MODERN WIRELESS

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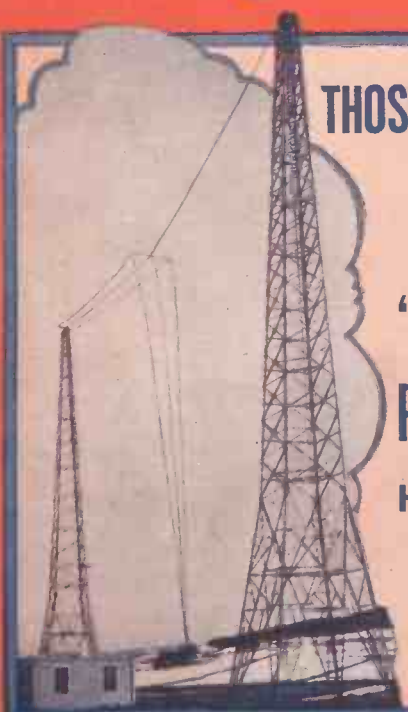
VOL: XVIII. Nº 69

SEPTEMBER 1932

SPECIAL ENLARGED RADIO SHOW NUMBER



THOSE FOREIGNERS—

all about them in

"THE WORLD'S PROGRAMMES"

HOW, WHEN and WHERE TO LISTEN.

Practical Aid in Choosing

YOUR NEW SET.

Articles by experts on how to get

BETTER RADIO

★

RADIO CONSULTANT-IN-CHIEF CAPT P.P.ECKERSLEY M.I.E.E.

CONTENTS

Vol. XVIII. No. 69. MODERN WIRELESS. SEPTEMBER, 1932.

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Vol. XVIII. No. 69. BRITAIN'S LEADING RADIO MAGAZINE. SEPTEMBER, 1932.

Our Special Exhibition Number—About the "Diodion"—This Month's "World's Programmes" Supplement—Our New Feature, "Better Radio"—The B.B.C.'s British Empire Short-Wave Station.

THIS special Exhibition Number of MODERN WIRELESS contains not only a very complete review of the Radio Show at Olympia, but a number of articles which are of particular interest to those readers who are considering what set to buy or to make this season.

Readers will find useful guidance on these points for practically all types of the best-known receivers of to-day, and, incidentally, full details for the construction of the "Diodion," a receiver which we have specially produced in the MODERN WIRELESS Research Department to celebrate the opening of the biggest Wireless Exhibition ever held in this country.

An Invaluable Supplement

We should like to draw our readers' attention this month especially to the "World's Programmes" Supplement. Helpful hints on getting foreign stations, short-wave technique and general reception conditions, with news of the new stations, wavelength alterations, etc., go to make this supplement invaluable to the long-distance listener.

Particularly timely at this period of the year is our new feature "Better Radio," which is packed with really practical first-hand information of use to every set owner.

A great many people will be making their first venture into the realm of practical radio this year, and will find the information on the subject in this special Exhibition Number particularly helpful.

In addition, we extend to all who visit the Radio Show at Olympia an invitation to our Stand (Number Eight).

Members of "M.W's" staff will be in attendance all the time that the doors are open to the public and will be delighted to talk over any radio-problems with our readers.

The British Empire Short-Waver

News is to hand as we go to press that by the end of the year the new British Empire short-wave transmitter service will be in operation. For some time past the companies which received the contract for the transmitter have been conducting numerous tests, and we now learn that their engineers have worked out a transmitter which, it is stated, will reach all corners of the British Empire.

Preliminary experimental transmissions will probably take place during November, and radiation will be from several directional aerials so arranged as to include all the points of the compass where there is British territory.

The power of the transmitter is rated at 20 kw. in the aerial circuit, which, we believe, is far in excess of that used by any other short-wave broadcasting station in the world.

Considerable attention has been given to the wavelengths most suitable for this new service, to provide first-rate, consistent, good reception in the various parts of the British Empire at a period roughly between the hours of 6 p.m. and midnight local time.

The Chief Engineer of the B.B.C., Mr. Noel Ashbridge, has decided that the best plan would be to divide the Empire into five zones, to be determined by three factors: (1) time of transmission; (2) direction of transmission, and (3) the distance of the point of reception from this country.

In all, six wavelengths have been chosen, ranging from 14 to 49 metres.

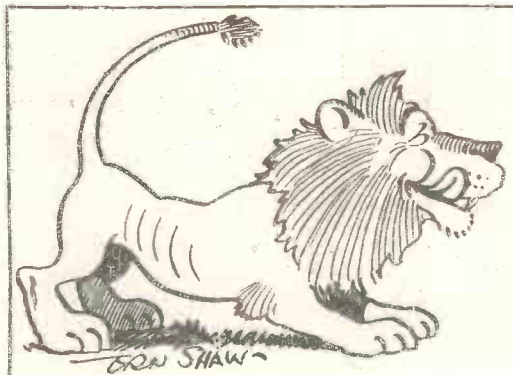
Worked Out in Great Detail

It will not be possible to transmit to the five zones simultaneously—such a procedure would necessitate the use of five transmitters—but Mr. Ashbridge has pointed out that consideration of the time differences between the various parts of the Empire shows that it is not likely to be necessary to serve more than two zones at the same time, and consequently only two transmitters will be built.

This new Empire scheme seems to have been worked out in commendable detail, and we should like to take this opportunity of congratulating the Chief Engineer of the B.B.C. on the first-rate plan he has evolved.

This new programme service from the Empire short-wave transmitter will be supplemented by recorded programmes, to be recorded on discs and circulated to stations which subscribe to the service. These records will not be on sale to the public, and records will be limited chiefly to entertainment national in character.

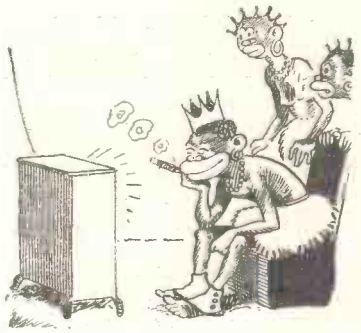
The service will probably be started during the next few months, and already we hear that one series of records will be devoted to the reproduction of the play "Waterloo," which was broadcast on the 18th June this year.



B.B.C. SUCCESS IN AFRICA

By "Jester"

WALLAPOPO was a nigger of the very darkest hue
And he occupied a grass-hut near the swamp of Wanderoo.
Languidly he lammed his ladies as they ground his daily corn,
Trifling meanwhile with a door-knob in his ear—where it was worn.
He could do a spot of witchcraft, and he held his liquor well ;
He could spear the fleeting antelope—and eat it where it fell,
He could face the wounded leopard, dodge the ***mamba*** as it struck,
And maintain a cold composure when a rhino ran amuck,
He was Adam in an Eden ; he was happy past a doubt,
Till Emanuel Arthur Goatwell intervened and shoved him out.



EMANUEL ARTHUR GOATWELL was a missionary bold ;
His job in life was making niggers think as they were told.
He taught our hero how to wash, to read and count and write,
And to be polite to ladies—provided they were white.
So Wallapopo, thrilling with a new-born sense of power,
Donned a pair of cast-off spats and aired his knowledge by the hour,
Till the Chief Witch-doctor jibbered from his wounded ***amour propre,***
And Emanuel rubbed his hands with glee and chuckled, "That's the dope."
Next, Emanuel brought a wireless set and put it in the hut,
And bade old Wallapopo hear the "wisdom from the nut."

THEN, good deed done and lunchward bound, he met a peckish lion ;
So—having left his gun at home—he winged his way to Zion.
Meanwhile, his ebon pupil was imbibing all the worth
Of the many-sided culture of the white men of the North.
He told his Chief that flogging girls was "a caddish thing to do,"
And that if the Chief would "cut it out," by gad ! he'd see him through !
At this the Chief threw seven fits and tried to bite a rhino ;
Then bastinadoed all his wives—six black and one albino.
Day after day the wireless droned. Our nigger grew acquainted
With Prohibition, Henry Hall and what Velasquez painted.

HE sickened all his missuses with "Chats on Chiaroscuro,"
And bored the hunters on the trail with anecdotes of Truro.
But Prohibition brought him low. He told the tribe that drinking
Was heap bad medicine for the mind and led to muddy thinking.
The Chief called up his wizards ; they assembled at the double,
And cast the magic monkey-skulls to diagnose the trouble.
The sentence was a sticky one, for our listener was laid,
Together with his set and spats, beneath the ant-hill's shade.
Then they covered him with honey, and they left him there to shout
Till the ants had switched his valves off and his H.T. had run out.

OLYMPIAN RADIO

ALL ABOUT A MARVELLOUS EXHIBITION

A special guide to new sets and components with candid advice for readers purchasing a set for the first time

ONCE again the National Radio Exhibition has come round, and we are presenting to our readers a special section of MODERN WIRELESS dealing with that gigantic Show.

This year the Exhibition is being held a month earlier than previously, in order that the many firms that take part will be able to get their products ready for the market before the rush for sets and parts commences.

Gigantic!

Once again the Show has broken all records as regards the space taken up, and this year the large hall at Olympia is being used, there being round about 300 stands, and well over 200 different firms represented.

So vast is the Show that it is impossible, without turning "M.W." into a glorified catalogue, to give in our pages this month anything but a brief survey of the things to be seen there. So we have not attempted to cover fully all the various sets, components, accessories, and so forth that are on view to an admiring, but not uncritical, public; but we have endeavoured to give a cameo idea of what is to be seen at Olympia.

For the Non-Technical

This review has been divided into sections, the titles of which are given in the contents box in this page, but special attention is drawn to the last chapter, which is written in non-technical language, and is expressly for the benefit of the non-technical reader, though we venture to suggest that it is not without interest to *all* our readers, however versed or otherwise they may be in the art of radio.

Visit Stand No. 8

Many of the most interesting components and sets are illustrated in the following pages, which we feel will be of great help to all, whether or not a visit to Olympia is contemplated.

If you can get down to the Show it will be well worth while, and MODERN WIRELESS will be looking out for you on Stand 8. We have many things to show you, as you will read on page 216, and we here tender our heartiest invitation to come and have a chat with us any time between 11 a.m. and 10 p.m. from August 19th to 27th.

Don't forget—Stand No. 8.

CONTENTS

The EXHIBITION AND HOW TO GET THERE

Olympia is easy to reach if you go the right way. The directions below will help you.

This year the National Radio Exhibition at Olympia is being held roughly a month earlier. It is also very much larger than heretofore, and occupies the main building.

It contains something like three hundred stands, occupied by about 220 firms anxious to bring their wares to the notice of the British radio public.

Commencing on August 19th, it continues till the following Saturday, the 27th, and it is expected that in spite of the possibility of hot weather, and the fact that the holiday month has been chosen, there will be a really fine attendance.

The problem of getting to the show is not difficult to solve, and the following brief directions for travelling from the main points of London will help those who have any doubt how to find this mecca of radio.

The map shows the routes taken by the buses, the chief ones being shown in black, while the other details will tell you how to get to Olympia from the main London railroad termini, by Underground.

KING'S CROSS.—Metropolitan Rly. (King's Cross Station). Book to Addison Road.

ST. PANCRAS.—Metropolitan Rly. (King's Cross Station). Book to Addison Road.

EUSTON.—Metropolitan Rly. (Euston Square Station). Book to Addison Road.

MARYLEBONE.—Metropolitan Rly. (Baker Street Station). Book to Addison Road.

PADDINGTON.—Metropolitan Rly. (Bishops Road to Addison Road, or Praed Street to Kensington High Street, and then bus to Olympia.

VICTORIA.—By District to Earl's Court and thence by train to Addison Road (every few minutes).

CHARING CROSS.—By District as above.

CANNON STREET and LONDON BRIDGE.—By District as above. Or by Hammersmith train to Baron's Court or West Kensington stations.

WATERLOO.—To Charing Cross, and then as above by District.

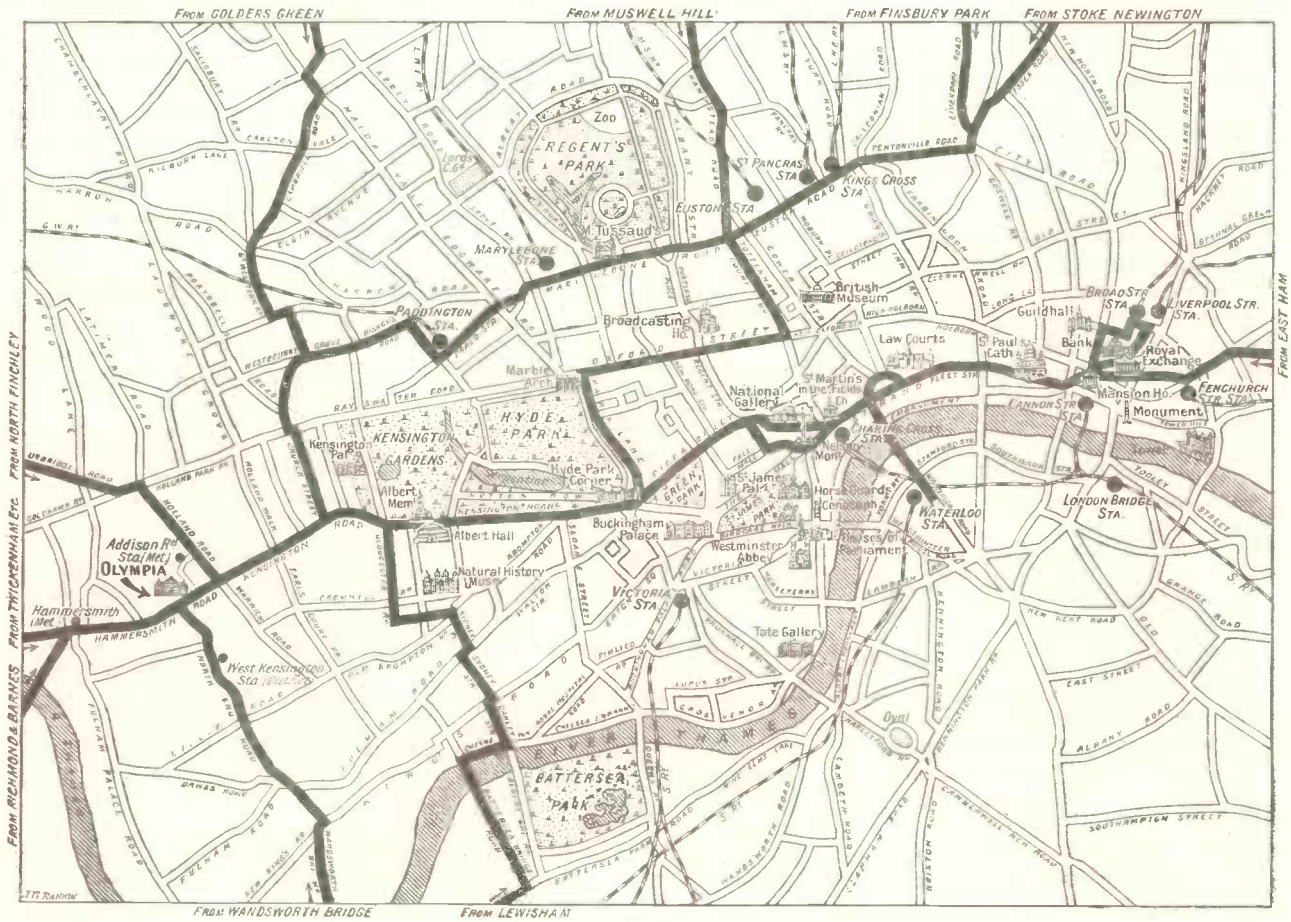
FENCHURCH STREET.—Mark Lane, District to Earl's Court as above, or by Inner Circle to High Street, Kensington and thence by bus.

LIVERPOOL STREET.—Metropolitan to Addison Road.

Apart from these lines, the Piccadilly Railway goes to Baron's Court, which is quite convenient. Also a large number of bus routes pass the door of the Exhibition.

On our map, as previously indicated, these are shown in deep black, and the bus numbers are as follow: 9, 27, 28, 33, 73, 92, 102, 127, 173, 233, 273, 291, 526.

So if you see any of these buses you may be sure that you can get to the Radio Show by bus. Tram routes will not help very much except as means to get you to one or other of the bus routes or electric railways.



Visit "MODERN WIRELESS"

The "Modern Wireless" Stand at Olympia is full of interest, and we hope all our readers who can possibly do so will visit it. The stand number is 8.

ONCE more MODERN WIRELESS will be taking an active part in the National Radio Exhibition, and this year the stand we have arranged is larger than ever. You will find it in the official guide under Amalgamated Press, Ltd., and, as usual, we are sharing with our sister journals "Popular Wireless" and "The Wireless Constructor."

The result is an exhibition of home-constructor set designs such as has never been equalled. The stand is spacious, so that you can easily walk round and examine the models, and members of the technical staffs of the three journals will be constantly in attendance to help you with any knotty problem if you desire to seek their aid.

Naturally the chief attraction on the stand will be "The Diodion," of which full details are given elsewhere in this issue. You will be surprised at the compactness of this set when you see it, and though it is not possible to operate it and let you hear it in action, we shall be very glad to explain any and every point concerning both the building and operation.

Near by will be a radio-gramophone—a mains three-valver—that is sure to come in for a great deal of attention. It is the "Mu-tone," and is to be described fully next month, but we have decided to show it in advance to all those who wish to examine the receiver first hand. It incorporates a variable-mu valve and a tone control enabling both the volume and character of the output to be controlled exactly as the owner wishes.

You will also be able to watch receivers being built, for we have arranged for one of the members of the Set Construction staff to be on the stand during the exhibition to demonstrate how home constructor set designs are built up in their final forms, after the research department has finished its tests.

In addition to the above, there will be on view one of the latest short-wave transmitters and receivers—a compact outfit for working on 5 metres. This has been designed and most successfully operated by our short-wave expert, W. L. S., who describes the receiver briefly in the constructional section of this number.

The "S.T.300" radio-gram, described in "The Wireless Constructor," will be there, while "Popular Wireless" is arranging another attractive display. "The Olympus Four," and "The Moderator Two" will form a prominent part of the "P.W." section of the stand among a fascinating array of radio gear that will arouse the envy of every home constructor who sees it.

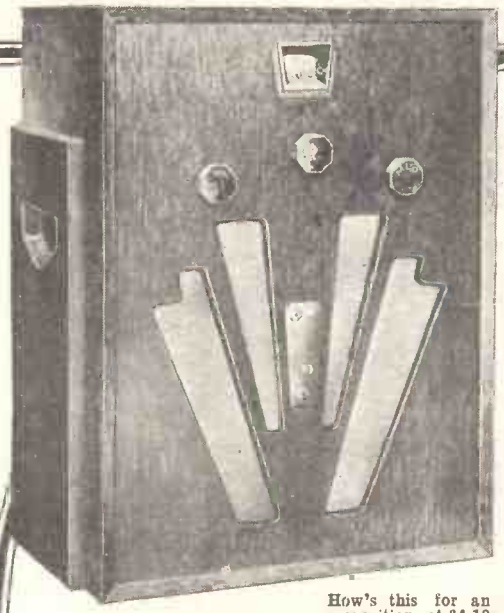
That, in brief, is an outline of the attractions on the MODERN WIRELESS Stand (No. 8) at Olympia. Make sure you do not miss it. You will be accorded a hearty welcome and, as we said before, we shall be delighted to answer any questions or give advice to those who require it. It is our annual chance to get into personal contact with our host of readers, and with the general public, for the invitation is not limited to readers. So bring your non-reader friends along and introduce us. We are looking forward to meeting you *all* on Stand No. 8.

MAKING SURE THERE IS NO DISTORTION

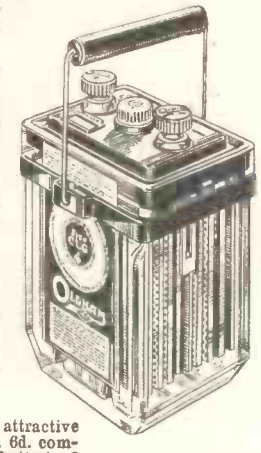
Carrying out one of the numerous tests that were made with the original "Diodion," shown on our stand at Olympia. Don't forget to come and visit us there and see this remarkable receiver for yourself.

Some of the Fine Features of the Show

BE SURE NOT TO MISS THESE ATTRACTIVE EXHIBITS



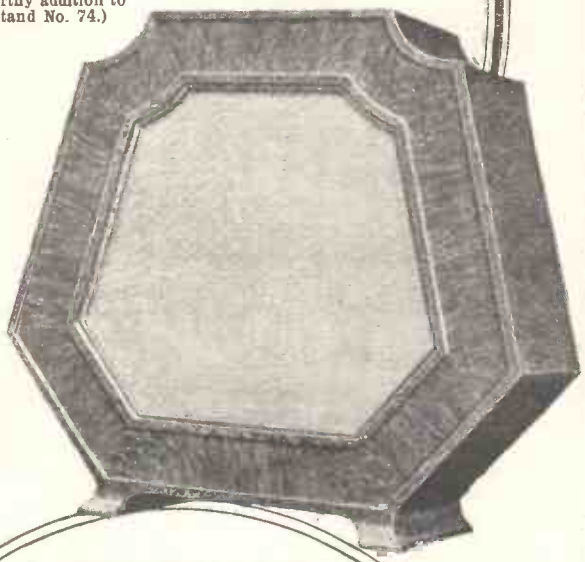
The sturdily-built Oldham C.L.G.4 accumulator is supplied complete with carrying handle. (Stand No. 85.)



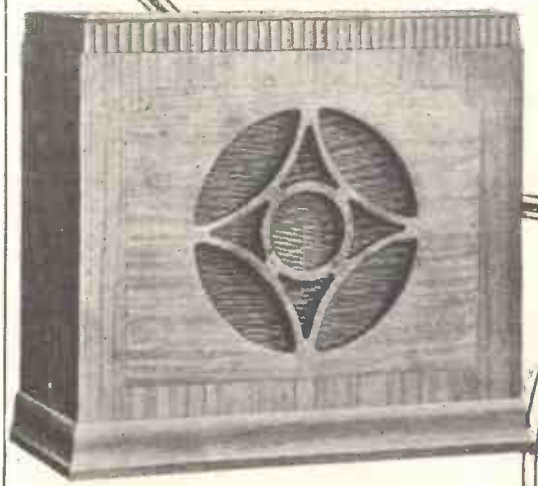
The controls are conveniently tucked away at the side of this new Lissen self-contained 2-valve battery receiver. (Stand No. 59.)

How's this for an attractive proposition at £4 19s. 6d. complete with valves and batteries? The new model "248" is a worthy addition to the Marconiphone range. (Stand No. 74.)

Power and plenty are the features of this Pertrix ultra-capacity battery, to be seen on Stand No. 126.



This attractive-looking bakelite moulding houses the G.E.C. magnetic speaker. (Stands Nos. 105 and 109.)



Never before have loudspeakers been of such a high standard as are some of the models to be seen at Olympia this year. The permanent-magnet moving-coil instrument seen above—the Blue Spot 32 P.M.—is a real luxury version. (Stand No. 35.)

An excellent example of the modern tendency to combine art with efficiency is to be found in the new Telsen model S.93 receiver. (Stand No. 66.)

KITS FOR CONSTRUCTORS

The home constructor gets the biggest kick out of radio, for he can build what and when he chooses.

IN addition to the numerous sets described by the radio periodicals, there are a number of commercial kits that are worthy of note, and in this short chapter we want to bring to your notice a few of these as well as some of the mains units and batteries that are available.

We have been accustomed to look upon the valve manufacturers as the chief sources of kits, but although they were the originators they are now only a few among a large list of concerns that are bent upon providing the home constructor with a wide range of choice in receiver designs.

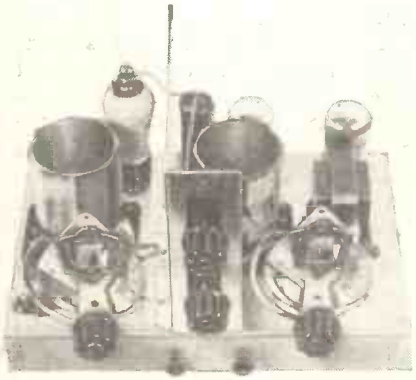
Keeping Their End Up

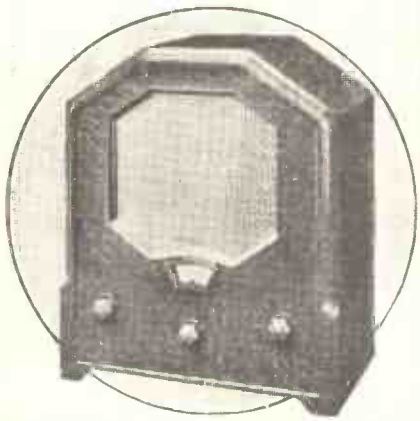
Cossor, the originators of the idea, are keeping their end up in fine fashion with two kits, which are available in similar form, the one having a built-in loudspeaker and the other being without this. The prices are £6 7s. 6d. and £7 17s. 6d. respectively. They are both Melody Maker chassis designs, employing S.G. three-valve circuits, and are very easy to build.

Ferranti are still marketing their band-pass kit, a three-valve design that can be obtained in either battery or mains form, while the G.E.C. are as usual making a strong bid for supremacy with an up-to-date Three, and the well-known "Music Magnet Four," now at a reduced price. The former is called the "Thirty-Three," and at 9 guineas represents excellent value. It is a handsome self-contained design in a moulded cabinet, and employs the popular S.G.–det.–L.F. circuit, with moving-iron loudspeaker.

Lissen have a kit that is worthy of special attention. It is known as

THREE FINE THREE'S





On the left the Cossor Melody Maker is being placed in its cabinet; in the centre is the "Ready Radio 303," while the other illustration is of the Osram "Thirty-Three" Music Magnet. All are kit sets that are obtainable for home assembly. (Stands 60, 106, and 105/109.)

Why Not Use the Mains for Your Set?

the "Skyscraper," and is also of the three-valve variety. It can be obtained in complete form if desired, and is operated by batteries. The complete form is available at £8 17s. 6d.

Pilot authors' kits are the main lines in sets from the factory of Messrs. Peto-Scott, in addition to band-pass units and short-wave adaptor kits. The authors' kits refer, of course, to the various designs published in this and other radio journals.

Four Distinct Forms

Radio for the Million are placing another kit on the market, called the "Stationmaster" Three, and this, as others in previous years, should be a great success. The kit is available in four distinct forms, battery and mains models being distinct. Ready Radio have a special kit this year called the "303." It is supplied with moving-coil loudspeaker, and embodies a straight three-valve circuit, being housed in a walnut cabinet. Another kit that is available is also a battery three with one H.F. stage, and it is an all-wave unit.

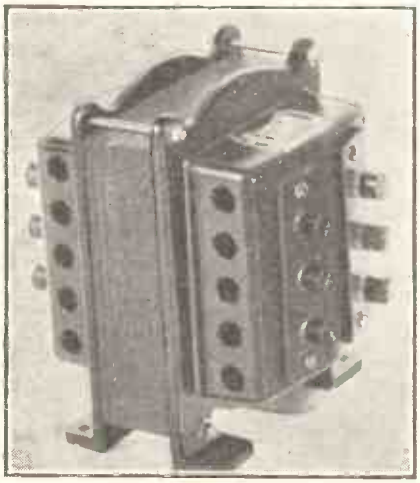
Typical Examples

The Six Sixty "Chassikit" is again being listed in up-to-date form with balanced-armature loudspeaker.

For the power side of the kits and other receivers we have a large variety of batteries and mains units. Here are some typical examples. Among the batteries are a wide range of H.T., L.T., and grid-bias cells, capable of driving quite large receivers.

Exide and Drydex batteries are known the world over, and, as expected, they are well to the front in their particular spheres this season. A new L.T. cell has been added to the famous D types, the D.X.G. having similar characteristics to the D.T.G., D.F.G., etc., but of unusually small dimensions. It is intended for use where space is more than usually precious, and retails at 9s. 6d.

FROM HEAYBERD



This is a Heayberd mains transformer of new pattern designed to operate with dry rectifiers. (Stand 13.)

JUST PLUG IT IN

A short-wave adaptor made by Messrs. Hustler, Simpson & Webb. (Stand 30.)

Gravity Indicators

Gravity bead indicators are available for all D cells, and batteries with these incorporated will be shown at Olympia.

Special large capacity H.T. wet batteries are also to be seen; these being the W.Y.10, W.T.10, and W.H.10, with capacities of 10,000 and 5,000 milliampere hours in the cases of the last-named two.

Edison-Swan are making a great effort in the H.T. battery line, and have developed a special selling campaign. The batteries are being made in two capacities. The standard size will give 60, 99, 103, and 100 volts, the latter with 7½-volt bias section. These give 10 milliamps.

A Boon for Battery Sets

The super-capacity types are 60-, 105-, and 120-volters, and provide 20 milliamps. These latter will be a boon for the battery-set owner, who is too often faced with a serious anode consumption problem.

A new and comprehensive range of H.T. batteries is also being introduced by Ever Ready; the "Winner" series is being continued together with the power types, but the new range will be particularly suitable for portable sets.

Wonderful Piece of Work

Lissen H.T. batteries are being continued with the same success, and, indeed, it is safe to say that they will have equally good if not better sales results during the coming season. The Lissen super-capacity battery is a wonderful piece of work, and has been responsible for the happy reception of innumerable listeners.

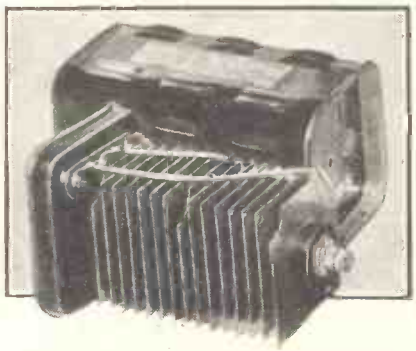
Oldham have improved their accumulators by incorporating what is termed a captive float which sinks when the battery needs recharging, while the Standard Battery company are continuing most of their lines.

For Heavy Duty

Pertrix have renamed the Junior series of H.T. batteries, and they will in future be called the "standard" type. The complete range of H.T. includes the Super, No. 3 heavy duty, the 45-milliamp. discharge types, and the "Ultra" and portable classes. Grid-bias batteries are also numerous, and several new 2-volt L.T. cells have appeared.

Siemens have a new "Full-o-Power" battery, a super size in 45-volt units, while the V.6 type has been increased in price from 21s. to 23s.

READY TO RECTIFY



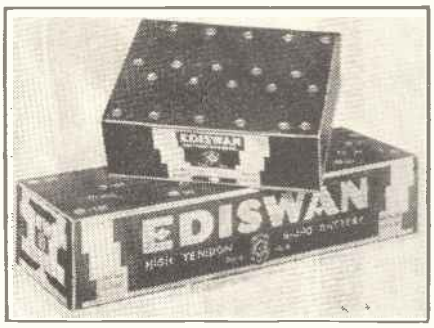
One of the many Westinghouse dry rectifiers to be seen on Stand 89.

We have little space left to discuss the various types of mains units that are available and are being exhibited at Olympia. They cover almost

Short-Wave Listening On An Ordinary Set

every contingency, though one could wish that there were more of the 30 to 35-milliamp. type. Prices are more reasonable in most cases, and the set owner who wishes to run the H.T. or the H.T. and L.T. of his

PLENTY OF PUNCH



A couple of Ediswan H.T. batteries. (Stands 75 and 230.)

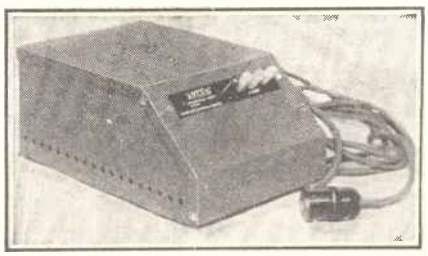
receiver from the mains will not have to wander far before he finds what he requires.

But here let us issue one word of warning. When choosing a mains unit, get one a little bigger than you think you need. It will surely be useful in the end when you build or buy a larger set, or decide to use a bigger output valve.

Particularly Suitable

The "M.W" and "Popular" units, designed by MODERN WIRELESS, are to be seen on the Heayberd stand. These are units that are particularly suitable for home-constructed sets, in that they have special terminals for earthing the heater circuit of the A.C. valves, so enabling the con-

WIRELESS WITHOUT WORRY



No need to worry about H.T. if you use this Atlas mains unit. (Stand 91.)

structor to cut out the hum that is so often a bugbear in mains receivers.

They are all-power units giving something like 50 and 35 milliamps. respectively, at 250 and 200 volts.

Dry rectifiers by the dozen are to be seen on the Westinghouse stand, covering all the possible needs of the mains set builder. Power transformers suitable for them are shown by R.I., Heayberd, Regentone and others, while mains units of all types employing these dry rectifiers are to be seen on the stands of Atlas, Tannoy, R.I., Varley, Formo, Heayberd, Ekco, Tunewell, and others.

The Maximum Consumption

We have already said that when choosing a mains unit it is advisable to get a big one if you can afford it, so that if you should one day need more output than seems likely at the time of purchase, you will not have to scrap the unit and get another.

