made better as a result of housing in a handsome metal cabinet. Besides being beautiful and enduring, this cabinet will shield unwanted signals from being picked up on your exposed set wiring.

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DEPENDABLE RADIO

"A.C." 4 POWER PACK

Below is a list of parts for building the A.C. Power Pack described in this issue

Parts required for "Pilot" type Power Supply

	£	s	d
ONE POWER TRANSFORMER, TYPE No.398-C (PILOT)	2	17	6
ONE DOUBLE CHOKE, COIL TYPE, No. 395 (PILOT)	2	2	6
ONE FILTER CONDENSER, BLOCK TYPE, No. 396 (PILOT)	2	17	6
ONE 8,000 OR 10,000 OHM PILOT FIXED RESISTOR		6	6
ONE 10,000 OHM PILOT FIXED RESISTOR		6	6
TWO PILOT VOLTAGE DIVIDERS, TYPE No. 960	17		6
ONE PILOT UX TYPE VALVE SOCKET		3	0
ONE MARCONI-OSRAM TYPE U5 RECTIFIER VALVE	1	5	0

Parts required for Ferranti type Power Supply:

	£	s	d
ONE HIGH VOLTAGE TRANSFORMER, TYPE EM1	3	15	0
ONE TYPE R80 METAL RECTIFIER	7	8	6
ONE TYPE B1 FILTER CHOKE	2	0	0
ONE TYPE B2 FILTER CHOKE	2	0	0
THREE TYPE C2 FILTER CONDENSERS, 2MF		19	6
FOUR TYPE C1 FILTER CONDENSERS, 2MF	1	12	0
ONE 8,000 OHM FIXED RESISTOR WITH CLIPS		7	6
ONE 15,000 OHM FIXED RESISTOR WITH CLIPS		7	6
ONE 40,000 OHM FIXED RESISTOR WITH CLIPS		7	6
THREE 25,000 OHM FIXED RESISTORS WITH CLIPS	1	2	6
ONE METAL SAFETY BOX	1	7	0

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RADIO PROFICIENCY

This week, in the third article of the series, we continue with practical examples of the use of Ohm's Law, and discuss the method of calculating current when it is carried by a number of resistors. The terms watt, "squared," kilowatt, joule, watt hour, kilowatt hour, Board of Trade unit, and "candlepower" are described. Metallic filament lamps, gas-filled lamps, and carbon filament lamps are also treated.

CONTINUING our lesson on practical calculations, using Ohm's Law, the reader is referred to the circuit diagram appearing last week. It was found that the current flowing round the circuit was two amperes by the formula I equals E over R , where E equals 10 volts, and R equals 3 ohms, plus the internal resistance of the battery—i.e. two ohms.

Note that the E.M.F. and resistance remain constant, and will have the same value in all parts of the circuit. This will always be the case as long as there is only one path for the current. There will, however, be a voltage drop along the circuit owing to the resistor. Through the resistance the voltage drop will be E equals IR —i.e., 7 equals 2×3 , i.e., 6 volts. A voltmeter connected across the resistance when the resistance is across the battery would read 6 volts. With the resistor removed the battery reading would be 10 volts. Again, to drive 2 amperes through the resistance of the battery a voltage of E equals IR , equals 2×2 , equals 4 volts, will be required, and the total voltage required to drive 2 amperes through the whole circuit will be 6 plus 4 volts, equals 10 volts. Thus, it will be noticed that Ohm's Law can be applied to the whole of a circuit, or to any part of it.

If a number of resistances are connected in parallel and a current passed through these resistances the currents will not be equal as is the case with a single circuit. If the current is passed through, say, three resistors that current will divide into values depending on the value of each separate resistance, the larger resistance carrying a smaller current, and the smaller resistance carrying a large current. Yet the sum of the resulting currents will be equal to the input.

In Fig. 1 will be seen a circuit of three resistances connected in parallel. The first has a resistance of 5 ohms, the second 8 ohms, and the third 10 ohms. If a current of 50 amperes is flowing at point A the same amount of current will be available at B. That means that the resulting current is equal to current through first resistor, plus current through second resistor, plus current through third resistor, or 7 plus 12 , plus 13 (where I equals current, and 1, 2, and 3 represent resistances 1, 2, and 3).

Let the voltage applied across AB equal 40 volts. Then the first resistor will carry (I equals E over R) 40 over 5 amps., equals 8 amperes; the second resistor will carry 5 amps. (40 over 8); and the third resistor will carry 40 over 10 , or 4 amps.; a total current of 23 amperes.

When a number of similar resistances are joined in parallel their total resistance is found by dividing the resistance of one by the number of resistances in parallel. It is obvious that the answer will give a resistance smaller than the resistance of one lamp. It is similar to opening up a number of gates in a sports ground in order that a



FIG. 1.

number of people will make their exit easier. Thus, if 200 lamps, each of 500 ohms resistance, were connected across the 240-volt mains, the total resistance of the lamps would be 200 over 500, equals 2.5 ohms. The total current taken would equal 240 over 2.5 (since I equals E over R), i.e., 96 amps. The current in each lamp would be 96 over 200 equals 12 over 25 amps., equals .48 amperes. Neglecting the voltage drop in the mains each lamp gets full pressure of the mains. Thus, if one lamp is burned out the rest are not affected. If two of the lamps were to be connected in series across the 240-volt mains the voltage drop in each would be 120 volts, and the current in each would be 240 over 500, plus 500 (since double the resistance has to be overcome). The current would, therefore, be .24 amperes. In this case each lamp would be burning at half brilliancy, and if one lamp should burn out the other lamp would not light, as the lamps are connected in series.

The unit of electrical power is the Watt, which is that power developed when one volt produces a current flow of one ampere. From this it will be seen that power equals 1 volt x 1 coulomb per second; or 1 volt x 1 ampere; or one watt. Watts equal volts x amps., i.e. $E \times I$, or, as is usually written, EI . E equals $I \times R$, or IR . Hence, watts equal $IR \times I$, equals I , squared times R . The term "squared" (usually denoted by a small 2 at the head of the symbol) denotes that the value must be multiplied by itself once. When the figure 3 appears at the head of the symbol or figure it must be "cubed"—i.e., multiplied by itself three times. Now I equals E over R . Therefore, watts will also equal $E \times E$ over R , or E squared over R .

A larger unit of power is the kilowatt (kw.), which is 1000 watts.

It should be clearly understood what is

meant by such expressions as 10 kw., 100-volt "dynamo." This means that the dynamo will supply 10 kw. (equals 10,000 watts) at 100 volts (equals 10,000 over 100, or 100 amps.), without being overloaded when rotated at its designed speed, usually measured in revolutions per second, or revolutions per minute—i.e. r.p.s., or r.p.m.

The term, "40 watt 240-volt lamp," denotes a lamp which requires 40 over 2400, equals 1/6 amp. at 240 volts, to keep it burning at its normal brilliancy.

The idea that I squared times R represents heat, energy, or even force, is very prevalent. This is quite wrong. The symbols represent the rate at which light and heat energy are produced in the lamp, or the rate at which mechanical energy is turned out by the motor or the rate at which a load is raised.

A cyclist travels at ten miles per hour. This does not tell us the distance he covers, but simply the rate at which he covers it. To know the distance traversed we must know the length of time for which he rides. Distance is equivalent to rate x time, equals 10 miles x 2 hours (length of time he is riding), which gives us 20 miles. Similarly, when a certain power is employed for a certain length of time, an amount of energy, in various forms, is available.

The unit of electrical energy is the Joule, and is the amount of energy produced by, or required to produce, a power of one watt for one second. Therefore, one joule equals one watt per second. Energy equals power x time equals EI (or I squared times R) watts x t seconds, or EIt joules, or I squared times R times t joules. Thus, energy equals $E \times I \times t$. If unity be placed in each of these symbols—i.e., 1 volt x 1 ampere, x 1 second, we have the equivalent of one joule.

Still larger units than the joule are the watt-hour and the kilowatt hour. The latter is known as the B.O.T. (Board of Trade Unit). One watt-hour is one watt for one hour, or 1 watt 1 hour, or one joule multiplied by 3600 seconds, or 3600 joules. One kw. hour equals 3,600,000 joules.

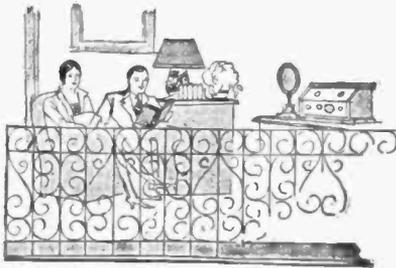
Incandescent lamps are rated, by their voltage, wattage, and candlepower.

There are three types of lamps in common use—metallic filament, gas-filled, and carbon filament. The carbon filament lamp is gradually becoming obsolete. Though it gives a very bright light it is very heavy on current, and soon blackens, owing to deposition of carbon. Each type is referred to as consuming so many "watts per candlepower." Metallic filament lamps vary from 1 to 2 watts per c.p.; gas-filled lamps take 1/2 watt per c.p.; carbon lamps take 3.5 to 4 watts per c.p. The two former consume less power to give the same amount of light, and hence are more efficient.

For general lighting purposes metallic filament lamps are preferable, but for accumulator charging on a small scale, where lamps in parallel are used to regulate the charging current, carbon lamps are preferable, as they pass more current, and fewer are required.

NEXT WEEK

In our next issue will be described a tuner and detector unit, which can be used in conjunction with the amplifier described this week. Constructors building the amplifier may then possess a complete receiver.



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CURVES AHEAD

The Experimenters' Department of Technical Progress
Conducted by Ross A. Hull M.I.R.E.



Pick-up Performance

SINCE the advent of the electrical gramophone pick-up there has been wide discussion concerning the various types produced. Among reproduction enthusiasts one hears constant argument and debate concerning the relative merits of different makes. Unfortunately, little accurate measurement work has been done in the comparison of pick-up performance, and experimenters have had to adopt the rather doubtful procedure of deciding on the merit of the instruments merely by listening to them in operation. The only comparative performance data which we have run across is contained in an article in March 6, 1929, issue of the "Wireless

Pick-up Test Results

Make	Volts (R.M.S.)		
	250 Cycles	1000 Cycles	2000 Cycles
Amplion	0.1	0.1	0.15
B.T.H. (Clitophone)	0.85	0.4	0.55
Blue Spot	0.85	0.4	0.25
Brown No. 2	1.4	0.74	1.6
Brown No. 3	0.15	0.2	0.35
Burndept	0.1	0.05	0.05
Celestion	0.38	0.28	0.36
Denstone	0.32	0.2	1.1
Edison Bell	0.95	0.4	0.7
G.E.C.	0.35	0.25	0.85
Igranlic	0.56	0.25	0.6
Igranlic (Tone Arm Model)	0.8	0.4	0.85
Loewe	0.15	0.05	0.05
Magnum	0.4	1.23	0.25
Markham	0.6	0.3	0.15
Philips	2.7	1.53	1.04
R.I. and Varley	0.3	0.35	—
Vasshof	1.09	0.6	0.85
Webster	1.5	0.75	0.6

World." This data, unfortunately, covers only the representative English and Continental pick-ups and one American type. Nevertheless, it is of such interest and value that we are reprinting it.

The figures were obtained, as is explained in the article mentioned, with the aid of constant frequency, constant output records. In these records the amplitude of the groove is inversely proportional to the frequency, and the A.C. output is therefore constant. The output voltage was measured with apparatus capable of reading down to 0.05 volts R.M.S. This, however, was found to be of insufficient sensitivity to read the output of some of the pick-ups at the higher frequencies. In the instances where the output was too small to be measured a dash is used in the table. The omission of the figure does not indicate that there was no output, but merely that the output could not be measured with the apparatus used.

As can be seen from the table, the number of dashes and the general tapering of most of the outputs towards the higher frequencies is quite striking. It seems possible that in most of the instruments this falling characteristic was intentional, the idea being to produce a pick-up which would eliminate some of the surface noise without the use of a separate "scratch filter." In the opinion of the writer, however, this elimination of the high frequencies has been carried to an extreme in the attempt to produce pick-ups (and for that matter, speakers) which would make a "pleasant" first impression. Already a trend is evidenced towards the production of reproducing apparatus which has a reasonably flat characteristic all the way up to at least 8000 cycles. With this equipment surface noise is more pronounced, but the "soaginess" of reproduction with the earlier apparatus is happily missing.

How Much Output?

THERE exists great difference of opinion on the matter of the power output required to produce a satisfactory "level" in musical reproduction for the home. In this country little actual quantitative measurement work has been done in the endeavor to come to some decision, and on account of this fact the investigations of engineers overseas might well be given serious study. During the next year or so, when it will be possible to lift radio reception in Australia to the status of musical reproduction, receiver manufacturers must come to realize that a much greater power output is necessary than is usually provided for in the present-day receiver. We intend to hammer on this point continually, and to present as data concerning it whenever it becomes available. For the moment we will have to be content to print the observations of a well-known American engineer—R. J. Kryter, who in RADIO BROADCAST, gives some details of tests carried out in the attempt to decide on the actual power output required to produce levels which would be described by the average listener as "low," "normal," "loud," or "very loud." Unfortunately, the tests were made before the moving-coil speaker came into general use, and it is certain that his figures would be definitely on the low side when such a speaker was being operated. Mr. Kryter's remarks follow:

"The music was supplied both by phonograph and radio, and included concert orchestra, jazz orchestra, military band, various trios, violin and piano, solo piano, singing voices from bass to soprano, and speaking voice. The loud speakers included short-horn, orthophonic-horn, magnetic-cone, and dynamic-cone types. The input to the loud speakers was supplied by a high-quality push-pull 210-type amplifier. The listening tests

were made by persons of widely differing tastes and musical accomplishments.

"The results of these tests were as follows:—

(1) "Low" volume was produced with an average signal voltage of 8 volts and an average current of 1.7 mA., corresponding to an output of 14 milli-volt-amperes

(2) "Normal" volume was produced with 18 volts, and 3.8 mA., or 68 milli-volt-amperes.

(3) "Loud" music was produced by 40 volts and 10 mA., or 400 milli-volt-amperes.

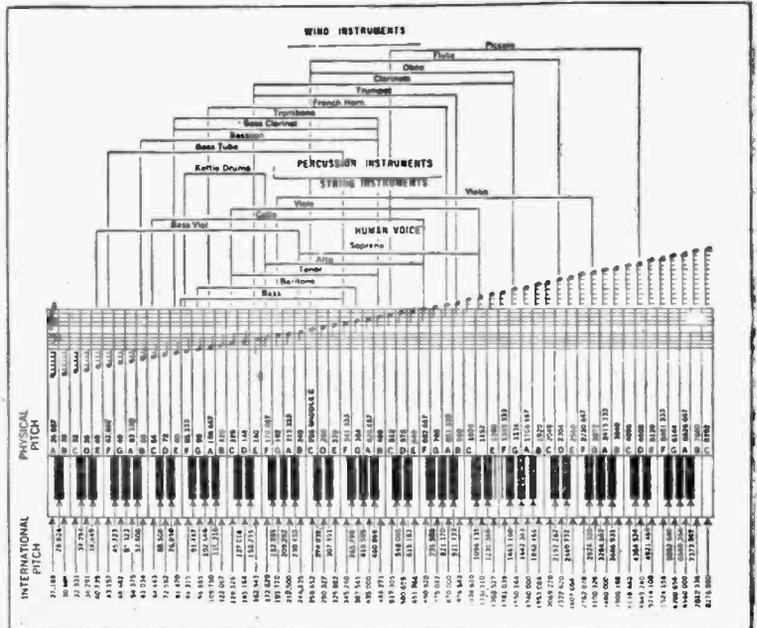
(4) "Very loud" music was produced by 120 volts and 24 mA., or 2900 milli-volt-amperes.

(5) The extreme limits were: Minimum 0.1 volt and 0.5 mA.; maximum, 195 volts and 55 mA.; maximum power ratio, 53,000. It is of interest to note that both the minimum and maximum values occurred in concert orchestra music, although the maxima were closely approached by the piano.

(6) The "average frequency" of music and speech as determined by correlating the average impedance calculated from the above figures with the impedance curves of the loud speaker units was 380 cycles.

(7) The impedance of the various loud speakers averaged about 3000 ohms at 50 cycles, 7200 ohms at 400 cycles, 13,000 ohms at 1000 cycles, and 25,000 ohms at 3200 cycles, ranging all the way from 1500 to 60,000 ohms in the 50-5000 cycles band.

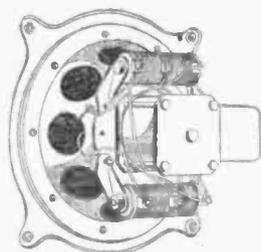
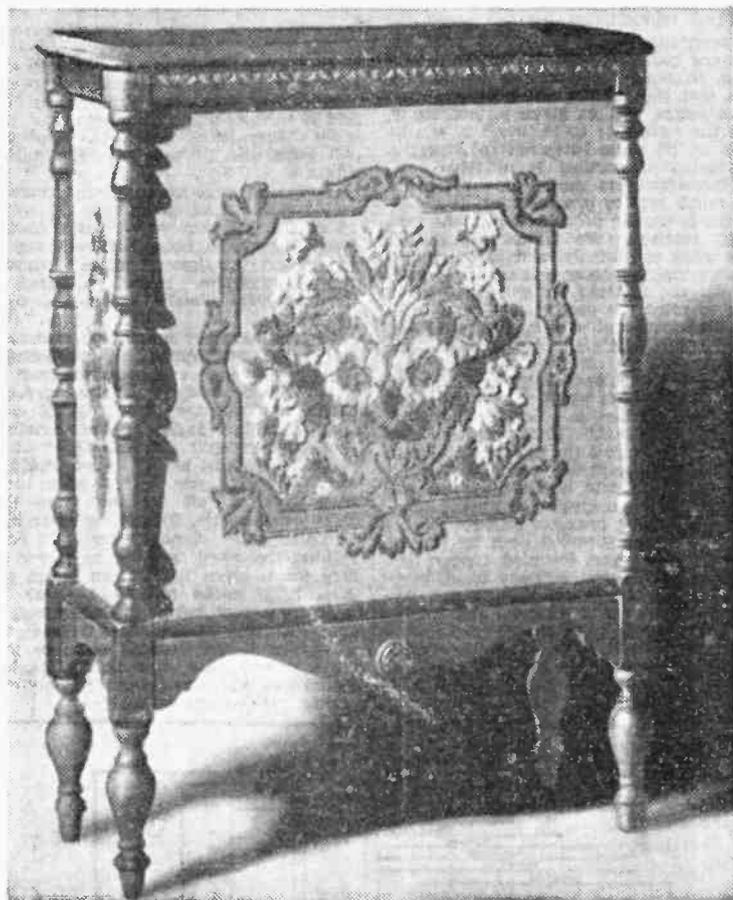
"This data demonstrates in startling fashion the great increase in power necessary for a given increase in sound output. Also, it is to be noted that peak values were frequently twice and sometimes three times as great as the above average values. Therefore, if over-loading is to be avoided on sustained bass passages or on sudden fortissimos, an output stage capable of supplying 1 to 2 watts is justified."



Experimenters interested in musical reproduction will find this chart of the relation between the musical scale and the piano keyboard of considerable value.

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OPERATING FILAMENTS FROM A.C.

HUM TROUBLES—SOME ATTEMPTS AT EXPLAINING THEIR CAUSE

(By R.W.M.)

IN "Proving Radio" recently a prize of a Precise 4-1 audio transformer was offered for the best explanation of why A.C. could not be used to the best advantage on D.C. valves. The argument is, of course, that the object of the filament is merely to supply electrons, which are drawn to the plate (the latter, being at a positive potential). It is understood that by passing a current through the filament wire it heats up and emits electrons. Using A.C. as the source of filament supply, the filament heats up just the same, and still emits electrons, but a hum results. Why?

Many answers were received. They differed considerably. One reader sent three pages crammed full of drawings of alternators and dynamos. Others were brief, and to the point. But none was correct. Apparently no one noticed the explanation of the effect given in the "Curves Ahead" section of the July 5 issue of WIRELESS WEEKLY.

A few of the "explanations" follow:—

"In Nos. 10 and 12, 'Proving Radio,' it is proved that A.C. flows in cycles, the half-cycle above zero being positive, and that below being negative. In No. 15 it is proved that no electrons can flow from the plate. If A.C. is used on all D.C. valves, the plates in the valves will be alternately positive and negative, the electrons flowing and ceasing correspondingly, thus a series of shocks are delivered to the plate and filament, making them vibrate and causing sound waves ('Proving Radio,' No. 12), which are amplified by transformers, etc., and a loud hum is heard."

Remarks: You are right in one thing—that is, "A loud hum is heard." You say the plates of the valves will be alternately positive and negative. You are wrong, since we are talking of using A.C. on the filament only. The polarity of the plate would not be affected by the filament, since the purpose of the latter is merely to supply electrons.

The next was a little better. It read:—"When using D.C. valves, the grid return or C plus, and plate return, or B negative, are connected to the negative side of the filament circuit, and in some cases to the positive side. Either side of a D.C. filament circuit is at a steady voltage, so that such a return is satisfactory. With A.C. applied to the D.C. valves, the change of voltage on the grid return would cause a continually changing grid bias, while for the plate return it would cause a continually varying plate voltage, and a loud hum is heard in the speaker, because of the changing factors in operation."

The next reads:—"A.C., unlike D.C., flows in cycles, i.e., it does not flow in a direct pulsating

form, but frequently changes its direction. The ordinary dull emitter triode valve has a very slender filament which (when A.C. is applied to it) responds to the various fluctuations typical of A.C. and, naturally, a pronounced hum is heard in the 'phones or speaker. However, by merely replacing the filament of an ordinary triode valve with a larger one, the hum would not be entirely eliminated, since the changeable nature of the A.C. would not allow the filament to retain an even temperature. (This applies to the detector valve only.) In order to overcome this inconvenience, the Indirectly Heated Cathode valve was designed in this valve, the filament has been insulated and a tungsten wire attached to this insulation, thus making electrical contact with the filament, but not mechanical contact. However, the insulation becomes heated, and does not prevent the cathode (tungsten wire) from heating and emitting electrons. This heater element, after being heated by the unrectified A.C., retains the incandescent temperature typical of the filaments of D.C. valves."

REMARKS: Though you are correct in some points, you are wrong in others. It is a fact that the varying temperature of the filament has something to do with the hum, but this happens to be the last, and least important factor involved. The Cathode is NOT the filament in an A.C. valve. Further the cathode is not insulation, and the "insulation" does not become heated. The cathode is the additional element placed in the valve. The filament, on receiving an electric current through it, heats up, and does emit electrons. The cathode heats up and emits electrons independent of those given off the filament.

And the next: "Since an alternating voltage passes through zero twice in each cycle, this means that the filament temperature, and therefore the flow of electrons emitted by the filament, must be also at zero twice during each cycle. Because the electron emitted by the filament cause the current to flow in the plate circuit of the valve, the plate current must therefore rise and fall twice during each cycle. The plate current would not be quite zero, because the filament would not lose all its heat during the brief time the voltage was at zero. This means that the current in all the valves' plate circuits would be pulsating at 120 times per second if the frequency of the filament supply was 60 cycles per second. Therefore the plate variations would be amplified by the valves and transformers or R.C.C.

units, so that a nasty hum of 120 cycles would be produced in the loud-speaker

REMARKS: You have made the same error as the previous writer. Your reasoning is good, but the fluctuating filament voltage is so small as to be of little account. Further, it is obvious that you are under the impression that (to use your own words): "The filament temperature and therefore the electrons emitted by it must also be zero twice during each cycle." This is where you are wrong. The filament temperature is not actually at zero twice during each cycle. The filament temperature, and consequently the filament emission, is fairly constant. The filament retains a certain amount of heat for a split fraction of a second after the amplitude of one half-cycle has decreased, and is brought to maximum again when the cycle is completed (another split fraction of a second), so that the temperature remains fairly constant, and is therefore NOT at zero, as you suggest.

Let us have a little talk about this "hum problem." It is a very interesting subject, particularly in view of the growing popularity of all-electric receivers, and eliminators, etc.

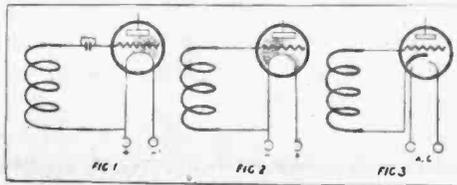
Business Efficiency

THE first five lectures of the series of business efficiency talks from 2BL Station at 2.30 p.m. on Mondays are being given by members of the staff of the Australian Institute of Industrial Psychology. Listeners will thus have an opportunity to hear something of the valuable work which is being done here in Australia in giving both to parents and to industrialists scientific guidance in all problems that relate to vocations or to general efficiency.

The Institute is under the direction of Dr. A. L. Martin, of the Sydney University Psychology Department, and is situated in "Manufacturers' House," 26 O'Connell Street, Sydney. Its work, which is so universally beneficial, is not yet generally known.

Few people know, too, that the work is being done in the true spirit of science by a group of workers who are not materially concerned with the financial side of the venture. The ultimate object of the Institute is research and most people will admit the need for research such as can be carried out by the carefully-trained scientific workers of the Institute into problems of unemployment, fatigue, waste, occupational diseases, and other problems that are facing the community to-day. There are practically no concerns in Australia that do not need research into their own particular troubles and practically no concerns of a size to maintain their own research staff. The Institute is to help with the knowledge of the Universities behind it, trained investigators, and a disinterested standpoint; all of which guarantee the earnestness, sincerity, and thoroughness of its work.

Mr. William Bell, the speaker for August 5 and 19, has just completed his University course in Psychology and is now assistant to Dr. Martin in the scientific guidance and investigation work. He has a brilliant University record, with many distinctions to his credit in Economics as well as in Psychology. Though still young he has many interesting anecdotes to tell of his experiences in this fascinating field.



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Flying Kites

Not the political kind, but the real thing which can afford the owner immense fun and which provides an excellent grounding in model aeronautics.

By NORMAN LYONS

EVERY boy finds delight in sports of the air, just as he does in sports like cricket, tennis, rowing, and swimming. The serial sport de luxe is, of course, making and flying model aeroplanes, but the lesser ones, such as kite-flying, boomerang-throwing, flying tops, etc., are instructive and enjoyable.

Kites are believed to have been invented by the Chinese thousands of years ago. In the years since then many interesting kinds have been developed, and to-day the Chinese fly kites of weird and wondrous shapes as a feature of their holidays. Kites are so called after the bird of that name, which has long been noted for its high soaring flights.

The simplest kite is the square shape formed by two sticks of equal length crossed at right angles in the centre, surrounded by an outline of string, and covered with light paper. Benjamin Franklin used such a kite in his famous lightning experiment, but his was covered with a silk handkerchief, as it was flown during rain. Such a kite, or others of single flat surface, require a tail, which steadies the flight, but, of course, adds weight, which holds the kite down somewhat.

Fig. 1 shows a three-stick kite which may be made flat and flown with a tail, or, if curved like the Hargrave kite, no tail is necessary. A kite tail is made by knotting pieces of paper or cloth about 6 inches square in a string, a foot apart. The length of the tail will depend upon the amount of balance required and the wind velocity; it is determined by experiment, starting with, say, 20 feet for a 3-foot kite.

Nearly any flat surface or combination of surfaces can be made to fly as a kite, by using the correct bridle and having the surfaces in proper relation and balance, using a tail if necessary.

Box Kites

The box kite was invented about 1895 by Lawrence Hargrave, an Australian, and a world pioneer in aeronautics. In the desire to secure forms which were stable when in the air, he devised cell-like structures of various shapes; some were cylindrical, some square, some rectangular, etc. Many of his devices were flown as kites, others were supplied with power. The box kite is called the Hargrave kite, after its designer.

To make a good kite (see Figure 2) obtain the following lengths of well-seasoned,

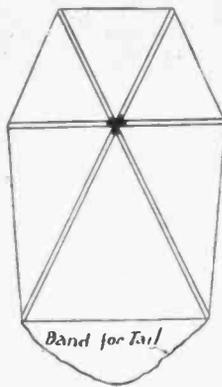


FIG. 1 Three-stick Kite

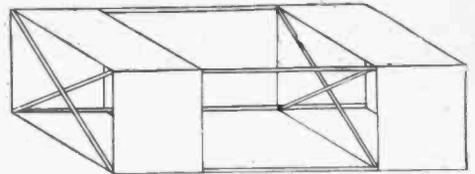


FIG. 2

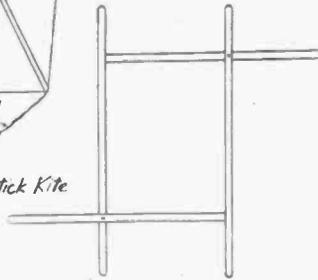


FIG. 4

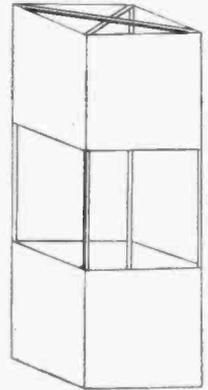


FIG. 3

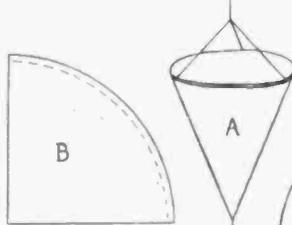


FIG 5

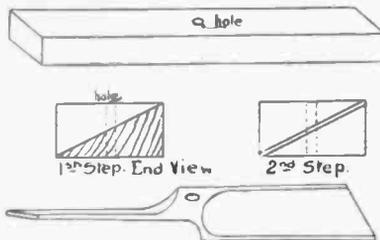
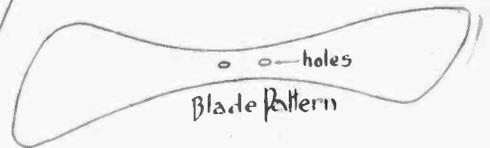


FIG. 6 All Carved ready for Stick.

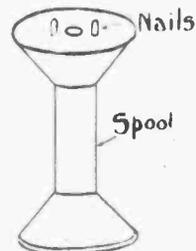


FIG. 7

strong, light, straight wood, 5-16ths of an inch square:—

- 4 pieces 36 inches in length.
- 8 pieces 24 inches in length.
- 8 pieces 12 inches in length.
- 4 pieces 27 inches in length.

Using two each of the 36 and 24 inch pieces, form two rectangles, making the joints with small nails and a strong adhesive. In each rectangle the shorter pieces should be between the long pieces. Next, 9 inches from each end fasten a 24-inch piece. Join these two frames with the 12-inch pieces attached where the 24-inch pieces intercept the longer ones. Brace this frame by means of the 27-inch pieces, putting them diagonally in the cells at each end, so that, looking from the end, they appear as an "X." They are fastened by cutting V-slots in the ends to fit the long strips, glueing and nailing them in place. The joints should be slightly offset from the right-angled ones, to keep from weakening the wood with too many nail holes in one place.

The cells at each end are now covered with paper or cloth. If the latter is used it should be China silk, cambric, or other light material. It is attached by glueing, stretching it

smoothly, and after it is dry painting with a thin solution of starch to fill the mesh and make it more airtight. The bridle is a string 50 inches in length attached on each side at the bottom of the upper cell. The kite string is fastened to it at the centre.

A box kite which is square-shaped at the ends (Fig. 3) can be made from four 36-inch pieces and sixteen 12-inch pieces, with four diagonals for bracing. The cells at each end are a foot square and a foot in length. The bridle is fastened at the top and bottom of one stick, and the kite string is fastened opposite the bottom of the upper cell. Box kites require no tails; they fly steadily and at high elevations.

