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The "Record" Short-Wave Receiver-Three-valve Set Fully Shielded

May also be Constructed as a One-valve Converter

By "Megohm"

With the increasing interest in short-wave reception from overseas, and the enlarging service available to listeners, readers will be interested in the following article on the construction of a fully-shielded three-valve Short-Wave Receiver, by "Megohm." The article describes a set which has actually been made and which is on exhibition in the Willis Street window of F. J. W. Fear & Co., Ltd., for a few days this week. A further section of the article will appear next week.

THIS short-wave set has been evolved by "Megohm" to provide constructors with a thoroughly reliable and sensitive complete short-wave set. The whole receiver is completely shielded in a copper case, easy of construction, which is recommended for use in towns and cities, or where there is any electrical interference. The shielding ensures a perfectly silent background, and cuts out quite an amount of noise that would otherwise detract from reception. The set gives good loudspeaker reception under favourable conditions of R.F.N., Chelmsford, PCJJ, KDKA, 2XAD, 2XAF, etc., but of course not boisterous volume equal to that of local broadcast reception. Results in Wellington have proved so good that constructors in places more favourable to reception of long-distance stations may look forward to recording some very fine achievements. There is no novelty in the actual circuit, which is a standard one that has given good results over a long period in a set of a more experimental nature.

GOOD COMPONENTS THROUGHOUT.

The use of good components throughout ensures reliability of reception and quality amplification, particularly having in view the fact that at no very distant date a short-wave set will probably be called upon to provide regular entertainment in the same way as does a broadcast receiver at the

present time. The making of the coils is well within the scope of most amateurs, and with reasonable care in construction they will function absolutely as well as factory-made ones. But some may prefer to purchase ready-made coils, and they will find several good makes on the market.

COST OF MATERIALS.

The following is a list of practically all materials required for the construction of the set, not including valves:—
£ s. d.
Hammarlund variable condenser 1 5 0
Accurate vernier dial 0 12 6

Other make of variable condenser, with vernier 0 16 6
Ferranti AF3 audio transformer 1 7 6
Igranic or other do. 0 16 0
Benjamin socket for detector... 0 4 6
2 Klossner do. for audio 0 4 6
2 switches 0 3 0
Rheostat, 30 ohms (Igranic)... 0 3 0
4lb. tinned 18's copper wire ... 0 1 6
Ebonite for coils..... 0 2 0
4 sockets, 12 pins 0 2 6
Sheet 4ft. by 2ft. 28's copper... 0 11 0
Wire for connections, celluloid, woodwork, screws, etc. ... 0 5 0
Grid leak, Lynch, 7 megs 2s. 6d., clips 6d. 0 3 0
Sangamo .0001 grid condenser 0 2 6

Connectors for condenser spindle 0 4 0
2 fixed condensers, 1 mfd., each 4s. 9d. 0 0 6
£7 13 6

ALSO AS A CONVERTER.

Although the provision of a complete set allows of short-wave reception under conditions too difficult for an unshielded set, some constructors may not care to go to the expense of a complete receiver, and for that reason, after the description of the full set has been given, the making of the detector portion alone as an adaptor to plug in to a broadcast set detector valve holder, will be dealt with. By dispensing with the audio portion and the shielding, which is not necessary on a converter, the saving in cost will be £2 19s., representing two transformers, two Klossner sockets, and copper sheet. Prices given are city prices, and purchasers will naturally expect to pay a little more for some lines in the country towns.

The Diagrams.

This week a plan of baseboard, view of tuning coils, and theoretical diagram are included. Next week a photographic reproduction of the rear view will be given, together with wiring under baseboard and other working details. The main description will be concluded in the next issue. Looking at the front panel, which is copper sheet finished with black

(Continued on Page 12.)

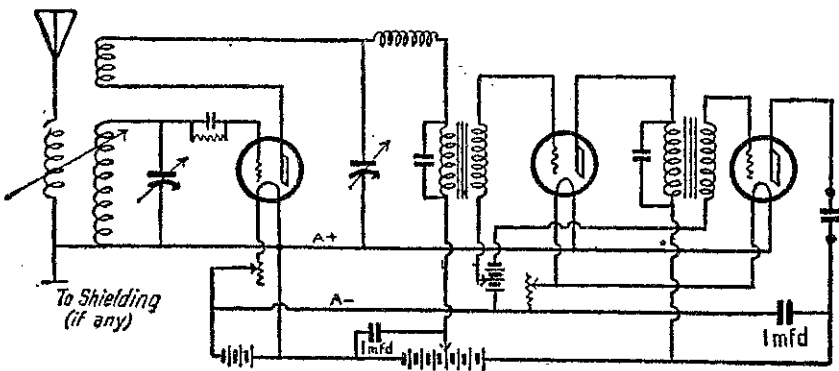
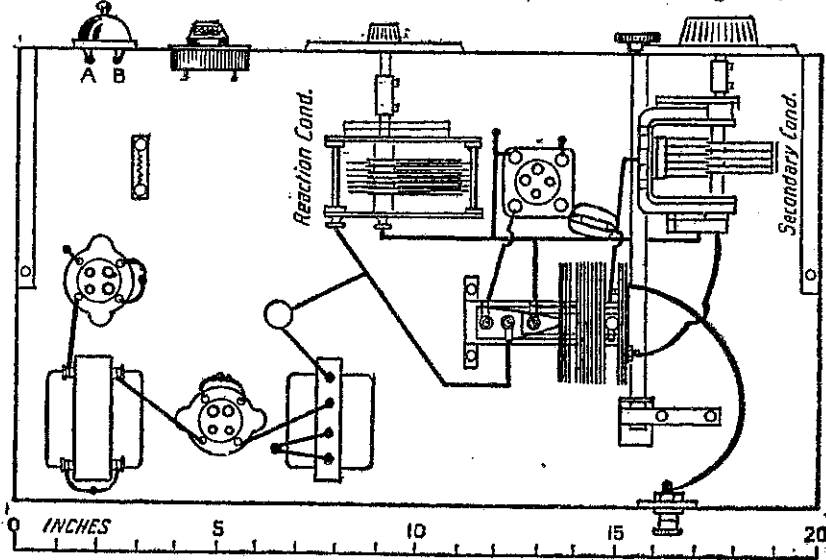
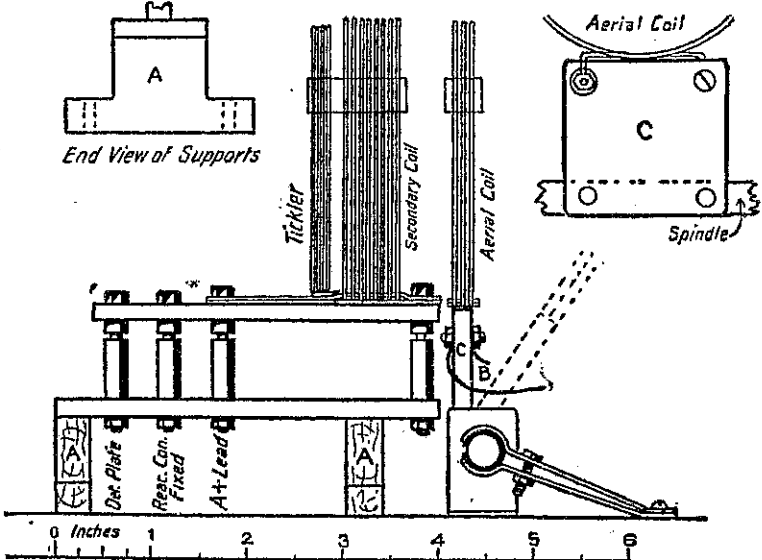


DIAGRAM OF THE "RECORD" SHORT-WAVE SET.



EXPLANATORY DIAGRAMS OF THE "RECORD" SHORT-WAVE RECEIVING SET (See Text of Article).

AUSTRALIAN PROGRAMMES

For the benefit of listeners to whom our paper gets in time we give the evening programmes of 2BL, Sydney (353 metres) for the rest of this week. This is the only station whose programmes the mail has brought us in time.

WEDNESDAY, DECEMBER 7.

8 p.m.: G.P.O. clock and chimes; Broadcasters' topical chorus. 8.3: Miss Heather Kinnaird (contralto songs). 8.40: Mr. Googs Hanton (novelty jazz pianist). 8.47: Mr. Douglas Graham (Scottish comedian). 8.54: The Canterbury District Band (bandmaster, Mr. Stan. Nicholls). Broadcast from Baker's Hall, Campsie. 8.44: Mr. Norman Wright (tenor songs). 8.51: Broadcasters' all-sports expert will talk on "Boxing, Golf, and General Sporting News." 9: Weather report and forecast by courtesy of Mr. O. J. Mares, Government meteorologist. 9.7: Mr. Googs Hanton (jazz numbers on the piano). 9.14: Miss Heather Kinnaird. 9.21: The Canterbury District Band (classical and popular selections). 9.41: Resume of racing results; greyhound coursing. 9.47: Mr. Douglas Graham. 9.51: Mr. Norman Wright. 9.58: Resume of following day's programme. 10: G.P.O. clock and chimes. 10.1: Dorothy Manning and Harry Graham present humour and harmony. 10.15: Dance music by Danny Hogan's Frisco Six, transmitting from the ballroom of the Bond Casino during intervals between dances. "Sun" news will be read from the studio. 11: G.P.O. clock and chimes; National Anthem.

THURSDAY, DECEMBER 8.

8 p.m.: G.P.O. clock and chimes; Broadcasters' topical chorus; an hour's programme presented by Home Recreations. Limited. 8.3: The Salomela Dance Orchestra. 8.13: Madame Goossens Viceroy (soprano), in selections from her repertoire. 8.23: The Salomela Dance Orchestra. 8.33: Mr. Robert Turner (entertainer), humorous and dramatic recitations. 8.46: Broadcasters' Viceroy, in further selections from her repertoire. 8.50: The Salomela Dance Orchestra. 9: G.P.O. clock and chimes. 9.1: Weather report and forecast, by courtesy of Mr. O. J. Mares, Government meteorologist. 9.2: From the Wemyss Street Hall, Marrickville, Salvation Army Band (bandmaster, Mr. H. E. Knight). 9.22: From the studio, Mr. Robert Turner (entertainer), humorous recitation. 9.29: Mr. Moore McMahon (violin solos). 9.36: From Wemyss Street Hall, Marrickville Salvation Army Band. 9.56: Resume of following day's programme. 9.59: Mr. Bert Gilbert (comedian) assisted by Ivy Ray, presents another adventure of Mr. Hopcroft. 10.14: Mr. Moore McMahon. 10.21: Dance music by Cyril Kaye and the Wentworth Cafe Orchestra, broadcast from the ballroom of the Wentworth, during intervals between dances news items by courtesy of the "Sun" newspapers will be read from the studio. 11: G.P.O. clock and chimes; National Anthem.

FRIDAY, DECEMBER 9.

8 p.m.: G.P.O. clock and chimes; Broadcasters' topical chorus. 8.3: From the King's Hall Hunter Street, the Cheero Girls, under the direction of Mrs. Bennett White. 9: G.P.O. clock and chimes; from the Stadium, a description by Mr. Basil Kirke of the champion boxing contest. 9.45: From the studio, weather report and forecast, by courtesy of Mr. O. J. Mares, Government meteorologist. 9.46: Broadcasters' all-sports expert will talk on "Cricket." 10: G.P.O. clock and chimes. 10.1: The sporting editor of the "Sun" will talk on the prospects of Saturday's racing. 10.22: From the ballroom of the Bond Casino, dance music by Danny Hogan's Frisco Six; during the intervals between the dances news items by courtesy of the "Sun" newspapers will be read from the studio. 11: G.P.O. clock and chimes; National Anthem.

SATURDAY, DECEMBER 10.

8 p.m.: G.P.O. clock and chimes; Broadcasters' topical chorus. 8.3: King's Mandolin Orchestra, under the direction of Mr. C. C. King. 8.10: Mr. Roger Jones

(baritone songs). 8.17: Miss Bebe Scott (soubrette and child impersonator). 8.24: Mr. Kyrie Sylvaney (dramatic artist). 8.31: Dance music by Cyril Kaye and the Wentworth Cafe Orchestra, transmitting from the ballroom of the Wentworth. 8.41: Miss Pauline Harford Foster (soprano songs). 8.49: Mr. C. O. King (mando-cello solos). 8.55: Mr. Roger Jones. 9.2: Dance music by Cyril Kaye and the Wentworth Cafe Orchestra. 9.12: King's Mandolin Orchestra. 9.19: Dance music by Cyril Kaye and the Wentworth Cafe Orchestra. 9.28: Resume of the racing events, greyhound coursing. 9.35: Mr. C. O. King (mando-cello solos). 9.40: Dance music by Cyril Kaye and the Wentworth Cafe Orchestra. 9.50: Miss Pauline Harford Foster. 9.57: Resume of following day's programme. 10: G.P.O. clock and chimes. 10.1: Miss Bebe Scott and Mr. Kyrie Sylvaney present a humorous sketch. 10.11: Another resume of the racing events, greyhound coursing. 10.15: Dance music by Cyril Kaye and the Wentworth Cafe Orchestra, transmitting from the ballroom of the Wentworth, during intervals between dances "Sun" news will be read from the studio. 11: G.P.O. clock and chimes; National Anthem.

SUNDAY, DECEMBER 11.

10.45 a.m.: Special news service. 11: Service broadcast from St. Jude's Church of England, Randwick, address by Rev. Canon C. O. C. Oake. 12.15 p.m.: Close down. 2 p.m.: G.P.O. clock and chimes. 2.1: Session for children in hospitals. 2.15: Recital by courtesy of the H.M.V. Gramophone Company. 2.45: Information service. 3: G.P.O. clock and chimes; close down. 3.30: G.P.O. clock and chimes; Bible class, conducted by Mr. W. "Cairo" Bradley. 4: From the Methodist Church, Leichhardt, a pleasant hour with the Central Methodist Mission, Leichhardt. 4.45: G.P.O. clock and chimes; close down. 5.45: G.P.O. clock and chimes. 5.46: Children's service from the studio. 7: Service broadcast from Chalmers Presbyterian Church. 8.30: From the Manresa Hall, North Sydney a band recital by the North Sydney Tramway Band (bandmaster, Mr. W. Barnes). 9.15: Weather report and forecast, by courtesy of Mr. O. J. Mares, Government meteorologist. 9.16: Broadcasters' Instrumental Trio—Dulcie Blair (violin), Bryce Carter (cello), G. Vern. Barnett (piano). 9.26: "Wind Flowers," a song cycle composed by Arthur Somervell, presented under the direction of Mr. G. Vern Barnett. Helena Stewart (soprano), Amy Ostinga (contralto), Lance Jeffrey (tenor), Peter Sutherland (bass). 9.40: Quartet, "A Crown of Windows," quartet, "High Over the Breakers," contralto solo, "The Wind Has Such a Rainy Sound," quartet, "Hope is Like a Harebell," duet, "Two Doves on the Self-Same Branches," quartet, "When Soft Voices Die," tenor solo and quartet, "When the Mounting Skylark Sings," quartet, "Going to Bed," bass solo and quartet, "Wind Night," finale, "All Around the House is the Jet Black Night." 10: G.P.O. clock and chimes. 10.5: Broadcasters' Instrumental Trio. 10.15: G.P.O. clock and chimes; National Anthem.

OTAKI COLLEGE RELAY

OUTSTANDING SUCCESS.

The relay by 2YA from the Otaki Maori College last week was brilliantly successful, and much appreciation has been expressed by listeners.

This is a typical letter:—"Just a small space if you would grant it to me about the Otaki Maori College concert relayed last week. I have heard one or two commend on the concert, and they are of the same opinion as myself. The music and Maori singing was a real treat, and we only hope the Maori College will be permitted to favour us with some more of their concerts, which would be looked forward to as a treat."

A GOOD AERIAL AND CORRECT EARTH

USEFUL ADVICE FOR BEGINNERS.

If the receiving set is to be located in a country district at a considerable distance from a local station (says the Melbourne "Listener-In") the degree of selectivity is not a paramount consideration, as interference is not to be expected, but the sensitivity of the set to signals from distant stations is a feature which probably will be greatly desired. Under these conditions an aerial 100 feet or more in length can be employed to advantage. This aerial should consist of a single wire supported at least thirty feet above the ground and located in such a position that it is not near any large objects. The lead-in may be a single wire anywhere from ten to thirty-five feet in length.

If, on the other hand, the receiver is to be installed in a city where interference may be expected from several powerful local broadcasting stations, telephone, electric light and power wires, tramways, generator plant, and one hundred and one other causes, it will usually be found necessary to employ a very short aerial. In some cases a single wire about sixty feet in length will best answer the requirements, and in extreme cases it may be found necessary to use one not more than forty feet long.

For Suburban Area.

Under average conditions in a suburban district an outside aerial consisting of a single wire approximately eighty feet in length will be found most satisfactory, and it is recommended that this size aerial be tried by all persons installing a receiver for the first time. If it is found that interference cannot be overcome by manipulating the tuning controls of the receiver, it may be necessary to reduce the length. However, it should not be shortened any more than necessary to eliminate the interference.

On the other hand, if no trouble is experienced from interference, the sensitivity of the set may be improved by adding to the length. When erecting this aerial every effort should be made to see that it does not pass near to any object which would be apt to absorb electrical energy. The lead-in wire to be used in connection with the antenna may be from 15 to 20 feet in length, thus making the over-all length of the aerial and lead-in from 95 to 100 feet.

Reliable Support.

Another point to consider is the method of support. Care should be taken to see that the wire is tightly stretched, and also that the screw eyes or other terminals are attached to a non-moving object.

With regard to insulation, it is most important that the "free" end of the aerial should be well insulated, for at this end the voltages set up in the aerial by the incoming signals are at the highest value. This does not mean, of course, that the insulation of the lead-in end of the aerial should be neglected.

The Earth Must be Good.

The earth is perhaps even more neglected than the aerial, a poor earth often being the unsuspected cause of insensitivity and unselectivity. The most usual symptoms of a poor earth, assuming all other things to be above suspicion, are poor signal strength and lack of sensitivity, together with flat tuning. A poor earth is tantamount to introducing a resistance in series with the aerial, thereby bringing about an appreciable loss of sensitivity.

Instability is also introduced for the reason that the earth terminal of the receiver is not actually at earth potential as it should be.

Types of Earth.

If from a variety of circumstances outside the control of the reader it is impossible to erect a good aerial, then the inefficiency of the latter can be offset to a large extent by the use of a good earth. The question now arises: Which of the various types of earths are the best? There are the commonly used water-pipe earth, the outside buried earth, the counterpoise earth, and others too numerous to mention. Generally speaking, the outside buried earth is better than the water-pipe earth, if the former is obtained by a short earth lead. Otherwise, the water-pipe is better, but a good joint must be made.

If the water-pipe is used, it should be made certain that the right pipe is chosen, and for this purpose the destinations of the various pipes should be traced out with the object of finding the "ascending main"—that is, the pipe connected directly to the underground main passing up to the taps and the cistern. This pipe is always filled with water, and thus makes a good conductor. The other pipes traverse long distances, and have many joints before entering the earth.

Don't Use the Gas Main.

The gas main should not be used as an earth, for apart from the danger of an explosion following a lightning discharge down the aerial, the joints of gas pipes are notoriously bad as conductors of electric currents.

Where neither an outside buried earth nor a water-pipe earth are easily obtainable, the counterpoise may be substituted. This type of earth consists of a wire or system of wires running directly underneath the aerial, and insulated from earth, being suspended by insulators at a height of three to six feet above the earth. Local interference from motor generators, etc., can be very much subdued by an "earth" of this type.

SOME NOTES ABOUT TELEPHONES

(By Waring S. Sholl, A.M.I.E.E.)

To all external appearances, the well-known headphone type of receivers are much alike. Roughly, the instruments may be divided into two types, viz., the simple diaphragm pattern, and the armature or "reed" type, in which the magnetic impulses are imparted firstly to a small, delicately pivoted armature which is linked up to the diaphragm. This form is used in the well-known "reed pattern" telephone, and is developed further in the "balanced armature" type of design employed in some makes of large loudspeakers. One great advantage of this design appears in the central pull upon the diaphragm, which avoids distortion to a considerable extent.

Resistance No Advantage.

The ordinary diaphragm type of instrument, however, works very well, and the user whose means will not allow of the purchase of the more expensive type will get every satisfaction from the less costly article. High resistance and low resistance are factors which need to be understood in the terms of electrical efficiency.

Resistance, as resistance, is a distinct disadvantage. True high resistance phones are wound with high conductivity wire of very fine gauge, about No. 47, S.W.G. copper, which enables a large number of turns to be got on the bobbins.

This produces a comparatively great effect, as a small current will have the same effect if sent round the pole-pieces a large number of times as a larger current which only traverses a few turns. Some makers have gone so far as to produce a "high-resistance" phone indeed, but wound with comparatively few turns of high-resistance wire, a thoroughly reprehensible swindle for which there is no extenuation whatever.

In choosing a set of telephones a fair test may be made of sensitivity by placing the instruments over the ears and putting one tag into the mouth. The other tag is rubbed gently upon a small file or a key which is held in the hand. A distinct rasping sound will be heard in the earpieces if the set is reasonably sensitive and in good order.

Telephones should have the leads clearly marked as to polarity, or continual use will tend to demagnetise the magnets; also the signals will not come up to full strength when the instrument is new. Far too many makers neglect this important point, and in such case the careful worker will do well to conduct the following test: Remove the ear-cap and diaphragm and place a compass near to the pole-pieces until the needle comes to rest. Arrange the phone so that its magnetic pull sets the needle at N.E.

Now place the phone leads on a battery and note if the compass needle comes over very slightly towards the telephone magnet. If so, it proves that the current is circulating the right way, and is tending to strengthen the magnet. If, on the other hand, the needle moves over towards north, it shows that the current is passing in the wrong direction, and that the magnets are being reduced in strength.

Having satisfied himself on this point, the user will do well to slip a piece of red sleeving over the positive tag, if of the pintype, or wind some red silk over the cord in the case of the spade type of terminal. After prolonged use, the ear-pieces should be wiped to avoid moisture rusting the diaphragms, and the phones hung up with the cords preferably straight. The method of packing the phones with the cords tightly twisted round the head-bands is thoroughly bad for the cords and displays a want of forethought upon the part of the makers.

Some phones are much improved by fitting thinner diaphragms, of ferrotype, in place of the heavier stallo. While this material is good in some cases, it is not always the best thing to use, although the word sounds very nice in advertisements. Buy the best phones you can afford, and then take care of them.

Statistics show that since the installation of wireless in English hospitals the average stay of patients has been reduced by a week. This should silence once and for all the critics of B.B.C. programmes.

ESPERANTO

THE LAST LESSON.

Below is the concluding lesson of the Esperanto course. It is designed to provide radio students with an opportunity to hear Esperanto in practice. Worthy of special note is the announcement (see lesson) of the instructor regarding the broadcast of an original passage for translation. Students should be on the alert to receive the broadcast passage, and it is hoped that every student who has followed the course will submit an effort to the instructor from whom translations of the two following passages, as well as of the test-piece, may be obtained. Communications should be forwarded to "The Esperanto Instructor," N.Z. Broadcasting Co., Wellington. To ensure a reply, enclose a stamped addressed envelope.

LESSON XX.

(To be broadcast from 2YA on December 15 from 7.39 to 7.54 p.m.)

The following passage and poem will be read by the instructor:—

Kiam la fama angla admiralo Hawke estis ankoraŭ knabo kaj la patro unufoje prenis lin sur ŝipon, kaj admonis la knabon bone konduki kaj aldonis, "Ĉiam mi esperas vidi vin kapitano." "Kapitano?" ekbris la knabo, "kara patro, se mi ne esperas fariĝi admiralo, mi ne konsentus esti maristo."

HO MIA KOR'.

Ho, mia kor', ne batu maltrankvile,
El mia brusto nun ne saltu for!
Ĝam teni min ne povas mi facile
Ho, mia kor'.
Ho, mia kor'! Post longa laborado
Ĉu mi ne venkos en decida hor'!
Sufice, trankvilig' de la batado,
Ho, mia kor'!

At this stage of the lesson the instructor will broadcast a short original passage in Esperanto. Students are required to write down the passage, to translate it into English, and to forward the translation, together with the name and address, to the instructor who will award prizes for the best and second best translations submitted to him. Translations must reach the instructor by the 31st. instant.

For the purpose of providing conversational Esperanto, the instructor will broadcast the following passage:—

Pardonu al mi, sinjoro, sed ĉu vi parolas Esperanton?

Mi ĝin parolas iom, sed tre malĝuste, ĉar mi ĝin lernis dum tre mal-longa tempo.

Sajnas al mi ke vi ĝin parolas tre bone.

Mi timas ke vi faras al mi komplimenton, sed mi ĝojas ke mi ĝin parolas sufiĉe bone por komprenigi. Ĉu vi bonvolos havigi al mi bileton por Aŭklando?

Kun multe da plezuro. Mi ankaŭ iras tien. Ĉu kiu klaso vi veturos? Ĉu la unua por tia longa veturo.

Mi ankaŭ, tial ni povas kunveturi.

The above passage may be translated as follows:—

Excuse me, sir, but do you speak Esperanto?

I speak it a little, but very incorrectly, because I have been learning it for a very short time.

It appears to me that you speak it very well.

I fear that you are paying me a compliment, but I am glad I speak it sufficiently well to be understood. Will you kindly procure me a ticket for Auckland?

With much pleasure. I also am going there. By what class do you travel?

By the first for such a long journey. I, too, so we can travel together.

PHOTOS BY RADIO

A facsimile system of transmission, known as photoradio, whereby a message, in the form of handwritten, type-written or printed matter, may be flashed across the ocean in its entirety, has been installed between New York and London, San Francisco and Honolulu on a regular commercial basis. Important news photographs are being flashed across the Atlantic as a matter of daily routine.

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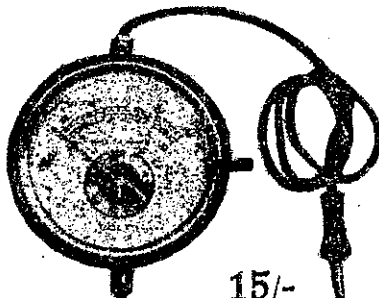
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THE PATENT TANGLE

WHAT WILL THE END BE?

POOLING SUGGESTED.

An article with a special appeal to New Zealand listeners, in view of the prospective position arising here in relation to patents, appeared in a recent issue of "Radio Retailing":—

"So far," it said, "in the neighbourhood of 5600 patents have been taken out in America on radio apparatus. Obviously so great a number of patents inescapably involves the radio industry in a maze of embarrassing entanglements. For the mass of claims overlap, conflict, and infringe each other like a heap of jack straws, until no man can see the way out, save through an interminable litigation that, if not avoided, will inflict partial paralysis upon the progress of the radio industry for years to come."

"Therefore, the subject of cross-licensing of patents is drawing steadily to the front. The Nema Radio Division is studying it. The R.M.A. has a committee at work. It is the topic of discussion everywhere. And the discussion is impelled by a gathering storm of patent litigation that is already beginning to whip the trade relations of a rapidly increasing number of radio manufacturers and jobbers and dealers into a state of pandemonium."

"Cross-licensing of patents at first thought appears a ponderous problem. As a matter of fact it is utterly simple, as witness the experience of the automotive industry, in which there is a wealth of guidance, if the radio man will but consult it. Patent litigation followed the same devastating course there, also, until the manufacturers of automobiles had wound each other up into a sweating, struggling mass bound round with the red-tape judicial decrees and inhibitions. Reason and leadership finally conquered, and these strangling patent restrictions were all thrown into a pot, free for use by anyone who joined the pool and paid the royalties to the owner of the patent that he used."