There is another point to watch, also, and that is that with the particular combination of valves you choose for your kit set you may over-run the unit unless you have some sort of reserve in hand. That is why we, in our lists of accessories always give the outside limit when it comes to the milliamp. consumption of a set.

A case in point is that of the "Five-Grid" Four, which was described last month. This set, on the majority of valve combinations, takes about 25 milliamps. In certain cases of valve grouping a consumption of 28 milliamps. may be reached, or even 30 in exceptional circumstances.

Thus we specified a unit giving 30 milliamps. at 120 volts.

Now on the Market

There are not many units that are sure of giving this figure and we mentioned two reliable makes in our list.

Unfortunately another type of unit, that has just been brought out, and which you will see at Olympia, was omitted, and we are taking this opportunity of drawing your attention to it.

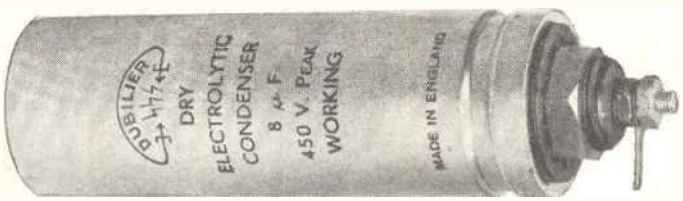
We refer to the Atlas A.C.300, which was advertised on page 163 of last month's MODERN WIRELESS, and which is eminently suitable for the set in question.

Although rated at 25 milliamps. at 150 volts, the unit is fully capable of providing 30 milliamps. at 120, thereby fulfilling the requirements of the set.

THE "KELSEY" ADAPTOR

An ingenious short-wave adaptor by Peto-Scott. (Stand 247.)

We are mentioning this specially, because some of our readers may be in doubt between the statement of the advertisement and the fact that the name of Atlas was omitted from our list of accessories.



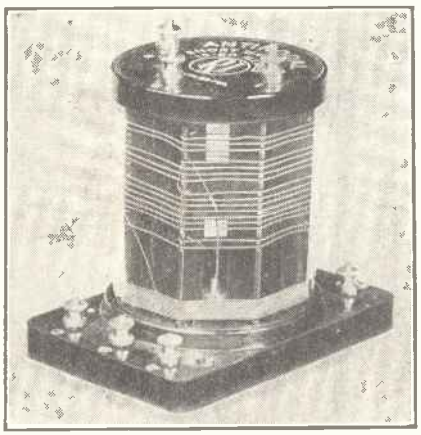
A DRY "WET" ONE

The new Dubilier electrolytic condenser for mains set operation. (Stand 84.)

This omission was in error, and Atlas should certainly have appeared among those makes suitable for the "Five-Grid" Four.

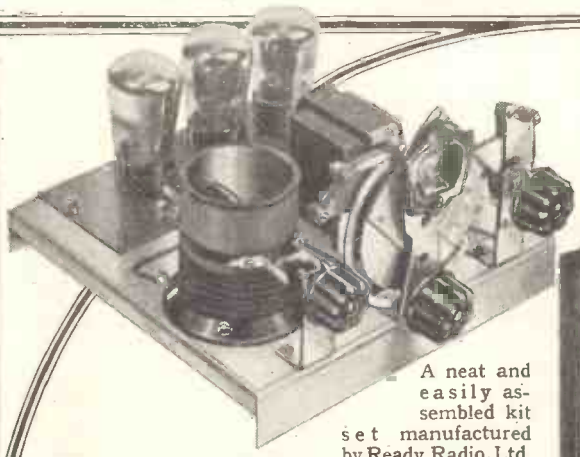
The unit in question is a very fine piece of work and, supplying G.B. as well as H.T. and trickle-charging, it is a particularly useful addition to the Atlas range.

BELOW 100 METRES



The R.I. Antinodal short-wave coil. (Stand 90.)

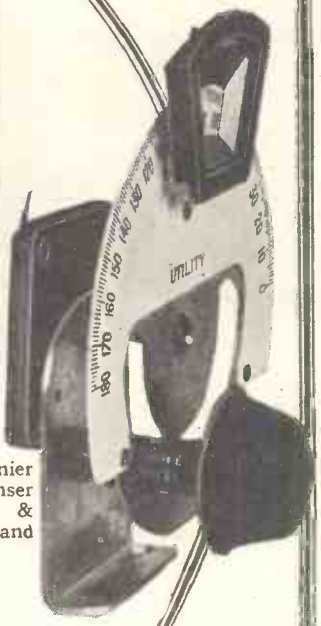
You Can See Them All At Radiolympia



A neat and easily assembled kit set manufactured by Ready Radio, Ltd. (Stand 106.)

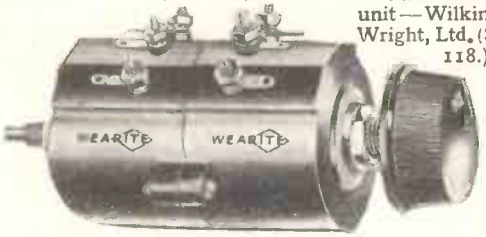
One of the best batteries on the British market. (Stand 63.)

The new "Station Master" three-valve kit set, by Radio for the Million. (Stand 248.)



A combined vernier drive and condenser unit—Wilkins & Wright, Ltd. (Stand 118.)

A medium-priced moving-coil loudspeaker capable of really high quality reproduction made by Epochs, Ltd. (Stand 41.)



This pair of ganged volume controls come from Wright & Weaire, Ltd. (Stand 82.)

Working from the A.C. mains, this Lotus "Bud" two-valver (left) is ideal for local station reception. (Stand 64.)

The Ferranti seven-valve super-heterodyne has a very attractive appearance together with outstanding station-pulling power. (Stand 78.)

The LATEST LOUDSPEAKERS

Loudspeaker development is going on apace, as will be seen from this account of the latest makes and types.

IN the winter-time the listener's fancy turns to thoughts of a new loudspeaker, and he goes (if he can) to the Radio Exhibition bent upon discovering for himself what

A CHALLENGER

The R & A 35/- "Challenger" Moving-Coil Speaker (Stand 69.)

progress, if any, has been made in the design of that instrument, and what are the prices asked for the various makes and types.

Prices are Tumbling Down

This year the surprises that are in store for the speaker searcher are many. Prices of the moving-coil types have come tumbling down to a remarkable degree, while the progress that has been made on the technical side, resulting in better reproduction, is very great.

There is no need now to bemoan the fact that it is beyond one's pocket to get a good moving-coil or an inductor speaker. Most of those to be seen at Olympia are of one or other of these types, mainly the former, and the powers of reproduction possessed by most of them are really astounding.

Manufacturers and Their Wares

We cannot give here a detailed account of the different models that are available, but in the short space at our disposal we have endeavoured to place before your notice the main manufacturers of loudspeakers and the chief wares that they are offering.

As we remarked a few paragraphs back, the one thing that is to be noticed more than anything else in the loudspeaker world is the fact that prices have fallen to such an extent that it is now possible to purchase a good moving-iron unit for only 5s. and a first-class cone assembly for something under 20s. Finally we can get a full-blooded moving-coil chassis for as little as £1.

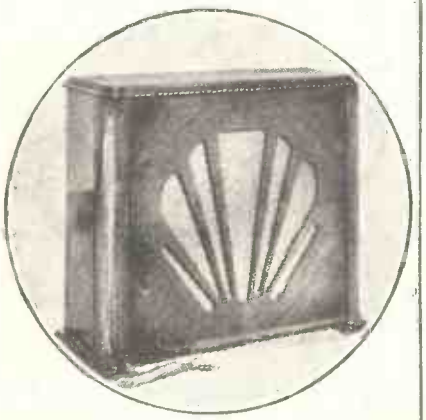
From this price upwards are to be found moving-coils and moving-irons of all sorts and sizes. There is the Epoch moving-coil range, with its inexpensive but excellent 35s. model, up through the 99K. to the high-power cinema types that are made by this firm. Celestion have a new model that is said to "beat the band," and you will have an opportunity of hearing it, and many of the other types and makes, in the demonstration rooms that have been arranged for set and speaker "shows."

A Very Goodly Show

The P.M.4 model of W.B. will take a prominent part in the exhibit of that firm, among the other larger speakers for which they are famous. Nearly every firm is showing complete cabinet models besides the chassis, and the hundreds of loudspeakers make a very goodly show.

R & A put themselves well to

HIGH OR LOW TONE



An ingenious tone control is fixed on the back of the Loewe "Varitone" Speaker. (Stand 223.)

the fore with the new "Victor" reproducer, though the full range of this firm consists of eight widely

Listen to Them at the Radio Exhibition

different models. The " Challenger " will be there, of course, at 35s. The " Victor " is 70s. and is of the moving-coil variety, having some very important features.

Ormond have an interesting pair of loudspeakers. The P.M. type is available at 38s. 6d., while at the other end of the scale we find a moving-iron unit for 5s.

Improved Marconiphone moving coils are to be seen, and the B.T.H. models have been altered in many ways. Notably the Junior Magnavox have extended their range, while the Lissen Balanced Armature and Solenoid units are to be available at 12s. 6d. and 5s. 6d. respectively. They are specially wound for use in the anode circuits of pentode valves and therefore need no output filter or impedance matching circuit.

Several Price Reductions

The inductor loudspeaker will still create a lot of attention, and Lamplugh, who were among the first to market this type, are again including one among their exhibits. In addition there are several entirely new moving coils. These are grouped under the name of the Silver Ghost range and include both mains-energised and permanent-magnet types.

A POPULAR " P.M."

One of the famous range of W.B Permanent-Magnet Moving-Coils. (Stand 108.)

The H.M.V. loudspeaker needs no introduction, and the S.7 Universal is now joined by the new Super Power moving coil, M.174, in walnut cabinet. It is a permanent-magnet model capable of handling as much as 6 watts, and costs £7 10s.

Ferranti have largely revised their speaker range, and prices have been reduced in several instances. The famous inductor now costs only 30s. in chassis form, for instance, and but £3 10s. in a stout and handsome cabinet.

Their Name is Legion

We have referred to the new Celestion speaker, but we must also draw attention to the remarkable price range covered by this firm's moving-coil chassis. These can be obtained from 27s. 6d. for the P.P.M. Soundex to 77s. 6d. for the P.P.M.29, and a price not yet (at the moment of writing) fixed for the new P.P.M.39.

The number of moving-coil speakers at the Show seems to be legion, for most of the firms have several models, the British Rola Company dazzling the eye with no less than 15. These range from £1 7s. 6d. to £3, and cover a wide range of field resistance, for most of them are designed for mains energising.

The famous Telsen unit and chassis is there, and home constructors will be glad to learn that the British Blue Spot have brought out a new improved model of the 66K. to retail at 15s., or complete with chassis at 19s. 9d. The 66R. and 100U. are continued, and a number of other chassis and complete speakers are available.

Of these particularly interesting lines are the new moving-coil chassis which sells at 75s., the model 99P.M. at 59s. 6d., and the moving-iron complete speaker 31K. at 31s. 6d.

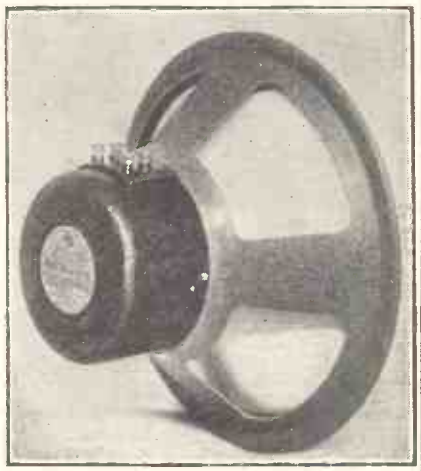
Baker's (Selhurst) are showing a full range of moving-coil chassis to suit practically every requirement, from the " Popular " to the ingenious Klock model in which an electric clock is combined in one cabinet with a moving-coil chassis.

Hear for Yourself

Our review must necessarily be brief, but as we said at the commencement of this chapter in our show supplement, it is impossible to give anything like a true idea of what is to be seen and heard at Olympia in the way of loudspeakers, and the only satisfactory way of finding out *all* about them is to go and hear and see for yourself.

Progress has been more rapid in the loudspeaker than would be first imagined from a cursory glance at the models on view. The outside of the case, the appearance of the chassis, can tell you practically nothing about the capabilities of the instrument.

AN INDUCTOR SPEAKER



The Lamplugh Inductor Dynamic Loudspeaker Chassis. (Stand 99.)

A loudspeaker has no easy task to perform. It has to turn electrical impulses into sound. And those electrical impulses are not always pure or true; often they are distorted, and the speaker cannot reproduce the quality as it should. Then people say: "What a rotten speaker "—reviling it for something that it may have no hand in at all.

Under Ideal Conditions

Too often is such the case when you hear a speaker at a friend's house, or as broadcast from the doors of a radio dealer. But at Olympia you will be able to hear this wonderful link in the radio chain under conditions laid down by the manufacturers themselves—in the demonstration rooms—and the true worth of the speakers can then be judged.

RECENT VALVE DEVELOPMENTS

A brief outline of the most important valve classes to be seen at Olympia.

THE improvements that have taken place in the design of the radio receiving valve during the last few months, and which will be well illustrated during the radio exhibition, are mainly confined

EARLY ARRIVALS

Two of the first of the British variable-mu valves. They are Cossor battery types. (Stand 60.)

to screened-grid and battery pentode valves.

The variable-mu valve has come into its own for A.C.-operated sets, though one or two D.C. variable-mus will be seen at Olympia, notably the Osram VDS, the Marconi, and, possibly, the Mazda 1-amp. heater type. Battery variable-mu screened-grid valves, as well as the mains types, have been brought out by Cossor and Lissen, though in the former make they have been on the market for some months.

Prominent manufacturers of variable-mu valves are Mullard, Osram, Marconi, Mazda, in addition to those mentioned above, and those who examine the A.C. radio-gramophone on the MODERN WIRELESS stand will see a practical application of one of the Mazdas.

The new pentodes we mentioned are those that have been specially designed for use in small battery receivers, and consequently they are of the low anode power consumption type. Typical examples are the Mullard P.M.22A., Mazda Pen.220 and 220A., Marconi P.T.2, and Osram P.T.2, Lissen P.T.225, and so on.

The Very Last Ounce

The P.M.22A., for instance, has an anode current consumption of only 4½ milliamps. at 100 volts, and 9½ at the full 150. These pentodes are extremely useful where the very last ounce of power output is required from a set with the minimum of power input.

It is surprising the number of mains pentodes that have been evolved by this firm, and yet they have not yet finished the collection. At the show is to be seen the P.M.24M., a 250-volt affair that has been adopted by many of the set manufacturers this season. The P.M.24D. is another huge pentode, this time the anode voltage is 500, and the output is enormous.

During the last few weeks a new range, or the beginning of a new range, of mains valves has made its appearance on the market. These are the Standard "Micromesh" short-path valves, and the types so far released are the rectifier, H.L., and power. The rectifier is designed to supply 250 volts and 60 milliamps., and has an indirectly-heated cathode.

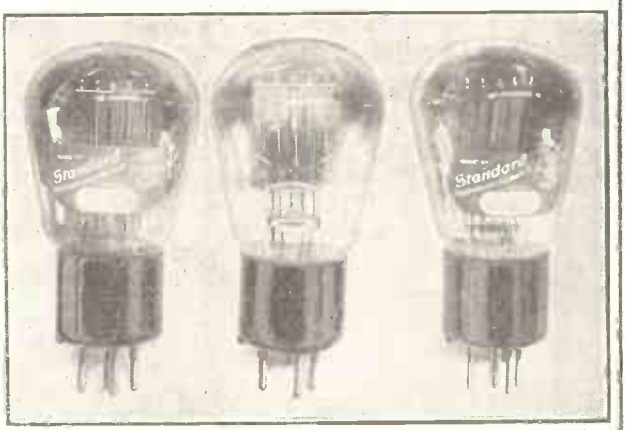
A Modified Variable-Mu

The H.L.A.1. is an H.L. type having exceedingly fine characteristics, the slope being 8 and the impedance 10,000 ohms. The third of the series, the P.A.1, has an impedance of 1,050 ohms, and a mutual conductance of 12.

Among the new valves also must be mentioned the modified Osram variable-mu type, the V.M.S.4. An improvement in efficiency has been made, a higher maximum mutual conductance being obtained with the same linearity of control.

The valves we have mentioned form but a skeleton upon which the visitor to the exhibition may work, but they indicate the main lines upon which most of the progress has been made.

THE SHORT PATH TO SUCCESS



Three Standard "Micromesh" valves, using "shortpath" principles. (Stand 107.)

Components for 1933

Many new lines are being introduced at the Exhibition. Here are some of the most interesting.

To the home constructor, the most exciting part of the Radio Exhibition is undoubtedly that which deals with the innumerable varieties of components. All sorts and prices are to be seen, covering every possible contingency that may be encountered by the set-builder. Does he want a triple or quadruple gang condenser? Radiophone, Polar, J.B., Cyldon, Utility are all waiting to supply him.

Does he need a gramophone pick-up? H.M.V., Marconiphone, B.T.H., Radiophone, Bulgin, Igranic, Bowyer-Lowe, A.E.D., Varley, Lissen and many others are ready to provide a variety that will meet all requirements.

Swelling the Ranks

From batteries to volume controls, transformers to trickle chargers—all are available at remarkably low prices, and all are to be seen at Olympia during the next few days.

Let us have a look at a few of the new components that have been brought out to swell the ranks.

Condensers are being made more and more accurate and the ganging is rapidly becoming perfect, as witness the various screened gang chassis manufactured by the British Radiophone Company. They have special end vanes which allow of very close matching, and there are models for practically every need with right-or left-hand drive and various sizes of spindle.

Utility are matching theirs to half per cent. in the case of the gang assemblies and, like Radiophone, have brought out a new model of small ·0005-mfd. to ·0002-mfd. variables.

One of the neatly built Telsen 1933 products.

A series aerial condenser with shorting switch. (Stand 66.)

A new slow-motion drive of the disc variety is available, while a novelty is a straight-line dial which will attract a large number of visitors. Several of the firms, notably Polar, Utility, Radiophone, and J.B., are showing special super-het. gangs where a special stator is provided for a ganged oscillator control.

Perfectly Built

Formo have a new gang assembly that should be examined, while the Cyldon stand is sure to receive the attention of connoisseurs, for there is always a good range of perfectly built condensers from the Sidney Bird Company's factory.

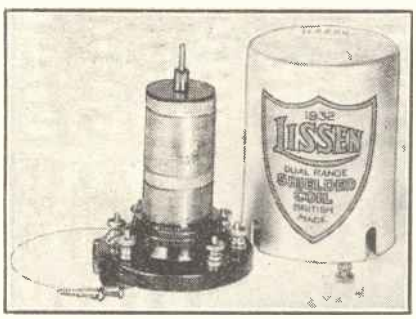
Solid-dielectric condensers have come to stay, and many examples of these in both the plain, differential, and self-shorting variety are to be seen on the Ready Radio, J.B., Polar, Telsen, Lissen, Ferranti, Graham Farish, and Igranic stands, to mention some of the many exhibitors.

Transformers and chokes of all kinds are to be found throughout the show. Ferranti are showing the full range of AF and mains transformers, Radio Instruments have on view the "Audirad" L.F. choke, which acts in two capacities at once, stopping both H.F. and L.F. impulses, and Ready Radio are continuing the "Instamat," a choke that allows easy matching of the output impedances of the set.

Better Than Before

New Telsen chokes and a new "Ace" transformer are to be seen, the new "Ace" having characteristics that are very much better than was the case with the old transformer of that name.

A CANNED COIL



The Lissen screened dual-range coil. (Stand 59.)

SMOOTH DESIGN

An efficient choke that is a newcomer to radio. (Stand 206.)

Choose Carefully to Ensure Good Results

The Bulgin Transcoupler will attract attention, as will the new Atlas PF 1 and the Benjamin auto-feed transformer unit. Varley nickel-iron transformers are there, and the Lissen Hypernik and the Torex will still be among the foremost. Igranic have several models, including the tiny "Parvo" for shunt feeding.

Such a great deal depends upon the transformer for the quality of the reproduction of a set that all constructors would be well advised to examine the many makes of transformers very carefully; they will find them of great interest, especially the new shunt-feed units.

Diversity of Design

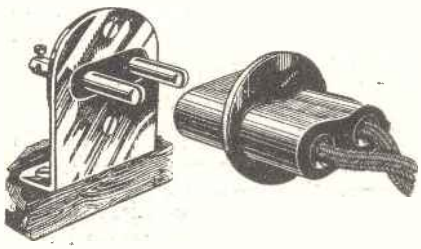
Among the coils we find a great diversity of design, though the main tendency is towards two distinct types. There is the simple screened wave-change dual-range coil, such as the Telsen, Lissen, Goltone, Colvern T.D; and there are the band-pass units and ganged units for band-pass and H.F. intervalve coupling.

These are to be found in great profusion on the stands of Colvern, Wright & Weaire, Varley, British General (who go in for intervalve band-passing with success), Tunewell, Watmel, etc.

Retaining Popular Models

Many of the last season's coils will be retained, such as the Cosmic dual range coil, sold by Sovereign, Lewcos, Wearite, Goltone, Peto-Scott, Ready Radio and others. Sovereign are

FOR MAINS OPERATION



This new input connector for mains sets is a product of Belling-Lee. (Stand 154.)

placing on the market a new coil known as the "Selectacoil," a dual range unit of high selectivity, while the Vario choke is an ingenious device to allow of constant control over a variable degree of H.F. choking in practically any type of circuit.

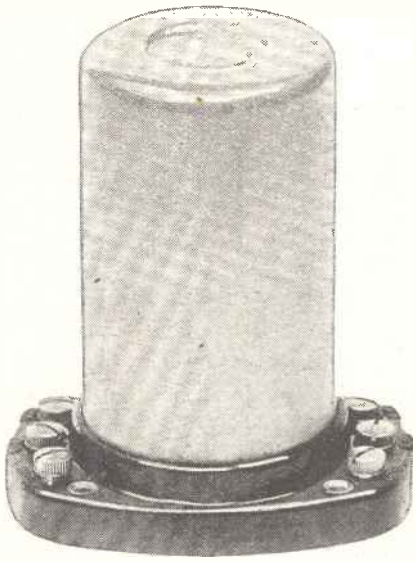
Ready Radio have a new high efficiency dual range coil fitted with a four-purpose knob giving long and medium wavelength, on-off, and selectivity and volume. Short-wave and S.G. coils are also available at moderate prices.

Telsen have developed a new screened coil with characteristics resembling those of the famous Telsen transformer, which is retained for another season.

Ultra-High Frequencies

A particularly interesting short-wave coil is being shown by Radio Instruments, who have made a study of the requirements of the ultra high

WELL SCREENED



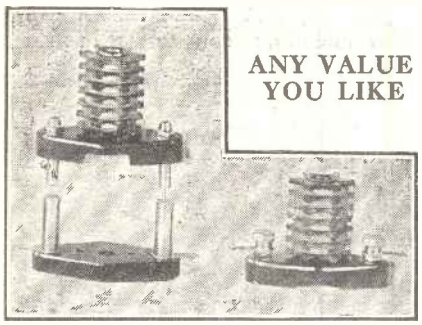
One of the T.D. Colvern coils as used in the "Diodion." (Stand 245.)

frequencies. The result is the Anti-nodal unit, which is said to do away with all dead spots in short-wave tuning and to have remarkable characteristics.

Short-wave coils and bases are being shown by Peto-Scott, who are supplying all coils used by the radio journals. Short-wave adapters and band-pass units are among the "tuning" items on view here.

Increased Efficiency

H.F. chokes are innumerable. There seem to be more than last year, and their design has, as a rule, been improved. We have the R.I. Quadastatic, Telsen Binocular, Lewcos types 11 and MC, Sovereign, Lissen, Ready Radio, Tunewell, Peto-Scott, Wearite, British General, Varley, among many others, some with two or three models, but most of them re-designed for the coming "season" with increased efficiency and reduced cost.



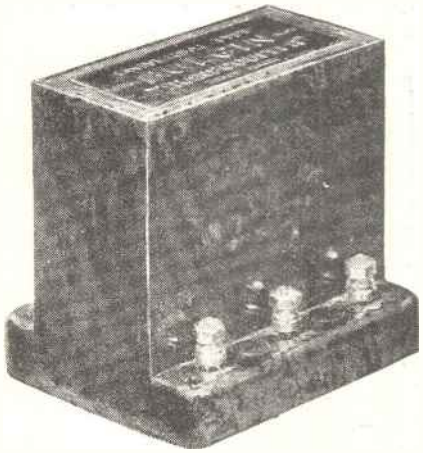
Wearite plug-in wire-wound resistances. (Stand 82.)

Resistances and potentiometers are legion. Lewcos have a new disc type of potentiometer contact, Telsen have a new one, Ready Radio have re-designed their volume control, and the knobs of their components, making them ever so much more attractive. Watmel, Varley, Sovereign, Colvern, Wearite are all to be commended on their volume controls.

Ganged Volume Controls

Wearite have a model combined with an ingenious on-off switching device, while Bulgin has one with a similar method of filament control. Ganged volume controls are available from most of the above, in addition to which we must mention British Radiophone, and

WILL ATTRACT ATTENTION



The Bulgin Transcoupler is a complete shunt-fed transformer unit. (Stand 151.)

Plenty of Parts for the Set Constructor

Igranic for particularly fine pieces of work.

Dubilier and T.C.C. are providing a fine array of fixed condensers from the ordinary metal and bakelite cased variety to the new electrolytic high-voltage types. Telsen, Lissen, Sovereign, and Graham Farish are also including condensers in their exhibits.

Found in Abundance

Special attention should be paid to the small "button" types which have done so much to assist in making the home-constructed set compact during the last year. These are to be found in abundance on the T.C.C. and Dubilier stands.

Valve holders have not changed greatly for some time, and it is only in small improvements that the visitor to Olympia this year will notice any difference in these components. All the old friends are there—Telsen, W.B., Lissen, Igranic, Benjamin, Bulgin, Clix, Graham Farish, and so on.

A new arrival is the Ready Radio at 6d. for the four-pin, and 9d. for the five-pin type. Some of the old friends have gone up in price a little, but for the most part the prices are about the same.

Of what may be termed the unclassified or miscellaneous section of the component trade there are one or two specific examples that we want to bring to your notice.

The Atlas Rheograd resistance is worth noting, for at 5s. it provides a very useful component. It is variable from about 2 megohms, and is capable of handling 2 watts without overheating.

Good wattage-carrying resistances are becoming the order of the day rather than the exception. Colvern, Wearite (whose plug-in types deserve special mention), Sovereign, Varley, Ferranti, are only a few of the makers who are catering for the mains set builder by providing resistances that will really carry some current.

Panels and baseboards are supplied by Peto-Scott, Ready Radio, and the various cabinet manufacturers as of old, in addition to such firms as British Hard Rubber Co., British Ebonite Co., etc. But the first-named deserves extra credit for the french-polished wood panels they are ready to supply to all who want them.

New Type Consolette

Cabinets of all descriptions, from handsome console radio-gram to the new type consolette and table models, are to be seen at Olympia on the stands of Messrs. Camco, Pickett, Lock, Gilbert, Osborn, Ready Radio, Peto-Scott, and some of these cabinets are really first-class pieces of work, making a set that is housed in them look every whit as good as a commercially built job.

Gramophone motors come under the title of components nowadays, and so we must mention the various motors placed before the public by such firms as B.T.H., whose many electric motors are too well known to need description here. Garrard has come into the home-constructor's field with several models at medium price, and also with an 8-record automatic player unit which is particularly ingenious.

Spring motors are also available in many types from this firm whose name has so long been associated with the gramophone industry.

The Igranic induction motor is still with us, and is available for use by the home constructor. Most of the modern motors are for A.C. working, though there are a few excellent dual-purpose types that will operate perfectly on either A.C. or D.C.

RELIABLE RESISTANCES

Graham Farish "Ohmite" resistances have a well-earned reputation for reliability. (Stand 50.)

SMOOTH AND SILENT

A Garrard A.C. motor for radio-gramophones. (Stand 122.)

Well Looked After

We have said nothing about the small gadgets, terminals, panel lights, switches, and so on.

These are being well looked after by our friends Messrs. Bulgin, Belling Lee, Clix, Igranic, Eelex, etc. Probably no firm has so many different lines as the first-named, for whatever the gadget you need for your set, it is tolerably certain that the Bulgin factory at Abbey Road, Barking, will be able to supply you.

This year we have an amazing array of new Bulgin lines, including lightning switches, mains on-off switches, transformers, volume controls, fuse-plugs, screened H.F. chokes, and so on.

Packed With Ingenious Devices

Belling Lee have led the way in terminal design for many years, and this year they are still well to the fore. New prices are current in several of their lines, while wander plugs, a new S.G. anode connector, insulated plugs and sockets, fuse holders and fuses, are all on the "just out" lists.

Short-wave converters and "Bylduron" cabinets are to be found among the wide range of small components on the Eelex stand. Messrs. J. J. Eastick & Sons, whose trade name it is, have packed the stand with ingenious devices.

WHAT SHALL I BUY?

This section is written expressly for the non-technical listener who wants advice on the purchase of a new receiver. It will be a great help during a visit to the Exhibition.

THERE must be many people who at this time of the year, with the Radio Exhibition in progress, decide to purchase or build their first radio receiver, and it is to them that this part of the "show section" of MODERN WIRELESS is devoted.

There are so many apparently contradictory and puzzling factors that have to be considered in the choice of a radio set that we feel a few words on the subject will not be amiss.

We are not going to use a lot of technicalities—in fact, as far as possible, no mention of any technical term will be made—but in as simple and straightforward language as we can we are going to try to explain one or two factors that govern the picking of a set, whether of the home-made or manufactured variety.

"Oh," you will say. "price is the main factor."

To Suit All Pockets

Of course it is, and, as you will see at the exhibition, you can pay anything from about £3 or £4 up to £70 or more for a commercial receiver, while for the home-made set the prices range from about 30s. for a cheap one-valver to £30 or so for a radio-gramophone.

But it is not so much the price of the purchase that we want to consider; we can safely leave that to the prospective purchaser. What we want to make sure of is that he has a fairly good idea of what sort of set he requires. He can choose his own price, then, to suit his pocket.

We can safely assume that if the reader has no knowledge of radio, and has not the slightest idea whether he wants a one, two, three, four or five-valve set, he at least has heard one or more operating at friends' houses.

He can also hear the various sets operating at the show, in the demonstration rooms; so he will be able, when he has made a rough choice, to hear the sets he fancies and get

AN ALL A.C. THREE

The Ekco M.23, an all-in A.C. receiver. (Stands 25 and 65.)

THE "VIKING"

One of the new G.E.C range of receivers. (Stands 105 and 109.)

some comparative idea of their merits.

Also, afterwards, he will be able to get the firms concerned to give him demonstrations in his own home,

TWO GADGETS IN ONE

A combined volume control and on-off switch by Wearite. (Stand 82.)

and we would very strongly advise him to do this.

Building Your Own

All this concerns the manufactured set. If he decides to build one for himself, as he can very well do from one or other of the radio journals' descriptions, he has the advantage that he has always a special technical service department at hand to help him not only choose the design, but to build and keep it going after completion.

Moreover, he can come along to the stand of the journal and get the fullest aid in the choice of the design by having a chat with the special staff in attendance throughout the exhibition.

What Type of Set?

But, for the sake of this discussion, we will assume that the reader has not decided whether he will buy or build a receiver, but that he wants to

A SUPER "SUPER"

The H.M.V. Autogram Super-heterodyne receiver. (Stand 55.)

know roughly what set he will require, and what he will be able to get out of it.

GRACEFUL DESIGN

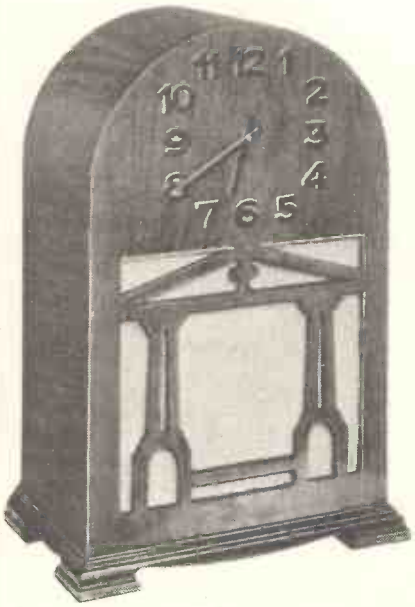
One of the latest Philips' receivers. (Stand 104.)

Naturally, a loudspeaker will be used, either incorporated in the set or externally, or two or more speakers may be used if the instrument is powerful enough.

Very Important

But just the fact of having a loudspeaker is not enough. We must decide how loudly that speaker is to deliver, say, the programmes from the nearest British stations.