Any pleasant, breezy day will do for kite flying. Light but strong string must be used; the lighter the string the less load the kite has to carry. Huge kites are flown with wire, such as piano wire. The string can best be handled from a reel. Fig. 4 shows the simplest form, made of four sticks and revolved by rotating the hands as though they were feet on a bicycle. To launch the kite, have an assistant hold the kite in the air facing the wind, with the tail, if any, coiled at his feet, so it will pay out without tangling. Walk about 50 feet away from the kite, into the

wind, paying out string as you go, then run with the kite that your assistant has released as he felt the string tug at it. Continue to unreel string as you run; soon you can stop and the kite will keep its elevation, gaining more as additional string is unwound. The height it attains will depend on its size, length and weight of string, and the wind velocity. Records of the Weather Bureau show that kites have been elevated nearly five miles.

If you are flying a kite that requires a tail, the usual rag or paper tail should be about 10 or 15 times the length of the kite. A much better tail is the "jelly-bag" variety, for it is not only less tedious to make, but not so liable to tangle. It merely consists of a series of cloth pockets (see Fig. 5A), strung together a yard or so apart. For a 3ft. kite their diameters need not be more than 4in. To make them, shape a piece of calico (or tough paper will do) as at Fig. 5B, making the length of the curved side, in this case, 12in. Form a hem along this, then stitch the straight edges together, and, having run a piece of split cane or wire through the hem to keep the bag distended, turn the latter inside-out and attach three suspending cords, which knot together as shown.

A great advantage possessed by this form of tail is that it admits of conveniently increasing or decreasing its weight by removing or adding a few of the "jelly-bags" to suit the varying strength of the wind and the size of the kite. Moreover, the bags will stow neatly in a "nest."

FLYING TOPS.

These little devices are in reality helicopters, or vertically ascending aircraft. They are easily made, and serve not only for amusement, but also as an introduction to propeller carving. Figure 6 shows how one type is made.

Secure a block of clear pine or similar wood 6 x 1 x 1 inches. Bore a quarter-inch hole in its centre, then cut each end from the upper left hand edge to the lower right-hand edge, carving nearly to the hub. Do the same on the other blade, then turn over and repeat, leaving the blades one-sixteenth of an inch in thickness. Put a needle or nail in the centre hole and balance the blades; if they do not balance, cut away on the heavy side until it evens up. Sandpaper smooth. Get a quarter-inch dowel stick and cut off a seven-inch length. Push this in the hole using a little glue. This completes the top. To launch the top hold it in the palm of the left hand with the fingers of the right. Then, by pushing forward the right hand and opening the hands, the top is spun and mounts high into the air.

Another flying top is illustrated in Fig. 7. It requires as material a jam tin, spool, pencil, piece of string, and two small nails. Cut the tin open and cut out a flat propeller to the shape shown. Punch two holes through a quarter of an inch from the centre. Now centre the hub of the propeller over a spool and mark where the holes are, then drive the nails in these marks, cutting them off one-eighth of an inch high. Bend the right edge of each blade upward a little. Put the spool on the pencil and see that it revolves freely. Wrap the string around the spool so that when the string is pulled the spool will rotate like the hands of a clock. Notice in Fig. 7 how the propeller is laid on the spool with its hub-holes over the nails. When the string is pulled the propeller will rotate, leaving the spool and spinning up into the air.

If higher flights are desired, cut down the hub of the spool so the string can impart more revolutions to the blade. Increasing the blade angle will result in quicker climb but less duration.

(See next week for all particulars regarding club formation in your district.)

BURRINJUCK HYDRO-ELECTRIC SCHEME

IMPORTANT developments are taking place in the group of wireless stations erected in connection with the Burrinjuck Hydro-electric Scheme.

A 1-K.W. transmitting station has recently been installed by Amalgamated Wireless (A/asia), Ltd., at Yass, whilst another 1-K.W. A.W.A. station is now being installed at Bogalara. At the present time three similar stations are in operation at the following points—Gundagai, Murrumburrah, Cootamundra. The main transmitting station for the hydro-electric scheme is located at the Burrinjuck Dam, and is a standard A.W.A. 2-K.W. telegraph-telephone transmitter. Working in conjunction with the whole of these transmitters are five portable sets, spread among various out-stations along the various high-tension transmission lines.

The object of these stations is to provide quick and efficient communication at all times, and to keep the power station at the dam in constant touch with all points of the transmission line during periods of emergency. For instance, should the lighting system at Cootamundra fail, the fact is immediately broadcast. The power house replies whether conditions there are O.K. or otherwise. Similarly, Murrumburrah and Gundagai stations report conditions at their end. If Murrumburrah reports that the power is on there, this points to a line break between Cootamundra and Murrumburrah. A linesman with a truck fitted with a portable wireless set is then sent out along the line. On discovering the fault, he erects the portable station (which is so arranged as to permit of messages being sent out six minutes after the truck pulls up), calls headquarters, or the officer-in-charge of the sub-station on the live side of the line, instructing him to open the switches and isolate his particular section of the line. On receiving advice that the line has been isolated, repairs are carried out by the linesman, and on completion he advises that the line is clear, and instructs that the switches be closed and power returned to the line.

Similar action is carried out when a linesman on patrol duty notes a faulty insulation of his section. He calls up headquarters, has the power cut off while he repairs the insulation, and on completion advises headquarters. By this simple and efficient means, reliable and constant communication is assured at all times, thus obviating long and unnecessary delays.

The application of wireless to the Burrinjuck Hydro-electric Scheme, has worked so satisfactorily that it has been a very instrumental factor in keeping the high-tension electric light and power lines in effective working order.

The Marconi Octagonal Cone Speaker

THIS new speaker is of the "plaque" type. At the centre of the grille is mounted a circular, brown, moulded cover of the driving unit, with its adjusting knob. The stiff paper cone itself is about nine inches in diameter. The instrument, which has a satin mahogany finish, is of good appearance.



Behind the plaque an iron framework protects the cone from serious damage, and a strut enables the speaker to stand on a table, on top of the receiver, or to be hung from a wall. A small terminal panel, with metal terminals, is provided, the positive terminal being coppered so that its polarity is clearly distinguishable. The electro-magnetic unit is of the adjustable reed type. The drive rod is constructed of an aluminium tube, which is pressed over it, and this prevents "whip" in the rod. On test the Marconi Octagonal Speaker gave a tone which was decidedly high, a fact which may be due to the fairly small cone used. While the base was not as prominent as in the Marconi model 75 speaker, there was, on the other hand, no drumminess, and the reproduction was very clear. Speech was particularly good.

The volume given was slightly less than the Marconi model 75, which fact was mainly due to the falling off of the lower register. The Marconi Octagonal Speaker was found to handle a good input without buzzing—more than sufficient for an ordinary room. It should prove popular for use with three and four valve sets.

An Aeronautical Dictionary

Angle of Wing Setting: The acute angle between the plane of the wing chord and the line of thrust. In model aeroplanes the line of thrust is parallel to the motor stick, and the wing is usually set at an angle by the use of clips of different sizes. Model multiplanes are seldom very successful, however, so the term decalage is not often used in model work.

Gap: The distance between the planes of the chords of any two adjacent wings of a multiplane, measured along a line at right angles to the chord of the upper wing at any designated point on its leading edge. That sounds difficult, but if you take two pieces of cardboard, and hold them in a

horizontal plane one above the other, the distance between them is the gap.

Stagger: The amount of advance of the leading edge of an upper wing of a biplane or any multiplane over that of the lower. The stagger is called "positive" when the upper wing is ahead of the lower.

Overhang: Either the distance from the outer strut attachment to the tip of the wings, or half the difference in span between any two wings of an aeroplane. When the term is used in the second sense, the overhang is positive when the upper wing has the larger span. A biplane having an upper wing with a span of 40 feet, and a lower wing with a span of 36 feet, would have an overhang of two feet.

The SONOCHORDE CONE

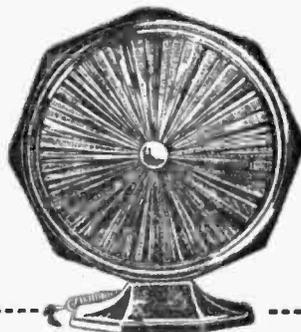
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£4

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Agents in Queensland: Intercolonial Boring Co., Ltd., Ann Street, Brisbane

Local Programmes, Friday, August 2

2FC

Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 412 metres).

EARLY SESSION—7 to 8.15 a.m.

- 7.0: "Big Ben" and weather forecast.
- 7.5: Early rising music.
- 7.40: Breakfast news.
- 7.45: Mails and shipping.
- 7.48: What's on to-day.
- 7.50: 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: To-morrow's sporting events.
- 10.45: From the State Theatre—Recital on the Grand Organ by Edzar Stone.
- 11.0: Household Helps—Cooking hints and recipes by Miss Ruth Furst.
- 11.10: Cables—Australian Press Association and the Sun-Herald Service.
- 11.15: The Studio Orchestra.
- 12.0: "Big Ben" and Stock Exchange. What to Read.
- 12.20: Midday market reports.
- 12.30: Close.

THE LUNCH HOUR—1 p.m. to 2.30 p.m.

- 1.0: Lunch to music with the A.B.C. Orchestra.
- 2.0: Stock Exchange, second call.
- 2.2: Popular Education—A talk on Music with illustrations.
- 2.20: A glance at the afternoon papers.

THE RADIO MATINEE—2.30 p.m. to 4.30 p.m.

- 2.30: The A.B.C. Orchestra.
- 2.45: Alma Berge, soprano.
- 2.52: Keith Kennedy, violinist.
- 3.0: "Big Ben."
- The A.B.C. Orchestra.
- 3.12: Stanley Clarkson, basso.
- 3.19: Scott Alexander, sketches.
- 3.29: Maynard Wilkinson, pianoforte solos.
- 3.34: The A.B.C. Orchestra.
- 3.49: Alma Berge, soprano.
- 3.51: Keith Kennedy, violinist.
- 3.58: Stanley Clarkson, basso.
- 4.5: Scott Alexander.
- 4.15: Maynard Wilkinson.
- 4.22: The A.B.C. Orchestra.
- 4.28: Stock Exchange, third call.
- 4.30: Close.

EARLY EVENING—5.45 to 7.55 p.m.

- 5.45: Kiddies' "Good-night" Stories. Uncle Bas, Goodie Reeve.
- 6.45: The Studio Dinner Orchestra.
- 7.30: Sporting news and views.
- 7.45: From the State Theatre—Mr Price Dunlavy at the Grand Organ.

EVENING PROGRAMME—8 p.m. to 11.30 p.m.

- 8.0: Keith Grant, New Zealand baritone.
- 8.7: Will and Barbara James, musical entertainers.
- 8.17: Frank Leonard, comedian.
- 8.27: Rae Foster, popular vocalist.
- 8.34: Hal Lyons, saxophonist.
- 8.41: Scott Alexander, in a Modern Radio Play.
- 9.6: David Burt and Partner, instrumentalists.
- 9.16: A Breath o' the Hieland Heather—Lindsay Lilts from the Land o' the Leal.
- 9.26: Harrison White and Connie, banjo and piano solos.
- 9.43: Fraser Coss, baritone.
- 9.50: Trifles from the Talkies.
- 10.15: Late news service and weather.
- 10.20: From the Ballroom of the Oriental Sydney Simpson's Syncopaters in dance music.
- 11.30: Close. National Anthem.

2BL

Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 358 metres).

OPENING SESSION: 8.15 to 11 a.m.

- 8.15: Music for every mood.
- 8.45: "Interest Item" on outstanding events of the day.
- 9.0: Song and choruses.
- 9.40: New music—a review of new records.
- 9.55: British official wireless news.
- 10.5: News service.
- 10.10: The Ladies' Club hour.
- 10.30: The Studio Orchestra.
- 11.0: Close.

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MIDDAY SESSION, 12 noon to 2.30 p.m.

- 12.0: A.B.C. Orchestra.
- 1.0: Afternoon news service.
- 1.15: Women's "Interest Talk."
- 1.30: Traders' "Selling the Set" music.
- 2.0: At the console of the Wurlitzer organ at the Capitol Theatre, Mr. J. Knight Barnett.

AFTERNOON ENTERTAINMENT, 2.30 p.m. to 5.45 p.m.

- 2.30: Business efficiency talks.
- 2.45: The Magic Carpet—Travel and Adventure.
- 3.0: The A.B.C. Dance Band.
- 3.12: Nell Judges, popular vocalist.
- 3.19: Carlton Fay, novelty pianist.
- 3.27: The A.B.C. Dance Band.
- 3.39: William Collins and May Nancarrow, in a humorous sketch.
- 3.46: Nell Judges, popular vocalist.
- 3.53: The A.B.C. Dance Band.
- 4.5: Carlton Fay, novelty pianist.
- 4.12: The A.B.C. Dance Band.
- 4.24: William Collins and May Nancarrow, in a sketch.
- 4.34: The A.B.C. Dance Band.
- 4.45: "The Trade Hour."
- 5.45: Close.

THE DINNER HOUR, 6.15 to 7.55 p.m.

- 6.15: The Studio Dinner Orchestra.
- 6.45: Boy Scouts—Mr. Norman Lyons.
- 7.5: Markets.
- 7.20: Late news.
- 7.30: The Studio Dinner Orchestra.
- 7.55: What's on the air to-night?

EVENING SESSION, 8 p.m. to 10.30 p.m.



KEITH GRANT,
popular New Zealand singer, who will be heard from 2BL to-night.

- 8.0: The National Broadcasting Orchestra.
- 8.20: Fraser Coss, baritone.
- 8.27: Lindley Evans, pianist.
- 8.39: The National Broadcasting Orchestra.
- 8.54: Daisy Mangan, soprano.
- 9.1: State and metropolitan weather forecast.

- 9.2: The National Broadcasting Orchestra.
- 9.14: Frank Leonard, comedian.
- 9.24: Will and Barbara James, musical entertainers.

- 9.34: Rae Foster, popular vocalist.
- 9.41: The National Broadcasting Orchestra.
- 9.53: Keith Grant, baritone.
- 10.0: G.P.O. chimes.

- David Burt and Partner, musical entertainers.
- 10.12: Fraser Coss, baritone.
- 10.19: The National Broadcasting Orchestra.

- 10.25: News service.
- 10.30: Close. National Anthem.

2GB

Theosophical Broadcasting Station, 29 Bligh St., Sydney (Wavelength, 316 metres).

- 10.0: Music.
- 10.10: Happiness Talk by A. E. Bennett.
- 10.20: Music.
- 10.30: Women's Session, by Miss Helen J. Beegling.
- 11.45: Close down.
- 2.0: Music.
- 2.5: Women's Radio Service, by Mrs. Dorothy Jordan.
- 2.50: Movie Know All.
- 3.0: Address.
- 3.30: Close down.
- 5.30: Children's Session, by Uncle George.
- 7.0: Music.
- 7.45: Feature story.
- 8.0: Miss Edna Lister, contralto.
- 8.7: Music from Studio.
- 8.15: Madame Betts-Vincent, in an illustrated talk on the making of music.
- 8.30: Humorous interlude by Mr. Jack Win and Mr. Heath Burdock.
- 8.35: Miss Doris Robinson, soprano.
- 8.45: Address.
- 9.0: Weather report.
- 9.3: Music from Studio.
- 9.13: Mr. Clifford Lathlean, baritone.
- 9.23: Humorous interlude by Mr. Jack Win and Mr. Heath Burdock.
- 9.28: Music from Studio.
- 9.38: Miss Edna Lister, contralto.
- 9.48: Music from Studio.
- 9.53: Miss Doris Robinson, soprano.
- 10.0: Instrumental music.
- 10.30: Close down.

2UW

Radio Broadcasting, Ltd., Palling's Building, Ash St., Sydney (Wavelength, 267 metres).

MIDDAY SESSION.

- 12.30: Request numbers.
- 1.0: G.P.O. clock and chimes; music.
- 1.15: Talk on Homecraft by Pandora.
- 1.40: Music and request numbers.
- 2.30: Close down.
- 4.30: Musical programme.

EVENING SESSION.

- 5.30: Children's Hour, conducted by Uncle Jack.
- 6.30: Close down.
- 7.0: G.P.O. clock and chimes.
- Request items.
- 8.0: Music of the moment.
- 9.0: Comments on Foreign Affairs by Mr. J. M. Prentice.
- 9.10: Music and request numbers.
- 10.30: Close down.

2KY

Trades and Labour Council, Goulburn St., Sydney (Wavelength, 280 metres).

MORNING SESSION.

- 10.0: Tune in to the ticking of the clock.
- 10.3: Popular fox trots.
- 10.15: Hawaiian steel guitar selections.
- 10.30: Request numbers.
- 10.50: Vocal items.
- 11.0: A few laughs.
- 11.5: Pianoforte selections.
- 11.15: Calls and announcements.
- 11.20: Musical interlude.
- 11.30: Request numbers.
- 11.40: Music and vocal items.
- 11.55: Where to go to-night.
- 12 (noon): Closing announcements.

CHILDREN'S SESSION.

- 6.0: Birthday calls, request numbers, and kiddies' entertainment. Aunt Jemima and Uncle Bert.

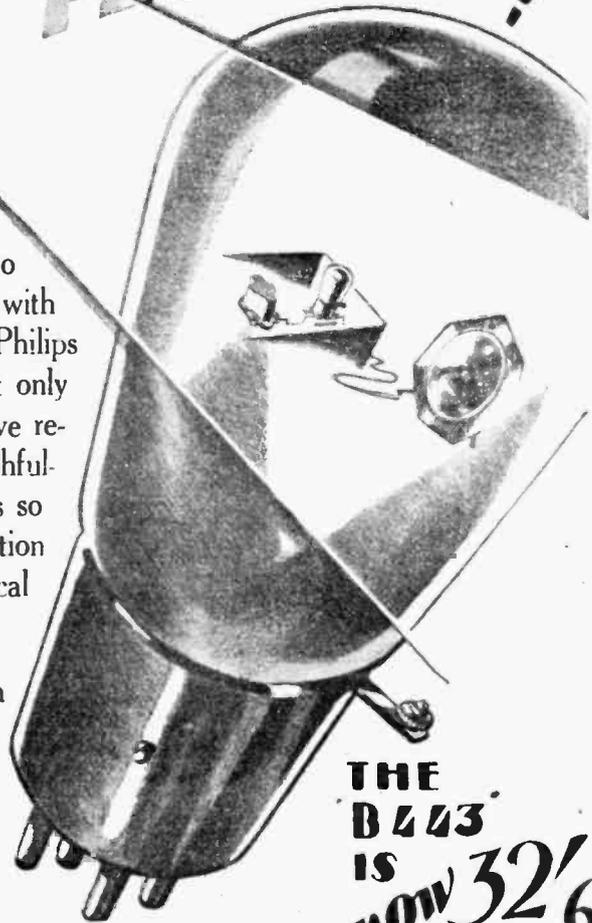
EVENING SESSION.

- 7.0: Musical interlude.
- 7.5: Birthday calls.
- 7.15: Sporting Feature; turf topics; review of candidates and their prospects for to-morrow. Mr. Geo. A. Davis.
- 7.40: Request numbers.
- 8.0: Hawaiian steel guitar selections.
- 8.15: Request numbers.
- 8.30: Musical and vocal items from the studio.
- 9.10: Sporting feature, presented by Toon and Co., Ltd., Kent Brewery, from ringside of McHugh's Leichhardt Stadium, full description of main 15-round fight: Mr. Jack Dunlavy.
- 10.0: Closing announcements.

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"MINIWATTS"

Interstate Programmes, Friday, August 2

3LO

Australian Broadcasting Co., 120A Russell St., Melbourne (Wavelength, 371 metres).

EARLY MORNING SESSION

7.0: Time signals from Melbourne Observatory. Weather forecast. 7.5: Early-rising music. 7.45: Mails and shipping. 7.43: What's On Today? 7.45: Birthday Greetings. 8.0: Breakfast news and market reports. 8.15: Close down.

MORNING MUSICALS

10.30: The Thought for To-day, Dr. Loftus Hills, D.Sc. 10.0: Reproduced music. 10.45: Arnold Coleman at the Wurlitzer Organ. 11 a.m. to 12.15: 3LO Studio Orchestra, with Ida and Lorraine Wright, soprano and contralto.

NEWS SESSION.

12.15: To-day's news. Rates on 'Change. Weather forecast.

MIDDAY NEWS SESSION

12.30: National Broadcasting Orchestra (under the direction Wm. G. James, conductor Percy Code). Military Overture, "Private Ortheris" (Ansell). "Prouette" (Finck). H. Stanley White (tenor). Orchestra. Popular Gems of Modern Opera and Ballet Music. 1.0 to 2.0: Luncheon Music supplied by the National Broadcasting Orchestra, under direction of Wm. G. James, conductor Percy Code.

THE LECTURE-TREE SESSION

2.0: Dr. Loftus Hills, D.Sc., "Some Wonders of Nature." 2.15: Reproduced Music. 2.25: Prof. G. H. Cowling, M.A., "Classical Allusions." 2.40: Reproduced Music. 2.45: Mr. J. M' Rae, M.A., "Careers for Our Boys."

THE RADIO MATINEE

3.0: National Broadcasting Orchestra, under the direction of Wm. G. James, conductor, Percy Code. Overture, "Vanily Fair" (Fletcher). "Dance of the Egyptian Maidens" (Shelley). 3.10: Yetty Landau, a Dramatic Episode of the Slums of Sydney. "Our Father in Yurong Lane." A Musical Monologue. "Don't I Wish I Were a Man." 3.20: William Stevens, Symeonized Pianists. 3.30: Orchestra, selection, "A Waltz Dream" (Strauss). 3.40: Norman French, the Crooning Banjoist. "Under the Southern Moon." 3.50: Fred. Sutcliffe (tenor). Three Australian Songs. 4.0: A Recital of Australian Verse by Mrs. John Hopkins. "Honeymooners from the Country," by John O'Brien. "Jim's Whip." 4.10: Orchestra. Suite, "Lavender and Lace" (Fredk. Hall). 4.20: Berthe Horsburgh (contralto). "Cradle Me Low" (B-shah). "Where the Yellow Kowhai Blooms" (James). "Star in the West" (Treharne). 4.30: Close down.

THE CHILDREN'S CORNER

5.45: "Billy Bunny" in a funny mood. 6.5: The 3LO Studio Orchestra, "Memories of the Past."

NEWS FROM EVERYWHERE

7.30: To-day's news. Rates on 'Change. Market Reports.

NIGHT SESSION

7.45: National Broadcasting Orchestra (under direction of Wm. G. James, conductor Percy Code). Selection from "The Pearl Fishers" (Bizet). "Nocturne" (Karakanoff).

9.0: A Classical Programme arranged by Fritz Hart will include: "Song of Mary" (Fritz Hart), for six-part women's choir. Solo, violin and piano. Albert Street Conservatorium Ladies' Choir. Overture Hesby, violin. Ida Scott, piano.

9.0: Reg. Bradley (soprano). "Piano" (Mozart-Kreisler). "Cavatte" (Glossic). "Minuet in G" (Beethoven).

9.10: J. Hewlett Ross—(Fletcher). "Dance of the Eyes of a Snake."

9.15: Collingwood Citizens' Band (conductor, F. C. Johnson). "March 'With Sword and Sabre.'" Overture, "Anne Bolens."

9.25: Allan Mitchell (tenor)—"Love's Philosopher" (London Ronald). "The Dream" (Rubinstein). "Mountain Voices" (Treharne).

9.45: Collingwood Citizens' Band—"Trombone solo, 'The Joker'."

9.55: Jessie Shmidt (contralto). 10.0: Eric Walsh will speak on to-morrow's V.A.T.C. Races at Caulfield.

10.0: Collingwood Citizens' Band—"Intermezzo, 'Bells Across the Meadow.'" March, "The Ringing of the Bells."

10.20: News from to-morrow's papers. 10.30: "The Rex" Dance Band.

10.30: God Save the King.

3AR

Australian Broadcasting Co., 120A Russell St., Melbourne (Wavelength 491 metres).

MORNING NEWS SESSION

10.0: G.P.O. clock. 10.1: Market reports; farm and station produce; fruit, fish, and vegetables. 10.25: Shipping reports; ocean forecasts. 10.30: Mail notices; express train information. 10.35: News service. 10.55: Weather forecast.

MORNING MUSICAL SESSION

11.0: The Strad Trio. 11.35: Cecil Parkes, violin. 12.8: The Strad Trio. 12.20: British Official Wireless news from Rugby; announcements. 12.30: Close down.

AFTERNOON SESSION

2.45, 3.10, 3.45, and 4.10: Description of the Public Schools' football, Wesley College versus Scotch College. 4.40: Close down.

EVENING SESSION

5.0: Recordings. 7.10: News service. 7.20: Recordings.

NIGHT SESSION

8.15: "Out of the Past." 8.16: Captain Donald McLean will continue his series of talks, "The Conquest of Peru." 8.30: "A Maker of History." 8.31: Community singing. The Radio Revellers. 10.30: News service, Announcements. 10.35: The Radio Revellers. "I'm on the Crest of a Wave" (Henderson). "The Magic Violin" (Leslie). "Shinamki Da" (Cole). "Where the Shy Little Violets Grow" (Kahn). "I Don't Care" (Dowell). "You'll Recognise My Baby" (Cohn). "Glad Rag Doll" (Ager). "That's Her Now" (Ager). "Only a Rose" (Friml). "Can You Blame Me?" (Goodwin). 11.0: God Save the King.

3DB

The "Herald" Broadcasting Station, Flinders Street, Melbourne (235 metres.)

MORNING SESSION

11.0: Time signal. Famous Players and Singers. 11.30: "The World's Fashions and Follies," by "La Vogue." 11.35: Vocal Gems and Orchestral Selections. 12.0: A Fit of the Blues. 12.25: News. 12.30: Close down.

AFTERNOON SESSION.

2.0: Symphony Orchestra and Some Singers. 2.30: Brass Bands and Ballads. 2.55: Atwater Kent Radio Hour, sponsored by A. G. Healing, Ltd., and E. T. Muir. 3.55: News. 4.0: Close down.

EARLY EVENING SESSION.

5.30: Billy Bunny's Children's Hour. 6.0: An Accorded, a Banjo, and some Vocal Duets. 6.30: Light Orchestra and Songs. 7.0: Chamber Music and Songs. 7.30: Mme. S. E. Soward, French Without Tears. 7.45: Market Reports.

NIGHT SESSION.

8.0: Victor Military Band, Joseph Hislop. Dussolina Ottanini, Michela Elman. 8.30: Extracts from "Hit the Deck." 9.0: Echoes of 1914. 9.30: Madrigals, Oles, and Orchestra. 10.0: Jean Lensen's Orchestra and Some Singers. 10.30: Slumber Song. 10.40: News. 10.45: God Save the King.

4QG

Queensland Government Radio Service, Brisbane (Wavelength, 385 metres).

EARLY MORNING SESSION

7.43: Time signals. 7.45: News service. 8.0: Recordings. 8.15: News service. 8.30: Close down.

MORNING SESSION

11.0: Music. 11.8: Social news. 11.15: Letteurette A cookery and household talk by "The Etiquette Girl." 11.30: Music. 12 (noon): Close down.

MIDDAY SESSION

1.0: Market reports and weather information. 1.20 Lunch-hour music. 2.0: Close down.

AFTERNOON SESSION

3.0: The Studio Orchestra: Overture, "Le Chevalier Breton" (Herman); waltz, "Lucille Love" (Olmann); dance Intermezzo, "Laughing Eyes" (Finck); caprice, "In the Starlight" (Hueter); rag step, "Live Wires" (Shepherd). 3.30: Organ recital by Mr. Geo Sampson, F.R.C.O. 4.0: Studio Orchestra: Extracts, "A Village in the Wilderness" (Russell); march, "The Glencoe" (Hayes). 4.10: Records. 4.15: News. 4.30: Close down.

NIGHT SESSION

8.0: The Studio Orchestra. (Conductor, A. R. Featherstone)—Overture, "Olympia" (Ascher). 8.8: The Silktone Apollo Club—Chorus, "Hill-Singing Morn." 9.12: J. K. Thompson, Baritone—"Passing By" (Purcell). 9.17: Feo Todd, Pianist—"Liebestraum" (Liszt). 9.22: The Silktone Apollo Club—Chorus, "In Sunny Devon." "Jolly Roger." 9.30: The Studio Orchestra—One step, "In the Sweet Long Ago." 9.35: A. Elliott, Tenor—"Souvenirs." 9.40: D. Owens, Elocutionist—Selected. 9.45: The Silktone Apollo Club—Chorus, "Lullaby." "In the Evening." 9.51: T. Westwood, Tenor—"One Fond Kiss." 9.56: The Silktone Apollo Club—Chorus, "March of the Cameron Men." 9.0: Metropolitan weather forecast; week-end road information for motorists, officially supplied by the R.A.C.Q. 9.15: The Studio Orchestra—"Kingdom of Flowers" (Ringblaban). 9.20: Messrs. Griffiths, Jones, Jenkyns, and Watson—Vocal Quartet, "Sabbath Call." 9.25: J. B. Morrison, Tenor—"Rocked in the Cradle of the Deep."

9.30: Feo Todd, Pianist—"Bitterly" (Liszt). 9.35: The Silktone Apollo Club—Chorus, "Sunset and Night." "John Peel." 9.44: The Studio Orchestra—"The March, 'Soldiers of the Sea'" (Fulton). 9.50: The Silktone Apollo Club—Chorus, "Kentucky Home." "Old Folks at Home." "Song of Innisfail." "Land of Hope and Glory." 10.0: News supplied by the metropolitan dailies; weather information; close down.

5CL

Central Broadcasters, Ltd., 114 Hindmarsh Square, Adelaide (Wavelength, 469 metres).

MORNING SESSION.

11.15: Chimes. 11.16: Recording. 11.45: Kitchen Craft and Menu Talk. 12.1: Recordings. 12.15: News session. British Official Wireless News. 12.40: Recordings. 12.52: Railway, Stock Exchange, and Meteorological Information. 1.1: Community Singing from the Adelaide Town Hall. 1.59: Weather. 2.0: Close down.

AFTERNOON SESSION.

3.0: Chimes. 3.1: Programme Review and Announcements. 3.10: Studio Concert. 3.23: Wilfred Thomas (bass). 3.30: Dr. Eleanor A. Allen, B.A., "Psychology." 3.45: Wilfred Thomas (bass). 3.52: Studio Concert. 4.10: An Educational Talk on "Grain-handling Methods in Argentina." "Japanese Food Regulations." "Oil versus Coal for Ships' Fuel." 4.25: Stock Exchange. 4.30: Close down.

EVENING SESSION.

6.0: Chimes. 6.1: Children's Happy Moments. 6.30: Dinner Music. 7.1: Senior Birthday League Greetings. 5CL's Sporting Service. General Market Reports. 7.15: "Mo" Manning on "Football." 7.30: Dr. W. Jethro Brown will speak on "Strife in Industry—Why?" 7.45: Mr. A. Grenfell Price, M.A., F.R.C.S., will continue his series of talks on "Pioneers of Australia." 7.55: The captains of the Inter-State Soccer teams will speak from the studio on the matches.

NIGHT SESSION.

8.0: Chimes. 8.10: From the Theatre Royal—The Final and Gala Performance of the Musical Comedy, "Jusitania" Lyrics and music by Tom King and Jack Fewster. Librett by Ethel Aird. Produced by Ray Walsh. During the two intervals Jean Finlay (pianiste) will entertain.

10.30: News Session. 10.44: Modern Dance Music. 11.0: Close down.

6WF

Commonwealth Government Broadcasting Station, Perth (Wavelength, 190 metres).