"As a result it is conceded that there are to-day probably twice as many cars at work on double the mileage of hard roads as could have been possible with everybody's patent obstructing everybody else's. And the automotive industry is ten years ahead."

"Cross-licensing is simply a business arrangement between a group of manufacturers to do away with litigation over patents, and permit its members to manufacture goods for the market, rather than try law suits against each other. It will entail a frank decision as to whether the executives of the radio industry are to devote their best hours and energies and intellects to the development and marketing of radio equipment, or to conduct the incessant offensive and defensive warfare among themselves. For in the present overburdened condition of our Courts the original trial in a patent suit is not called inside of two years, and from four to seven years of planning and prosecution elapse before the possibilities of legal action are exhausted."

"What price law suits?"

"Naturally, in the early stages of the discussion of cross-licensing in any industry, there is always an apparent split between the interests of large and small manufacturers. But experience has shown that the cost of patent sharing is less than the cost of patent litigation. And the large company that contributes a large proportion of patents is more than compensated by its larger participation in

"Make This a Radio Christmas"

Suggestion Approved by Trading Circles

"A Trader" writes:—"The radio traders of New Zealand would be sadly lacking in vision if they did not take the hint published in the last issue of 'The N.Z. Radio Record' regarding the approaching opportunity of making this a 'Radio Xmas.' For myself I thank you sincerely for your suggestion, and congratulate the Editor on his foresight in prompting the traders to take such action, as I am sure it will mean a harvest to a trade which up till this year has languished badly. In previous years it was only the relatively few with a scientific turn of mind who turned to radio as a respite at the end of their day's toil. The absence of an up-to-date and ample broadcast service in New Zealand caused many a radio trader to close down. The real public, that is to say the average man or boy, had not touched radio, and it was utterly impossible to work up public interest, let alone enthusiasm, in broadcasting to attempt to storm the people with the slogan 'Make This a Radio Xmas.' It was impracticable before the advent of the Radio Broadcasting Company of New Zealand to supply a ghost of the programmes we now enjoy, when there was no direct substantial revenue going to the existing broadcast stations. You sold a receiving set at 50 guineas to a man with the idea that he was going to obtain a service commensurate with the cost of his set and his license fee. When the novelty wore off the purchaser's interest flagged, for, owing to the difference in time, even then, between Australia and New Zealand, he could obtain only a fragment of the programmes from the Australian stations before he had to close down owing to the lateness of the hour. You know nobody who has a set with loudspeaker range would endure headphones so that the members of his family would not have their sleep disturbed. Then, also, business men cannot sit up night after night till a late hour in order that they may obtain their entertainment from Australia."

"As for the farming community late nights are anathema, for early rising is a necessity to the farmer. A word of praise, however, is due to the pioneer broadcasters of this country for their plucky endeavours against the lack of substantial financial support. The sinews of broadcasting were very attenuated, but with the meagre funds at their disposal, the pioneers achieved wonders, although, of course, the thing could not last. Traders realised they were up against it, and it was, as I have previously stated, impossible to work up public enthusiasm."

the increased progress and prosperity of the industry, and by its larger relief from the sapping burden of litigation expense."

"And so it will be in the radio industry, when the large and the small sit down together to accept joint responsibility for protecting the public against this growing artificial and uneconomic tax. For the high cost of patent suits will be super-imposed on the price of radio equipment unless something is soon done about it."

The first radio valve, which was invented in 1904 by Professor Fleming, an Englishman, possessed only a filament and a plate. This was improved upon by Dr. Lee De Forest, an American, in 1907, who added the grid to the valve. This improved valve has remained to this day in practically its original form.

"Now, all is changed. With an undeniably splendid place in the radio world. We have a liberal schedule, and it is not difficult to convince the man in the street that there is unending entertainment and interest, also instruction, to be derived from the ownership of a broadcast receiving set. The impossible, though admittedly wonderful distant-getting three-coil regenerative set, with its puzzling and elusive method of tuning has now been relegated to a place among the things that were. For this the radio trader should be truly thankful. Interminable servicing in order to train purchasers to operate the tricky three-coil set rendered radio selling an utterly losing game. A new era has opened up. The sets now available to the public possess none of the intricacies in tuning peculiar to the old three-coil outfit, and it may be truly said a little child could be taught to tune in on the present-day valve set with a few minutes' tuition."

"The news sessions, lectures, etc., of the present broadcast service are a source of tremendous interest to my many patrons scattered throughout my district, and it is my experience never to hear of one listener who has discarded his set through disappointment with what he is now getting out of it. On the contrary the general enthusiasm of the listeners with whom I come in contact has proved infectious among the uninitiated, and many a set is now being sold purely as the direct result of observing the pleasure derived by those who already own a set."

"Cordially, I thank you again for the proposal that we traders should 'Make This a Radio Xmas.' That slogan will find a conspicuous place in my windows. I shall do everything possible to prove to the public that my radio goods possess the power to bring enjoyment through the air in a way that will open up a new life of wonder, interest and entertainment. There is no reason why two-thirds of the homes in New Zealand should not have a radio set. It is going to become more indispensable than the ubiquitous piano or gramophone. The news of the world, talks of interest, an unending variety of music, recitations, are what radio offers, and therefore what other household chattel can compete with it? Pardon the length of this letter, but my enthusiasm has taken charge of my pen. At all events if the trade lacks enthusiasm how can he expect to instil it into others? The good folk in my district will have every inducement to 'Make this a Radio Xmas.'"

In testing a wet battery it is decidedly more reliable to employ a hydrometer instead of a voltmeter. A cell may show a high voltage when it is more than half discharged.

Mr. Edward F. Spanner says that mammoth airships designed for world communications, have no commercial future. In fact, the little future they have seems, at the moment, to be all in the air.

THE BUGBEAR—STATIC

VARIOUS THEORIES.

Many theories have been advanced to explain the cause of static, and it is probable that a variety of different factors contribute to this annoying interference with wireless communication. Thunderstorms undoubtedly play their part, and electrical discharges in the atmosphere are certainly one of the chief causes of the trouble in summer. An interesting suggestion which has been made to account for some of the trouble is that it is sometimes caused by meteorites entering the earth's atmosphere. Meteorites are masses of material, usually metal, of varying sizes, which wander at high speeds through space. Occasionally—that is, in proportion to the number of these bodies which are free in space—one will strike the earth's atmosphere, and the intense heat generated by the friction as it rushes through the upper layers of the atmosphere heats the outer surface of the body to white heat, causing the "shooting stars" seen in the night sky. It is estimated that tens of thousands of these visitors strike the earth's atmosphere daily, and the larger ones are believed on occasions to produce some of the static which is heard. Electrical disturbances in the sun are also said to cause trouble sometimes. Indeed, mysterious noises which wireless operators once believed to be signals from other planets were later considered to be caused by disturbances in the sun.

To Minimise Effect.

Although the interference caused by static cannot be entirely eliminated from a receiver, its effects can be considerably reduced. The fortunate possessor of a superheterodyne receiver or similar supersensitive set is in the best possible position to combat the nuisance, because he can use a loop aerial for reception. When the loop is pointed directly at the desired station it reduces interference to a minimum, because only the signals coming in one direction will affect it strongly. Next to using a directive loop for reception, the best way to reduce the nuisance caused by static is to reduce signal strength to the set. It is found that for a given intensity ratio between a signal and static the interference which the static causes is least when the set is so adjusted that signals are as weak as it is possible to make them without causing discomfort to listeners. Signals can be reduced in a variety of ways. The easiest is to use a plug and jack arrangement, by which one or two valves in the receiver can be taken out of use. If this equipment is not included in the set the filaments of the valves can be turned down until the signals begin to weaken. Another method which is often used is to employ a very small aerial for reception when static is bad. This arrangement, in addition to giving the desired general strength reduction, appears often to possess the further advantage of being less responsive to static, in proportion to the signal, than is a large aerial.

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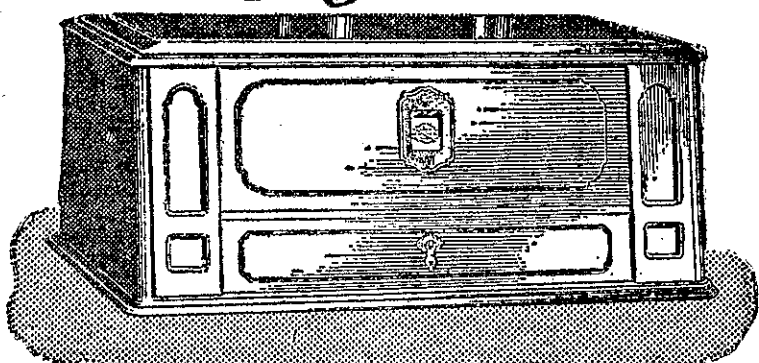
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THE NEW ZEALAND Radio Record

PUBLISHED WEEKLY.

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No responsibility is accepted for blocks, stereos, etc., remaining unclaimed after last use, beyond a period of three months.

A. J. HEIGHWAY,
Managing Editor,
"The N.Z. Radio Record."

P.O. Box 1032.
WELLINGTON.

WELLINGTON, DECEMBER 9, 1927

The outcome of the experimental broadcast to schools which has been arranged for December 13 by the Education Department will be waited with much interest. On that day between 2 and 3 p.m., several lectures will be given from the studio of 2YA and reception reported on from a large number of country schools throughout the country. The use of wireless in schools is no new thing. In both Britain and America it is in use and also in a number of Continental countries. The purposes for which it is used there may be slightly different from those aimed at here, and it remains to be seen how our averagely greater distances between station and school affect the position. Obviously, wireless presents an extraordinary facility for reaching simultaneously large numbers of children on special occasions or with special lessons which will aid the individual teacher in his personal contact. Whether directly educational or not in its intent, it is impossible for any broadcast session not to leave some trace upon the life of the community. Subtly, but definitely, every spoken word entering every home is leaving its impress on the diction, thought or feeling of the listeners and experienced observers predict, through broadcasting, a steady breaking down of dialects and the creation of common purity in language. Similarly, through music there will be wrought a development of taste which will be far reaching. Just how far broadcast tuition can be adapted to New Zealand's conditions and circumstances remains to be seen, but it is encouraging that the Education Department is arranging this test as a preliminary to determining its acceptance or otherwise of the offer of the Broadcasting Company to give a regular session daily for school work.

LICENSED LISTENERS

TOTAL OF 37,918.

The secretary of the Post Office, Mr. G. McNamara, advises that the number of wireless receiving licenses actually received to December 2 is as follows:—

Receiving station licenses.	Total
Auckland district	13,011
Canterbury district	7563
Otago district	2063
Wellington district	13,447
Total	36,084

Transmitting licenses.	Total
Auckland district	40
Canterbury district	26
Otago district	17
Wellington district	50
Total	133

Radio dealers' licenses.	Total
Auckland district	493
Canterbury district	290
Otago district	175
Wellington district	742
Total	1700

Experimental licenses.	Total
Auckland district	1
Total	3
Grand total	37,918

3YA'S SCOTTISH CONCERT

Station 3YA made a night of it on the evening of St. Andrew's Day. A Scottish concert followed the broadcast of Mr. Amery's speech. Not very many items had been given before the telephone began to ring with messages of appreciation, and at least one listener in requested that, although the programme was starting late, "please do not curtail it." There were many requests for encores, one coming from as far away as Milton. It was, of course, impossible to accede to these requests. In some cases the singers did not have the music or words of the song asked for, and in any case the programme was concluded only just in time for members of the staff to catch the last cars to the suburbs.

Some of us in this world resemble pins. Although our faculties are pointed one way we are headed another.

One only has to consider one's bachelor friends to realise the truth contained in the old saying: "Tis better to have loved and lost."

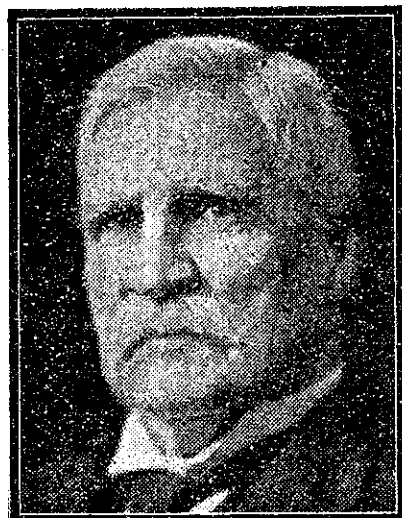
BRITAIN AND AMERICA

SIR FREDERICK CHAPMAN TO SPEAK.

Of widespread interest—indeed of deep international importance—is the subject chosen by Sir Frederick Chapman for the lecture he has consented to broadcast from 2YA on Monday evening, December 12—"America and Britain: A Policy of Common Aims."

Sir Frederick Revans Chapman is a son of Mr. Justice H. S. Chapman, and one of the most distinguished Judges that have honoured the Bench of the Dominion. He was born at Karori in March, 1849, and has thus been associated with the Dominion throughout the major period of its development. After a distinguished legal career, in which he was prominent in a number of important trials, he was raised in 1903 to the Supreme Court Bench. For the first 3½ years he was President of the Court of Arbitration. This occupied nearly all his time, to the exclusion of ordinary Supreme Court business, but he regularly sat in the Court of Appeal. For 17 years Sir Frederick tried many important civil and criminal cases throughout the Dominion, amongst the most outstanding of these being the trial of the prophet Rua, which lasted 47 days, probably the longest period for a criminal trial in Australia and New Zealand.

In 1921 Sir Frederick retired at the age limit, but was immediately appointed Compiler of Statutes under a new law creating that office. In October of the same year he was asked to resume his seat on the Supreme Court Bench with a temporary commission, which was running on four successive occasions, making a period of 20 years' service as a Judge. He finally retired in 1924, giving up at the same time his position as chairman of the War Pensions Appeal Board, which he had held for some months. He was knighted in 1923.



—S. P. Andrew, photo.

SIR FREDERICK CHAPMAN.

Sir Frederick has always been a wide and deep reader and student of domestic and international politics, and is exceptionally well qualified to present in an interesting form a summary of the aims of Britain and America in the subject of which he has chosen to speak.

MR. L. C. M. S. AMERY.

Mr. L. C. M. S. Amery, Secretary of State for the Dominions, will give an address of a quarter hour's duration at 2YA on Thursday, December 15, commencing at 7.30 p.m. Station 3YA will rebroadcast the speech.

WIRELESS IN SCHOOLS

INTERESTING AND IMPORTANT EXPERIMENT FROM 2YA.

On Tuesday, December 13, between 2 p.m. and 3 p.m., the Department of Education will conduct an important experiment test—a test of the reception at a large number of State schools, from Auckland to Invercargill, of instructional lectures broadcast from 2YA by officers of the Department. As announced last week, the tentative programme arranged for this interesting test will include items by a children's choir, short talks by the Director of Education (Mr. T. B. Strong) and Mr. Longworth; a literature lesson by Mr. Bird; and an instructional talk on melody-forming by Mr. Douglas Tayler, using piano or violin, or an interpretation of the gramophone record.

The Director of Education has conveyed to the Radio Broadcasting Company the thanks of the Department for having so readily agreed to broadcast this test educational programme for schools, in which, doubtless, keen interest will be manifested throughout the Dominion.

A most interesting programme is being presented by the Philharmonic Quartet on Sunday, December 18. The quartet numbers include "First Nowell," "Annie Laurie," "O Happy Eyes," and "Hail, Heavenly Song," of Wagner's "Lucia," "Ave Maria" will be sung by Mrs. Ellison Porter, while Miss Madge Freeman will present "Still as the Night." Together they will sing that delightful duet, "Calm, Silent Night." Mr. W. W. Marshall is singing "A Song of the Morn," "A Little Coon's Prayer," and "Gloriana" will be sung by Edwin Duncan in his inimitable manner. He, with Mr. Marshall, will sing the duet "Watchman! What of the Night?"

ANNIVERSARY DAY

CANTERBURY CELEBRATIONS.

For Anniversary Day in Canterbury, marking the foundation of the Province on the arrival of the first four ships, a special programme has been arranged for 3YA on Friday, December 16.

During the evening one of those who arrived then will broadcast some of his reminiscences of a long life—Mr. A. Dudley Dobson, now aged 86.

Mr. Dobson was born in London in



—Photo, Chilton.

MR. A. D. DOBSON.

1841. He arrived in Lyttelton in the barque Cressy on December 27, 1850. This was the last of the first four ships to arrive. These ships, which brought the Canterbury Pilgrims to New Zealand, were the Sir George Seymour, Charlotte, Jane, Randolph, and Cressy. Mr. Dobson was educated at Christ's College, was articled as a pupil to his father, Edward Dobson, M.N.C.E., and on completion of his term, was engaged under the Provincial Government in engineering and exploration survey work. On March 12, 1864, he discovered the Pass known as Arthur's, which the Government named after him.

Mr. Dobson will unquestionably have much of interest to tell listeners about the early days.

The items to be given by Mr. Alex. Johnson, elocutionist, will be appropriate to Anniversary Day, namely, "Pioneers," and "The Night Watch on the Charlotte Jane, 1858."

Selections from the "Bohemian Girl" sung by Misses Hamerton and Renaud and Messrs. Williams and Sumner. These selections will comprise solos as well as concerted items. They are all old and well-known melodies.

Bright and popular items will be contributed by Miss Elaine Moody's Hawaiian party and by Mr. C. O'Connor, whose comic songs are always most acceptable.

RADIO FOR TRAINS

USEFUL POSSIBILITIES

AMERICAN PROPOSALS.

Admiral Bullard, chairman of the Radio Commission, told the telegraph and telephone section of the American Railway Association recently that the use of radio in operating trains was a "perfectly feasible proposition and should be developed." He declared the desirability of control and communication between moving trains and different parts of the same train, as between the locomotive and the caboose (car for the use of the crew of a goods train) was highly desirable.

"Twelve years ago," said Admiral Bullard, "I was approached by one of the big Western railroads and asked to develop a scheme by which they could develop radio for controlling their trains. They had the idea of controlling their dispatching and communication between their long freight trains by means of radio."

Saved Much Expense.

"I gave a report at that time that it was an impractical proposition and recommended strongly against it. Eighteen months later a gentleman representing that organisation told me that my recommendations had saved them thousands of dollars. Now, however, the proposition is feasible."

"You must remember, however, that every time one of these little waves goes out it fills up and clutters the air. If we had all the railroads operating what we call mobile stations the whole atmosphere would be jammed."

CATHEDRAL SERVICES

TO BE BROADCAST BY 3YA

On Sunday evening, December 18, the evening service in the Church of England Cathedral, Christchurch, will be broadcast by 3YA. The Bishop of Christchurch, Dr. Campbell West-Watson, will be the preacher, and Dr. J. C. Bradshaw (Mus. Doc.) will preside at the organ. A twenty minutes organ recital will be given by Dr. Bradshaw after the service.

CHRISTMAS NIGHT.

On Sunday, December 25, Christmas Day, the Cathedral evening service will be again broadcast. It will be a full choral service, with anthem, and Christmas carols at the conclusion. On this occasion the preacher will be the Very Rev. Awdry Julius, Dean of Christchurch.

CATHEDRAL MALE QUARTET

Mr. W. Lowry is one of the lay clerks in the Anglican Cathedral. He possesses what is unique in men, a fine alto voice.

Mr. J. Hinton is another member of the Cathedral Choir. His tenor voice has won for him gold medals at competitions.

Mr. Harry Gill is a lay clerk in the Cathedral, and is leading tenor soloist.

Mr. A. Woodward (bass), another lay clerk in the Cathedral, is a particularly promising singer.



MR. WILLIAM LOWRY.

Mr. William Lowry, whose training as a male alto of St. Paul's Cathedral, London, enabled him to accept posts at St. Martin's, Ludgate, and St. Clement Danes, and later to tour with the Westminster Glee singers throughout the Dominion, Australia, Malay States, India, etc. He is a member of the Cathedral Male Quartet.

CRICKETER AT THE "MIKE."

One of the advance fixtures at 3YA is a talk by Mr. W. E. Merritt, of the New Zealand cricket team, which toured Britain. His lecture is fixed for December 22.

full of these wave-lengths, and it would be an extremely difficult proposition for the Radio Commission to keep them all separated. So I would give a word of warning that possibly you might use some other means."

Experiments Suggested.

Admiral Bullard stated that sixteen railroads had for their own use 153,964 miles of telegraph wire. Similarly, these railroads use over 395,000 miles of telephone wire.

While cautioning his hearers that the use of wireless for communicating between the locomotive and caboose of a train would require a different wave-length for every railroad, Admiral Bullard said he would like to see experiments carried out along that line, with all the railroads co-operating.

A loose contact of partly worn-out E batteries frequently creates disturbances that sound exactly like static. Test batteries for the proper voltage, and make a careful search for the bad contact.

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NEW QUARTETS

ARRANGED FOR 3YA

DISTINGUISHED NEW SINGERS
FOR RADIO.

Commencing with next week, there comes into force at 3YA the new system of programme making and organisation which was first introduced at 2YA. Next week there will appear sixteen artists who have been engaged to sing regularly at 3YA. These artists have been organised into quartets, each of which has its forte in a definite type of entertainment.

Following on a well-thought-out plan these quartets have a certain night devoted to each, and the particular types of entertainment on each night at 3YA are intended to dovetail in with the programmes at the other stations in such a way that no two stations will be broadcasting the same type of programme on the same night. In this way the owner of a valve set who desires an entertainment of only one type will be able to secure what he wants nearly every night of the week from one or other of the New Zealand stations. It will be remembered that this was one of the aspects of a proposal outlined by the general manager some time ago when discussing the difficult problem of attempting to broadcast programmes which will please everyone.

The crystal set user, like the valve set user, will know that a certain class of entertainment, and that his favourite singers, if he favours any more than others, are broadcasting on a particular night of the week. He will know, too, that these singers will be able to submit a great variety of entertainment while still keeping true to type. The artists who have been engaged and who will form the backbone of the programmes—though not the whole programme, for other artists will assist—are very versatile and will submit diversified programmes at each appearance.

The new quartets, to make their first bow next week, will include some new artists to radio, a fact which testifies to two things, namely, that the stated intention of the general manager of the Broadcasting Company to secure the best talent available, is being carried out, and that the high and rightful place of radio in the musical world is being rapidly recognised.

PERSONNEL OF ONE QUARTET.

Before coming to New Zealand, Mrs. Claris Shaw was a well-known contralto singer in the English Midlands. She took part in competitions in Christchurch in 1913, and was very successful. The musical judge at the competitions gave her very high praise. In one instance the judge said her singing was of "extraordinarily high merit. Her style was easy, and her articulation concise." Mrs. Shaw has been well known from her connection with the Christchurch Operatic Society as musical director for its concert party during the past winter season.

Miss Mildred Russell, L.A.B., L.T.C.L., who will be associated with her brother, Mrs. Shaw, and Mr. Richards in the quartet, brings to radio a splendidly trained voice, which broadcasts well. She was a pupil of Madame Josephine Otlee, A.R.A.M., and studied music under Mr. W. J. Bellingham, F.S.M., and at Canterbury College. She has been a soloist with the Christchurch musical and other societies, and is, and has been for a number of years, a leading soloist of Holy Trinity Choir, Avonside. Miss Russell teaches singing at her own home in Avonside.

Mr. Gregory Russell is one of the most popular singers on the 3YA roll of artists. He is possessed of a very fine resonant tenor voice, and is always listened to with great pleasure by hosts of listeners-in. Mr. Russell, who trained with Madame Josephine Otlee, A.R.A.M., is a member of the Christchurch Savage Club's committee, and has sung at innumerable concerts and functions in and around Christchurch. Mr. Russell has for many years been a prominent soloist of Holy Trinity Choir, Avonside.

Mr. W. J. Richards has frequently been heard at 3YA. He is a fine bass singer and a winner at competitions. He sings for the Christchurch Male Voice Choir.

A New and Brilliant Quartet for 3YA

Lovers of opera will be delighted to learn that a quartet of exceptional talent in the persons of Madame Gower-Burns, Miss Jessie King, Mr. Harold Prescott, and Mr. Bernard Rennell, is specialising in opera from 3YA, and will be coming to the microphone shortly.

Described by several world-famous artists from overseas as the "Melba of New Zealand," Madame Gower-Burns occupies a unique and unchallenged position in the musical life of Christchurch, not only because of her wonderful vocal gift, but also because of the great extent to which she has devoted it to the advantage of the city. She has been unstinting in her efforts in any good cause. In return, Christchurch has honoured Madame Gower-Burns with all the means in its power. She has not been altogether like the proverbial prophet who is honoured save in his own country. She has sung by command before and been congratulated by Royalty—the King and Queen, the Prince of Wales, and the Duke of York. She is the only lady soloist to have sung in Christchurch Cathedral Choir. She was honoured by the Roman Catholic Church when she was asked to sing at the opening of the new Cathedral, a most important occasion. When the war broke out Madame was the first person in Christchurch to organise a patriotic concert, and was the first, and for several years the only, lady soloist at Anzac Day memorial services. Madame Gower-Burns also had the distinction of being the first in Christchurch to produce the song cycles, "Persian Garden," "The Daisy Chain," and "Flora's Holiday."

Madame Gower-Burns's voice was really trained for opera, and had she devoted her life to that branch of art in the capitals of Europe instead of settling in New Zealand, she would have been world famous. Her training was in Italy. She lived for many years

there as a child, and acquired the accent perfectly. She studied for five years in Milan under a great operatic singer, and in England and New Zealand she studied oratorio under the best masters.

The quartet with which Madame Gower-Burns will be associated, and which will bear her name, will specialise in opera. Everyone who tunes in to 3YA on Thursday, December 15, will listen to a delightful entertainment. The next appearance of the quartet will be just before Christmas, when it is intended that the programme should be in keeping with the occasion.

Miss Jessie King, contralto, who holds the diploma of Associate of the Conservatorium of Music, Melbourne, has had the greater part of her musical training at that institution, covering a period of several years of close study of all the necessary departments of vocal equipment, including languages. Miss King studied with Miss Mary Campbell, to whom Dame Nellie Melba has referred as "one of my lieutenants," and to whom, in the forward of her recently-published work, "The Melba Method," she expresses her indebtedness for her share in compiling the book. Miss King herself has had the distinct advantage of having attended the Melba classes at the Conservatorium, and of having had personal instruction from the great diva. In this connection she was privileged to appear in scenes from opera, with Dame Melba as the principal figure. For some time before coming to New Zealand Miss King was an associate teacher on the staff of the Conservatorium in East

Melbourne, and has valuable credentials from the director of the Conservatorium, Mr. Fritz Hart, F.R.C.M.

Of Dominion-wide reputation, Mr. Harold Prescott, the well-known bel canto tenor, comes of a very old-established musical family of Manchester, England. Mr. Prescott has sung with a number of famous artists, and when Fraser Gange and Amy Evans were in New Zealand, in 1920, they spoke in the highest terms of his interpretative powers and his artistic and conscientious rendering of classical music. A few of Mr. Prescott's recent engagements include "Lucia de Lammermoor," "Carmen," "Faust," "Hiawatha," "Cavalleria Rusticana," "Judas Maccabaeus," "The Creation," "Elijah," "The Messiah," "Olivet to Calvary," Elgar's "King Olat," and "Caractacus," "The Rose Maiden," and "Merrie England," for which Mr. Prescott has been tenor soloist no less than eight times.

Another fine singer who has not been parsimonious in his efforts for charity and to the public generally is Mr. Bernard Rennell, a member of the Madame Burns Operatic Quartet.

Mr. Rennell, who is a pupil of Mr. Roland Foster, of the Conservatorium of Music, Sydney, performed with success in Sydney, and played the part of the Host in "May Queen" (opera) at the Conservatorium Hall. In Christchurch he has taken an active part in musical circles, principally with the Amateur Operatic Society and "Charities, Unlimited." During the visit of the Duke of York Mr. Rennell sang before him at a cabaret given by the Hon. Mr. Tahu Rhodes.