THE TIME—



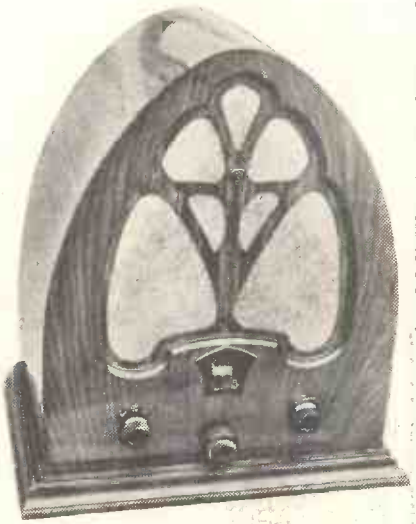
This is an ingenious Baker Selhurst loudspeaker-cum-electric-clock. (Stand 83.)

—FOR SPEAKERS—

The B.T.H. R.K. Minor Permanent Magnet Model in cabinet form. (Stand 119.)

The first question he must ask himself is, "What in the way of programmes do I require? How many stations?" For upon the answer to this depends to some extent the number of valves he will need in the set, and according to the number of valves in it, so to a certain degree does the price of the receiver vary.

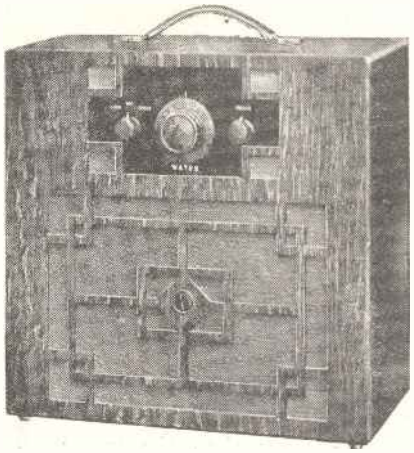
—AND SETS



A fine Lissen three-valver. (Stand 59.)

This may be a silly question at first sight, but there are so many different grades of loudspeaker

Improved Performance is the Order of the Day



Made by the Standard Battery Co., this light-weight portable is a very good proposition. (Stand 26.)

loudness that it is essential to decide whether the strength is to be just what might be termed quiet room strength or whether it will be sufficient to fill a small dance-hall.

For Ordinary Listening

The quiet room strength is enough for ordinary listening when the set is used in a small room, but it is often desirable to have a bit of reserve volume in hand, and we would recommend a receiver that will give good volume, say, in a room about 25 ft. long and 15 ft. wide.

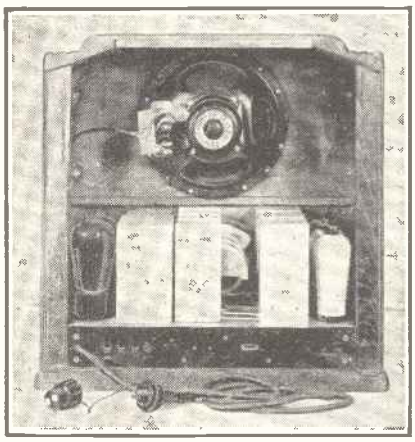
Then there is enough in hand to ensure that when the set is used in a small room there will be no chance of overloading of the valves and causing distortion when you want to "let it out" a bit. In other words, it forms something of a volume distortion safety factor. But the reader who goes to the exhibition will be able to judge for himself when he hears the various instruments in the demonstration rooms, while he who cannot get to Olympia is advised to have a good look round in the show rooms of the local dealer, and to hear as many makes as he can, comparing the volume and quality given.

Important Points

So far we have brought out two points that need consideration—the number of stations required (the sensitivity of the set) and the volume needed (the power of the instrument). There remain two more.

One concerns the type of power supply that can be provided to work the receiver, and the other the degree of "selectivity" (power to cut out near-by stations when getting others). This latter will have to be decided according to the location in which the instrument will be used.

ALL-FROM-THE-MAINS



A fine example of compact design in all-electric receivers. This particular instrument comes from the Standard Battery Co. (Stand 26.)

VARIABLE COUPLING

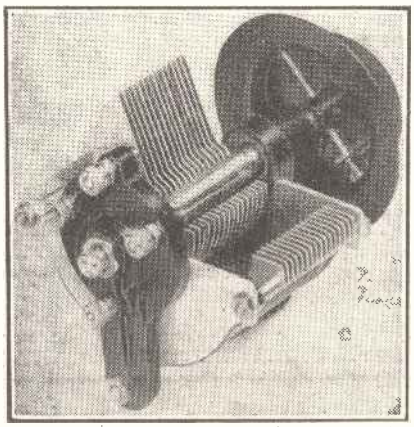
Introduced quite recently, the Sovereign vario-choke provides variable H.F. coupling. (Stand 152.)

The Power Supply

Let us get back to number three. The power supply to a radio receiver can be from either batteries or the electric light mains. If the prospective owner has no electric light supply to his home, he will perforce have to use batteries. This, however, will cramp his style somewhat in the choice of the set, for battery-operated receivers are not so powerful as the electric-light-supply-operated types, and so he will not be able to get the same amount of volume.

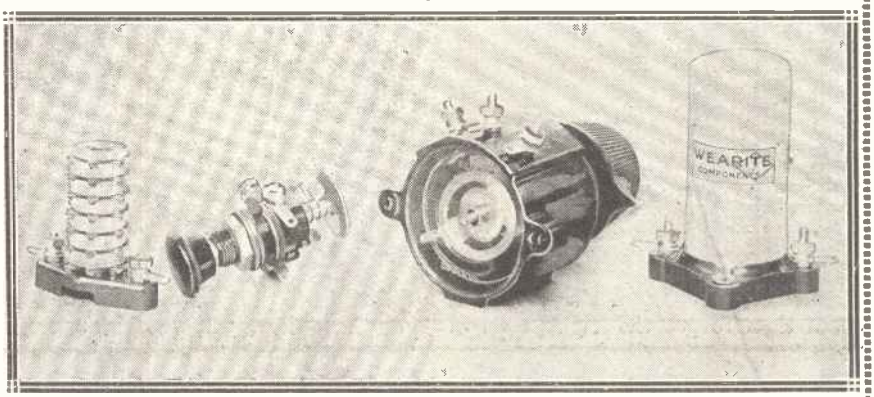
With electricity available very much more can be achieved with the

A POPULAR EXTENSER



The Formo extenser is very soundly constructed and will give endless and faithful service. (Stand 100).

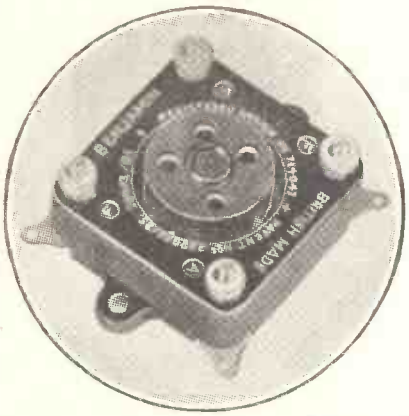
SOME USEFUL HIGH-QUALITY COMPONENTS



A useful collection of components, comprising an R.D. resistance, a push-pull switch, a volume control and a screened H.F. choke — all made by Messrs. Wright & Weaire. (Stand 82.)

same number of valves, and the problem of having batteries charged, and getting new high-tension batteries every now and then (which occurs if the set is battery operated) does not arise. The instrument is switched on and off just like the electric light, and it runs for a very low cost.

GOOD CONTACT

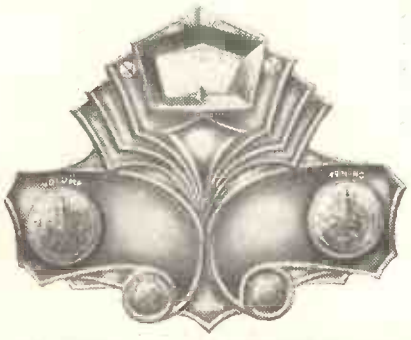


Firm springs and good contact characterise this Benjamin valve holder. (Stand 40.)

Mains Drive

Thus, if the electric light is available our prospective listener should certainly get a mains-operated set. In doing this he will have to give the type of electric supply he has. This can be found from the supply corporation, and will be either A.C. or D.C. (alternating current or direct current) at a certain voltage, probably between 200 and 250 volts.

THE TELSEN " TELORNOR "



This tuning unit has an oxydised silver escutcheon plate for carrying volume and tuning controls, together with wave-change and on-off switches. (Stand 66.)

These details he gives to the set manufacturer or the dealer, and he is sure then to get the right type of receiver.

But we are pushing forward too rapidly, for we have not yet decided question number one.

The number of programmes required will decide very largely the size of the receiver—the number of valves employed—though the two sides of the equation, as it were, are not completely proportional, though they are interdependent.

For instance, although as a general rule the more valves there are in a receiver the more stations and the more volume it will give, it does not necessarily mean that if there are two sets and one has twice the number of valves as the other, it will get twice the number of stations or give twice the volume. Actually it will probably give either very much more than twice the number of stations or more than twice the volume.

In order to get an idea of the value of valves in a receiver one must differentiate between the types employed. These for the purpose of our discussion can be divided into two classes. There are the high-frequency (H.F.) and low-frequency (L.F.) valves; sometimes known respectively as radio and audio frequency.

FOR TABLE USE

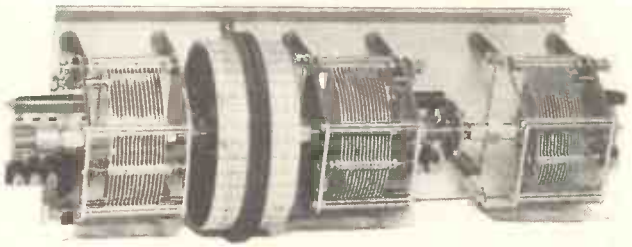
A new " Camco " cabinet designed to take a complete radio-gram outfit. (Stand 123.)

Cutting Out Interference

Now then. The more of the former you have in a set (within certain limits that need not concern us here) the more stations will it receive and the better chance of cutting out interfering stations there will be.

Thus as a general rule, and conditions of reception being equal, a receiver with no H.F. valve will not get so many programmes as a set with one H.F. valve. While one with two or more of these will receive even more stations than the instrument with one.

A TRIPLE-GANG " EXTENSER "



One of the Cyldon Extenser series. (Stand 158.)

Similarly the receiver with two instead of one L.F. valve will give the bigger volume on the various stations. Though here again there are limits that we cannot go into here.

Increased Range

Roughly, then, the more H.F. valves you have, the more will you be able to pick up foreign programmes, and the more L.F. valves, the more volume the loudspeaker will push out.

Now, then, how are we to choose between the various sets and the various numbers of valves? In all cases where it is desired to pick up programmes other than those of the nearest British stations with anything like regularity, it is advisable to have a set having at least three valves.

These will be divided advisedly between one H.F., a detector (which all

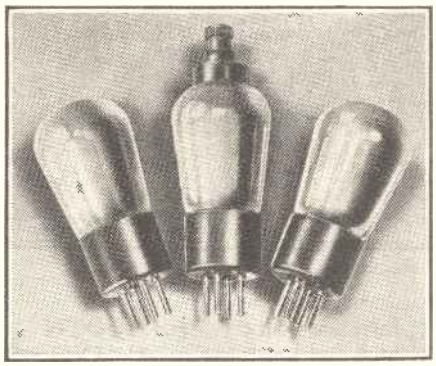
ONE OF THE PYE PORTABLES

All the Pye sets are of very attractive appearance. (Stand 80.)

Why Not Treat Yourself to a New Receiver?

sets have), while the third will be the L.F. valve. This should give you some dozen or so stations at comfortable strength on the loudspeaker during the evening, but unless it is a mains set using a pentode valve it

CLARION CALLING



A S.G. and two three-electrode valves from Messrs. Clarion. (Stand 120.)

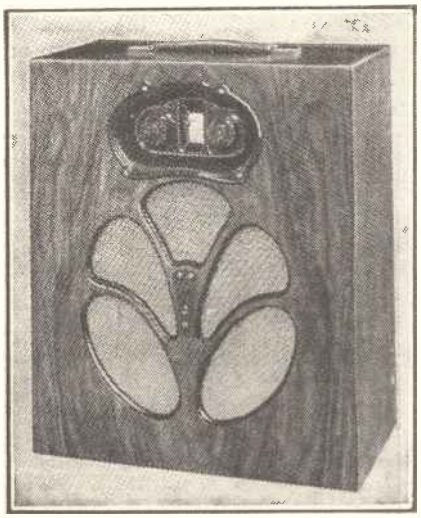
will not be very powerful even on the local transmission.

Pentode Advantages

That pentode is a thing to watch when choosing a small set. It does practically the work of two valves of the L.F. variety, and so a set having a pentode will give a more powerful output than one with the same number of valves and no pentode. (There are exceptions, but this can be taken as a general rule.)

If you need more than the dozen stations, or you want to get more

"SUPER" PORTABILITY

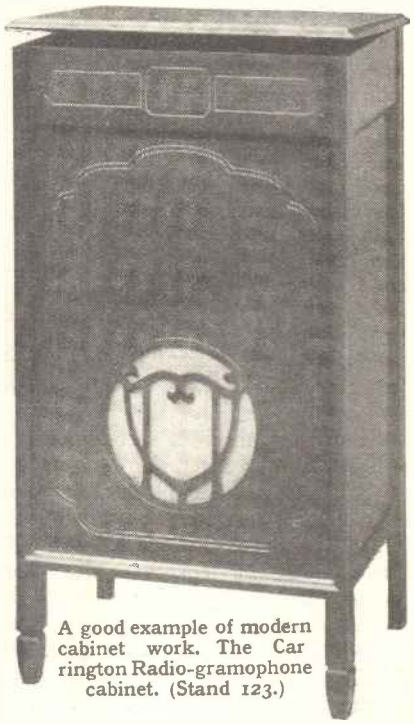


H.M.V.'s latest—a light-weight superheterodyne portable receiver. (Stand 55.)

power on the local, perhaps for dancing, you will want a set having in the first case another H.F. valve, and in the second case another L.F. valve. Unless the pentode is used, when we would advise a four-valve set having two H.F. valves, a detector, and the pentode. This would give excellent strength, and would also enable a large number of stations to be received.

Before we go any farther, perhaps it would be as well if we mentioned some of the sets that you ought to consider, typical makes that will meet with the approval of most people as regards station-getting capabilities and the power of their reproduction.

SELF-CONTAINED



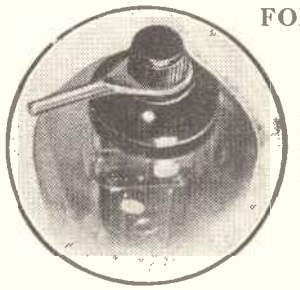
A good example of modern cabinet work. The Carrington Radio-gramophone cabinet. (Stand 123.)

Thus we have a very excellent three-valve set (with pentode), made by such people as Marconiphone, H.M.V., General Electric, Ekco, Lotus, Radio Instruments, and so on. They are mains-driven for the most part, though battery models of various types can be obtained from most of these concerns.

Unlimited Selection

Larger models are available, too, giving more power and a greater number of programmes. There are also the radio-gramophones, which have similar properties on the radio side, but also comprise electric gramophones, so that one can have either radio or record at will.

FOR S.G.'S



This handy connector for the anode terminal of S.G. valves comes from the "Clix" people. (Stand 225.)

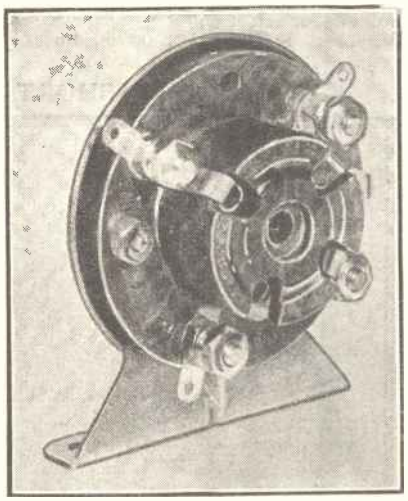
These are more expensive, of course, but they allow the owner to choose his programme when and where he wants it, and are really a great boon. Notable among these are the H.M.V., Marconiphone, G.E.C., and "Gambrell," which all produce many types of radio-gramophones of varying capabilities.

Large Receivers

There are receivers having more than four valves, of course, but these are generally what are known as super-hets. They employ a different method of reception, which enables very sharp tuning to be attained. They are thus extremely useful for use in areas where there is a broadcasting station close by, and where the owner wants to get as many foreigners as possible in spite of that disadvantage.

They are quite easy to operate, and possess remarkable sensitivity. A

UNIVERSAL MOUNTING



The Telsen universal-mounting valve-holder. (Stand 66.)

good super-het. should be capable of picking up practically all there is in Europe in the way of broadcasting, even although there is a local station going full pelt almost next door.

Thus for the man who lives right on top of a station the super-het. is ideal if he wants to get a lot of other programmes while the local is broadcasting.

Most of the supers are mains driven, though there are battery models, notably the H.M.V. and Marconiphone which have just been brought out. They are designed to require very little battery power, so that although they do not give a great volume of sound they do run reasonably economically, and are capable of getting a large number of stations.

Most of the well-known firms have mains-driven supers, Ferranti, H.M.V., Marconiphone, G.E.C., Lewcos, Radiophone, being a few of the names that come to mind.

We have seen then that loudness and station getting both depend upon the number of valves, though we must point out that the three-valve mains set with a pentode valve is probably the most popular of all the mains receivers and it will get practically all the stations required if used with a decent aerial and earth.

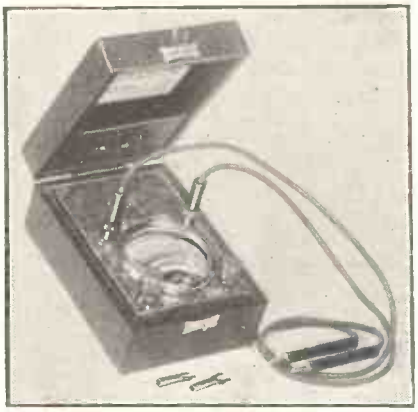
It is selective enough in most cases, especially if it contains what is known as a "band-pass circuit," to be able to cut out the local at quite short range, for this capability is one of the essentials of modern radio receivers.

So much for the first two points. Now to clear up one or two things about the second pair. With regard to the question of power supply to the receiver, it may not be fully realised what is meant by a mains-driven set in contrast to a receiver used with a mains "unit."

The difference is this. In the first case the apparatus is supplied with all its power from the electric light or power mains. It needs, and has, no batteries whatever. In the second instance the high tension is supplied from the mains through a small box arrangement known as a mains unit, but an accumulator is required in the same way as with a battery-driven set, and probably small dry batteries known as grid bias batteries are also used.

Thus, though the instrument is more economical to run than one

ACCURATE TESTING

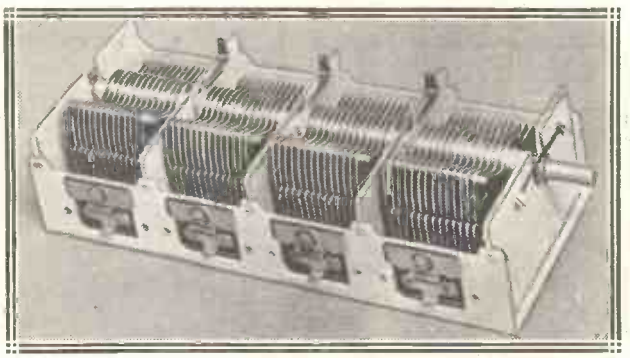


Many types of meters are to be seen at the Show. This is an all-in meter of moderate price.

MULLARD A.C. RANGE

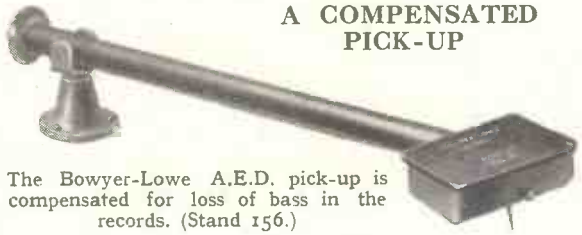
The new 904V is a high-mag. indirectly heated valve specially suitable for detection purposes. (Stand 79.)

FOR MULTI-CIRCUIT SETS



A four-gang Radiophone condenser. (Stand 93.)

A COMPENSATED PICK-UP

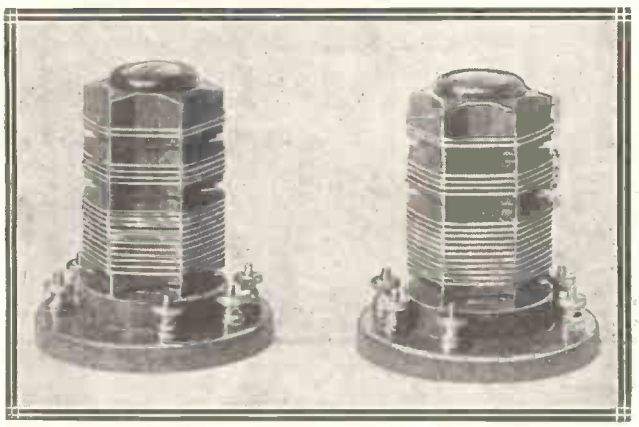


The Bowyer-Lowe A.E.D. pick-up is compensated for loss of bass in the records. (Stand 156.)

SMOOTH TUNING

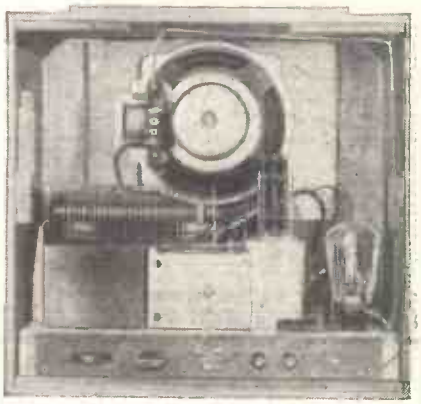
A neat drum-drive unit. Polar. (Stand 129.)

FOR THE SHORT WAVES



A couple of triple-range Lissen short-wave coils. (Stand 59.)

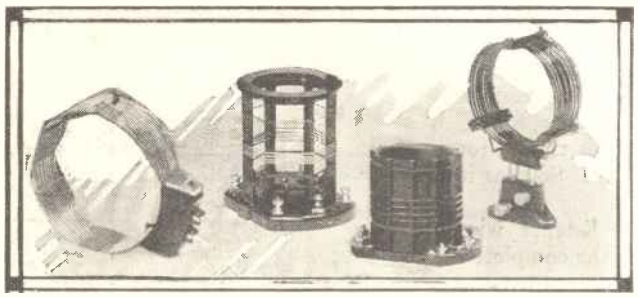
INSIDE THE PYE



The interior of the Pye "K" receiver. (Stand 80.)

Sets and Speakers of all Prices in Profusion

A TYPICAL COLLECTION OF S.W. COILS



Igranic, Goltone, Wearite, and Melbourne coils are represented in this group of short-wave coils.

totally driven by battery power, it is not so economical as a full mains set owing to the fact that the accumulator has to be charged at regular intervals, and the small bias batteries need replacing every now and then. With the full mains set no replacements or charging of this nature is necessary.

The fourth point that we raised was one of selectivity. The power to cut out interfering stations, to separate stations one from the other.

Cutting Out the Local

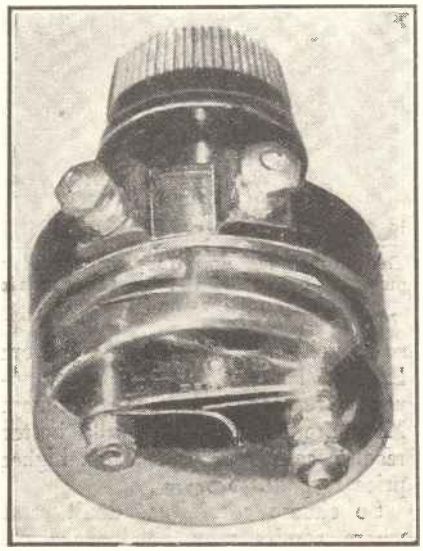
This power is most needed when the owner of the set lives near a broadcasting station—say, a matter of ten miles or less away. Then he must have this quality called selectivity if he is to be able to pick up any programmes other than those of the local during broadcasting hours.

Selectivity means valves—H.F. valves, and so if the need is very great a multi-valve set is required; and, as we have seen, this may conveniently be a super-het.

Much of the power of reception that a set possesses when in use in the listener's home depends upon the type of aerial and earth he uses. If a good high outdoor aerial is available, then he should be able to get plenty of foreign programmes, though it may be detrimental to the station-separating powers of the instrument.

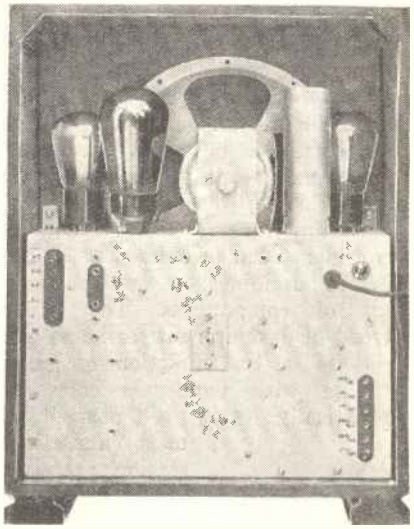
In most cases the best aerial is one about 30 feet high and 30 to 40 feet long, with a good earth to an earth pin or a water pipe.

SMOOTH CONTROL



Lewcos have just produced this disc contact potentiometer. (Stand 153.)

NEAT LAYOUT



The chassis of one of the Standard Telephones' receivers. (Stand 107.)

The Aerial Question

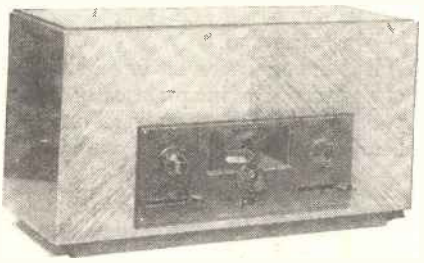
When choosing a set, the listener should go into the matter of the aerial available when he is discussing it with the saleman.

Many mains receivers have what is termed a mains aerial device. This means that the electric light mains can be used as the aerial, no other connection being required than that connecting the set to the electric light socket.

This is very useful for flat dwellers or those who only want a restricted number of programmes, for the mains aerial does not act so efficiently as an outside or even indoor aerial as a rule.

It is, however, useful if you want to move the receiver from the room where the usual aerial is fixed to another room temporarily for the reception of the local programme. It then does away with the need for the erection of even a temporary indoor aerial from which to operate the set.

CHASTE DESIGN



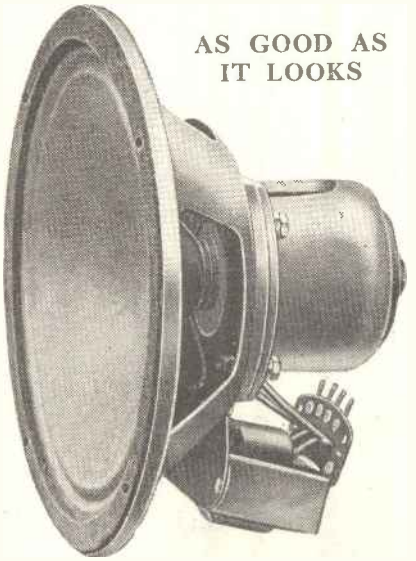
One of the Blue Spot mains sets to be seen at Olympia. (Stand 35.)

Ask for Demonstrations

All the foregoing applies to the home-constructed receiver, but it is better to take commercial examples so that the searcher for a set can go along to the exhibition or the local dealer and hear for himself what type of reception he is likely to get with, say, a three-valve set without band-pass, a three with band-pass, a four-valver, five-valver, or a super-het.

He will also be able to compare the performances of battery, and mains-operated instruments, and he will no

AS GOOD AS IT LOOKS



The Ormond P.M. moving-coil speaker chassis, which is sold complete with transformer. (Stand 87.)

Loudspeakers Will Cost You Less This Season

doubt be surprised at the difference in quality, power and reception range between the two.

But in conclusion let us add a word of warning. Having practically chosen your set (if it is a commercial one) and heard it in the dealer's showroom, do not settle on having it until you have also had it on trial for a few days in your own home, under the conditions under which you will be using it.

All reliable firms will be only too pleased to let you have this trial, and it must be remembered that a set may behave very differently in two places only a comparatively short distance apart.

The set may be very fine at the dealer's, but your location may have some unsuspected feature about it that may greatly upset the performance of the instrument. So hear it at home.

So much for the listener who is concerned only with the complete set. What about the constructor?

He has seen in the previous pages much of what is being offered at Olympia in the way of parts, mains units, loudspeakers and so on, but how shall he go about choosing new things for his set?

MADE BY CELESTION

An attractively finished Cabinet loudspeaker from the Works of Messrs. Celestion, Ltd. (Stand 127.)

The Home Constructor

If he has a receiver already he will probably know roughly what it is he requires to give him better results—a new loudspeaker perhaps, or more punch in the way of a larger mains unit with a better output valve. Or he may want to build a new set altogether.

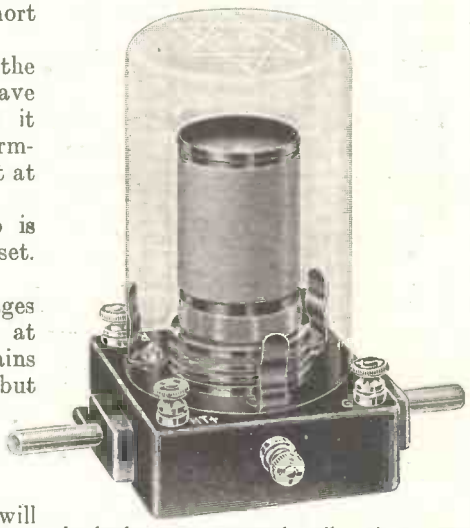
In any case, he should carefully consider what results he is after before deciding on any particular kit of components. The general trend of development for home-made sets is in the direction of ganged tuning with band-pass coils, and practically every set, except the most simple local-station receivers, are going in for screened-grid H.F. amplification, one or more stages being employed.

In the case of components it is as well to examine their characteristics before finally choosing any particular make. Transformers, especially, should be examined for their curves, for nothing can upset a set more than a bad transformer. Shunt-fed transformers are very prominent, and have much to recommend them. Several types of these in compact form are to be seen at Olympia.

Of the other components there is little to be said except to impress upon the intending purchaser that he will be very well advised not to cut price unless he is sure that by doing so he will not spoil the results from his set. Many cheap lines in components are very good value for money. Many are not. But generally better results can be expected if a higher price is paid.

So choose carefully; don't stint where results may be jeopardised, and you will be sure of a successful radio "season."

CANNED COILS

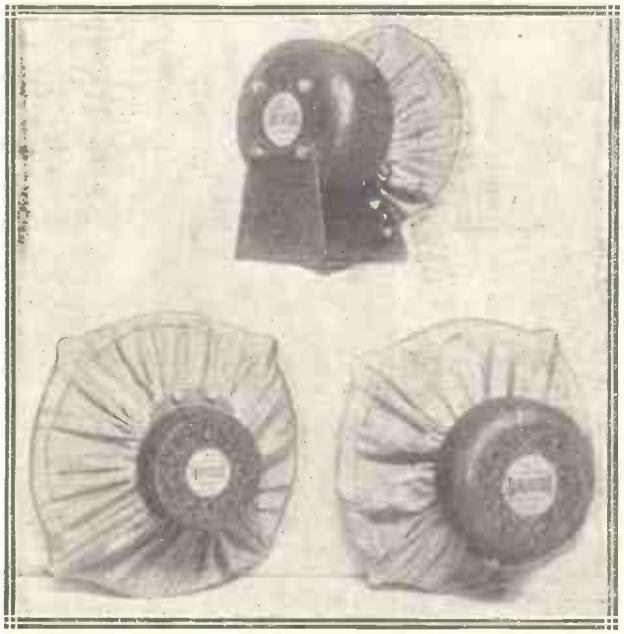


A dual-range screened coil unit manufactured by British General, Ltd. (Stand 29.)

SOME VALVE!

The large valve used for demonstration purposes on one of the General Electric Co.'s stands (105 and 109).

GOOD REPRODUCTION



A group of Ferranti moving-coil permanent magnet loudspeakers—types M.1, M.2 and M.3. (Stand 78.)

ON THE SHORT WAVES

by W.L.S.

Are you interested in short waves? If you are, you will find this article written by "M.W.'s" short-wave expert particularly readable, for he covers his subject in a most fascinating manner. If, however, you are a little sceptical of the entertainment value of the higher frequencies, we will leave you in the capable hands of "W.L.S.", who explains among other things just why he considers reception on this band so worth while.

As I write these notes, with the thermometer in my "shack" registering 88 degrees, it occurs to me that it needs some enthusiasm to put the 'phones on late at night in this real summer weather. Probably, however, by the time this reaches you the weather will be completely different, in which case you will find less difficulty in making for the short-waver and logging stations from untold distances!

Those who have short-wave receivers that really are capable of giving loudspeaker results are doubly fortunate in summer; and I think there is little doubt that short waves are going to be sufficiently important in the future for the loudspeaker receiver to become quite common.