10.0: Gramophone records. 11.0: Close down. 12.30: Markets, News, etc. 1.0: Time. Weather. 1.3: Music. 2.0: Close down. 3.30: Tune in. 3.35: Music. 4.30: Close down. 6.45: Tune in. 6.48: Bedtime stories by Uncle Duffy. 7.5: Light music. 7.30: Commercial and general information. 7.45: Racing talk. 8.0: Time signal. 8.1: Weather. 8.3: Vocal Artists. 8.50: Late news. Station announcements. Ships within range. Late weather. 8.58: "Gardening" Talk by Mr. James Conarty. 9.14: Programme continued. 10.30: Close down. 10.45: Metre Transmission. Simultaneous broadcast on 104.5 metres of programme given on 1250 metres commencing at 6.45 p.m.

7ZL

Tasmanian Broadcasters Pty., 95 Elizabeth St., Hobart (Wavelength, 516 metres).

11.30 a.m.: Musical selections. 11.34: Midlands weather forecast. 11.35: Musical selections. 11.55: Tasmanian station's 9 a.m. weather report. 12.0: G.P.O. clock chime. The hour. 12.1: Ships within wireless range; mail notices; housewives' guide; commercial news. 12.8: Musical selections. 12.30: Announcements. 12.33: Musical selections. 12.55: News service; British official wireless news; Railway auction produce sales, held at Railway. 3.0: Musical selections. 1.30: Close down. 3.0: G.P.O. clock chime the hour. 3.1: Musical selections. 3.4: Weather information. 3.5: Musical selections. 4.15: Readings from the "Weekly Courier." 4.30: Close down. 6.15: Children's hour, with "Uncle David" and "The Storey Lady." 7.10: News session. 7.15: Sid Jones will speak on "Football." 7.30: A studio concert by 7ZL artists (interspersed records)—solos by Mr. Will Thompson, baritone—(a) "The Drinking Song." (b) "The Lute Player" (Martha). 7.44: Florence Sturges, contralto—(a) "Mighty Lak" Rose" (Nevini). (b) "You'll Git Heaps of Lickin's" (Clarke). 7.58: Doris Barker, soprano—(a) "You and Love" (d'Harlelot). (b) "Songs My Mother Taught Me." (Dvorak). 8.12: Will Thompson—(c) "Temple Bells." (d) "Less than the Dust." 8.26: Florence Sturges—(c) "A Pat Little Feller with His Mamma's Eyes" (Gordon). (d) "A Mother's Song" (Clayton). 8.40: Doris Barker—(c) "Love's Rhapsody" (d'Harlelot). (d) "Hill-Sing Morn." (Bond). 8.45: J. M. Counsel, (c) "The History and Development of Music." 9.45: News session. 10.0: G.P.O. clock chime the hour. Close down.

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2FC

Australian Broadcasting Company, Ltd. Market St., Sydney (Wavelength, 412 metres).

EARLY SESSION.—7 to 8.15 a.m.

- 7.0: "Big Ben" and weather forecast.
- 7.5: Early rising music.
- 7.40: Breakfast news.
- 7.45: Mails and shipping.
- 7.48: What's on to-day.
- 7.50: 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: The Racing Observer.
- 10.45: From the State Theatre—Recital on the Grand Organ by Edgar Stone.
- 11.0: Household Helps—Week-end suggestions by Miss Ruth Furst.
- 11.10: Cables—Australian Press Association and the Sun-Herald Service.
- 11.15: The Studio Orchestra.
- 12.0: "Big Ben" and Stock Exchange. Music.
- 12.20: Midday market reports.
- 12.50: From Warwick Farm—Description of races in running, by the Racing Observer.
- During intervals, from the Studio—Musical numbers by the A.B.C. Orchestra. Popular songs by Gwladys Rowling.
- 4.35: Late sporting results.
- 4.45: Close.

EARLY EVENING—5.45 to 7.55 p.m.

- 5.45: Kiddies' "Good-night" Stories, by the "Hello Man" and Aunt Margot.
- 6.45: The Studio Dinner Orchestra.
- 7.30: Sporting news and views.
- 7.45: From the State Theatre—Mr. Price Durlavay at the Grand Organ.

EVENING PROGRAMME—8 p.m. to 11.30 p.m.

- 8.0: Radio Male Quartette.
- 8.10: Simon Phillipoff, Virtuoso Ballalika.
- 8.17: Alf. Lawrance and Nell Crane, entertainers.
- 8.27: Hazel Fuller, soprano.
- 8.34: Maisie Otte, novelty pianist.
- 8.41: Aussie and Pom, in an original Australian Sketch.
- 9.8: The Versatiles, in Mirth and Melody.
- 9.23: Compton Couits, comedian.
- 9.33: Wendling and Molloy, musical entertainers.
- 9.43: Margaret Grimshaw, in popular numbers.
- 9.50: The Versatiles, in Mirth and Melody
- 10.5: Radio Male Quartette.
- 10.15: Late news service and weather report.
- 10.20: Romano's Cafe Dance Orchestra, conducted by Bennie Abrahams.
- 11.30: Close. National Anthem.

2BL

Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 333 metres).

OPENING SESSION, 8.15 to 11 a.m.

- 8.15: Music for every mood.
- 8.45: "Interest Item" on outstanding events of the day.
- 9.0: A musical pot pourri.
- 9.40: New music—a review of new records.
- 9.55: British official wireless news.
- 10.5: News service.
- 10.10: A gardening talk, by G. Cooper.
- 10.30: The Studio Orchestra.
- 11.0: Close.

MIDDAY SESSION, 12 noon to 2.30 p.m.

- 12.0: A.B.C. Orchestra.
- 1.0: Afternoon news service.
- 1.15: Music.
- 2.0: At the console of the Wurlitzer organ at the Capitol Theatre, Mr. J. Knight Barnett.

AFTERNOON ENTERTAINMENT, 2.30 p.m. to 5.45 p.m.

- 2.30: Studio music.
- 2.55: From the Sydney Sports Ground, description of the football match.
- 4.0: From the studio, musical numbers.

- 4.10: From the Sydney Sports Ground, description of the football match.
- 5.0: From the studio, complete sporting and racing resume.
- 5.15: Close.

THE DINNER HOUR, 6.15 to 7.55 p.m.

- 6.15: The Studio Dinner Orchestra.
- 6.45: Tales of adventure, Mr. Kirke
- 7.5: Markets.
- 7.20: Late news.
- 7.30: The Studio Dinner Orchestra.
- 7.55: What's on the air to-night?

EVENING SESSION, 8 p.m. to 12 midnight.

- 8.0: The A.B.C. Dance Band.
- 8.12: Lionel Lunt, baritone.
- 8.22: Wendling and Molloy, musical entertainers.
- 8.32: Compton Couits, comedian.
- 8.42: The A.B.C. Dance Band.
- 8.54: Margaret Grimshaw, popular vocalist.
- 9.0: State and metropolitan weather forecast.
- 9.1: Maisie Ottey, jazz pianist.
- 9.9: "Aussie and Pom," entertainers.
- 9.19: The A.B.C. Dance Band.
- 9.31: Alf. Lawrance and Nell Crane, entertainers.
- 9.41: Simon Phillipoff, Ballalika virtuoso.
- 9.48: Hazel Fuller, soprano.
- 9.53: The Versatiles, in radio versatility.
- 10.7: Lionel Lunt, baritone.
- 10.15: News service.
- 10.20: The A.B.C. Dance Band.
- 11.30: Romano's Dance Band, conducted by Bennie Abrahams.
- 12.0: Close. National Anthem.

2GB

Theosophical Broadcasting Station, 29 Bligh St., Sydney (Wavelength, 316 metres).

- 3.0: Musical session.
- 5.30: Children's Session, by Uncle George.
- 7.0: Request hour.
- 8.0: Dance programme.
- 10.30: Close down.

2UW

Radio Broadcasting, Ltd., Palling's Building, Ash St., Sydney (Wavelength, 267 metres).

- 5.30: Children's Hour, conducted by Uncle Jack.
- 6.30: Close down.
- 7.0: Request numbers.
- 10.30: Close down.

2KY

Trades and Labour Council, Goulburn St., Sydney (Wavelength, 280 metres).

CHILDREN'S SESSION.

- 6.0 p.m.: Birthday calls; request numbers and kiddies' entertainment; Aunt Jemina and Uncle Bert.

EVENING SESSION.

- 7.0: Musical interlude.
- 7.5: Birthday calls
- 7.15: Sporting feature; turf topics; how they ran to-day. Mr. Geo. A. Davis.
- 7.50: Request night.
- 10.0: Closing announcements

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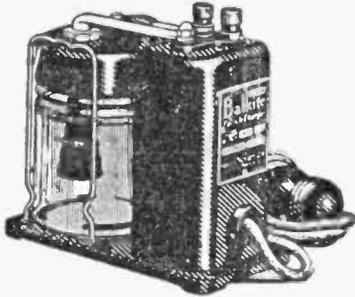
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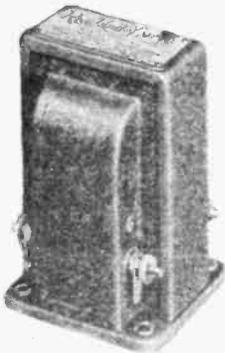
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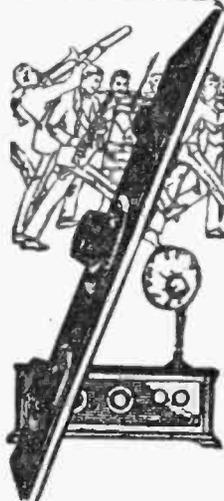
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Interstate Programmes, Saturday, August 3

3LO

Australian Broadcasting Co., 120A Russell St., Melbourne (Wavelength 371 metres).

EARLY MORNING SESSION.

7 a.m.: Time signal from the Melbourne Observatory. Weather forecast. 7.5: Early rising music. 7.40: Mails and shipping. 7.45: What's on to-day. 7.45: Birthday greetings. 8.0: Breakfast news and market reports. 8.15: Close down.

MORNING MUSICALS.

10.30: The "Sunset" for to-day—Mr. Charles Nuttall. 10.35: Reproduced music. 10.45: Arnold Coleman at the Wurliizer organ. 11: Eric Welch's selections for to-day's V.A.T.C. races at Caulfield. 11.10 to 12.15: 3LO Studio Orchestra, with Oliver Peacock, baritone.

NEWS SESSION.

12.15: To-day's news. Rates on 'Ochange. Weather forecast.

MIDDAY SESSION.

12.30: National Broadcasting Orchestra (under direction Wm. G. James; conductor, Percy Cody)—Overture, "Die Felsemuhle" (Reissiger), "Amour Coquet" (Prini), Olive Painter, mezzo-soprano. Orchestra, "A Somerset Rhapsody" (Holst), "Pas Des Fleurs" from "Naila Ballet" (Delibes). 1.0 to 2.0: Luncheon music, provided by the National Broadcasting Orchestra (under direction of Wm. G. James; conductor, Percy Cody).

AFTERNOON SESSION.

2.0: National Broadcasting Orchestra (under direction Wm. G. James; conductor, Percy Cody). 2.0 to 5.30: V.A.T.C. races described by Eric Welch. Football descriptions by Mel Morris.

THE CHILDREN'S CORNER.

5.45: "Little Miss Kookaburra" will tell about the wreck of the Dunbar off the coast of Sydney on August 20, 1857. 6.5: 3LO Studio Orchestra in some merry melodies.

NEWS FROM EVERYWHERE.

7.30 to 7.45: To-day's news. Market reports. All sporting results.

NIGHT SESSION.

* 4.5: Brunswick City Band (conductor Hugh Niven): Overture.

"Le Coffret de St. Domingue."

"Torquato Tasso" (Donizetti).

8.0: Victor Baxter, tenor—

"In May" (Schuman).

"When Thy Brides" (Schuman).

"I Love You More" (Lee).

A Programme of Spanish Music.

8.10: Harold Elvins, piano—

"Allegro di Concerto" (Granados).

"Legend of the Cretan Heroes" (Gawarrri).

"Prelude from Songs of Spain" (Albeniz).

8.25: Mary Thirlwall, contralto—

"Oh, Thank Me Not" (Mallinson).

"A Little Winding Road" (Ronald).

"Pluck This Little Flower" (Ronald).

8.40: Brunswick City Band—

Fantasia, "The Maid of Orleans" (Laurent).

8.50: O. G. Manzoni, fandollin—

Mandolin Medley arranged by O. G. Manzoni—

"Mazurka de Concerto" (Muller).

9.0: "The Black Dominoes," a bright and breezy programme of melody and lilt.

10.20: News from to-morrow's papers.

10.30: "The Rex" Dance Band.

11.30: God Save the King.

3AR

Australian Broadcasting Co., 120A Russell St., Melbourne (Wavelength 484 metres).

MORNING NEWS SESSION

10.0 to 10.59: See Friday.

MORNING MUSICAL SESSION

11.0: The Strad Trio. 11.30: Cecil Parkes, violin. 11.44: Gladstone Glees. 11.50: British Official Wireless news from Rusby; selections for to-day's V.A.T.C. races at Caulfield; announcements; rates of exchange, as supplied by Thomas Cook and Son. 12.0: Close down.

AFTERNOON SESSION

1.28: Description of the Crimea Trial, nine furlongs, V.A.T.C. races, at Caulfield. 1.35 and 2.30: Description of the baseball match, Richmond v. Essendon, at the Richmond Cricket Ground. 2.23: Description of the Steeplechasers' Flat Race, one mile seven furlongs, V.A.T.C. races, at Caulfield. 2.45. 3.5. 3.45. 4.20. 4.40. 4.35: Description of the football, Richmond v. Essendon, at Richmond Cricket Ground. 2.55: Description of the Australian Hurdle Race, three and a quarter miles, V.A.T.C. races, at Caulfield. 3.25: Quarter-time football scores, League and Association matches. 3.38: Description of the Malakoff Stakes, one mile and one furlong, V.A.T.C. races, at Caulfield. 4.0: Half-time football scores, League and Association matches. 4.13: Description of the Moonchase Steeplechase, two miles and one furlong, V.A.T.C. races, at Caulfield. 4.35: Three-quarter time football scores, League and Association matches. 4.48: Description of the Mornington Welter, one mile, V.A.T.C. races, at Caulfield. 5.30: Final scores, League and Association football matches. 5.35: Close down.

EVENING SESSION

6.0: Sporting results. 6.30: Seraphic selections for Saturday. 7.10: News session; announcements. 7.20: Seraphic selections.

NIGHT SESSION

7.45: "Out of the Past."
7.46: Captain Donald MacLean will continue his series of talks, "The Conquest of Peru."
8.0: "A Maker of History."
8.1: The Brunswick Band.
Selection, "Der Frelschutz" (Weber).
8.15: Victor Harding, bass.
"Fling Broad the Sails" (Oatnes).
"The Song of the Clock" (Burchall).

8.22: The Brunswick City Band.
Overture, "La Coquette" (Greenwood).
8.32: Dawn Harding, mezzo-soprano.
"Tune Thy Strings" (Dvorak).
"Silent Woods" (Dvorak).
8.39: The Radio Revellers.
"That's What I Call Sweet Music" (Meskill).
"I Fell Head Over Heels in Love" (Thayer).
"The Tile Trot" (Penso).
8.49: The Melody Makers.
In half an hour of mirth and melody.
9.0: The Brunswick City Band.
Selection, "La Diavola" (Auber).
9.19: Victor Harding, bass-baritone.
"The Two Grenadiers" (Schumann).
"Erl King" (Schubert).
9.26: Lindsay Biggins, piano.
"Romance in G Major" (Schumann).
"Album Leaf" (Schumann).
"Fuguetta C Minor" (Schumann).
"Imromptu C Minor" (Schubert).
"Moment Musical in F Minor" (Schubert).
"Moment Muscale A Flat Major" (Schubert).
"German Dances" (Schubert).
9.45: Dawn Harding, mezzo-soprano.
"Meeting of the Woods" (Schumann).
"The Wanderer" (Schubert).
9.53: The Radio Revellers.
"Deep Night" (Henderson).
"Shivering" (Dooey).
"Stay at Home Girl" (O'Hagen).
"I Can't Give You Anything But Love" (Fields).
"Revenge" (Lewis).
"She's Got a Great Big Army of Friends" (Nelson).
"Sonatique" (Katzman).
"I Ain't Never Been Kissed" (Leslie).
10.30: Late sporting results.
10.35: The Radio Revellers.
"You Went Away Once Too Often" (Bryan).
"Gwine Sure Just Love" (Hill).
"Roses of Yesterday" (Berlin).
"Cradle of Love" (Wayne).
"Anywhere is Heaven" (Brady).
"I'm Sorry, Sally" (Kahn).
Selected.
11.0: God Save the King.

3DB

The "Herald" Broadcasting Station, Flinders Street, Melbourne (355 metres).

MORNING SESSION.

10.0: Time signal. Symphony Orchestra and Light Classical Songs. 10.30: Violin, Piano, and Soprano. 11.0: Some Light Music. 12.0: Close down.

EARLY EVENING SESSION.

5.30: Bolly Bluegum's Children's Hour. 6.0: Tea-time music. 6.25: What's On at the Theatre and Movies. 6.27: Radio Movie Club. 6.30: Sporting results. 6.45: Symphony Tea-time Music. 7.0: Arthur Pryor's Band. Harold Williams, Hubert Eisdell. 7.30: A Synchronic Concert and a Contralto. 8.0: Chamber Music. 8.30: A Band and Some Roger Quilter Songs. 9.0: Latest Releases. 10.0: Popular Overtures and Negro Spirituals. 10.30: Slumber Music. 10.40: News. 10.45: God Save the King.

4QG

Queensland Government Radio Service, Brisbane (Wavelength, 385 metres).

EARLY MORNING SESSION

7.30 to 8.30: See Friday.

AFTERNOON SESSION

3.0 to 4.30: See Friday.

EARLY EVENING SESSION

6.15: "Queenslander" bi-weekly news service for distant listeners. 6.30: Bedtime stories, conducted by "Uncle Ben." 7.0: To-day's races in detail. 7.20: General sporting notes. 7.5: Sailing notes by Mr. Fred Smith.

NIGHT SESSION

8.0: Overture by the Savoy Orchestra.
8.10: Ernest Harper, baritone.
"The Adjutant" (Fisher).
"Time to Go" (Sanderson).
8.20: The Aloha Novelty Trio.
Five minutes' melody.
8.35: Jean Naylor, contralto.
A short recital, including—
"My Heart is Warm" (Goring Thomas).
"Als Die Alte Mutter" (Anton Dvorak).
"If But a Bird Were I" (Hiller).
"I Hope" (Gerald Jonas).
3.40: Orchestral music.
9.0: Patricia McOnigley, soprano.
"My Heart is Warm" (Goring Thomas).
"A Little Coon's Prayer" (Hope).
9.10: The Aloha Novelty Trio.
More melody.
9.15: Stanley Wardle, elocutionist.
"The Tug's Curse" (Wilder).
"The Black Man I Know" (Grey).
9.25: The Aloha Novelty Trio.
More Hawaiian melodies.
9.30: Dance music.
10.0: News supplied by the metropolitan dailies.
Weather information. Close down.

5CL

Central Broadcasters, Ltd., 114 Hindmarsh Square, Adelaide (Wavelength, 469 metres).

AFTERNOON SESSION.

12.0: Chimes. 12.1: Special late selections for Caulfield Races. 12.3: Probable Starters and Selections

for Gawler Races. 12.15: General News Service. 12.45: Gawler, Riders and Positions for Plate. 12.50: Musical interlude. 1.0: Gawler, Running Description of Plate. 1.5: Musical interlude. 1.20: Gawler, riders and positions for Phoenix Hurdle Race. 1.30: Caulfield Results. 1.35: Gawler, Running Description of Phoenix Hurdle Race. 2.1: Resume of previous race results. 2.3: Gawler, Riders and Positions for the Plate. 2.15: Running description of the Plate. 2.25: Caulfield, Running Description of Australian Hurdle Race. 2.40: Gawler, Riders and Positions for the Handicap. 3.40: League Football. 4.0: Resume of race results and football matches. 4.3: Gawler, Riders and Positions for Second Division of the Plate. 4.8: League Football. 4.15: Gawler, Running Description of Second Division of Plate. 4.20: League Football. 4.40: Gawler, Riders and Positions for First-class Plate. 4.45: League Football. 4.56: Gawler, Running Description of First-class Plate. 5.0: League Football. 5.5: Resume of Race Results. Dividends on First-class Plate. Final Football Scores.

EVENING SESSION.

6.0: Chimes and Resume of Gawler and Caulfield Races. 6.5: Children's Happy Moments. 6.30: Dinner. 7.1: Senior Birthday League Greetings. 7.10: Rev. G. E. Hale, B.A. 7.25: C. L. Riley on "Items of Interest." 7.40: 5CL's Sporting Service, including Gawler and Caulfield Race Results, League Football scores, Country Sporting, Golf Results, Soccer, 3 races, Lacrosse Results, Ladies' and Gentlemen's Hockey, Cycling, Athletics, and other sporting results.

NIGHT SESSION.

8.0: Chimes. 8.10: A Special Programme. 10.30: Sporting Service. 10.35: C. L. Riley on "Modern Dance Recordings." 11.0: Close down.

6WF

Commonwealth Government Broadcasting Station, Perth (Wavelength, 100 metres).

10.0: Gramophone records. 11.0: Close down. 12.0: Racing anticipations. 12.7: Pianoforte solos. 12.44: Markets, news, etc. 1.1: Weather bulletin. 1.3: Close down. 3.30: Sporting session. Race results and quarter-time scores from the studio. 8.30: Musical items. 5.30 Approx.: Close down. 6.45: Tune in. 6.48: Bedtime stories by Auntie Amy. 7.12: Sports results. 7.30: Commercial and general information. 7.45: Music. 8.0: Time signal. Weather. 8.3: Popular programmes from the studio. 8.30: Dance music. 8.50: Late news. Shins within range. Late weather. 9.6: Programme continued. 10.30: Close down. 10.5: Metre Transmission. Simultaneous broadcast on 104.5 metres of programme given on 1250 metres, commencing at 6.45 p.m.

7ZL

Tasmanian Broadcasters Pty., 95 Elizabeth St., Hobart (Wavelength, 516 metres).

11.30 a.m.: Recordings. 11.34: Midlands weather forecast. 11.35: Records. 11.55: Tasmanian Station's 9 a.m. weather report. 12.0: G.P.O. clock chimes the hour. 12.1: Shipping information; ships within wireless range; mail notices; housewives' guide; commercial messages. 12.8: Record recital. 12.30: Announcements. 12.33: Record recital. 12.55: News service: British official wireless news; Railway auction produce sales, held at Railway. 1.10: Record recital. 1.30: Close down. 2.45: Transmission from the North Hobart Oval—football match, Lefroy v. North Hobart, described by Sid Jones. During the afternoon running descriptive will be given of the Flemington races, held at Flemington Racecourse, Victoria. 4.50: All sporting results to hand. 5.0: Close down. 6.0: All sporting results to hand. 6.15: Children's hour with "Uncle David." 7.30: Roy Johnson will speak on "Manual Training." 7.45: J. M. Counsel will speak on "European Affairs." 8.0: G.P.O. clock chimes the hour. 8.1: A request programme of popular records specially arranged by Paton's Music Warehouse. 9.30: News session. 9.45: Request programme (continued). 10.20: Close down.

W. FURNESS,

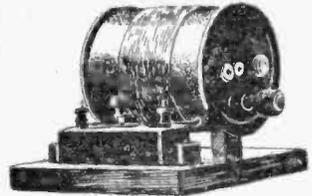
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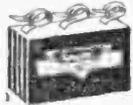
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12/6

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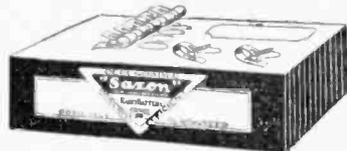


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22/6

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60 Volt Heavy Duty Saxon 30/-



32 CLARENCE ST.

'Phone, B2002

Local Programmes, Sun., Aug. 4

2FC

Australian Broadcasting Company, Ltd., Market St. Sydney (Wavelength, 442 metres).

THE CHURCH HOUR—10 a.m. to 12.30 p.m.

10.0: Announcements.
10.5: Studio music.
10.30: This morning's news.
10.35: Rugby Wireless news.
10.45: Music.
11.0: From St. John's Church of England, Balmain—The Morning Service, conducted by Rev. A. G. Rix.
12.15: Music.
12.30: Close.

AFTERNOON CONCERT—3 p.m. to 4.30 p.m.

3.0: Pleasant Sunday Afternoon Programme from the Lyceum Hall, arranged by the Central Methodist Mission, conducted by the Rev. A. J. Gould.
4.30: Close.

EVENING PROGRAMME—6 to 10.30 p.m.

6.0: A programme of instrumental music.
6.40: Mr. D. H. Drummond, Minister for Education, will speak on "Books and the Child."
7.0: Orchestra music.
8.0: Grand Concert Programme, arranged by Will Prior.
10.0: Meditation music.
10.30: Close.

2BL

Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 353 metres).

MIDDAY SESSION, 10.55 a.m. to 3 p.m.

10.55: Announcements.
11.0: From the Newtown Methodist Mission, morning service, conducted by Rev. A. E. Walker.
Hymn 414 (Methodist Hymn Book).
Prayer.
Hymn 218.
Psalm 92.
Children's address.
Children's Hymn—149—Alexander Hymn Book.
Scripture reading.
Solo, Mr. Bassett Evans.
"He Will Give You Rest" (Sweney).
Announcements and offering.
Anthem, "Comes at Times a Stillness" (Woodward).
Hymn 430.
Sermon—Text: "And Everything Shall Live, Whithersoever the River Cometh." Rev. A. E. Walker.
Hymn 1008.
Benediction.
12.15: Studio presentation of a specially-arranged programme of music.
12.30: News service.
12.38: Studio music.
2.15: The "Cheer-up" Society—Mr. Grose.
2.30: Half an hour's music from the Great Masters.
3.0: Close.
4.30: Organ recital—vocal and instrumental music.

EVENING SESSION, 6 p.m. to 10 p.m.

6.0: For the children in the hospital—Mr. Stevens.
6.40: Studio music.
7.0: From the Randwick Presbyterian Church—evening service, conducted by the Rev. W. J. Grant.
8.30: From St. Francis' Church, Albion Street—an augmented choir (Mr. A. Giardelli, conductor) will broadcast a four-part mass, composed by the Rev. Eris M. O'Brien (Sydney) and C. R. Kelly (Melbourne), supported by other items.
Overture, "The Rosary" (Nevin) Mount St. Mary's Orchestra, Golden Grove.
"Kyrie" (O'Brien and Kelly), St. Francis' Choir.
Recitative and Aria, "Hear My Prayer; Enter Not Into Judgment" (Costa's El).
Messrs. Clardelli and Egan.
"Credo" (O'Brien and Kelly), St. Francis' Choir.
Solo, "Ave Maria" (Luzzi), Lena Quirk.
Sanctus and Benedictus (O'Brien and Kelly), St. Francis' Choir.
Organ solo, Miss M. Toohy.
"Agnus Dei" (O'Brien and Kelly), St. Francis' Choir.
10.0: National Anthem. Close.

2GB

Theosophical Broadcasting Station, 29 Bligh St., Sydney (Wavelength, 316 metres).

9.0: Address by Miss Mary Rivett, "Confidence and the Concept of Confexes." 9.30: Address by Mr. Victor E. Cromer, "Confidence and Faith." 10.0: Music from Studio. 10.15: Organ music from St. Alban's Church, Regent Street, Sydney. 10.30: Morning Service from St. Alban's Church. 12 noon: Music from Studio. 12.30: Close down. 3.0: Musical Session. 5.30: Children's Session, by Uncle George. 7.0: Lecture from Adyar House. 8.0: Music from Studio. 8.15: Concert; player piano solos. 8.23: Miss Beatrice Kendrick, contralto. 8.30: Mr. Gregory Valentine, violinist. 8.40: Mr. Cecil Chaseling, baritone. 8.45: Miss Gladys Aubin, soprano. 8.52: Player piano solos. 9.0: Weather report. 9.1: Miss Beatrice Kendrick, contralto. 9.8: Mr. Cecil Chaseling, baritone. 9.15: Mr. Gregory Valentine, violinist. 9.23: Miss Gladys Aubin, soprano. 9.30: Address by Miss Mary Rivett, "Dare We Have Visions?" 9.40: Close.

2UW

Radio Broadcasting, Ltd., Paling's Building, Ash St., Sydney (Wavelength, 267 metres).

10.30: Music and request items. 1.0: Close down. 5.30: Children's Hour, conducted by Uncle Jack. 6.30: Close down. 7.0: Request numbers. 10.30: Close down.

POUNDS OF PENNIES

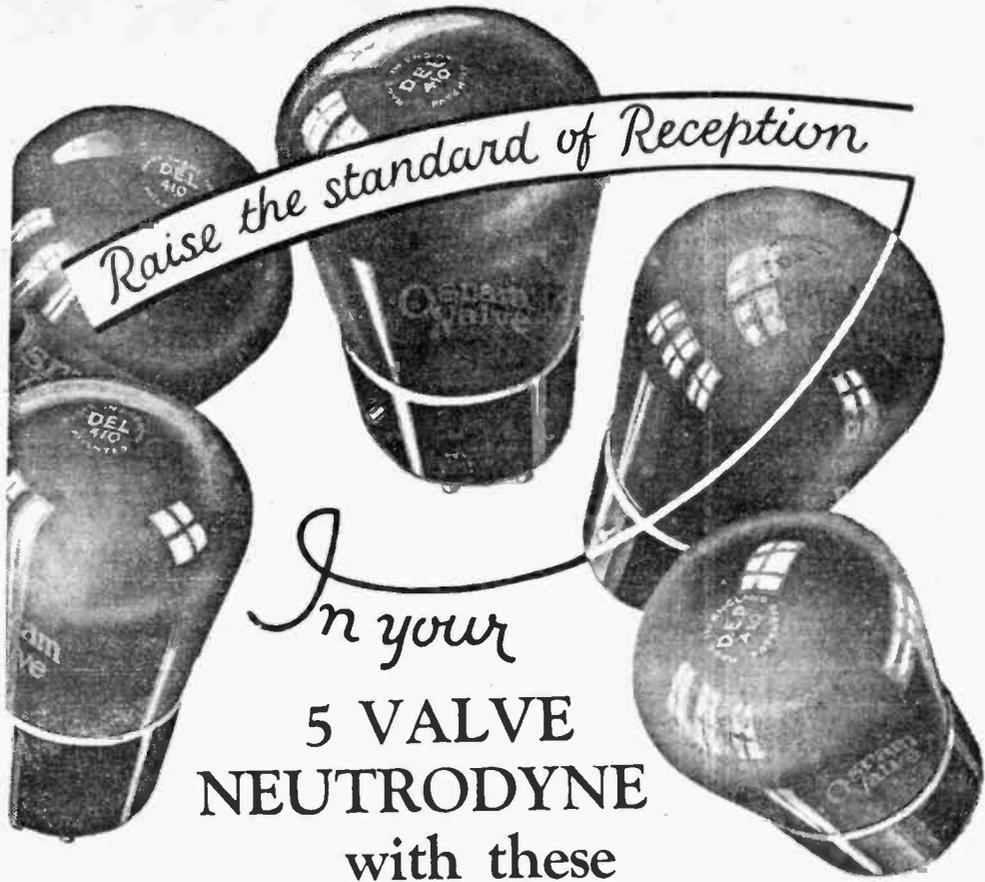
"Take care of the pennies, and the pounds will take care of themselves." There is more in that old saying than perhaps you realise. Pennies are more easily come by than pounds; they are more easily saved, for a penn'orth of self-denial is easier to practise than a pound's worth at a time.