A Distinguished new Quartet for 3YA. From left: Mr. Bernard Rennell (baritone), Madame Gower-Burns (soprano, leader), and Miss Jessie King (contralto). —Sarony, photo.



—Steffano Webb, photo.

SPORTING

TROTTING NEXT WEEK

Thursday, December 15.—New Brighton Trots. 3YA.
Saturday, December 17.—New Brighton Trots. 3YA.

AUDIO HOWLING

In a cascade, three stage amplifier, using transformers as a means of coupling between the valves, trouble is often experienced due to howling between stages, although each stage may work satisfactorily by itself. In some cases if the connections to the primaries of each transformer are reversed, the howling will cease. Transformers should be placed as far as possible from one another, and care should be taken that their cores are always placed at right angles to one another, as, should they be close and in parallel, the fields of each would interact, thus causing distortion, howling, and bad amplification. It is advisable to earth the casing of each shielded low frequency transformer.

RECEPTION SPOILERS

HOME ELECTRIC DEVICES.

There are many devices in the average home that may ruin the reception of the finest set on the market. A vacuum cleaner, an electric refrigeration plant, or any other general utility device within the house may not only ruin the reception in the home where they are being used, but they may disturb the reception in the entire neighbourhood. The interference may be louder at some house in the next block than it is at the place where the interference is being propagated.

The making and breaking of a circuit in a motor, or moving parts in other devices cause small sparks which generate radio waves. This spark trans-

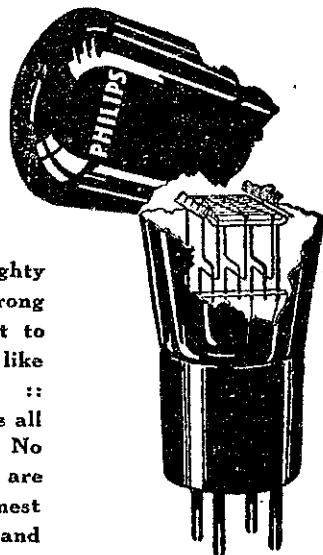
mission, which has no definite wavelength, will use distant wiring as a form of antenna, and is very hard to tune out of any set.

Several manufacturers have put out appliances to eliminate the disturbance, or interference.

The real solution, however, is to correct the trouble at its source. This may be done by using high voltage condensers, shunted across the line and grounded at their midpoint.

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From the Woman's Point of View.

By VERITY.

OUR TROPICAL CLIMATE

It rained and rained, and rained and rained—
The average was well maintained,
And when our lawns were simply bogs,
It started raining cats and dogs!

After the drought of half an hour,
There came a most refreshing shower,
And then, most curious thing of all,
A gentle rain began to fall.

Next day was pretty fairly dry,
Save for a deluge from the sky,
That wetted people to the skin,
But after that the rain set in.

Folks wondered what they next would
get,
They got, in fact, a lot of wet.
But soon we'll see a change again,
For we shall have a drop of rain.
—A Dunedin Sufferer.

The Right Hon. L. S. Amery and Mrs. Amery are the guests in Dunedin of Sir James and Lady Allen, who saw much of their distinguished visitors during Sir James Allen's tenure as High Commissioner for New Zealand.

They Say:

That all women and most men are delighted with the selection of Mr. J. F. Platts-Mills as one of the two Rhodes Scholars; his mother, Dr. Platts-Mills, being an untiring and devoted social worker, her charming voice, fluent phraseology, and unselfish effort being at all times available to help along the woman's cause.

Mr. and Mrs. Stanley Smith, well known through the Dominion, particularly in the newspaper world, are arriving by the "Makura," after an extensive tour in England and abroad, and purposes going on at once to their home in Dunedin.

Colour in the Kitchen.

The kitchen is a corner into which the home decorator can introduce colour at a very modest outlay. A few yards of gaily checked towelling for runner towels in place of the usual drab patterns; checked gingham to match for curtains, table runners, pot holders with bound or embroidered borders make the most enviable of kitchen ensembles.

Christmas Gifts.

Among Christmas gifts from America that are different, smart little quilted taffeta pillows are finding great popularity. The fascination of them lies in the work itself, and the satisfaction the giver feels in bestowing them upon her friends. Pale colours, such as delicate green or lemon, are favourites, and the quilting is stitched in all kinds of designs, both intricate and simple.

A gift that is sure to please is a new bridge table cover for smart bridge parties. Made of felt or heavy linen with little snappy pet dogs appliqued in each corner caught in the act of balancing a heart or a diamond, a club or a spade, on the tip of his impertinent nose. Such a cover bears the unmistakable hall-mark of up-to-dateness; and with its vivid binding and corner ties is bound to lend new vigour to the spirit of the game.

For the Out-door Man.

Hand knitted golf stockings to match his cardigan make a definite appeal to the golfer. His women-folk like them, too, because they are easier to mend and last three times as long as the ordinary kind. In the case of shrinkage, the discomfort of a too short toe can be easily overcome by undoing the toe stitches and knitting a little extra length. His favourite colour introduced into the patterned top give the right touch of smartness, and the comfort ensured through right fitting gives added pleasure to sport.

An Interesting Art.

The large number of tints and shades of hosiery worn to-day has made hosiery dyeing a complicated, but interesting, art. Colour has become one of the best salesmen. Hence constant endeavour is to furnish the latest and most fashionable colours; these, applied with a beautiful soft finish, complete the stocking into which have been put pure silk and the best skilled workmanship. Let it be borne in mind that stockings are completely made before the dyeing is done (that is, the yarns are not dyed before the knitting, except for some fancy styles). Fancy effects on men's hosiery are now an important part of hosiery dyeing. Considerable study and research are necessary to select a pleasing and harmonious multi-colour effect. In compounding the various shades, about one hundred and forty carefully selected pure dye-stuffs and chemicals are used. These have been picked by rigid tests from among the hundreds of dye-stuffs available to-day. —Mrs. W. Thomas, 2YA.

The Letters of Annabel Lee

My Dear Elisabeth,—

The Christmas month seems to have come in even more hastily than usual, and the shops are filled to overflowing with seductive gewgaws that ravish the hearts of old and young. Particularly am I impressed, now that hordes of them throng the streets, the girls slim and colourful, the boys in white flannels, with the beauty and strength of young New Zealand. And intelligent withal. While wandering across hill and dale in search of a flat—which sounds so like a human entity, doesn't it?—Nona and I lost our bearings several times amid the twists and turns of sequestered spots, where we were tracking down the ideal "two rooms and kitchenette" like a pair of sleuth hounds. And those who restored us to the right track, answered our enquiries briefly and to the point, without a trace of the puzzled distrust apt to appear in the face of the grown-up suddenly accosted, were boys of twelve or so. Full of go and ginger, entirely devoid of curiosity (or was this just natural good manners?), with nice freckled faces and carrotty locks, they almost literally helped us over the stile. Nona's shallow purse and fastidious taste are hard to reconcile, and she is still homeless. In one strange place of doomful aspect, a "foreign body" eyed us distrustfully. "I want no young gals here, with their swearing and their cocktails!" he announced truculently, as he wrathfully eyed the petite and slender figure that deludes so many into classing Nona as one of the Very Young. After a chat, however, in which there was an opportunity to grasp the really remarkable astuteness of the fairy he had condemned, his opinion changed. "Not so young as you look. You ain't no chicken, I can see that!" he stated, with conviction, as we departed, leaving his flat on his hands. Quite a lot of desirable nests there are, with views, fascinating modern stoves, penny-in-the-slot caliphons, and musical instruments tabooed, all very desirable to the lover of peace and the soft ways of life; but invariably going, going, or already gone to some nabob. Alas, when the perfect home, the perfect partner, is at last discovered, he, she, or it is so frequently just out of reach.

Which reminds me of that play by Somerset Maugham, in which he elaborates the theory that when the darling of our eyes, the desire of our heart, is at the long last within our reach, we don't want it any more. Wherein I don't agree with him; that is to say, if we knew what we wanted, which few women do.

Talking of youth, how diverting, to be sure, is that modern young man, Mr. Beverley Nicholls, clever compiler of "Crazy Pavements," who is so ingeniously interested in his own ego, writing his autobiography at the early age of twenty-five. A year or so later, he now gives a smiling world the explanation of Why He Remains a Bachelor, tactfully telling that it is because of the essentially transitory nature of human emotions, forbidding him to tie himself irrevocably to Only One; and further mentioning that, being eminently adapted to paddling his own canoe in luxurious loneliness, he will not trust himself to that sex which he shrewdly suspects are hopelessly bad housekeepers. Well, well!

From Dunedin comes a tale of rain and rain and rain, drenching, hopeless, unabated, reducing the gayest hearts to pessimism, and entirely ruining that great occasion, the People's Day at the Show. One regrets this the more, as the Southern City is so ready in response to any and every good cause, be it civic, social, or philanthropic. Perhaps more particularly does it rise to anything connected with arts, the recent reception to Joseph Hislop being a particularly successful function; for is he not one of the elect, a great artist, an Edinburgh man, no less, and One of Us! The clannish Scot asks no more of the chosen, and on this occasion gave a right royal party in the Somerset Hall, the decorative scheme carried out in tall glimmering poppies and purple patches of beautiful blooms. Many interesting and notable people turned up to honour this musician of charm and achievement. Mrs. Hudson was a vivacious and delightful hostess, and Mrs. Wilkie, so long a notable figure in the world of music, was greeted gladly by many old friends, also receiving, as always, the affectionate homage of the younger generation, many of whom she has trained in the pleasant path of music and art generally.

Susan Ertz has put plenty of "punch" into her latest book, "Now East, Now West," a sparkling presentment of a pair of married Americans who go forth to England in a snobbish quest of social splashing on the part of the wife, and of the people that ambitious young woman met there and the giddy pinnacles she climbed. A brilliant portrayal of a not uncommon type that thoroughly believes in its own attractions and readily credits mere man, when he flatters and philanders, with the desire to do and dare all, and throw his bonnet over the windmill, if need be, for her sweet sake. Her fascinating Englishman was not in the least desirous of anything of the sort, and Althea had a rude awakening, going thankfully back to her nice, stodgy, American husband, who meantime had been effectively consoled by an extremely clever and companionable lady of fifty summers, to whom Mrs. Ertz gives pride of place in her gallery of attractive women; so it would seem as though the pendulum veers from the young, lovely and sophisticated to the middle-aged and still more sophisticated.

Thoroughly exhausted with house-hunting, we turned into a tea-room in Manners Street, where we were deafened with jazz, and then went forth and bought some attractive trifles in the way of mats and things for the dressing-table, fashioned of golden lace adorned with tiny flowerets ravishing enough to have come from the garden of Titania. Hats are good this season: with scanty trimming, and of supple and pliable straws. One of the cloche variety, with a yellow rose and a brown one, at a perilous angle, would make a lovely setting for the eyes of youth and its complexion; while the tawny-yellow chapeaux, that are so modish, when worn by the flaxen nymphs, who abound, will certainly persuade gentlemen to prefer blondes. The artificial flowers are beautiful enough to have come from Mars, where 'tis said the flowers of happiness grow; and somehow remind me of a poem I liked in my romantic youth:—

A lilybud, a pink, a rose,
I'll give to you;
But you must bring me oceans more,
Be true, be true!
Your
ANNABEL LEE.

THE DIFFERENCE

Some sad scribblers will echo the following groan from a contemporary:—
*A fellow may write with the best of intent,
And may put his whole heart in his rhyme,
But to pen a love lyric and have what you meant
Printed wrong, is disastrous at times.
A plague on the man who did set up my lay
On the DIMPLES of Annabel Lee;
Plague take the proof-reader, the feather-brained Jay,
Who can't tell a "D" from a "P."
Though I've written Annabel note after note,
She's never at home when I call,
She surely must know it was DIMPLES I wrote.
I never wrote PIMPLES at all.*

Feminine Ferocity.

A feminine speed fiend was driving a racing sports model on a country road, accompanied by her unsporting and somewhat timid fiancé. The latter was cowering in abject terror as the telegraph poles flew by until they resembled a tooth comb. A village approached, and the fair one yelled through the roar of her engine, "That's a pretty village—wasn't it?"

Umbrellas.

We hear dismal stories all around us of slumps in this trade and that, but surely umbrella makers have been making hay while the sun forgot to shine! And yet there was a time (almost impossible to imagine) when such things as umbrellas were unknown to Western civilisation. The first time an umbrella was used in England was in 1750. Mr. John Hanway, a great traveller, brought it from China, and there was tremendous excitement when he was seen walking the streets of London holding it over his head to keep the rain off. The umbrella has altered very little in shape since 1750, but a German once tried to improve it by making little glass windows in the folds, so that one could keep it well down over the head and at the same time keep an eye upon the on-coming traffic. This umbrella was not popular and did not stay, the average Britisher preferred blindly to forge his way ahead.

Reasonable!

There was once a colonel of a certain cavalry regiment who was a martinet in all except his own habits. On one occasion the regiment was about to start on a long march, and orders were issued that baggage should be reduced to a minimum. A lieutenant of the squadron had just received from his father a small box of books, and asked the colonel if he might take it along. "Certainly not, sir," roared the chief. "I'm very sorry, colonel," answered the lieutenant, "it will be very dull out there without any reading. My father sent me a case of whisky, but of course I couldn't take that?" "Not take it?" again roared the colonel. "Certainly you can. Anything in reason."

An Opportunist.

A man went into a jeweller's shop one day. "I wish you would fix this watch for me," he said, "something's the matter with it." The jeweller examined it carefully. "I don't see anything wrong with it," he said. "Well," said the man, "it's lost a minute in the last three months." "That's nothing to worry about," answered the jeweller with a smile. "Aren't some of the works broke, or some of the jewels lost or something?" asked the other. The jeweller looked at it again. "No," he said, "everything is O.K." Still the man didn't seem satisfied. "Well," he said, "I've suspected lately that the case is plate. What do you say?" "Solid gold," replied the jeweller. "None better," "Well, I'm glad to hear you say that," said the man cheerfully; "then perhaps you wouldn't mind letting me have fifty on it."

Christmas Cake.

Take 1lb. butter, beat to a cream with 1lb. brown sugar, add half a teaspoonful almond essence, six drops of vanilla, and six drops of lemon essence. Add eight eggs, one by one, beating in one spoonful of flour after each egg. Sift in 1½lb. of flour, then add 4lb. of mixed fruit, carefully cleaned and dried. This includes lemon and cherry peel, sultanas, and currants, and lastly, half a teaspoonful of brandy or whisky. Put the mixture into a tin lined with several thicknesses of paper, when the oven temperature reaches 400 degrees put it in; turn the element to medium for about one hour, then to low for another two hours; then right off, and leave the cake in for at least a couple of hours after this. If an old scone tray or sponge tin is turned upside down on the shelf directly below the cake it will keep it quite moist at the bottom.—Mrs. Sinclair, 2YA.

Latest statistics show that married women live longer than their single sisters. Mr. Henpeck, who draws our attention to the fact, adds that on occasion statistics can be very cruel.

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Some Features of Next Week's Programmes

DIARY DATES FROM 1YA

Mr. Frank Sutherland, whose splendid bass-baritone voice is always such a pleasure to listen to at 1YA, will be heard again on Tuesday, when he will be one of the artists contributing to an excellent concert. Another will be Mr. Stan. Pritchard, who is always such a popular singer at 1YA. Miss Gladys Evans, who will make her first appearance before the microphone at 1YA on Tuesday, is credited with possessing a fine contralto voice.

Mr. Russell-Wood, a well-known elocutionist on the Auckland concert platform, will make his bow to radioland at 1YA on Tuesday in a humorous sketch entitled "The Film Scenario." He will also give a recital, "Benny's Sermon." Mr. Russell-Wood will be assisted by Misses Erid Hosking and Edna Smeaton.

Mrs. Cyril Towsey, Auckland's popular mezzo-contralto singer, will be heard at 1YA on Tuesday. Her items will include "The Sands of Dee" and "Matinata."

The well-known Auckland tenor Mr. George Barnes will be singing two songs from "Rigoletto" and "The Gondoliers" on Tuesday.

Two accomplished instrumentalists, Mr. Hal McLennan (flautist) and Mr. Alfred Gracie (violinist), will be playing at 1YA on Tuesday.

On Wednesday evening at 7.15 there will be a short talk on "Concrete and Its Uses." This lecture should

A feature on Thursday evening's programme will be a number of Dickens character sketches, performed by Mr. Thomas Harris. His excerpts will include a delineation of Scrooge from "A Christmas Carol," Major Bagstock from "Domby and Son," and Uriah Heep from "David Copperfield."

The programme for Friday will consist of vocal and instrumental items performed entirely by the blind members of the Institute for the Blind. The programme will include part-songs by the school choir, piano solos and duets, recitations, clarinet and brass quartets, items by the Institute Band, and organ solos by the Rev. E. Chittie, M.A. During the evening a brief explanation of the institute's work will be given by the director, Mr. Cynthia Mackenzie. Mr. Clifford Bell will also continue his entertaining talks on great authors.

The municipal organ recital in the Town Hall will be relayed by 1YA on Saturday evening. Mr. Maughan Barnett will be at the keys. The recital will be followed by a relay of dance music from the Dixieland Cabaret, where the orchestra is under the conductorship of Mr. Clyde Howley.

The church service for Sunday evening will be broadcast from St. Mary's Cathedral, the Rev. Canon P. James being the preacher, and Mr. E. Randall the organist. This will be followed by a relay of the Municipal Band concert from the Auckland Town Hall, the bandmaster being Mr. Christopher Smith.



MR. HARTLEY WARBURTON.

A very popular baritone at 1YA. He sings frequently at the studio, and is a soloist at Municipal Band concerts. He will be next heard from on Thursday evening. —Stevens, photo.

On this occasion the "Melodie Four" will be heard in four quartets, ranging from soft lullabies to broad humour. "Stars of the Summer Night" is a melodious four-part arrangement calling for much expression and delicate treatment. In this number the quartet at times breathes its notes in a blend of exquisite pianissimo, which is the hall-mark of perfect quartet singing. The "Moon Man," while in lighter vein, has a lilting waltz refrain as its principal theme, while humour is provided in "They Kissed" and "Peter, the Cat."

On Friday evening, December 16, the William Renshaw quartet will open their programme with the familiar old English folk song, "Early One Morning."

A feature of the evening's vocal music will be three songs composed by Mr. Herbert Oliver. These are to be sung by Mr. Renshaw, who studied under Mr. Oliver for some years before coming to New Zealand. Mr. Oliver's opera, "The Bells of Vauxhall," has recently been produced in London, where it met with instantaneous success.

Among Miss Nora Greene's items will be "The Fortune Hunter." This song, which is a London silhouette from "Bow Bells," will be rendered in Miss Greene's own inimitable style, and with a touch of realism which will lose nothing from the fact of Miss Greene's recent visit to the "Great Metropolis."

Two solo numbers are to be sung by Mrs. Amy Dunn and by Mr. T. C. Woods.

Other contributors to this excellent programme will be Miss Violet Wilson, elocutionist (whose versatility will be demonstrated in the contrasting items, "Fairy Tales" and "Mrs. Harris on the Farm"), and Mr. W. J. Tasker, flautist, whose work requires no commendation to listeners.

Quite an appetizing "bill of fare" from the musical point of view is to be presented by the Apollo Four on the 15th instant.

"The Meeting of the Waters" is a typical example of the best type of Scottish national song; "Old Farmer Buck" is a poignant ditty telling of certain things which one ought not to do; "Spin, Spin," is a delightful Swedish folk song rich in vocal colour, and "Alexander" presents a business deal in a musical setting, well seasoned with humour—perhaps Scottish! "Comrades, to Arms," a stirring duet, not very often heard, sung by two robust voices, should prove exceedingly popular.

Tuesday, December 13, will be a night devoted to songs of other days—the songs of fifty years ago—the singing of which by the members of the Orpheus Quartet will doubtless bring to the older folk happy memories of their young days. What fragrant recollections cling to the melodies of "Long Ago," "Just a Song at Twilight," and "Home, Sweet Home," in which on this evening the voices of these four popular singers will be blended. The old favourite, "Larboard Watch" will be sung as a duet for tenor and bass, and is bound to "go over" well, while the solo numbers will comprise some of the sweetest of the dear old songs—"Silver Threads Among the Gold," "Won't You Buy my Pretty Flowers," "The Dear Homeland," and "Hearts of Oak," and "When You and I Were Young, Maggie." These are songs that will never grow too old to be loved, never lose their appeal.

The Beethoven Trio in G Major will be the third work by the great Bonn master to be performed by this trio. Each of the four movements has its own distinctive charm, but, perhaps, the slow movement will make the most appeal through its beautiful heart-searching melody.

The slow movement of the trio in F major by the popular French composer, Saint Saëns, possesses a hauntingly rhythmic lilt, which makes it extremely attractive. Miss Ava Symons will play the lovely andante which forms the second movement of the well-known Concerto in E minor, by Mendelssohn.

Mr. George Elwood will play as 'cello solos "Chanson de Nuit" (Evening Song), a broadly flowing melody of great beauty by Elgar, and "To the Guitar," a fanciful caprice by the elegant Polish composer Moszkowski.

"The Rivulet," to be played by Mr. Gordon Short, is an excellent example of Emil Sauer's style of writing, and is a veritable cascade of sound, suggestive of sunshine playing on running water.

The male quartet, which met with such decided success at its initial performance at 2YA on December 5, will again broadcast from this station on Monday, December 12.

HANDEL'S MESSIAH.

Handel's "Messiah" is to be broadcast by 2YA on relay from the Terrace Congregational Church on the evening of Saturday, December 17. The Terrace Congregational Choir will be augmented for this performance, and will present the oratorio under the baton of Mr. Len Barnes. Mr. Harry E. Brusey will be at the organ.

Of the soloists little need be said, as three of them—Mrs. Alice Harris (soprano), Miss Lily Mackie (contralto), and Mr. Arthur Coe (tenor)—are associated with Mr. Barnes in the Orpheus Quartet, whose work is pleasantly familiar to listeners to 2YA.

Mr. Ray Kemp is the baritone soloist, and he is already well known to local audiences as a fine singer blessed with a good ringing baritone voice.

George Frederick Handel was born at Halle in 1685. In 1708 he went to Italy, and in 1712 to England, where he settled. In 1737 he turned his attention to oratorio, after having written forty-seven operas. He died in 1759, having been blind for some five years. He commenced writing "The Messiah" on August 23, 1741, and it was completed on September 12 of the same year. The whole oratorio takes nearly four hours to perform, but it is not usual to give more than about a two hour performance. This great work is divided into three parts, depicting the advent and the birth of Christ, the Passion and the Ascension, and finally the triumph over death.

tions, which means that every taste will be suited. In addition to the concerted works, each member of the quartet will contribute solos.

After the broadcast of the Rev. Tulloch Yuille's service at Knox Church on Sunday, December 11, a concert to be given by the St. Kilda Band will be relayed.

In future Tuesday night at Dunedin will be Band night. Next Tuesday the programme will be rendered by the St. Kilda Band and assisting artists. A fine programme has been arranged, the band playing some popular numbers, and first-class individual items will be heard by some of Dunedin's leading entertainers. The inimitable comedian, Mr. R. Wilson Brown, who spent a long time with the original "Diggers" in England, will contribute three popular whispering baritone solos. Mr. J. B. McConnell, possessor of one of the best broadcasting voices in Dunedin, will provide humorous monologues, and recitations. Mr. Reg. Richards, well known baritone, will sing two light popular numbers, and Drummmond's "Homeland." Mr. Dan Fogarty, possessor of a beautiful silver tenor voice, will render Lambert's "She is Far from the Land," and two other numbers.

Thursday night has been reserved for a very special occasion at 4YA, when Handel's ever popular oratorio, "The Messiah," will be performed by Mr. Ernest Drake, Dunedin's leading music teacher, and a brilliant tenor with a New Zealand-wide reputation. Mr. Drake will have associated with him several foremost artists, including Miss



POPULAR TRIO AT 3YA.

Miss Elaine Moody's Instrumental Trio, which plays popular Hawaiian airs at 3YA.

—Steffano Webb, photo.

prove of exceptional benefit to country folk who are not conversant on the preparation and uses of concrete. The lecturer will be Mr. F. E. Powell, A.M.I.M.E. (Lond.).

The concert programme for Wednesday evening has been arranged by "The Thespians," and will be unique in that all the artists contributing to the programme were prize winners at the recent elocutionary and musical competitions held in Auckland. Listeners may, therefore, confidently look forward to an enjoyable evening's entertainment.

Operatic arias will be a feature of the solos to be sung by Mr. Hartley Warburton on Thursday evening. Two of the finest from "Il Trovatore" and "Rigoletto" have been selected.

Miss Nellie Lingard, the popular contralto, has chosen "Abide With Me" and the delightful "Little Boy Blue" for her items on Thursday.

On Thursday evening Mr. Leonard Griffiths, horticulturist, will give another of his interesting talks, his subject this time being "The Magic of Herbs." Mr. Griffiths has the happy knack of always making his subject entertaining.

The Lido Instrumental Trio, Miss Ruby Brame (flautist), Miss Marion McMurtrie (violinist), Nell the Bohemian (who plays popular melodies), and Mr. Pete Black (with songs at the piano), are on Thursday's programme.

Mr. Robert Peter, whose pleasing tenor voice is always a delight to listen to, will include among his items on Thursday evening "Molly Brannigan," by Stanford, and "Kirkconnell Lea."

Miss Nora Greene,

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JOTTINGS FROM 2YA

The "Theme and Variations" of the mighty trio by Tschaiikowsky, played recently by the Symons-Elwood-Short Trio, called forth appreciation from many listeners-in. It is interesting to note that Tschaiikowsky frequently confessed that it was torture for him to have to listen to the combination of piano with violin and violoncello. The day came, however, when he relinquished this prejudice, and wrote this trio in memory of a great artist, Nicholas Rubinstein, brother to the famous Anton, and himself a magnificent pianist. Tschaiikowsky is ever profoundly touching in his elegiac vein, and this trio is worthy to rank among the loveliest of musical laments.

The Beethoven Trio in G Major will be the third work by the great Bonn master to be performed by this trio. Each of the four movements has its own distinctive charm, but, perhaps, the slow movement will make the most appeal through its beautiful heart-searching melody.

The slow movement of the trio in F major by the popular French composer, Saint Saëns, possesses a hauntingly rhythmic lilt, which makes it extremely attractive. Miss Ava Symons will play the lovely andante which forms the second movement of the well-known Concerto in E minor, by Mendelssohn.

Mr. George Elwood will play as 'cello solos "Chanson de Nuit" (Evening Song), a broadly flowing melody of great beauty by Elgar, and "To the Guitar," a fanciful caprice by the elegant Polish composer Moszkowski.

"The Rivulet," to be played by Mr. Gordon Short, is an excellent example of Emil Sauer's style of writing, and is a veritable cascade of sound, suggestive of sunshine playing on running water.

The male quartet, which met with such decided success at its initial performance at 2YA on December 5, will again broadcast from this station on Monday, December 12.



GRAND THEATRE ORCHESTRA, CHRISTCHURCH.

An orchestra heard regularly at 3YA. Personnel: Miss Renee Algie (cellist), Mr. W. Poore (flautist), Mr. F. Turner (cornet), Mrs. K. Black (pianist and leader), Mr. A. Gordon (violinist), Mr. J. Costley (drums and effects).

—Steffano Webb, photo.