The Economical Way

The most economical way of arranging things—for those who already use a fair-sized broadcast receiver—is undoubtedly to use a short-wave adaptor, or to make a single-valver which can be followed up by the "general-purpose amplifier." This is what I always do myself.

My broadcast receiver now is an all-A.C. two-valver—screened-grid and detector only. My short-waver is a battery-operated "one." My gramophone cabinet contains the turntable, pick-up, and a two-stage A.C. amplifier, complete with power supply and field supply for the moving-coil speaker.

The input side of the amplifier is wired to an input jack into which can be fed short waves, broadcast, or pick-up. Surely nothing could be much more simple or economical, particularly when one carries it still farther and uses the same gear as a speech amplifier for two separate transmitters! My "note-mags." are quite the busiest things in the house.

Consistent L.S. Reception

It is possible nowadays (although short-wave conditions are right down in the "trough" of the eleven-year cycle) to receive at least ten distant stations *consistently* on the loudspeaker with three valves. Considering the varied fare that is provided by their programmes, this surely makes a short-wave set worth while, particularly when we reflect that the general level of conditions should be improving steadily for the next 5½ years!

AN AMATEUR TRANSMITTER IN HIDING

This short-wave transmitter, installed in a car, was used by a North London Radio Society in connection with direction-finding experiments. The car with its mysterious cargo was taken to a secret location somewhere north of London, where the transmitter was set working. The other members of the society then proceeded to track it down with their portable D.F. receivers.

This brings up the general question that is often put to me about the worth-whileness of a short-waver. In my opinion, the answer is that a short-waver is always *well* worth while to every man who makes radio a hobby. Owners of sets that are used for "family" purposes only would probably not derive much extra amusement from short waves; but all those whose delight in life is finding new stations, and generally "monkeying around," are in their element as soon as they discover short waves for the first time.

Question Number Two is: "What is it all leading to?" Here, again, I can give only my personal opinion in reply, but I think we shall see the short waves put to a vast variety of commercial uses, particularly the "ultra-shorts" below 10 metres.

More Stations

I rather think that short-wave broadcasting will remain as it is, except for a multiplication of the number of stations working. After all, every month's list contains four or five "new faces."

The proprietors of any short-wave broadcast station will tell you that their "fan" mail is simply terrific. At the same time, the majority of those who write to them seem to be the type that are keenly interested in radio as a hobby, and are not content with the mere thrill of hearing a programme from a long distance.

It is quite certain that the number of short-wave listeners is steadily increasing and that short-wave broadcasting is on a firm footing. The only question is: "How can we make it pay?"

Sponsored programmes, of course, solve the difficulty in most countries. Advertisers can shout the odds over the whole world instead of over a few thousand square miles. The listener, of course, can never be made to pay for the entertainment he receives on the short waves!

Give-and-Take

This is where a spirit of give-and-take makes its appearance. We are indirectly paying towards the establishment of the Empire Broadcasting Station at Daventry. Others will enjoy the programmes. But we must not forget that we are able to enjoy the programmes that come from *their* countries!

Now, let us consider the uses to which the "ultra-shorts" may possibly be put. The most striking band of all is the 5-metre region, although 2½ metres will probably show us something still more startling.

Five metres is ideal for reliable communication over short distances using the very lowest power and the very simplest gear. A transmitter small enough to go in one's pocket will certainly cover a range of a mile or so, and for aeroplanes the wave is ideal.

Some Future Uses

Automatic beacons, automatic alarms worked by radio, even local telephone systems, may arrive on these waves in the future. Most important of all, it gives a new lease of life to television, since, as I am never tired of pointing out, there is more "space" between 10 and 5 metres than between 10 and 30,000 metres.

Further, there is more space between 5 and 2½ metres than between 5 and 30,000 metres! And so on, *ad infinitum*. Hundreds of television stations, using channels up to 500 kc. in width, could be accommodated below 5 metres.

After all this, there are enormous possibilities of "wired wireless" applied to these high frequencies.

The B.B.C.'s experimental transmission should be in full blast by now. Reports of preliminary tests are circulating as I write these notes; and elsewhere in this issue you will find a short description of my 5- and 7-metre receiver, which is simple enough for anyone. For Londoners I think it would be worth while to receive programmes on 7 metres, if only to get away from such bugbears as Mühlacker and local squealers.

Readers of "M.W." do not seem to be taking it very seriously as yet, judging by my correspondence, but I boldly prophesy a very different state of affairs in a year or so.

With the Amateurs

The results of the British Empire Radio Union tests held in February are now published and confirmed. In case this should strike readers as ancient history, I had better point out that hundreds of Empire amateurs entered for the tests, and that headquarters had to wait for logs from all over the world to come in before they could even begin to check the results.

The Trophy awarded for the greatest number of contacts with stations in different parts of the Empire, held last year by an Australian station, "comes home" this time to Mr. Miles (G 5 M L), of Coventry. During four week-ends he had some 70 contacts with distant Empire stations in ten different districts. Second place goes to Ceylon (V S 7 G T), and third place is held by G 6 Q B (London).

Friendships Made

Contests of this nature serve a double purpose, for the transmitting and receiving gear must be absolutely up to scratch at both ends. Apart from the experimental angle, though, consider the way in which new friendships may be made all over the world.

The American Radio Relay League realises this—that is evident by the title they gave to their tests this year. They were styled the "International Goodwill Contests."

Not the least important aspect of amateur transmission is the fact that a large proportion of the "amateurs" hold positions in commercial firms. Although their own stations are strictly amateur, they serve the purpose of a training-ground for the professionals and technicians of the future. Were it not for short waves, there would probably be no amateur transmission to-day; and, strangely enough, had it not been for amateur transmission there probably wouldn't have been any "short waves"!

A Nasty One!

In this connection I recently saw a "Stray" in "QST" that pleased me immensely, to this effect: "It is generally an amateur who succeeds in doing the impossible, because, being an amateur, he doesn't know that it *is* impossible."

THE AIR IS FULL OF MUSIC

"The air is full of music, travelling half-way round the earth."—Upton Sinclair, in "Mammonart."

The air is full of music. As I stand
In silence on the hills and nothing hear,
I know that flashing by, and sounding clear
In countless homes wide-scattered o'er the land,
Go strains of music—organ-anthem grand,
Some modernistic piece with rhythm queer,
A lilting, swaying dance-tune full of cheer,
The stirring clangour of some martial band.
So clerk, mechanic, tiller of the soil,
May hear these sounds that echo round the earth,
And glad their minds, benumbed with weary toil,
With strains of grandeur, melody or mirth:
Strains from the lattice masts in stillness hurled
To wake their singing half around the world.

I. O. EVANS.

Have You Heard the B.B.C. on 7 Metres Yet?

Short-wave listeners can do their bit, too. Most of the stations that are regularly on the air are greatly in need of reports on their transmissions from day to day.

Here are some points you should bear in mind. First, an isolated report on one particular transmission will probably not be of much use; but a report covering, say, seven consecutive days is a different tale altogether.

If half a dozen listeners, in different parts of the country, were to send in detailed reports to some particular stations that they had followed for a week or more, those in charge of the stations would be able to learn something about the changes in conditions, and whether any inconsistencies were the fault of the transmitter or were due only to varying "conditions."

Reports Appreciated

Most of the regular broadcasters are very appreciative of any reports that show evidence of the spending of time and trouble on them. A friend of mine received from the director of one of the Bandoeng stations a beautifully illustrated book about the country, with photographs of the stations and their locations, together with an assortment of the postage stamps of the country. ("Radio stamp-collectors," please note.)

I have it in my mind to start a small "bureau" for undertaking work of this kind, and should be glad to receive the names of regular readers of "M.W." who would care to lend a hand.

The chief points to watch would be these: Character of location (i.e. high, low, hilly, flat, near sea or river, etc.); direction of aerial; direction of any serious screening, such as mountains, hills, large buildings, and so on; type of receiver in use; and hours available for listening.

Valuable Data

Just think of the valuable data that "M.W." could supply to a new station just starting up if fifty listeners could all take careful notes about him for the first ten nights he was on the air.

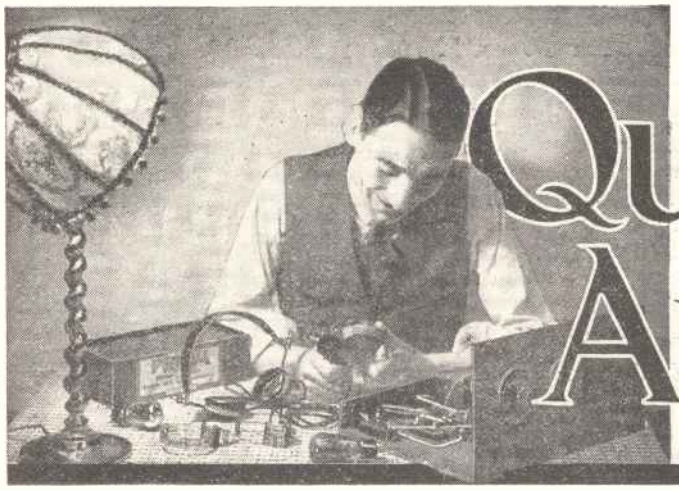
Amateur transmitters are constantly receiving reports to this effect: "Heard your signals Sunday, August 7th. R7 very clear speech." No mention of wavelength, type of receiver, time heard, or anything that really matters. And then the sender often grumbles because he doesn't get a card back in reply.

I am not suggesting that "M.W." readers are as slack as all this; doubtless they are more methodical. At all events, if there are any slack ones among them, perhaps they will take this hint and introduce a little more detail into their work.

LINKING UP THE LISTENER WITH THE STUDIO

"DID YOU HEAR HER?"

The upper of these two photographs illustrates a colossal switchboard used for distributing radio programmes and special announcements to listeners in a large block of flats in New York. It supplies entertainment to nearly 3,000 people. In the other photograph you see Helen Wills-Moody, of Wimbledon fame, broadcasting from one of the studios that feed the N.B.C. chain of short-wave stations in the States. It would be interesting to know if any short-wave enthusiasts in this country heard her broadcast.



QUESTIONS ANSWERED

"Local" Distortion

M. M. (Watford).—"My set is an S.G., detector and L.F. three-valver, and I find that I get troublesome distortion on the local station which I cannot cure by connecting a volume control across the transformer secondary in the usual manner. On distant transmissions the receiver gives excellent reception, and, apart from a certain amount of difficulty in cutting out the 'locals,' the distortion trouble is the only complaint I have to make."

The distortion is probably due to detector overloading—a common trouble in cases where the receiver is being operated close to a powerful transmitter such as the London Regional or National.

The symptoms are normally an over-emphasis of the higher speech frequencies, giving a high-pitched effect. On the actual tuning point, when the transmission should be heard at its greatest volume, the result of overloading the detector is to cause a diminution at this point with pronounced humps on either side as the set is detuned slightly.

The remedy is to fit a pre-detector volume control so that the input to the valve can be cut down to a reasonable level. One method is to use a variable-mu valve. Another and popular scheme is to connect a potentiometer ($\frac{1}{2}$ to 1 megohm) across the grid circuit on the aerial coil. Further details of how these various methods may be applied can be obtained from the Technical Queries Dept. of MODERN WIRELESS.

Speaker Windings

D. C. (Faversham).—"I am about to replace the power valve in the output stage of my set with a super-power taking about 15 milliamperes at 150 volts H.T. My loudspeaker winding is at present connected directly in the anode circuit of the last valve. Is it likely that the speaker will be damaged in any way if I retain this method of connection when I use the super-power valve?"

Without some knowledge of the 'speaker windings it is impossible to say, and only the makers could give a definite ruling on this point.

Speaking generally, it is fairly safe to assume that the windings and magnetic system are *not* designed to carry a current of this magnitude.

The probabilities are:

1. That saturation will occur, with a detrimental result to the quality of reproduction.

2. There is a risk of the magnetic field being decreased below its satisfactory working limits due to accidentally connecting the loudspeaker the wrong way round.

There are two courses open to you. The first is to employ an output filter consisting of a low-frequency choke and a large fixed condenser. The second is to interpose a 1—1 ratio output transformer between the anode circuit of the output valve and the loudspeaker.

External Interference

O. S. (and others) complain of interference from electric trams and other electrical devices, such as flashing signs, dynamos, etc.

External interference of this nature is rarely remediable by alteration to the receiver. Occasionally the trouble can be reduced by shifting the position of the aerial or by using an indoor or frame aerial. Sometimes the removal of the earth lead helps matters.

The Post Office authorities have frequently been able to assist listeners in bad areas by suggesting to the owners of the interfering apparatus methods of overcoming the trouble, and asking them for their co-operation in mitigating the evil. In most instances this co-operation has been readily forthcoming, and it is on those lines wherein lies the cure.

Broken Grid Circuit

N. G. (Bexley Heath).—"A curious fault has occurred in my two-valve set. Until a day or two ago I was getting perfect reception. Now when I switch on I get a terrific howl, accompanied by a hum which I assume is from the electric light mains. I am using H.T. batteries and not a mains unit, and the batteries are new ones."

This is the type of fault which commonly occurs when a break exists in the grid circuit of the detector valve. The first procedure is to examine the grid leak. See that it is making satisfactory contact with its holder and also that the leads to the holder are not broken.

Try substituting another grid leak. Also go over the tuning coil connections in case the grid winding has developed a fault. It will usually be found that the grid leak or its holder is the cause of the trouble.

FOR THE CONSTRUCTOR

A NEW SECTION FOR DISCRIMINATING SET-BUILDERS

CONTAINING-

"MY 5-METRE RECEIVER"

BY W.L.S.

FULL DETAILS OF A NOTABLE NEW-SEASON SET

THE "DIODION"

ORIGINAL-ECONOMICAL-
DISTORTIONLESS AND
EXTREMELY SELECTIVE

"FROM 14 TO 50 METRES"

A HIGHLY ACCURATE WAVE-LENGTH INDICATOR WHICH ANYONE CAN MAKE

AND OTHER INVALUABLE FEATURES

"W.L.S." OUR POPULAR SHORT-WAVE EXPERT DESCRIBES

RECENT discoveries, showing that the waveband in the neighbourhood of 5 metres could be put to practical use for short-distance working, have given a tremendous impetus to the use of this band by amateur transmitters.

Whereas, in their great " downward trek " from 1,000 metres to 20 metres, they found each step downwards to be productive of better DX working, this last step has turned out to be just the reverse.

Five metres—at present quite useless for work over long distances—has proved to be an excellent wave for local conversations, which cannot be overheard at a distance, and which were fornerly conducted on the longer waves, to the annoyance of others trying to do DX work on the same bands.

We have to admit that the U.S.A. " get away with it " this time. Our own men, it is true, have been doing short-distance work for a long time on 5 metres (and by " short-distance " I mean only a mile or so); but the Americans put fire-towers, skyscrapers and aeroplanes into use and showed that it was possible to work up to 100 miles or more.

Almost An "Optical" Wave

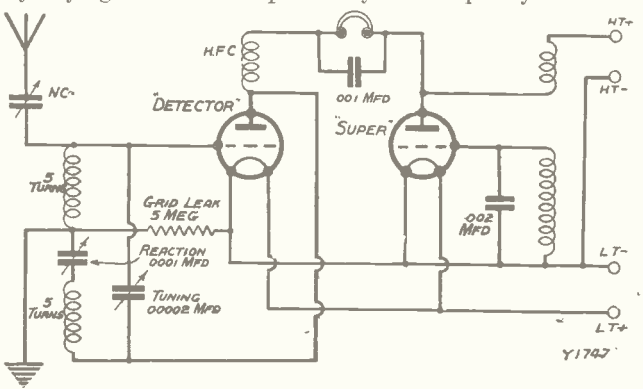
Five metres—like the 7-metre wave to be used by the B.B.C.—is almost an " optical " wave. By this I mean that you won't hear the other man unless you can *see* him—or *could* see him with a telescope. Hills and buildings provide serious obstructions unless the distance between transmitter and receiver is very small.

A transmitter in an aeroplane, on the other hand, should have no difficulty, with the very smallest power, in establishing contact with most of the country that is visible to the pilot.

This is enough to show that there are possibilities. Accordingly it struck me that a description, in some detail, of my own 5-metre receiver might be of interest to readers, particularly as the same receiver is entirely suitable for 7-metre work.

The circuit used is a modernised version of the old " super-regenerator "; an ordinary reacting detector is used in conjunction with a separate " supering " valve, which is really a long-wave oscillator.

The principle may be roughly explained in a few words by saying that the comparatively low-frequency oscillations of the latter valve are introduced into the plate circuit of the short-wave detector in such a way as to keep it sliding in and out of oscillation some 50,000 times per second.

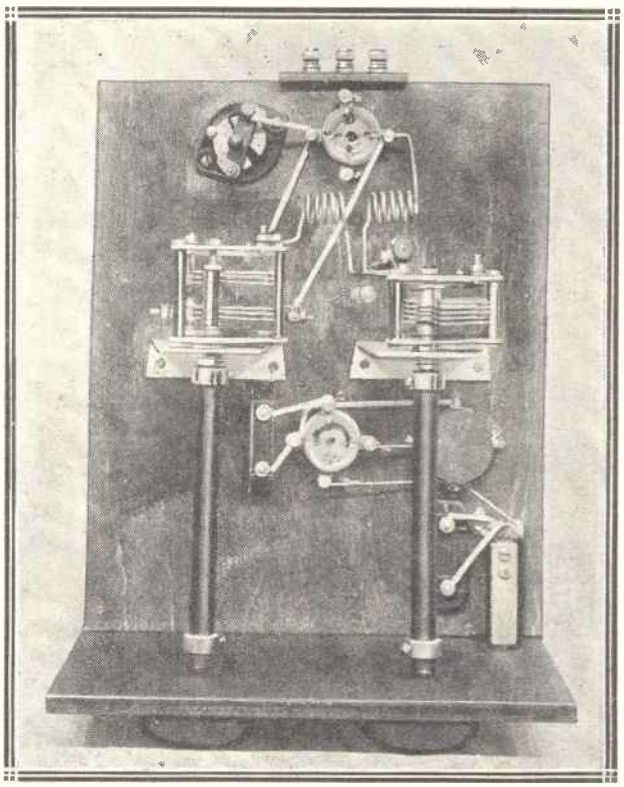


As Near Ideal as Possible

This is the nearest approach we can manage, as yet, to the ideal state, which would be to keep the valve right on the most sensitive spot—the very point of oscillation.

Actually it has not yet been possible to do this; even the smoothest reaction control is really " ploppy " compared with the ideal state of affairs.

TWO TINY TUNING COILS!



THE CIRCUIT—AND THE SET!

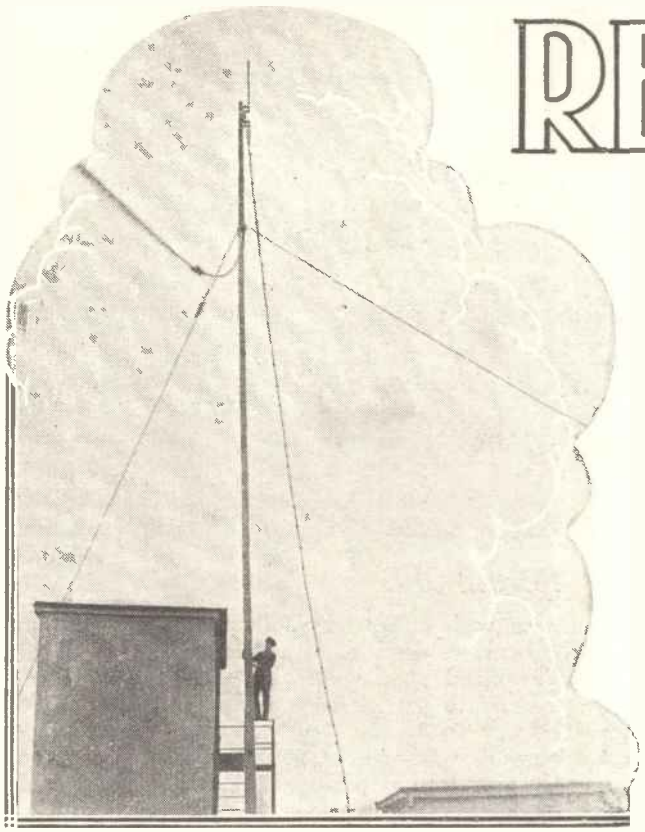
Extreme simplicity characterises both the theoretical and practical arrangements—it has to, on 5 metres!

The two coils (grid and reaction) are exactly similar, and each consists of five turns of No. 12 gauge bare copper wire wound round a ½-in. ebonite tube and pulled out so that there is a spacing of nearly one diameter between turns.

About half an inch is left between the " insides " of the two coils, which, it will be noted, are mounted directly on to the condensers.

There is no stray wiring between the tuned circuits

"MY FIVE METRE RECEIVER"



BERLIN'S BAYONET AERIAL

A short "bayonet" at the top of the mast is all the aerial used at this Berlin 5-metre station.

and the detector valve—it wouldn't need much to double the wavelength on which the set functioned.

The detector is the valve at the back of the baseboard, near the terminal strip. The condensers are mounted on "dummy panels," and to save space the "super" valve and its coils have been placed between the condensers and the real front panel. No hand-capacity effects result from that, and the "super" part of the set is extremely stable.

The Long-Wave Super-Windings

Its coils are wound together on a former with two slots, which was turned from a solid ebonite former 1½ in. in diameter. The grid coil has 1,000 turns and the reaction coil 750. Actually these values are not critical, and old plug-in coils of roughly these sizes may be used.

It is important, however, that the grid coil should be shunted by a capacity of ·002, or thereabouts.

Although readers may be a little frightened by the circuit of the receiver, they may rest assured that its operation is child's play. The fact that no slow-motion dials have been used should be sufficient proof of this.

The reaction control on the detector hardly needs touching; in fact, the set *can* be operated easily without moving it at all.

It is quite easy to check whether the set is working properly. Simply remove the "super" valve and make sure that the detector is working normally and oscillating over the band.

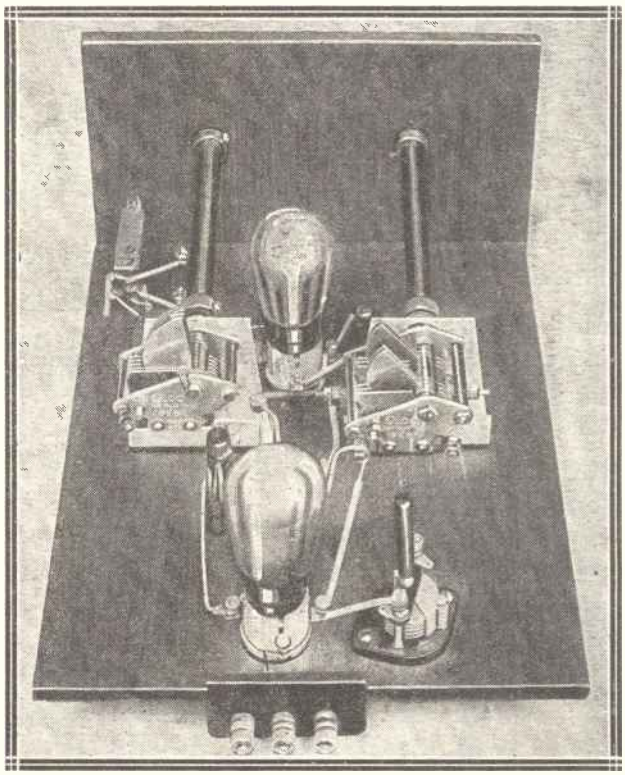
When you are satisfied that the detector is working well, put in the other valve, which may be an H.L. or an L. —and look out for the characteristic mush, which will only be heard when *both* valves are oscillating. If you know that the detector can be made to oscillate, and there is none of this "mush," then your "super" is not working. Try reversing the coils and, if necessary, altering the sizes.

Amateurs To Listen For

The only serious snag is that you will have nothing to listen to on 5 metres unless you are within the working range of an amateur transmitter. More than a score of London "hams" are active on this band, and a note to me, c/o "M.W.," will put you in touch with your nearest active man, who will probably be overwhelmed with joy at the thought of having one more station to listen to him.

The chief point about the receiver is that the substitution of 7-turn coils for the 5-turn affairs shown takes it up to 7 metres, where there may be some perfectly good B.B.C. programmes by the time you read this.

A FREQUENCY OF 60,000,000!



Five metres represent a frequency of sixty million cycles a second—so the wiring has to be carefully done!

A NOTABLE NEW SEASON'S SET

AN INTRODUCTORY FOREWORD

THIS month, and in the future, we are presenting our set designs in a new and more attractive form. No longer will it be necessary to read through the whole article or most of it in order to find out any particular feature of the set, or to clear up any matter concerning the construction or operation.

As you will appreciate from the following pages, it is and will be the simplest thing in the world to refer to any particular feature or section of the set, and to see almost at a glance what you want to know.

The descriptions of the sets, as with the "Diodion," which we present here, will be divided up into logical sections, each dealing with one well-defined point of view of the receiver. For instance, if a set is described logically it is obviously necessary to talk about it first in a general way, to introduce it, then to discuss more closely the circuit, the parts required, the actual building operations, and results obtained.

Most Valuable Sequence

That, in short, is the logical sequence with which anyone tackles the design of a receiver in his mind, and it is the sequence most valuable to him who would read about the set after it is finished.

We have followed that method in dealing with the "Diodion," our special Exhibition design, and we feel sure that the new presentation will do a great deal to simplify set construction even more. Perhaps he is on the look-out for something to suit his particular requirements, or it may be just general interest in the trend of design.

He will find the new scheme of enormous help, for he will be able to skip the actual constructional part, and read about the set in general, its circuit and what it will do, quite separately, untrammelled with a lot of practical data that at the moment he does not require.

THE NEED FOR SELECTIVITY

NO modern receiver is worth the name unless it can do one of two things—or both!

It must either give good quality, with a modicum of selectivity, so that on the local transmissions it is possible to get almost perfect reproduction; or it must be capable of sorting out the terrible ether congestion and getting programmes from foreign stations.

The ideal is to get, in one receiver, the various features that allow both these qualities to be obtained.

Every month the problem of separating the numerous transmissions from one another is getting more difficult to solve. Not only are the transmitters of Europe crowded together, cheek by jowl, in wavelength, but they are constantly increasing their power so as to make themselves heard above their neighbouring broadcasters.

The result is obvious—more and more selectivity is required by the radio receiver in order that anything shall be sorted out of the chaos that exists.

There are various ways of getting satisfactory selectivity in different degrees, and all have their own particular advantages and disadvantages.

Super-hets., band-pass receivers, multi-tuned stages, and so on, all are methods of obtaining the desired sharpness of tuning, but they have their own inherent disadvantages, either in difficulty of operation or their effect upon the quality of reproduction. And it will be remembered that we have said that the ideal is to obtain both selectivity *and* quality.

The DIODION

WHAT IT IS—AND DOES

THE question of selectivity and its need we have already outlined; it remains now to decide which method of obtaining selectivity, and at the same time good quality reproduction, we can best employ.

Incidentally, cost must also be borne well in mind, for few people can afford expensive receivers these days.

Let us consider the various features that are necessary for the home-constructed receiver.

First, it must be as inexpensive as possible; then it must be easy to construct; it must be selective and give good quality; and finally it must not be difficult to operate.

In the case of the mains-driven receiver, the question of running cost does not enter much into the problem; but when it comes to the battery-operated set, the running costs must also be closely taken into account.

The ideal, therefore, is a set that is extremely selective, gives perfect reproduction, is easy to build and to operate, and finally is cheap both in construction and running.

That ideal has never been reached, and it is doubtful if it ever will.

That is a blunt and candid remark, but it is true.

There is, however, no reason why we should not go a very long way towards this ideal, and the receiver we are about to describe is a great step in that direction.

In the search for the best type of receiver to get as close as possible to the high standard we have set ourselves, a great many types of circuits were tested and the merits and demerits of each were carefully classified and examined.

In Search of Selectivity

The one S.G. stage was considered best for general purposes of sensitivity, but with only two tuned circuits it was realised that this would not give anything like adequate selectivity unless much use was made of reaction to sharpen things up. This would have a bad effect upon the quality.

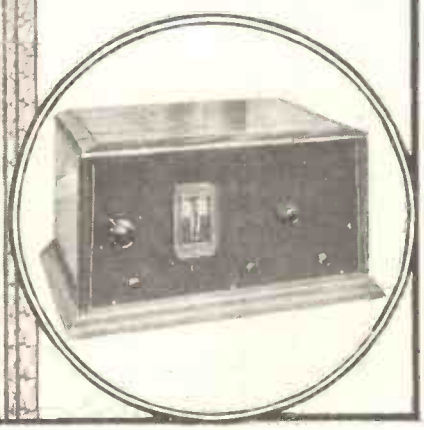
Accordingly it was decided, as described last month, to make use of a scheme much acclaimed by the B.B.C. engineering staff and to adapt the diode detector to our needs.

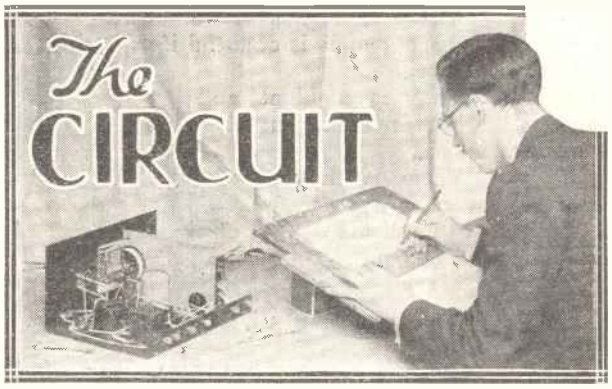
This would give not only good selectivity, owing to its low damping (unlike the high damping of the tuned circuit applied by the leaky-grid detector), but it would at the same time offer a solution to the quality problem. which always arises where a screened-grid valve is followed by a leaky-grid detector with its ease of overflowing.

Almost Ideal

Obviously, as the set was to be battery operated, so-called "power-grid detection" was out of the question.

It was decided that the diode should help us out of the quandary, and so we present to you the "Diodion."





THE circuit of the "Diodion" has been made as simple as is consistent with the obtaining of selectivity and quality of reproduction.

It will be seen to consist of a screened-grid stage coupled by plain tuned anode, to a diode detector which is connected to two L.F. stages. These latter are automatically biassed, so that there is no need to have a separate battery, and steep-slope valves are chosen so that the bias required is small and the subtraction of voltage from the H.T. battery is correspondingly low.

The aerial coupling is adjustable by means of the four taps on the T.D. coil and the series condenser.

Volume Controlling

This latter is a most valuable pre-detector volume control, and the sensitivity of the set is such that many stations need the condenser well towards the minimum position. The local station, if it is not more than twenty or so miles distant, requires the control at the minimum, to prevent overloading of the first L.F. valve.

It can be seen that the damping of the tuned-anode circuit is extremely low (the circuit is not shunt-fed so that the full value of it is obtained), due to the two ·0001-mfd. condensers in series with the grid connection to the diode valve, and the complete absence of any leak across the circuit.

The ·5 leak and its parallel condensers on the L.F. side of the diode do not affect the tuning circuit, for they are isolated from it in an H.F. sense by the H.F. choke between the diode and L.F. valve grids. This choke, therefore, must be of good design, and "any old" choke, as explained later, will not do.

The last valve is a high-mag. type, either the Mazda P.220 or a valve slightly larger being suitable.

Automatic grid bias is obtained quite easily with the aid of the 800-ohm resistance between the H.T. — and L.T. — terminals of the set.

Automatic Bias

Automatic bias for the first L.F. valve, which is of the H.L. variety, is obtained by the ·5-meg. leak which causes bias to be applied when a station is tuned in. Wave-changing is carried out by the usual push-pull switch method, but what will probably strike the reader most is the absence of reaction.

The "Diodion" is intended primarily for economical reception of the local station, and one or two of the more powerful foreigners. For this purpose there is no need for reaction, for you will find, owing to the very small damping effect of the diode on the tuned-anode circuit, and the loose-coupled aerial which applies little damping to the S.G. grid coil, that the screened-grid valve is enabled to give a very high degree of amplification—much more than is usually the case.

Good Sensitivity

As a matter of fact, the sensitivity is such that a large number of stations can be received at good volume on the speaker, as will be seen from the list and chart given farther on.

No use is made of the plate of the diode detector, as this is not required, the grid being more suitable for acting as the anode in this particular circuit.

Thus we have a true two-element rectifier, which has in itself no powers of amplification. Used as shown in this circuit it is much more sensitive than the old type, where a positive bias was applied to the anode of a valve, and the valve was placed across the tuned circuit of a receiver, in parallel with the grid and filament of an amplifier valve. In that case the damping caused by the valve was quite considerable, and therefore the sensitivity of the arrangement (for it has not any amplifying properties like the grid-leak rectifier, and it does not make use of reaction) was not very high.

On this page the main features of the circuit which makes possible the remarkable results given by the "Diodion" are dealt with in detail.