Think it out—better still, try it out—the steady, sincere saving of the small coins: the practical appreciation of the small things and their cumulative value.

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6-volt	DEL. 610	DEL. 610	DEL. 610	DEL. 610	DEP. 610 or P625A

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Interstate Programmes, Sun., Aug. 4

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the Children.

3LO

Australian Broadcasting Co., 120A Russell St.,
Melbourne (Wavelength, 371 metres).

MORNING SESSION.

10.0: Birthday Greetings. 10.15: Reproduced Music.
10.45: News of the week-end. 11.0: Morning Service,
from Collins Street Baptist Church. Sermon by
Rev. W. D. Jackson, B.A. "Psalms of Human Life."
12.30: Close down.

AFTERNOON SESSION

2.0: Frank Lanterman at the Wuriltzer in a Medley
of Popular Items. 3.0: Pleasant Sunday After-
noon Service from Wesley Church. 4.30: Close down.

CHILDREN'S HOUR

8.0 to 7.0: An Hour of Brightness Dispensed by
"Plain Peter" and "Brother Bill."

EVENING SESSION

7.0: Evening service from Wesley Church. Sermon
by Rev. Dr. F. W. Boreham.
8.30: The State Theatre's Sunday Night Musical
Ensemble, with Mr. Stanley Porter's Symphony Or-
chestra. Mr. Bob M'Queenen's Melody Boys, Frank
Lanterman at the grand organ, and a company of
broadcasting vocalists and instrumentalists.

Overture, Stan Porter's Symphony Orchestra.
"Martha" (Flotow).
Flute Solo, Homer Lucas, "Gypsy Dance" (Ger-
man).

Vocal Number, Charles Stephens (tenor), "Lo-
lita" (Di Capua).

Melody Number, Bob M'Queenen and his Melody
Boys in a popular selection of popular ballads.

(a) "I Can't Give You Anything but Love"
(b) "I'll Get By"

(c) "Honey"
(d) "She's Funny That Way"

Organ Solo, Frank Lanterman, Classic Gems from
Brahms—

(a) "Ballade Edwards"
(b) "Hungarian Dance No. 7"

(c) "Waltz in A"
(d) "Sapphic Ode"

(e) "Hungarian Dance"
Trumpet Duet, Messrs. Robertson and King—

"The Two Inns"
Vocal Number, selected.

Orchestral Suite—
"Scenes Poetique" (Alford)

(a) "In the Woods,"
(b) "On the Mountains,"
(c) "In the Village."

Cello Solo, Joan Smith—
"Abernethy" (Schumann).

Melody Number, Bob M'Queenen and his Melody
Boys, "Talking to the Moon." Soloist, Bob
M'Queenen.

Vocal Quartette, the Big Four. Selected.
Quintette, Clarinet, Les Shuz; string quar-
tette, Messrs. Briskla, Whitincham, Clifford,
Pavroff. "First Movement from the Mozart
Quintette."

Organ Solo, Frank Lanterman—
(a) "Love's Old Sweet Song,"
(b) "The Sweetest Story Ever Told,"
(c) "Believe Me If All Those Endearing Young
Charms."

Violin Solo, Arved Norli—
"La Gitana" (Kreisler).

Orchestral Number, Stan Porter and his Sym-
phony Orchestra—
"Dreams" (Wagner).

"Marche de la Gloire" (D'Albes).
Saxophone Solo, Charles McFee—
"Valse Vanille" (Weidott).

Organ Solo, Frank Lanterman, Popular Request
Numbers. Mr. Lanterman will play a bunch
of request numbers received through the post.

Melody Number, Bob M'Queenen and his Melody
Boys—
"In a Persian Market."

Orchestral Number, Stan Porter and his Sym-
phony Orchestra. "The Student Prince Selec-
tion." Soloists, Carlo Martini and Oscar Lans-
bury.

10.30: God Save the King.

3AR

Australian Broadcasting Co., 120A Russell St.,
Melbourne (Wavelength, 384 metres).

MORNING SESSION

11.0: Morning service from the Collins Street In-
dependent Church; preacher, Rev. A. Penry Evans.
12.20: Close down.

AFTERNOON SESSION.

3.0: Half an hour of orchestrations, organs, and
oratorios. 3.30: J. Howlett Ross will speak on
"The Battle of Flands River." 3.45: Mr. Lord
Sreghina presents a famous Australian, William
Murdoch, pianoforte; "Sonata Pathetique C Minor,
Op. 13" (Beethoven); "Sonata Appassionata in F
Minor, Op. 57" (Beethoven). 4.15: Eminent Or-
chestrations. 4.30: Close down.

EARLY EVENING SESSION.

5.0: "Brer Rabbit," your old friend, will tell you
a story. 5.30: Close down.

EVENING SESSION.

7.0: Evening service from Scots Church, Collins
Street, Melbourne; preacher, Rev. Dr. W. Borland.

NIGHT SESSION.

8.30: The Strad String Quartette (Cecil Parkes
violin; Kingsley Parkes, violin; Eunice Gregory,
viola; and Frank Johnstone, cello)—
"String Quartette, Op. 18, No. 2, G Major"
(Beethoven).

8.50: Mary Mack, contralto—
"Resting Place" (Schubert).
"The Young Nun" (Schubert).

8.57: The Strad Trio (Cecil Parkes, violin; Myrs
Montague, piano; and Frank Johnstone, cello)—
"Trio G Major" (Haydn).

Andante.
Poco Adagio Cantabile.
Gipsy Rondo.

9.9: Eddie Fitch, and the famous Regent Wurilt-
zer—

"Request numbers."

9.48: Mary Mack, contralto—
"The Lord Is My Light" (Allitsen).
"Rest Thee, Sad Heart" (Del Riego)

9.55: Announcements.
10.0: God Save the King.

3DB

The "Herald" Broadcasting Station, Flinders Street,
Melbourne (235 metres).

AFTERNOON SESSION.

3.0: Chamber Music. 4.0: Symphony Orchestra and
Operatic Excerpts. 4.30: Close down.

EVENING SESSION.

6.30: Children's Hour. 7.0: An Opera. 8.0: Re-
quest Items. 10.0: God Save the King.

4QG

Queensland Government Radio Service, Brisbane
(Wavelength, 385 metres).

MORNING SESSION

11.0: The complete morning service will be relayed
from St. Stephen's Roman Catholic Cathedral. 12.30:
Close down.

AFTERNOON SESSION

3.15: The band concert provided by the Brisbane
Newtown Band will be relayed from the Botanic Gar-
dens. 4.30: Close down.

EARLY EVENING SESSION

6.0: Greetings to little listeners, and replies to
letters.

NIGHT SESSION

7.30: The complete evening service will be relayed
from St. Stephen's Roman Catholic Cathed-
ral.

8.30: At the conclusion of the evening service
band concert provided by the Brisbane Municipal
Concert Band will be relayed from the bandstand in
Wickham Park.

9.30: Close down.

5CL

Central Broadcasters, Ltd., 114 Hindmarsh Square,
Adelaide (Wavelength, 409 metres).

MORNING SESSION.

10.40: From St. Laurence's Roman Catholic Church,
a short organ recital, by Norma Tellesme—(a)
"Sonata in A Minor (First Movement)" (Rheinber-
ger), (b) "Military March" (Schubert). 11.0: Pon-
tifical High Mass, from St. Laurence's Roman Catho-
lic Church, North Adelaide. "Mozart's Twelfth
Mass." St. Laurence's Choir. 12.10: British official
wireless news. 12.15: Close down.

AFTERNOON SESSION.

2.30: From the Adelaide Town Hall, an organ
recital, by Mr. W. E. Knox. 3.0: The 15th annual
observance, Violet Memories Day. 4.0: Close down.

EVENING SESSION.

6.0: Chimes. 6.1: Children's happy moments. 6.15:
"The Bird Lady" and "The Sunshine Songsters" will
entertain the children. 7.0: Chimes. 7.1: Divine
service from Pile Street Methodist Church.

NIGHT SESSION.

8.20: Announcements.
8.30: Diggers' concert and items by Holden's Silver
Band.

9.40: P. H. Nicholls will give a "War Talk."
9.52: General news.
10.0: Close down.

6WF

Commonwealth Government Broadcasting Station,
Perth (Wavelength, 100 metres).

10.30: Special half-hour for the enthusiastic lis-
tenser. 11.0: Morning service from St. Andrew's
Church, Perth. 12.15: Close down. 3.30: Tune in.
7.35: Musical programme. 4.30: Close down. 6.45:
Bedtime stories. 7.30: Evening service from St.
George's Cathedral. 8.45: Concert relayed from
Queen's Hall, Perth. 10.5: Close down. 10.45 Metre
Transmission. Simultaneous broadcast on 104.5
metres of programme given on 1250 metres, com-
mencing at 6.45 p.m.

7ZL

Tasmanian Broadcasters Pty., 95 Elizabeth St.,
Hobart (Wavelength, 516 metres).

10.45 a.m.: Bells from Trinity Church, Hobart.
11.0: Morning service from the Glenorchy Presby-
terian Church. 12.15: Close down. 3.30 p.m.: A
concert programme, arranged by the Pleasant Sun-
day Afternoon Association. 4.30: Close down. 6.15:
Children's chorus singing, conducted by Trevor Mor-
ris. 6.45: Bertha Southey Bramhall. 7.0: Evening
service from Dares Street Methodist Church, Hobart.
8.25: A programme of sacred and classical music,
arranged by J. M. Counsel. 9.45: News session.
9.50: Close down.

EMMCO'S

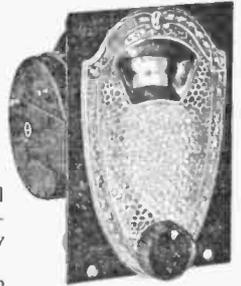
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Local Programmes, Monday, August 5

2FC

Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 442 metres).

EARLY SESSION—7 to 8.15 a.m.

- 7.0: "Big Ben" and weather forecast.
- 7.5: Early rising music.
- 7.40: Breakfast news.
- 7.45: Mails and shipping.
- 7.48: What's on to-day.
- 7.50: 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: Racing Observer.
- 10.45: From the State Theatre—Recital on the Grand Organ by Edgar Stone.
- 11.0: Household Helps—Cooking Recipes by Miss Ruth Furst.
- 11.10: Cables—Australian Press Association and the Sun-Herald Service.
- 11.15: The Studio Orchestra.
- 12.0: "Big Ben" and Stock Exchange. Fiction talk.
- 12.20: Midday market reports.
- 12.30: Close.

THE LUNCH HOUR—1 p.m. to 2.30 p.m.

- 1.0: Lunch to music with the A.B.C. Orchestra.
- 2.0: Stock Exchange second call.
- 2.2: Popular Education—A talk arranged by a Sydney University Lecturer.
- 2.20: A glance at the afternoon papers.

THE RADIO MATINEE—2.30 p.m. to 4.30 p.m.

- 2.30: The A.B.C. Orchestra.
- 2.42: John Andrews, tenor.
- 2.49: Dorothy Farmer, pianist.
- 2.59: Roger Jones, baritone.
- 3.6: Lionel Hickey, violinist.
- 3.13: The A.B.C. Orchestra.
- 3.28: John Andrews, tenor.
- 3.33: Dorothy Farmer, pianist.
- 3.43: The A.B.C. Orchestra.
- 3.58: Roger Jones, baritone.
- 4.5: Lionel Hickey, violinist.
- 4.13: The A.B.C. Orchestra.
- 4.28: The Stock Exchange. final call.
- 4.30: Close.

EARLY EVENING—5.45 to 7.55 p.m.

- 5.45: Kiddies' "Good-night" Stories. Uncle Ben and Aunt Willa.
- 6.45: The Studio Dinner Orchestra.
- 7.30: Sporting news and views.
- 7.45: From the State Theatre—Mr. Price Dunlavy at the Grand Organ.

EVENING PROGRAMME—8 p.m. to 11.30 p.m.

- 8.0: The National Broadcasting Orchestra.
- 8.15: Margaret James, contralto.
- 8.22: Sonia Mitchell, pianist.
- 8.34: H. W. Varna and Partner in a modern play.
- 8.59: Keith Grant, New Zealand baritone.
- 9.6: The National Broadcasting Orchestra.
- 9.21: The Harmony Four.
- 9.33: Victor M'Mahon, flute solos.
- 9.43: Jack Lumsdaine, Radio Rascal.
- 9.53: Spanish Serenaders.
- 10.5: Vernon Sellars and Patsy Hill, duetists.
- 10.15: Late news service and weather report.
- 10.20: Romano's Cafe Dance Orchestra, conducted by Bennie Abrahams.
- 11.30: Close. National Anthem.

2BL

Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 353 metres).

OPENING SESSION, 8.15 to 11 a.m.

- 8.15: Music for every mood.
- 8.45: "Interest Item" on outstanding events of the day.
- 9.0: Light music and songs.
- 9.40: New music—a review of new records.
- 9.55: British official wireless news.
- 10.5: News service.
- 10.10: The Ladies' Club hour.
- 10.30: The Studio Orchestra.
- 11.0: Close.

MIDDAY SESSION, 12 noon to 2.30 p.m.

- 12.0: A.B.C. Orchestra.
- 1.0: Afternoon news service.
- 1.15: Women's "Interest Talk."
- 1.30: Traders' "Selling the Set" music.
- 2.0: At the console of the Wurlitzer organ at the Capitol Theatre, Mr. J. Knight Barnett.

AFTERNOON ENTERTAINMENT, 2.30 p.m. to 5.45 p.m.

- 2.30: Business efficiency talks.
- 2.45: The Magic Carpet—travel and adventure.
- 3.0: The A.B.C. Dance Band.
- 3.12: Robert Scott, tenor.
- 3.19: Walter Searle, entertainer.
- 3.26: The A.B.C. Dance Band.
- 3.38: Laurel Mather, popular numbers.
- 3.45: Sydney Symphon; saxophone solos.
- 3.52: Robert Scott, tenor.
- 3.59: The A.B.C. Dance Band.
- 4.11: Walter Searle, entertainer.
- 4.18: The A.B.C. Dance Band.
- 4.28: Laurel Mather, popular numbers.
- 4.35: The A.B.C. Dance Band.
- 4.45: "The Trade Hour"
- 5.45: Close.

THE DINNER HOUR, 6.15 to 7.55 p.m.

- 6.15: The Studio Dinner Orchestra.
- 6.45: Boys' Aero Club—Mr. Norman Lyons.
- 7.5: Markets.
- 7.20: Late news.
- 7.30: The Studio Dinner Orchestra.
- 7.55: What's on the air to-night?

THE EVENING SESSION, 8 p.m. to 10.30 p.m.

- 8.0: The Harmony Four.
- 8.10: The Spanish Serenaders, instrumentalists.
- 8.20: Fred Bluett, comedian.
- 8.30: Palmistra, the wizard of the keys.
- 8.38: Jack Lumsdaine, the Radio Rascal.
- 8.48: The Two Fosters, musical entertainers.
- 8.58: Vernon Sellars and Patsy Hill, entertainers.
- 9.8: State and metropolitan weather forecast.
- 9.9: Elma Perdriau, monologues.
- 9.17: Victor M'Mahon, flautist.
- 9.24: Margaret James, contralto.
- 9.31: Fred Bluett, comedian.
- 9.41: The Two Fosters, musical entertainers.
- 9.51: Keith Grant, baritone.
- 10.8: Palmistra, the wizard of the keys.
- 10.15: Elma Perdriau, monologues.
- 10.25: News service.
- 10.30: Close. National Anthem.

2GB

Theosophical Broadcasting Station, 29 Bligh St., Sydney (Wavelength, 316 metres).

- 10.0: Music. 10.10: Happiness Talk by A. E. Bennett. 10.20: Music. 10.30: Women's Session, by Miss Helen J. Beegling. 11.30: Music. 11.45: Close down. 2.0: Music. 2.5: Women's Radio Service, by Mrs. Dorothy Jordan. 2.50: Music. 3.30: Close down. 5.30: Children's Session, by Uncle George. 7.0: Music. 7.30: Feature story. 8.0: Miss Hazel M'Lennan, contralto. 8.7: Symphony Orchestra. 8.15: Mr. Tom Harrison, baritone. 8.22: Instrumental Trio. 8.30: Humorous interlude by Mr. Jack Win and Mr. Heath Burdock. 8.35: Miss Elsie Brown, soprano. 8.45: Address. 9.0: Weather report. 9.3: Symphony Orchestra. 9.13: Miss Hazel M'Clelland, contralto. 9.23: Mr. Heath Burdock, Shakespearean Recital. 9.33: Mr. Tom Harrison, baritone. 9.43: Instrumental Trio. 9.50: Miss Elsie Brown, soprano. 10.0: Humorous interlude by Mr. Jack Win and Mr. Heath Burdock. 10.5: Instrumental music. 10.30: Close down.

2UW

Radio Broadcasting, Ltd., Palling's Building, Ash St., Sydney (Wavelength, 267 metres).

MIDDAY SESSION.

- 12.30: Request numbers. 1.0: G.P.O. clock and chimes; music. 1.15: Talk on Home-craft by Pandora. 1.40: Music and request numbers. 2.30: Close down. 4.30: Musical programme.

EVENING SESSION.

- 5.30: Children's Hour, conducted by Uncle Jack. 6.30: Close down. 7.0: G.P.O. clock and chimes. Request items. 7.45: Radio Talk by Mr. E. Homfray. 8.0: Wagner recital. 9.0: Comments on Foreign Affairs by Mr. J. M. Prentice. 9.10: Music and request numbers. 10.30: Close down.

2KY

Trades and Labour Council, Goulburn St., Sydney (Wavelength, 280 metres).

MORNING SESSION.

- 10.0: Tune in to the ticking of the clock. 10.3: Popular fox trots. 10.15: Hawaiian steel guitar selections. 10.30: Request numbers. 10.50: Vocal items. 11.0: A few laughs. 11.5: Pianoforte selections. 11.15: Calls and announcements. 11.20: Musical interlude. 11.30: Request numbers. 11.40: Where to go to-night. 12 (noon): Closing announcements.

CHILDREN'S SESSION.

- 6.0: Birthday calls, request numbers, and kiddies' entertainment. Aunt Jemima and Uncle Bert.

EVENING SESSION.

- 7.0: Musical interlude.
- 7.15: Dance music.
- 7.45: Militant Women's Group.
- 8.0: Overture.
- 8.8: Tenor solos, Mr. A. Hillman.
- 8.15: Dance music.
- 8.30: Series of Biblical talks, presented by I.B.S.A.
- 8.45: Soprano solos, Miss Wright.
- 9.0: Novelty interlude.
- 9.10: Request numbers.
- 9.30: Selection of latest Parlophone, Columbia, Regal, Brunswick, and Golden Tongue records.
- 10.0: Closing announcements.

Owing to the fact that we have not been able to give our many service calls the attention they demand, we have removed to 235 Livingstone Rd., West Marrickville, and are now ready for quick action.

For any Service Calls or Information, Ring

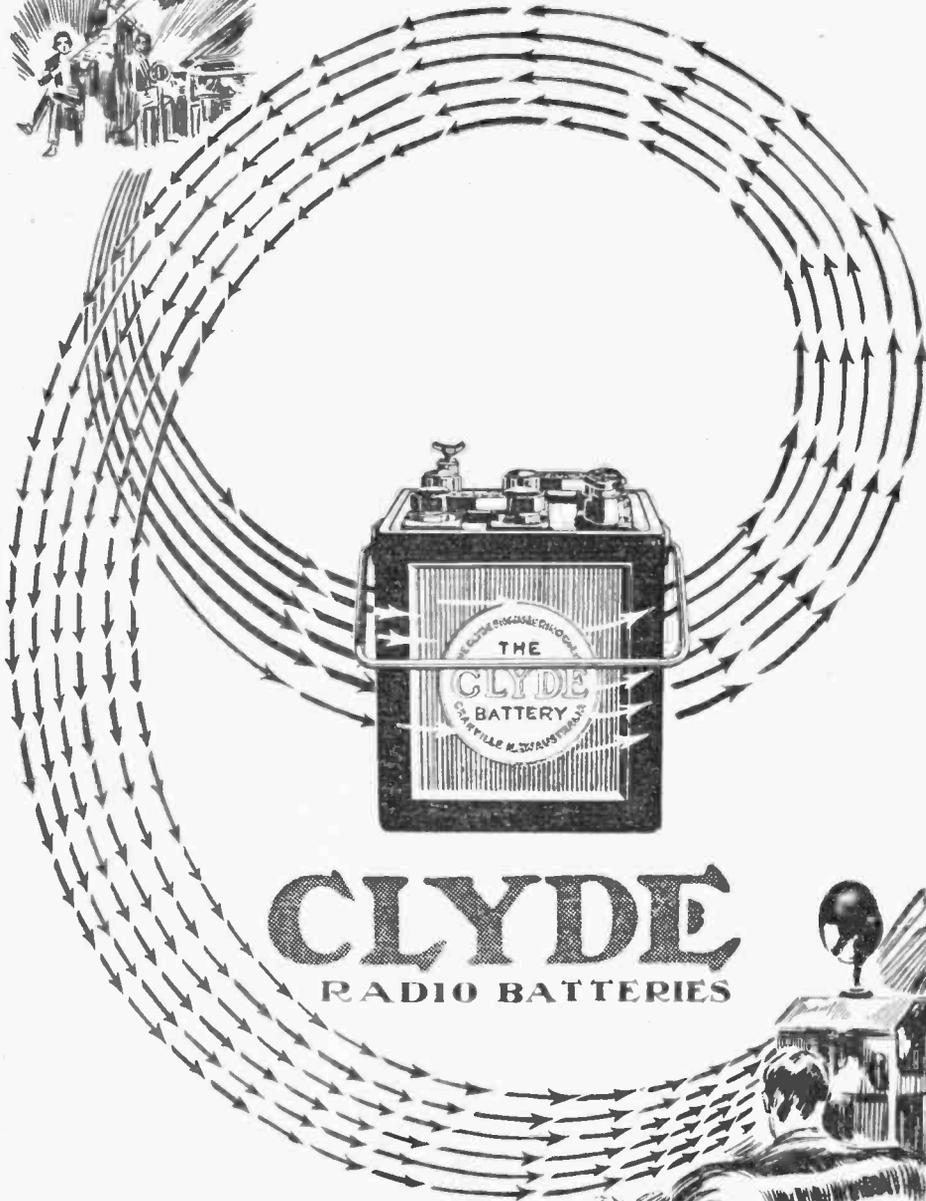
PETERSHAM 1630

Note our New Address:—

The Resco Radio Supply Co.,

235 LIVINGSTONE RD., WEST MARRICKVILLE

Petersham 1630



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Interstate Programmes, Monday, August 5

3LO

Australian Broadcasting Co. 120A Russell St., Melbourne (Wavelength, 311 metres).

7.0: Time signal from Melbourne Observatory. Weather forecast. 7.5: Early-rising music. 7.40: Mails and Shipping. 7.43: What's On To-day? 7.45: Birthday Greetings. 8.0: Breakfast News and Market Reports. 8.15: Close down.

MORNING MUSICALS

10.30: The Thought for To-day, Dr. Loftus Hills, D.Sc. 10.35: Reproduced Music. 10.45: Arnold Coleman at the Wurlitzer Organ. 11.0 to 12.15: 3LO Studio Orchestra, with Kate Cornell (entertainer). 12.15: To-day's news. Rates on 'Change. Weather forecast.

MIDDAY SESSION

12.30: National Broadcasting Orchestra (under direction of Wm. G. James). Conductor, Percy Code. Overture, "Raymond" (Thomas). "Valse Bluette" (Drigo). Harold Webb (baritone). Orchestra. Suite, "Summer Days" (Coates). 1.0 to 2.0: Luncheon Music supplied by the National Broadcasting Orchestra, under direction of Wm. G. James; conducting Percy Code.

THE LECTURETTE SESSION

2.0: Mr. Percival Selie, "Our Australian Writers—Shaw Nielson." 2.15: Reproduced Music. 2.25: Mr. F. T. Sung, Chinese Consul-General, "Recent Events in China." 2.40: Reproduced Music. 2.45: Hon. J. H. Keating, LL.B., "Early Days of Our Commonwealth."

THE RADIO MATINEE

3.0: National Broadcasting Orchestra (under direction Wm. G. James; conductor, Percy Code). "Stradella" (Finetti). "La Cinquante" (Marie). 2.10: Marie Maud isoprano. "Three Old English Songs" (traditional). "I Know a Bank" (arr. Martin-Shaw). "Come and Trip It" (arr. Mary Campbell). 3.30: A Comedy Drama specially written for radio by Frank Pearson. "The Eternal Triangle." Billy Reid (the Husband), Frank Pearson; Beatrice Reid (the Wife), Miss Vety Landau; Harry Armstrong, Leslie Williams. Scene—A sitting-room at the Reids' home. Time—The present, midnight. Note: During the action of this play there are two pauses, of 10 seconds each, to denote lapses of time. 3.50: The Whidburns, Hawaiian Instrumentalists. "Songs of the Southern Seas." 3.40: James Fraser (baritone). "Sivellin" (Sinding). "Gracious and Kind" (Brahms). "The Sweet Old Song" (Kreiser). 3.50: The Whidburns. Some More Hawaiian Music. 4.0: Harry Kilts (tenor). "Oh, Cease Thy Singing, Maiden Fair" (Rachmanninoff), violin obbligato by Bertha Jorgensen. "Serenade" (Tschakowsky). "Eleanor Coleidge" (Taylor). 4.10: Orchestra. Selection, "The Vagabond King" (Friml). Suite, "Melodique" (Friml). Selected. 4.30: Close down.

THE CHILDREN'S CORNER

5.45: "Billy Bunny" will tell a whimsical story. 6.0: "The Mouth Organ Band" will play the melodies we all like. 6.15 to 7.30: Dinner Music provided by 3LO Studio Orchestra.

NEWS SESSION

7.30: News session. Rates on 'Change. Market reports.

NIGHT SESSION

7.45: National Broadcasting Orchestra, under direction of Wm. G. James; conductor, Percy Code. Selection, "Moskovskiana." 7.55: W. J. Cadogan (tenor). "Si Mes Vers Avalent des Ailes" (Hahn). "Wondrous Art Thou, My Lovely Queen" (Brahms). "Sunday" (Brahms). 8.5: Owen Prockter (cello). "Elegie" (Fauré). "Serenade Espagnole" (Glazounov). "Vito" (Popper). 8.20: Methodist Male Choir of Elsternwick—"Song of the Northman" (Maunders). "Come Where My Love" (Dickx). "Swanee Town" (Holst). "Stars of the Summer Night" (Hattori). "On the March" (Becker). 8.35: Orchestra—Selection from "Pagliacci" (Leoncavallo). 8.45: Melbourne Repertory Theatre Company present "Rory Aforesaid," a comedy in one act, by John Brandane. The play is founded on an old French farce, "Maitre Pierre Pathelin," which is famous as containing for the first time the now hackneyed phrase, "revenons a nos moutons." "to return to our muttons." It was produced for the first time for broadcasting at Glasgow under the direction of the present director of the Melbourne Repertory Theatre. People of the play—MacConnachie, the Court Officer, Frederick Drew, Duncan MacCallum, Merchant and Small Sheep Farmer at Ardnish. Robert Guthrie, Rory MacColl, Shepherd to MacCallum, Howard Smith, Mr. MacIntosh, an Oban Lawyer, George Faulkner, The Sheriff-Substitute, also from Oban. Frank D. Clewlow, Mrs. MacLean, a Crofter Widow Woman, Irene Webb

The place of action is the court house at Torlachan, in the West Highlands. The production under the direction of Frank D. Clewlow. Note: Little or no accent will be used, so that all may follow easily, but the Highland turn of speech will be found in the dialogue.

9.30: Orchestra—Suite, "Woodland Pictures" (Fletcher). 8.40: With the Foreign Legion in Africa. (Atmos-

pheric sketch, all musical. Produced by George English).

- Part 1. In France. (The Departure).
- 1. Chorus, "The Marseillaise" (Rouget de Lysle).
- 2. Solo, "Hope Ever" (L. Clapsson).
- 3. Chorus, "The Departure of the Patriots" (Anon.).
- 4. "Adieu, Fair France" (Anon.).
- 5. Chorus, "To Die for Home and Country (Alphonse Varney)." Part 2. In Africa.
- 6. Orchestral, "The Patrole."
- 7. Song, "Far Across the Desert Sands" (Woodforde Finden).
- 8. Song, "How Many a Caravan" (Woodforde Finden).
- 9. Chorus, "Allah be With Us" (Woodforde Finden).
- 10. Song, "I Will Await Thee" (Coningsby Clarke).
- 11. Chorus, "The Flagon Chime" (Anon.).
- 12. Song, "Thou Whom My Heart Desires" (Coningsby Clarke).
- 13. Chorus, "The Foreign Legion" (Anon.).
- 14. Song, "The Sun of Britanny" (L. Puget).
- 15. Finale, "The Marseillaise" (Rouget de Lysle).
- 10.20: News from to-morrow's papers.
- 10.30: "The Rex" Dance Band.
- 11.30: God Save the King.

3AR

Australian Broadcasting Co. 120A Russell St., Melbourne (Wavelength 484 metres).

EARLY MORNING SESSION

10.0 to 10.59: See Friday.

MORNING MUSICAL SESSION

11.0: The London Symphony Orchestra, conducted by G. Schneevogt. "Norwegian Dances," Nos. 1, 2, 3, and 4 (Grieg). 12.10: British official wireless news from Rugby; announcements. 12.20: Community singing, transmitted from the King's Theatre, conducted by G. J. Mackay, assisted by the Radio Revellers, Arthur Douglas, a Braw Scot, and Madoline Knight, contralto. 1.45: Close down.

AFTERNOON SESSION

3.0: Recordings. 3.45: Captain Donald Maclean. 4.0: Recordings. 4.30: Close down.

EVENING SESSION

6.0: Recordings. 7.10: News session; announcements. Acceptances and barrier positions for the Findon Harriers races, to be held at Moonee Valley on Wednesday, August 7. 7.20: Ecstatic Euphonies.

NIGHT SESSION

- 7.45: Madame Soward will speak to students of French.
- 8.0: The Strad Trio—"Trio, Op. 15. F. Major" (Rubinstein). Con moto Moderato. Finale.
- 8.16: Syd. Ewton, tenor—"Marthe" (Davies). "Rosebud" (Drummond).
- 8.23: Cecil Parkes, violin—"Hymn to the Sun" (Rimsky Korsakov). "Obertass" (Wieniawski).
- 8.32: The Sundowners' Radio Revue Company present a burlesque sketch, specially written and produced for radio by J. Harcourt Bailey.
- 9.0: Lindsay Higgins, piano—"Prelude" (Chopin). "Nocturne, F Minor" (Chopin). "Mazurka, A Minor" (Chopin). "Polonaise, G Minor" (Chopin).
- 9.30: Syd. Ewton, tenor—"The Secret" (Scott). "Five Eyes" (Gibbs).
- 9.37: The Radio Revellers—"My Mother's Eyes" (Baer). "I Faw Down and Go Boom" (Brockman). "In a Little Town Called Home, Sweet Home" (Donaldson).
- 9.47: Alan Adcock, entertainer—Humoristies.
- 9.54: The Radio Revellers—"My Angelina" (Wayne). "The Wedding of the Painted Doll" (Brown). "What'd ya Say" (Brown).
- 10.5: Alan Adcock, entertainer—Just for Fun.
- 10.11: The Radio Revellers—"Sonny Boy" (Jolson). "Sally of My Dreams" (Kernell). "Paradise and You" (Packay).
- 10.20: Age news service; announcements.
- 10.30: The Radio Revellers—"Oh, Isabella" (Schuster). "Forty-seven Ginger-headed Sailors" (Sarony). "That's How I Feel About You" (Davis). "Marie" (Berlin). "Ain't She Real Cute?" (Hamy). "By the Lazy River" (Packay). "My Castle in Spain is a Shack in the Lane" (Friend). "That's What I Call Sweet Music" (Meskill). "I Fell Head Over Heels in Love" (Thayer).
- 11.0: God Save the King.