"RADIO FOUR" FOR 4YA

Commencing next week a high-class vocal quartet, "The Radio Four," will be heard every Friday evening. The members of the quartet need little introduction, for they are probably the best known vocalists in Dunedin. The soprano is Miss Roma Buss, possessor of a glorious voice which has placed her among the few first rank competitors in the local competitions. Miss Mollie Andrews is the mezzo-soprano, who is such a favourite in the southern city, and whose delightful singing will be a treat for listeners each week. Mr. Les Dalley will be heard in the tenor parts. At the present Mr. Dalley is the public's favourite, having not only a wonderful voice, but a most artistic interpretation. Mr. J. B. McPherson is the bass, whose voice is ideal for broadcasting, being equally rich in range from the highest to the lowest note.

The "Radio Four" will draw from a large repertoire, ranging from Grand Opera works to musical comedy selections.

Winnie McPeak (contralto), Miss Rita Holmes (soprano), Mr. A. Langley (baritone), Mr. D. Craigie (baritone), and Mr. J. B. McPherson (bass). Mrs. Ernest Drake will render on the piano forte the "Pastoral Symphony."

Prior to the actual performance Pastor W. D. More will give a short talk on "The Messiah."

In addition to the Radio Four, Friday's programme will include Miss Anita Winkel, a leading lady elocutionist, who will provide monologues and recitations, and Miss Marjorie McDowell, a brilliant young pianiste, who will perform classical pianoforte solos, by old and modern composers. A feature of the evening will be a vocal duet, "The Miserere Scene," from "Il Trovatore," sung by Miss Rome Buss and Mr. Les Dalley.

A really fine programme has been arranged for Saturday evening, when another group of brilliant talent will be present. Miss Irene Hornblow, L.R.A.M., who recently returned from

(Continued on Page 15.)

FACTS?

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Full Programmes for Next

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NEWS AND NOTES

(By "Switch.")

It is always better to use wire stays and wire halyards for radio aerials. Rope contracts in wet weather, and stretches in dry weather. Galvanised wire lasts better than unprepared rope.

It has been calculated that even the best receiving aerial does not receive more than about one-trillionth of the power radiated by a broadcast station, even in the vicinity.

An aerial connected directly to earth is capable of receiving radio waves of a wave-length about four times its length of wire. Thus a single wire 100 feet in length can receive waves of a wave-length of 400 feet, without the addition of the usual tuning inductances in a wireless set, which increase or decrease the wave-length at will. A metre is equivalent to 3.28 feet, or, roughly, 3 feet 3 1/4 inches.

The broadcast waves picked up by your aerial travel only along the surface exterior of the aerial wire, and do not penetrate to the core of the wire. This phenomenon is known as "skin effect." An aerial which is badly corroded subjects the radio waves to a certain amount of resistance.

In some home-made "B" eliminators, especially when the transformers and chokes are wound by the constructor, there is apt to be a lot of heat generated. Therefore, never enclose a home-made eliminator in an air-tight cabinet. If you must use a cabinet, provide an ample number of holes in its sides to allow good ventilation. If a "B" eliminator transformer is allowed to heat up, it may burn out the windings and blow the fuses. Ventilation will keep the heat at a minimum and often prevent such an occurrence.

Though radio waves can pass through bricks, mortar, concrete, and wood, metals have the same effect upon them as mirrors have upon light, deflecting them temporarily from their natural course.

The best way to connect the earth wire to a waterpipe is to clean the surface of the pipe thoroughly by scraping, filing, or sandpapering. The end of the earth wire should then be cleaned the same way, and wrapped two or three times around the waterpipe. It is then essential that the wire be firmly soldered to the waterpipe.

Valves should not be burned too brightly or their lives will be shortened. Turn on the rheostats only so far as the point at which best reproduction is obtained. To turn the rheostats further than this is to shorten the lives of the valves without any benefit. By operating the filament of a valve at 95 per cent. of its rated voltage, its life will be doubled.

An outdoor aerial will become heavily oxidised within the space of a year. This oxidation reduces the over-all efficiency of the aerial system; and should therefore be cleaned off every six months or so. Here is a simple and effective way of doing it. Purchase a shilling's worth of muriatic acid, and mix it with three parts of water in a large earthenware dish. Coil the aerial wire into a roll and place it in the dish. Leave it there for about an hour and stir the solution three or four times every fifteen minutes or so. Next prepare a strong solution of soda and water in another large dish and place the roll of wire in this to neutralise the acid. Let the wire remain in this solution for about ten minutes; then take it out and scrub off any remaining scales of oxidation with an old tooth brush. You will find the wire to be in the same clean condition as when purchased.

An indoor loop aerial to tune to the wavelengths of the New Zealand and Australian broadcast stations can be made with a diameter of 4 feet to carry seven turns of wire spaced half an inch apart and to be operated with a .0005 mfd. variable condenser in parallel.

High resistance headphones are sensitive because they are wound with a very large number of turns of wire, and not as a natural result of their high ohmic resistance. This latter is simply the result of their requiring to be wound with fine wire to pack the numerous turns into a small space, and is no advantage in itself.

The more ambitious of experimenters will find it interesting and instructive to test out crystals of different minerals for sensitivity. While thousands of crystals and combinations of crystals have been tried out, a new combination may accidentally be discovered that will bring results well worth the trouble. Now, you boys, get busy!

The "earth" wire should be kept as short as possible, otherwise, not only is the resistance of the aerial-earth circuit as a whole increased, but useless inductance is added to the circuit, necessitating the use of a smaller number of turns in the tuning inductance, without the compensating advantage of any additional energy collected by the earth wire.

Sunday, December 11th

1YA AUCKLAND (333 METRES)—SUNDAY, DECEMBER 11.

3 p.m.: Afternoon session—Selected Studio items.

4.30: Close down.

6.55: Relay of church service from St. David's Presbyterian Church. Preacher, Rev. D. C. Herron; organist, Mr. E. C. Craston.

8.30: Relay of organ recital from Town Hall. Organist, Mr. Maughan Barnett.

9.30: A thought.

9.31: Close down.

2YA WELLINGTON (420 METRES)—SUNDAY, DECEMBER 11.

6 p.m.: Children's session, conducted by Rev. E. Weeks.

7.0: Relay of evening service from St. Gerard's Redemptorist Church, Hawker Street, Wellington. Order of service:—

Organ—Mr. Henry Mount, "Hymn to St. Cecilia" (Gounod).

The Rosary with choral responses.

Antiphon—"Alma Redemptoris" (Richardson).

Sermon.

Motets—"Worthy is the Lamb" (Handel), "O Holy Mother," "Magnificat" (Rossi).

Organ—Mr. Henry Mount, "Offertoire" (Hartwell).

The Benediction service will consist of the following Motets: "O Salutaris Hostia" (Petrosi), "Tota Pulchra Es Maria" (Smith), "Tantum Ergo" (Murray), "Divine Praises" (Rev. F. O'Meehan), "Adoremus and Laudate Dominum" (Allegrì).

Organ—Mr. Henry Mount, "Marche Triumphale" (Lemmens).

Organist, Mr. Henry Mount; choral director, Mr. Frank J. Oakes.

8.15: Quartet—The Wm. Renshaw Quartet, "God is a Spirit" (Sterndale-Bennett).

Bass solo—Mr. Thomas C. Wood, "Holy City" (Adams).

Soprano solo—Mrs. Amy Dunn, "Come Unto Him" (Handel).

Instrumental quartets—The Ellwood String Quartet, (a) "First Movement" from "B Flat, Maori Quartet" (Hill); (b) "Haka" from "B Flat, Maori Quartet" (Hill).

Tenor solo—Mr. William Renshaw, "If With All Your Hearts" (Mendelssohn).

Contralto solo—Miss Nora Greene, "O Rest in the Lord" (Mendelssohn).

Instrumental Quartets—The Ellwood String Quartet, (a) "First Movement" from "G Major Quartet" (Mozart); (b) "Minuetto" (Boccherini).

Vocal duet—Miss Nora Greene and Mr. Wm. Renshaw, "O, Lovely Peace" from "Judas Maccabeus" (Handel).

Bass solo—Mr. Thomas C. Wood, "Out of the Deep I Call" (Martin).

Soprano solo—Mrs. Amy Dunn, "Jerusalem" (Mendelssohn).

Instrumental quartet—The Ellwood String Quartet, "Andante Cantabile" from "D Major Quartet" (Tschalkowsky).

Tenor solo—Mr. Wm. Renshaw, "An Evening Song" (Blumenthal).

Contralto solo—Miss Nora Greene, "My Prayer" (Squire).

Quartet—The Wm. Renshaw Quartet, "Cast Thy Burden" (Mendelssohn).

3YA CHRISTCHURCH (306 METRES)—SUNDAY, DECEMBER 11.

5.45: Children's song service, under Uncle Sam, assisted by scholars from the Papanui Presbyterian Sunday School.

7.0: Relay of evening service from Salvation Army Headquarters, Victoria Square. Choruses and hymns, etc., will be sung by 130 voices. The Boys' Band will accompany the congregational singing and the orchestra will accompany the singing of the younger people.

Brigadier Bladen in charge of service. Mr. J. Taylor, Y.P.S.M., conductor of music.

After service, at 3YA the Christchurch Broadcasting Trio will give the following items:—

Instrumental trio—Christchurch Broadcasting Trio, "Allegro Vivace" from "D Major Trio" (Beethoven).

Violin solo—Miss Irene Morris, "Romance" from "Second Concerto" (Wieniawski).

Instrumental trios—Christchurch Broadcasting Trio, (a) "Allegro"; (b) "Andante"; (c) "Tempo di Marcia" (Bohm).

Pianoforte solo—Miss Aileen Warren, "Serenade" (Schubert-Liszt).

Close down.

4YA DUNEDIN (463 METRES)—SUNDAY, DECEMBER 11.

5.45 p.m.: Children's song service, conducted by Big Brother Bill.

Hymns will be sung by the Methodist Sunday School children. Order of service: Hymn, prayer, Lord's Prayer, hymn, Scripture reading, hymn, Bible story (Big Brother Bill), hymn, Benediction.

6.20: Close down.

7.0: Relay of evening service from Knox Church. Preacher, Rev. Tulloch Yuille, M.A., B.D. Organist, Mr. W. Page tGale.

8.0: Relay from St. Kilda (weather permitting) of concert by the St. Kilda Band. Conductor, Mr. James Dixon.

Monday, December 12th

1YA AUCKLAND (333 METRES)—MONDAY, DECEMBER 12.

SILENT DAY.

2YA WELLINGTON (420 METRES)—MONDAY, DECEMBER 12.

3 p.m.: Afternoon session—Selected Studio items.

Chimes.

3.1: Selected gramophone items.

3.30: Lecturette—Representative of James Smith, Ltd., "Fashions."

3.45: Relay of Manuel Hyman's Exhibition Band from the Adelphi Cabaret. Selected gramophone items.

5.0: Close down.

6.0: Children's hour—Aunt Jo and pupils of St. Mark's Schol. Unison singing, St. Mark's School, "Dance of the Rainbow Fairies" (Riley), "The Sleepy Song" (Riley). Aunt Jo sends birthday greetings. Unison singing, St. Mark's School, "I Passed by Your Window" (Brahe), "Danny Boy" (Weatherby). Aunt Jo, story time. Unison singing, St. Mark's School, "Admiral's Broom" (Bevan). Recitation, cousin, selected. Maori songs, St. Mark's School, "Tapua" (Rivers), "Waiata Poi" (Hill). Choir, St. Mark's School, "School Song" (Watkins).

7.0: News session, market reports, and sports results.

7.40: Lecturette—Mr. G. G. Stewart, editor, "Railway Magazine," "Holiday-making on the Railways."

8.0: Chimes of the General Post Office clock, Wellington.

8.1: Overture—"Nell Gwyn" (German).

8.5: Vocal quartet—Melodie Four, "Stars of the Summer Night" (anon.).

8.9: Steel guitar—Mr. E. J. Palmer, (a) "Blue Skies" (Berlin); (b) "Three o'clock in the Morning" (Young).

8.14: Humour—Mr. A. Stanley Warwick, (a) "W'en the Road's Hup" (Long-staffe); (b) "Night of the Party" (Roberts).

8.17: Tenor solo—Mr. C. E. Williams, "I'll Sing Three Songs of Araby" (Clay).

8.20: Instrumental trio—Symons-Ellwood-Short Trio, "First Movement" (first part) (Tschalkowsky).

8.30: Baritone solo—Mr. R. S. Allwright, "The Gay Highway" (Drummond).

8.34: Flute solos—Mr. Claude Tucker, (a) "Romanza" (De Lorenzo); (b) "The Whirlwind" (Krantz).

8.40: Vocal quartet—Melodie Four, "Peter the Cat" (Eastman).

8.43: Violin solo—Miss Ava Symons, "Andante" from "Concerto" (Mendelssohn).

8.50: Mezzo-soprano solo—Miss Eirene Bull, "Waiata Maori" (Hill).

8.55: Weather forecast.

8.56: Vocal quartet—Melodie Four, "They Kissed" (Merry).

9.0: Mandoline—Mr. E. J. Palmer, (a) "Hello, Aloha" (Baer); (b) "Honolulu Moon" (Lawrence).

9.17: Tenor solo—Mr. F. Bryant, "I Heard You Singing" (Coates).

9.21: Instrumental trio—Symons-Ellwood-Short Trio, "First Movement" (second part) (Tschalkowsky).

9.30: Lecturette—Sir Frederick Chapman, "America and Britain: A Policy of Common Aims."

9.45: Mezzo-soprano solos—Miss Eirene Bull, (a) "The Pearl"; (b) "Amber and Amethyst" from the "Jewel Cycle" (Carse).

9.49: Humour—Mr. A. Stanley Warwick, "Knocking Down Ginger" (Thomas).

9.52: Bass solo—Mr. W. W. Marshall, "Down Withcombe Way" (Ewing).

9.55: Flute solo—Mr. Claude Tucker, "Caprice—Il Vento" (Briccialdi).

9.58: Vocal quartet—Melodie Four, "The Moon Man" (Macy).

10.0: God Save the King.

3YA CHRISTCHURCH (306 METRES)—MONDAY, DECEMBER 12.

3 p.m.: Afternoon session—Selected Studio items.

4.30: Close down.

6.0: Children's hour—Uncle Jack and Aunt Edna. Bed-time stories, songs, etc.

7.0: Close down.

7.15: News and reports.

7.30: Talk—Mr. A. L. Chappell, Philatelic Society, "History and Stamps."

8.0: Chimes. Studio concert by Christchurch Municipal Band, under conductorship of Mr. A. J. Schnack, assisted by 3YA artists.

8.1: Relay of orchestral selections from Strand Picture Theatre Orchestra, under the direction of Mr. Harry Ellwood.

8.10: March—The Band, "Twentieth Century" (Hume).

8.15: Male voice quartets—Cathedral Male Voice Quartet, (a) "Come, Let Us Join the Roundelay" (Beale); (b) "Summer Eve" (Hatton).

8.21: Selection—The Band, "Le Domino Noir" (Auber).

8.28: Tenor solo—Mr. J. Hinton, "Mountain Lovers" (Squire).

8.32: Waltz—The Band, "Love and Life in Vienna" (Komazah).

8.39: Bass solo—Mr. Arthur Woodward, "Hope, the Hornblower" (Ireland).

8.41: Hymn—The Band, "Abide With Me" (Monk).

8.47: Tenor solo—Mr. Harry Gill, "Oh! for the Breath of the Moorlands" (Whelpsey).

8.50: Recital—Mr. J. J. Flewellyn, "Tony Weller's Advice to His Son" (Dickens).

8.54: Cornet solo, with band accompaniment—Mr. Fred. Fox, selected.

8.59: Male voice quartet—Cathedral Male Voice Quartet, "A Red, Red Rose" (Roberts).

9.2: Relay of orchestral selections from Strand Theatre.

9.15: Tenor solo—Mr. J. Hinton, "Morning" (Speaks).

9.18: March—The Band, "Loyal Hearts" (Greenwood).

9.23: Male voice quartets—Cathedral Male Voice Quartet, (a) "Haste Ye, Soft Gales" (Martin); (b) "I Saw Esau" (Branscombe).

9.29: Selection—The Band, "Melodious Melodies" (Rimmer).

9.38: Bass solos—Mr. Arthur Woodward, (a) "Barbara Allan" (traditional); (b) "Lass of Richmond Hill" (traditional).

9.45: Recital—Mr. J. J. Flewellyn, "On Strike" (M.S.).

9.49: One-step—The Band, "Parce" (Padilla).

9.55: Tenor solo—Mr. Harry Gill, "Phyllis Is My Only Joy" (Whelpsey).

9.59: Overture—The Band, "Diamond Cross" (Greenwood).

10.8: Male voice quartet—Cathedral Male Voice Quartet, "Good Night, Beloved" (Hatton).

10.14: March—The Band, "Steadfast and True" (Teike).

God Save the King.

4YA DUNEDIN (463 METRES)—MONDAY, DECEMBER 12.

SILENT DAY.

Tuesday, December 13th

1YA AUCKLAND (333 METRES)—TUESDAY, DECEMBER 13.

3 p.m.: Afternoon session—Selected Studio items.

4.0: Literary selection by Mr. Culford Bell.

4.30: Close down.

6.0: Children's hour—Uncle Leo and pupils of Mrs. Bartley-Baxter.

7.0: Close down.

7.15: News and information session.

7.45: Close down.

8.0: Chimes.

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Relay of orchestral overture from Majestic Theatre Orchestra, under the direction of Mr. J. Whiteford-Waugh.

8.10: Tenor solo—Mr. Geo. Barnes, "Questa o Quella" from "Rigoletto" (Verdi).

8.14: Contralto solos—Miss G. Evans, (a) "Vale" (Kennedy-Russell); (b) "Waiaata Poi" (Hill).

8.22: Flute solo—Mr. H. McLennan, "Scotch Fantasia" (Briccialdi).

8.27: Baritone solos—Mr. S. Pritchard, (a) "The Lord Is My Light" (Allittsen); (b) "Thoughts" (Bryan).

8.35: Sketch—Mr. W. Russell-Wood, "A Comedy Sketch."

8.47: Soprano solo—Mrs. C. Towsey, "The Sands of Dee" (Weeks).

8.51: Violin solo—Mr. A. Gracie, "Liebeslied" (Kreisler).

8.55: Bass-baritone solo—Mr. F. Sutherland, selected.

9.0: Weather forecast.

9.2: Relay of orchestral selections from Majestic Theatre.

9.12: Tenor solos—Mr. Geo. Barnes, (a) "Thank God, for a Garden" (Del Riego); (b) "Take a Pair of Sparkling Eyes" (Sullivan).

9.19: Contralto solo—Miss Gladys Evans, "You've Got Your Mother's Eyes" (Drummond).

9.23: Flute solos—Mr. Hal. McLennan, (a) "Romance" (Pidcock); (b) selected.

9.31: Baritone solo—Mr. Stan. Pritchard, "A Song of Thanksgiving" (Allittsen).

9.35: Relay of orchestral entr'acte from Majestic Theatre.

9.40: Soprano solos—Mrs. Cyril Towsey, (a) "Vorreil" (Tosti); (b) "Matinata" (Tosti).

9.47: Violin solos—Mr. Alfred Gracie, (a) "On Wings of Song" (Mendelssohn); (b) "Spring Song" (Mendelssohn).

9.54: Bass-baritone solos—Mr. F. Sutherland, selected.

10.0: A thought.

10.2: God Save the King.

2YA WELLINGTON (420 METRES)—TUESDAY, DECEMBER 13.

2 p.m. Education Department demonstration, arranged by Director of Education (Mr. T. B. Strong).

3 p.m.: Afternoon session—Selected Studio items.

Chimes of the General Post Office clock, Wellington.

3.1: Selected gramophone items.

3.30: Lecturette—Mrs. Barrington, of Turnbull and Jones, Ltd., "Electric Cooking."

3.45: Relay of Manuel Hyman's Exhibition Band from the Adelphi Cabaret.

4.15: Lecturette—Dr. L. A. Line, "First Aid."

4.30: Selected gramophone items.

Relay of Manuel Hyman's Exhibition Band from the Adelphi Cabaret.

5.0: Close down.

6.0: Children's hour—Uncle Jasper and Mr. Stewart start the Radio Express. Trip to Stewart Island. Stop at Christchurch, Dunedin, and Invercargill. Items from Berhampore School. Two-part glee, school, "Soft on the Sands of the Silver Sea" (Note). Three-part song, school, "Sweet and Low" (Barnby). Pianoforte solo, cousin, "To the Spring" (Greig). Recitation, cousin, "A China Tragedy" (anon.). Three-part song, school, "In a Garden" (Palliser). Uncle Jasper and Spot send greetings. Two-part song, school, "Sleep, Holy Babe" (Dykes). Two-part song, school, "Oh, Wert Thou in the Cauld Blast?" (Mendelssohn).

7.0: News session, market reports, and sports results.

7.40: Lecturette—Mr. E. A. Bradshaw, of Vacuum Oil Company, "The Ignition System and Ignition Troubles."

8.0: Chimes of the General Post Office clock, Wellington.

8.1: Overture—"Plymouth Hoe" (Ansell).

8.5: Quartet—The Orpheus, "Long Ago" (traditional). (All items rendered by members of the Orpheus Quartet of old-time character.)

8.9: Japanese one-string fiddle—Mr. L. Bevan, "Vale" (Russell).

8.13: Baritone solo—Mr. Len. Barnes, "Hearts of Oak" (traditional).

8.17: Instrumental trio—Symons-Ellwood-Short Trio, "Trio in G Major, First Movement" (Beethoven).

8.27: Contralto solo—Miss Lily Mackie, "Won't You Buy My Pretty Flowers?" (traditional).

8.31: Humour—Mr. Leslie Anderson, "Trying a Magistrate" (Toole).

8.37: Flute solo—Mr. L. W. Rothwell, "Graceful Dance" (Lemmone).

8.44: Vocal duet—Messrs. Arthur Coe and Len. Barnes, "Larboard Watch" (traditional).

8.50: Tenor solo—Mr. Arthur Coe, "Silver Threads Among the Gold."

8.56: Weather forecast.

8.57: Lecturette—Mr. H. C. South, "Books: Wise and Otherwise."

9.12: Vocal quartet—The Orpheus Quartet, "Just a Song at Twilight" (Molloy).

9.16: Instrumental trio—Symons-Ellwood-Short Trio, "Trio in G Major, second and third movements" (Beethoven).

9.26: Soprano solo—Mrs. Alice Harris, "The Dear Homeland."

9.30: Cello solos—Mr. Geo. Ellwood, (a) "Chanson de Nuit" (Elgar); (b) "Zur Gitarre" (Moscowski).

9.37: Humour—Mr. Leslie Anderson, "The Troubles of Guy de Vere" (Toole).

9.42: Japanese one-string fiddle—Mr. L. Bevan, "The Call of the Angelus" (Walton).

9.48: Baritone solo—Mr. Len. Barnes, "Wait Till the Clouds Roll By" (traditional).

9.52: Flute solo—Mr. L. W. Rothwell, "Valse Bijoux" (De Lorenzo).

9.56: Quartet—The Orpheus, "Home, Sweet Home" (traditional).

10.0: Close down.

3YA CHRISTCHURCH (306 METRES)—TUESDAY, DECEMBER 13. SILENT DAY.

4YA DUNEDIN (463 METRES)—TUESDAY, DECEMBER 13.

3 p.m.: Afternoon session—Selected Studio items.

Town Hall chimes.

3.1: His Master's Voice recital.

3.30: Address on "Fashions."

3.45: Studio music.

4.0: Address on "Cooking by Electricity."

4.15: His Master's Voice recital.

4.30: Close down.

6.0: Children's hour—Big Brother Bill and Miss C. Sundstrum's Endeavour Choir, singing part-songs, (a) "Sunshine" (Root); (b) "The Dryad Asleep" (West); (c) "Tell Me Blue Bell" (Bunning); (d) "Birdie's Message" (Wheeler).

7.0: Close down.

7.15: News session.

7.30: Address on "Tourist Resorts," by A. E. Wilson, "Dunedin manager of the Tourist Department."

8.0: Town Hall chimes. Band concert by the St. Kilda Band, conducted by Mr. James Dixon, and assisting artists.

8.1: March—St. Kilda Band, "BB and CF" (Hume).

8.5: Selection—St. Kilda Band, "Musical Fragments" (Rimmer).

8.17: Light vocal solo—Mr. R. Wilson Brown, "To-night's My Night With Baby" (Meyer).

8.21: Monologue—Mr. J. B. McConnell, "Devil May Care."

8.26: Waltz—St. Kilda Band, "Casino Tanze" (Gungl).

8.34: Baritone solos—Mr. Reg. Richards, (a) "Homeland" (Drummond); (b) "The Fortune Hunter" from "Bow Bells" (Willeby).

8.41: Cornet solo, with band accompaniment—Mr. George Christie, "Garden of Happiness."

8.47: Tenor solos—Mr. Dan Fogarty, (a) "She is Far from the Land"; (b) "Absent" (Metcalfe).

8.54: Humorous recital—Mr. J. B. McConnell, "The Groom Story."

9.0: Town Hall chimes and weather forecast.

9.2: Sacred selections—St. Kilda Band (a) "Air Varie"; (b) "Eventide" (Rimmer).

9.10: Baritone solo—Mr. Reg. Richards, "Because I Love You" (Berlin).

9.15: Light vocal solos—Mr. R. Wilson Brown, (a) "I'm Knee-Deep in Daisies"; (b) "Cecilia" (Dreyer).

9.23: Selection—St. Kilda Band, "A Country Wedding."

9.35: Tenor solo—Mr. Dan Fogarty, "Joybird" (Barnes).

9.39: Trombone fantasia—St. Kilda Band, "The Parachute."

9.44: Humorous monologue—Mr. J. B. McConnell, "A Clean Sweep."

9.51: March—St. Kilda Band, "The Howitzes."

10.0: God Save the King.

Wednesday, December 14th

1YA AUCKLAND (333 METRES)—WEDNESDAY, DECEMBER 14.

3 p.m.: Afternoon session—Selected Studio items.

4.0: Literary selection, by Mr. Cuford Bell.

4.30: Close down.

6.0: Children's hour—Uncle Tom and pupils of Miss Griffiths.

7.0: Close down.

7.15: Talk on "Concrete and its Uses," by Mr. F. E. Powell, A.M.I.E.E. (Lond.).

7.30: News and reports.

7.45: Close down.

8.0: Chimes. Concert arranged by The Thespians.

8.1: Relay of orchestral overture from Strand Theatre Orchestra, under the direction of Eve Bentley.

8.12: Vocal chorus—The company, "The Thespians' Anthem."

8.16: Pianoforte duet—Phyllis Cato and Eric Maxwell, "Invitation to the Waltz" (Weber).

8.21: Humour at the piano—Edna Jenkins, "A Musical Description of a Melodrama" (Sidney).

8.26: Soprano solo—Ida Armstrong, selected.

8.31: Humour—Frank Adeane, "When Richard the First Sat on the Throne" (Jackson).

8.37: Recitation—Louise Jourdain, "The Midnight Minuet."

8.42: Violin solo—Alfred Gracie, "Ave Maria" (Schubert).

8.47: Dramatic recital—Audrey Perry, "The House With Nobody In It" (Kilmer).

8.52: Humorous sketch—Edna Smeaton, Hector Taylor, and Jim Sharp, "Reggie Makes a Complaint" (De Vere Peach).

9.4: Weather forecast.

9.6: Relay of orchestral selections from Strand Theatre.

9.16: Contralto solo—Edna Peace, "The Glory of the Sea" (Sanderson).

9.21: Musical monologue—Winifred Crosher, selected.

9.25: Duet—Tom Moffitt and Frank Adeane, "Nocturne" (Denza).

9.30: Humour at the piano—Jim Sharp, "The Girl With the Single Tune" (Jackson).

9.36: Relay of orchestral selections from Strand Theatre.