One of the biggest problems in radio design work is to keep the damping of the tuned circuits down to reasonable limits, though naturally if there were no damping at all self-oscillation would begin as soon as an H.F. impulse was received. It has been said that a diode detector is purely a passenger, and to some extent this is true. But it must not be forgotten that while the valve does not in itself amplify, it does allow a greater amount of H.F. amplification to be attained in the preceding stage, and it also prevents distortion taking place from imperfect rectification.

It is also very economical in itself, for it takes *no* H.T. From the point of view of the constructor who is considering his first set, or who has few valves to spare, the "Diodion" is extremely kind, for practically any old valve with an intact filament and a normal grid can be used as the diode.

As explained farther on, provision has been made for the inclusion of a meter in the anode circuit of the first L.F. valve. This meter is not an essential part of the circuit arrangement, for it can be shorted out if desired without in any way altering the operation of the set.

Distant Stations

It was included, or rather the terminals for it were included, so that those who want to get visual indication of the tuning of the set (a very useful check when dealing with distant-station searching, or when you want to test the strength of a transmission), as well as audible indication, can insert a small milli-ammeter across the terminals when the exact tuning point will be shown by the maximum deflection of the needle.

It can thus act as a useful indication, not only that the set is in tune, but of the strength with which any particular transmission is coming in, the degree of deflection giving an idea of the strength.

H.T. Tappings

Only two H.T. tappings are required for the "Diodion," and the only "critical" one (and this is not really *critical*) is that controlling the voltage of the screening grid of the S.G. valve. The other tap allows the full voltage of the battery or mains unit to be applied to the anode circuits of the S.G. and L.F. and the output valves, all of which can do with as much voltage (up to the maximum rating) as they can get.

Not that the set is useless with, say, only 120 volts on it. At this voltage it will give very good results, but if the full 150 can be obtained the extra 30 volts will be well made use of by the valves that receive them.

The H.F. choke we have stated is a most important factor in the operation of the receiver, for it is essential that no, or extremely little, H.F. impulses shall reach the grid of the first L.F. valve. For this reason also it is essential that the by-pass condenser across the anode resistance of the diode be used, its value being kept as low as possible consistent with quality requirements.

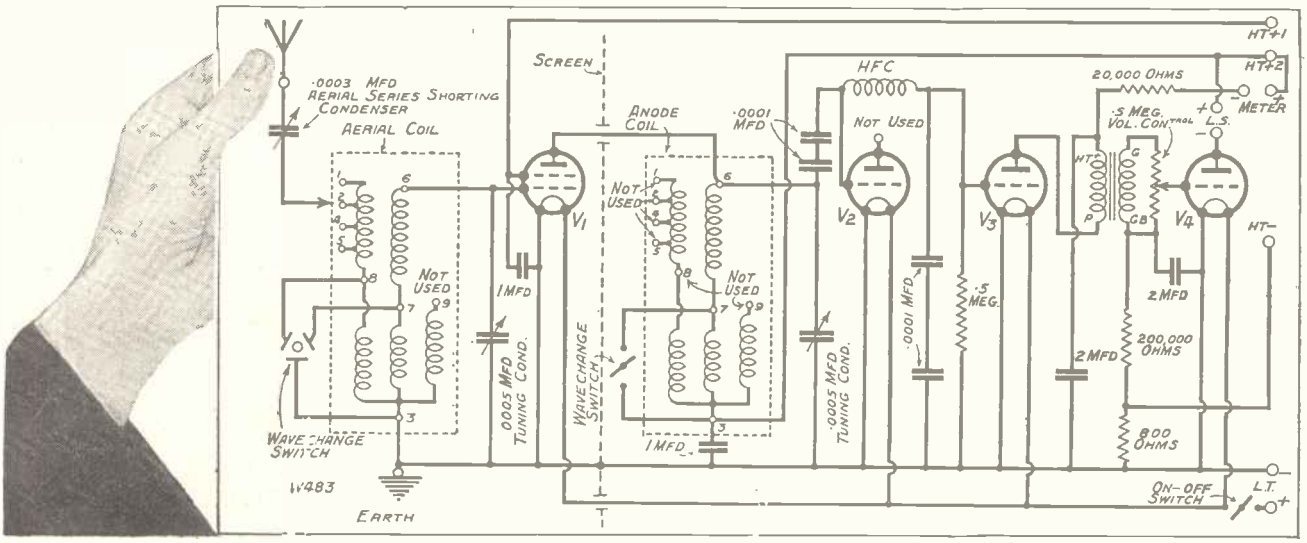
Highly Important

As this condenser is right across the grid circuit of the L.F. valve, it is obvious that if it has a large capacity it will operate excellently as regards an H.F. decoupler, but it will also tend to by-pass the highest audio-frequency impulses.

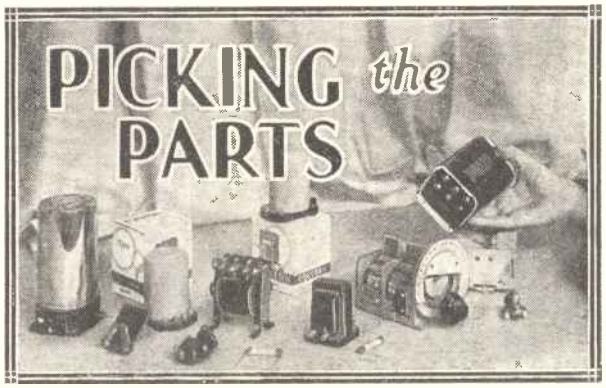
Thus the capacity must be kept as low as is barely sufficient for H.F. by-pass purposes. Hence the vital need for an efficient choke. By the way, the choking capabilities of the choke condenser system can be easily tested by withdrawing the diode valve and listening to the local station without it.

The strength of the reception will give an indication of the choking properties of the choke, and if it is operating satisfactorily enough for all ordinary purposes in this set it will be found that the strength of reception is very weak indeed.

Holding the Secret of Distortionless Reception



The second valve is the detector, and you will note that no connection is made to its plate. This electrode is not employed because the method of detection utilised is the two-electrode-valve principle.



A little guidance in the choice of the right components, emphasising the importance of using correct types to ensure full " Diodion " results.

IN a set of the description of the " Diodion " every component must pull its full weight. Otherwise the set will not give the output that it should. For instance, the H.F. choke is a most important component, for if this is not a good one the restriction of the H.F. impulses to the diode circuit will not take place, and much of the high-frequency input will leak past into the grid circuit of the first L.F. valve.

The result of this will be that the L.F. side of the set will distort, and it will be impossible to load up the output valve to the full extent, a state of affairs that is essential to the proper operation of the set.

One of the Vital Components

Another important component, specially important in this set where we are out to get distortionless detection, is the L.F. transformer. If this is of poor manufacture or design it will nullify the effect the diode has upon the quality, and the final results will be poor. We cannot here go into the question of the good, indifferent and poor transformers on the market, but none of our readers is likely to fail to realise that in radio as in everything else the best should be used wherever possible.

It is, therefore, up to the individual constructor to purchase the best transformer he can afford, realising that the better the component the better are his results likely to be.

We have assisted the choice, in some measure, by mentioning some of the good transformers in the list of parts, but many makes have had to be omitted for lack of space, and it is advisable for the man who contemplates building the " Diodion " to go carefully into the characteristics of the transformer he is thinking of using before he commences the set, should his choice fall on a make not specified.

It will be noticed that in two places we have used a couple of ·0001-mfd. condensers in series, when obviously in each instance one ·00005-mfd. condenser would have fulfilled the demands. This was done because it is far easier to get two of the ·0001-mfd. condensers than the ·00005-mfd. type, which is not readily available on the market.

The Question of Alternatives

On this page will be found a complete list of the component parts actually used in the construction of the set, together with a number of alternative parts that can be used instead if desired. No attempt has been made to make this alternative list absolutely complete, such would be nigh impossible, but we would like to stress the point that, although it is not necessarily the case that any component not in the list is not suitable—it can be taken that all those quoted are suitable for the " Diodion."

Constructors will, therefore, be well advised if they contemplate using parts not mentioned to look carefully before they leap. The parts they have in mind may be equally as good asthose used in the original set, but on the other hand, they may be quite unsuitable.

Care Should Be Taken

It may be thought that we are making much ado about little, but we have seen too many sets spoiled because their owners have not taken sufficient care in the selection of their components, and we do not want this to happen to readers who make our Exhibition receiver.

Another point where it is possible to slop up is in the choice of the varied resistances. If you, constructor, do not wish to use the makes specified, please use equally suitable types and values that are correct. One of the resistances has to carry the total anode current of the set, and though this is not a great amount, the resistance must be faultless if it is to do its work without fail. You may be able to cut down the cost of the set a few pence by the substitution of unknown parts here and there, but you will also be betting on unknown, and probably inferior results.

It is well to remember that the components specified by a set designer are chosen after due care and thought, and they are meant to be followed. Otherwise it is sheer waste of time and space, making out and publishing the list.

What you will need and the makes to buy

PANEL
14 × 7in. (Peto-Scott, Permcol, Wearite, Becol, Goltone, Ready Radio).

CABINET
To fit, with baseboard 14 × 10 in. (Peto-Scott, Ready Radio, Camco, Pickett, Osborn, Gilbert, Smith's, Morco).

VARIABLE CONDENSERS
1 double-drum type, ·0005 (Cyldon Synchratune Junior log).
1 ·00025–·0003-mfd. " Series " with shorting (Telsen, Ferranti) device

SWITCHES
2 two-point on-off and wave-change,
1 three-point wave-change (Telsen, Lissen, Ready Radio, Tunewell, Goltone, Wearite,).

RESISTANCES
1800-ohm (Graham Farish Ohmite, Dubilier 1-watt type).
1 ·5-megohm (Graham Farish Ohmite, Dubilier 1-watt type).
1 200,000-ohm (Dubilier 1-watt type, Graham Farish Ohmite).
1 20,000-ohm (Dubilier 1-watt type, Graham Farish Ohmite).
1 ·5-meg. volume-control potentiometer (Igranic, Lissen, Wearite, Ready Radio. Watmel).

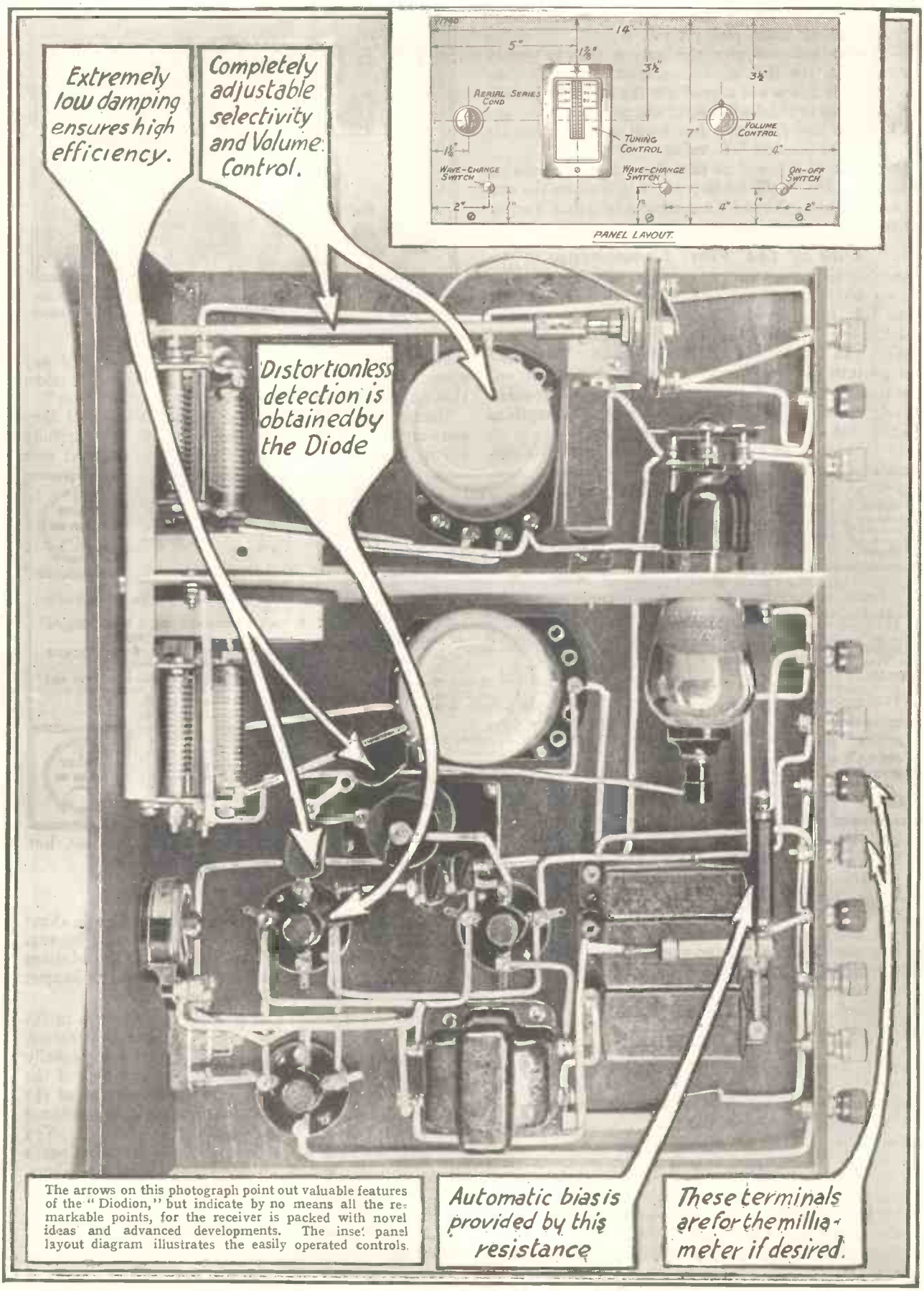
FIXED CONDENSERS
4 ·0001-mfd. (Dubilier type 665, T.C.C., Telsen. Lissen, Ferranti, etc.).
2 1-mfd. (Telsen, Dubilier, Lissen, T.C.C.).
2 2-mfd. (Telsen, etc.).

VALVE HOLDERS
1 horizontal type (Lissen, Telsen, W.B.).
3 normal type (Lissen, Telsen, W.B., Graham Farish, Lotus, Igranic, Wearite.

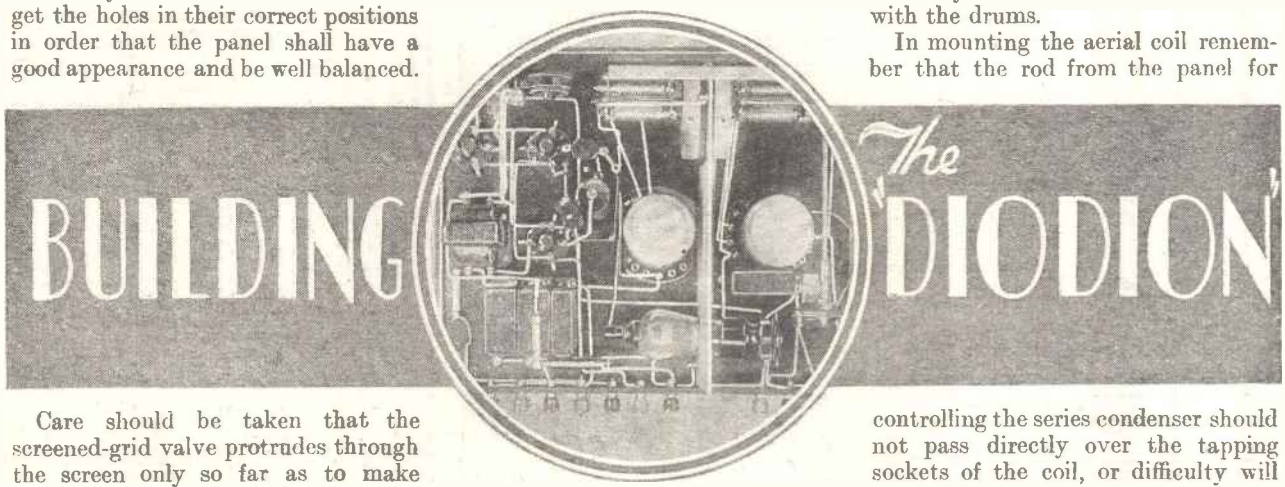
CHOKES AND COILS
2 screened coils (Colvern T.D.).
1 H.F. choke (Telsen Binocular, Lewcos type 11, Sovereign Super, Tunewell Wearite, Goltone Super, Peto-Scott).

L.F. TRANSFORMER
1 (Lissen Hypernik, R.I. Hypermite or Hypermu, Varley Nicore, Tunewell, Slektun, Igranic, Ferranti A.F.3 or A.F.5).

MISCELLANEOUS
9 indicating terminals (Bulgin, Belling-Lee, Eelex, Igranic, Clix, etc.).
2 plain terminals, 1 red, 1 black (Bulgin, etc.).
Screen, 1 standard 10 × 6 in. (Magnum, Peto-Scott, Ready Radio).
1 bracket and 7½ in., ¼-in. brass rod and coupling link for aerial series condenser, and panel bush (Wearite).
1 terminal strip, 14 × 1½ in.
Connecting wire and sleeving (18 gauge) (Wearite).
Flex, screws, etc.
Battery plugs (Belling-Lee, Bulgin, Clix, Eelex, Igranic).
S.G. valve connector (Belling-Lee, etc.).



The arrows on this photograph point out valuable features of the "Diodion," but indicate by no means all the remarkable points, for the receiver is packed with novel ideas and advanced developments. The inset panel layout diagram illustrates the easily operated controls.



ALL ABOUT THE CONSTRUCTIONAL WORK

THE actual construction of the "Diodion" is extremely easy, if care over the layout is taken and the wiring diagram given on the following page is followed. There are no unseen snags that will crop up and foil the constructor in his attempt to build a really first-class receiver. Everything is straightforward. There is little soldering to be done, and, as a matter of fact, if the ·0001-mfd. fixed condensers are of the 670 type Dubilier, these can be connected by means of their terminals instead of being soldered together.

The part that needs most care is the drilling of the panel, which must be done accurately if the variable condenser assembly is to be properly fitted.

A drilling template is provided by the manufacturers, and this will make the task very much easier. Do not be tempted to use another make of condenser assembly unless you feel absolutely sure of your power to rearrange the set on a larger baseboard and with a longer panel, for other twin-drum condenser units are, as a rule, larger than the one chosen for the set.

Well-Balanced Panel Appearance

The adjustable bracket for the series condenser will enable you to adjust for any discrepancy in the positioning of the hole on the panel for the series condenser control, but every effort should be made to get the holes in their correct positions in order that the panel shall have a good appearance and be well balanced.

Care should be taken that the screened-grid valve protrudes through the screen only so far as to make its screen skirt flush with the hole in the vertical screen. Recently we saw a case of a reader's set (which was unstable) in which the S.G. valve was protruding almost right through the screen, which consequently was not acting efficiently.

It will be noticed that there are two terminals on the terminal strip marked meter. These are for the attachment of a low-reading milliammeter for those who would like to use a meter for tuning in. It is not essential for this instrument to be used, and those who do not want to use a meter can either short the terminals together, or they can omit them and take the leads that go to the terminals together to either terminal H.T. plus 2 or to L.S. plus.

The Tuning Indicator

The meter, it will be seen, is in the anode circuit of the first L.F. valve, and its reading will vary with the strength of the received broadcast impulses.

Thus it is an accurate indication as to when the set is fully tuned-in to any particular station. Tuning can be done quite easily by ear, but the meter does help when searching for distant programmes, and it is very fascinating to *watch* a station being tuned-in as well as *hear* it. Any old meter reading up to about 5 millamps will do—it need not be at all accurate.

As regards the bias resistance—the 800-ohm one. This holds good over a fair range of valves, and these are given in the list of accessories. It is advisable to keep to these if possible, but if different makes and types are really required the resistance can be altered in value, though the use of output valves having different characteristics from those specified will upset the electrical balance of the set, and it is likely that its range and power will be affected.

Earthing the Metal Screens

It is a good plan to wire up the switches on the panel before the variable condenser is put into position, and this latter should be mounted before the screen is fixed. Connection between the screen and the back plate of the condenser is required for earthing the latter, as the moving vanes are insulated from the metal back plate, and so the earthing of these does not constitute an earth for the plate. The vertical screen must fit between the two drums of the condenser, but if the latter is to run smoothly it must not be in contact with the drums.

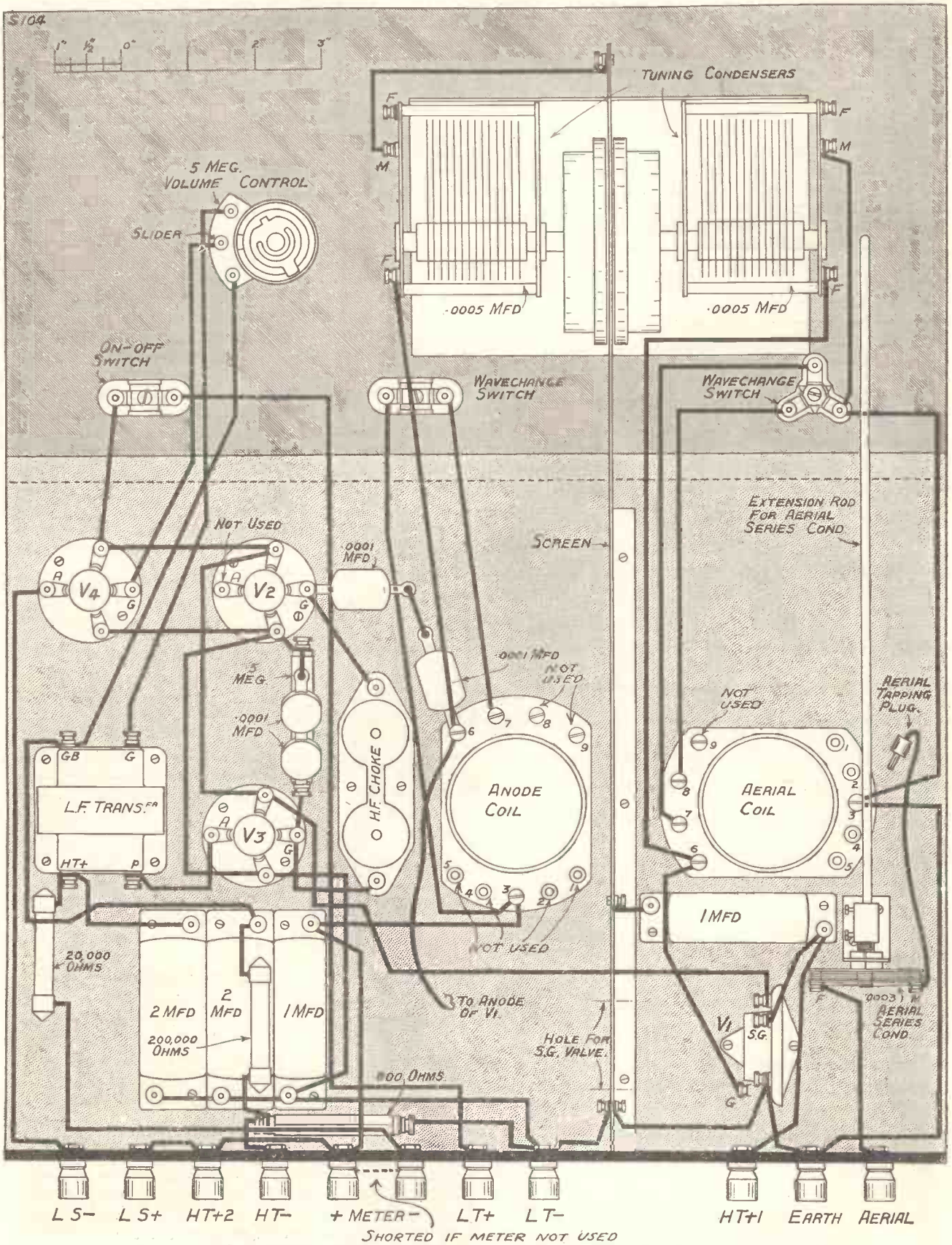
In mounting the aerial coil remember that the rod from the panel for controlling the series condenser should not pass directly over the tapping sockets of the coil, or difficulty will be experienced in setting the selectivity plug when it comes to operating the receiver.

Panel Bush for Extension Rod

There is no need to use a panel bush for the extension rod of the series condenser, but it makes a much better job if this is employed. Slackness is thereby eliminated, and the operation of the control is thus very much smoother and reliable. By the way, if the alternative make of series condenser is employed (and it must have a self-shorting position that makes reliable contact, remember), it will be necessary to use extension rod of less diameter, 3–16th inch being required instead of ¼ inch.

The small ·0001-mfd. condensers are slung on the wiring for a purpose, to prevent as far as possible any capacity to earth being introduced by their proximity to the baseboard, so do not be tempted to make the set look neater by carefully arranging these condensers flat on the baseboard. It will look better, perhaps, but the results are likely to be adversely affected.

A Plan that will Lead You to Real Radio



See that you get the connections right. They are all quite easy if you just follow the black lines.

The ACCESSORIES TO USE

WHAT are usually termed the accessories of a radio receiver consist of the loudspeaker, the valves, batteries or mains unit, and accumulator. These are not difficult to choose in most cases, but it is always advisable to do so with circumspection. In the case of the "Diodion" there are one or two points that need special care.

The main point is the choice of valves. The screened-grid valve can be of any good make, it being borne in mind that the better the valve the more sensitive will be the set to the transmissions from distant stations. The first L.F. valve should be of the H.L. type, as this has to be automatically biased by the incoming "carrier" of the received transmission.

The Output Stage

The output valve must be chosen to go with the bias resistance, or the latter will have to be changed. A larger valve than the one specified in the accompanying list could be used if desired; but such a procedure would upset the economy side of the set, for it would take much more anode current and, instead of being eminently suited for use with dry batteries, it would come into the field of mains unit receivers.

This was not the intention of the designers, for they set out to produce a set that would be really economical with dry H.T. batteries, and that is why they chose the Mazda P.220 as the output valve.

Other valves that can be used without altering the value of the bias resistance, though they have the effect of increasing the anode current somewhat, are the P.220A. and the P.M.202. The latter gives excellent results in the set, but increases the H.T. consumption at 150 volts to about 16 milliamps.

Increasing the Power

If the set is used with a mains unit, as may well be the case in many instances, this valve can be thoroughly recommended. It gives a larger output than the first named, and consequently will provide a bigger volume of sound on the local station, it having a much larger grid swing.

The H.T. battery should naturally be chosen with the milliamp. consumption of the set in mind.

VALVES AND LOUDSPEAKER

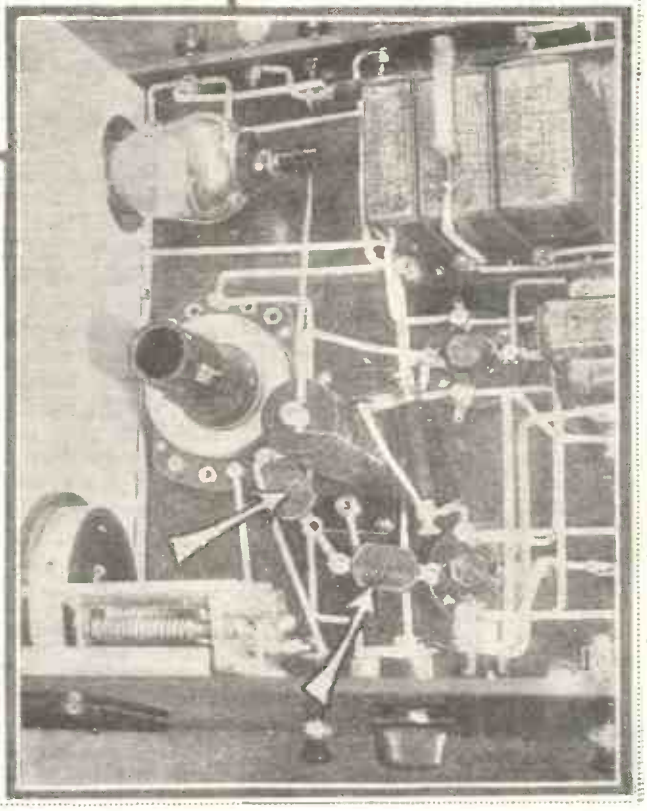
Loudspeaker. Marconiphone, Blue Spot, H.M.V., Celestion, B.T.-H., R. & A.

Valves. S.G.: Marconi S.22, or Mullard, Cossor, Mazda, Eta, Osram, Tungsram, Lissen.
Det.: Any detector type, such as H.L., H., or small L.F.
1st L.F.: Mullard P.M.1H.L., or H.L. type of valve of above makes.
2nd L.F.: Mazda P.220.
With these valves the consumption at 150 volts H.T. is approx. 10 milliamps.
Larger output valves can be used if desired, with larger anode current (see text).

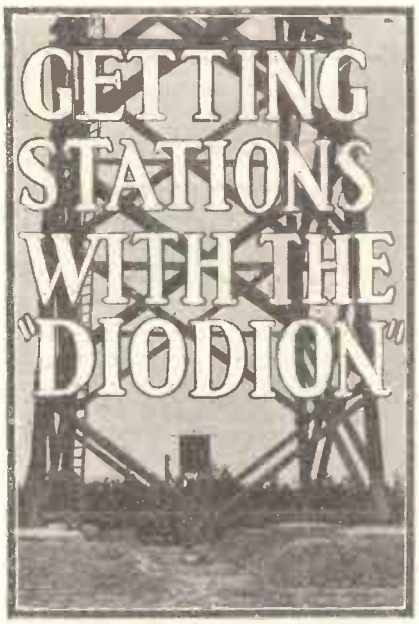
BATTERIES AND MAINS UNIT

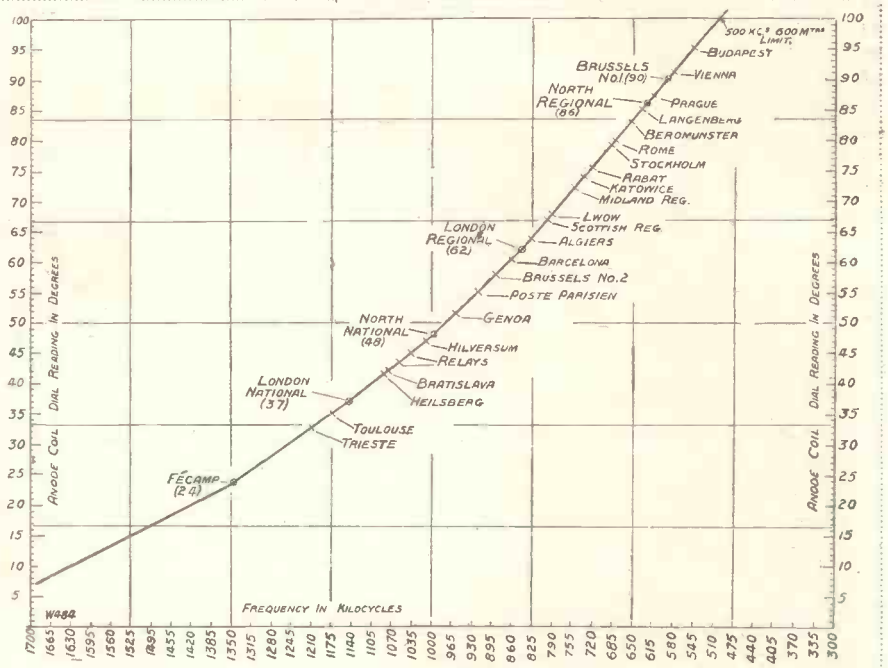
Batteries. L.T., 2-volt accumulator (Ediswan, Pertrix, Lissen, G.E.C., Exide, Oldham).
H.T., 120–150 volts, preferably latter, to give 10 milliamps, if valves specified are used (Pertrix, Lissen, Magnet, Ediswan, Ever Ready).

Mains Units. To give 120–150 volts at 15 or 25 milliamps., dependent upon output valve used (Atlas, Heayberd, Lotus, R.I., Formo, Regentone)



The arrows indicate the two ·0001-mfd. condensers that are connected in series.





Some of the stations that you can log with ease on the "Diodion."

WITH the construction of the "Diodion" completed, and the accessories to hand, it only remains to connect up and get the set working. There are only two H.T. positive taps to be taken: the first is to H.T. pos. 60 to 80 volts (H.T. plus 1), and the other is to the full voltage (up to 150 volts) of the battery.

The L.T. Supply

A 2-volt L.T. battery is employed, and connected in the usual way to the two L.T. terminals. Aerial and earth go to their respective terminals, and the loudspeaker to the appropriate pair. This leaves us with two more—those marked "meter," unless you have omitted them as suggested in the section on the construction of the set.

If no meter is to be used, these terminals should be shorted with a piece of wire. If a meter is decided upon it is connected with its plus side to the terminal marked meter positive.