3DB

The "Herald" Broadcasting Station, Flinders Street, Melbourne (255 metres).

MORNING SESSION

11.0: Time Signal. Musical Comedies and Revues. 11.30: "The World's Fashions and Follies," by "La Vogue." 11.35: Amy Woodford Finden and Albert

W. Kettelbey. 12.0: A Scotch Programme. 12.25: News. 12.30: Close down.

AFTERNOON SESSION

2.0: Time Signal. Some Famous Australians. 2.30: Plantation Melodies. 2.55: Atwater Kent Radio Hour, sponsored by A. G. Healing, Ltd., and E. T. Muir. 3.55: News. 4.0: Close down.

EARLY EVENING SESSION

5.30: Billy Bunny's Children's Hour. 6.0: Mrs. Dorothy Silk, "Homcrafts." 6.15: Sousa's Band and Some Singers. 6.30: Hawaiian Music. 7.0: Old-time Melodies. 7.30: Irish Songs and Music.

NIGHT SESSION

8.0: Aeolian Hour. 8.30: Purely Classical. 9.0: A Ballad Salad with an Orchestra. 10.0: Organs and Chords. 10.30: Slumber Music. 10.40: News. 10.45: God Save the King.

4QG

Queensland Government Radio Service, Brisbane (Wavelength, 385 metres).

EARLY MORNING SESSION

7.43 to 8.43: See Friday.

MIDDAY SESSION

1.0 to 2.0: See Friday.

AFTERNOON SESSION

3.0 to 4.30: See Friday.

EARLY EVENING SESSION

6.0 to 7.45: Lecturette.

NIGHT SESSION

8.0: From the studio, Doris M'Innes, soprano. "The Piper of Love" (Carew). 8.4: Kennedy Allen. The sixth of a series of reviews on Shakespeare and his works, "Shakespeare's Murderers." 8.14: A. E. Little, baritone. "That Old Waltz Tune." 8.20: Tex Dawson, baritone. "Get Out and Get Under the Moon." "There's a Rainbow Round My Shoulder." 8.25: Mary L. Spanjer, contralto. "Summer Time on Bredon" (Peel). 8.30: From the School of Arts. A choral recital by the Brisbane Extended Choir. Chorus, "The Pleasure of the Plains" (Handel). Ladies' choir, part-song, "O Peaceful Night" (German). Full choir, madrigal, "Winter's Sadness" (Weeks). Male choir, part-song, "Rolling Down to Rio" (German). 9.0: Metropolitan weather forecast. 9.1: Doris M'Innes, soprano. "Dawn" (Curran). 9.5: Tex Dawson, baritone. "Plantation Melodies." "Repease Band March." 9.12: A. E. Little, baritone. "Drake Goes West." (Sanderson). 9.16: Mary L. Spanjer, contralto. "Providence" (Carner). 9.20: An organ record. 9.24: Tex Dawson, baritone. Intermezzo from "Il Trovatore." 9.30: A programme of music by the Brisbane Excelsior Band. 10.0: News supplied by the metropolitan dailies. Weather information. Close down.

5CL

Central Broadcasters, Ltd., 114 Hindmarsh Square, Adelaide (Wavelength, 409 metres).

MORNING SESSION

11.15 to 2.0: See Friday.

AFTERNOON SESSION

3.0 to 4.30: General programme, see Friday.

EVENING SESSION

6.0: Chimes. 6.1: Children's happy moments. 6.30: Dinner session. 7.0: Chimes. 7.20: Mr. Geoffrey Samuel (plant pathologist, Waite Research Institute) will speak on "News Items on Plant Diseases." 7.35: The 5CL Twinkler Boys' Club.

NIGHT SESSION

8.0: Chimes. 8.10: Walter Barratt and his Maison Masters of Melody—"My Mother's Eyes" (Baer). "I Faw Down Go Boom" (Brahm). "Let's Talk About My Sweetie" (Donaldson). 8.20: Nettie Rooney, soprante—"Stay Out of the South" (Dixon). 8.24: Walter Barratt and his Maison Masters of Melody—"On the Crest of a Wave" (De Sylva). "Just Like a Melody Out of the Sky" (Donaldson). "If You Want the Rainbow, You Must Have the Rain" (Rose). 8.34: James Riley, tenor—"I Love You" (Scoonza). 8.38: Walter Barratt and his Maison Masters of Melody—"The Wedding of the Painted Doll" (Brown). "Mississippi Moon" (Teese). "That's What I Call Love" (Kahn). 8.48: Jack Burgess and his ukulele—"Pretty Little Dear" (Crumit). 8.52: Walter Barratt and his Maison Masters of Melody—"I Know It was You" (Murray). "High Up on a Hilltop" (Baer). "Good News" (De Sylva).

10.30: Continuation of old-time dance night. Schot-tische—
 "Mandy Jane."
 10.35: Jack Burgess and Netta Rodney, entertain-ers—
 "Right or Wrong."
 "Anything You Say."
 10.41: uadrille—
 "Mikado."
 10.45: The Lads and Lassies of the Village, con-ducted by Horace Perkins, assisted by the Madrigal Singers—
 The old-time choruses will be:—
 "Sweet Marie."
 "Till the Sands of the Desert Grow Cold."
 "Good-bye, Adelaide Town."
 0.54: Waltz—
 "Waves of the Ocean."
 11.0: Close down.

6WF

Commonwealth Government Broadcasting Station.
 Perth (Wavelength, 160 metres).

10.0: Gramophone records. 11.0: Close down. 12.30: Markets, news, etc. Weather. 1.30: Music. 1.30: Close down. 2.30: Afternoon tea music. 4.0: "Seal-ing Wax Craft," by Miss B. Hoyle. 4.30: Close down. 6.45: Bedtime stories by Uncle Duffy. 7.5: Light music. 7.30: Commercial and general infor-mation. 7.45: Popular science talk. 8.0: Time signal. 8.1: Weather. 8.3: Children's Orchestra. 8.50: Late news. Ships within range. Late weather. 9.5: Programme continued. 10.30: Close down. 104.5 Metre Transmission. Simultaneous broadcast on 104.5 metres of programme given on 1250 metres, commencing at 6.45 p.m.

7ZL

Tasmanian Broadcasters Pty., 95 Elizabeth St., Hobart (Wavelength, 516 Metres).

11.30 a.m.: Selections. 11.34: Midlands weather forecast. 11.35: Selections. 11.55: Tasmanian Sta-tion's 9 a.m. weather report. 12.0: G.P.O. clock chimes the hour. 12.1: Shipping information; ships within wireless range; mail notices; housewives' guide; commercial news. 12.8: Selections. 12.29: Announcements. 12.33: Selections. 12.55: News ser-vice: British official wireless news; Railway auc-tion produce sales, held at Railway. 1.10: Selections. 1.30: Transmission from the Imperial Hotel, Hobart. 2.0: Close down. During the afternoon running descriptions will be given of the Findon Hatriers' Hunt Club races, held at Moonee Valley Racecourse, Moonee Valley, Melbourne, Victoria. 3.0: G.P.O. clock chimes the hour. 3.1: Selections by the Melody Masters. 3.4: Weather information. 3.5: Selections by the Melody Masters. 4.15: Readings from the "Illustrated Tasmanian Mail." 4.30: Close down. 5.15: Children's hour with Bertha Southey Bram-mall and J. M. Counsel. 7.15: News session. 7.30: Miss M. D. Wilson, Instructress of dressmaking, will speak on "Winter Fashions." 7.45: Rev. J. W. Davi-son will speak on "The Authors and Origin of Hymns." 8.0: G.P.O. clock chimes the hour. 8.1: Selections by the Melody Masters. 8.6: A Columbia recital, including latest releases, specially arranged by Findlay's Music Warehouse. 9.30: News session. 9.45: Columbia recital (continued). 10.0: G.P.O. clock chimes the hour. Close down.

Proving Radio Club

EXECUTIVE REPORT.

MR. LONG, M.H.R., is arranging a furthe-visit to Pennant Hills Wireless Station for the Proving Radio Club, to take place soon. Discussing this week's work, it was decided that group leaders, in addition to having the Admiralty Handbook, should possess the A.R.R.L. Handbook. No group re-ports are to hand, owing to the change over to the new series of articles. Members are at present fagging maths. and trig.

Concord Group has taken up set construc-tion, and excellent progress has been made with the morse class, two of the members having attained a speed of 15 words per min-ute sending and receiving.

Dulwich Hill Group reports that most of the members' time has been taken up with arithmetic. The morse class has returned to 29 Blairgowrie Street, Dulwich Hill, and In-struction takes place from 7 p.m. till 9 p.m. every Wednesday. This group is building the "Marco" with screen-grid, also a S.W. adaptor with screen-grid, and a gramophone pick-up.

Bondi Beach Group, at their last meeting finished the last of the "Proving Radio" series, and held a lengthy discussion on the new series.

Mosman Group will shortly be opened in that district by one of the Bondi Group mem-bers, and anyone wishing to join please get in touch with the organising secretary, Mr. O. Y. Hook.

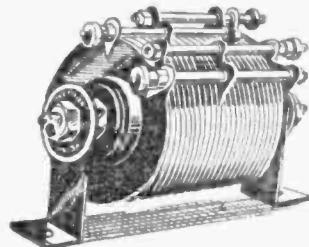
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 NO REWIRING; NO HUM.
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Local Programmes, Tuesday, August 6

2FC

Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 442 metres).

EARLY SESSION—7 to 8.15 a.m.

- 7.0: "Big Ben" and weather forecast.
- 7.5: Early rising music.
- 7.40: Breakfast news.
- 7.45: Mails and shipping.
- 7.48: What's on to-day?
- 7.50: 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: The Racing Observer.
- 10.45: From the State Theatre—Recital on the Grand Organ by Edgar Stone.
- 11.0: Household Helps—Hints to Housewives by Miss Ruth Furst.
- 11.10: Cables—Australian Press Association and the Sun-Herald Service.
- 11.15: The Studio Orchestra.
- 12.0: "Big Ben" and Stock Exchange A Literary Talk.
- 12.20: Midday market reports.
- 12.30: Close.

THE LUNCH HOUR—1 p.m. to 2.30 p.m.

- 1.0: Lunch to music with the A.B.C. Orchestra.
- 2.0: Stock Exchange, second call.
- 2.2: Popular Education—A Talk on Broadcast English.
- 2.20: A glance at the afternoon papers
- 2.30: Close.

THE RADIO MATINEE—2.30 p.m. to 4.30 p.m.

- 2.30: The A.B.C. Orchestra.
- 2.42: Alda Bulmus, soprano.
- 2.49: David M'Kissock, cellist.
- 2.52: The A.B.C. Orchestra.
- 3.7: Joe Cahill, entertainer.
- 3.14: Wilfred Arlom, pianist
- 3.24: The A.B.C. Orchestra
- 3.36: Alda Bulmus, soprano
- 3.45: David M'Kissock, cellist.
- 3.50: Joe Cahill, entertainer.
- 3.57: The A.B.C. Orchestra.
- 4.9: Wilfred Arlom, pianist.
- 4.17: The A.B.C. Orchestra.
- 4.28: The Stock Exchange, final call.
- 4.30: Close.

EARLY EVENING—5.45 to 7.55 p.m.

- 5.45: Kiddies' "Good-night" Stories, conducted by "Hello Man" and Aunt Eily.
- 6.45: The Studio Dinner Orchestra.
- 7.30: Sporting news and views
- 7.45: From the State Theatre—Mr. Price Dunlavy at the Grand Organ

EVENING PROGRAMME—8 p.m. to 11.30 p.m.

- 8.0: From Fullers—Vaudeville Vignettes.
- 8.15: From the Studio—The A.B.C. Dance Band.
- 8.27: Wally Baynes, comedian
- 8.34: The A.B.C. Dance Band
- 8.41: Peter Brookes.
- 8.48: The A.B.C. Dance Band
- 9.0: Dan Thomas and May Crane, entertainers.
- 9.10: The A.B.C. Dance Band.
- 9.22: Nea Hallett, popular vocalist.
- 9.29: The A.B.C. Dance Band.
- 9.41: Charles Zoli, in a Melange of Mirth
- 9.48: The A.B.C. Dance Band.
- 10.0: Peter Brookes, baritone.
- 10.7: The A.B.C. Dance Band.
- 10.15: Late news service.
- Official weather forecast.
- 10.20: The A.B.C. Dance Band.
- 11.30: Close. National Anthem.

2BL

Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 353 metres).

OPENING SESSION—8.15 to 11 a.m.

- 8.15: Music for every mood.
- 8.45: "Interest Item" in outstanding events of the day.
- 9.0: A bunch of ballads.
- 9.40: New music—a review of new records.
- 9.55: British Official Wireless news.
- 10.5: News service.
- 10.10: The Ladies' Club Hour.
- 10.30: Studio Orchestra.
- 11.0: Close.

MIDDAY SESSION—12 noon to 2.30 p.m.

- 12.0: The A.B.C. Orchestra.
- 1.0: Afternoon news service.
- 1.15: Women's "Interest Talk."
- 1.30: Traders' "Selling the Set" Music.
- 2.0: At the Console of the Wurlitzer Organ at the Capitol Theatre—Mr. J. Knight Barnett.

AFTERNOON ENTERTAINMENT—2.30 p.m. to 5.45 p.m.

- 2.30: Business Efficiency Talks.
- 2.45: The Magic Carpet—travel and adventure.
- 3.0: Romano's Cafe Dance Orchestra, conducted by Bennie Abrahams.
- 3.12: From the Studio: Len Maurice, popular vocalist.
- 3.19: Nellie Ferguson, monologues.
- 3.26: Romano's Cafe Dance Orchestra, conducted by Bennie Abrahams.
- 3.38: From the Studio—Agnes M'Diarmid, soprano.
- 3.45: Len Maurice, popular vocalist
- 3.52: Dance items.
- 4.0: G.P.O. chimes.
- Romano's Cafe Dance Orchestra, conducted by Bennie Abrahams.
- 4.15: From the Studio—Len Maurice, popular vocalist.
- 4.22: Dance numbers.
- 4.29: Agnes M'Diarmid, soprano.
- 4.36: Romano's Cafe Dance Orchestra, conducted by Bennie Abrahams.
- 4.45: "The Trade Hour."
- 5.45: Close.

THE DINNER HOUR—6.15 to 7.55 p.m.

- 6.15: The Studio Dinner Orchestra.
- 6.45: Girl Guides—Miss Gwen Varley.
- 7.5: Markets.
- 7.20: Late news.
- 7.30: The Studio Dinner Orchestra.
- 7.55: What's on the air to-night?

EVENING SESSION—8 p.m. to 10.30 p.m.

- 8.0: From 4GG Brisbane—Relay of Programme: Symphony Orchestra, conducted by Eric John.
- 9.0: From the Studio: State and metropolitan weather report.
- 9.1: Wally Baynes, comedian.
- 9.8: Carlton Fay and Maggie Foster, musical entertainers.
- 9.18: Nea Hallett, popular vocalist.
- 9.25: Dan Thomas and May Crane, entertainers.
- 9.35: The Ahad Duo, steel guitars.
- 9.43: Fernice Patterson, popular vocalist
- 9.50: Carlton Fay and Maggie Foster, musical entertainers.
- 10.0: A Talkie Trifle.
- 10.19: From the Studio—The Ahad Duo, steel guitars.
- 10.19: Fernice Patterson, popular vocalist
- 10.25: News service.
- 10.30: Close. National Anthem.

2GB

Theosophical Broadcasting Station, 29 Rialt St., Sydney (Wavelength, 316 metres).

- 10.0: Music.
- 10.10: Happiness Talk, by A. E. Bennett.
- 10.20: Music.
- 10.30: Women's Session, by Miss Helen J. Beegling
- 11.30: Music.
- 11.45: Close down.
- 2.0: Music
- 2.5: Women's Radio Service, by Mrs. Dorothy Jordan.
- 2.50: Movie Know All.
- 3.0: Music
- 3.30: Close down.
- 5.30: Children's Session, by Uncle George.
- 7.0: Music.
- 7.30: Talk from Radio Service Department by Mr. Stan Crittenden.
- 8.0: Miss Heather Kinnaird, contralto.
- 8.7: Instrumental Quartette.
- 8.15: Mr. Cecil Houghton, tenor.
- 8.22: Symphony Orchestra.
- 8.30: Humorous interlude by Mr. Jack Win and Mr. Heath Burdock.
- 8.35: Miss Gladys Verona, soprano.
- 8.45: Instrumental Trio.
- 8.50: Miss Heather Kinnaird, contralto.
- 9.0: Weather report.
- 9.3: Address
- 9.15: Symphony Orchestra.
- 9.25: Mr. Cecil Houghton, tenor.
- 9.35: Humorous interlude by Mr. Jack Win and Mr. Heath Burdock.
- 9.40: Symphony Orchestra.
- 9.50: Miss Gladys Verona, soprano.
- 10.0: Instrumental music.
- 10.30: Close down.

2UW

Radio Broadcasting, Ltd., Pallin's Building, Ash St., Sydney (Wavelength, 267 metres).

MIDDAY SESSION.

- 12.30: Request numbers.
- 1.0: G.P.O. clock and chimes; music.
- 1.15: Talk on Home-craft by Pandora.
- 1.40: Music and request

- numbers.
- 2.30: Close down.
- 4.30: Musical programme.

EVENING SESSION.

- 5.30: Children's Hour, conducted by Uncle Jack.
- 6.30: Close down.
- 7.0: G.P.O. clock and chimes.
- Request items.
- 8.0: Famous Duets Recital.
- 9.0: Comments on Foreign Affairs by Mr. J. M. Prentice.
- 9.10: Music and request numbers.
- 10.30: Close down.

2KY

Trades and Labour Council, Goulburn St., Sydney (Wavelength, 260 metres).

MORNING SESSION.

- 10.0: Tune in to the ticking of the clock.
- 10.3: Popular fox trots.
- 10.15: News items.
- 10.30: Vocal items.
- 10.50: Hawaiian steel guitar selections.
- 11.0: A few laughs.
- 11.5: Pianoforte selections.
- 11.15: Calls and announcements.
- 11.20: Musical numbers.
- 11.30: Request numbers.
- 11.40: Music and vocal items.
- 11.55: Where to go to-night.
- 12 (noon): Closing announcements.

CHILDREN'S SESSION.

- 6.0: Birthday calls, request numbers, and kiddies' entertainment. Aunt Jemima and Uncle Bert.

EVENING SESSION

- 7.0: Musical interlude.
- 7.15: Sporting feature; turf topics; how they should run to-morrow. Mr. Geo. A. Davis.
- 7.45: Request numbers.
- 8.0: Novelty numbers. Miss Billie Underwood.
- 8.10: Soprano solos.
- 8.18: Baritone solos, Mr. Higgins.
- 8.26: Pianoforte solos; Mr. Hancock.
- 8.30: Series of Biblical talks, presented by I.B.S.A.
- 8.45: Music and request numbers from the studio.
- 9.0: Sporting feature, presented by Tooth and Co., Ltd., Kent Brewery, from the right-side of M'Hugh's Leichhardt Stadium, results of early events, and full description of main 15-round event.
- 9.40: Dance music from the studio
- 10.0: Closing announcements

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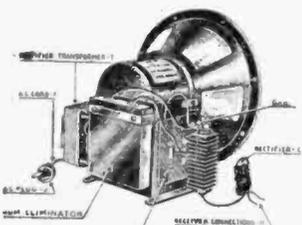
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Interstate Programmes, Tuesday, August 6

3LO

Australian Broadcasting Co., 129A Russell St., Melbourne (Wavelength, 371 metres).

7.0: Time signal from Melbourne Observatory, weather forecast, 7.5: Early-rising music, 7.40: Mails and Shipping, 7.43: What's On To-day? 7.45: Birthday Greetings, 7.55: Breakfast News, 8.0: Time signal from Melbourne Observatory, 8.1: Market reports, 8.15: Close down.

MORNING MUSICALS

10.30: The Thought for To-day, Mr. Charles Nuttall, 10.35: Reproduced Music, 10.45: Arnold Coleman at the Wurilizer Organ, 11.0 to 12.15: 3LO Studio Orchestra, with Billie King, Songs at the Piano, 12.15: News of the Day, Rates on 'Change, Market reports.

MIDDAY SESSION

12.30: National Broadcasting Orchestra (under direction Wm. G. James; conductor, Percy Code). Overture, "Così Fan Tutti" (Mozart), "Beneath the Balcony" (Lacombe), Horace Calvert (tenor), Orchestra, selection, "Rose Marie" (Prin), 1.0 to 2.0: Luncheon Music supplied by the National Broadcasting Orchestra, under direction Wm. G. James; conductor, Percy Code.

THE LECTURETTE SESSION

2.0: Mr. Robert Reid, B.A., "Some Suggestions for Choosing a Career", 2.15: Reproduced Music, 2.25: Miss Hattie Knight, "A Woman Motorist's First Drive Alone", 2.40: Reproduced Music, 2.45: Mr. Frank D. Clevlow, "My Impressions of the Continental Theatre".

RADIO MATINEE

3.0: Stevens Dance Orchestra, "Opera Up-to-date", 3.10: Courtenay Ford tententainer, 3.20: Rose Clayton (soprano), "When I Leave Town" (Stuart), "Tact" (Stuart), "I've a Inkling" (Stuart), 3.30: Fred Stevens (xylophone solo), 3.40: Robert Lee Ben (humorous recital), "Lilt Irish Mother" (John O'Brien), "Last Week" (A. B. Paterson), "A Bush Christening" (A. B. Paterson), 3.50: Stevens Dance Orchestra, Jazz Melodies, 4.0: "The Matinee Idols" in half an hour of fun and frivolity, 4.30: Close down

THE CHILDREN'S CORNER

5.45: "Bobbie Bluegum" and his two little friends, "Ector and Orace", 6.5: 3LO Studio Orchestra, Some fanciful music for the children, 6.15 to 7.30: Dinner music provided by 3LO Studio Orchestra, 7.30: News session, Rates on 'Change, Market reports.

NIGHT SESSION

7.45: National Broadcasting Orchestra, under direction of Wm. G. James, conductor, Percy Code, Incidental Music to the "Merchant of Venice" (Rossi).

7.55: May Daley (soprano)—"At Night" (Rachmaninoff), Song of the Shepherd Lull (Rimsky-Korsakov), "The Swan" and "The Princess" (Grieg)
8.5: Donald M'Beath (violin)—"Indian Lament" (Dvorak-Kreisler), "Liebesfreud" (Kreisler), "Romance" (Wienlawski), "Obertass" (Wienlawski), Scene from Shakespeare.
8.20: Mr. and Mrs. John Hopkins, Scene from "King Richard III", "The Wooing of Lady Anne", Richard, Duke of Gloucester, John H. Hopkins, Lady Anne, Mrs. John H. Hopkins.
Scene—A Street in London, Enter Lady Anne, following the corpse of King Henry VI.
8.35: "The Romanoff" Trio, A Programme of Russian Music.
8.55: Norman Bradshaw (tenor), "Thou Standest Like a Flower" (Liszt), "Angels Guard Thee" (Oodard), "Mattinata" (Leoncavallo).

ALL TASTES CONSIDERED

9.5: Orchestra, 9.15: Thomas George (bass)—"Prince Ivan's Song" (Allitsen), "Piling Broad the Ball" (Oaines), "Tally-ho" (Leon), 9.25: Carter and Buckland (instrumentalists)—Southern Melodies, 9.35: Norman Pill (entertainer) will deliver a serenade or two, 9.45: Orchestra, 9.50: "The Wanderers" in Song and Story—A Shipboard Concert, 10.20: Orchestra, 10.25: News from to-morrow's papers, 10.30: "The Rex" Dance Band, 11.30: God Save the King.

3AR

Australian Broadcasting Co., 129A Russell St., Melbourne (Wavelength 484 metres).

EARLY MORNING SESSION.

10.0 to 10.59: See Friday.

MORNING SESSION.

11.0: Recordings, 1.30: Albert Sammons, violin, and William Murdoch, piano, "The Kreutzer Sonata in A Major" (Beethoven), 12.20: British official wireless news from Rugby; announcements, 12.30: Close down.

AFTERNOON SESSION.

3.0: The Strad Trio, 3.15: Recordings, 3.30: Cecil Parkes, violin, 4.0: Frank Johnstone, cello.

4.7: Variety vocalised, 4.17: The Strad Trio, 4.30: Close down.

EVENING SESSION.

8.0: Recordings, 7.10: News session; announcements, 7.20: Recordings.

3DB

The "Herald" Broadcasting Station, Flinders Street, Melbourne (255 metres.)

MORNING SESSION.

11.0: Bands and Singers, 11.30: A Symphony Concert, 12.0: From the Operas, 12.25: News, 12.30: Close down.

AFTERNOON SESSION.

2.0: Quartettes and an Orchestra, 2.30: The Music of Schumann, 2.55: Atwater Kent Hour, sponsored by A. G. Healing, Ltd., and E. T. Muir, 3.55: News, 4.0: Close down.

EARLY EVENING SESSION

5.30: Children's hour, 6.0: Musical Masterpieces, 6.25: What's On at the Theatre and Movies, 6.27: Radio Movie Club, 6.30: Band, Baritone, Cello, 7.0: Light and Bright, 7.30: Organ and Singer, 7.45: Market Reports.

NIGHT SESSION.

8.0: Chamber Music and Songs, 8.30: Famous Australian Artists, 9.0: Symphony Orchestra and Songs, 9.30: From the Sunny South, 10.0: Let's Dance, 10.30: Slumber Music, 10.40: News, 10.45: God Save the King.

4QG

Queensland Government Radio Service, Brisbane (Wavelength, 385 metres).

EARLY MORNING SESSION.

7.43 to 8.30: See Friday.

MORNING SESSION.

11.0 to 12.0: See Friday.

MIDDAY SESSION.

1.0 to 2.0: See Friday.

AFTERNOON SESSION.

3.0 to 4.30: See Friday.

EARLY EVENING SESSION.

6.5: An Astronomy Talk—"Shall we ever reach the Planets?" by Mr. A. K. Chapman, 7.45: Lecturette.

NIGHT SESSION.

8.0: The 4QG Symphony Orchestra—"Tannhauser" Overture (Wagner), 8.18: May Jordan (soprano)—"Roberto O Tu Che Adoro" (Meyerbeer), 8.20: Symphony Orchestra—"First Movement" (from "Fifth Symphony"—Beethoven), 8.28: W. W. Crisp (tenor)—"King Duncan's Daughter" (Handel), 8.34: Symphony Orchestra—"Finale" from "Fifth Symphony" (Beethoven), 8.45: Ella Howie (contralto)—"The Silver Ring" (Chaminade), 8.49: Symphony Orchestra—"Serenade" from "Millions d'Arlequin" (Drigo), "Moment Musicale" (Schubert), 9.0: Metropolitan weather forecast, 9.1: Rex Harrison (baritone)—"It is Enough" (from "The Messiah"), 9.6: Symphony Orchestra—"Egyptian Ballet" (Luigini)—Parts 1 and 2, 9.13: May Jordan (soprano)—"Ah Fors e Lui" (Verdi), 9.19: Symphony Orchestra—"Egyptian Ballet" (Luigini)—Parts 3 and 4, 9.27: W. W. Crisp (tenor)—"Sea Rapture" (Coates).

9.33: Symphony Orchestra—"Ride of Valkyries" from "The Valkyries" (Wagner), 9.40: Ella Howie (contralto)—"To Music" (Schubert), 9.44: Symphony Orchestra—"Zampa Overture" (Herold), 9.50: Rex Harrison (baritone)—"O Star of Eve," from "Tannhauser" (Wagner), 9.53: Symphony Orchestra—Selections from "The Gondoliers" (Gilbert and Sullivan), 10.0: News supplied by the Metropolitan Dailies, Weather information, "Queenslander" news, specially supplied for distant listeners, 10.30: Music from the Country Women's Association and Missions to Seamen Ball, 11.0: Close down.

5CL

Central Broadcasters, Ltd., 114 Hindmarsh Square, Adelaide (Wavelength, 409 metres).

MORNING SESSION.

11.15 to 2.0: See Friday.

AFTERNOON SESSION.

3.0 to 4.30: See Friday.

EVENING SESSION.

6.0: Chimes, 6.1: Children's happy moments, 6.30: Dinner session, 7.0: Birthday League greetings; sporting service; general market reports, 7.15: Under the auspices of the Workers' Educational Association, Mr. H. G. Oliphant, Dip.E., will speak on "Something About Money", 7.30: Mr. R. G. Bald, Ph.D. (lecturer in English at the Adelaide University, will continue his series of talks, 7.46: Dr. Herbert Baseow, M.P., in another of his interesting Australian talks.

NIGHT SESSION.

8.0: Chimes, 8.10: A presentation of the famous opera, "Lucia di Lammermoor", Characters:
Lucia (soprano) Marcelle Berardi
Edgar (tenor) Dino Pelardi
Enrico (baritone) Bert Woolley
Raymondo (bass) Fred Guster
Alisa (contralto) Gwen Collett
Arturo (tenor) Vincent M'Murray
Norman (mezzo) Ann Young
And Chorus.
Explanatory remarks by Horace Perkins, Mus. Bac., A.M.U.A., and Deslie Francis, Music by Operatic Orchestra.

10.15: Under the auspices of the Legacy Club, of Adelaide, Legatee Harvey will speak on "The Legacy Club and What It Stands For", 10.25: General news service, 10.45: Modern dance music recordings, 11.0: Close down.

6WF

Commonwealth Government Broadcasting Station, Perth (Wavelength, 190 metres).

10.0: Oramophone records, 11.0: Close down, 12.30: Markets, news, etc. 1.0: Weather, 1.2: Luncheon music, 1.4: Talk, 1.9: Music, 2.0: Close down, 3.30: Tune in, 3.35: Pianoforte solos, 4.30: Close down, 6.45: Tune in, 6.48: Bedtime stories by Uncle Duffy, 7.5: Light music, 7.30: Commercial and general information, 7.45: Talk, 8.0: Time signal, 8.1: Weather, 8.3: Variety programme, 8.50: Late news items, Late weather, 9.5: Programme continued, 10.30: Close down, 10.45: Metre Transmission, Simultaneous broadcast on 104.5 metres of programme given on 1250 metres, commencing at 6.45 p.m.



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7ZL

Tasmanian Broadcasters Pty., 95 Elizabeth St., Hobart (Wavelength, 516 metres).