9.47: Bass solo—Duncan Black, selected.

9.52: Instrumental trio—Marion McMurtrie, Ruby Brame, and Peter Black, selected.

9.59: A thought.

10.0: God Save the King.

2YA WELLINGTON (420 METRES)—WEDNESDAY, DECEMBER 14. SILENT DAY.

3YA CHRISTCHURCH (306 METRES)—WEDNESDAY, DECEMBER 14.

3 p.m.: Afternoon session—Selected Studio items.

4.30: Close down.

6.0: Children's hour—Uncle Peter and Mother Hubbard.

7.0: Close down.

7.15: News and Addington stock market report.

7.30: Talk—Mr. Gordon Troup, Boys' High School, on "France."

8.0: Chimes Relay of orchestral selections from Grand Picture Theatre Orchestra, under the direction of Mrs. Black.

8.15: Vocal quartet—Mrs. Claris Shaw, Miss Mildred Russell, L.A.B., A.T.C.L., Messrs. Gregory Russell and W. J. Richards, "Sleepy Ceylon" (Moncton).

8.18: Soprano solo—Mrs. Claris Shaw, "She's All Right" (Rubens).

8.21: Bass solo—Mr. W. J. Richards, "Pearl of Sweet Ceylon" (Moncton).

8.25: Instrumental trio—Christchurch Broadcasting Trio, "Allegro Moderato, Trio in D Minor" (Arensky).

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It is not advisable to attempt to use more than two stages of transformer audio amplification in a receiving set, as the inherent reaction effects in the circuit become more pronounced, and produce a tendency to self-oscillation at audible frequencies. This self-oscillation creates the sound known as "howling."

The query is often put as to whether using two crystal detectors simultaneously on one set is better than one crystal. Little or no advantage is gained by employing two crystal detectors, for, although more complete rectification might be obtained, the added resistance in the circuit would cut down the current flowing.

It is the effective height of an aerial that counts, and not always the height above ground. If an aerial is 15 feet above the galvanised iron roof of a two-storied lofty residence the effective height of the aerial would be only 15 feet, and not 35 or 45 feet, which is its height above the ground. The aerial's effective height is only its height above the objects over which it passes.

Jacks frequently occasion trouble by reason of one of the contact leaves or springs failing to make contact, or being so closely spaced that a spark discharge takes place. The little points on the leaves of a jack will corrode through even a small amount of gas fumes reaching them. Sea or salt air will also cause corrosion. These points should be cleaned gently with the finest glass-paper occasionally.

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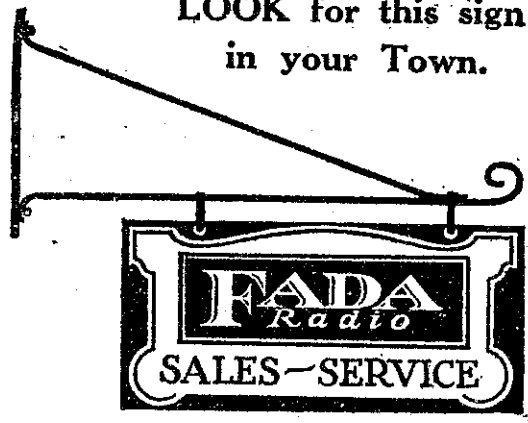
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Programmes Continued

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- 8.35: Soprano and tenor duet—Mrs. Claris Shaw and Mr. Gregory Russell, "Pretty Poll" (Moncton).
8.38: Contralto solo—Miss Mildred Russell, "My Cinnamon Tree" (Moncton).
8.41: Tenor solo—Mr. Gregory Russell, "The Ladies" (Moncton).
8.44: Recital—Mr. A. H. Todd, "My Idea of a Girl" (Low).
8.48: Cello solo—Mr. Harold Beck, "Après une Reue" (Faure).
8.51: Bass solo and quartet—Mr. W. J. Richards and chorus, "Hail, the Noble" (Moncton).
8.56: Soprano solo—Mrs. Claris Shaw, "My Heart's at Your Feet" (Moncton).
9.0: Relay of Orchestral selections from Grand Theatre.
9.15: Tenor and contralto duet—Mr. Gregory Russell and Miss Mildred Russell, "You and I" (Rubens).
9.18: Bass solo—Mr. W. J. Richards, "Dear Little Cingalee" (Rubens).
9.22: Vocal quartet—Mrs. Shaw, Miss Russell, and Messrs. Russell and Richards, "The New Year" (Rubens).
9.26: Cello solo—Mr. Harold Beck, "Serenade" (Popper).
9.30: Tenor solo—Mr. Gregory Russell, "I Love You So" (Norton).
9.34: Recital—Mr. A. H. Todd, (a) "If You Like" (Harker); (b) "O Memory" (Harris).
9.41: Soprano and bass duet—Mrs. Claris Shaw and Mr. W. J. Richards, "Make a Fuss of Me" (Rubens).
9.43: Contralto solo—Miss Mildred Russell, "The Dance I'll Lead" (Rubens).
9.47: Instrumental trios—Christchurch Broadcasting Trio, (a) "Melodie Mignonne" (Sindin); (b) "Andantino" (Lemare); (c) "Anitra's Dance" (Greig).
9.59: Vocal quartet—Mrs. Shaw, Miss Russell, and Messrs. Russell and Richards, "Island of Gay Ceylon" (Moncton).
God Save the King.

4YA DUNEDIN (463 METRES)—WEDNESDAY, DECEMBER 14.
SILENT DAY.

Thursday, December 15th

1YA AUCKLAND (323 METRES)—THURSDAY, DECEMBER 15.

- 3 p.m.: Afternoon session—Selected Studio items.
4.0: Literary selection, by Mr. Culford Bell.
4.30: Close down.
6.0: Children's hour—Peter Pan and Bayfield School pupils.
7.0: Close down.
7.15: Talk on "The Relation of Correct Lubrication to Power Farming," by "Gargoyle."
7.30: News and reports and book review.
7.45: Close down.
8.0: Chimes. Relay of orchestral overture from Rialto Theatre Orchestra, under the direction of Henry C. Engel.
8.11: Baritone solo—Mr. Hartley Warburton, "Il Balen" from "Il Trovatore" (Verdi).
8.15: Contralto solos—Miss Nellie Lingard, (a) "Little Boy Blue" (Nevin); (b) "The Rosary" (Nevin).
8.24: Flute solo—Miss Ruby Brame, "Valse Pathétique" (De Lorenzo).
8.28: Talk—Mr. Leonard Griffiths, "The Magic of Herbs."
8.38: Tenor solos—Mr. Robert Peter, (a) "Kirkconnel Lea" (Moffat); (b) selected.
8.46: Instrumental trio—The Lido Trio, "Serenade" (Schubert).
8.50: Character sketch—Mr. Thomas Harris, "Ebenezer Scrooge" from "A Christmas Carol" (Dickens).
8.58: Vocal solo—Nell the Bohemian, "The World is Waiting for the Sunrise."
9.2: Weather forecast.
9.4: Relay of orchestral selections from Rialto Theatre.
9.12: Vocal—Mr. Peter Black, "Songs at the Piano."
9.17: Contralto solo—Miss N. Lingard, "Abide With Me" (Liddle).
9.21: Violin solo—Miss M. McMurtrie, "Liebstrum" (Liszt).
9.26: Baritone solos—Mr. H. Warburton, (a) "Pari Siamo" from "Rigoletto" (Verdi); (b) "Dei Viene Alla Finestra" from "Don Giovanni" (Mozart).
9.34: Character sketch—Mr. T. Harris, (a) "Major Bagstock" from "Domby and Son" (Dickens); (b) "Uriah Heap" from "David Copperfield" (Dickens).
9.48: Tenor solo—Mr. R. Peter, "Molly Braumigan" (Stanford).
9.47: Vocal solos—Nell the Bohemian, (a) "You Forget to Remember"; (b) "Hawaiian Love Songs."
9.55: Instrumental trio—The Lido Trio, (a) "Traumerel" (Schumann); (b) "Capricci" (Lemmon).
10.3: A thought.
10.5: God Save the King.

2YA WELLINGTON (420 METRES)—THURSDAY, DECEMBER 15.

- 3 p.m.: Afternoon session—Selected Studio items.
Chimes of the General Post Office clock, Wellington.
3.1: Selected gramophone items.
3.30: Lecture—Representative D.I.C., Ltd., "Fashions."
3.45: Selected gramophone items.
4.20: Lecture—Miss McKeown, of Mrs. Rolleston, Ltd., "Care of the Skin."
4.35: Relay of Manuel Hymen's Exhibition Band from the Adelphi Cabaret.
5.0: Close down.
6.0: Children's hour—Uncle Sandy and Lyall Bay School. Two-part song, Lyall Bay School, "A Madrigal of Spring" (Fletcher). Unison, Lyall Bay School, "Reveille" and recitation (Dyson). Two-part song, Lyall Bay School, "O Beautiful Violet" (Reinecke). Uncle Sandy sends birthday greetings. Two-part song, Lyall Bay School, "The Dream Seller" (Markham Lee). Songs and recitation, Lyall Bay School, old Christmas carols, "Here We Come a-Wassailing," "Good King Wenceslas," "I Saw Three Ships," "Merry, Merry Christmas Bells" (Chimes, Carol Party, Arrival of Santa Claus, Departure). Uncle Sandy, bed-time story.
7.0: News session, market reports, and sports results.
7.30: Talk—Rt. Hon. L. C. M. S. Amery, "A Message to New Zealand."
8.0: Chimes of the General Post Office clock, Wellington.
8.1: March—First Wellington Regiment Band, "Listen to the Band" (Chapman).
8.6: Vocal quartet—Apollo Four, "The Meeting of the Waters" (Kerr).
8.9: Overture—First Wellington Regiment Band, "Royal Windsor" (Greenwood).
8.16: Tenor solo—Mr. S. Duncan, "Mary of Argyle" (Nelson).
8.20: Trombone solo—Bandsman W. J. Matson, "Drinking" (Bilton).
8.27: Duet—Messrs. E. W. Robbins and Roy Dellow, "Comrade, to Arms" (Watson).
8.31: Intermezzo—The Band, "White Lillies" (Ord Hume).
8.39: Mezzo-soprano solo—Mrs. Topia Ames, "Waiata Poi" (Hill).
8.43: Euphonium solo—Corporal J. Brittain, "The Cavalier" (Sutton).

If you operate a crystal detector keep your fingers off the mineral. Handling the crystal leaves a greasy surface, spoils its sensitivity, and it is more apt to collect dust. Always use tweezers to lift a crystal.

A well-known fan remarked at the meeting of the Wellington Radio Society the other evening: "I am satisfied that nearly all the interference from howling valves one hears at night originates in home built sets."

The Melbourne "Listener In" states: "The majority of the reports of reception of inter-States with crystal receivers are freak receptions put up under conditions where results would have been astonishing on a valve receiver as well as a crystal. The majority of these reports are also from country listeners who are not troubled with interference and are able to put up aerials of length up to hundreds of feet. They hold the advantage over the suburban listener, who has to limit the size of his aerial so that he can separate the local stations."



MISS AUDREY L. PERRY.

Miss Audrey L. Perry, of Auckland, who has been well-known for some years as a very talented elocutionist, made her first public appearance at the Competitions at Hamilton in 1924, where at the age of 16 she won the senior ladies' test. Since then Miss Perry has repeated this performance at the Auckland Competitions for the last three years, capping this performance at the recent festival in Auckland by winning the championship. This year Miss Perry has also completed the Trinity College examinations, her I.T.C.I. Diploma being awarded her last June. Miss Perry will be on the air from 1YA on the 14th, as a member of the Thespians Club. Her number will be "The House with Nobody in it."

— S. P. Andrew, photo.

Home-builders should always remember that space is the best insulator for the high frequency currents used in radio. Keep the wires well apart and avoid trouble in the set.

To form a good "earth" where a waterpipe is not available, a couple of kerosene or benzine tins filled with a mixture of finely-crushed coke and calcium chloride should be buried two or three feet below the surface of the ground after they have been soldered together and the "earth" wire also soldered to one of them. The ground should afterwards be kept moist by pouring water upon it.

Some listeners wonder why the enamel on the aerial wire does not prevent the broadcast waves from reaching and travelling along the aerial. Electro-magnetic waves pass freely through all insulating substances, but once they strike an aerial they create an oscillating current in the aerial, which is then restrained by insulation.

A gas-pipe should never be used for an "earth." Owing to the number of "red-leaded" joints which usually occur in the average household gas-pipes the conductivity is poor. A more important objection is the risk of fire owing to the possibility of a heavy static charge induced in the aerial by a passing thundercloud.

Rust forming on nickel may be readily removed by first greasing the article, and, after a few days, rubbing it with a rag which has been soaked in ammonia. If the rust does not come off readily under the treatment, add a few drops of hydrochloric acid to the ammonia and rub the object well. Then rinse with water.

Home-builders should keep the wires off the base board as much as possible. Run each lead direct and short. Don't try to see how many fancy square corners you can make. Efficiency is the main rule in wiring up a set. If a particular wire can be made extremely short but does not look neat, do not mind the appearance; just make the wire as short as possible.

- 3.50: Vocal quartet—Apollo Four, "Old Farmer Buck" (Williams).
8.55: Carols—The Band, (a) "Christians, Awake" (Wainright); (b) "Adeste Fideles" (Reading); (c) "While Shepherds Watched" (Dykes).
9.0: Lecture—Mr. Arch. Sando, manager of "The Dominion," "The Romance of the Press."
9.15: Vocal quartet—Apollo Four, Swedish folk song, "Spin, Spin" (Jungst).
9.19: Mezzo-soprano solo—Mrs. Topia Ames, "My Dear Soul" (Sanderson).
9.24: Selection—First Wellington Regiment Band, "Rigoletto" (Verdi).
9.36: Baritone—Mr. S. E. Rodger, "The Devout Lover" (White).
9.41: Cornet solo—Bandsman W. Bark, "The Triplet" (Reynolds).
9.46: Bass solo—Mr. Roy Dellow, "From Oberon in Fairyland" (Slater).
9.50: Vocal quartet—Apollo Four, "Alexander" (Bridge).
9.55: March—First Wellington Regiment Band, "Medley of Famous Fragments from Rimmer's Marches" (arr. G. Hawkins).
10.0: God Save the King.

3YA CHRISTCHURCH (306 METRES)—THURSDAY, DECEMBER 15.

- 12 p.m.: Relay description of New Brighton trots.
3.0: Afternoon session—Selected Studio items.
4.30: Close down.
6.0: Children's hour—Chuckie and Chook, assisted by pupils of Madame Audibert.
7.0: Close down.
7.15: News and reports.
7.30: Rebroadcast of 2YA address by Rt. Hon. L. C. M. S. Amery.
8.0: Chimes. Relay of orchestral selections from Everybody's Picture Theatre, under the direction of Mr. Albert Bidgood.
8.15: Vocal duet, soprano and baritone—Madame Gower-Burns and Mr. Bernard Rennell, "Revenge Be Mine" (Mascagni).
8.20: Pianoforte solo—Miss Aileen Warren, "Serenade" (Schubert-Liszt).
8.25: Tenor solo—Mr. Harold Prescott, "The Poet's Song" (Puccini).
8.30: Recital—Miss Lucy Cowan, "Sherwood" (Noyes).
8.35: Vocal duet, contralto and tenor—Miss Jessie King and Mr. Harold Prescott, "Once More Returning" (Verdi).
8.40: Instrumental trio—Christchurch Broadcasting Trio, "Scherzo and Adagio, Trio in D Minor" (Arensky).
8.54: Aria—Madame Gower-Burns, "An Empress Am I" (Massene).
9.0: Relay of orchestral selections from Everybody's Theatre.
9.15: Talk—Mr. Raynor White, F.L.C.M., "Music."
9.30: Contralto solo with quartet—Miss Jessie King, "Habanera" (Bizet).
9.35: Pianoforte solos—Miss Aileen Warren, (a) "Finnish Dance" (Palmgren); (b) "Menuett Waltz" (Palmgren).
9.40: Vocal duet, soprano and tenor—Madame Gower-Burns and Mr. Harold Prescott, "Stay! Stay! Turiddu" (Mascagni).
9.45: Humorous recital—Miss Lucy Cowan, Shakespearean recital from "Twelfth Night" (Shakespeare).
9.51: Baritone solo—Mr. Bernard Rennell, "The Toreador's Song" (Bizet).
9.56: Instrumental trio—Christchurch Broadcasting Trio, (a) "Cantabile" (Widor); (b) "Bolero" (Ravina).
10.5: Quartet, soprano, contralto, tenor, bass—Madame Gower-Burns, Miss Jessie King, Messrs. H. Prescott, and B. Rennell, "What! From Vengeance Yet Restrain Me" (Donizetti).
God Save the King.

4YA DUNEDIN (463 METRES)—THURSDAY, DECEMBER 15.

- 7 p.m.: Town Hall chimes.
7.1: Request gramophone concert.
7.30: Address on League of Nations.
8.0: Town Hall chimes. Performance of Handel's oratorio, "The Messiah," by Mr. Ernest Drake and assisting artists.
8.1: Talk on "The Messiah," by Pastor W. D. More.
8.12: Recit. and air—Mr. Ernest Drake, "Comfort Ye" and "Every Valley Shall be Exalted."
Chorus—"And the Glory."
Recit. and air—Mr. J. B. MacPherson, "Thus Saith the Lord" and "But Who May Abide?"
Recit. and air—Miss Winnie McPeak, "Behold, a Virgin Shall Conceive," and "O, Thou That Tellest."
Recit.—Mr. Arthur Langley, "For Behold, Darkness Shall Cover the Earth."
Air—"The People that Walk in Darkness."
"The Pastoral Symphony" on the piano, by Mrs. Ernest Drake.
Recits.—Miss Rita Holmes, "There Were Shepherds" and "Lo, the Angel," "And the Angel Said Unto Them" and "And Suddenly There Was With the Angels."
Chorus—"Glory to God."
Air—Miss Rita Holmes, "Rejoice Greatly."
Recit. and air—Miss Winnie McPeak, "Then Shall the Eyes of the Blind be Opened" and "He Shall Feed His Flock."
Air—Miss Rita Holmes, "Come Unto Him."
Chorus—"Behold, the Lamb of God."
Air—Miss Winnie McPeak, "He Was Despised."
Recits. and airs—Mr. Ernest Drake, "Thy Rebuke Hath Broken His Heart," "Behold, and See if There be Any Sorrow," "He Was Cut Off," "But Thou Didst Not Leave His Soul in Hell."
Chorus—"Lift Up Your Eyes, O Ye Gates."
Air—Miss Rita Holmes, "How Beautiful Are Thy Feet."
Air—Mr. D. Cragie, "Why Do the Nations?"
Recit. and air—Mr. Ernest Drake, "He That Dwelleth in Heaven," "Thou Shalt Break Them."
Chorus—"Hallelujah Chorus."
Air—Miss Rita Holmes, "I Know That My Redeemer Liveth."
Recit. and air—Mr. D. Cragie, "Behold, I Tell You a Mystery" and "And the Trumpet Shall Sound."
Chorus—"Amen Chorus."

Friday, December 16th

1YA AUCKLAND (323 METRES)—FRIDAY, DECEMBER 16.

- 3 p.m.: Afternoon session—Selected Studio items.
4.0: Literary selection, by Mr. Culford Bell.
4.30: Close down.
6.0: Children's hour—Nod and Christmas sketch, by Mrs. Bell's pupils.
7.0: Close down.
7.15: Talk on "Motoring," by Mr. Geo. Campbell.
7.30: News and reports.
7.45: Close down.
8.0: Chimes. A programme of vocal and instrumental music, entirely by the blind members of the institute.
8.0: Part-song—School choir, "The Ash Grove" (Old English).
8.5: Pianoforte duet—Jos. Papesch and Stuart Gordon, "Two Spanish Dances" (Kirchner).
8.10: Band—Institute Band, "Blind Institute March" (Cater).
8.15: Relay of orchestral selections from Majestic Theatre Orchestra, under the direction of Mr. J. Whitford-Waugh.
8.25: Chorus—Six children, "The Grasshopper."
8.30: Recitation—Ray Brown, "Curiosity" (anon.).
8.34: A brief explanation of the institute's work by the director, Mr. Clutha Mackenzie.

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Programmes Continued

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- 8.44: Quartet—Institute Brass Quartet, selected.
8.49: Organ solos—Rev. E. Chitty, M.A., (a) "Toccato in the Corian Mode" (Bach); (b) "Intermezzo" (Hollins).
9.0: Weather forecast.
9.2: Pianoforte solo—Miss Lilian Martin, scenes from "The Carnival" (Schumann).
9.6: Relay of orchestral selections from Majestic Theatre.
9.16: Part-song—School choir, "Pond Lilies" (Forman).
9.21: Recitation—Robt. Martin, "The Girl and the Gloves" (Pain).
9.25: A talk on "Great Composers," by Mr. Culford Bell.
9.35: Pianoforte solos—Miss M. Bray, (a) "Elizabeth" (Parry); (b) "Horn-pipe" (Handel-Grainger).
9.40: Clarinet quartet—Institute Quartet, Handel's "Largo."
9.44: Relay of orchestral selections from Majestic Theatre.
9.49: Organ solos—Rev. E. Chitty, (a) "Rondon Caprice" (Bach); (b) "Festive March" (Smart).
9.55: Band—Institute Band, "Gay Paris" (Newton).
9.59: Closing remarks by Mr. Clutha Mackenzie.
10.4: A thought.
10.5: God Save the King.

2YA WELLINGTON (420 METRES)—FRIDAY, DECEMBER 16.

- 3 p.m.: Afternoon session—Selected Studio items.
Chimes.
3.1: Selected gramophone items.
3.30: Lecturette—Miss Marion Christian, of Wellington Gas Company, "Gas Cooking."
3.45: Selected gramophone items.
Relay of Manuel Hyman's Exhibition Band from the Adelphi Cabaret.
5.0: Close down.
6.0: Children's hour—Uncle Ernest and Hataitai School Orpheus Society. Chorus, Hataitai School Orpheus Society, "Cornelius March" (Mendelssohn). Dramatic sketch, selected. Three-part song, Hataitai School Orpheus Society, "The Streamlet" (Pattison). Uncle Ernest, birthday greetings. Solo, cousin, "School." Three-part song, Hataitai School Orpheus Society, "All Through the Night." Recitation, cousin, selected. Four-part song, Hataitai School Orpheus Society, "Old Mother Hubbard." Recitation, cousin, selected. Lecturette, cousin, "Beethoven." Pianoforte solo, cousin, "Minuet in G" (Beethoven). Three-part chorus, Hataitai School Orpheus Society, "The First Noel." Uncle Ernest, story time.
7.0: News session, market reports, and sports results.
8.0: Chimes of the General Post Office clock, Wellington.
8.1: Overture—"Semper Fidelis" (Sousa).
8.5: Quartet—The William Renshaw Quartet, "Early One Morning" (Boughton).
8.9: Italian mandolin—Mr. L. Haywood, "Peter Gink," adapted from Peer Gynt Suite" (Grieg).
8.14: Soprano solo—Mrs. Amy Dunn, "A Birthday" (Cowen).
8.19: Instrumental trio—Symons-Ellwood-Short Trio, "Finale, G Major Trio" (Beethoven).
8.29: Bass solo—Mr. Thomas C. Wood, "Jonathan Jones" (Slater).
8.34: Flocution—Miss Violet Wilson, "Fairy Tales" (Ogilvie).
8.40: Contralto solo—Miss Nora Greene, "When All Was Young" from "Faust" (Gounod).
8.44: Cornet solo—Mr. Thomas Goodall, "Carnival de Venice" (Briccialdi).
8.51: Tenor solos—Mr. William Renshaw, (a) "Her Fragrant Hair" (Oliver); (b) "The Flirt" (Oliver).
8.55: Flute solo—Mr. W. J. Tasker, "Spring Tide" (Forman).
8.58: Weather forecast.
8.59: Lecturette—Editor-Announcer, "Foreign Affairs."
9.13: Italian mandolin—Mr. L. Haywood, "Two Little Blue Birds" (Kern).
9.17: Bass solo—Mr. Thomas C. Wood, "All Through the Night" (old Welsh).
9.20: Instrumental trio—Symons-Ellwood-Short Trio, "Slow Movement Trio in F" (Saint-Saens).
9.30: Soprano solo—Mrs. Amy Dunn, "Vorre" (Tosti).
9.34: Pianoforte solo—Mr. Gordon Short, "The Rivulet" (Saner).
9.38: Vocal duet—Mr. Wm. Renshaw and Mr. Thomas C. Wood, "In this Solemn Hour" from "La Forza Del Destino" (Verdi).
9.42: Flute solo—Mr. W. J. Tasker, "Berceuse, Op. 30, No. 2" (Hohler).
9.46: Contralto solo—Miss Nora Greene, "The Fortune Hunter" (Willoughby).
9.49: Cornet solo—Mr. Thomas Goodall, "Island Emperor."
9.53: Tenor solo—Mr. Wm. Renshaw, "Your Song" (Oliver).
9.56: Humour—Miss Violet Wilson, "Mrs. Arris on the Farm."
9.59: Quartet—The Wm. Renshaw Quartet, "Good Night, Good Night, Beloved" (Pinsuti).

3YA CHRISTCHURCH (306 METRES)—FRIDAY, DECEMBER 16.

(Anniversary Day.)

- 3 p.m.: Afternoon session—Selected Studio items.
4.30: Close down.
6.0: Children's hour—Big Brother, together with a company of Girl Guides in Guide camp fire songs, choruses, and instrumental items.
7.0: Close down.
7.15: News and reports.
7.30: Talk—Mr. J. D. Baybutt, physical training instructor, St. Andrew's College, on "Physical Culture."
8.0: Chimes. Relay of orchestral selections from Liberty Picture Theatre Orchestra, under the direction of Mr. Ernest Jamieson.
8.15: Opening talk—Mr. A. D. Dobson, member of executive of Canterbury Pilgrims' Association, "Reminiscences of Early Canterbury and Early Surveyors."
8.30: Tenor solo—Mr. Russell Sumner, "There's a Land, a Dear Land" (Allitsen).
8.34: Recital—Mr. Alex. Johnson, "The Pioneers" (Wall).
8.38: Hawaiian string trios—Miss Elaine Moody's Hawaiian Trio, (a) "Dreamy Nights in Honolulu" (Hampton); (b) "Hawaii, I Am Lonesome For You" (Squire).
8.44: Bass solo—Mr. T. D. Williams, "Land of Hope and Glory" (with chorus), (Elgar).
8.48: Instrumental trio—Christchurch Broadcasting Trio, "Allegro Non Troppo, Trio in D Minor" (Arensky).
8.58: Soprano solo and chorus—Misses Frances Hamerton, L.A.B., and Belle Renaut, Messrs. Sumner and Williams, "In the Gypsies' Life You Read" from "Bohemian Girl" (Balfé).
9.2: Relay of orchestral selections from Liberty Theatre.
9.15: Contralto solo—Miss Belle Renaut, "All Through the Night" (Welsh traditional).
9.18: Violin solos—Miss Irene Morris (a) "Swing Song" (Barns); (b) "Serenade" (Barns).
9.24: Happy songs—Mr. Cheslyn O'Connor, (a) "Just a Bird's Eye View" (Donaldson); (b) "Then I'll Be Happy" (Friend).
9.30: Soprano solo—Miss Frances Hamerton, L.A.B., "I Dream That I Dwelt in Marble Halls" from "Bohemian Girl" (Balfé).
9.33: Recital—Mr. Alex. Johnson, "Night Watch on the Charlotte Jane (1853)" (M.S.).
9.37: Bass solo—Mr. T. D. Williams, "The Heart Bowed Down" from "Bohemian Girl" (Balfé).
9.40: Hawaiian string trios—Miss Elaine Moody's Hawaiian Trio, (a) "Honolulu Sunshine" (Squires-Ross); (b) "Hilo March."
9.46: Tenor solo—Mr. Russell Sumner, "The Fair Land of Poland" from "Bohemian Girl" (Balfé).
9.50: Instrumental trios—Christchurch Broadcasting Trio, (a) "Valse" (Rebikov); (b) "Minuet in G" (Beethoven); (c) "Serenata" (Moscowski).
10.0: Happy song—Mr. Cheslyn O'Connor, "Where'd You Get Those Eyes" (Donaldson).
10.3: Violin solo—Miss Irene Morris, "Mazurka" (Sitt).
10.7: Soprano solo and chorus—Miss Frances Hamerton, "Home, Sweet Home" (Bishop).
10.11: Vocal quartet—Misses Hamerton and Renaut and Messrs. Sumner and Williams, (a) "Summer Wind" (Cruikshank); (b) "Evening" (Cruikshank).
God Save the King.