Whether it is used or not, the following procedure of tuning is unaltered, except that with the meter, instead of using your ears to denote the tuning in of a transmission, watch is kept on the meter, and when it kicks downwards it is known that a carrier is reached, and the tuning is adjusted until the downward deflection of the meter is at its maximum, where it will remain as long as the set is tuned to that station.

Variable Selectivity

Before we start tuning let us set the selectivity of the set at the degree we think will be most useful. If we are near a local station we shall probably use the No. 1 tap on the aerial coil, but if some way away (over 30 miles, say) we shall try Nos. 2, 3, or even 4.

This is a rough setting of selectivity and sensitivity, and merely controls the number of turns in the aerial primary coupling coil. The most useful control is obtained through the series condenser, which is continually variable.

To start, set this at maximum by turning it to the right. It is now shorted, and the full blast of the local station will come in at great strength if you are anywhere near it.

Easy to Tune

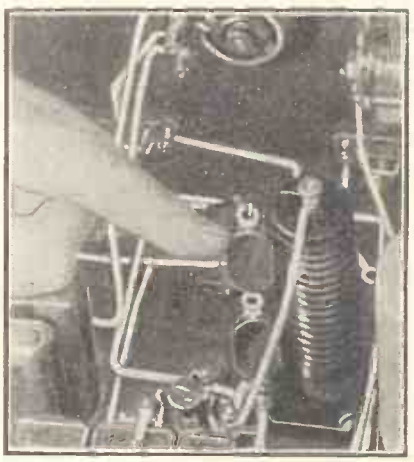
You will find that as the drums of the condensers are rotated they keep fairly well in step when the aerial tap is a low one, and the series condenser is towards the minimum, though the readings will not necessarily be the same.

But when the condenser is fairly well "in" or the tapping point on the coil is high the left-hand drum will work out-of-step a little, the amount depending on the characteristics of the aerial and earth.

The control of volume is carried out both by the series condenser and by the volume control potentiometer across the secondary of the L.F. transformer.

WATCHING THEM COME IN!

JUST A SMALL POINT

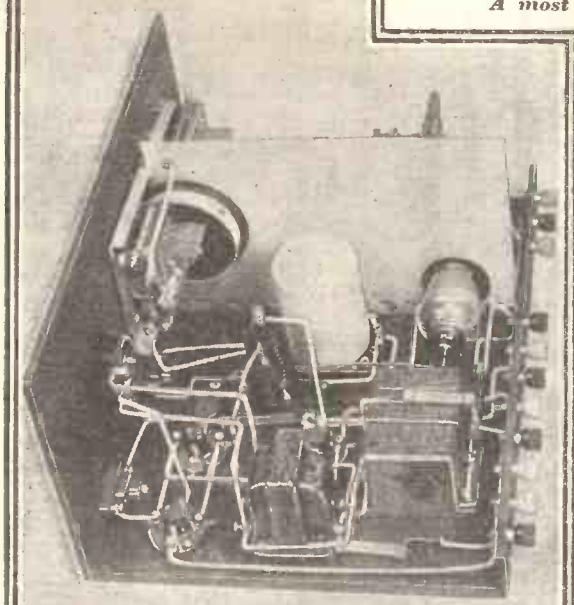


(*Left.*) Hair-breadth tuning presents no difficulties in the "Diodion," because a meter can be used to indicate exactly the critical point.

(*Right.*) Because they are more easily obtained, two ·0001-mfd. condensers are used in series to provide an effective capacity of ·00005 mfd.

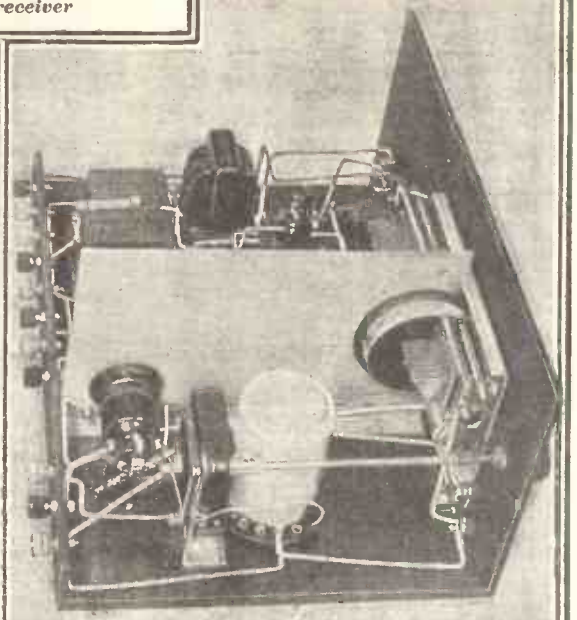
FROM ALL POINTS OF VIEW

A most remarkable receiver



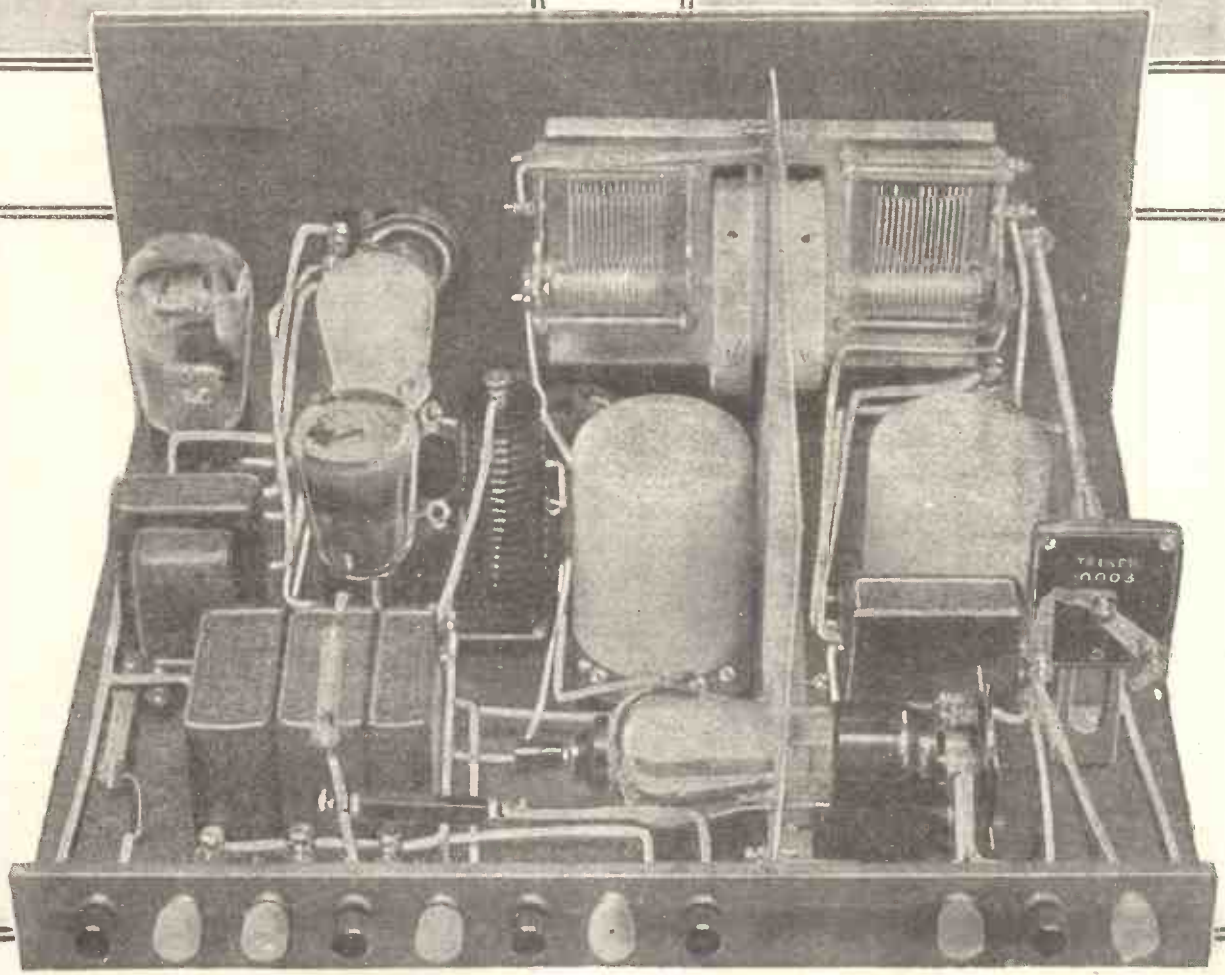
ON LEFT

The powerful and compact low-frequency end.



RIGHT

Showing the extension handle employed with the series aerial condenser



When completed and with the valves in position, the receiver immediately strikes one as particularly straightforward. There is no difficult wiring, and no complicated constructions to be dealt with. Note how few connections there are and also how the vertical screen passes between the two drums of the ganged tuning condenser assembly.

ALL EUROPE AT YOUR COMMAND ON THE "DIODION"

Some notes on the sensitivity of this receiver and a list of stations which indicates how easily foreigners can be picked up.

KEEP YOUR WORK-BENCH TIDY WITH THIS CABINET

It is simple to make and will not cost you a penny, but will save you any amount of time and trouble.

USERS of the "Diodion" will be surprised at the sensitivity of the set. At 20 miles from the London stations, with a fairly good aerial it is necessary to use tap 1 on the aerial coil and to set the series condenser right out—that is, at minimum—in order to prevent overloading of the L.F. valve, while the volume control is also set back a little to stop overloading of the last valve.

The number of stations that can be tuned in on the set is remarkably large. On the medium waves (wave-change switches "out") over 35 stations were tuned in at a strength sufficient to overload the L.F. valves in the outskirts of London during one evening a few weeks ago.

On the long waves most of the important stations were easily picked up on the speaker. The list gives some indication of the dial readings of the medium-wave stations as received on the original model of the "Diodion." These readings will not necessarily be the same for all models, but they will not be far out, especially in the case of the anode condenser.

THE "DIODION" DIALS

Some Typical Tuning Positions

DIALS.		STATIONS.
25	21	Konigsberg
29	24	Fëcamp
35	32	Trieste
39	35	Toulouse
40	36	Hörby
40½	36½	Leipzig
41	37	London National
43	39	Moravska-Ostrava
43½	40	Lille
44	41½	Heilsberg
45	42	Bratislava
50	47	Hilversum
51	47½	North National
51½	49	Bordeaux-Lafayette
52	51	Genoa
53	52	Poste Parisien
54	53	Brussels No. 2
57	54	Strasbourg
57½	55	Barcelona
60	62	London Regional
65	63	Mühlacker
69	67½	Lwów
72	71	Bucharest
73½	72	Midland Regional
74	72½	Sottens
75	73½	Katowice
77	79	Stockholm
84	82	Beromunster
84½	85	Langenberg
85	86	North Regional
86	86½	Prague
91	90	Brussels No. 1
92	90½	Vienna
95	94	Munich
97	96	Sundsvall
98	96½	Budapest

Models for the Mains

Finally, to those of our readers who are more interested in mains sets than battery models, we hope to publish details of a mains "Diodion" in the near future. This will probably be one for D.C. mains, using the new D.C. valves. It will probably be followed by an all-A.C. model, complete with radio-gram equipment.

These mains sets will represent, in the all-electric set world, just as great an advance as the model we have been discussing has represented in the battery class, and the quality of reception and the sensitivity and selectivity will be just as, if not more, amazing.

THIRTY-TWO match-boxes go to make this workroom "cabinet." Each match-box is glued to its neighbour, each row of the boxes being interleaved with thin sheets of cardboard which are also glued securely in position.

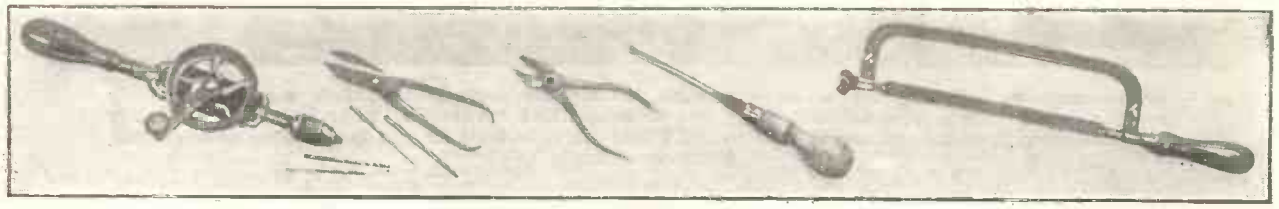
After the match-boxes have been glued together in this manner, strips of cardboard are glued round the edges of the match-box assembly so built up,

FOR ODDS AND ENDS

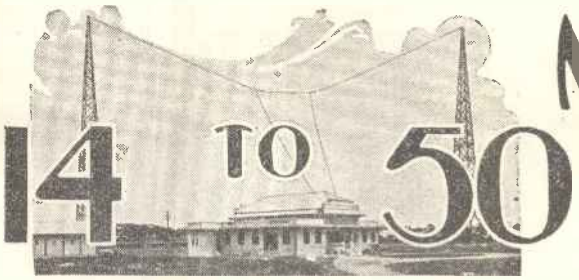
You will always be able to find just the right nuts and bolts, etc., if you make this handy chest.

and finally wooden strips are glued over the cardboard strips in order to give greater stability to the structure.

The strip forming the base of the cabinet is allowed to project somewhat at each end, so that the cabinet may conveniently be screwed down to a shelf, or in whatever position it is required to occupy.



FROM 14 TO 50 METRES



There are approximately 90 telephony stations transmitting between 14 and 50 metres, which is a waveband capable of accommodating rather more than 1,600 separate transmitters. How to find those that are actually transmitting is shown in this article.

By G. T. KELSEY

BETWEEN the wavelengths of 14 and 50 metres—which represents a change of 36 metres—there are at present rather more than 90 stations transmitting.

Between the wavelengths of 300 and 336 metres, which represents an exactly similar change—there are *twelve* stations transmitting, and even then the engineers will tell you that there is severe overcrowding!

It seems all wrong, doesn't it? And it only goes to show you how terribly misleading the term wavelength can be.

But supposing we forget about wavelength for a few moments. Supposing we consider the little problem in terms of frequency. You will soon see that the paradoxical statement made above is not nearly so paradoxical as it might at first appear!

The wavelength of 14 metres corresponds to a frequency of 22,000 kilocycles, and that of 50 metres to 6,000 kilocycles. In other words, between these two wavelengths there is a frequency difference of 16,000 kilocycles.

Frequencies and Wavelengths

What happens to the frequency side of the question when you get up to 300 metres? Between 300 metres, which represents 1,000 kilocycles, and 336 metres, which is equivalent to just under 900 kilocycles, there is a frequency change of only 100 kilocycles!

But perhaps you do not see the connection. Well, it's just this.

In accordance with the generally accepted ideas for the proper separation of broadcast transmitters, it is desirable for all stations to be separated by a little band of frequencies 10 kilocycles wide.

In other words, between 300 metres and 336 metres, which represents a frequency change of 100 kilocycles, there is really room for only ten stations, whereas there are actually twelve transmitting because 9 kilocycles separation is in use at present. But between 14 metres and 50 metres, which, in terms of frequency, is a change of 16,000 kilocycles, there is room for 1,600 stations, and there are only 90 transmitting there!

A Question of Tuning

I may as well tell you that there is a moral behind all these illuminating disclosures, but more about that later!

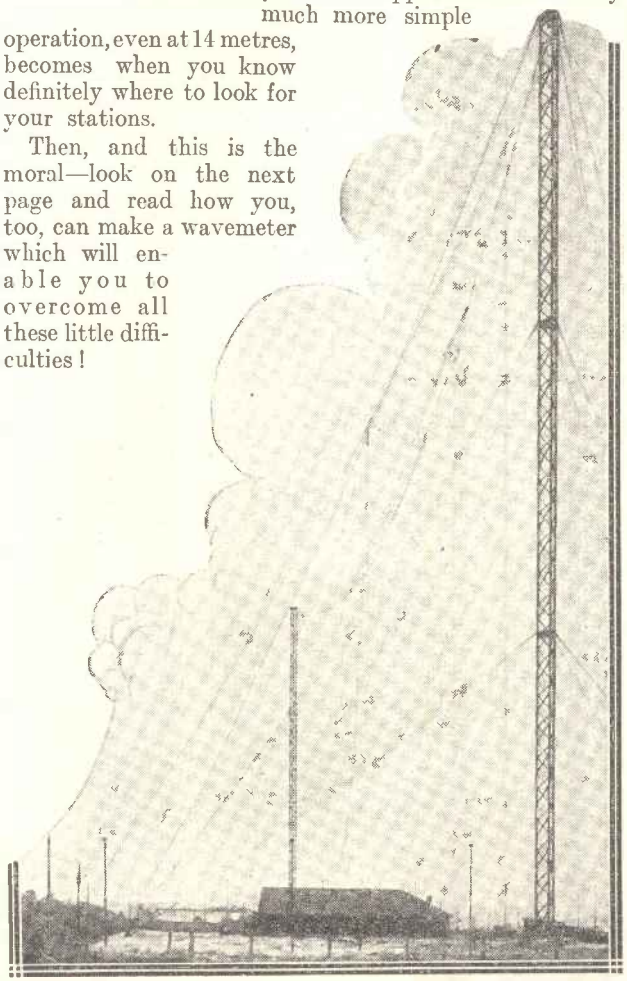
Meanwhile there is another aspect of the matter, connected with the practical side, which must be mentioned.

On the short waves it is usual to cover a much larger band of frequencies and therefore nnmber of possible channels, with one rotation of the tuning dial than it is on the broadcast waves. The reason for this is to avoid continual changing of coils in covering a small number of stations; for as just explained the number of stations working on short waves compared with the number that *could* be working is a very low proportion.

The net result of this is that tuning becomes much sharper and the dials have to be moved many times slower on the short waves than on the medium. And the higher the frequencies the sharper becomes the tuning in comparison with medium waves.

When these little facts and figures have soaked in you will suddenly discover more than ever before that you want a wavemeter! You will realise how very easy it is to be lost when only 90 stations are occupying a band in which 1,600 can be placed, and you will appreciate how very much more simple operation, even at 14 metres, becomes when you know definitely where to look for your stations.

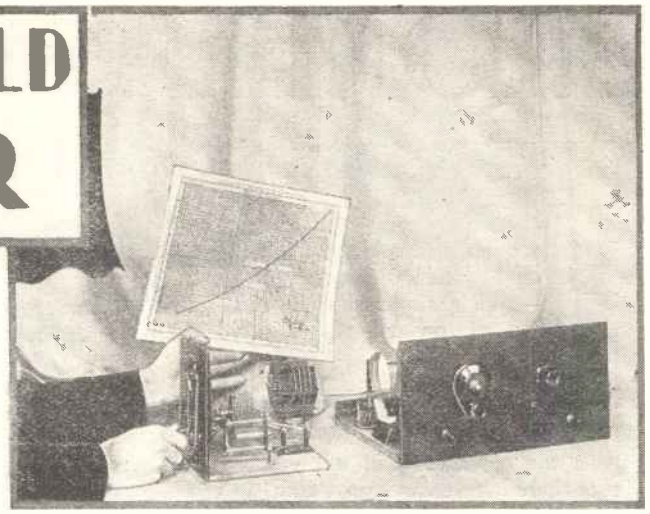
Then, and this is the moral—look on the next page and read how you, too, can make a wavemeter which will enable you to overcome all these little difficulties!



The announcer at 3 L O, Melbourne, Australia—the masts of which station are shown above—has to commence work at six o'clock on a Monday morning in order to provide us with a programme on the previous Sunday evening!

AN EASY-TO-BUILD WAVEMETER

Roaming the world on the short-waves is apt to be difficult unless you can be reasonably sure of "where you are." One of the easiest ways of knowing the wavelengths is by means of a wavemeter, which is about the most simple of all short-wave apparatus.



When once your wavemeter is calibrated you can identify almost any short-wave station in the world ! You leave the set adjusted on the doubtful transmission, rotate the wavemeter condenser until the set stops oscillating, and then just consult your graph !

THE best investment that anyone who is interested in short-wave reception can make is to buy the parts for a short-wave absorption wavemeter.

They may cost you ten shillings, or they may cost you twenty—it will depend upon the parts you choose to use —but irrespective of cost, you will find such a unit one of the most useful things imaginable whenever you are on the look-out for distant short-wave transmitters.

My own personal opinion is that a wavemeter for short-wave work is indispensable. You may have different ideas on the subject, but somehow I think that you, too, will agree if you have managed to sort out the figures given on the preceding page !

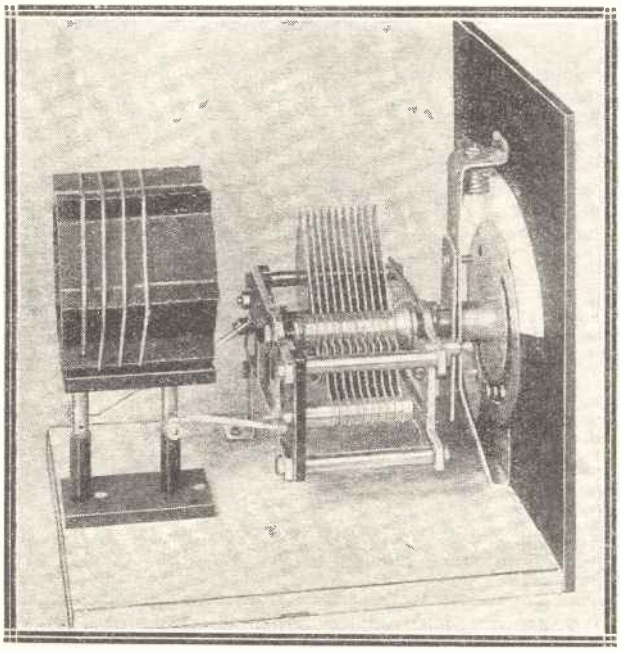
A Tuning-Fork of the Ether

When we talk about the figures of 14 and 50 metres in terms of wavelength they seem straightforward enough, don't they ? But 16,000 kilocycles ! Only 90 stations where in theory 1,600 could be placed !

Just try to imagine striking correctly 90 unmarked notes on a piano with 1,600 keys ! You would want some tuning-forks, wouldn't you ?

Then why not a radio "tuning-fork" to pick out the 90 stations between 14 and 50 metres ?

"ABSORBING" APPARATUS !



In this little absorption circuit there are only two main components—the short wave coil and a variable condenser.

But enough of generalities. If you have read the previous page (and, if you haven't, I'm going to suggest that you do), I am quite convinced that you will want to know something about wavemeters in general, and this one in particular.

As a matter of fact, the wavemeter illustrated in these pages is my own personal instrument, and I may as well be candid and admit that I treasure it like a new-born babe ! It's quite a sturdy little fellow really, but I have got it calibrated to such a high degree of accuracy that I almost swooned at the sight of our staff photographer propping it up on matchboxes ! First of all have a look at the photographs. You will see that all it consists of is a condenser, a coil, and a decently-marked dial.

The condenser (which is a Cyldon in the original) can be of any reliable make, and if you can get a straight-line frequency model it will simplify the calibration and the drawing of the tuning curve. But irrespective of type, it must be of ·0005 microfarads capacity.

Special Condenser is Not Needed

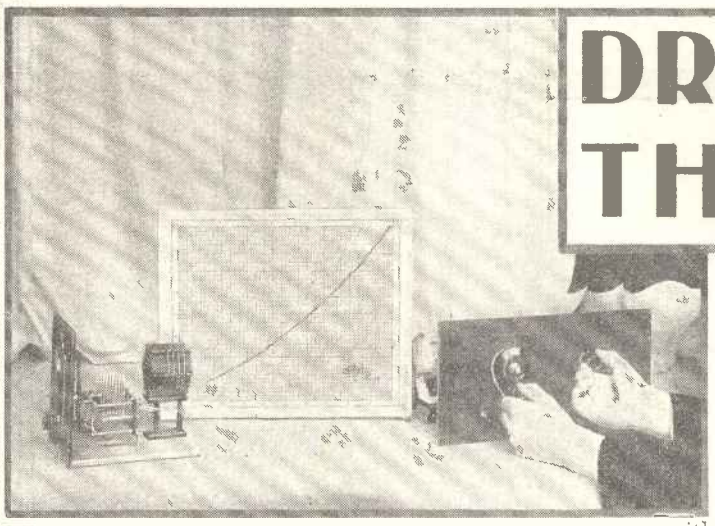
As a matter of fact, the condenser in my wavemeter is not of the straight-line frequency type, and that accounts for the fact that my calibration line is curved.

With regard to the condenser dial, the one used in the original model is an American Pilot dial, merely because I happened to have it by me and it seemed to be ideal for the job. But any good slow-motion dial will do.

The coil for the wavemeter can, if you like, be home-made. It consists of four turns of No. 18 tinned-copper wire on a ribbed former measuring 3 in. to the outside of the ribs. Just as a matter of interest, may I mention that the coil in the original was not home-made. It is one of the Bulgin standard short-wave coils with a turn or two and the reaction winding stripped off it. It is mounted on a plug-in base, which means to say that the wavemeter is not limited only to the band between 14 and 50 metres.

As for construction, well, need I say anything at all ? You mount the condenser, you fix the coil, you join the two terminals of the coil to the two terminals of the condenser, and your wavemeter is complete ! And to calibrate it, well, you will find all the necessary details on the next page.

DRAWING THE LINE!



Think of the hours of tedious searching you avoid when, by means of a wavemeter, you adjust your set to a given wavelength in a couple of minutes or so! You just set the wavemeter and then adjust the set until you find the "dead spot."

The calibration of a short-wave wavemeter may, at first sight, appear to present difficulties; but it is really quite a simple matter if you proceed in the manner described in this article.

IT'S rather strange, but one usually finds that it is necessary to draw the line somewhere with most things! And radio is no exception.

Fortunately, the "line" in this case doesn't represent any sort of limitation. It happens to be the calibration line, without which your wavemeter is worth little more than the face value of the parts of which it is made.

So now, what about this line?

First of all, I think it would be best if I explained as briefly as possible the way in which an absorption type of wavemeter is used, for you will not be able to proceed very far with the compilation of the curve until you are *au fait* with the method of procedure.

Suppose that you have tuned in a station which you have definitely identified as W 2 X A F on 31·48 metres. You leave the tuning dial on your short-wave set at exactly this position, and you advance the reaction condenser until the set just commences to oscillate.

If you now place the wavemeter coil somewhere between about 6 and 12 inches away from the grid coil in your set, and slowly turn the wavemeter dial, you will find a setting extending possibly over five or 10 degrees which has the effect of stopping your set oscillating.

Only a Fraction

That is just a rough setting, but if you slowly move the wavemeter away from your set, you will find that its no-oscillation effect upon the set becomes narrowed down until it is only effective over a fraction of a degree. That setting on the wavemeter corresponds exactly to the wavelength of the station you are receiving, so you just make a note of the wavemeter condenser setting and the wavelength to which it corresponds.

Then the rest is easy!

You listen on your short-waver for two or three evenings until you have logged about half a dozen or so of the "key" stations between 14 and 50 metres, and for every one you go through exactly the same procedure.

Suggested stations for this purpose are Buenos Aires (L S Y) on 14·47 metres, W 2 X A D on 19·56 metres, G 5 S W on 25·53 metres, or Rome on 25·4 metres, W 2 X A F on 31·48 metres, Bangkok on 41 metres, Moscow (R E N) on 45·38 metres, and W 8 X K on 48·86 metres, W 3 X A L on 49·18 metres, or Moscow T.U. on 50 metres. Then when you have got the wavemeter settings corresponding to these settings, you can "draw the line."

For the graph you will want some squared paper with lots of lines on it. In this connection it is desirable to use paper with large squares measuring about 2 in. each with each square divided into hundredths, and each tiny square divided again into twenty-fifths.

The drawing of the actual curve is simple, and you will be able to arrive at the shape of the curve by charting the points you have already recorded.

Incidentally, it is best to plot dial readings along the horizontal line, which refers, of course, to the dial readings of the wavemeter *and not the set*, and wavelength along the vertical line.

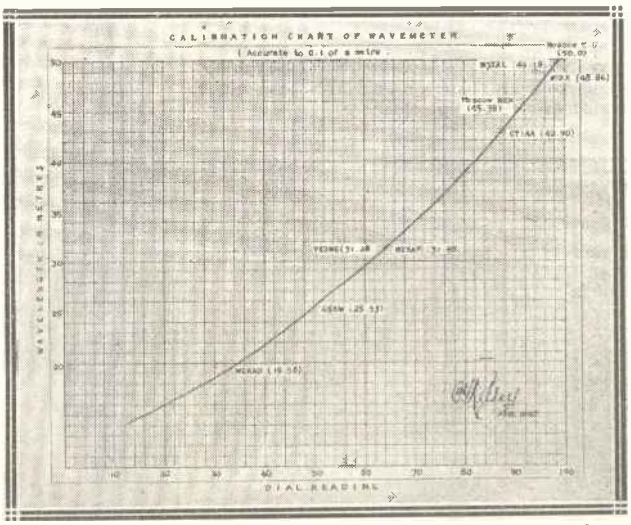
Find the "Dead" Spot

In operation, the wavemeter is very simple. Supposing you want to tune in a given station. You set the wavemeter at the appropriate wavelength, stand it somewhere near the set, and turn the set tuning control with the receiver *just* oscillating until you find the "dead" spot.

If the "spot" extends over more than a fraction of a degree, then you just move the wavemeter farther away until the desired effect is obtained.

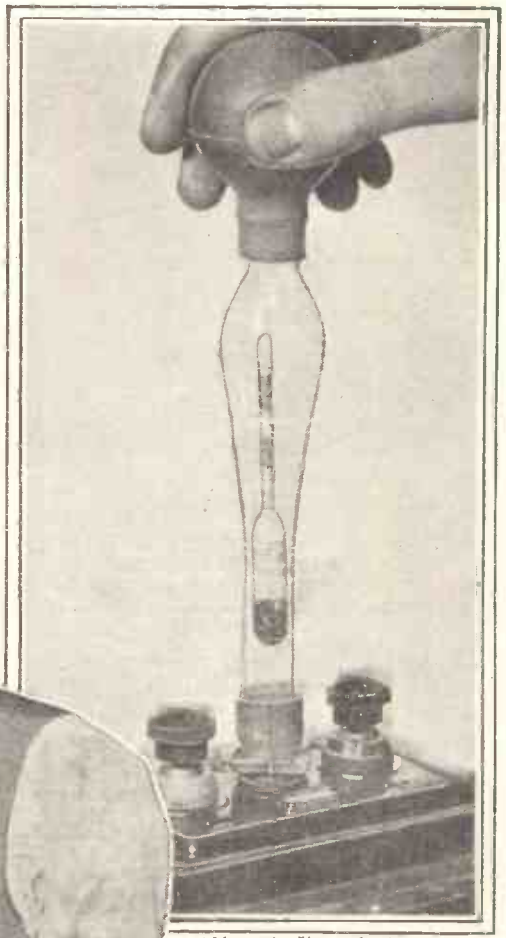
To reverse the process, if you have tuned in a station and want to know its wavelength, you leave the set fixed and operate the wavemeter dial until you strike the same setting. You can then read it straight off on your graph.

16,000 KILOCYCLES LONG!



Your own calibration curve may differ slightly in shape from this specimen, but that won't affect the accuracy of the wavemeter. Make a note of the kind of paper to use.

HALF A DOZEN DODGES!



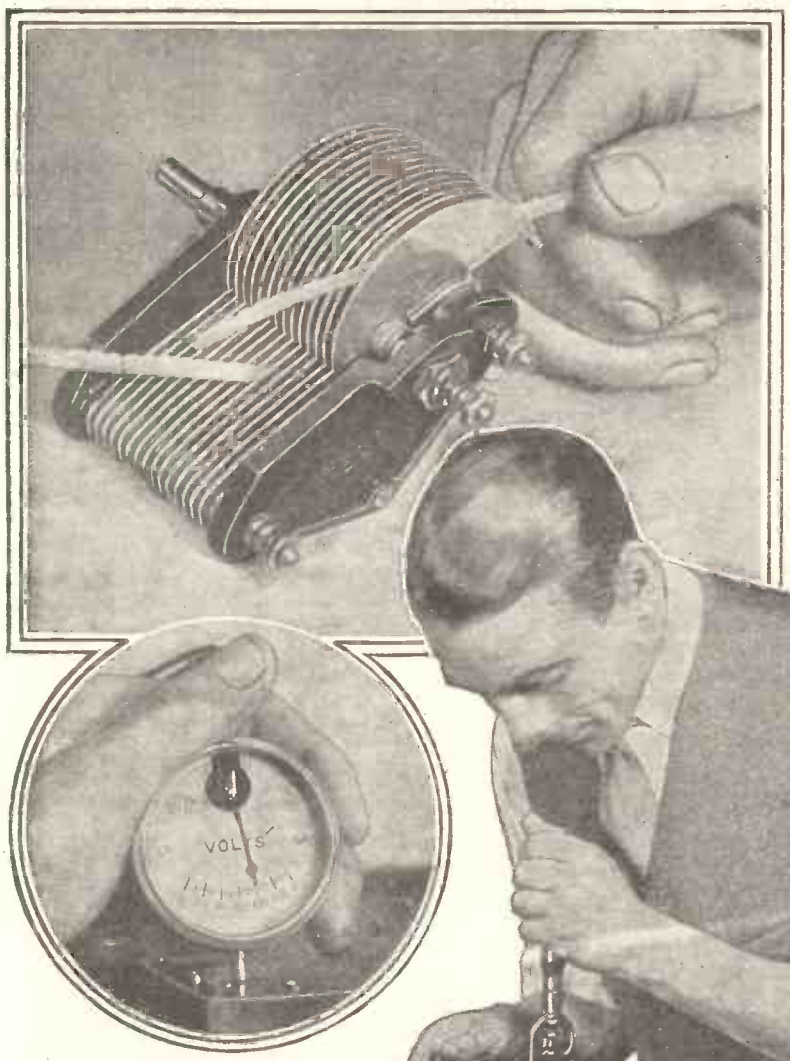
(Above.) Use a hydrometer as well as a voltmeter to test your accumulator.