11.30: Musical selections. 11.34: Midlands weather forecast. 11.35: Musical selections. 11.55: Tasmanian station's 9 a.m. weather report. 12.0: G.P.O. clock chimes the hour. 12.1: Shipping information; ships within wireless range; mail notices; housewives' guide; commercial news. 12.8: Musical selections. 12.29: Announcements. 12.33: Musical selections. 12.55: News service; British official wireless news; railway auction produce sales, held at railway. 1.10: Monsieur Sonora—musical selections. 1.30: Close down. 3.0: G.P.O. clock chimes the hour. 3.1: Record recital and player selections. 3.4: Weather information. 3.5: Musical selections. 3.45: Miss Joyce Walker will speak on "Homecraft." 1.0: Record recital. 4.15: An educational talk on "Trade—the Sheltered Markets of the Empire." 4.30: Close down. 5.15: Children's hour, with "Uncle David" and "The Story Lady." 7.0: Answers to letters and birthday greetings, by "Uncle David" and "The Story Lady." 7.5: Record recital. 7.15: News session. 7.30: E. T. Bessell, of the Government Tourist Bureau, will speak on "See Tasmania First." 7.45: W. E. Fuller will speak on "Literary Lapses and Library Lists." 8.0: G.P.O. clock chimes the hour. 8.1: Record recital. 8.15: A programme of dance music, supplied by the Discus Dance Ensemble. 8.27: Nick Lucas, "When You Said Good-night." 8.30: Dance numbers. 8.42: Al Joison, "There's a Rainbow Round My Shoulder." 8.45: Dance numbers. 8.57: Frank Munn, "Was It a Dream?" 9.0: Dance numbers. 9.12: Chester Gaylord, "Here's That Party Now in Person." 9.15: Dance numbers. 9.27: Nick Lucas, "Sunshine." 9.30: News session. 9.40: Dance numbers. 9.55: Slumber music. 10.0: G.P.O. clock chimes the hour. Close down.



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W.E.9

A Much Travelled Picture

ONE of the most remarkable feats in the telegraphic transmission of pictures was accomplished recently, when a photograph of the scene of the hospital disaster at Cleveland, Ohio, U.S.A., was sent to Berlin. The first stage of its journey, from Cleveland to New York, a matter of over four hundred miles, was accomplished over the land telephone line by means of an American system of picture transmission.

The three thousand odd miles from New York to England were by way of the Beam wireless service. From London to Berlin the picture was sent by the Fultograph process. The final six hundred miles of the journey being over the telephone line and the submarine cable. The photograph was sent for the Scherl Group of newspapers in Germany, and the fact that after having been handled by three quite different methods of transmission and having made two sections of its journey over the wires and one by wireless, a picture suitable for reproduction in the newspaper was received, is a remarkable tribute to the high state of efficiency to which the sending of pictures by electrical means has now been brought.

The most difficult part of the task was that undertaken by Fultograph, since it was inevitable that the picture should have lost a little of its original sharpness during the two previous stages of its transmission. The successful relay of the picture over its final stage by the simplest of all the three methods used, was a notable achievement.

2GB and the Dogs

STATION 2GB has established a Puppy Dogs' Club, with Bimbo the Poodle as president, Tango the Wang as hon. secretary, and Whicky the Wu as hon. treasurer. Bimbo belongs to Mr. George Sutton, who reads the president's report each Wednesday evening to the children. An Order of Merit, in connection with which a leather medal has been struck, will be awarded each month to the dog whose owner has done the kindest deed during that month. When the warmer weather comes it is intended to hold a dogs gymkhana to which all the boys and girls who listen to 2GB will be invited. Prizes will be given for the ugliest dog, the bandiest dog, the longest-eared dog, and the shortest-tailed dog.

Local Programmes, Wednesday, August 7

2FC

Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 412 metres).

EARLY SESSION—7 to 8.15 a.m.

- 7.0: "Big Ben" and weather forecast.
- 7.5: Early rising music.
- 7.40: Breakfast news.
- 7.45: Mails and shipping.
- 7.48: What's on to-day?
- 7.50: 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 General Sporting Talk.
- 10.45: From the State Theatre—Recital on the Grand Organ by Edgar Stone.
- 11.0: Household Helps—Cooking Recipes by Miss Ruth Furst.
- 11.10: Cables—Australian Press Association and the Sun-Herald Service.
- 11.15: The Studio Orchestra.
- 12.0: "Big Ben" and Stock Exchange. A "Dickens" Story.
- 12.20: Midday market reports.
- 12.30: Close.

THE LUNCH HOUR—1 p.m. to 2.30 p.m.

- 1.0: Lunch to music with the A.B.C. Orchestra.
- 2.0: Stock Exchange, second call.
- 2.2: Popular Education—A Talk by a Lecturer from the Department of Education.
- 2.20: A glance at the afternoon papers.
- 2.30: Close.

THE RADIO MATINEE—2.30 p.m. to 4.30 p.m.

- 2.30: The A.B.C. Orchestra.
- 2.45: Thelma Houston, contralto.
- 2.52: Una Black, violinist.
- 3.0: "Big Ben."
- The A.B.C. Orchestra.
- 3.15: Dorothy Hall, monologues.
- 3.22: Ida Fitzgerald, pianist.
- 3.32: The A.B.C. Orchestra.
- 3.47: Thelma Houston, contralto.
- 3.54: Una Black, violinist.
- 4.1: Dorothy Hall, monologues.
- 4.8: Ida Fitzgerald, pianist.
- 4.16: The A.B.C. Orchestra.
- 4.28: Stock Exchange, third call.
- 4.35: Late sporting results.
- 4.45: Close.

EARLY EVENING—5.45 to 7.55 p.m.

- 5.45: Kiddies' "Good-night" Stories—told by Uncle Bas, assisted by Aunt Willa and Marjorie.
- 6.45: The Studio Dinner Orchestra.
- 7.30: Sporting news and views.
- 7.45: From the State Theatre—Mr. Price Dunlavy at the Grand Organ.

EVENING PROGRAMME—8 p.m. to 11.30 p.m.

- 8.0: From the Conservatorium—The Conservatorium Orchestra (to be relayed to 3LO).
- 9.0: From the State Theatre—Radio Presentation—Will Prior's Symphony Orchestra. Price Dunlavy at the Grand Organ. Clive Hood, producer.
- 9.45: From the Studio—Etta Field, soprano.
- 9.53: Carl Budden Morris, pianist.
- 10.7: Peter Sutherland, basso.
- 10.17: Late news service. Official weather forecast.
- 10.30: Romano's Dance Orchestra, conducted by Bennie Abrahams.
- 11.30: Close. National Anthem.

2BL

Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 353 metres).

OPENING SESSION—8.15 to 11 a.m.

- 8.15: Music for every mood.
- 8.45: "Interest Item" on outstanding events of the day.
- 9.0: An Old Folks' programme.
- 9.40: New music—a review of new records.
- 9.55: British Official Wireless news.
- 10.5: News service.
- 10.10: The Ladies' Club Hour.

10.30: The Studio Orchestra.

11.0: Close.

MIDDAY SESSION—12 noon to 2.30 p.m.

- 12.0: The A.B.C. Orchestra.
- 1.0: Afternoon news service.
- 1.15: Women's "Interest Talk."
- 1.30: Traders' "Selling the Set" music.
- 2.0: At the Console of the Wurlitzer Organ at the Capitol Theatre—Mr. J. Knight Barnett.

AFTERNOON ENTERTAINMENT—2.30 p.m. to 5.45 p.m.

- 2.30: Business Efficiency Talks.
- 2.45: The Magic Carpet—travel and adventure.
- 3.0: The A.B.C. Dance Band.
- 3.12: Nora Hill, soprano.
- 3.19: Hilda Grace, novelty pianist.
- 3.26: The A.B.C. Dance Band.
- 3.38: The Two G's, entertainers.
- 3.45: Fred Williamson, baritone.
- 3.52: The A.B.C. Dance Band.
- 4.4: Nora Hill, soprano.
- 4.11: Hilda Grace, novelty pianist.
- 4.18: The A.B.C. Dance Band.
- 4.32: The Two G's, entertainers.
- 4.39: Fred Williamson, baritone.
- 4.45: "The Trade Hour"
- 5.45: Close.

THE DINNER HOUR—6.15 to 7.55 p.m.

- 6.15: The Studio Dinner Orchestra.
- 6.45: Boys' Radio Club—Mr. Norman Lyons
- 7.5: Markets.
- 7.20: Late news.
- 7.30: The Studio Dinner Orchestra.
- 7.55: What's on the air to-night?

EVENING SESSION—8 p.m. to 10.30 p.m.

- 8.0: An Hour of Comic Opera—Selections by the Metropolitan Band. Solos by Keith Grant. Solos by Ann Mills. Choruses by the Wireless Singers.
- 9.0: G. Vern Barnett's Trio—instrumentalists.
- 9.15: Peter Sutherland, basso.
- 9.22: John Boulton and Reg Mitchell—sketches.
- 9.34: Athos Martelli, cellist.
- 9.41: Etta Field, soprano.
- 9.48: G. Vern Barnett's Trio—instrumentalists.
- 10.0: John Boulton and Reg Mitchell—sketches.
- 10.12: Keith Grant, baritone.
- 10.19: Moore M'Mahon, violinist.
- 10.25: News service.
- 10.30: Close. National Anthem.

2GB

Theosophical Broadcasting Station, 29 Bligh St., Sydney (Wavelength, 316 metres).

- 10.0: Music.
- 10.10: Happiness Talk, by A. E. Bennett.
- 10.20: Music.
- 10.30: Women's Session, by Miss Helen J. Beegling.
- 11.30: Music.
- 11.45: Close down.
- 2.0: Music.
- 2.5: Women's Radio Service, by Mrs. Dorothy Jordan.
- 2.50: Movie Know All.
- 3.0: Labor Saving Demonstration from Nock and Kirby.
- 4.0: Close down.
- 5.30: Children's Session, by Uncle George.
- 7.0: Music.
- 7.45: Feature story.
- 8.0: Mr. J. Lou Walters, basso.
- 8.7: Symphony Orchestra.
- 8.15: Miss Mary Neal, contralto.
- 8.22: Instrumental music.
- 8.30: Humorous interlude by Mr. Jack Win and Mr. Heath Burdock.
- 8.35: Mr. William Green, tenor.
- 8.45: Address.
- 9.0: Weather report.
- 9.3: Symphony Orchestra.
- 9.13: Mr. J. Lou Walters, basso.
- 9.23: Humorous interlude by Mr. Jack Win and Mr. Heath Burdock.
- 9.28: Instrumental music.
- 9.33: Miss Mary Neal, contralto.
- 9.43: Symphony Orchestra.
- 9.50: Mr. William Green, tenor.
- 10.0: Instrumental music.
- 10.30: Close down.

2UW

Radio Broadcasting Company, Ltd., Palling's Building, Ash St., Sydney (Wavelength, 267 metres).

MIDDAY SESSION.

- 12.30: Request numbers.
- 1.0: G.P.O. clock and chimes; music.
- 1.15: Talk on Homecraft by Pandora.
- 1.40: Music and request numbers.
- 2.30: Close down.
- 4.30: Musical programme.

EVENING SESSION.

- 5.30: Children's Hour, conducted by Uncle Jack.
- 6.30: Close down.
- 7.0: G.P.O. clock and chimes. Request items.
- 8.0: Piano Recital.
- 9.0: Comments on Foreign Affairs by Mr. J. M. Prentice.
- 9.10: Music and request numbers.
- 10.30: Close down.

2KY

Trades and Labour Council, Goulburn St., Sydney (Wavelength, 280 metres).

MORNING SESSION.

- 10.0: Tune in to the ticking of the clock.
- 10.3: Popular fox trots.
- 10.15: Hawaiian steel guitar selections.
- 10.30: Request numbers.
- 10.50: Vocal items.
- 11.0: A few laughs.
- 11.5: Pianoforte selections.
- 11.15: Calls and announcements.
- 11.20: Musical interlude.
- 11.30: Request numbers.
- 11.40: Music and vocal items.
- 11.55: Where to go to-night.
- 12 (noon): Closing announcements.

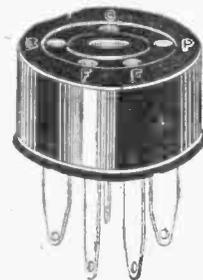
CHILDREN'S SESSION.

- 6.0: Birthday calls, request numbers, and kiddies' entertainment. Aunt Jemima and Uncle Bert.

EVENING SESSION.

- 7.0: Musical interlude.
- 7.15: Sporting feature; complete review of to-day's racing. Mr. Geo. A. Davis.
- 7.40: Health feature. Northey Du Maurier.
- 8.0: Hawaiian steel guitar selections.
- 8.15: Tenor solos. Mr. Chas. E. McDonald.
- 8.30: Banjo solos, Master Harry Weir.
- 8.36: Al. Rosenberg at the piano.
- 9.10: Sporting feature, presented by Tooth and Co., Kent Brewery, from Sydney Stadium, full description of main 15-round event.
- 9.50: Music from the studio.
- 10.0: Closing announcements.

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Interstate Programmes, Wednesday, August 7

3LO

Australian Broadcasting Co. 120A Russell St., Melbourne (Wavelength 371 metres).

EARLY MORNING SESSION

7.0: Time signal from Melbourne Observatory. Weather forecast. 7.5: Early-rising Music. 7.40: Mails and shipping. 7.43: What's On To-day? 7.45: Birthday Greetings. 7.55: Breakfast News. 8.0: Melbourne Observatory time signal. 8.1: Market reports. 8.15: Close down.

MORNING MUSICALS

10.30: The Thought for To-day, Dr. Lottus Hills, D.Sc. 10.35: Reproduced Music. 10.45: Arnold Cookeman at the Wurliizer Organ. 11.0 to 12.15: 3LO Studio Orchestra, with John Howard (bass-baritone). 12.15: To-day's news. Rates on 'Change. Weather forecast.

MIDDAY SESSION

12.30: National Broadcasting Orchestra, under direction of Wm. G. James, conductor. Percy Code. Overture, "Sally" (Kern). "Valse des Alouettes" (Drigo). Millie McCormack (mezzo-soprano). Orchestra, suite, "St. Agnes' Eve" (Coleridge-Taylor). "Scherzo" (Mendelssohn). 1.0 to 2.0: Luncheon music supplied by National Broadcasting Orchestra, under direction of Wm. G. James, conductor. Percy Code.

THE LECTURE SESSION

2.0: Mr. Charles Nuttall, "Castles in the Air." 2.15: Reproduced music. 2.25: R. H. Croll, "One-day Walks for Women." 2.40: Reproduced music. 2.45: Mr. W. C. Groves, B.A., Dip.Ed., "Queen Emma of the Isles."

THE RADIO MATINEE

3.0: National Broadcasting Orchestra, under direction of Wm. G. James, conductor. Percy Code. 3.10: Leo Fisher (tenor). "Kathleen Mavourneen." "The Bloom is on the Rye." "Sally in Our Alley." 3.20: Helga Brennecks (cello). "Largo and Minuetto" (De Sech). "Two Minuetto from G. Major Sonata" (unaccompanied) (Bach). "Aria" (Penaclia). 3.35: Herbert Sanderson (baritone). Tom Temple (tenor). "Flow Gently, Devo" (Parry). "Drink to Me Only with Thine Eyes" (Old English). "The Moon Hath Replenished Her Lamp Above" (Benedict). 3.40: Eleanor Clapham (piano). "Le Carillon de Cythere" (Couperin). "Pastorale and Caprice" (Scarlatini). "Cavert" (Gluck). 4.0: Myrtle Walscott (contralto). "The Banks of Avian Water." "All Thro' the Night" (Old Welsh). "She Wore a Wreath of Roses" (Knight). 4.10: Orchestra. Memories of Gilbert and Sullivan. 4.30: Close down.

THE CHILDREN'S CORNER

5.45: "Little Miss Kookaburra." "The Little Princess Who Liked Climbing." "Fair Bread and Butter." Roy Ryan will imitate bird calls. 6.15 to 7.30: Dinner Music, supplied by 3LO Studio Orchestra. 7.30: To-day's news; rates on 'Change; weather forecast.

NIGHT SESSION

7.45: Major-General F. E. Elliott, C.B., C.M.G., D.S.O., D.C.M., will speak on "Lone Pine." 8.5: Transmission from Station 2FC, Sydney Broadcast from the Conservatorium Hall, Sydney. An orchestral concert by the N.S.W. State Conservatorium Orchestra, of 75 players, under the baton of Dr. Arundel Orchard, Director of the Conservatorium. Overture, "The Hebrides" (Mendelssohn). "Ballad in A Minor" (Coleridge-Taylor). "Good Friday Music" (Wagner). "Concerto for Violin and Orchestra (Brahms). Soloist, Miss Elsie Steele.

FROM THE STUDIO.

9.0: Louie Dunn—A Dramatic Recital. 9.10: Leslie Burklan (flautist)—"Minuetto" (Krantz). "Concertino" (Chaminade). 9.20: Norman McKenzie (baritone). A POPULAR PROGRAMME. 9.30: Coburg City Band (conductor Thos. B. Davison). March, "Cavalry of the Clouds" (Alford). "Andante in G" (Baltiste). 9.40: The 3LO Christy Minstrels—Half an hour of Melody and Mirth. 10.10: Coburg City Band—"Marche Militaire" (Schubert). 10.20: News from "The Morning's papers. 10.30: "The Rex" Dance Band. 11.10: God Save the King.

3AR

Australian Broadcasting Co. 120A Russell St., Melbourne (Wavelength 484 metres).

EARLY MORNING SESSION

10.0 to 10.50: See Friday. MORNING MUSICAL SESSION 11.0: London Symphony Orchestra, conducted by Felix Weingartner, "Choral Symphony No. 9 D Minor" (Beethoven). 12.20: British official wireless news from Rugby; announcements. 12.30: Close.

AFTERNOON SESSION

1.28: Description of the Mernda Hunt Race. 2 miles. Flindon Hunt Club races, at Moonee Valley. 1.35: Breezy ballads. 1.38: Description of the Woolpert Maiden Hunters' Steeplechase, 2 miles 8 chains. Flindon Hunt Club races at Moonee Valley. 2.3 Cheerful Chirpings from the Seraphina. 2.28: Description of the Epping Handicap, 1 1/2 miles. Flindon Hunt Club races. 2.35: Breezy ballads. 4.8: Description of the "Whitless" Steeplechaser's Flat Race 1 1/2 miles. Flindon Hunt Club races, at Moonee Valley. 4.15: Cheerful chirpings. 4.30: Description of the Woodstock Corinthian 1 mile. Flindon Hunt Club races, at Moonee Valley. 4.45: Close down.

EVENING SESSION

6.0: Science and symphony synchronised. 7.10: News session; announcements. 7.20: Science and symphony synchronised.

MORNING SESSION

7.45: Out of the Past. 1.0: J. Howlett Ross will speak on "The Change of Luna Mine." 8.0: A Special Programme has been arranged. 11.0: God Save the King. 7.40: Captain Donald MacLean will speak on—"The Conquest of Peru." 8.0: A MARCH OF HISTORY. 8.1: "The Radio Reveals"—"It's a Precious Little Thing Called Love" (Davis). "Sweethearts on Parade" (Lomardo). "Deep Night" (Henderson). 8.10: Jessie Smith, Contralto—"Sally in Our Alley" (Parry). 8.15: The Radio Revelers—"Stay at home girl" (Hagen). "See and the man in the moon" (Monaco). "High Lension" (See). 8.22: Jack Hocking, the Signing Serenader—"A Mournful Melody." 8.25: The Radio Revelers—"Ah, Sweet Mystery of Life" (Herbert). "Ten Little Muses from Town" (Kahn). "If you want the Rainbow you must have the Rain" (Rose). 8.34: Arthur Douglas, the Hilander—"I Love a Lassie." 8.37: The Radio Revelers—"Happy Days and Lonesome Nights" (Fisher). "Love Dreams" (Mendoza). "Dada Dada" (Dowell). 8.46: Jessie Smith, Contralto—"A Good Man Nowadays is Hard to Find." 8.49: The Radio Revelers—"Pickin' Cotton" (Henderson). "I'm on the Great of Wave" (Henderson). "The Magic Violin" (Leslie). 8.58: Jack Hocking, the Signing Serenader—"Oh, You have No Idea." 9.1: The Radio Revelers—"Shankin' Da" (Cole). "Where the Shy Little Violets Grow" (Kahn). "I Don't Care" (Dowell). 9.10: Arthur Douglas, the Hilander—"Straight from Aberdeen." 9.13: The Radio Revelers—"You'll Recognise my Baby" (Cohn). "Glad Rag Doll" (Ager). "That's Her Now" (Ager). 9.22: Jessie Smith, Contralto—"Mighty Lak a Rose" (Nevin). 9.25: The Radio Revelers—"Can You Blame Me" (Oodwin). "Casablanca" (Evans). "Melancholy Mama" (Sherwin). 9.34: Jack Hocking, the Signing Serenader—"An Up-to-the-Minute Melody." 9.37: The Radio Revelers—"Shake that Thing" (Jackson). "She's Funny that Way" (Moret). "Chilly Pom-Pom Pee" (Bryan). 9.40: Arthur Douglas, the Hilander—"A New One." 9.49: The Radio Revelers—"Carolina Moon" (Burke). "Thinking of You" (Ruby). "Up in the Clouds" (Ruby). 9.58: Jessie Smith, Contralto—"I Love You More" (Lee). 10.1: The Radio Revelers—"I Kiss Your Hand, Madame" (Ruby). "Mc Mother's Eyes" (Barr). "I'm a Fool and Go Boom" (Brockman). 10.10: Jack Hocking, the Signing Serenader—"A New One." 10.13: The Radio Revelers—"In a Little Town Called Home Sweet Home" (Donaldson). "My Anselme" (Warne). "The Wedding of the Painted Doll" (Brown). 10.20: News service; announcements. 10.30: The Radio Revelers—"What dya Say" (Brown). "Sonny Bop" (Johnson). "Sally of My Dreams" (Kernell). "Paradise and You" (Packay). "Oh, Isabella" (Schuster). "Forty-seven Ginger Headed Sailors" (Sarony). "That's How I Feel About You" (Davis). "Marie" (Bertlin). "Ain't She Real Cute" (Hany). "By the Lazy River" (Packay). 11.0: God Save the King.

NIGHT SESSION.

8.0: Alf Featherstone and His Orchestra—Fox Trots—"We, My Honey and Me" (Woods). "The Only Girl" (Russell). 8.10: Harry Borradaile (elocutionist)—Some humorous items. 8.20: Alf Featherstone and His Orchestra—Fox Trots—"My Old Girl's My New Girl Now" (Friend). "My Starlight" (Rose). 8.30: Shirley Bradford (soubrette)—"Sonny Boy." "Sally of My Dreams." 8.40: Alf Featherstone and His Orchestra—Jazz waltz, "Chiquita" (Wayne). 8.50: "Tex Watson" (banjoist)—"I'm so Lonely." "Midnight Waltz." 9.0: Metropolitan weather forecast. Movements of lighthouse steamers. 9.5: Alf Featherstone and His Orchestra—Fox Trots—"Afraid of You" (Daly). "When Eyes of Blue are Fooling You" (Clare). 9.15: Beatrice Pugh (soprano)—"When Love Comes Singing" (Brewer). "The Valley of Laughter" (Sanderson). 9.25: Alf Featherstone and His Orchestra—Fox Trots—"Mother o' Mine" (Johnson). "Dear, on a Night Like This" (Conrad). Selected. 9.45: Alf Featherstone and His Orchestra—Dance music. 10.0: News published by the Metropolitan Dailies. 10.15: Alf Featherstone and His Orchestra—Dance music. 10.30: The Hoot Owls. 11.0: Close down.

5CL

Central Broadcasters, Ltd., 114 Hindmarsh Square, Adelaide (Wavelength, 409 metres).

MORNING SESSION

11.15 to 2.0: See Friday.

AFTERNOON SESSION

3.0 to 4.30: See Friday.

EVENING SESSION

6.0: Chimes. 6.1: Resume of race results. 6.2: Birthday greetings. 6.30: Dinner session. 7.1: Senior Birthday League greetings; 5CL's sporting service. 7.30: Programme review. 7.45: An old-time dance night. "Waltz," "Memories," "Over the Waves" (encore). "54. Old-time songs, under the direction of Horace Perkins, assisted by the Madrigal Singers. The old-time songs will be "Ole in the Stilly Night," "Where Did You Get That Hat?" "Vive l'Amour," "8.0: Marine fourstep—"Old Melodies." 8.5: Netta Rodney, soubrette—"Mississippi Mud" (Barris). "My Idea of Heaven." 8.10: Barn dance—"Waiting at the Church." 8.16: Choruses by the Boys of the Village, conducted by Horace Perkins, assisted by the Madrigal Singers. Join in, far-away friends. The old-time choruses will be—"Sweet and Low." "In the Shade of the Old Apple Tree." 8.22: Alberts—"Variety tunes." 8.36: Tom O'Dea, comedian—"Just for Fun." 8.41: Schottische—"Silver Threads among the Gold." "Old Kentucky Home" (encore). 8.49: Richard Smith, xylophonist, will play to you. 8.54: Waltz—"The Blue Danube Waltz." 9.2: Meteorological information, including compass-rose. 9.3: Overseas grain report. 9.4: Jack Burgess and Netta Rodney, entertainers—"From the Old Accordeon Man." "After My Laughter Came Tears." 9.10: Lancers—"Our Miss Gibbs." 9.30: Old-time songs, under the direction of Horace Perkins, assisted by the Madrigal Singers—"Juanita." Solo, "K-k-k-Katy." "I'm on My Way to Mandalay." 9.38: Polka-Mazurka—"Clementine." 9.42: Tom O'Dea, comedian—More merry moments. 9.47: Barn Dance—"Golden Slippers." "Lily of Laguna" (encore), with vocal harmony by Jack Burgess and Netta Rodney. 9.57: Richard Smith, xylophonist, will play to you again. 10.2: Waltz—"After the Ball." 10.10: Choruses by the Boys and Girls of the Village, conducted by Horace Perkins, assisted by the Madrigal Singers—Are you listening, friends? The old-time choruses are—"Is the Old Home?" "When You and I were Young Maggie" "Waltzing Matilda." 10.15: General news service. British Official Wireless news. Meteorological information. Announcements.

4QG

Queensland Government Radio Service. Brisbane (Wavelength, 385 metres).

EARLY MORNING SESSION.

7.40 to 8.30: See Friday.

MORNING SESSION.

11.0 to 12.0: See Friday.

MIDDAY SESSION

1.0 to 2.0: See Friday.

AFTERNOON SESSION

3.0: Mail train running times. 3.1: A programme by Hotel Carlton Orchestra, including—"Overture 'Titanic' (Hildreth); waltz, "Wedding of the Winds" (Hall). Plain solo "Souvenir" (Drula); selection, "The Arcadians" (Monckton); Tarantella, "Spider Dance" (Gruenwald); waltz ballet, "Intermezzi Russe" (Franke); ballad, "Out of the Dusk to You" (Leel); selection, "Mary" (Hirsch); march, "Soldiers of the Air" (Fulton); Mrs. Jordan (soprano) and Arthur Aldridge (tenor) will sing selected numbers between orchestral items. 5.15: Afternoon news. Close down.

EARLY EVENING SESSION.

7.45: Lecture arranged by the Queensland Agricultural High School and College.

9.3: Meteorological information, including Semaphore tides.
 9.3: Overseas grain report; announcements.
 9.5: A dialogue, specially written for 5CL by Mr. Henry Cohen. A special effort on the part of 5CL to make you realise the advantage of buying Australian goods.

"BUY SOUTH AUSTRALIAN GOODS."

Characters:

Bill Jack Burgess
 Tom Henry Cohen

9.15: Walter Barratt and his Maison Masters of Melody—
 "I Love to Hear You Singing" (Haydn Wood).
 "Skinner's Sock" (Skinner).
 "My Blackbirds are Bluebirds Now" (Friend)
 9.25: Netta Rodney, soubrette—
 "Grand and Glorious Feelings" (Johnson).
 9.28: Walter Barratt and his Maison Masters of Melody—
 "I Can't Give You Anything but Love" (Fields).
 "Good Little, Bad Little You."
 "Laugh, Clown, Laugh."
 9.38: James Riley, tenor—
 "Duna" (McGill).
 9.42: Walter Barratt and his Maison Masters of Melody—
 "A Room with a View" (Coward).
 "Me and the Man in the Moon" (Leslie).
 "Stay at Home Girl" (O'Hagan).
 9.52: Netta Rodney and Jack Burgess, entertainers—
 "Everything is Made for Love" (Yellen).
 9.56: Walter Barratt and his Maison Masters of Melody—
 "Ho-Ho-Ho-Hogan" (Tucker).
 "Ten Little Miles from Town" (Kahn).
 "Ah, Sweet Mystery of Life" (Herbert).
 10.6: James Riley, tenor.
 10.10: Walter Barratt and his Maison Masters of Melody—
 "It Goes Like This."
 "Sonny Boy" (Jolson).
 10.16: General news service.
 10.30: Walter Barratt and his Maison Masters of Melody—
 "Chilly Pom-Pom-Pee" (Bryan).
 "Love's Dream" (Akst).
 "Rio Rita" (Tierney).
 "The Kinkajou" (Tierney).
 Request numbers.
 11.0: Close down.

6WF

Commonwealth Government Broadcasting Station, Perth (Wavelength, 109 metres).
 10.0: Gramophone records. 11.0: Close down. 12.30: Market, news, etc. 1.0: Time. Weather. 1.3: Pan-tropic Hour. 2.0: Close down. 3.30: Musical programme. 4.30: Close down. 6.45: Bedtime stories by "Uncle Duffy." 7.5: Light music. 7.30: Commercial and general information. 7.45: Talk by Lieut.-Colonel le Soeuf, Director, Zoological Gardens, South Perth. 8.0: Time signal. 8.1: Weather. 8.3: Concert. 8.20: Talk. 8.50: Late news. Ships within range. Late weather. 9.5: Programme continued. 10.30: Close down. 10.45 Metre Transmission. Simultaneous broadcast on 104.5 metres of programme given on 1250 metres, commencing at 6.45 p.m.

7ZL

Tasmanian Broadcasters Pty., 93 Elizabeth St., Hobart (Wavelength, 516 metres).
 11.30: Record recital. 11.34: Midlands weather forecast. 11.35: Record recital. 11.55: Tasmanian stations' 9 a.m. weather report. 12.0: G.P.O. clock chimes the hour. 12.1: Shipping information: ships within wireless range; mail notices; housewives' guide; commercial news. 12.8: Record recital. 12.29: Announcements. 12.33: Record recital. 12.55: News service; British official wireless news; railway auction price sales held at railway. 1.10: Record recital. 1.30: Close down. 3.0: G.P.O. clock chimes the hour. 3.1: Record recital. 3.4: Weather information. 3.5: Record recital. 4.15: "Aunt Edna" will speak on "Outdoor Apparel for Women and Children." 4.30: Close down. 6.15: Children's hour, with "Uncle David." 6.45: Mollie Power will play the piano for the wee folk—"Moon Binkys," "Selected." 7.0: Answers to letters and birthday greetings, by "Uncle David." 7.5: Record recital. 7.15: News session. 7.30: Under the auspices of the Tasmanian University, A. N. Lewis will speak on "Our Living Globe." 7.45: Geo. Collis will speak on "Physical Culture." 8.0: G.P.O. clock chimes the hour. 8.1: Record recital. 8.6: A concert programme, arranged by Madame Helen George. 9.30: News session. 9.45: Record recital. 10.0: G.P.O. clock chimes the hour. 10.1: Close down.

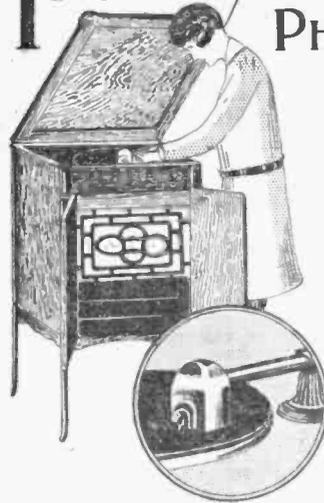
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Local Programmes, Thursday, August 8

2FC

Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 442 metres).

EARLY SESSION—7 to 8.15 a.m.