4YA DUNEDIN (463 METRES)—FRIDAY, DECEMBER 16.

- 3 p.m.: Town Hall chimes.
3.1: His Master's Voice recital.
3.15: Talk by Miss Sprosten, of the D.I.C., "Good Taste in Dress."
3.45: Relay of instrumental music from the Savoy.
4.0: Studio music.
4.30: Close down.
6.0: Town Hall chimes. Children's hour—Big Brother Bill. All about Christmas. The Girl Citizens' Club will sing the following carols:—

A good, long, well-insulated indoor aerial is better for long-distance reception than an indoor loop aerial. Neither of these, however, can compare with even a poor outdoor aerial.

A first-rate aerial should be about 40 feet above all objects and about 145 feet in length, including the lead-in. This is a fairly long aerial and not likely to be selective, but it will serve splendidly for reaching out for the Australian broadcast stations.

Radio valves are a delicate mechanism. Handle them gently and do not jar them by dumping your receiving set down on the table. A little care and with nightly use your valves will give efficient reception for upwards of a year, and even two years.

If you must use an indoor aerial wound around the walls of your room see that the aerial is enamelled or otherwise insulated. There are heavy leakages when an uninsulated wire is used for this purpose.

Keep all batteries out of the sun, for a high temperature is bad for all types of batteries, wet or dry. If your batteries are near a window and the sunshine falls on them, cover them up with a newspaper, or, better still, an old cloth.

If 250,000,000 atoms of copper or gold were lined up in a row, like marbles, just touching each other, the row would be only an inch in length. But an electron, which is a small atom of electricity, has a diameter of probably only one hundred-thousandth of that of an atom.

Resistance is the opposition to the flow of an electric current through a conducting medium. All metals have more or less electrical resistance. Copper is used universally for both electrical and radio work on account of its low resistance, comparatively low cost and ready supply.

If a T shaped aerial is used the lead-in should be attached to the very centre of the aerial, otherwise the aerial will consist of two unequal parts, each with its own wave-length. In the latter case anything like sharp tuning will be impossible, since the two sets of oscillations will fight each other.

When a battery is said to be suffering from sulphation, it means that the plates have become coated in places with an insoluble deposit (basic lead sulphate) which reduces their active surfaces. Sulphation is caused through neglect; a battery should not be left long in a discharged condition, but it should be recharged as soon as possible at the correct charging rate.

If the natural wavelength of an aerial is 400 metres and it is desired to receive waves of about 300 metres, the natural wavelength of the aerial has to be artificially reduced by the use of a small series condenser, which appreciably lessens the efficiency. In practice the best possible results are obtained when the natural wavelength of the aerial is from two-thirds to three-quarters the wavelength which it is desired to receive.

Some home-builders like to put lettering on the front panels of their sets. The surface of the panel should first be cleaned with wood alcohol to remove any film of grease. The lettering can then be put on the panel with a steel pen and draftsmen's white ink. When the lettering is dry it should be covered with a protective coat of transparent varnish, using a fine camel's hair brush. A rag dampened in wood alcohol will remove the lettering at any time.

If an audio amplifying valve persists in howling, try attaching a wire from the negative terminal of the "A" battery to the earth post of the set. If the howling continues, try earthing the iron core of the audio transformers by attaching a wire to the core and bringing it to the earth terminal of the set. Use insulated wire for this purpose to avoid the risk of a short-circuit.

The audio frequency transformers should be placed about four inches apart, and mounted with the windings at right angles to each other. Make the grid and plate wires as short as possible, and keep them apart. See that no wires are running too close or parallel. Try connecting the cores of the audio frequency transformers to the ground binding post.

Many of the noises in a radio set can be traced to the batteries. Because these noises resemble static it is seldom that any other source for them is thought of. Poor or dirty battery connections cause more "static" than any other one fault. "A" battery connections should be made by means of a clip which can be made to grip the terminals of the battery. It is preferable that the "B" battery connections also be made by means of a smaller clip than used on the storage battery; these clips should have a very strong gripping power.

Never use old scraps of wire to connect up the "A" or the "B" battery to the set, or either the input or output circuits of the "B" eliminator. If a short-circuit should occur, you may find some damaged apparatus, a badly run-down battery, or even a fire started by the heat generated at the short-circuit. Buy good, heavily-insulated wire and, if a break in the insulation should occur, replace the entire wire. Do not attempt to splice in another short piece, as you will probably only run into more trouble.

(a) "Holy Night," (b) "As With Gladness," (c) "While Shepherds Watched," (d) "Good King Wenceslas," (e) "Angels from the Realms of Glory," (f) "Thou Didst Leave Thy Throne."

- 7.0: Close down.
7.15: News session.
7.30: Book talk, by Mr. H. Greenwood, of the Athenaeum.
8.0: Town Hall chimes.
8.1: Quartet—The Radio Four, "Good Night, Good Night, Beloved" (Pinsuti).
8.5: Tenor solos—Mr. Les. Dalley, (a) "I Hear a Thrush at Eve" (Cadman); (b) "In a Little Spanish Town."
8.13: Pianoforte solo—Miss Marjorie McDowell, "Hexentanz" (McDowell).
8.17: Recital—Miss Anita Winkel, "The Fool" (Service).
8.21: Quartet—The Radio Four, "An Erisky Love Lilt" (Fraser).
8.25: Soprano solos—Miss Roma Buss, (a) "Dawn" (Curran); (b) "Homing" (Del Riego).
8.32: Pianoforte solo—Miss Marjorie McDowell, "Concert Study" (McDowell).
8.36: Recital—Miss Anita Winkel, "Having It Out."
8.39: Quartet—The Radio Four, "In This Hour of Softened Splendour" (Pinsuti).
8.43: Bass solos—Mr. J. B. MacPherson, (a) "On a January Morning" from "Tom Jones" (German); (b) "Oberon in Fairyland" (Slater).
8.51: Pianoforte solo—Miss Marjorie McDowell, "Sonata, Op. 7" (Beethoven).
8.59: Recital—Miss Anita Winkel, "Listening-In."
9.3: Vocal duet—Miss Roma Buss and Les. Dalley, "Miserere Scene" from "Il Trovatore" (Verdi).
9.8: Mezzo-soprano solos—Miss Mollie Andrews, (a) "One Fine Day" from "Madame Butterfly" (Puccini); (b) "Nymphs and Shepherds" (Purcell).
9.16: Relay of dance music from the Savoy.
10.0: Close down.

Saturday December 17th

1YA AUCKLAND (333 METRES)—SATURDAY, DECEMBER 17.

- 3 p.m.: Afternoon session—Selected Studio items.
4.0: Literary selection, by Mr. Culford Bell.
4.30: Close down.
6.0: Children's hour—Cinderella and pupils of Miss Blamires.
7.0: Close down.
3 p.m.: Afternoon session—Selected Studio items.
7.45: Close down.
8.0: Chimes. Relay of municipal organ recital from Town Hall. Mr. Maughan Barnett, organist.
9.30: Relay of dance music from Dixieland Cabaret, by the Internationals, under the conductorship of Mr. Clyde Howley.
11.0: A thought.
11.1: God Save the King.

2YA WELLINGTON (420 METRES)—SATURDAY, DECEMBER 17.

- 3 p.m.: Afternoon session—Selected Studio items.
Chimes of the General Post Office clock, Wellington.
3.1: Selected gramophone items.
3.30: Available sports results.
3.33: Relay of Manuel Hyman's Exhibition Band from the Adelphi Cabaret. Selected gramophone items.
5.0: Close down.
6.0: Children's hour—Aunt Gwen and cousins. Pianoforte duet, cousins Joan and Nancy, "March Militaire" (Schubert). Sketch, cousins, Marie, Alison, Ina, and Gwen, "Fairies and Puck" (Shakespeare). Songs, cousin Zena (a), "The First Spring Day," (b) "Roses for You" (Drummond). Recitation, Cousin Sybil, "In the Days of La Fayette." Recitation, Cousin Stella, "The Doll's Wooing" (Field). Song, Cousin Eliot, "Crying for the Moon" (Dickson). Aunt Gwen sends birthday greetings. Song, Cousin Guy, "Advice" (Barrie). Recitation, Cousin Evelyn, (a) "Napoleon at Marengo." Recitation, Cousin Miriam, "Matilda" (Belloc). Song, Cousin Guy, "The Birds Go North Again" (Willeby). Recitation, Cousin Eliot, "Vespers" (Milne). Violin solo, Gordon Nash, selected. Aunt Gwen, story time.
7.0: News session, market reports, and sports results.
8.0: Chimes of the General Post Office clock, Wellington.
8.1: Relay of the Terrace Congregational Church augmented choir's performance of Handel's "Messiah." Musical director, Mr. Len. Barnes. Soloists: Soprano, Mrs. Alice Harris; contralto, Miss Lily Mackie; tenor, Mr. Arthur Coe; baritone, Mr. Ray Kemp. Organist, Mr. Harry Brusey.

3YA CHRISTCHURCH (306 METRES)—SATURDAY, DECEMBER 17.

- 12 p.m.: Relay description of New Brighton trots.
6.0: Children's hour—Uncle Sam and Aunt May.
7.15: News and reports.
7.30: Sports results, etc.
8.0: Chimes. Relay of orchestral selections from Crystal Palace Picture Theatre Orchestra, under the direction of Mr. A. J. Bunz.
8.15: Bass solo—Mr. W. Inkster, "The Mighty Deep" (Jude).
8.19: Song with ukulele—Mr. Roy August, "Mary Lou" (Wagner).
8.25: Soprano and tenor duet—Miss Mabel Thomas and Mr. David McGill, "Parigi o Cara" from "La Traviata" (Verdi).
8.31: Instrumental trios—Christchurch Broadcasting Trio, (a) "Serenata" (Toselli); (b) "Third Movement" from "Trio in F" (Godard).
8.39: Humour and song at the piano—Mr. Jock Lockhart, "She's Mine, All Mine" (Albert).
8.42: Soprano solo—Miss Mabel Thomas, "I Hear a Thrush at Eve" (Cadman).
8.45: Improvisations on piano—Mr. Ivan Perrin, (a) "Improvisation" in "B Flat Minor" (M.S.); (b) "Oh! Miss Hannah" (M.S.).
8.50: Bass solos—Mr. W. H. Inkster, (a) "Vale" (Russell); (b) "Forever and Forever" (Tosti).
8.55: English concertina duets, Frances and Master Theo. Gunther, (a) "Sweet Chiming Bells" (M.S.); (b) "Napoleon's Last Charge" (M.S.).
9.0: Relay of orchestral selections from Crystal Palace Theatre.
9.15: Songs with ukulele—Mr. Roy August, (a) "Meadow Lark" (Fiorito); (b) "You Don't Like It, Not Much" (Kahn).
9.21: Tenor solo—Mr. David McGill, "Thank God for a Garden" (Del Riego).
9.25: Relay of dance music from Dixieland Cabaret (by permission of Mr. J. Dickson). Music by Les. Marston's Dance Orchestra.
9.40: Soprano and tenor duet—Miss Mabel Thomas and Mr. David McGill, "O! Lovely Night" (Ronald).
9.44: Instrumental trios—Christchurch Broadcasting Trio, (a) "Swedish Folk Song, No. 2" (Svendsen); (b) "Angels Guard Thee" (Godard).
9.52: Tenor solo—Mr. David McGill, "Who Knows?" (Ball).
9.55: Pianoforte novelty turns—Mr. Ivan Perrin, musical switches of popular songs, extemporisations of "Moonbeams," Kiss Her For Me," and popular airs (M.S.).
10.2: English concertina duet—Frances and Master Theo. Gunther, "Norwegian Cradle Song" (M.S.).
10.6: Soprano solo—Miss Mabel Thomas, "Roberto O Tu Che Adoro" from "Roberto H Diavolo" (Meyerbeer).
10.11: Humorous Scotch song at the piano—Mr. Jock Lockhart, "It's Nicer to Lie in Bed" (Lauder).
10.15: Instrumental trios—Christchurch Broadcasting Trio, (a) "Reverie" (Ganne); (b) "Intermezzo" (Mascagni); (c) "Valse Song" (Gounod).
God Save the King.

4YA DUNEDIN (463 METRES)—SATURDAY, DECEMBER 17.

- 7.15 p.m.: News session.
7.30: Address by Miss M. Puechegud, on "Interior Decoration."
8.0: Town Hall chimes.
8.1: Orchestral music, conducted by Mr. Chas. Parnell, relayed from the Empire Theatre.
8.11: Bass solos—Mr. E. G. Bond, (a) "Hybrias the Cretan" (Elliott); (b) "King Charles" (White).
8.18: Violin solo—Mr. A. Watson, "Valse" (Bohm).
8.23: Cornet solo—Mr. George Christie, "Allegro Symphonique" (Jenkins).
8.25: Soprano solos—Miss Florence Sumner, (a) "Homing" (Del Riego); (b) "Spring Song" (Parry).
8.31: Flute solo—Mr. A. Levi, "Sonata in C Major" (Bach).
8.40: Baritone solo—Mr. Arthur Lungley, "Trade Winds" (Keel).
8.44: Violin solo—Mr. A. Watson, "Ave Maria" (Kahn).
8.49: Contralto solos—Miss Irene Horniblow, (a) "Life and Death" (Coleridge Taylor); (b) "All Through the Night" (Welsh traditional).

(Continued on Page 14.)

Mainly about Construction

BY "MEGOHM"

MAKE YOUR OWN FIXED CONDENSERS

A COMPLETE SCHEME FOR CONSTRUCTORS

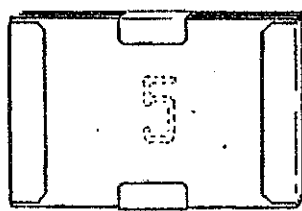
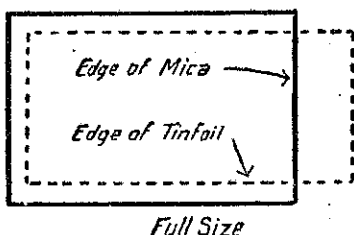
With a set of fixed condensers made on the plan set out below, it is possible with a certain amount of trial, to get the best possible tone from the audio side of a receiving set, and those who have constructed the Browning Drake four-valver are advised to give this idea a full trial, when previous results will in very many cases be improved upon. The owner of a set of condensers need not be greatly concerned as to the exact value of any of them, so long as he has tried several, and found a particular one to give the best results. "Megohm" commenced making fixed condensers on this plan five years ago, and has used them with success ever since. For experimental work they must be both durable and capable of being quickly changed.

Mica is usually rather scarce in New Zealand, and most listeners will be obliged to take what they can get, and quite likely many will have to split up a thick piece. This is easily done by inserting a sharp knife-blade at one corner, and running it round until a layer splits off. These layers should not be made too thin and "papery," but should have the stiffness of, say, a visiting card, with rather less thickness. All should be made as nearly the same thickness as possible, but double thickness is advisable for outside plates.

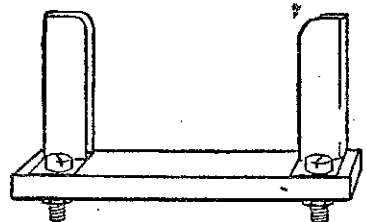
The standard size of mica adopted for the plates is 1 1/4 in. by 1 in., and the tinfoil to be used is to be cut into slips 0.8 in. wide and 1.7 in. long. These are shown exact size in the diagram. A piece of tinfoil is attached to each thin piece of mica in the position shown, projecting at one end, shellac dissolved in methylated spirits being used to stick the tinfoil to the mica. Any number of plates can now be put together, each one stuck to the next with shellac, and the projecting tinfoil placed at each end alternately. A piece of the thicker mica is placed on each side of the assembled plates, and the whole put under a weight of two or three pounds to set.

End clips are made from very thin copper sheet cut 0.4 in. by 0.9 in., as shown, and folded in two over an edge of suitable thickness. The projecting tinfoils are now turned over on one side at each end to lay on the outside plate. Then a small quantity of fish glue or seccotine is put on each end of the other outside plate and a copper clip pushed carefully on each end and nipped close with pliers. In order to keep the condenser as solid as possible, smaller clips can be put on the sides in the same way. One of the outside plates should be num-

bered in reverse with white or other paint, showing the number of tinfoil plates. This number is then placed inwards, and will show through the mica, and never rub off. There is such variation in the thickness of mica whether bought ready or split at home that it is impossible to give



Showing Plates Assembled Alternately



capacities with any accuracy, but, roughly, an average two plates may be about .00025 mfd. Experimenters will require a few capacities smaller than two plates. Two tinfoils 0.6 in. wide will give a 1 1/2 plate; two 0.5 wide, a 1 plate; two 0.2 wide, a half plate, and so on.

It should be noted that good, transparent mica with a ruby tinge should be procured if possible, as quality is (Continued in Next Column.)

"Record" Short-Wave Set

(Continued from Cover.)

cycle enamel, and backed with three-ply, the secondary condenser dial is at the left, and lower down is the aerial coil control to alter the coupling. Near the centre is the reaction condenser dial, then the detector rheostat, and at the extreme right two switches, one above the other, for A and B current. The switches are handy, especially the B, as it allows of high-tension being quickly cut off before raising the shield to change coils. The shield is designed to lift up quite easily, hinging on the back lower edge. Four sets of coils, each set plugging in at one operation, cover the short-wave band at present in use. To give the shielding full effect, all leads between batteries and the set must also be shielded, but this is done in a simple way that will be described. For this reason connections to the set are made without the orthodox array of terminals lined up on a strip at the rear. The battery leads all leave the set through the bottom shield, and form one cable to the box containing all batteries, A, B, and C. It is important that all components be spaced out on the base in exactly the position shown, exact measurements being worked off with the accompanying scale. No earth connection is made to the set, but A positive must be connected to the front panel and bottom shield.

The Tuning Coils.

The aerial coil of three turns is permanent, and is three inches in diameter, wound with its own space of 18's between each turn. Celluloid strips are put on inside and outside in three places, and fixed with cement made by dissolving chips of celluloid in liquid acetone. The coil is bolted by its ends to two bolts in a piece of ebonite 2 by 1 5/8 inches, and the lower edge of this is screwed to a flat on a 3/8ths dowel stick, that acts as a spindle to move the coil backwards and forwards. A light piece of flex is attached to each end of the coil; one of these goes to the aerial terminal, the other to moving plates of secondary condenser.

There are four secondary coils, 3 inches in diameter, each a separate slip of ebonite, and each having attached an appropriate tickler of slightly smaller diameter, and 22's enamelled wire. The aerial and secondary coils are made from 18's bare tinned wire, specially suitable, as the tinning prevents corrosion of the surface. The ebonite mounting strips are 3/4 by 1 inch, and the piece supporting the aerial coil is 1 1/4 wide by 1 5/8 high. (To be continued.)

[CONDENSORS CONTINUED]

just as important in these small accessories as elsewhere.

When you have cut sufficient 14 by 1 pieces to make one-tenth inch thickness, measure them against a measure and you will then get the average thickness from the following table:—

No.	Thickness.
20	.005in.
25	.004in.
33	.003in.
50	.002in.

Clips to hold the condenser are shown full size in the diagram. These are made from 28's hard sheet brass cut as shown, bent up, and bolted to a slip of ebonite 1 1/4 in. long by 1 in. wide. When experimenting, several condensers may be put together and held against the outside of the clips by a small rubber band passed round the lot. Instead of cutting away the square corner of clip it could be bent up along A and a depression made to hold a grid leak or resistance.

Good values to make besides those less than one plate are 1, 2, 3, 4, 5, 6, 8, 10, 12, 16 plates.

Next week will be described a simple method of finding the capacity of the condensers after they are completed, which is the only satisfactory way of determining value.

Recently it was stated, in answer to a correspondent, that at a temperature of 70 degrees Fahrenheit the rectifying properties of a chemical rectifier are impaired. Some authorities place the figure fairly low, but 120 degrees Fahrenheit, or 50 centigrade, is often stated as a limit. The larger the amount of current passed, the sooner will over-heating occur.

"HEAR HERE!"
STIRTON'S
Music and Radio Store.
PETONE.

HUTT VALLEY AGENTS FOR:
CROSLY AND C. AND B.
BROWNING DRAKE SETS.
SERVICE AND SATISFACTION
GUARANTEED.

ANSWERS TO CORRESPONDENTS.

(By Megohm.)

Browning-Drake.

R.J. (Wellington) had a B.D. with close-wound coils, and was unable to tune out 2YA. He has wound low-loss coils and made improvements according to specifications, and can now tune in either 1YA or 3YA while 2YA is on the air, without a trace of the latter, and without a wave-trap. This indicates that good workmanship has been put in, and also shows clearly how owners of unselective sets can greatly improve them. The writer wishes to give the article you mention at an early date.

A South Canterbury reader, noticing that a northern reader intends using 199 valves all through his set, states that, in his experience, he finds that there is a marked falling-off if a voltage below 60 is used for the detector. He also finds that a total voltage of about 120 gives best results. This reader also recommends numbering the valves and changing them round, say, once a fortnight, so that each valve gets its turn in the easy positions, thus all retain sensitivity much longer.

J.T. (South Canterbury).—It is probably high capacity in the R.F. valve that prevents you from tuning below 20 degrees. Yes, some wonderful results were obtained with the high-priced valves of a few years ago.

A.P. (Invercargill).—Your B.D. should be very selective if made according to specifications. Reduce the small aerial condenser for greater selectivity, and increase height of aerial if possible. Noises may be caused by bad contacts, loose connections, faulty B accumulator, or leak-

ages across same, faulty fixed condensers, or from nearby power mains, or many other causes, but you do not say enough to enable it to be located.

Installing a Set.

A.M. (Rangiora).—Your proposed aerial would be very good, and the full 200 feet would be worth trying, as the height will make up for any small loss of selectivity. A strong aerial wire and stays to the poles will be required. No wave-trap should be necessary if your receiver is "selective." As you are so far away from a charging centre, get the dealer to supply valves of low current consumption, so that the A battery will not need frequent charging. It is not the purpose of this column to recommend particular makes of receivers. A good four-valve set will get all that you require for entertainment, New Zealand and Australian main stations on loud-speaker, or the latter sometimes on headphones.

Charging With Daniell Cells.

Correspondents are asking if the Daniell cell system will keep charged 40 and 80-amp. hour accumulators. It is clearly stated in the article that the output is limited, and, though it would charge up the small Exide cells, it should not be expected to do more. Then there is the question of consumption, which must be strictly limited to half-amp., which means that valves must be carefully chosen to suit.

Plate Current of Valves.

"Rongotai" (Wellington).—Certainly a UX112 power valve will require (Continued Next Page.)

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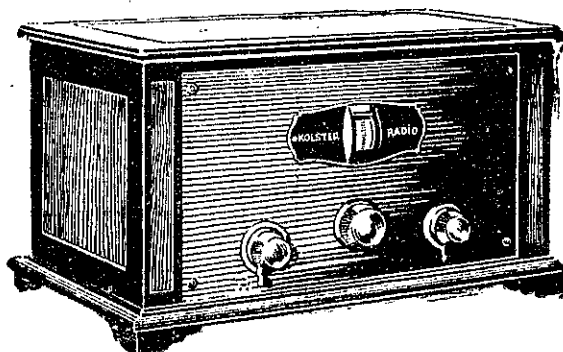
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P

ROCKING further with the question of the supply of power for radio receiving sets of the multi-valve type, one of the most talked about and most interesting questions automatically comes up for review. That is the question of the elimination of all batteries and the provision of apparatus capable of supplying the radio set direct from the power mains.

To the lay mind it undoubtedly seems an extraordinary state of affairs that, with power to burn (in every sense of the word) in a house, the householder has to invest a comparatively large sum of money in purchasing batteries for providing more power to run his radio set. The bold statement that the house supply mains do not supply the correct kind of current is an unsatisfactory statement to many of an inquiring turn of mind, and a salesman is frequently called upon by prospective purchasers to justify his statements concerning his inability to supply moderately priced equipment to plug straight into the light or power socket.

THE PRODUCTION OF SOUND WAVES.

Briefly, radio signals are made audible by virtue of electrical effects induced in the antenna system being amplified and then "detected," amplified again, and then passed through head telephones or loudspeaker, where they become audible as sound waves. The sound waves are set up in the air by the movement of a metal diaphragm, and this is caused to move by being attracted in a greater or lesser degree towards a magnet, whose strength is varied in proportion to the amount of current arriving from the radio set. It thus follows that the greater the movement the greater the volume of sound. The greater movements of the diaphragm do not depend however, on a large volume of current arriving from the radio set, but depend on greater "variations" of current to cause large variations in the diaphragm. A large volume of current could thus be passed through the sound reproducer without any sound resulting at all, providing the current remained constant in volume or was at a continuous pressure. Immediately the pressure or volume is varied, the diaphragm commences to vary its position and disturb the air, thus affecting the human ear by setting up air waves.

Notes for Beginners:

By M. I. R. E.

Batteries and Power Supply Explained

MAIN CURRENT UNSUITABLE.

While no signals are passing through a radio set, therefore the speaker should be quite silent. This would not happen if power were taken from the light or power mains, because this type of current is not continuous, but is alternating in pressure fifty times every second, and if such power were used it would set up a very loud, low-pitched note having a periodicity of the before mentioned figure. In the city of Auckland, direct or continuous current is used for power supply by this term as applied to its actual continuity is purely a relative one. For power or lighting purposes, it certainly is "continuous" enough, but not for radio, because it is full of irregularities which are quite insufficient to make a lamp flicker, for instance, but are so tangible to the hearing when produced in a loudspeaker that the required signals are entirely blotted out. Equipment has been procurable for some time which will smooth out these irregularities, but great care must be exercised in the purchasing of D.C. (direct current) battery eliminators, or "Socket Powers," and a guarantee should be forthcoming from the dealer who is supplying, that the outfit meets the regulations of the Public Works Department, as well as those drawn up by the Fire Underwriters, because some of them are dangerous. Where the design is an approved one, there is no more to be feared from them than any other domestic appliance.

Where AC (alternating current) is used, the problem becomes a more complex one because this type of current does what its name suggests, and that is, alternates in direction, thus making it definitely discontinuous, because it has to rise to its full pressure from zero in one direction, and then fall to zero before it can reverse to rise to its maximum in the other direction. Consequently two operations have to be performed to make such current supply a radio set. First, the current flowing in the wrong direction must be reversed, and second the gaps existing in the supply filled in.

From the foregoing it will be seen that an outfit capable of delivering current

from the supply mains to the radio set carries out no unimportant or mean performance, and to do it reliably and efficiently, the purchaser must realise that he is in the same position as the prospective purchaser of a receiver, and that is that he must only purchase products turned out by makers who are known to be reliable, and he should only purchase through a dealer who is prepared to guarantee his apparatus against mechanical defect for a reasonable period.