* * *

(Left.) When drilling panels, keep the drill upright to ensure properly fitting components.

* * *

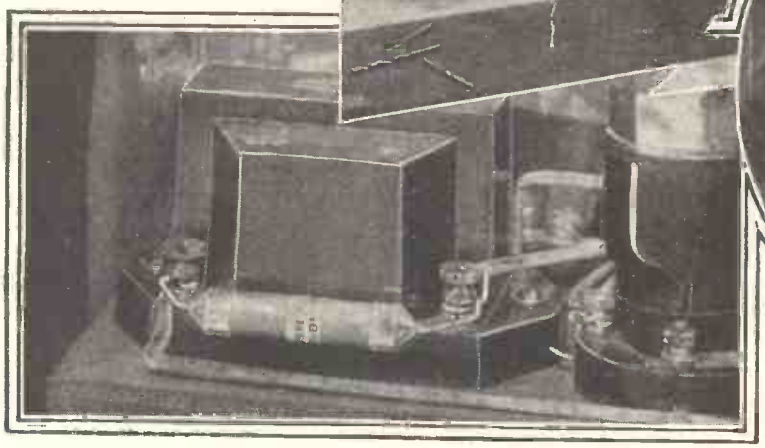
(Below.) In dry weather, water the "earth" as well as the flowers.



(In Circle.) Use a high-resistance voltmeter to test H.T. batteries, and take special care to do your testing with the set switched on.

* * *

(Above Circle.) To prevent crackles when tuning, keep dirt from between variable condenser vanes by means of pipe cleaners.



(Left.) A 1-megohm grid-leak across the transformer secondary will often overcome L.F. instability troubles.

The DAYS OF MY YOUTH by DE GROOT

the world-popular violinist and conductor, whose broadcasts from the Piccadilly Hotel were among the most delightful programmes of the B.B.C.'s earlier days.

I WAS born in Rotterdam and came of a musical family, for my father played the double-bass for a living, my mother was an accomplished pianist, and an uncle was an excellent violinist who also taught music. One of his sons is now a professor of the violin at Chicago.

A typical scene on one of the canals romantically associated with the boyish memories of De Groot

Dance Music at a Halfpenny a Time!

My father had a hard job to make a good living, and we lived in a few rooms at the top of an old house in one of the meaner quarters of the city. At a very early age I began to teach myself the rudiments of violin playing, and my father, believing I had talent, persuaded his brother to give me lessons.

I loved the violin and would practise on it when other children would have been playing with toys. I always had a passionate belief that one day I would make good, and my misery was intense when one day I overheard a conversation between my uncle and my father. They were discussing my future and the argument was abruptly terminated by my uncle saying: "Better make him into a baker, for he'll never become a violinist!"

Family Breadwinner at Fourteen

Soon after this incident, a competition was held at the conservatoire for two scholarships, which carried with it free tuition for five years, with the chief professor, Joseph Cramer, a fine violinist and teacher who was known as "the Joachim of Holland." Along with some hundred and fifty others, I presented myself for the examination and succeeded in obtaining one of the two places. It was with particular jubilation that I told my uncle of my success!

My studies with Professor Cramer went so well that it was arranged that when my five years were completed I should go on and have lessons of Joachim in Berlin. But the time of my departure coincided with an accident which happened to my father.

His bow arm was so badly broken that he was frankly told that it would be many years before he could hope to play again. I was an only child and upon me at once devolved the responsibility of being the breadwinner for the family. I was barely fourteen.

There was a small village some two miles from Rotterdam where on two evenings a week dances were given in a small hall. I managed to get myself engaged as the violinist, and myself and a man who played the piano comprised the orchestra.

When I played there it was from six in the evening until five or six the next morning. A charge of about 2d. was made for each dance, and this was divided between the orchestra and the manager! As the longer we played the more money we received the pianist and I were never in a hurry to go home!

At that time I was required to be at the conservatoire to receive my lessons at eight o'clock in the morning. So on my way back to Rotterdam on the leisurely-moving canal boat, instead of snatching some sleep I would run over the music I was to practise with the professor that morning.

A Generous Teacher

I did not dare tell Cramer that I had been playing throughout the night, for I feared that he would stop it. So although when I arrived for the morning lesson I was jaded and tired out, I always made a tremendous effort and tried to give him the impression that I had just come from a good night's rest.

When I was not playing at the dance hall I filled in my other evenings by fiddling at a circus, or deputising in theatre orchestras and sometimes by playing at small concerts.

Whilst Professor Cramer continued to be ignorant of the desperate straits to which my family were now reduced, he knew that even at the best of times we had very little money to spare. Generous to an extreme, he not only gave me all my music, but even bought new strings for my violin when they broke.

But in return he demanded a very high level of accomplishment, and it became more and more difficult to keep myself up to the pitch which he expected. One morning he stopped me playing and abruptly said: "What have you been up to, young man? You are not playing as you should." Of course, I denied that there was anything wrong, but, unbeknown to me, he made inquiries and discovered what I was doing.

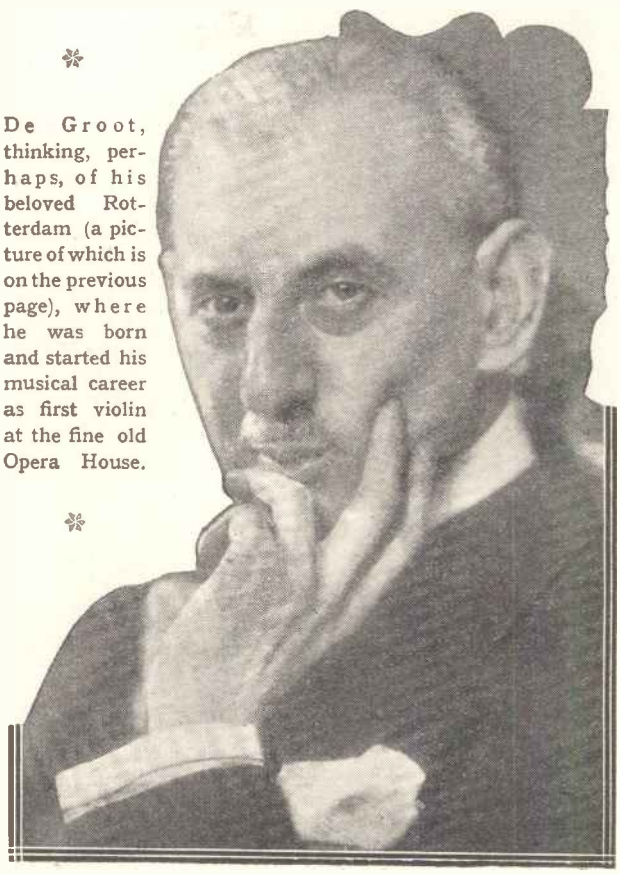
He then called on my father and said I must choose between going to Berlin, where he would ensure that Joachim would give me personal lessons, or if I wanted to persist in playing for a living I must give up the conservatoire. My father did not hesitate. I must go to Berlin.

The Greatest Violinist in the World

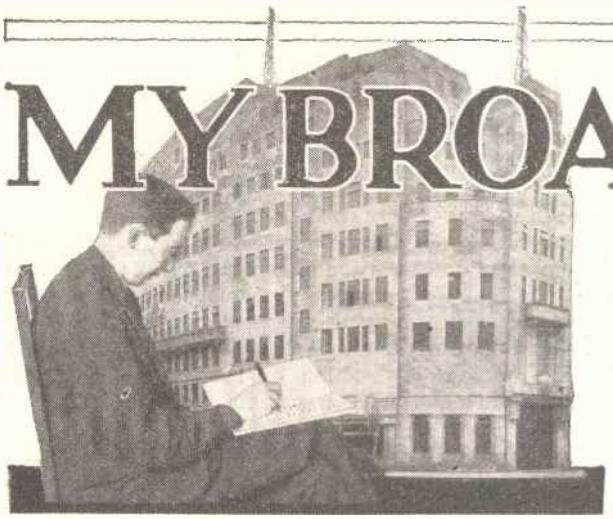
But I decided otherwise: It almost broke my heart to decide that I should never have lessons of the greatest violinist in the world—as Joachim then undoubtedly was—but how could I desert my home at that time? So not only did I refuse to leave Rotterdam, but I worked harder than ever.

(*Continued on page* 304.)

IN PENSIVE MOOD



De Groot, thinking, perhaps, of his beloved Rotterdam (a picture of which is on the previous page), where he was born and started his musical career as first violin at the fine old Opera House.



MY BROADCASTING DIARY

Our Own Broadcasting Correspondent keeps a critical eye on the affairs of the B.B.C., and each month, for the benefit of listeners, comments frankly and impartially on the policies and personalities controlling British broadcasting.

I WONDER what happened to that very interesting proposal for a B.B.C. "staff council" that was sponsored by Lord Clarendon and Lady Snowden while the former was Chairman? The idea was brought forward to protect the main body of the B.B.C. staff, and to introduce a new spirit of collective responsibility. But it was suddenly dropped without explanation, considerably to the surprise of those members of staff who had been invited to support it as a new charter of protection and opportunity.

It may well have been that the machinery was cumbersome or ill qualified to do what was expected of it. In any case, however, where there exists a possibility of introducing such a scheme it would appear to be worth trying.

Registers of Listeners

The Western Area Council of the Central Council for Broadcast Adult Education has been experimenting with what has been called a "Register of Listeners," that is, an organisation of listeners recognised for a small fee and given special facilities in the way of pamphlets and advice about receiving sets and so on.

Apart from securing a reliable index of the distribution of listeners, the Council's object was to test the degree of acceptability of its various types of lectures and highbrow propaganda. A preliminary report has been presented to headquarters in London, and those who are keen on the idea hope that it will be extended to cover the whole of the country.

The B.B.C. may well see in this the nucleus of a national organisation of listeners under its remote control; but the Council looks upon the project as its own to such an extent that it is even whispered that the resulting organisation might be used by the Adult Educationalists against the B.B.C. if in 1934, when the present subsidy expires, the latter body refused to renew it.

There seem to be various possibilities of trouble in all this, and I fancy Broadcasting House will not like the idea.

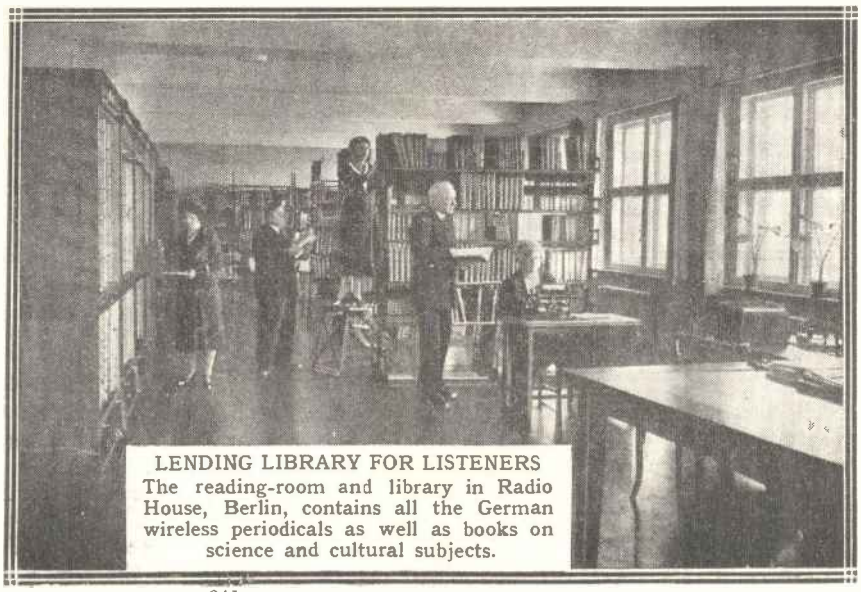
Regional Broadcasting

The recent critical and prolonged struggle between centralisation and regionalism in the B.B.C. has abated, partly through the exhaustion of the principal combatants. Perhaps the honours, if any, rest with the regional people, who, of course, had the invaluable support of Sir John Reith at the moment when the centralisers thought all was over bar the shouting.

It is now no longer a secret that the mantle of leadership of the centralisers has been transferred from Mr. R. H. Eckersley, the Director of Programmes in London, to his former subordinate and now co-equal, Mr. Charles Siepmann, Director of Talks.

The latter's rise to power has been the feature of 1932 in B.B.C. politics. His ability and relentless ambition, combined with his known popularity with the Chairman, Mr. Whitley, have induced some shrewd observers to select him as the successor to Sir John Reith when the Director-General chooses to seek new worlds to conquer. But this development is not yet.

Meanwhile Mr. Siepmann reaches out in various directions, including the Provinces. The effect of the success



LENDING LIBRARY FOR LISTENERS
The reading-room and library in Radio House, Berlin, contains all the German wireless periodicals as well as books on science and cultural subjects.

Candid Comments on Radio Topics of the Day

of his policy would be rapidly to restrict the scope of provincial control. And would not this ultimately eliminate programme-building outside London ?)

But I doubt very much whether he will succeed while Sir John is in charge. The present "D.G." has much too sound a sense of political realities, and of the foundations of B.B.C. goodwill, to agree to such a course, even if there were not strong sentimental arguments against the dispersal of so many of the original brigade of broadcasters.

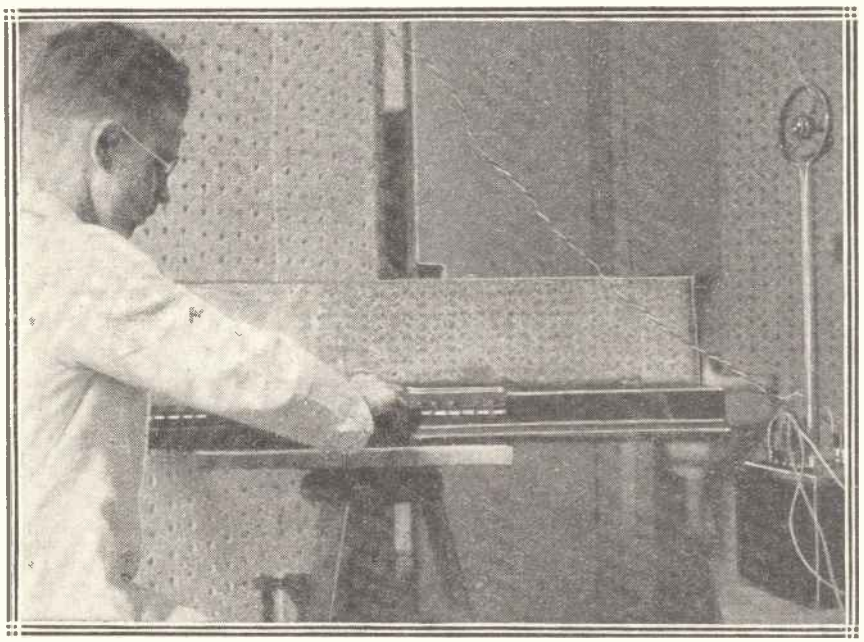
For the moment there is a truce based on the appointment of a new liaison official, whose function it will be to impart to provincial broadcasting "London efficiency" where it is supposed to need it.

I have not heard who is to have this job—certainly no sinecure !

A World Tour for B.B.C. Orchestra

The plan for a world tour of the B.B.C. Orchestra was first broached by the great impressario, the late Lionel Powell, who saw in it not only a profitable venture for all concerned, but also a wonderful advertisement for British artistic achievement and organisation.

But the premature passing of Mr. Powell, and the general economic depression, stopped the discussion. Now, however, I am interested to see it revived in the United States, where the quality of Dr. Boult's orchestra and his own ability are perhaps more adequately recognised than in this country.



DAMPING DESIGNED TO REDUCE RESONANCE

In this highly damped room the walls are covered with two coatings (the upper one being perforated) so that a resonance time of only $\frac{1}{8}$ sec. is secured. As an interesting comparison, the concert hall at Broadcasting House has a resonance time of 2 secs., the Vaudeville Studio, 1·3 secs., and the Talks Studio, $\frac{2}{3}$ sec.

The latest suggestion is that the tour should be planned for 1936. The orchestra would accompany one of the world cruises of a British liner, occupying about nine months, and visiting all the great cities of the world.

The chief objection, of course, is what would happen to B.B.C. programmes in the absence from London of the orchestra. To this the reply is that in four years' time the technical facilities for transmission will be so developed that B.B.C. programmes can be filled successfully by the orchestra in whatever part of the world it may happen to be when its services are needed at home !

It might be argued also that if this is so then why send the orchestra on tour at all ? But the answer is obvious. The physical presence of this magnificent aggregation in the artistic centres abroad is essential.

I shall follow up this proposal with the keenest interest, hoping that no obstruction or lack of statesmanlike handling will stand in the way of its due fulfilment.

Extension of Broadcasting House

The B.B.C. is wisely proceeding with its plans for the extension of Broadcasting House. Of course, there can be no early finality to the requirements of broadcasting in London. Houses adjoining the present building in Portland Place have been acquired, and will be adapted as soon as possible.

Then there is the growing need for a concert hall, and I have reason to believe that the B.B.C. may yet secure and adapt Queen's Hall for this purpose. The financing of this project is now under consideration.

There is also need of more accommodation for experimental purposes, both technical and programmatical. If this can be found near the present site so much the better ; but found it must be somewhere if the experimental work is not to be hung up.

More Honours ?

The knighthood for Admiral Carpendale in the Birthday List does not complete the honours contemplated for B.B.C. staff.

It is known that as long ago as 1926, after the General Strike, about a dozen names were recommended to Downing Street for submission to His Majesty. It was thought then, however, that broadcasting was too junior a service to merit the recognition of anyone but its executive chief.

Since then the position has changed radically. Broadcasting is now one of the recognised national and imperial services, and it is only right that the sweep of honours should be widened. Hence I fully expect several more names to be included in the New Year List.

West Regional Progress

Work on the West Regional transmitters is making better progress than was hoped for last year. The station is situated near Watchet, in Somerset, and is the last which will be built under the high-power regional scheme.

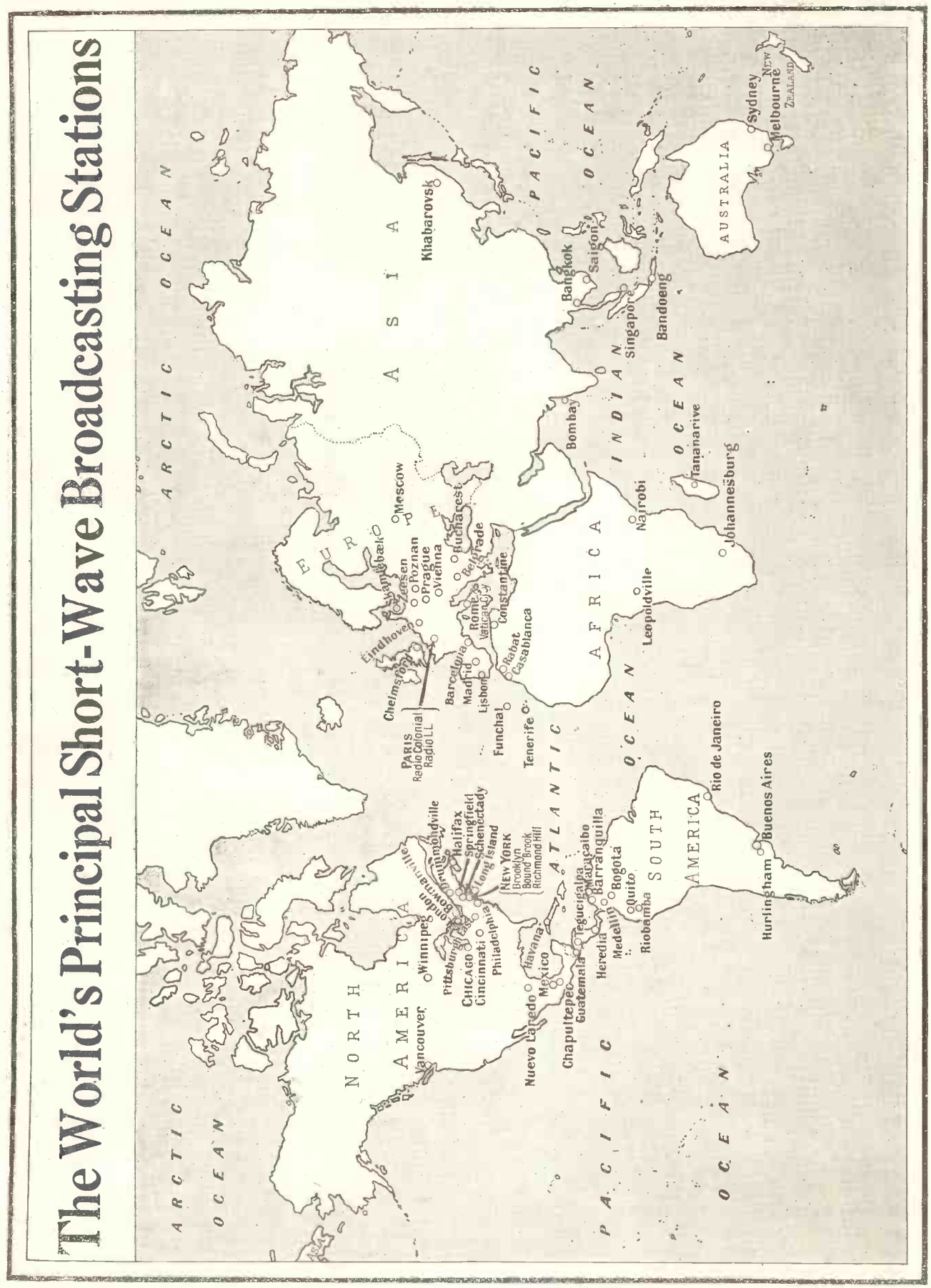
Despite several unfortunate mishaps, of which not the least regrettable was the accident to a mast which resulted in loss of life, it seems now certain that Watchet will be ready to transmit under service conditions by the middle of February next. This will be a great boon for the West Country and for a large part of Wales.

THE WORLD'S PROGRAMMES

HOW WHEN AND WHERE TO HEAR THOSE FOREIGNERS

PLAYING AT WORK. Even potato-peeling can become a pleasure when radio is used as an accompaniment to housework. A German farm provides a happy scene (in the circle above) for our photographer.

CONTENTS OF THIS SPECIAL SUPPLEMENT


The World's Principal Short-Wave Broadcasting Stations
ARCTIC OCEAN
NORTH AMERICA
PACIFIC OCEAN
ATLANTIC OCEAN
SOUTH AMERICA
EUROPE
ASIA
AFRICA
INDIAN OCEAN
AUSTRALIA
NEW ZEALAND
Vancouver
Winnipeg
Pittsburgh
CHICAGO
Cincinnati
Philadelphia
Halifax
Springfield
Schenectady
Long Island
NEW YORK
Brooklyn
Bound Brook
Richmond Hill
Nuevo Laredo
Havana
Mexico
Chapultepec
Guatemala
Tegucigalpa
Heredia
Medellin
Barranquilla
Maracaibo
Bogotá
Quito
Riobamba
Rio de Janeiro
Buenos Aires
Hurlingham
Leopoldville
Tananarive
Johannesburg
Nairobi
Bombay
Singapore
Bandoeng
Saigon
Bangkok
Khabarovsk
Sydney
Melbourne
Moscow
Kootwijk
Zeesen
Poznan
Prague
Vienna
Bucharest
Belgrade
Rome
Vaticano
Constantine
Rabat
Casablanca
Eindhoven
Chelmsford
PARIS
Radio Colonial
Radio LL
Barcelona
Madrid
Lisbon
Funchal
Tenerife

CARNIVAL by WIRELESS

RADIO'S PART IN THE "GREEN HELL"

DESCRIBED BY

ROSITA FORBES

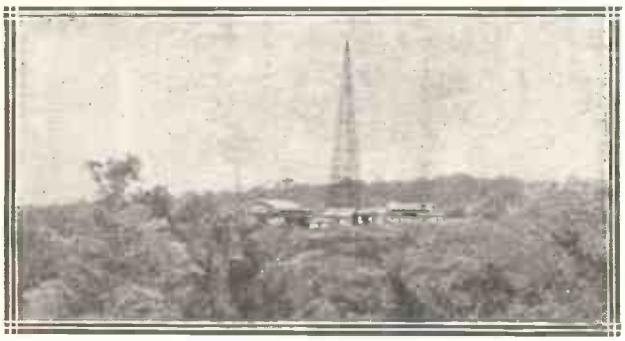
TWELVE hundred miles north of the River Plate, near the frontiers of Chile, Bolivia, and the most inaccessible province of the Argentine, there is an English sugar estate. It measures land, not by the acre, but by the league of three square miles.

Fifty years ago, when the province was covered with virgin forest, the first English sugar-mill (from Fawcett Preston, of Liverpool) was brought up in bullock carts, behind teams of twelve and twenty. There were no roads. The rivers were often flooded.

With billhooks and axes the pioneers cut their way through the jungle. At night they had to make a zariba of the carts, inside which, with sentinels posted and rifles ready, they could beat off the Indians' attack.

The great wheel of the mill weighed three tons. Under it the carts sank into swamps and progress was often limited to 200 yards a day.

The estancia now produces 22 million tons of sugar a year, and this output could be multiplied by five if costs of production and of transport were lowered to enable the Argentine to compete in the world market. Under the 12,000 ft. peaks of the Andes, snow-crowned throughout the torrid summer, half a million acres have been cleared from the forest.



The authoress, who has penetrated to the remotest parts of distant continents, is here talking to Chiriguano workers during Carnival.

The mast in the centre picture rises from the green depths of a Brazilian forest, which, like the village depicted on the right, is linked with town life only by means of radio.

The cane is like a smooth, green carpet. Through it, for a few score miles, mud roads lead from one village to another. But beyond it and all around it is the still impenetrable jungle, the "Green Hell" of the Chaco that breeds tarantulas the size of kittens and a cactus with a sensitive branch which, according to the Indians, stretches out like the tentacle of an octopus to catch and crush the unwary.

Into this dark world, lit by the flames of a thousand flowering trees, scarlet, orange and star-white, the

Indians retire after the harvest. But for five or six months of the year they work among the cane, and at Carnival, the week dedicated to their curious conception of the Christian god, they dance to the music of grand opera, relayed by wireless from Buenos Aires!

It is a world in which Alice-of-the-Looking-Glass would have found herself at home. In spite of the temperature, which soars to 105° or 110° Fahr., the Indian women wear fifteen or twenty fluted red petticoats, one on top of another!

Their heavy black pigtails fall to their knees. They work hatless and barefoot, but in their bodices they carry strange amulets against still stranger ills.

The men wear dark trousers and pyjama coats. They have peculiar Mongol faces with the cruellest and most sensual mouths I have ever seen, but they are gay and amusing.

The knives with which they cut and strip the cane are taken away from them before the week of Carnival. Otherwise the 13-in. blades would be sheathed in human flesh.

In spite of this precaution I met one man with forty knife wounds, which would suggest that he had a roving eye; and another who had been slashed open and sewn up so hurriedly by his wife that, as he expressed it, she had "made tucks of tripe and flesh together."

When the Chiriguano Indians are courting, or willing to be courted, they paint bright circles of vermilion on their cheeks. They will not kill a horse except by hanging it on a lasso over the branch of a tree.

They believe that a twin—any twin—can cure horse sickness, and, indeed, it is extraordinary the way an animal, in what appears to be the last frenzy of "mad staggers," will quieten under the hands of an authentic twin!

Hereditary in certain families is the power of curing festering wounds from the sight of a footstep or a hoof-mark. And this is considered so reasonable that an English manager, with 5,000 labourers under him and a score of clerks clicking their typewriters in his office, will note the spoor of a sick animal, cover it with leaves, and send for the wise man or woman, who will immediately, without even seeing the sufferer, effect its cure.

The forest Indians build themselves tents of branches while they work in the cane, and burn them when they leave lest some of their spirit linger in their habitation, and be subject to the next lodger.

They are paid in kind, under the watchful eyes of a Chaco inspector. At the end of the season, a man goes into the one and only store, property of the company, and stacked like a village fair.

"You have so many pesos to spend," says the storekeeper. "What'll you have?"

"A horse," says the Indian, and that costs him between £1 and £5.

His wife chooses a roll of brilliant material. Then there is a pause.

"What else?" asks the shopman.

"Some trousers."

"Very well. But you've still got fifteen pesos."

"I'll have a hat."

A wide-brimmed felt, stiff as metal, is handed over the counter.

"That leaves you ten pesos. What else d'you want?"

The pause becomes a sink, a pool, a swamp of silence. At last: "I'll have a hat," says the Indian. He puts the two, one on top of another, on his head.

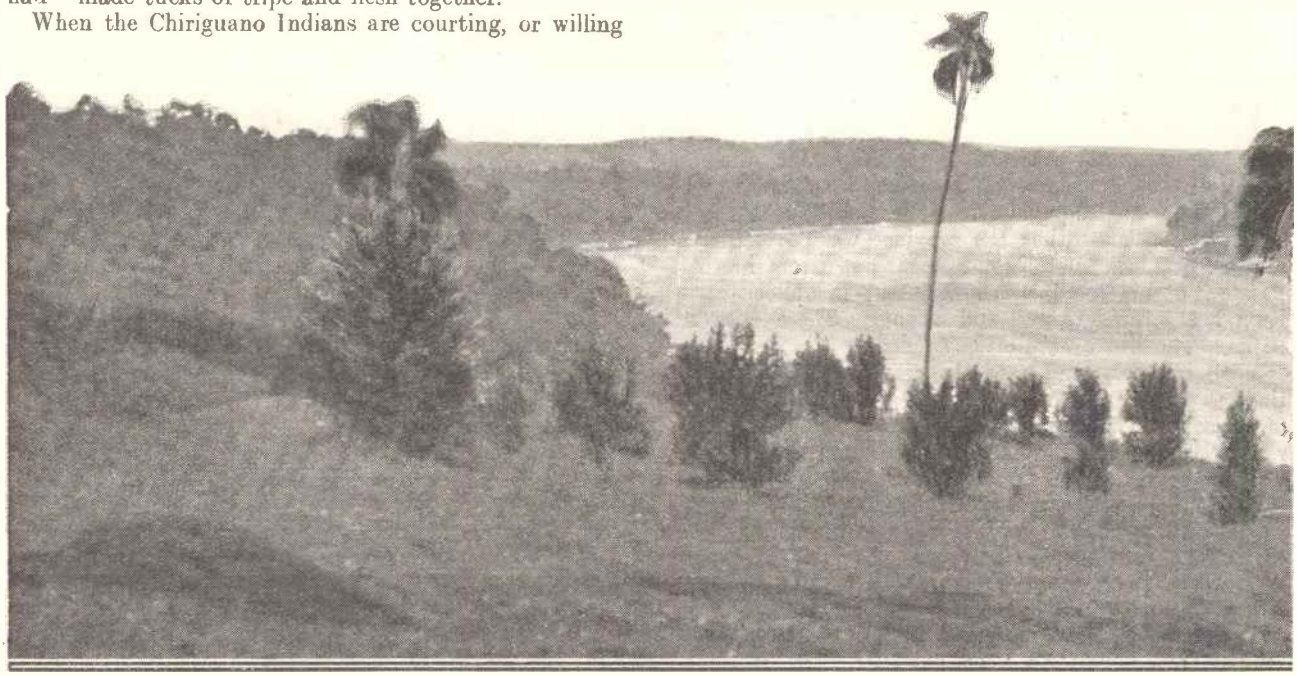
"Still five pesos to spend," says the storeman, and after æons of exhausting thought the Indian repeats: "Give me a hat."

He walks out, proudly balancing three tiers of headwear on the top of an ebony shingle, and a few hours later he probably exchanges a hat for a kilo of meat.

One day the butcher had twenty-five pairs of trousers in his shop. The forest Indians had worn their wages for a day or two and then tired of them!

A chief who had been given a mule as a present tried to exchange the animal in the next village for a quart of alcohol. Another, who had bought what must have been a remnant in horseflesh for 16s., and found it as inadequate as most other bargains, returned to ask the storeman if he could have a pair of rope-soled sandals in its stead.