- 7.0: "Big Ben" and weather forecast.
- 7.5: Early rising music.
- 7.40: Breakfast news.
- 7.45: Mails and shipping.
- 7.48: What's on to-day?
- 7.50: 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: The Racing Observer.
- 10.45: From the State Theatre—Recital on the Grand Organ by Edgar Stone.
- 11.0: Household Helps—Domestic Notes by Miss Ruth Furst.
- 11.10: Cables—Australian Press Association and the Sun-Herald Service.
- 11.15: The Studio Orchestra.
- 12.0: "Big Ben" and Stock Exchange. With the Poets, by Eleanor Ross.
- 12.20: Midday market reports.
- 12.30: Close.

THE LUNCH HOUR—1 p.m. to 2.30 p.m.

- 1.0: Lunch to music with the A.B.C. Orchestra.
- 2.0: Stock Exchange, second call.
- 2.2: To-day's acceptances, by the Racing Observer.
- 2.12: Popular Education—A Talk on Nature's Wonders.
- 2.20: A glance at the afternoon papers.
- 2.30: Close.

THE RADIO MATINEE—2.30 p.m. to 4.30 p.m.

- 2.30: The A.B.C. Orchestra.
- 2.45: Gordon Hele, baritone.
- 2.52: Brunton Gibb, entertainer.
- 3.0: "Big Ben."
- The A.B.C. Orchestra.
- 3.15: Peggy Bell, soprano.
- 3.22: The A.B.C. Orchestra.
- 3.42: Gordon Hele, baritone.
- 3.49: The A.B.C. Orchestra.
- 4.4: Peggy Bell, soprano.
- 4.21: Marcus Burkitt, pianist.
- 4.28: Stock Exchange, third call.
- 4.30: Close.

EARLY EVENING—5.45 to 7.55 p.m.

- 5.45: Kiddies' "Good-night" Stories, told by the "Hello M.," assisted by Uncle Ted and "Sandy."
- 6.45: The Studio Dinner Orchestra.
- 7.30: Sporting news and views.
- 7.45: From the State Theatre—Mr. Pricer Dunlavy at the Grand Organ.

EVENING PROGRAMME—8 p.m. to 11.30 p.m.

- 8.0: The A.B.C. Grand Opera Duo.
- 8.10: Gabrielle Joffe, pianist.
- 8.22: Molly Devine, soprano.
- 8.29: Norman Lindsay's Quartet.
- 8.41: Lucille Bruntnell—The Production of a Modern Drama.
- 9.6: Leslie McCallum, flautist.
- 9.13: Cello solo.
- 9.20: William Dallison, tenor.
- 9.27: Norman Lindsay's Quartet.
- 9.39: James Donnelly, songs at the piano.
- 9.49: Suzanne Ennis, contralto.
- 9.56: The Mankey Trio, instrumentalists.
- 10.6: Vernon Sellars and Patsy Hill, vocal duets.
- 10.15: Late news service.
- Official weather forecast.
- 10.20: From the Hotel Australia—Dance music.
- 11.30: Close. National Anthem.

2BL

Australian Broadcasting Company, Ltd., Market St., Sydney (Wavelength, 353 metres).

OPENING SESSION—8.15 to 11 a.m.

- 8.15: Music for every mood.
- 8.45: "Interest Item" on outstanding events of the day.
- 9.0: A Melange of Mirth and Melody.
- 9.40: New music—a review of new records.
- 9.55: British Official Wireless news.
- 10.5: News service.
- 10.10: The Ladies' Club Hour.
- 10.30: The Studio Orchestra.
- 11.0: Close.

MIDDAY SESSION—12 noon to 2.30 p.m.

- 12.0: The A.B.C. Orchestra.
- 1.0: Afternoon news service.
- 1.15: Women's "Interest Talk."
- 1.30: Traders' "Selling the Set" Music.
- 2.0: At the Console of the Wurlitzer Organ; at the Capitol Theatre—Mr. J. Knight Barnett.

AFTERNOON ENTERTAINMENT—2.30 p.m. to 5.45 p.m.

- 2.30: Business Efficiency Talks.
- 2.45: The Magic Carpet—travel and adventure.
- 3.0: Romano's Cafe Dance Orchestra, conducted by Bennie Abrahams.
- 3.12: From the Studio—Celine Hooper and Ellie M'Donald, duets.
- 3.19: Carlton Fay, novelty pianist.
- 3.26: Romano's Cafe Dance Orchestra, conducted by Bennie Abrahams.
- 3.38: From the Studio—Turner Ross, entertainer.
- 3.45: Dance numbers.
- 3.52: Celine Hooper and Ellie M'Donald, duets.
- 4.0: G.P.O. chimes.
- Romano's Cafe Dance Orchestra, conducted by Bennie Abrahams.
- 4.15: From the Studio—Turner Ross, entertainer.
- 4.22: Carlton Fay, novelty pianist.
- 4.30: Romano's Cafe Dance Orchestra, conducted by Bennie Abrahams.
- 4.45: "The Trade Hour."
- 5.45: Close.

THE DINNER HOUR—6.15 to 7.55 p.m.

- 6.15: The Studio Dinner Orchestra.
- 6.45: Girls' Radio Club—Miss Gwen Varley.
- 7.5: Markets.
- 7.20: Late news.
- 7.30: The Studio Dinner Orchestra.
- 7.55: What's on the air to-night?

EVENING SESSION—8 p.m. to 10.30 p.m.

- 8.0: From the Capitol Theatre—Radio Presentation—Ted Henkel's Orchestra.
- Fred Scholl at the Wurlitzer Organ
- 8.12: From the Studio—Vernon Sellars and Patsy Hill, entertainers.
- 8.22: The Mankey Trio, instrumentalists.
- 8.32: Ad Cree, Scottish Comedian.
- 8.40: Suzanne Ennis, contralto.
- 8.47: From the Capitol Theatre—Fred Scholl at the Wurlitzer Organ
- 9.7: From the Studio—State and Metropolitan weather forecast Vincent Aspey, violinist.
- 9.14: Gabriel Joffe, pianist.
- 9.23: James Donnelly, entertainer.
- 9.30: Leslie McCallum, flautist
- 9.37: Grand Opera Duo.
- 9.47: From the Capitol Theatre—Fred Scholl at the Wurlitzer Organ
- 10.7: From the Studio—Ad Cree, Scottish comedian.
- 10.15: The Mankey Trio, instrumentalists
- 10.25: News service.
- 10.30: Close. National Anthem.

2GB

Theosophical Broadcasting Station, 29 Bligh St., Sydney (Wavelength, 316 metres).

- 10.0: Music. 10.10: Happiness Talk by A. E. Bennett. 10.20: Music. 10.30: Women's Session, by Miss Helen J. Beegling. 11.30: Music. 11.45: Close down. 2.0: Music. 2.5: Women's Radio Service, by Mrs. Dorothy Jordan. 2.50: Movie Know All. 3.0: Music. 3.30: Gardening Talk. 3.40: Close down. 5.30: Children's Session, by Uncle George. 7.0: Music. 7.15: Gardening Talk. 7.30: Feature story. 8.0: Miss Kathleen Cracknell, soprano. 8.7: Cello solos. 8.15: Mr. Austin Punch, baritone. 8.22: Mr. Jack Win and Miss Nora Windle, in a dramatic sketch. 8.32: Symphony Orchestra. 8.40: Miss Gwladys Edwards, contralto. 8.50: Miss Ada Brook, pianiste. 9.0: Weather report. 9.3: Address. 9.15: Miss Kathleen Cracknell, contralto. 9.25: Cello solos. 9.35: Mr. Austin Punch, baritone. 9.45: Mr. Jack Win and Miss Nora Windle, in a humorous sketch. 9.55: Miss Gwladys Edwards, soprano. 10.5: Instrumental music. 10.30: Close down.

2UW

Radio Broadcasting, Ltd., Paling's Building, Ash St., Sydney (Wavelength, 367 metres).

- 12.30: Request numbers. 1.0: G.P.O. clock

and chimes; music. 1.15: Talk on Home craft by Pandora. 1.40: Music and request numbers. 2.30: Close down. 4.30: Music programme.

EVENING SESSION.

5.30: Children's Hour, conducted by Uncle Jack. 6.30: Close down. 7.0: G.P.O. clock and chimes. Request items. 7.45: Garden Talk by Mr. S. H. Hunt. 8.0: Recital of songs and ballads. 9.0: Comments on Foreign Affairs by Mr. J. M. Prentice. 9.10: Music and request numbers. 10.30: Close down.

2KY

Trades and Labour Council, Goulburn St., Sydney (Wavelength, 280 metres).

MORNING SESSION.

10.0: Tune in to the ticking of the clock. 10.3: Popular fox trots. 10.15: Hawaiian steel guitar selections. 10.30: Request numbers. 10.50: Vocal items. 11.0: A few laughs. 11.5: Pianoforte selections. 11.15: Calls and announcements. 11.20: Musical interlude. 11.30: Request numbers. 11.40: Music and vocal numbers. 11.55: Where to go to-night. 12.0: Closing announcements.

CHILDREN'S SESSION.

6.0: Birthday calls, request numbers, and kiddies' entertainment. Aunt Jemima and Uncle Bert.

EVENING SESSION.

7.0: Musical interlude. 7.5: Birthday calls. 7.15: Request numbers. 7.30: Hawaiian steel guitar selections. 7.45: Humorous interlude. 8.0: Orchestral selections. 8.10: Tenor solos. Mr. G. Mason. 8.17: Bert Warne presents a humorous interlude. 8.30: Frederick Holt presents a recital of Australian composers and compositions, with musical and vocal illustrations. 8.45: Selection of humorous records. 9.10: Request numbers. 9.40: Continue record recital. 10.0: Closing announcements.

WIRELESS TALKS

From Station 2GB

Sunday, August 4th

9 a.m.: MARY RIVETT, M.A.
Confidence and The Concept of "Complexes."

9.30 a.m.: VICTOR E. CROMER
Confidence and Faith.

9.30 p.m.: MARY RIVETT, M.A.
Dare We Have Vision?

These talks deal, from various angles, with the fundamental question: Are there spiritual forces, and, if so, what are the laws underlying their conscious contacting and use by man for constructive ends, both in his own body and in the body politic.

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Tuesday EVENINGS at 7.45 o'clock.

THE KING'S HALL,
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Interstate Programmes, Thursday, August 8

3LO

Australian Broadcasting Co., 120A Russell St., Melbourne (Wavelength, 371 metres).

7.0: Time signal from Melbourne Observatory. Weather Forecast. 7.5: Early-rising Music. 7.40: Mails and Shipping. 7.43: What's On To-day? 7.45: Birthday Greetings. 7.55: Breakfast News. 8.0: Time Signal from Melbourne Observatory. 8.1: Market Reports. 8.15: Close down. 10.30: Current events in the racing world, by Eric Welch. 10.40: Reproduced Music. 10.50: "The Football Field," by Mel. Morris.

MORNING MUSICAL

11.0 to 12.30: 3LO Studio Orchestra, assisted by Marie Jackson, with her mandolin. 12.30: Close down.

LUNCHEON MUSIC

1.0 to 2.0: Provided by the National Broadcasting Orchestra (under the direction of Wm. G. James conductor, Percy Code).

SCHOOL SESSION

2.0: Mr. J. Howlett Ross, "Great Australians." 11. Lord Forrest. 2.15: Reproduced Music. 2.25: Dr. A. E. Floyd, "Characteristics of Composers." Illustrated. 2.40: Reproduced Music. 2.45: Monsieur Th Rouel, B.A., "A Talk in French."

THE RADIO MATINEE

3.0: From Sunny Spain—National Broadcasting Orchestra (under direction of Wm. G. James, conductor, Percy Code) Selections from "Carmen" (Bizet). 3.10: J. Alexander Brown (baritone) "Toreador Song." "Castilian Lament." "Bizet," "Don Juan." "Serenade." "El Riego." 3.20: Ina Nordment (pianist) will give a programme of Spanish Music by Albeniz and Granados. 3.35: Orchestra Selection, "La Gran Via" (Valverde) "Spanish Serenade" (Friml) 3.45: Charles Stephens (tenor) "La Paloma" and "Española" (S. Franck) "Fraderer." 3.55: The Cavallians, Spanish guitar and steel guitar. "El Honorario Mito." "Lilla Serenade." "Spanish Lovesong." 4.0: Orchestra "Marcheta" (Schetzner) 4.10: Guildford Bishop (violin) "Dance Espagnole" (Moszkowski) "Borelio" Miss Gahy du Valli (soprano) "Cavellitos." "Estrellita." "Carmenita" 4.25: Orchestra "Spanish March." "Avechillo" 4.30: Close down.

THE CHILDREN'S CORNER

4.45: "Robby Bluey" in song and story. 6.15: "Clever Clarice" at the piano. 6.30: A talk of interest to the older boys and girls.

EVENING SESSION

6.45: Mr. J. M. Pae, M.A., "Let's Talk About Our Animals." 7. Intelligence in Animals." 7.0: Mr. J. R. Lyall, B.A., "Marriage Customs of Manikand." 7.15: Dr. E. A. Sweetman, M.A., LL.D., "Recent Discoveries of Ancient Civilisations." 7.30: Mr. Arthur Garrels, American Consul-General, "Diplomats and Consuls."

NIGHT SESSION

7.45: Frank Lanterman at the Wurlitzer organ. 8.0: National Broadcasting Orchestra (under direction of Wm. G. James conductor, Percy Code) Selection, "Philomena and Baucis" (Gounod). 8.10: Melbourne Male Quartette. "Has Sorrow Thy Young Days Shaded" (Moore) "My Heart's in the Highlands" (Prothers) "Lovestoft Boat" (Elgar). 8.20: Louis Hattenbach (cellist) in a programme of his own compositions. "Melodie." "Menuetto." "Cradle Song." "Anzures in G Major." 8.35: Madame Elise Davies (soprano) "Aria," "The Voice from Fa" (Rossini) "Ave Maria" (obbligato Bertha Jorgensen) (Gounod). "The Cuckoo Clock" (Schafer). 8.45: Orchestra— "Valse Lyrique" (Sibelius). "Andante for First Symphony" (Beethoven). 8.55: A. C. Bartlman (baritone)— "Scena and Aria, "Alzati," from "Un Ballo in Maschera" (Verdi). "Pi Tu Che Macchavali." "Dream in the Twilight" (Strauss) "Trade Winds" (Fredk. Peeli). 9.5: You will hear the outstanding Personality of the Week. 9.15: Orchestra— "Suite," "My Native Heath" (Haydn-Wood). 9.25: Frank Hatherley presents a Rollieking Farce "A Mock Trial" (action to recover damages, with musical interruptions). Adapted and produced for radio by Frank Hatherley. Cast of Characters— Mr. Justice Newge (Judge), Mr. Circuit Shortt (Registrar), Mr. O. B. Kwiell (Usher), Mr. Chas. Larkin (Plaintiff), Mr. Ellis Dee (Counsel for Plaintiff), Alceorn Fitzhugh (Defendant), Mr. Hush Home (Counsel for Defendant). Witnesses: Nurse Marion Erle, Count von Richman, Dr. Adney Payne, L.S.D., M.P.S., Mr. Esau Backford, Master George Wood, Lady Fitzhugh, P. S. MacHinery, B.S. 10.5: Thelma Ready will entertain with her banjo. 10.15: Orchestra— "Selections from "The Firefly" (Friml) 10.25: News from to-morrow's papers. 10.35: "The Rex" Dance Band. 11.30: God Save the King.

3AR

Australian Broadcasting Co., 120A Russell St., Melbourne (Wavelength, 371 metres).

MORNING SESSION

8.15: Morning music. Weather forecast. Items of interest. 9.30: British official wireless news. 9.40: Reproduced music. 10.45: Arnold Coleman at the Wurlitzer. 11.0: Close down.

COMMUNITY SINGING

12.0: Community singing, transmitted from the Melbourne Town Hall. Conductor, Frank Hatherley. Proceeds in aid of the Lord Mayor's Hospital Radio Fund. 12.15: Midday news session from the studio. 12.30: Community singing resumed.

AFTERNOON SESSION

2.0: Metropolitan Fire Brigade Band. Conductor, P. C. Johnston. March, "Argandab." Overture, "Calliph of Baghdad." 2.10: Grace Evans (soprano) "Knowest Thou the Land" ("Mignon") (Thomas). "The Lass with the Delicate Air" (Anna). "A Cradle Song" (Taubert). 2.20: A one-act play, produced by Catherine Neill, "The Wedding Morn," by Arthur Schnitzler. Anatole, Charles Laneley; Max, Phillip Wade; Lana, Catherine Neill. 2.35: A Novel Trio. 3.50: Jessie Clarke, Songs at the Piano. 3.0: Gregory Trahoff (violinist). 3.10: Guy Moore (tenor) "From the Land of Sky-blue Water" (Wakefield-Cadman). "Far Off I Hear a Lover's Flute" (Wakefield-Cadman). "The Crown" (Ruel). 3.20: Metropolitan Fire Brigade Band. Selection, "Faust" (Gounod). 3.30: Miss A. Babington, "Temperament and What It Means." 3.45: "Your Feet and Comfort," by a leading Orthopedic Authority. 4.0: Miss Alice Smith, "Correct Speaking." 4.15: Reproduced music. Traders' Demonstration Session. 4.45: Evening, transmitted from St. Paul's Cathedral. 5.45: Close down. 6.15 to 7.30: Dinner Music, supplied by the Studio Orchestra.

EVENING SESSION

7.30: What's on the Air To-night. 7.32: Latest Musical Releases. 7.45: Market reports.

NIGHT SESSION

8.0: Overture by Symphony Orchestra, under direction Stanley Porter. 8.10: The Royal Male Quartette. 8.20: Miss A. Lewis, the Australian Harpist. 8.30: Rita Coonan (soprano)— "Siesta" (Basley). "There is a Lady Sweet and Kind" (arr. War Grey). "Clouds" (Basley). 8.40: The Moscow" Trio. 8.55: Surprise Item. 9.10: Lorna Reid, Songs at the Piano. 9.20: "Cherry Blossom Time in Old Japan." Musical Comedy produced by Hugh Huxham. 9.50: "The Regal" Quartette. 10.0: Syd. Hollister (comedian)— "Ten Minutes' Nonsense." 10.10: Boc d'Questen's Melody Boys. 10.30: God Save the King.

4QG

Queensland Government Radio service, Brisbane (Wavelength, 385 metres).

7.43 to 4.30 See Friday.

EARLY EVENING SESSION

7.45: Lecture—"A Talk on Books," by Mr. J. Doyle.

NIGHT SESSION

8.0: A light entertainment by Mrs. Matthews' Cadenza Plectral Club and Banjo Band— Cadanza Plectral Club— "Gloriano" (Verdi). Elsiebeth Camper (soprano)— "I Love the Joy and Dance" (Davies). Claire Matthews, violinist— "Romance d'Automne" (Adele Gerard). Sid. Smith and Mrs. Matthews' Banjo Band— Popular numbers. Claire Matthews and Ida Heckenburg (mandolinist)— "Mandolin duet. "A Perfect Day" (Jacob Bond). Mrs. Matthews' Banjo Band— "The American" (Bertram). Elsiebeth Camper, soprano— "Big Lady Moon" (Coleridge-Taylor). Mrs. Matthews' Cadanza Plectral Club— "La Rondinella, Amabile" (Acton). Stewart Mackay, in plantation melodies, with old style banjo accompaniment: Claire Matthews, violinist— "Poupee Valsante" (Fritz Kreisler). Leo Crump, with Banjo Band, in popular numbers. Cadanza Plectral Club and Banjo Band— "Magnificent" (Grosby). 9.0: Metropolitan weather forecast. Movements of the travelling dental clinic. 9.5: Mrs. Phil Stewart, soprano— "The Dawn" (D'Hardelot). 10.10: E. Ryberg— Mouth-organ solos, selected. 9.18: Claude Walker— Ten Minutes with Henry Lawson. 9.28: W. E. Davis, cornetist— Cornet solos, selected. 9.38: Mrs. Phil Stewart, soprano— "Vorret" (Could I) (Tosti). 9.42: E. Ryberg— Mouth-organ solos, selected. 9.48: H. Humphreys, a Dickens' reading. 10.0: News supplied by the metropolitan dailies, weather information. Close down.

5CL

Central Broadcasters, Ltd., 114 Hindmarsh Square, Adelaide (Wavelength, 409 metres).

MORNING SESSION

11.15 to 2.0: See Friday.

AFTERNOON SESSION

3.0 to 4.30: See Friday.

EVENING SESSION

6.0: Chimes. 6.1: Birthday greetings, correspondence, songs, and stories by "The Wattle Lady." 6.30: Dinner session. 7.0: Senior Birthday League greetings; 5CL's sporting service; General market reports. 7.20: Dr. G. H. Wright, M.A., will continue his series of literature talks. 7.35: A gold talk. 7.45: Mr. A. M. Whittebury—hints to poultry breeders.

NIGHT SESSION

8.0: Chimes. 8.10: From the Adelaide Town Hall, Mr. Scullin, leader of the Opposition in the Federal House, will speak to you. 9.0: Chimes. 9.1: Meteorological information, including Semaphore tides. 9.2: Overseas grain report. Announcements. 9.7: From the Hindmarsh Town Hall—a concert by the Hindmarsh Municipal Band, including items by the Windarra Male Quartette and Don Fraser. 10.15: General news service. 10.29: Modern dance music. 11.0: Close down.

6WF

Commonwealth Government Broadcasting Station, Perth (Wavelength, 409 metres).

10.0: Gramophone records. 11.0: Close down. 12.30: Markets, news, etc. 1.0: T. T. sign. 1.1: Weather. 1.3: Organ recital. 1.20: Community singing. 1.50: Programme continued. 2.0: Close down. 6.45: Bedtime news by Uncle Duffy. 7.5: Light music. 7.30: Commercial and general information. 7.45: Talk. 2.0: Time signal. Weather. 8.3: Musical programme. 3.50: Late news. Ships within range. Late weather. 9.5: Programme. 9.45: "Health" talk. 10.30: Close down. 104.5: Metre Transmissioin. Simultaneous broadcast on 104.5 metres of programme given on 1250 metres, commencing at 8.45 p.m.

7ZL

Tasmanian Broadcasters Pty., 95 Elizabeth St., Hobart (Wavelength, 516 metres).

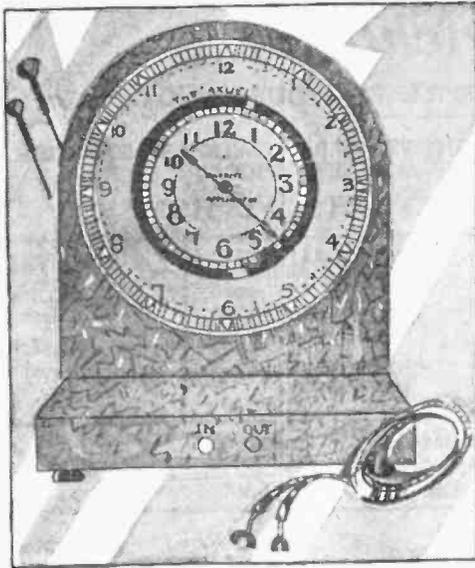
11.30 a.m.: Musical selections. 11.34: Midlands weather forecast. 11.35: Musical selections. 11.55: Tasmanian Station's 9 a.m. weather report. 12.0: G.P.O. clock chimes the hour. 12.1: Shipping information; ships within wireless range; mail notices; housewives' guide; commercial news. 12.8: Musical selections. 12.29: Announcements. 12.33: Musical selections. 12.55: News service; British official wireless news; Railway auction produce sales, held at Railway. 1.10: Musical selections. 1.30: Close down. 3.0: G.P.O. clock chimes the hour. 3.1: Musical selections. 3.4: Weather information. 3.5: Musical selections. 4.15: A representative of the Child Welfare Association will speak on "The Sensitive Child." 6.15: Children's hour, with "Uncle David" and "The Storey Lady." 7.15: News session. 7.30: Under the auspices of the "Conic to Tasmania" Organisation, J. B. Reid will speak on "How to Spend a Holiday in Tasmania." 7.45: W. H. Cumine will speak on "Soccer." 8.0: G.P.O. clock chimes the hour. 8.1: Record recital. 8.15: 7ZL's community singing—artists, C. Alomes, Fred Kummer, H. Hurst, Mrs. Cliffe Hughes; accompanist, Miss Lella Reid. 8.45: One-act play, produced by W. E. Fuller. 9.0: Community singing (continued). 9.30: News session. 9.45: Record recital. 10.0: G.P.O. clock chimes the hour. Close down.

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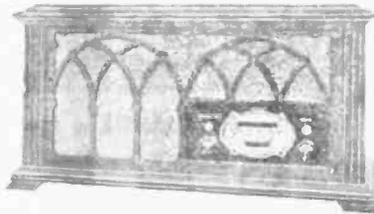
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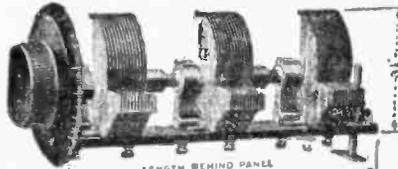


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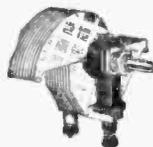
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The WIRELESS WEEKLY RADIO INFORMATION SERVICE

Under the direction of Ross A. Hull

G.W. (Netherlands).—"Can you tell me what wavelengths the Japanese stations work out?"
Answer: JOAK 345 metres, JOBK 400. JOJK 353. JOGG 380, JOHK 390, and JOJK 361. All stations use approximately 10 k.w.
(2) "What town or city are these stations situated in?"
Answer: JOAK Tokyo, JOBK Osaka, JOJK Hiroshima, JOGG Kumamoto, JOHK Sendai, JOJK Sapporo.

E.F. (Halpowa).—"I have been reading up articles on dry rectifiers, and though I follow the theory perfectly, it seems hard to believe that oxidised copper can rectify. My argument is this: A three electrode valve rectifies and also detects. An ordinary two electrode rectifier can also be used as a detector. The crystal detector is a rectifier. Then why cannot the dry rectifier be used as a detector?"
Answer: It can—after a style. Here is an interesting experiment you might care to try. Take an inch or two of fairly heavy gauge copper wire. Flatten it at one end, and oxidise it to blackness in a blue gas flame. Wrap the round, bright end into your crystal detector cup in place of the usual crystal, and tickle the flat, black end with the cat-whisker. Tune into some fairly loud station, and you will find that the copper oxide is a rectifier.

R.O. (Kirkbrill).—"I am using a crystal set, and I have an inductor aerial, but I can only get two stations (2BL and 2GB). I should like to get 2PC. Please advise what alterations I must make."
Answer: Such letters as these tend there are a lot of them! Only waste our time and yours. You should have mentioned the circuit in use, or forwarded a copy of it. As matters stand, we can only suggest that the receiver is out of date, and that the best thing you could do would be to re-model the receiver, as per the "Kug" (published about a month ago). A wavepat might help matters. If you write again, please give description of coils and tuning apparatus.

J.H. (Waverley).—"Re enclosed circuit. I built this set, and had 2BL spread from 10 degrees on dial to 85 degrees. 2PC comes in, with 2BL in the background. 2GB is mixed with 2BL. 2UE, 2UW, and 2KY can all be heard at the same time as 2BL and 2GB."
Answer: Glad you forward circuit, which points out probable error. The condenser has been placed in series with the secondary instead of in shunt with it. Further, you will probably find that the grid return for the valve mentioned should be A positive, not A negative. Make these alterations, and set should be O.K. Disconnect coil lead (secondary) to fixed plates of 0005 condenser, and carry the lead to the moving plates. Now connect the fixed plates to the other end of the secondary coil, i.e., the end that connects to the grid condenser. When connecting up the "A" battery, put the plus lead on to the moving plates of the 0005 condenser, and connect the rheostat to A negative and B negative.

R.H.W. (Barga).—"I recently built the Countryman's One-valve, and find that 2BL, 3LO, 4QG, 5CL, 2PC, 3AE, and 7ZL come through O.K., but on 2GB and 2KY the set refuses to oscillate as it does on the longer wavelengths. Volume is good on all stations received, though 2PC is slightly broad."
Answer: Add a few more turns to the reaction coil. It is already fully embedded in the secondary. I have since found that this receiver can be vastly improved by placing a .001 fixed condenser across the "phone terminals, as it assists oscillation.

S.L. (Queenland).—"Would you please inform me if there is a station JOBK in Japan or anywhere else?" On a few occasions last week I tuned in to a station, and the announcer each time said JOACK."
Answer: As far as we are aware, there is no such station. However, think you mistook the name on the A for C. It sounds something like this: "Jay Ayeeteeteete Owe Kayeevee." so that the station you heard was probably JOAK.

G.S. (Queensland).—See below. Yes. 5-1 transformer. There is no transformer in the Countryman's One-valve, but you can add a stage of audio. Circuit was published in query columns recently.

GENERAL.—Can any reader supply Mr. G. Skzoll, Rowland Terrace, Inawick, Queensland, with a copy of WIRELESS WEEKLY dated January 25, 1929?

A.F.J. (Eumungie).—"I am having a bit of trouble with my five-valve receiver. A buzz is heard on 2PC at night, but you can add a stage of audio. Circuit was published in query columns recently."

G.V.P. (Condonohin).—"I wish to use a loud-speaker in a room apart from my set. The intervening distance is approximately 65 feet. Please ad-

vice cost of wire, type wire to use, and results I may get."

Answer: Use electric light flex, about 10/ per 100 feet. Interference from house bells and other electrical apparatus may prove troublesome unless cable is shielded and earthed.

G.E.H. (Newtown).—"0005 condensers are desirable. The 00025 condensers could be used, though they will not cover the 200-600 metre band in the Neutrodyne."

C.K. (Pt. Stephens).—"How can I advise you if the consumption is good or bad when you do not mention the number of hours per day your receiver is used?" Some listeners only have the receivers running in the evening. Others listen all day.

J.G. (Mosman).—"Lewcos coils O.K. If you find a gap, vary aerial coupling coil. Your letter has been passed on to the Back Number Department."

GENERAL.—The following querist wishes to get in touch with some reader in the vicinity of Waterloo who has built a Go-Getter.

G.H.O. (Waterloo).—"You do not tell us anything beyond the fact that the receiver is unsatisfactory. Cannot advise unless you give us some details. As requested, have published a request last above. Address: Mr. G. E. Oakley, 44 Morehead Street, Waterloo."

L.A.L. (Victoria).—"Yes, the eliminator O.K. but only up to three valves. If you desire to use the eliminator on a receiver using more than three valves a rectifying valve must be used. The firm supplying the eliminator can also supply a rectifying valve to suit requirements, price 12/ extra."

"Exponential" (Goulburn).—"I am interested in 'Curves Ahead,' 28/6/29, concerning the exponential speaker. I wish to make one of these, and would be grateful for measurements through your columns."
Answer: Dimensions would depend on the lowest frequency it is required to reproduce. If this is 64 cycles, the area should be doubled every foot. The mouth of the horn should be made equal to one quarter wavelength of the lowest frequency required. If this is still 64 cycles the mouth of the horn should measure about five feet across.

"2"—"Can I make this speaker square shape instead of round? If so, it would certainly save a lot of work in the building."
Answer: Yes, quite O.K. The joints must be made solid.

(3)—"Which do you consider the best speaker, the true exponential or the moving-coil cone?"
Answer: There are good and bad speakers of both types. Actually there is little to choose between them as regards performance, though the exponential is much more cumbersome than the moving-coil speaker. We are endeavoring to find some Australian experimenter who has built an exponential horn. An article on the subject is contemplated.

W.I. (Ipwich).—"I have a dynamic speaker—(all electric model), used with a power amplifier. The hum is very bad, due mainly to reproduction of a 120-cycle note coming through."
Answer: You may be able to eliminate this by placing an electrolytic condenser across the field of the speaker, but the use of this condenser will undoubtedly shorten the life of the rectifier.