Research is concentrated on this problem of finding an economical method of supplying power supply for radio sets cheaply and reliably, and the problem so far as the "B" battery eliminator is concerned, may be reckoned to have been solved. Up till a year ago the factor of obsolescence had to be considered, but that day has passed, and although many important improvements of methods and design will materialise, the eliminator is here to-day in a form which is thoroughly efficient and well worthy of the attention of the set owner or purchaser who is sick of, or doesn't want to be loaded with, the queer tricks which a radio set gets up to when attached to run-down batteries.

SPECIALY-DESIGNED RECEIVERS

Owners of multivalve sets (meaning from 3 valves upwards) are strongly recommended to discuss the question of quitting their batteries with a radio dealer, and adopt the eliminator or socket power. Specially-designed receivers definitely modelled for use with A.C. mains supply are being talked about, and are certainly due for production. In fact, there are one or two types already available on the market. It may be safely said that the orthodox style of receiver with standard designs of socket powers show all the features necessary to convince those interested that this new design exhibits nothing in the way of an improvement. It certainly demonstrates another way of arriving at the same result, but incidentally does it without any lessening of apparatus or cost. Un-

questionably interesting developments will take place along these lines in years to come, but revolutionary improvements will have to show up to warrant a swing-over from existing ideas.

The real problem in the supply of power for radio sets is the question of A supply for the filaments. For technical reasons it is impossible to apply the same principles of obtaining "B" power. The method of smoothing and filling-in the irregularities of the current will not work in this case owing to the low pressure and large volume required demanding a design of smoothing apparatus which would be of such mechanical proportions as to be impracticable of adoption.

THE "TRICKLE-CHARGER."

The popular method of solving this problem to date has been the adoption of a combination of what has become generally known as a "trickle-charger" and an accumulator battery. The term "trickle" is descriptive enough to convey a meaning of its method of performance without further detail. When the receiver is in action, the battery is supplying power, but when the receiver is switched off the battery is taking a very small charge continuously from the mains, and the rate of charge is designed to replace in the battery what the receiver absorbs with average usage. To all intents and purposes this is a complete solution of the problem because except for a periodical examination of the battery, the owner can forget his battery troubles and sympathise with his less fortunate neighbour, who may be seen making heavy weather once a fortnight towards the nearest charging station, and alternately getting a heavy list to port or starboard, according to his changing over his accumulator from his left to right hand as his arm tires.

From the point of view of economy of initial outlay, the trickle-charger and battery combination is going to be the most popular design for many a long day to come. The same com-

bination in its more flexible design, as described before, in the shape of a straight-out accumulator of standard design, with a charger capable of putting a charge of considerable, but regulable, size into the battery, is undoubtedly the best from point of view of ultimate life of battery. This is unquestionably the opinion of those who understand battery maintenance, but the results are dependent on the user keeping the battery in a charged condition, and not permitting it to be run right down. With the trickle-charger the capacity of the battery is usually low, and if unusual demands are made on the receiver by, leaving it inadvertently, switched on, or by continuous running for any legitimate reason, then the output may exceed the input, and the receiver will just simply go out of commission pending a supply slowly building up again in the battery. Good types of trickle-chargers have means for adjusting the charging rate, and under such circumstances the battery should stand up to its overload.

It will be appreciated that, from the point of view of minimum amount of worry, the A eliminator, or socket power, of the trickle-charge design is certainly the best offering at present.

THE PROBLEM OF "A" POWER.

It was mentioned previously that developments were in train which were designed to produce a special type of receiver, adaptable to consumption of energy from A.C. power mains. As was also stated before, no very marked improvement was likely to result from such developments unless revolutionary discoveries were made. The same may be said to apply to a similar application of principles to the furnishing of A power. In order to apply these principles at all, the orthodox method of assembling the filament supply circuits has had to be altered, thus rendering this class of supply apparatus useless for standard machines. Furthermore, special valves have to be used.

These remarks should not be interpreted as in any way condemnatory. The new system will find its own place. If it is not a success, then the place it will find will be the same as many anti-static inventions of the past, and that is oblivion. The systems in general vogue to-day are tried and true, and guarantees of success and service may, therefore, be made and received with mutual good-will.

Mainly About Construction

(Continued from Previous Page.)

more plate current at a given voltage than will a 201A. The difference is as follows, correct grid bias being shown in parentheses:—At a high-tension voltage of 135 (9) the plate current of 201A is 2.5 milliamps, and at 90 (4½), 2 milliamps. With a voltage of 135 (9) the UX112 takes 6 milliamps, and at 90 (6) the plate current is 2.5 milliamps. It is thus seen that if the high-tension voltage is kept down the difference is not great, but it would not be worth while to run a power valve at less than 90 volts, because it would not be running under advantageous conditions. It would pay you to discard dry B batteries, as you could either charge an accumulator or run an eliminator from the mains. Then you may put 150 volts on the plate of UX112, with a grid bias of 10 volts.

Crystal Queries.

J.B. (Kilbirnie).—The "Record" crystal set is described in the issue of August 19.

W.H.P.—It is not feasible to use more than two carborundum detectors in one set, and then only by a special dual arrangement.

H.M.J. (Main Trunk).—The grid and plate of each PM4 are connected together for rectifying purposes in the B eliminator.

CRYSTAL JOTTINGS

The microphone bar amplifier is not used as much as it might be, but in many cases it will give good amplification and better tone than a low-priced two-valve amplifier when added to a crystal. The first cost of the bar amplifier is low compared with a two-valve amplifier, and the running cost is very much less.

In crystal rectification the current passes from the cat's-whisker to the crystal. The principle of rectification allows very little current to pass in the opposite direction. It is always worth while to try reversing your crystal connections so that current flows in the opposite direction, as it is frequently found that results are better with the current passing through the circuit in one direction than in the other.

Zincite crystals are both natural and artificial. For some time they have been manufactured as "synthetic" zincite, and give results equal to the natural variety. The synthetic crystals are hard, and not brittle, and may be used as oscillating or amplifying crystals. They are made by heating in a furnace ordinary "zinc white,"

such as is used in paint, with or without a trace of manganese dioxide. A cherry-red heat produces a yellow-looking, glassy mass, and when this is carefully broken and tested much of it will be found to be very sensitive to radio signals.

Carborundum is carbide of silicon, and is manufactured by fusing a mixture of fine sand and coke in an electric furnace. This crystal is not attacked by acids of any kind. If purchased unmounted, the light steel-blue variety is best for wireless reception.

Where selectivity is required in a crystal set, loose-coupled tuning should be adopted, as a slight variation in the coupling will often cut out interference, and bring in the broadcast just the same.

In Britain, where two stations are frequently simultaneously broadcasting the same programme on different wave-lengths, crystal sets are often used constructed with two separately-tuned circuits, one receiving each station, and these two series of signals, passing through the same 'phone, result in much increased volume. The volume is not usually doubled, because, as a rule, one station will be situated at a greater distance than the other.

A POCKET CRYSTAL SET.

Next week there will be a special article describing the making of a handy pocket crystal set, easily made, cost very small, yet quite good for permanent use near a broadcast centre. Cyclists out for the day will be able to try this out at various distances. A length of thin wire hitched to a tree makes a good temporary aerial, and the end of a wire run into a creek makes a good earth, whilst 'phones occupy little space with the headbands temporarily removed.

For crystal amplifiers employing an ordinary valve in the first stage, a grid bias of 1½ volts will often be all that is necessary to improve the tone. This means that one dry cell which may be flashlight size is all that is required. To install this, find the secondary terminal of audio transformer connected to negative A and disconnect this wire, connecting it instead to the positive of the 1½-volt cell. The negative side of the cell is then connected to the transformer terminal. It must be clearly understood that this connection is not to be made on the side of the transformer secondary that is connected directly to the grid of the valve. The higher the impedance of a valve, the lower the grid bias required.

(End of Construction Section.)

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MARCONI INTERVIEWED

FAITH IN BEAM SERVICE.

During his recent visit to New York and Washington, Marconi granted many interviews to newspaper reporters.

Commenting on his latest discovery, the beam wireless, Signor Marconi prophesied that it would soon supplant the ordinary commercial wireless services. The beam service has already been inaugurated between England and its colonies and the Anglo-American circuit will shortly be opened.

In most fields the beam wireless will supplant the cable, the inventor believes, although the cable route may still be preserved for secret messages. In the air there is always the danger of interference or the possibility that an unauthorised station may pick up the message. The danger is, however, more theoretical than practical, Signor Marconi feels, for with the beam system several hundred words a minute will be sent, requiring complicated and expensive receiving sets, and he felt it was not within human power to transcribe otherwise messages coming in at that rate.

The immediate future of fac-simile transmission by wireless, Signor Mar-

coni believes, will see whole pages of newspapers transmitted by the square inch instead of by the word, from one end of the world to the other. Reporters' notes put in the air in London will, in a few minutes or seconds, be visually before an editor in New York.

The success of wireless enterprise in America, which has so signally developed since the inventor's visit five years ago, he attributed to this country's vast financial resources and to the enthusiasm of America's youth.

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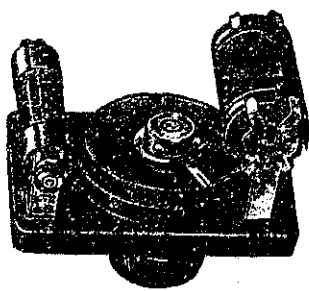
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Programmes Continued

(From page 11.)

- 8.57: Cornet solo—Mr. George Christie, "La Serenata" (Schneider).
 9.2: Relay of orchestral selections from Empire Theatre.
 9.12: Bass solo—Mr. E. G. Bond, "Bells of the Sea" (Solmon).
 9.16: Flute solo—Mr. A. Levi, "Salterello" (German).
 9.20: Soprano solo—Miss Florence Sumner, "Rose Softly Blooming" (Spohr).
 9.24: Violin solo—Mr. A. Watson, "Canzonetta" (d'Ambrosio).
 9.29: Baritone solos—Mr. Arthur Langley, (a) "Drink to Me Only With Thine Eyes"; (b) "When the Dew is Falling" (Schneider).
 9.37: Cornet solo—Mr. George Christie, "Edelweiss" (Hoch).
 9.46: Contralto solos—Miss Irene Horniblow, (a) "The Arrow and the Song" (Balfe); (b) "A Love Song" (McAlpine).
 9.52: Flute solo—Mr. A. Levi, "Three Trifles" (Macfarren).
 9.57: Relay of orchestral music from the Empire Theatre.
 10.1: Close down.

Sunday, December 18th

1YA AUCKLAND (333 METRES)—SUNDAY, DECEMBER 18.

- 3 p.m.: Afternoon session—Selected Studio items.
 4.30: Close down.
 6.55: Relay of church service from St. Mary's Cathedral. Preacher, Canon P. James; organist, Mr. E. Randall.
 8.30: Relay of band concert from Town Hall, under the conductorship of Mr. Christopher Smith.
 9.30: A thought.
 9.31: God Save the King.

2YA WELLINGTON (420 METRES)—SUNDAY, DECEMBER 18.

- 6 p.m.: Children's service, conducted by Uncle Ernest.
 6.55: Relay of evening service from the Terrace Congregational Church (carol service). Preacher, Rev. Ernest Weeks. Musical director, Mr. Len. Barnes; organist, Mr. Harry Brusey.
 8.30 (approx.): Studio concert.
 Quartet—Philharmonic Quartet, "The First Nowell" (traditional).
 Vocal solo—Mrs. Ellison Porter, "Ave Maria" (Luci).
 Vocal duet—Mr. Edwin Dennis and Mr. W. W. Marshall, "Watchman, What of the Night?" (Sergeant).
 Quartet—Symons-Ellwood String Quartet, "Tangi" from "Maori Quartet" (Hill).
 Vocal quartet—Philharmonic Quartet, "O. Happy Eyes" (Elgar).
 Vocal solo—Mr. W. W. Marshall, "The Song of the Horn" (Flegler).
 Quartet—Symons-Ellwood String Quartet, "Finale" from "Maori Quartet" (Hill).
 Vocal quartet—Philharmonic Quartet, "Annie Laurie" (Scott).
 Vocal solo—Miss Madge Freeman, "Still as the Night" (Bohm).
 Quartet—Symons-Ellwood String Quartet, "Moment Musical" (Schubert).
 Vocal duet—Mrs. E. Porter and Miss M. Freeman, "Calm, Silent Night" (Geotze).
 Cello solo—Mr. Geo. Ellwood, "Air With String Accompaniment" (Bach).
 Vocal solos—Mr. Edwin Dennis, (a) "A Little Coo's Prayer" (Hope); (b) "Gloriana" (Mallinson).
 Vocal quartet—Philharmonic Quartet, "Hail, Heavenly Song" (Wagner).

3YA CHRISTCHURCH (306 METRES)—SUNDAY, DECEMBER 18.

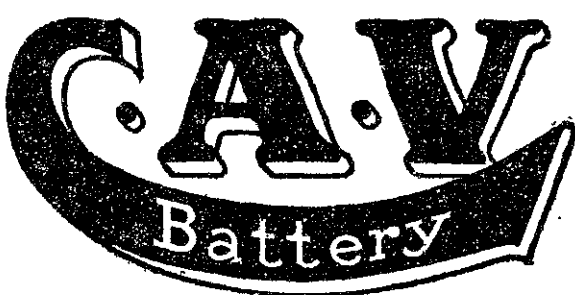
- 5.45 p.m.: Children's song service, from 3YA Studio, by Uncle Sam, assisted by scholars from Linwood Congregational Sunday School.
 7.0: Relay of evening choral service from Christchurch Anglican Cathedral. Full choral service and anthem. Preacher, the Rt. Rev. Campbell West Watson, D.D., Bishop of Christchurch. Organist and choir-master, Dr. J. C. Bradshaw, Mus.Doc. At the conclusion of the church service a twenty minutes' organ recital will be given by Dr. Bradshaw.
 8.30: Close down.

4YA DUNEDIN (462 METRES)—SUNDAY, DECEMBER 18.

- 5.45 p.m.: Children's song service, by Big Brother Bill and the Anglican Sunday School children. Order of service: Hymn, prayer, Lord's Prayer, hymn, Scripture, reading, hymn, Bible story by Big Brother Bill, hymn, Benediction.
 6.55: Relay of service from the Methodist Central Mission. Preacher, Rev. W. Walker. Organist, Mr. Chas. A. Martin.
 8.10: Relay from St. Kilda (weather permitting) of concert by the St. Kilda Band. Conductor, Mr. James Dixon.

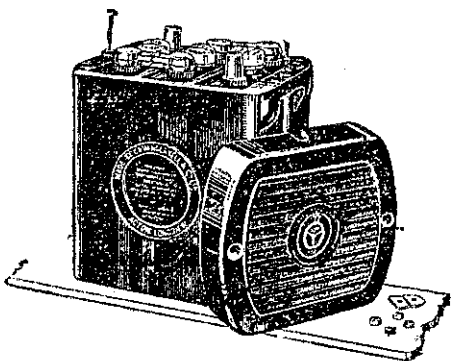
Distant thunderstorms are often the cause of noises like static. A lightning flash is a gigantic spark which produces powerful ether waves that travel great distances, causing crashing sounds in one's loudspeaker.

The inverted L type of aerial is the best for broadcast reception. The electrical length of an aerial is the distance from the farthest end of the wire to the place where the lead-in is attached, plus the length of the lead-in itself.



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Quality of Programmes.

"T.P." Island Bay: I would like to say a word or two regarding what some correspondents are pleased to term "highbrow" stuff purveyed to listeners-in from the 2YA studio. What exactly is meant by that term I am not quite able to state in so many words, but if it is intended to cover such items as those being rendered from time to time by the Symonds-Ellwood-Short Trio, then all I can say is that to use such a term in disparagement of music of that nature—consisting as it does of gems from the works of such masters as Beethoven, Brahms, Schubert, Mendelssohn, and others—is neither more nor less than sacrilege. I, for one, do sincerely hope and trust that, while taking care that good miscellaneous programmes may still be provided by the Broadcasting Company for our entertainment and instruction, yet I feel sure that I am voicing the opinion of a large body of listeners-in when I say that the items mentioned are looked for with keen and pleasurable anticipation as each issue of the "Radio Record" comes to hand. May I say further that congratulations are due to the management on the fact that we are so soon to have not only a trio, but also a string quartet for Sundays, as announced in your issue of 2nd instant. Again, it will, I am sure, be welcome news to many to notice the feast of glorious sacred music with which we are to be regaled after the church services have been concluded. I am delighted to notice that these programmes as announced comprise a number of gems of oratorio and other music of such a nature as to harmonise completely and consistently with the character of the Lord's Day. The items mentioned are to a praiseworthy extent sacred in the real sense of the word, and not, as has so often been the case in the past, sacred only in name.

"A Little of Everything."

"F.H.G." (Tiakitahuna): Perhaps to the easy-pleased I may appear a "grump" and an extremely critical listener, but without critics the world would be a dull spot. To-night, in particular, a few friends assembled here for the purpose of hearing Mr. Warwick's recital, especially to the items of Miss Wilson. The switch-over took place in the middle of both items, her item being unlucky enough to follow immediately after the one given by the Symonds-Ellwood-Short Trio, who played and played and played ad infinitum the "Trio in E Flat, Allegro and Adagio," the tune being much longer than the title. Now, Sir, we appreciated this trio at first, but the same thing might after night is getting very monotonous indeed. No doubt the reply will be they play only once before 9 p.m. and once after, but they make the best of it in the length of the item. No doubt to the initiated, or "high-brow," musician all this is very beautiful, but don't forget the Broadcasting Company are catering for thousands of us ordinary people, who enjoy a little of everything.

A Picton View.

Radio (Picton): I would like to say a few words of praise of the manner in which the children's sessions are conducted at the three stations. The Sunday evening session at 2YA is really too good to be classed as amusement; it is inspiring and an education for both old and young, and it seems that no pains have been spared at any of the stations to bring these sessions up to the high standard in which they are at the present time.

Great credit is due not only to the Broadcasting Company, but to the "uncles" and "aunts" as well. The "Record," too, is deserving of great credit. I have noticed plenty of very fine music lately from the stations; last night the programme of 1YA, given by some of the old artists, was a treat indeed. Reception lately has been very fair over here, 2YA very good and steadier, 1YA strong most times, but not quite the tone of 3YA, which unfortunately fades rather badly at times with us here. You will no doubt notice I have not included 4YA in my remarks. They have some very fine items on the programme what a great pity insufficient power prevents these items being made available to all New Zealand listeners. Can you give the listeners any information in regard to increasing the power of that station? Wishing the "Record" and B.C. every success.—[Progress is being made with strengthening Dunedin's power.—Ed.]

A Short-wave Query.

G.G., Alfredton: I wish to express my appreciation of the programmes broadcast from 1, 2, and 3YA, though I agree with "Metric" about the light items, but we cannot complain, as the company cannot please everyone.

Last Sunday (27th) I was listening in on my short-wave set at about 8 o'clock, just after breakfast, and I heard a station broadcasting what sounded like a football match. I never heard any call sign; it was not very clear, but fairly loud. Could you or any reader supply information as to its whereabouts? Why is it I can receive Dunedin on two wave-lengths, 463 and 235 metres? It is much louder and clearer on the low wave. I have not heard of anybody else doing the same.

Broadcasting Religious Services.

"H.D.N." Auckland: With the great interest I have perused all reference in your journal to the question as to whether it is desirable that the Anglican Church shall erect and operate a broadcast station in Auckland for the following avowed purposes:—

(1) The broadcasting of church services, especially for the young, the sick, the aged, and isolated.

- (2) Scriptural and other religious instructions.
 (3) Lectures on Church history, etc.
 (4) Propaganda for the Church's social work.
 (5) Information on parish and general Church news.
 (6) Good church music.
 (7) Special messages from prominent church people.

Now, I submit that those who have paid their license fees for the service supplied by the Radio Broadcasting Company of New Zealand did not anticipate that the Government would permit any circumstance to interfere with the fullest enjoyment of that service. Without a shadow of doubt the erection of another full-powered broadcast station in Auckland will seriously interfere with reception of 1YA, Auckland, by some hundreds of listeners in and around Auckland. In Sydney the introduction of a number of broadcast stations created a tremendous amount of trouble for thousands of owners of crystal sets, and even for owners of valve sets. Some thousands of pounds had to be spent by these listeners to improve the selectivity of their sets, and even now many listeners in certain areas of Sydney still have to submit to a background of interference from one local station while they are tuned into another local station. Here, in Auckland, when we purchased our sets, there was no question of another broadcast station starting in opposition to 1YA. Why should the hundreds of boys and grown-ups who operate crystal sets in and around Auckland be put to considerable trouble and expense so that the Anglican Church shall employ the gladdening gift of radio for the exploitation of religious propaganda. It is also an axiom in radio that the longer the aerial the better the reception of long-distance stations, but unfortunately there is a parallel axiom which lays it down that the longer the aerial the less the selectivity of the receiving set. There are many hundreds of owners of valve sets in and around Auckland who employ long aerials for the better reception of the broadcast stations at Wellington, Christchurch, and Dunedin, a privilege for which they pay the New Zealand Government. It is true that these valve sets may be rendered selective enough to be able to tune out one of the two Auckland stations to listen to the other, but only in many instances, by the shortening of their aerials which means weaker long-distance reception.

I cannot believe the Government will give a permit for the operation of a station which is admittedly to be used purely for propaganda purposes—in this case religious propaganda. One can only judge the Broadcasting Company's attitude as friendly towards the Anglican Church by its invitation to send a representative of the Church to confer upon the subject of broadcasting the Anglican services from the existing stations. This offers the Anglicans an opportunity of obtaining a reasonable place "on the air" without the prodigious expenditure which the erection and maintenance of a special broadcast station would involve.

I cannot too strongly emphasise the fact that if the Government were to grant the Anglican Church a permit to erect the station in Auckland they will establish a dangerous precedent. Others organisations may rightly demand a permit for the erection of stations in the other New Zealand centres, and if the question came to a legal test the Auckland case would be urged as a precedent. And these other organisations may offer even less acceptable propaganda than religious propaganda.

In conclusion I maintain that a most reasonable alternative is offered the Auckland Anglican Church by the Broadcasting Company, which is prepared to give the Church the use of its stations on equal terms with other churches. I am satisfied that if the matter were put to a plebiscite of Auckland listeners, in view of the above, the Anglican Church's station would not have 5 per cent. of the votes cast in favour of it.

Records Objected To.

Dancing Listener-in.—Might I suggest through your valuable paper that those in charge of programme arrangements revert to the use of the dance band in the studio instead of using the records, as at present, every

Saturday night? I can assure you that the majority of listeners would prefer it, and also to remind you that nearly every home in New Zealand has a gramophone and can put a record on if they wish. I also wish to mention that we heard the same number three times last Saturday night. "Honolulu Moon" was played twice on records and once at the cabaret. Now if a band was playing at the studio this would not occur!

Programmes Appreciated.

G. C. Petersen (Palmerston North): It is pleasing to note that the Broadcasting Company has adhered to its original resolve to keep its programmes up to the highest possible standard. This has been done consistently, and is evidenced by the way in which the most highly qualified performers available are being retained to take part in the programmes. In this connection I desire particularly to express my appreciation of the performances of Mr. A. Stanley Warwick. The excellent quality for transmission of his voice, combined with his marked ability as an elocutionist, renders his items a delight to the listener. Miss Violet Wilson also can always be relied on for a first-class item. Personally I should like to see a greater number of good orchestral items appear on the programmes. I think that broadcasting has a great opportunity of educating the public to a better appreciation of the best music, and if it were successful to any extent in this direction alone it would more than justify itself.

A Radio Christmas.

G. C. H. (Masterton): Now that the festive season is not far distant, and in view of the extraordinary popularity of radio as compared with twelve months ago, it behoves the programme director and the Broadcasting Co. to combine to "make this Christmas a Radio Christmas," the former by arranging appropriate Yuletide programmes and the latter by providing extra sessions in keeping with the occasion. As a beginning I would suggest a late night on Christmas Eve, with Christmas carols, etc.; a relay of a morning church service on Christmas Day; that the evening session on New Year's Eve continue until midnight, and so "see the old year out." Possibly further and perhaps more suitable suggestions will be forthcoming, and it should be a comparatively easy matter for the Broadcasting Co., with a few innovations, to introduce the true spirit of Christmas into radio land, and thus bring further enjoyment to all listeners, more especially to those, such as the aged and the sick, who are not able to enjoy Christmas in other directions. I expect the company already have this matter in hand, and in that case I trust they will not deem this letter "uncalled for."

[Certainly not. We know the company appreciates suggestions, and we, on our part, are pleased to receive from listeners correspondence covering their views. Interests are mutual, and correspondence largely replaces personal contact, which smooths away many troubles.—Ed.]

A Suggestion.

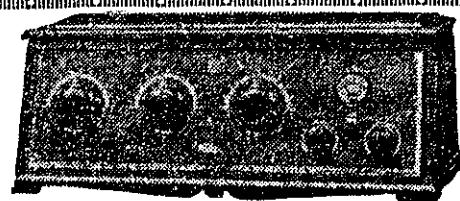
Equaliser (Christchurch): At the present it is the practice of the Radio Broadcasting Coy. of New Zealand to have one silent night at 1YA, 2YA, and 3YA, and two at 4YA stations. Would it not be possible to have these silent nights on a separate night to each other, thereby giving listeners a choice of at least three stations on any one night of the week, instead of two stations being silent on Monday and Wednesday nights as at present. To make my suggestion clear, I give the following as silent nights: Monday, 4YA (first night); Tuesday, 3YA; Wednesday, 2YA; Thursday, 1YA; Friday, 4YA (second night). If this arrangement were carried out, it would give a good choice for every evening. You will notice I have put 4YA's second night down to Friday, as this, being the late shopping night, it would be a better night lost than Wednesday, especially to crystal users.

Always bring in your lead-in through a porcelain or ebonite tube. If the bare wire of the lead-in is permitted to touch the window-sill there is sure to be a loss in signal strength.

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Programme Features Continued

(Continued from Page 7.)

study in Europe, will make her first appearance at 4YA. Miss Hornblow has a magnificent mezzo-contralto voice, possessing wonderful control of it. She will be heard in a group of charming numbers. Miss Florence Summer, one of the clearest and most artistic singers in Dunedin, will contribute a group of mezzo-soprano songs. Mr. Arthur Langley, the popular baritone, will present in his usual fine style a group of songs old and new.

Instrumental solos will be performed by three of the best performers available—Mr. A. Levi (flautist), Mr. A. Watson (violinist), and Mr. George Christie (cornetist to the St. Kilda Band).

MICROPHONIC MURMURS FROM 3YA

On four nights next week the newly-organised quartets at 3YA will be singing. Other artists, singers, elocutionists, and instrumentalists, as well as the renowned Christchurch Broadcasting Trio, will be assisting to make a week of splendid entertainments.

The Cathedral Male Quartet will make its first appearance before the microphone on Monday evening. This is the usual band night, and on this occasion the Municipal Band, under Mr. Schnacle, will, in conjunction with the members of the quartet, provide a first-class entertainment.

Mr. J. Flewellyn, a well-known elocutionist, will also be assisting on Monday evening. One of his items will be a Dickens' sketch, in which Sam Weller is given advice by his father.

Mr. A. L. Chappell, who will give a talk on the history of stamps on Monday evening, is the president of the local Philatelic Society. He has a very valuable collection of stamps, for which he has received prizes at exhibitions.

Wednesday evening will see the advent of the Russell Quartet, composed of Mrs. Claris Shaw (soprano), Miss Mildred Russell, L.A.B., A.T.C.L., Mr. Gregory Russell, and Mr. W. J. Richards. Some songs from a very popular musical comedy will be sung. They comprise quartets, duets, and solos. Assisting with the programme will be the ever-welcome Instrumental Trio.

A talk on "France" will be given by Mr. Gordon Troup, of the Boys' High School, on Wednesday evening at 7.30.

An elocutionist and entertainer new to 3YA, in the person of Mr. A. H. Todd, of Ashburton, will be heard on Wednesday evening. He comes to the microphone with good recommendations.

The Madame Gower-Burns Quartet will have its share of the microphone on Thursday evening, when the quartet will broadcast its first programme. A glance at the published list will show the class of item which these fine artists will render. All the items are taken from operas which have caught the public's fancy.

Miss Lucy Cowan, the popular elocutionist, whose voice is so admirably suited for radio, will be heard again through the microphone on Thursday evening.

The talk on "Music," which Mr. Raynor White, F.L.C.M., was to have given last week, and which was adjourned till next week, has been arranged for 9.15 on Thursday.

A cordial welcome will be extended to Miss Mabel Thomas on Saturday evening. This very gifted and very rarely heard singer will make her advent to radio, and her items may be looked forward to with pleasurable anticipation. Miss Thomas is a successful music teacher in Christchurch.

Another singer who will give pleasure on Saturday evening will be Mr. David McGill. Mr. McGill's fine tenor voice is in great demand in Christ-

church. He has sung previously for 3YA, and always most acceptably. Mr. McGill will be heard in solo items and also in duets with Miss Mabel Thomas. That fine bass singer, Mr. W. Inkster, who has previously been heard at 3YA, will sing again on Saturday evening.

Mr. Roy August, in his songs with ukulele, Mr. Ivan Perrin, in his clever improvisations at the piano, Mr. Jock Lockhart, in humorous songs at the piano, and Miss Frances and Master Theo. Gunther, with their concertinas, will be contributing to the entertainment on Saturday evening.

The next address by Mr. J. B. Barbutt on physical culture will be given on Friday evening. Mr. Barbutt is an experienced instructor.

Mr. Arthur Lilly, who is organist and choirmaster of Holy Trinity Church, Avonside, from where the service was broadcast on November 27, has received many congratulatory messages from a wide radius on the excellence of the musical portion of the church service. The choral work was splendid, and Mr. Gregory Russell sang most artistically "Comfort Ye."

THE TRIO AT 3YA

FINE PROGRAMME NEXT WEEK.

Arensky wrote two beautiful trios. The one to be played during next week by the Christchurch Broadcasting Trio is the better known one of the two, and is so universally liked as to be almost classed as popular music. Arensky belonged to a group of modern Russian composers which constituted the leading school of modern composition at the latter end of the nineteenth century. His music abounds in a wealth of melody and richness of harmonisation. The first movement is full of warm feeling and delicate fancy, while the brilliant second movement will always appeal by its very vivaciousness. The beautiful third movement, which is headed by the composer "Elegica," is considered by many to be the gem of the whole trio. Beautiful and sorrowful as the music is, it is untinted with morbidity. The last movement is full of power and vigour.

Among other interesting numbers to be played by the Christchurch Broadcasting Trio is a dance from Grieg's Peer Gynt Suite. It is the dainty dance of Anitra, the Bedouin's slender daughter, most charming in invention and tinted with the art of a magician in tonal colours.

The "Serenata" of Mozowski is one of the prettiest of modern pieces. It is just what a serenade should be like—a light, graceful melody, over an accompaniment that might be chords on a guitar; an intervening part that sounds like an improvisation of the moment—a gliding back to the original melody, which gradually dies away as if serenaders were departing through the night.

Other popular numbers will be Le-mare's "Andantino," arranged by Gustav Holst, "Melodie Mignonne," by Sinding, a brilliant "Bolero" by Ravina, the well-known "Valse" by Beethoven, and Beethoven's "Minuet in G."

Miss Irene Morris (violinist) will play a mazurka by Hans Sitt and the ever-popular "Swing Song" by Ethel Barns.

Miss Eileen Warren is to play several pianoforte soli, including "Waltz in D Flat," by Dvorak and "Romance in F Sharp" by Schumann.

Mr. Harold Beck's cello solos will be the French composer Faure's "Après un Reve" and a Serenade by Popper, which is considered as one of the best compositions of this brilliant writer for the cello.

On the advertisements of a certain patent medicine we read: "Every picture tells a story." It will be nice when our picture palaces can accept this as their slogan.

CHILDREN'S SERVICES

SUNDAY EVENING AT 3YA

SOME REMARKABLE TRIBUTES.

The Sunday evening children's services which were inaugurated under Uncle Sam some months ago at 3YA have been wonderfully successful with people of all ages. Letters of appreciation are frequent. The following are worth quoting:—

A Great Blessing.

Mr. D. Macpherson, manager of the Benevolent Institution, Caversham, Dunedin, writes to Uncle Sam: "It is with a great deal of pleasure I write you with reference to your Sunday evening children's services. As the manager of the above institution, I desire on behalf of the inmates to thank you, and also all the children, who from time to time take part. You can hardly realise the blessings that are sent out, and the benefit derived therefrom. The hymns, solos, and the talks and Bible readings are very much appreciated, and I feel that I must write you, so as to thank you and also to convey our sincere thanks for all the efforts put forth. It reflects great credit on you and also the children. Thank you all."

Young Man of 70.

Mr. John Hadfield, of 38 Strickland Street, Sydenham, describing himself as "a young one of three score years and ten," writes to Uncle Sam: "Being unable to attend the evening church service, I have become a constant listener-in at your children's services, and I desire to express my great appreciation of the whole service. The singing of the little folk is really fine, and I am sure, affords much pleasure to a large circle of listeners-in, the solos with choruses being specially nice. To those who train the children and to yourself for the excellent little service given to us each Sunday deserves our hearty thanks."

What Radio Means to the Deaf.

Mr. Hadfield's letter induced Mr. B. G. Watkinson, of 205 Lichfield Street, Christchurch, another young man who has passed the allotted span of life, to write a most interesting and eloquent letter to Uncle Sam and the children. He says:—

"I heard you telling the dear children to-night and reading a letter from a young man seventy years old. We are never old when our hearts are young. I am older than that. I have children, grandchildren, and great-grandchildren. I am still working from 8 o'clock in the morning till 5 o'clock at night, and always try to hear the children, both week days and Sundays. I have only missed hearing them once since they have been broadcast. Tell them it is over 60 years since I started working. I had to be at the works at 5.30 a.m., half an hour for breakfast, one hour for dinner, and knock off at 5.30 p.m., and I had just turned 12 years old."

"I want you to tell them that I have never been in a church for nearly forty years, never heard a concert or lecture, for the simple reason that I am very deaf. I could not hear a gramophone or a piano unless I put my head against it, or anyone singing in the same room. Still, I can hear every song and practically every word you children sing, and Uncle Sam's voice perfectly well. I have a powerful radio receiving set with seven valves and earphones and a loudspeaker, with which I can hear all New Zealand and Australian stations."

My dear children, you will understand what wireless means to me, and how grateful I am to you for giving me the pleasure of hearing your young, clear beautifully-trained voices after being unable to hear for so long.

DELIGHTFUL HOURS AT 2YA

Monday, December 12, and St. Mark's School on the air again! We all remember them and the great treat they gave us last time they were at 2YA. They have various numbers for us again, among them a special school song, and some Maori selections. Aunt Jo, too, will be there.

Hullo! Another trip, and this time to Stewart Island. That's quite a long journey, is it not? Mr. Stewart will conduct the Radio Express, and afterwards Uncle Jasper, with the Berham-pore School in his train, will entertain the kiddies. The school mates have a variety of part-songs and choruses.

Three cheers for Lyall Bay School! We haven't heard them for quite a while, so now we shall anticipate their coming on the 15th. They have selected such a fine number of carols, especially for little girls and boys who love Christmas. Uncle Sandy will join the Lyall Bay School, so we are assured of a happy hour.

On December 16 our old friends, the Hataitai School Orpheus Society will again entertain you. They are always novel and interesting. Some excellent choral items are being provided, and other selections suitable for the Christmas season. Uncle Ernest will, as usual, be amusing and instructive.

On Saturday an excellent hour's entertainment is assured. Mrs. Martyn Williams and her talented pupils have a treat in store for the little ones. Auntie Gwen will be the usual dear, and will heartily welcome all her nieces and nephews.

The Children's Corner

By "ARIEL"

CHILDREN'S HOUR AT 3YA

After next Wednesday Uncle Peter and Mother Hubbard will be absent from the children's sessions at 3YA until the end of January. During that period Uncle Peter and Mother Hubbard (the Rev. and Mrs. Parr, of Christchurch Grammar School) will be out of town for the school vacation. During their absence the children's sessions on Wednesdays will be carried on by Uncle Sam and Chuckle and Chook.

BIG BROTHER BILL AT 4YA

Listen in for "The Happy Ditty" on Tuesday at 6 o'clock exactly at 4YA. Then the Town Crier's bell announcing the results of competitions. After which comes letters, and the Birthday Basket. Then Miss Sandstrum's Endeavour Choir singing part-songs. Princess Silverwings has a story for the Chickabiddies, and Big Brother Bill is going to hunt big game in South Africa. Who's going with him?

Big Brother Bill will again entertain the kiddies on Friday at 6 p.m. Christmas is coming! If you don't believe it, listen to Big Brother Bill. A specially written Christmas verse of "The Happy Ditty" at 6 o'clock. The Girls' Citizen Club singing Christmas carols. The Town Crier's bell, letters, and the Birthday Basket. Do the fairies and the brownies and gnomes keep Christmas? Princess Silverwings will tell. And Big Brother Bill talks about plum puddings and mince pies.

Radio Rhymes

(By Mirthful Mother.)

Oh, Brother Bill, heed not the wail
Of "Frantic Father's" piteous tale,
It's only guile.
The mothers all are with you still,
Remember this, Big Brother Bill,
Sit tight, and smile.

The precipice you're standing on
Is not an awful thing of doom,
That's only fudge.
A pedestal of high degrees
You're building with your recipes,
So don't you budge.

What if the grocer's bills grow fat?
Let "Frantic Father" see to that,
It's naught to you.
You'll always find that father's handy
When Ray and Teddy make your candy,
He likes it too!

What if our wandering fussy cat
Is gined with toffee to the mat,
Why should we mourn?
No longer on the roof he prowls
And makes night hideous with his howls,
We sleep till dawn.

What if that screeching cockatoo
Which oft distraught we fain had stow
Is stilled at last?
The bit of fudge that laid him low,
Big Brother Bill to you we owe,
His day is past.

One time our kiddies roamed the street,
And every policeman on his beat
Was sorely tried.
But now each little listener-in
Is in his place when you begin,
All safe inside.

So spread your sweetenings far and wide,
O'er mount and dale at eventide,
With heaps of fun.
You've got the mothers with you still,
Remember this Big Brother Bill,
And don't you run.

RIDDLES.

Why is a man stronger than a horse?
—Because he carries two buildings, two trees, two animals, four fishes, and a bird. The two buildings are the two temples, the two trees are the two palms, the two animals are the two calves, the four fishes are the two soles and (h)eels, and the bird is the swallow.

An apple on a tree, a bird on the apple. How can you get the apple without disturbing the bird?
Answer.—Just keep quiet and wait till the bird flies away.

If you put the kettle on at four o'clock, what time would it boil for tea? Never, but the water in it would boil very quickly if the fire was good.

If a goose weighs seven pounds and half its own weight how much does it weigh?—Fourteen pounds.

What is the resemblance between a thought, a sigh, a motor-car, and a donkey?

Answer.—A thought is "idea," a sigh is "oh, dear," a motor-car is "too dear," and a donkey is you, dear!

LIMERICKS.

A doormouse who lived at Dunoon
Woke up from his slumbers too soon.
He said "Oh, my word,
This cold is absurd!"
And he made him a coat of shalloon.

An astronomer's dear little lass
Went out for a ride on an ass.
She felt on her head:
To her daddy she said:
"Look, the Milky Way's taken to jazz!"

FOUND IN AUTUMN.

Use the letters of the word "Autumn" and find:—
1. An insect. 2. A colour. 3. Found on the floor. 4. A relation. 5. Something to crack.
Answers.—1. Ant. 2. Tan. 3. Mat. 4. Aunt. 5. Nut.

A RIDDLE IN RHYME.

My first is in vessel, but not in ship.
My second's in hawthorn, but not in hip.
My third is in lady, and also in lad.
My fourth is in fiddle, but not in fad.
My fifth is in nutmeg, but not in spice.
My sixth is in skating, but not in ice.
My seventh's in inches, but not in yards.
My eighth is in singers, but not in bards.
My ninth is in elephant, easy and ear.
My whole is remembered but once in a year.
Answer.—Valentine.

"WHO AM I?"

My first loves flowers in a garden rural.
My second's a verb implying the plural.
My third is heard as an exclamation.
My fourth's drunk by people of every station.
My fifth's an aspirate by cockneys un-heeded.
My sixth's a male if by my fifth one preceded.
My seventh and second are both just the same.
My eighth and my first both bear the same name.
My ninth appears in each human face.
My tenth's an old measure of length or of space.
And as my eleventh's precisely the same
The answers will give you the name of someone you know quite well. Who is he?

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If you want FINE RESISTANCES, RHEOSTATS, JACKS, PLUGS, CONVENIENCE OUTLETS, for SPEAKER, BATTERY, AERIAL AND GROUND CONNECTIONS, in any ROOM, or AUTOMATIC CONTROL,
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Stations Available to New Zealand Listeners

THE popularity of the schedule of stations available to New Zealand listeners, published in the "Radio Record" of November 18, has prompted its publication again, with minor additions and alterations. Listeners have forwarded the particulars of various American stations which they have heard and have suggested their inclusion in the list. A comparison of the various stations mentioned and the locality in which they were picked up clearly shows that these stations are not generally heard throughout New Zealand. Therefore they do not merit a place in the schedule.

It is well known that some of the Australian broadcast stations are not operating on their stated wave-lengths. The heterodyning of stations outside Australia has necessitated slight variations in the allotted wave-lengths of some of the Commonwealth stations, and in other cases the stations have not been tuned to their official wave-lengths through the result of readjustments in the operating plant. At all events, despite this, the wave-lengths of the Australian stations as published in the Commonwealth radio Press are as per official list, which has been deviated from by some of the stations.

However, in compliance with the suggestions of a number of correspondents, the actual, instead of the official, wave-lengths of the Australian stations are now shown in the schedule.

A note of warning must be sounded with regard to long-distance reception at this time of the year. Beginners who have recently purchased multi-valve receiving sets of a high reputation may be dismayed at the weakness of some of the Australian stations. They are prone to blame their equipment for their disappointment, while, as a matter of fact the fault lies in

SPECIAL SCHEDULE OF LOCAL AND OVERSEAS STATIONS AND OPERATING TIMES

some natural phenomenon experienced at this time of the year. The periods of poor reception are fortunately not protracted, and during summer-time there are weeks during which the long-

distance stations come in with remarkable strength.

The following schedule is not offered as a finished product. There are still variations from the official wave-

lengths to be inserted, but, on the whole, the schedule in its present form should prove a handy reference list for those who seek interest by reaching out for distant broadcasting.

LONG-DISTANCE STATIONS MOST FREQUENTLY HEARD IN NEW ZEALAND, AND MINOR N.Z. STATIONS.

Call.	Place.	Wave.	Power.	Schedule.
KEX	Portland, Ore., U.S.A.	240	2500	Till 8.30 p.m.
KFON	Longbeach, Cal., U.S.A.	242	500	Till 8.30 p.m. daily.
3BY	Melbourne, Australia	250	50	1 a.m. till 4.15 a.m., Sun. and Mon.
5KA	Adelaide, Australia	250	600	11 p.m. till 1 a.m., Mon., Wed., Fri., Sat., and Sun.
12Q	Auckland, N.Z.	253	50	Sunday afternoons, Monday and Thursday evenings.
3DB	Melbourne, Australia	255	500	10.30 p.m. till 1.30 a.m.
2UW	Sydney, Australia	267	500	From 10.30 p.m.
12B	Auckland, N.Z.	275	250	Sunday afternoon, Monday nights.
2ZF	Palmerston N., N.Z.	278	50	From 7.30 p.m., Mon., Wed., Fri., Sat., Sun.
2KY	Sydney, Australia	280	1500	From 10.30 p.m. daily.
2UE	Sydney, Australia	293	250	From 11.30 p.m. Tues. and Thurs., and from 10.30 p.m. Sundays.
42B	Dunedin, N.Z.	290	50	Irregular.
CNRV	Vancouver, Canada	291	500	Till 7.30 p.m. daily.
WOAI	Texas, San Antonio, U.S.	303	5000	Till 8 p.m. daily.
2GB	Sydney, Australia	310	3000	From 10.30 p.m. daily, excepting Tues., Thurs.
5DN	Adelaide, Australia	313	500	From 11 p.m. daily.
3UZ	Melbourne, Australia	319	100	From 10.30 p.m. Mon. and Wed.
KNX	Hollywood, Cal., U.S.A.	339	1000	Till 8.30 p.m. daily, but occasionally till 10.30 p.m.
KJR	Seattle, Wash., U.S.A.	349	2500	Till 8.30 p.m. daily.
2BL	Sydney, Australia	349	5000	From 10.30 p.m. daily.
7BY	Bombay, India	357	3000	From 4 a.m. daily.
JOCK	Nagoya, Japan	360	1500	From 10 p.m. daily.
KFWB	Los Angeles, Cal., U.S.A.	364	500	Till 7.30 p.m.
3LO	Melbourne, Australia	371	5000	From 10.30 p.m.
7CA	Calcutta, India	370	3000	From 3.30 a.m. daily.
JOAK	Tokio, Japan	375	1500	From 10 p.m. daily.
KGO	Oakland, Cal., U.S.A.	384	5000	Till 8.30 p.m. Sundays, and 7.30 p.m. Thurs., Fri., Sat.
JOBK	Osaka, Japan	385	1000	From 10 p.m. daily.
WBBM	Chicago, Ill., U.S.A.	389	5000	Till 8.30 p.m.
4QG	Brisbane, Australia	395	5000	From 10.30 p.m. daily.
5CL	Adelaide, Australia	405	5000	From 11 p.m. daily.
KZRM	Manila, Philippines	406	1000	From midnight.
KPO	San Francisco, U.S.A.	422	5000	Till 8.30 p.m. daily.
2FC	Sydney, Australia	442	5000	From 10.30 p.m. daily.
KFI	Los Angeles, Cal., U.S.A.	468	5000	Till 8.30 p.m. daily.
3AR	Melbourne, Australia	484	1600	From 10.30 p.m.
7ZL	Hobart, Australia	516	3000	From 10.30 p.m. daily.

TRANS-ATLANTIC BROADCASTS

Preliminary plans have been completed for engineering experiments to develop international broadcasting between England and America, it was announced recently by a representative of the National Broadcasting Company. Plans for the initial engineering work were completed at a series of conferences between Captain P. P. Eckersley, chief engineer of the British Broadcasting Corporation, and Dr. A. N. Goldsmith, consulting engineer of the National Broadcasting Company of U.S.A.

"We propose an intensive experimental and development programme, but we are unable to give any present guarantees of service. The programme will include the erection of a powerful short-wave relay broadcasting transmitter and the installation of a special short-wave relay broadcasting receiving station in England and the systematic utilisation of similar facilities in the United States. We believe that ultimately short-wave development is likely to permit inter-continental broadcasting.

The engineers pointed out that while short-wave broadcast transmissions for the relaying of programmes over long distances had yielded occasional results of great interest, they were unreliable as indicators of the present capabilities of such a service because large-scale international broadcasting to the public had stringent requirements which had not yet been fully met.

Captain Eckersley will return to England immediately, it was said, to push the development of the plan in that country, and the National Broadcasting Company would proceed with the corresponding plans in this country.

The engineers expressed hope that the plans would be carried forward rapidly enough to permit the working out of administrative details and programmes by Sir John Reith, managing director of the British corporation, with officials of the National Broadcasting Company, during his contemplated visit to the United States in the near future.

EDISON, THE WORLD'S WIZARD

INTERVIEWED BY RADIO

HIS INTERESTING OPINIONS.

It will be remembered that a very fine reception of the speech of Thomas A. Edison was accomplished a few weeks ago from the short-wave broadcast station 2XAD, Schenectady, U.S.A., by Mr. F. W. Sellens, of Northland, Wellington. A full report of the occasion is given by the "New York Times" of October 22, as follows:—"Thomas A. Edison made his debut as a radio speaker in a novel fashion last night. He gave an interview over the radio from the library of his home in West Orange, N.J., from 10.15 to 10.22 o'clock, answering questions put to him by E. W. Rice, an honorary chairman of the Board of Directors of the General Electric Company. The interview was broadcast by station WJAF in New York and forty-two other stations throughout the country.

The occasion was an "Edison Night" programme, sponsored by the General Electric Company in celebration of the forty-eighth anniversary of Mr. Edison's invention of the incandescent electric lamp. During the interview Mr. Edison and Mr. Rice sat at the centre of a long table in the middle of the Edison library, with microphones before them.

First Radio Interview.

The first Edison radio interview follows:—

Q.—Are you working as hard as ever? A.—Yes.

Q.—Do you think, Mr. Edison, that hard work shortens life? A.—Never, if you like it.

Q.—What, Mr. Edison, do you consider your most important inventions? A.—The incandescent electric light and power system.

Q.—Does the present incandescent lamp retain the essentials of the first lamp made? A.—Yes.

Q.—What do you consider the greatest factor in human progress, comfort, and happiness. A.—The intro-

duction of electricity, power, telephone, etc., in our daily life.

Q.—Have the possibilities of electric invention and discovery been exhausted? A.—Oh, no. It appears endless.

Q.—You invented the phonograph in 1877, and the incandescent lamp in 1879, when you were a comparatively young man. Do you find, Mr. Edison, that most great inventions are made by men in their earlier years? A.—Yes, because they have greater energy and will to work.

Q.—At what age is man's productivity at the highest? A.—Depends entirely on his health, ambition, and will to work.

Q.—Have any important inventions been made by women? A.—I cannot recall. Madame Curie is a great research woman.

Greater Field for Youth.

Q.—Do you believe, Mr. Edison, that a young man's opportunities for success are greater to-day than ever before? A.—Yes, far greater. There is a great scarcity of competent men to manage our increasingly large industries.

Q.—Do you think, Mr. Edison, that the tendency in America will be toward bigger and bigger business? A.—Competent men are so scarce that there are not enough to go around. Hence, large corporations are of advantage, as they can afford high salaries, and thus obtain better management.

Q.—Will business ever get so big that it will be desirable to have it handled by the Government? A.—Government management is fatal to success. The Government should regulate, not manage, private business in its relations with the public.

Q.—From your experience, Mr. Edison, what advice would you give to the youth of to-day? A.—Youth does not take advice.

Advocates Light Eating.

Q.—You once told me, Mr. Edison, that you were a great believer in light eating, and that you believed if most people ate less they would enjoy better health. Do you still believe this to be true? A.—Yes. My experience is that if people generally will diminish

their food one-half they will not lose weight and will have better health.

Q.—What period of your life do you look upon with greatest satisfaction?

A.—After perfection of each invention the satisfaction is great. Then I plunge into another one, with all its trouble, to await another period of satisfaction.

Q.—Is life to-day a happier experience for the average man or woman than it has been in the past? A.—Yes, in the U.S.A.

Q.—Taking life as a whole, its successes and its disappointments, would you be glad to live it over again?—Yes.

Records of His Achievements.

Also seated at the table were Mrs. Edison, Gerard Swope, president of the General Electric Company; John W. Lieb, vice-president and general manager of the New York Edison Company; George F. Morrison, vice-president of the General Electric Company; and Kolin Hager, of the General Electric Company, the radio announcer. The room contained priceless records of Mr. Edison's inventive achievements, including his first phonograph.

The Edison Night programme lasted from 10 to 11 o'clock. It began with an announcement of the purpose of the programme, emphasising the fact that Mr. Edison's first incandescent lamp was based upon principles which have now been applied to the radio valve. Then came music by the Goldman Band from Carnegie Hall, followed by the interview with Mr. Edison, and then more music by the Goldman Band until 10.40.

At that time the national hook-up ended, and each station in the network continued with a local Edison Night programme for twenty minutes. Station WJAF carried short talks by Messrs. Swope and Lieb, paying tribute to Mr. Edison.

World's Debt to Edison.

"With the millions of incandescent lamps in use in almost every home in every country in the civilised world, it is difficult to realise that forty-eight years ago to-day incandescent lamps did not exist," Mr. Swope said. The invention was due to the genuine patience, persistence, courage in adversity and under great discouragement of Mr. Edison. The world is indebted to him not only for this great invention, but also indirectly for the inventions that have followed from this beginning, which has made the United States the outstanding leader in the marvellous development of the incandescent lamp industry of the world. The inventions of Mr. Edison and his followers here in the United States are recognised literally everywhere. But Mr. Edison did more than this; he conceived the system of power distribution and the electrical network necessary to bring electric current to every home and to every workshop."

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MARCONI'S BEAM

FADING—A BIG PROBLEM

ARE SUNSPOTS RESPONSIBLE?

Guglielmo Marconi told the Institute of Radio Engineers and the American Institute of Electrical Engineers in New York recently that he has succeeded in girdling the globe with a radio beam, the principle of which he demonstrated just five years ago before a joint meeting of those two electrical societies. In 1922 he had a crude framework erected on the platform to show how he believed the beam would work. He then showed lantern slides of powerful beam stations.

Senator Marconi said fading was the big problem in connection with radio, especially on short-waves. He pointed out that fading has been a marked feature of long distance radio, especially when short waves were employed, and although in his experience fading appeared to be worse on wave-lengths between 200 and 1000 meters it often proved to be serious on the very short waves utilised by the beam system.

"Fading has always been more frequent and more severe on the England-Canada circuit than on any of the others," he said. "It may be noticed that our Canadian service is also our shortest distance service, that it is mostly across the sea and that the Canadian station is the one which happens to be nearest to the north magnetic pole.

DO SUNSPOTS CAUSE FADING?

"It frequently occurs that when the Canadian communication fades out for some hours on end, the other services to Australia, India, and South Africa, which use similar wave-lengths, continue working with undiminished efficiency. It has also been noticed that the times of bad fading practically always coincide with the appearance of large sunspots and intense aurora borealis, usually accompanied by magnetic storms, and at the same periods when cables and land lines experience difficulties or are thrown out of action. "We have also frequently noticed that during these periods signals could be received on a shorter wave-length

than the one usually employed, often on a 16-metre wave when a 26-metre wave would not come through.

PECULIARITIES OF WAVE-LENGTHS.

"As is now generally known very short waves of 16 metres and under can be better received at long distances by daylight and in summer time than during winter or at night, and we also know that very long waves are not affected by daylight."

Marconi said short waves would solve congestion in the ether.

"If we assume that long waves may be classed between 5000 and 30,000 metres, and short waves between 5 and 100 metres," he said, "then, by applying the basis of a rule proposed for the consideration of the International Radiotelegraph Conference at Washington, we find that 3700 wave-bands or channels will be practicable and permissible for the short-waves, but only 90 for the long waves."

Static is always with us, that type of interference which sounds like a ton of coal being dumped. So far no real solution has been found for static elimination, although some methods now in use minimise its effects. The loop is one of these devices, and for that reason loop sets will not pick up as much static as an antenna set. As much of the static originates in the tropics or north of New Zealand, the directional properties of the loop will aid in reducing this source of trouble, due to the fact that the loop receives best in the plane in which it is pointed and poorest from sections at right angles to the loop. From this we can see that if the loop is pointing east and west most of the static originating in the North is rejected and the Australian stations come through with great volume, while stations in the South and North are not received. A shifting of the plane of the loop will lift the direction of greatest response.

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