(2)—"What alterations are necessary to cut out the dry rectifier, and put in its place a UX280?"
Answer: You would strike many difficulties in making this alteration, mainly owing to the fact that the field excitation transformer is probably not centretapped.

D.M. (Cremorne).—"My query is straight to the point. Why is it taking you so long to give us the Screen Grid Marco Four?"

Answer: The Marco Four has already been published in this year, once as an ordinary three electrode valve receiver, and again (at readers' requests) as an all-electric receiver. However, it has now been definitely arranged to have the S.G. version treated in an early issue. Sorry you are so tired of waiting.

W.O.H. (Conds).—"Will you please tell me what the following valves are—A635, A609, 2B05, A615? Is the A635 a screen grid valve? Are these valves good? Could I use this receiver for short waves?"

Answer: The Marco Four has already been published in this year, once as an ordinary three electrode valve receiver, and again (at readers' requests) as an all-electric receiver. However, it has now been definitely arranged to have the S.G. version treated in an early issue. Sorry you are so tired of waiting.

G.H.P. (Yeppoon).—"I am situated 300 yards from a house-lighting plant which interferes very much with my reception. Can you advise me of anything that might be done to eliminate this interference?"

Answer: Advise the owner of the plant, and suggest that condensers be placed across the brushes to reduce sparking. Suggest you try the interference eliminator published in these columns a couple of months back.

W.M. (Bendigo).—"The distortion may be caused by poor or unsuitable transformers, de-magnetise speaker,

wrong grid bias, too high detector plate voltage, or faulty valve."

G.G. (Addington).—"A circuit of a single-stage resistance coupling was published in these columns a little time back. The first stage amplification shown in the Aberdonian Three will be O.K. Ifrak resistance 100,000 ohms, second resistance 1 megohm. Condenser .006 or .05. Yes, rheostats could be used in Aberdonian Three. Connections as usual, in place of the Brachistats. No; the secondary is not wound either side of the primary, but the primary is wound over the secondary. Part of the secondary is covered by the primary. This explains why you mistook the drawing."

A.J.N. (Waverley).—"What variable condenser obtainable in Sydney can I get in place of a double-spaced 00025, as I am unable to procure this?"

Answer: Procure a .0005 variable condenser; remove half the fixed plates and half the rotor plates, and double-space the remainder. Removing half the plates will make it .00025, and double-spacing will make it .000125. The nearest marketed condenser to this is a .0001, but this is not double-spaced.

K.C. (Marriekville).—"Rectifier may be faulty, or condenser broken down."

R.T. (Canterbury).—"Your circuit diagram is incorrect. The plate of the R.F. valve should connect to B plus 45 volts, NOT the filament. The bottom of the R.F. secondary should connect to A plus, not A minus. The complete circuit was published recently under the name, "Marco Four." When the extra coil is used the first turn connects to aerial, and the other to earth, also to positive filament. The other end of the secondary (since end of primary and commencement of secondary are joined) connects to grid of R.F. valve."

"FAIR GO" (N.S.W.).—"Your question is impossible to answer unless you state whose receiver is in use, ampere-hour capacity of batteries, type of valves used, characteristics of valves (unless they are of a well-known type), etc. The same applies to reception conditions. Mount David should be O.K. Your list is quite moderate, and is O.K. for five valves. The reception may be excellent if conditions there are bad, but this is a question that is best answered by comparing your results with local listeners."

E.R.W. (Wisham).—"I am enclosing a circuit diagram. Is it O.K.? Will addition of 'C' bias be necessary? If so, how should it be connected? What potential? Will Philips' B eliminator suit? What Philips' valves should I use? C.A.V. accumulator O.K.?"

Answer: Circuit O.K. It is a Rehnart. "C" bias a decided advantage. Disconnect leads from P minus of each transformer, which are shown in your drawing, to be connected to filament. Now connect these two terminals together and take a common lead to C negative. Pour and a half-volt "C" battery will suit. Philips' eliminator O.K. Valves, first stage A615, second B406, third B400. Sixty actual ampere-hour four-volt accumulator. C.A.V. If you do not use grid bias, reverse your connections to the "A" battery, otherwise "A" positive will be connected to P negative of transformers. It would be better to use an R.F. choke than the 250-turn coil.

QUERY COUPON

If you are in difficulties about reception or set-construction, let us know, and we will endeavor to see you right. Make your questions brief to the point, and, where possible, show lay-out and wiring design. Under no circumstances will answers be quites be made by letter or by telephone. All answers will appear in the columns of this department in the order in which they are received.

The Radio Information Service, 441 North Brisbane Street, Sydney
 Please enclose the accompanying query in this coupon in order to indicate that I am a bona-fide inquirer.

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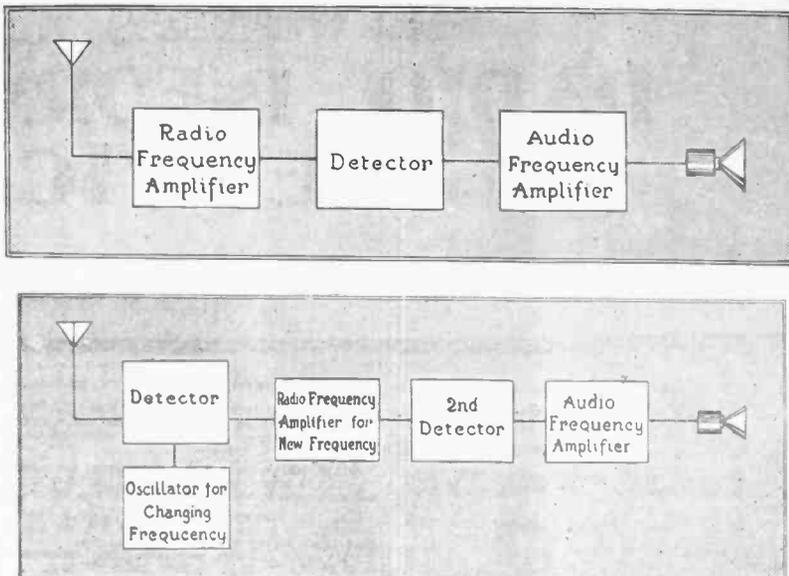
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F.W.H. Leichhardt, and Starter." Yarras, are both interested in the super-heterodyne. They ask, respectively, where the super-heterodyne differs from the ordinary tuned radio frequency receiver, and whether it is capable of better "distance getting" than other sets.

Answer: The super-heterodyne does differ fundamentally from the usual tuned radio frequency set. Two diagrams are printed to illustrate this point. In the first one is shown the tuned radio frequency amplifier of the ordinary set, followed by the detector and then the audio frequency amplifier. In the second diagram the super-heterodyne is shown. In it there is a first detector coupled to an oscillator, which forms a frequency changing unit. This unit may or may not be preceded by a tuned radio frequency amplifier, but in either case its work is to change the incoming radio frequency to a lower or intermediate radio frequency. This intermediate frequency is the same, irrespective of the frequency or wavelength of the transmitter, and consequently it can be amplified by a fixed radio frequency amplifier. After this the much amplified signal is detected by the second detector, and then amplified at audio frequencies. The modern super-heterodyne has advantages over the usual tuned radio frequency amplifier set in permitting great sensitivity to be obtained with less difficulty in adjustment. It is a receiver particularly suited for the "home-builder" who is prepared to use six or seven valves in the attempt to arrive at a highly sensitive set. The range of any sensitive receiver is usually limited only by the "background" noises. Both types of receivers are susceptible to such noises, and for this reason their maximum ranges probably would not differ greatly.

H.K. Yarras asks if it would be possible to receive the Sydney stations with a crystal set, the distance being about 230 miles.

Answer: The crystal receiver has a very low sensitivity, and its use is ordinarily practical only up to distances of 10 or 15 miles from a good broadcasting station. Signals are often received over much greater distances than these, but unless the receiver is particularly well located and fitted with an excellent aerial, the music is almost certain to be very feeble. Under exceptional conditions, it may be possible for you to get a few whispers with a crystal set, but we strongly advise you to interest yourself in a receiver with valves—preferably with three, four, or five of them.

A.E.W. (Brisbane).—Your letter passed on to Colville-Moore, who have undertaken to distribute all C.S.L. cards previously held here.

L.J.F. (Brisbane).—See above.

H.M.C. (South Australia).—See above.

C.H. (Hobart).—See above.

H.D. (Albury).—All Empire. Yes; Go-getter parts could be used. All-Empire is simply a Go-Getter with stage of S.G.R.F. added. Sorry no copies of All-Empire left. See below. December 28 copy noted as requested.

GENERAL.—Can any reader please supply Mr. H. Dixon, 477 Olive Street, Albury, N.S.W., with a copy of WIRELESS WEEKLY containing the All-Empire receiver?

J.X. (Williamstown).—"Can you give me any reason why 2FC is received so badly here, whilst 2BL is perfect?"

Answer: This is a question that has been puzzling many prominent men for some time. It is generally known that the Newcastle district gets good reception of 2BL, and poor reception of 2FC. To date the phenomenon has not been satisfactorily explained, though there are many vague theories. You may remember the recent plebiscite conducted by 2FC and 2BL. This conclusively proved that reception in Newcastle district of 2FC was inferior to that of 2BL. A scientist recently suggested that some kind of ore between Sydney and Newcastle had something to do with the trouble.

However, there is no definite explanation. See remarks further on by R.H.M. (Newcastle).

GENERAL.—Can any reader please supply Mrs. Ross, "Newhaven," Fitzroy Street, Abbotsford Place, with a copy of WIRELESS WEEKLY dated March 22, containing the Renown Three?

H.R.H. (Mo'sman).—You are using the wrong tapping. The four volt tapping should be used. The charging rate may be increased to 2 amperes, but this will shorten the life of the battery. Steadpower "A" unit O.K.

J.E.O.G. (Tempe).—"Having built the Marco Four published in WIRELESS WEEKLY, February 1, 1929, I cannot receive Interstate stations, though local stations come in excellently. I am using an A409 for the R.F. stage. When set is working I can remove R.F. valve, and still receive local stations." Answer: It is quite in order to be able to receive local stations with R.F. valve removed. The A409 is not an R.F. valve, and would suggest you try an A425. Experiment with R.F. plate voltage, and place R.F. plate coil nearer detector secondary.

A.L.F. (Arncliffe).—"Could you please let me know the name and address of the secretary of the Arncliffe 'Proving Radio Club' group?" Answer: Mr. Simmonds, "Gunton," Marsh Street, Arncliffe.

S.H. (Manly).—"Having assembled the Pentavox, there still seems to be something amiss. The complaint is a fluttering in the speaker. Occasionally it becomes a loud popping, and is very unpleasant. The 5 megohm grid leak did not seem very suitable, so I replaced it with one of lower resistance."

Answer: Wet your finger, and place it on grid terminal of valve socket. If set does not roar, change grid leak until the noise is heard. Now listen to the "fluttering noise," and at the same time alter grid bias. If speed of fluttering increases or decreases it will show that there is either an open grid circuit or that grid bias is incorrect. Test grid condenser. If altering grid bias does not alter "fluttering" tap leads with finger, and listen for a click in the speaker. This will indicate a loose lead. Look to speaker connections.

F.H. (Wollongong).—"I would be pleased if you could supply me with copies of WIRELESS WEEKLY dated December 28 (P.R. part 1) January 11, (P.R. part 3) January 18 (P.R. part 4), January 25 (P.R. part 5), February 1 (P.R. part 6), March 15 (P.R. part 12), March 29 (P.R. part 14). If you are unable to supply could one of your readers supply them. I am willing to pay postage."

Answer: We can supply all copies but January 11, 25, and February 1. Some reader may be able to supply other copies. Inquirer, F. Hockey, c/o A. J. Davis, Rosemont Street, Wollongong, South Coast, N.S.W.

T.F. (Glen Innes).—"I bought a radio set for cash. The set carried a 12 months' guarantee. Only a month has passed. What privileges does this guarantee carry?"

Answer: As a rule the guarantee covers repairs to the receiver when it becomes faulty. It does not, however, include battery and valve replacements, though transformers or other faulty apparatus are usually exchanged, providing the set has not been interfered with in any manner. Some firms will, under their guarantee, install fresh batteries at the customer's expense, i.e., price of batteries. Guarantee seldom covers reception of certain stations, owing to the fact that localities differ greatly as regards reception.

GENERAL.—Can some reader please supply Mr. E. Owen, 54 Eskdale Road, Caulfield, Victoria, with a copy of WIRELESS WEEKLY containing the All-Empire short-wave receiver.

"Jehu" (Buderim Mt.).—Reason why clock hours of battery life are not given with each receiver is because capacity of batteries differ greatly, and the life is dependent on consumption of valves used. Carbon cells can be used if desired. First cost greatest. Upkeep very small. You can use any type battery you choose. Generally speaking, the greater the cost, the longer they will last. Don B. Knock may be found at 102 Nelson Bay Road, Bronte.

F.H.D. (Bexley).—Suggest you add a stage of R.F. or another stage of audio. You would do better if you used a 199 valve in place of the 201A. The 199 is a 3.5 volt valve, and the 201A is a 5-volt valve. You cannot expect the two valves to work together at maximum efficiency, on the one four volt "A" battery. The variable condenser will not be able to boost up the signals. You cannot improve the volume on distant stations without adding the extra stage. Glad the "P.R." course proved so helpful to you in your A.O.P.C.

A.W. (Lidcombe).—See reply to J.E.O.G. (Tempe).
"Diagraph" (South Australia).—As requested, here we are again! Error probably (word left out), yes, Marnock Five. The Go-Getter with an R.F. stage becomes an "All-Empire." Suppose you have the copy? You had bad luck with the Air King. It's a big set to build, and needs a lot of care with the R.F. stages, otherwise results are poor. You will find one querist this week praising the receiver. Sorry, can't advise on your location, because don't know whether it is Marmalade or Adelaide. Understand reception in Adelaide is normal. Don't know about reception in Marmalade—probably mushy. Re coil. Quite correct. Your notes on recent replies noted. Thanks for kind remarks.
XXX (Grafton).—Yes: use A425, A425, A415, B408, B405. Yes: "C" battery will probably require changing.

F.M. (Manly).—Using a 3/4-inch former, you tell me the number of turns and gauge of wire, and the spacing between coils, for a Reinartz three-valve receiver.

Answer: Use 24 gauge D.C.C. wire. Primary 15 turns. Space 1/4 inch. Secondary, 45 turns. Space 3/8 inch. Reaction, 25 turns. If desired when winding the secondary, no space need be left, and the reaction winding continued straight on, with tapping taken at 4th turn for filament.

(2) How many plates would I have to take off a 0005 condenser to reduce to 00025?

Answer: 0005 equals 00025 x 2, so that half the plates will have to be removed.

(3) "How many turns of wire, gauge, and diameter of former will be required to make the choke?"
Answer: 180 turns of 24 gauge D.C.C. on a 3/4-inch diameter wooden dowel, about 5 inches long.

J.W.L. (Adelaide).—You should have repeated your query. Have no trace of the original letter.

J.M. (Double Bay).—Yes: see below.

GENERAL.—Can any reader please supply Mr. J. Massey, 167 Bellevue Road, Double Bay, with a copy of the New York "Radio News" for December, 1927. Inquirer is willing to remit cost before papers is forwarded, and is willing to pay for loan only if desired.

R.H.M. (Newcastle West).—I am wondering why 2BL gives me such poor reception. This is bad at night, and recouping at night, but I cannot understand a word of what is being said or sung. 2BL is O.K. All other stations are splendid.

Answer: See reply to J.X. (Williamstown).

GENERAL.—All Q.S.L. cards have now been passed over to Messrs. Colville Moore, Rowe Street, Sydney, who will distribute them to the owners or make them available at the institute as desired. Can arrive this morning for VK5HG, VK5JH, VK5BV, VK2RZ, VK5HC, VK3PA, VK3PM, VK5XO, VK2LJ, VK3JA, VK2EK, VK3PM, VK3ML, VK3PM.

R.E. (Homebush).—I have built a Reinartz Two and cannot hear anything. What is the matter?
Answer: Your details are too meagre. A hundred-and-one things may be wrong. Look first to an open circuit, badly soldered lead, faulty component, flat batteries. See that valves are making contact in sockets, and test transformer windings.

A.R.P. (Brisbane).—I have to thank you for the information received through the columns of your paper. The set is now O.K. inasmuch as it has been, as suggested by you, in the transformer. The change-over of the B plus and plate corrected the howl immediately.

Answer: This is the meaning of your letter, because many constructors complain of this howl when using different makes of transformers.

W.C.R. (Dungog).—Stage of audio and constructional details were recently published in "Providing Radio."

R.P.G. (Wagga).—Your explanation of A.C. hum almost word for word an explanation given in a contemporary magazine. The explanation happened to be incomplete. The prize has been awarded.

J.B. (Homebush).—No: this cannot be done.

W.D. (Deniliquin).—Aerial touching some object, altering capacity of circuit, or loose lead.

L.G. (Kensington).—I have noticed that in lists of short-wave stations appearing in WIRELESS WEEKLY from time to time the times of transmission are expressed in an unintelligible manner, such as, "Daily, from 0900-2300." Could you please enlighten me as to the meaning of this?

Answer: This method is internationally used. The day is divided up into twenty-four hours, finishing midnight, which represents 24 hours, no ten minutes, and no units, minutes, or 2400. One a.m. becomes 0 tens hours, 0 unit hour, 0 tens minutes 0 unit minutes, or 0100. Two a.m. is 0200; 3 a.m. 0300, three-thirty is 0330, 5 a.m. is 0500, 10 a.m. is 1000, 12 noon is 1200. One p.m. is 1300; 2 p.m. is 1400. 3.30 p.m. is 1730, 11.45 p.m. would be 2345. The term, "Daily from 0900-2300," would mean, "Daily, from 9 a.m. to 11 p.m."

"GENERAL" (Bungendore).—Sorry, we have no circuit suited to your particular requirements. No doubt it may be possible to publish such a one before long.

R.E.A. (Dorrigo).—See 1929 A.R.R.L. Handbook.

L.E. (Stanmore).—Use an iron screw for the core should be 1 1/2 inches long and 1/4 inch diameter. Place roller of paper round core, and use carboider sheet, and essential as support of winding. Check should be 1 1/2 inch in diameter. Wind on a layer of 24-gauge D.C.C. wire (leaving about six inches free wire before you start winding, and then give a trip of paper over the winding, and wind second check. Place strip of paper over this, and repeat procedure till spool is full. Keep windings

even. This makes a very strong electro-magnet, and is a description of that used in the original "Providing Radio" experiments.

E.L.A. (Liverpool).—"I have just fought down a horrible desire to use the axe on my set, though now I have become calmer, think, perhaps you may be able to help me again. Set is now working O.K. (thanks to you) except for crackling in the speaker, which I cannot eradicate, and which is very annoying. Please state possible causes and remedy. Sometimes noise develops into something which will be necessary to alter grid bias if I use a power valve?"

Answer: The last query may be the cause of your trouble. The power valve requires a relatively high grid bias. However, in case you are not using the power valve, look to following:—Open grid circuit, faulty grid leak or grid condenser, frayed speaker lead, loose connections to reaction condenser, valve loose in its base, open circuit in transformer, bad battery contact.

H.W.S. (Brisbane).—No; this would not be high-speed fading, since it is noticed on every station, harmonics of local stations included. The trouble is probably with the grid leak, which is unsuitable, or your aerial may be awaying about, or touching some earthed object.

R.W.J. (Brisbane).—The Countryman's One-Valver, published recently.

R.D. (Toowoomba).—"I recently replaced a transformer in my set. As I could not procure one of the same make as that in the set, I used an Ideal 5-1. I find there is a whistle in the speaker whenever the full 90 volts is turned on or metal part of speaker is touched."

Answer: Simply reverse the two connections on the primary of the new transformer. This will probably set you right. See reply to A.R.P. (Brisbane).

(2) "I have a number of back copies of WIRELESS WEEKLY, Vols. 10, 11, 12, and 13, to No. 18. These are for sale at 3d per copy. If you will pay postage, Copies of Radio, Vol. 1, No. 4 to Vol. 2, are also available at 6d each."

H.C.W. (Hannam Vale).—"Kindly let me know where I can obtain zincs for the sack type Leclanché cell."

Answer: British General Electric Co., Clarence Street, Sydney.

A.F. (Palm Beach).—"Will you please tell me which is the better method of coupling, transformer or resistance, and what advantage and disadvantages both have?"

Answer: Depends on one's requirements. Advantage of transformer coupling is that transformers have a greater amplification per stage than resistance coupling. It is also that transformer resistance coupling to give same output as two transformer stages. Resistance coupling generally gives very little distortion. In case of trouble with the stage, but in the case of a burnt-out transformer winding, it is necessary to replace the transformer.

W.C.A. (Wallend).—"In a recent issue there was an article on amplifier in 'Providing Radio.' Could you tell me if this amplifier could be used with a Cosmo screen-grid receiver. What type of valve should I use?"

Answer: Yes; the amplifier could be used, as this receiver consists of an R.F. stage, detector, and one audio. The filament of the transformer should be 24 volts. You will need a two-volt valve, say, a Mullard PM2, which requires a filament voltage of 2. filament current of 3 amp, maximum plate voltage of 150. There is an auxiliary grid transformer with this power valve, which should be connected to B plus.

(3) "I have also seen reference to coils for the Cosmo to cover between 900 and 2000 metres. What stations are you referring to with these coils?"

Answer: Probably 6WT, Perth, on 1000 metres, but there are no other broadcast stations working on this band. You will, however, be able to hear plenty of code stations sending at all speeds, and this is good practice for learning Morse code.

W.G. (Sydney).—A Marco Four can be made with the parts you have.

"BADLY BITTEN" (North Brisbane).—"I have a P1 set, detector and two audios, and have had splendid results, and am thinking of installing a Penthode in last stage. Will it be O.K.?"

Answer: Yes; quite O.K.

(2) "I also use a short-wave adaptor. Will Penthode valve mar or improve short-wave reception?"
Answer: Penthode can be used, but if it feeds into a pair of telephones there will probably be a heavy "background," on account of particular amplification of the high frequencies. The trouble could be overcome by shunting the second audio transformer with a fixed condenser of .002 mfd., or greater.

GENERAL.—Mr. P. Cullen, Merrylands, writes:—"Re my par in WIRELESS WEEKLY, June 21, 1929, offering back copies. All copies containing popular circuits have been disposed of, and only a few issues are left, these containing nothing of much account. Publish this to stop further inquiries, please."

T.D. (Belmore).—O.K. to have your earth on water pipe. Keep earth wire as short as possible. Condenser plates probably touching. Place a 1 mfd. condenser tested 500 volts in series with earth lead. Loose connection probably cause of intermittent faint reception.

"Interested Reader" (Tamworth).—"Either harmonics or due to use of old-fashioned condensers, which give double readings. Yes; valves consume greater current when rheostat turned full on."

K.A.R. (Homebush).—"Considerable accurate mechanical work would be necessary, but a satisfactory speaker would possibly result. A new input transformer would be essential as the existing one was designed before the days of musical reproduction."

J.R. (N.Z.).—Improved Countryman's Two-valver, Ninety volts on plate of last valve. Dry batteries would last approximately one month, "A" and "B" about three months. No ground set for circuit, and grams, etc., but perhaps later room may be found.

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(Continued from Page 8.)

with an impedance of 1650 ohms each, when used in push-pull, will have the impedance doubled, but as it would then be only 3300 ohms, our requirements are admirably met.

The proof of the pudding is in the eating, and in this regard I would like to mention that those who have heard a coil-driven speaker being operated correctly will never again be satisfied with anything less. There is a depth and grandeur about reproduction from these units that is very satisfying to the music lover. My earlier experiments with the electrical phonograph were conducted with an ordinary good cone removed from its frame and baffled, and although I really thought the reproduction exceptionally good, a later comparison with the dynamic speaker now installed made the first outfit seem very pale indeed. One thing I would like to point out: The dynamic speaker is capable of reproducing faithfully a greater range of notes than are broadcast by our Australian stations, and therefore, used solely for radio reception, some of its qualities are latent. It is my opinion that every owner of this type of speaker, and there will probably be many, as they now sell from £7 15/-, should possess himself of a phonograph pick-up device, for by this means he will give the dynamic speaker some work to do that it will not get on broadcasting. Much more brilliant reproduction may be obtained from good records than over the air (although this should not be). Just recently I had the pleasure of hearing one of these speakers equipped with its own 11X310 power pack, and operating in conjunction with a good gramophone "pick-up." It was my opinion that the finest phonograph in existence was years behind it.

The Gramophone Graduates

(Continued from Page 3.)

ever before, that the gramophone, as a medium for improving the public taste, can exercise a tremendous influence—and that it will create for the public a very high standard of musical performance.

There are several minor details worth noticing. For instance, it is very important that the machine should run at the right speed, which is universally accepted to be 78 revolutions per minute. The thicker the needle the harder the tone. The needles should be changed for every new record; and with needles such problems as size, distance set into the cavity, etc., are for individual experiment to solve. Fibre needles give a very soft tone; but you must be careful they don't spread out, offering two points to the record, for then you will hear two consecutive bars of music played at the one time.

Miss Hazel Fuller

MISS HAZEL FULLER, dramatic soprano, has worked for Fullers' and played in several of their revues. She has travelled all over Australia, and was soloist with the N.S.W. State Orchestra, under Henri Verbrugghen. On one occasion, Miss Fuller states, when she was singing a duet the "Miserere from Il Trovatore," with a tenor who was singing off stage, he forgot his part, so Mr. Verbrugghen, with great presence of mind, stepped into the breach and sang the part himself. The audience did not know the difference. Miss Fuller will be broadcasting through 2FC on Saturday, August 3.

Radio Rewards its Followers

(By WALTER PITT.)

LADY RADIO has treated her admirers well, despite what they might say about her fickleness and the money they spent on her without return. Every once in so often we encounter a habitual wailer, who, when the subject of radio is discussed, will come forth with the classic phrase: "Me? I lost loads of money on radio. I spent dozens, yes, hundreds of pounds, trying out freak circuits, and what did I make out of it? Look at me to-day." But if the truth were known, nine times out of ten such statements would be branded unhesitatingly in the terms of a recent comedy, as "Applesauce."

In the majority of cases where a man has wooed and aided radio in her development he was well paid for the effort. He may be telling the truth when he says that he spent hundreds of pounds on parts, but he fails to mention that most of this was other people's money. It was these men who would be approached by friends and neighbors when they contemplated the purchase of a receiving outfit, and it was these men who would build such outfits and finally, with a very few exceptions, it was these men who realised a substantial profit for the time and labor expended. Take the case of a man we shall call Smith.

KNEW LITTLE OF RADIO

Smith was an unusual type, since, in the first place, he knew less about radio than the average fifteen-year-old boy fan, but he was equipped with a degree of nerve that would put the most expert little gold-digger to shame. Smith got his start in the radio business one night at a friend's house. It seems the friend's set refused to play, and Smith volunteered to locate the trouble. Fortunately for him, the only difficulty was that a wire had been disconnected from the "B" batteries.

His belief in himself thus strengthened by his ability to repair this single receiver, he decided that he would go into the radio repair business, and he did. As a result, each night, for the first few weeks, he would lay in wait for me and plague me with the problems he had encountered in his daily rounds, and the next day put into practice the suggestions I offered.

When he started in the radio repair business Smith was earning about £6 a week, and his general appearance showed it. He had no particular training whatsoever, and if he had lost his clerking job it would have been difficult for him to replace it with one at a similar figure. But, lo and behold, a scant three weeks passed since his entry into the field of radio repair man, and he blossomed forth in a new twelve-guinea suit, new hat, new shoes, and silk shirt. Another week passed, and he showed me a complete testing outfit that cost him £15, and about which he frankly confessed he didn't know a blessed thing. Four months after he repaired his first set he bought a brand new car of the super-type, which, he explained, would enable him to make three times as many calls as at present.

BUSINESS IS GOOD

At the rate he is going, it won't be long before Smith owns his own home, and, after that, who can tell? Here is a definite case of how radio helps its devotees. But for her, Smith would still be earning £6 a week, walking around in shabby clothes, and his family, if not in want, would certainly just barely exist. And Smith is not the only one

What has become of all the old radio fans who used to try the circuits printed in the radio magazines? Take a peek in the radio industry. Some of them are dealers; others have pretty good jobs in the engineering de-

partments of large manufacturing organisations; others are with the radio stations; many are wholesale radio salesmen, who are able to discuss their product with intelligence when talking to a technically inclined jobber, and a very great percentage of them are custom set builders or repair men, and every mother's son of them is making a lot more money than he ever did in his life. If not, isn't it reasonable to assume that they would seek other fields of endeavor?

SOME EXCEPTIONS

Exceptions to the rule must not be overlooked, for there are men who have dabbled with radio and not realised a satisfactory financial return from it. However, investigation will show that they did so purely for a hobby, and if they were not rewarded in a material way, they were well compensated when their efforts were crowned with success.

The foregoing is not written with the thought in mind that anyone might tinker a bit with radio, and then go forth into the world and demand a huge salary; nor is it meant to indicate that this branch of industry pays lordly salaries—it doesn't. The point I wished to stress at the outset was merely that those who spent their time building crazy circuits attended a mighty good training school, and if they were wise enough to take advantage of the fact, reaped the profits.

Even to-day the average man might begin the elementary study of radio by building a one-valve set and work his way up into the intricacies of multi-valve sets. While it is admitted that he won't be an engineer at the conclusion of his study, if he applies himself earnestly, he will be a good average radio repair man and set builder, and his earnings will be regulated only by his ability as a business man.

Spring Gardening

NOW that Spring is in the offing and the thoughts of many listeners will be turning towards their gardens, the talks to be given from 3LO by Mr. J. T. Smith will be of great interest. Mr. Smith is Curator of Melbourne's public parks and gardens.

Community Singing

THE first session under the New Era will be transmitted from the Melbourne Town Hall by 3AR on August 8, under the direction of Frank Hatherley. Excellent programmes have been arranged.

MELBOURNE FEATURES

William Murdoch to Broadcast

A FEATURE artist for 3LO programmes is William Murdoch, the eminent Australian pianist who has achieved world fame for his remarkable playing. Mr. Murdoch will make his first appearance at the big 3LO Studio on Monday night, July 29.

Kate Cornell and "Mrs. Murphy"

LISTENERS should not forget to watch for Miss Kate Cornell, who will be broadcasting from the new 3LO Studio on August 5. Though Miss Cornell is new to radio audiences, she enjoys a great reputation as a concert artist, both in Melbourne and throughout Victoria, where her "Mrs. Murphy" sketches have made her a firm favorite.

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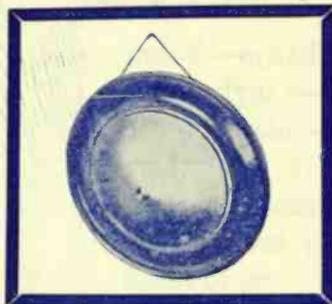
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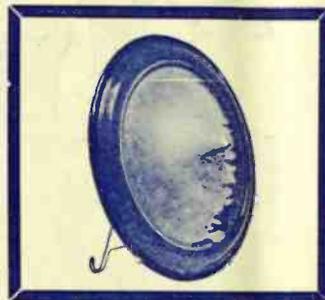


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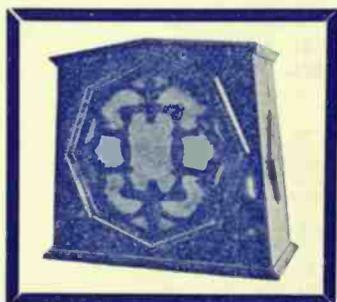


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