Eddies of these people settle in the villages, mushroom-

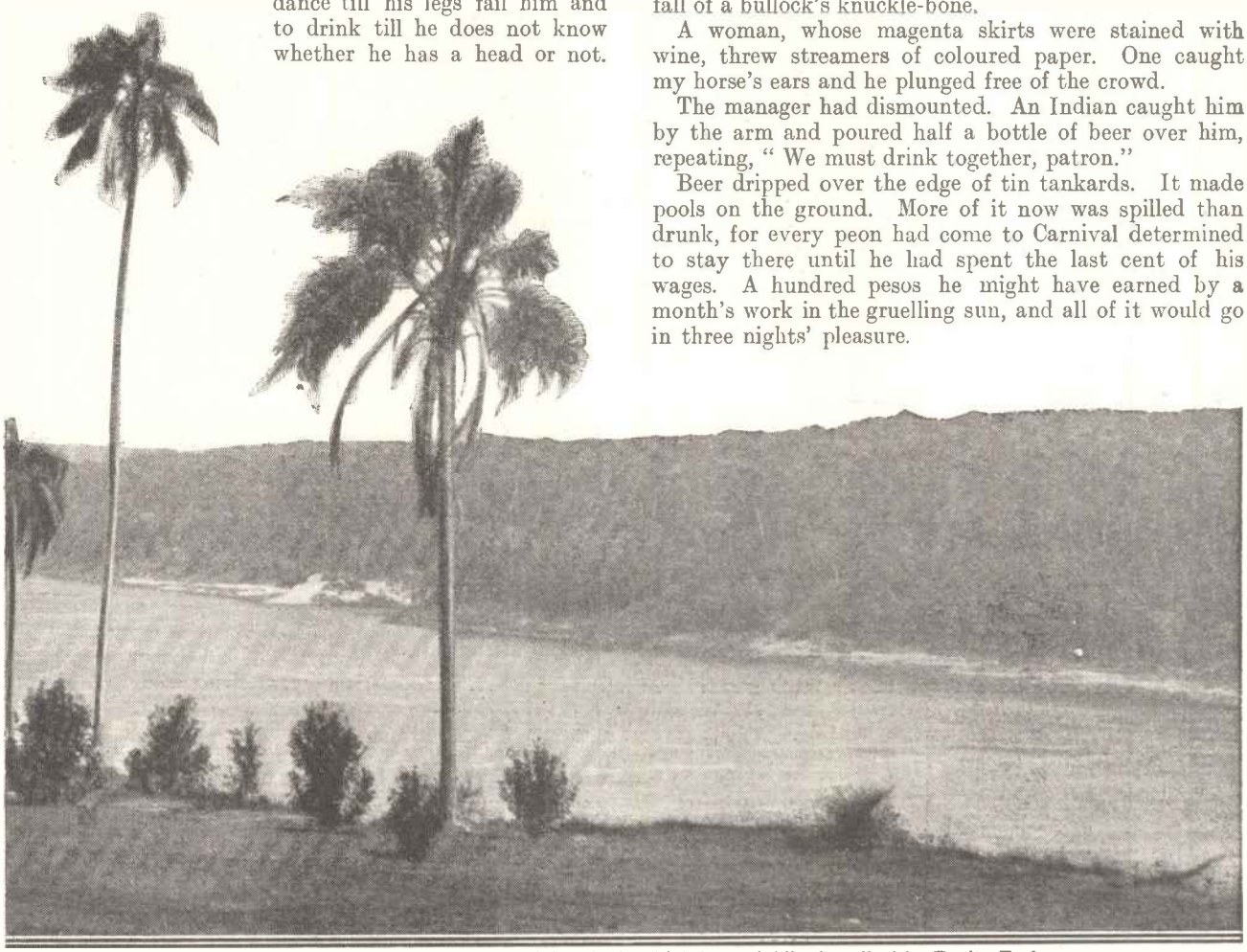


This impressive panoramic view of one of the vast stretches of South American forest, near El Dorado,

grown among the cane, in huts made of mud bricks or the rusty sides of kerosene oil tins, thatched with creepers or a crazy piece of galvanised iron. And in Carnival week they swell the throng of mixed Spanish-Indian types, parading in the grandly-named "Plaza," an irregular space of mud seamed with ruts and hoof-marks.

"Carnival-trees," burdened with candles of yellow flowers, shower their petals on the crowd. Booths are erected where the weary may suck bitter maté tea out of gourds, or eat oddly-shaped cakes sticky with sugar.

Beer flows. Literally, it does. For every peon comes to the Carnival determined to dance till his legs fail him and to drink till he does not know whether he has a head or not.



gives an idea of the dark splendour of the background of Carnival, which is so vividly described by Rosita Forbes.

Of course, it's an orgy. Round and round, in the dust and in the mud, twirl the dancers, stepping solemnly in circles, always one man to two women, to the thread of a flute and the heart-rending stammer of hide drums, with a flood of Italian opera sweeping out of a loudspeaker and drowning the local rhythm.

The cry of La Tosca as she flings herself off the battlements in the famous Colon Opera House at Buenos Aires crosses 1,200 miles of field and forest to echo startlingly over the crowd of sweating peons, bemused by drink and three days' repetition of the same movement.

We sat on our country-bred horses on the edge of the crowd and listened to the music from a capital which is more sophisticated than Paris, more formal than pre-war Vienna. The opera became, for no reason that we could understand, a famous band playing dance music at Armenonville, the Café de Paris of Buenos Aires.

In another moment, I felt, we might hear a lecture on cattle-breeding, or the latest traveller, arrived that morning by the Royal Mail from Europe, giving his or her irrevocably pre-conceived opinions on the great Argentine Republic.

Neither of these eventualities would have affected the dark-skinned, excited audience. They were wound up for the third night of Carnival. If they slept at all, it would be where they fell, in the dust, in the mud, or dragged into a corner of the shed, where their fellows, a little less unsteady on their feet, were betting on the fall of a bullock's knuckle-bone.

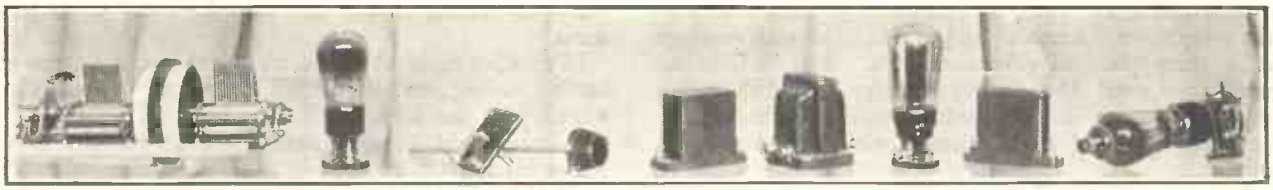
A woman, whose magenta skirts were stained with wine, threw streamers of coloured paper. One caught my horse's ears and he plunged free of the crowd.

The manager had dismounted. An Indian caught him by the arm and poured half a bottle of beer over him, repeating, "We must drink together, patron."

Beer dripped over the edge of tin tankards. It made pools on the ground. More of it now was spilled than drunk, for every peon had come to Carnival determined to stay there until he had spent the last cent of his wages. A hundred pesos he might have earned by a month's work in the gruelling sun, and all of it would go in three nights' pleasure.

And over all this madness, over the unsteady dancers who dared not stop for fear that heads and feet should give way together, over the dust-stained cars which are gradually taking the place of the sheep-skin saddled horses, over the Taba players gambling their season's gains, dominating the local music, gathering this outlandish Carnival of tropical forest and the untrodden Andene snows into the fun and fashion of a capital city's boulevards, came now a tango.

From Buenos Aires it came, from the resplendent boulevards 1,200 miles away, where for one week or one hour under the blazing lights of Carnival the Argentines forget that sadness of the pampas which accompanies them to the towns and makes them take their pleasures more seriously than any Englishman ever born.



SHORT WAVES FOR BEGINNERS

EVERY year, at "Show" time, more and more readers of "M.W." decide that they would like to try their hand at short-wave work, that section of radio that is responsible for more thrills and more falsehoods than any other.

By this year of grace 1932, people are accepting the fact that "America on one valve" is quite a commonplace matter, but the tone they usually adopt is; "Oh, short waves, of course; that's different." Some decide that short-wave listening is too much trouble; some (a very few) are simply not interested; and others launch out right away and have the time of their lives.

Several Excellent Designs

It is to all three classes that my few wise words are addressed, and even the hardened short-wave "fan" may conceivably benefit from an article that is really written for the novice.

It is not proposed to tell you how to build a short-wave receiver. Several excellent designs have appeared from time to time in "M.W." and "P.W." and you cannot do better than go ahead and make your set in accordance with one of them.

There are, however, some very practical points that are often lost sight of, and it is not possible to repeat them at the end of *every* description of a short-wave receiver.

With this short explanation I will proceed with the business. First of all, the tyro must understand that the term "short waves" is very, very vague. It is used to describe all wavelengths under 100 metres, and those of interest to the home constructor extend from 100 metres down to 10 metres and will probably be extended shortly to still greater depths.

Between 100 metres and 10 metres we have a frequency-band 27,000 kilocycles in width. Remember that the broadcast waves between 200 and 600 metres—packed with stations—occupy a width of only 1,000 kilocycles, and you will realise the tremendous extent of the bands you have to cover with a short-wave receiver.

It obviously isn't feasible to do the whole thing with one coil, over one sweep of a condenser. Tuning would be somewhat akin to tight-rope walking, and very uncomfortable indeed.

For this reason we generally use three different coils covering, with a condenser of about ·00015 capacity, the ranges 15–30 metres, 28–60 metres, and 58–100 metres.

Not Much Down There

A separate coil may also be used for everything below 15 metres, but there is not at present much down there that the average man will want to listen for.

The short-wave broadcast stations are allotted wavebands to themselves, each of them of a considerable width in kilocycles, although it doesn't sound much in metres. These bands are in the neighbourhood of 16 metres, 19 metres, 25 metres, 31 metres and 49 metres.

You will notice that if we stick to the conventional wavelength ranges, as mentioned above, we shall have the 49- and 31-metre stations on our "middle" coil, and the 25-,19- and 16-metre folk on the smaller coil.

All the "great, wide, open spaces" in between these bands are naturally put to use for other purposes, but apart from the comparatively narrow amateur bands there is little to interest the average listener. The domains of the amateurs centre round 21, 42 and 84 metres, and many interesting transmissions may be heard.

Don't Be Disappointed

The main point that I want to make is this: **Don't** be disappointed about your short-waver if on the first swing round of the dial it gives you the impression of being "all Morse." Naturally there are a tremendous number of very powerful C.W. stations using Morse all day and all night; they occupy the greatest part of the short-wave spectrum. But once you find the broadcast and amateur bands you will hear plenty to interest you, and to spare.

Now for two golden rules. Tune *slowly*; and listen to *everything*. If you disregard weak signals you will never hear anything interesting.

All short-wave signals are weak until they have been carefully tuned in, but it is surprising to find that excellent clear speech and music may be coaxed out of what appeared at first to be a faint little chirp.

You have been trained, on the broadcast bands, to search with your receiver *not* oscillating. On the short waves it is advisable to search with the set *just* oscillating.

"W.L.S."—

"M.W.s" well-known expert—puts you wise to the short-wave game.

Keep the reaction control set so that the receiver is just at the sensitive point, and as soon as you find a carrier-wave reduce reaction so that you are just below the point of oscillation.

This may sound a dangerous method to recommend, but there is actually no harm in it, for various reasons. Firstly, the re-radiation from a short-wave receiver in an oscillating state appears to be much weaker than what we have become accustomed to on the broadcast waves. Secondly, short-wave listeners are not herded together like ordinary broadcast listeners (not *yet*, at least!); and if you have another short-wave fan within a short distance of you, you are practically sure to know him.

It's Quite Permissible

Don't on any account let your set oscillate *hard* while you are searching; this might upset others and would effectively spoil your own chance of finding weak signals. But remember that it is quite permissible to use your set *just* on the threshold of oscillation.

If you are worried by "hand-capacity troubles"—those annoying effects that cause the disappearance of a signal as soon as you remove your hands from the dial—try leaving off the earth lead or, alternatively, tuning it with a ·0005-mfd. condenser in series.

OVERSEAS ITEMS FROM POONA TO MADRID

POONA. A proposal is afoot for a 49-metre station at Poona to broadcast to the villages of India. Villagers will listen by means of super-hets. contained in ferrocrete "pill-boxes," and requiring no attention except periodical maintenance.

* * *

WARSAW. The short melody sometimes employed as an interval signal consists of the first few notes of a Polonaise by Chopin.

CALCUTTA. London Regional's programme was recently picked up direct on a light-vessel in the River Hoogli.

* * *

KONIGSWUSTERHAUSEN. The short-wave relay system at Zeesen, near Konigswusterhausen, is to be extended by the erection of another transmitter to work on 49 and 25 metres.

* * *

JOHANNESBURG. Serious complaints have been made of interference caused by the mission station transmitter run by the Rev. Mr. Martins, in a Johannesburg suburb. It works on 42·2 metres and broadcasts addresses, etc.

* * *

VIENNA. The new transmitter now being erected at Bisamberg will probably be on the air by Christmas.

MONTREAL. The wavelength recommended for the projected 50-kilowatt station is 411 metres.

* * *

NEW YORK. The Columbia broadcasting network charges advertisers £3,390 per hour for a simultaneous broadcast through its 89 stations.

* * *

BOLZANO. As there is no suitable land-line between Rome and Bolzano, the latter uses radio as a link when it relays the Rome programme.

* * *

ROME. The big studio in the new Broadcasting House measures 97 ft. by 14 ft., and will hold an orchestra and audience of 120.

* * *

BARCELONA. The new station planned for Barcelona under Spain's latest Broadcasting Scheme is to have a wavelength of 368 metres, and power of 20 kilowatts.

* * *

VALENCIA. Three hundred and forty-nine metres is the wavelength planned for the proposed Valencia station. Its power, like Barcelona's, will be 20 kilowatts.

* * *

MADRID. A 10-kilowatt short-wave station is one feature of Spain's newest broadcasting plans.

ON THE LONG WAVES

It seems rather a pity that the "top boy" of Europe — that is, the longest-wavelength station that is easily receivable—should have the disconcerting habit of exchanging programmes and announcements with a totally different station that works on medium waves only. Yet this is what happens with Huizen, the Dutch long-waver on 1,875 metres. And the medium-wave station in question is Hilversum.

* * *

Until the end of September an arrangement is in force by which "Hilversum" programmes come from Huizen, and vice versa. But on October 1st, and for the following three months, Huizen will really be Huizen. This double-dutch habit has given rise to much confusion in the past, so it is here mentioned as a timely warning for the listener who is exploring the top of the long waveband after a spell away from the dials.

* * *

Between Huizen and our own Daventry 5 X X there are only three stations, but two of them are prime favourites—Radio Paris and Konigswusterhausen. The other, Lahti, the Finn, is seldom heard except on first-class long-distance receivers. Everybody knows Radio Paris, but the wavelength of Konigswusterhausen is uncomfortably close to Daventry's on all but rather selective sets, and thus Germany is not so well represented on long waves as France. Especially as France has a second string to her bow in the form of Eiffel Tower, on 1,445·7 metres.

* * *

Immediately below the Eiffel Tower programme is another first-class station to watch for, Warsaw. At the time of writing the weather is too bright for the powerful Pole to do himself justice, but as soon as the evenings really draw in Warsaw will be one of the most popular stations on the long waves. The name of the station, by the way, is pronounced "Varshova," and it can often be identified by the words "Polskie Radio," and by its musical interval signal, which takes the form of the first two bars of Chopin's Polonaise in A major.

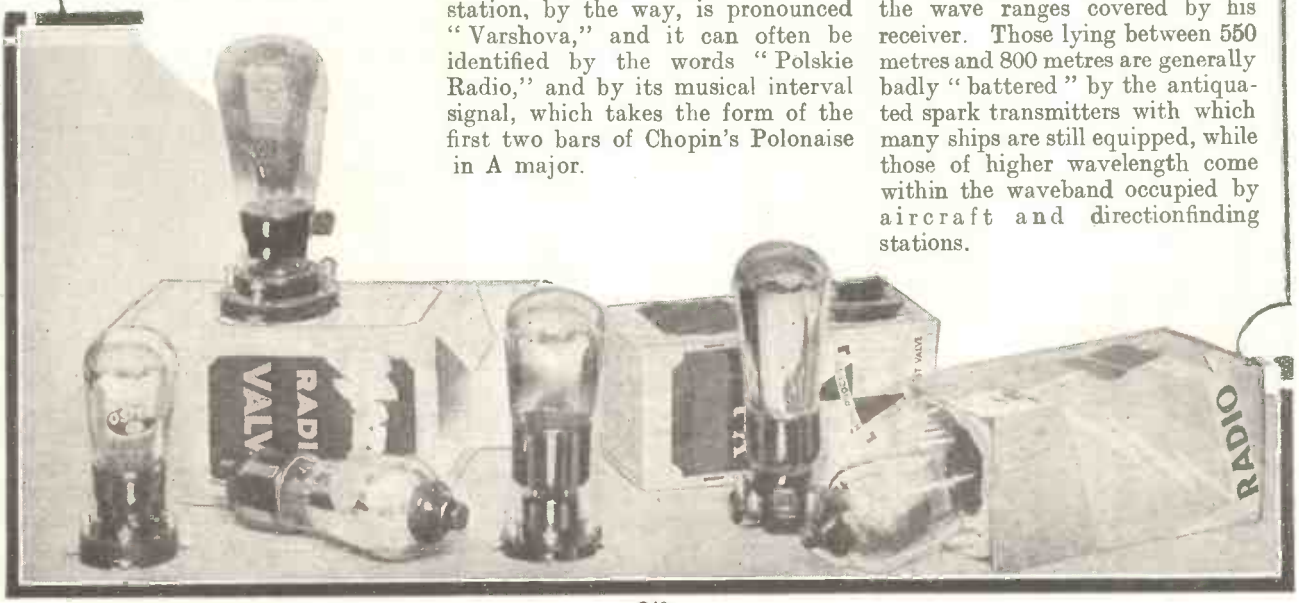
Lower down the dial the old favourites such as Motala, Moscow Trades Union, Kalundborg, and Oslo are to be found, and it is worth noting that Kalundborg is now building a fine new station which will employ far greater power than the transmitter which has already made the Danish programmes so popular, on 1,153 metres.

There is also the new Luxembourg station, not perhaps officially placed on the list of Europe's long-wavers, but determined to be, and to make a big noise.

* * *

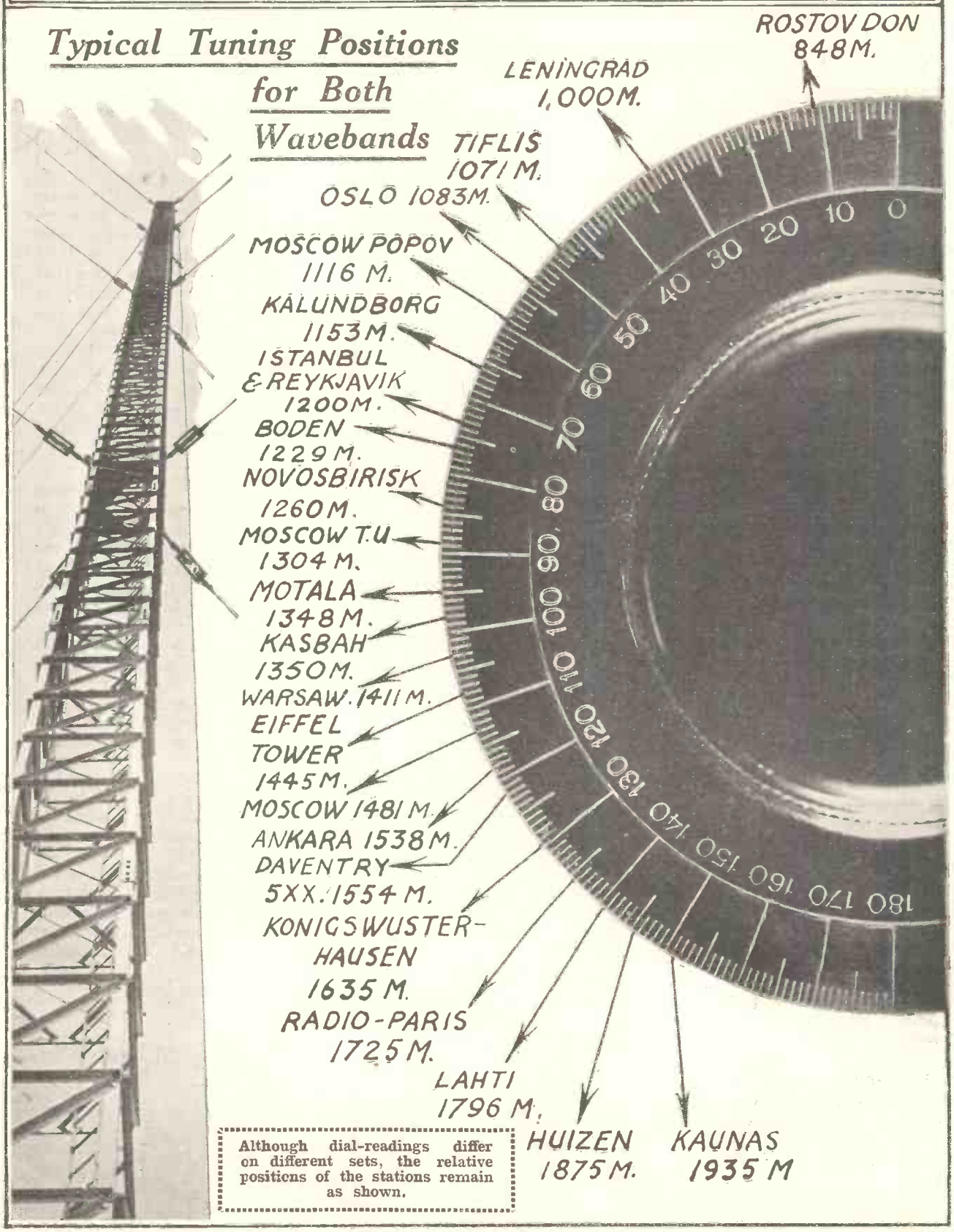
Although the term "the long waves" is generally taken to mean wavelengths of one thousand metres and above, it is often worth remembering that about twenty of Europe's stations lie in the doldrums, between Budapest (550 metres) and the lowest of the long-wavers, which is Leningrad, on 1,000 metres.

As a rule, however, they are not of much use from an entertainment point of view, so the listener need not worry about their being out of the wave ranges covered by his receiver. Those lying between 550 metres and 800 metres are generally badly "battered" by the antiquated spark transmitters with which many ships are still equipped, while those of higher wavelength come within the waveband occupied by aircraft and directionfinding stations.

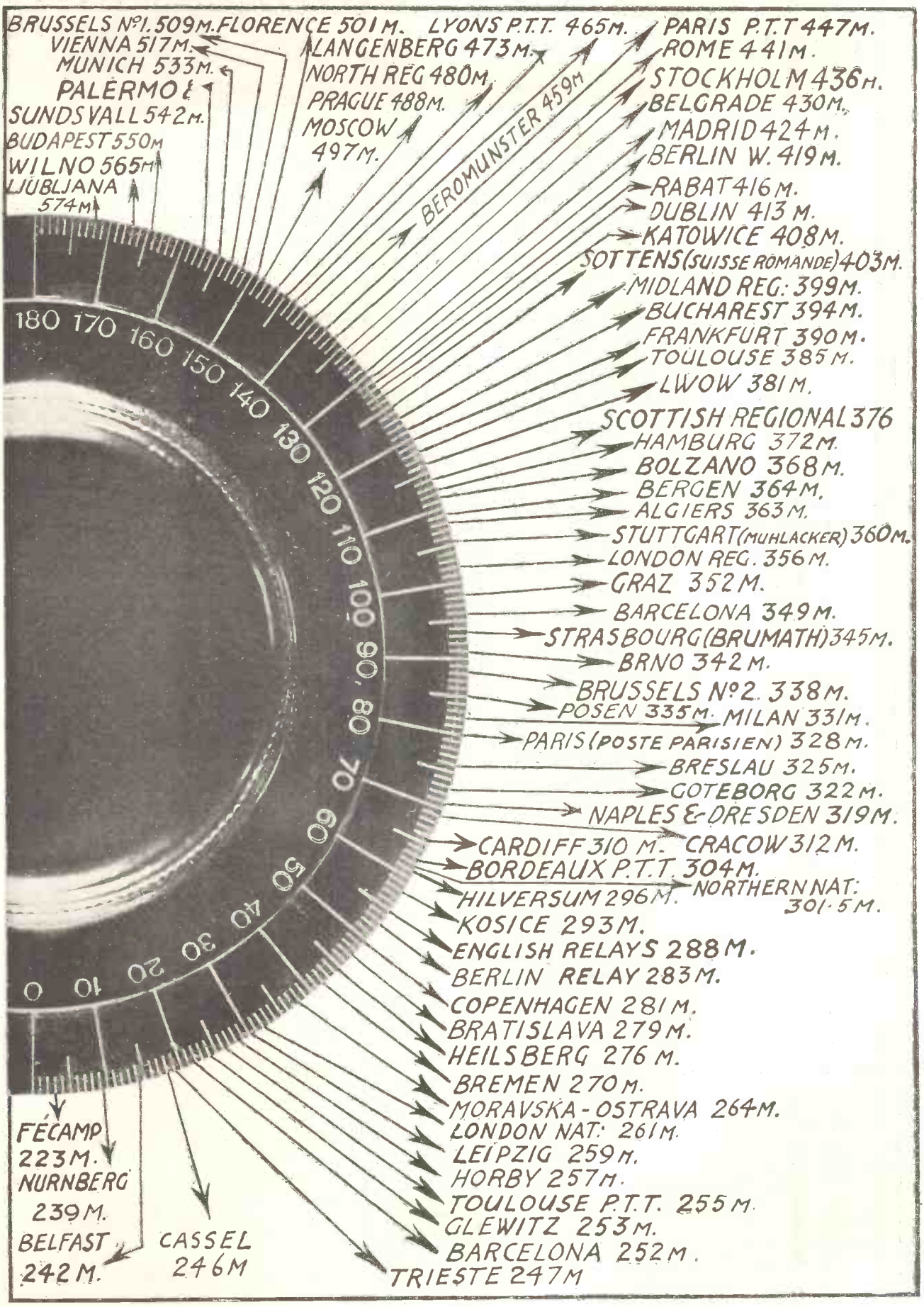


HOW THE STATIONS STAND!

Typical Tuning Positions for Both Wavebands



Although dial-readings differ on different sets, the relative positions of the stations remain as shown.


BRUSSELS No1. 509M.
FLORENCE 501M.
LYONS P.T.T. 465M.
PARIS P.T.T 447M.
VIENNA 517M.
LANGENBERG 473M.
ROME 441M.
MUNICH 533M.
NORTH REG 480M.
STOCKHOLM 436M.
PALERMO
PRAGUE 488M.
BELGRADE 430M.
SUNDSVALL 542M.
MOSCOW 497M.
MADRID 424M.
BUDAPEST 550M
BERLIN W. 419M.
WILNO 565M
BERAMUNSTER 459M
RABAT 416M.
LJUBLJANA 574M
DUBLIN 413M.
KATOWICE 408M.
SOTTENS (SUISSE ROMANDE) 403M.
MIDLAND REG: 399M.
BUCHAREST 394M.
FRANKFURT 390M.
TOULOUSE 385M.
LWOW 381M.
SCOTTISH REGIONAL 376
HAMBURG 372M.
BOLZANO 368M.
BERGEN 364M.
ALGIERS 363M.
STUTTGART (MUHLACKER) 360M.
LONDON REG. 356M.
GRAZ 352M.
BARCELONA 349M.
STRASBOURG (BRUMATH) 345M.
BRNO 342M.
BRUSSELS No2. 338M.
POSEN 335M.
MILAN 331M.
PARIS (POSTE PARISIEN) 328M.
BRESLAU 325M.
GOTEBORG 322M.
NAPLES & DRESDEN 319M.
CARDIFF 310M.
CRACOW 312M.
BORDEAUX P.T.T. 304M.
NORTHERN NAT: 301·5M.
HILVERSUM 296M.
KOSICE 293M.
ENGLISH RELAYS 288M.
BERLIN RELAY 283M.
COPENHAGEN 281M.
BRATISLAVA 279M.
HEILSBERG 276M.
BREMEN 270M.
MORAVSKA-OSTRAVA 264M.
LONDON NAT: 261M.
LEIPZIG 259M.
HORBY 257M.
TOULOUSE P.T.T. 255M.
GLEWITZ 253M.
BARCELONA 252M.
TRIESTE 247M
CASSEL 246M
FECAMP 223M.
NURNBERG 239M.
BELFAST 242M.
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0

From 250 to 550 Metres

A rapid review of reception conditions on the main broadcasting band, with notes on the chief stations to look for, and useful hints for easy identification.

A LOT of talk is always going on about the short waves, the ultra-short waves, and the long waves, but it is always to the good old medium waveband, comprising the wavelengths in the 250 to 600-metre region, that we turn for the best programmes that Europe provides for the listener in this country. For scope, for variety, for interest and for sheer distance there is nothing to touch this part of the broadcasting spectrum.

A Nightly Haul

Nowadays few listeners are content with B.B.C. programmes alone. Even a one-valve set will bring in foreigners, and the average three-valve set is capable of a nightly haul of at least half a dozen good alternatives. But many listeners neglect to reap the rich harvest of high-power programmes that awaits them because they do not trouble to *identify* the stations. And that is a great mistake.

Never-Ending Delight

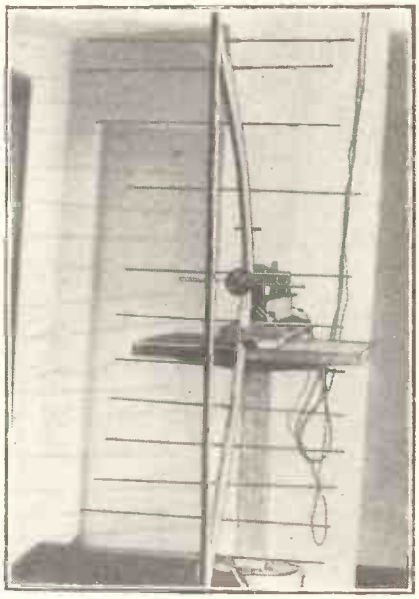
The various European stations are quite easily identified, and the student of the world's programmes will find never-ending delight in "visiting" them. A paper and pencil near the set to jot down dial-readings and remarks on the items heard will soon form the basis of a knowledge of the various station peculiarities. And even without the slightest acquaintance with the languages used, the stay-at-home listener can soon meet a host of friends "on the air."

Compare Your Dial

On the preceding page is a typical dial-display of Europe's leading medium-wave stations. If your tuning dial is like the one shown you are "on velvet," for although the dial readings will be different, *the relative positions remain the same* for all sets. Thus, Trieste will come in near the bottom, Budapest near the top, and London Regional near the middle of the tuning condenser's travel, and so on.

Now let us run up the medium waveband, and remark on a dozen or so stations of outstanding interest that are just now being received well. Near the bottom, as stated, you may find Trieste, or possibly Belfast, or Cork, or Radio Normandie (Fécamp). The latter three are very easy to recognise, and so is Trieste, if you remember that in Italian it is pronounced like "Tree-ess-tay," and the programme is usually linked with Turin's (pronounced "Torino" by the lady announcer).

THE BERLIN BEAM



This is one of the special beam aerial reflectors evolved by the Germans in connection with ultra-short-wave experiments. It is expected that the coming winter will see enormous advances in this interesting field of radio research.

Well above the London National dial-reading there is "Torino" (Turin) itself, with the powerful German station Heilsberg about one degree above it. As Heilsberg serves the populous Konigsberg area, this latter town is often mentioned.

* * *

A little farther up we find the B.B.C. stations at Bournemouth, Newcastle, Plymouth and Swansea working on a common wavelength, and listeners outside these areas will receive the four-fold transmission as a sort of jumble of distorted "National" programmes that is easily recognisable, and forms a good "finger-post" which tells what dial-reading on your set corresponds with the 288·5-metre common wavelength.

Special Value in the East

Higher up is Hilversum, the powerful Dutch station which, at the moment of writing, is announcing itself as "Huizen." This is a first-class station of special value to dwellers in the Eastern counties. And not far above Hilversum the North National, Bordeaux and Cardiff programmes will appear.

Middle of the Scale

There are numbers of good transmissions round about the middle of the dial, but one of the very best is "Poste Parisien," on 328·2 metres. This is a fine new station that has only been working a few weeks, and it promises to be one of the top-notchers of the dials. Nearly half-way between it and the London Regional there is the Brussels No. 2 programme, with Strasbourg and Barcelona just above it.

Easily Recognised

Approximately half-way between the Midland Regional and North Regional on 480 metres, there is the easily recognised "Radio-Roma" or "Roma-Napoli" announcement, that indicates you are listening to Rome (441 metres).

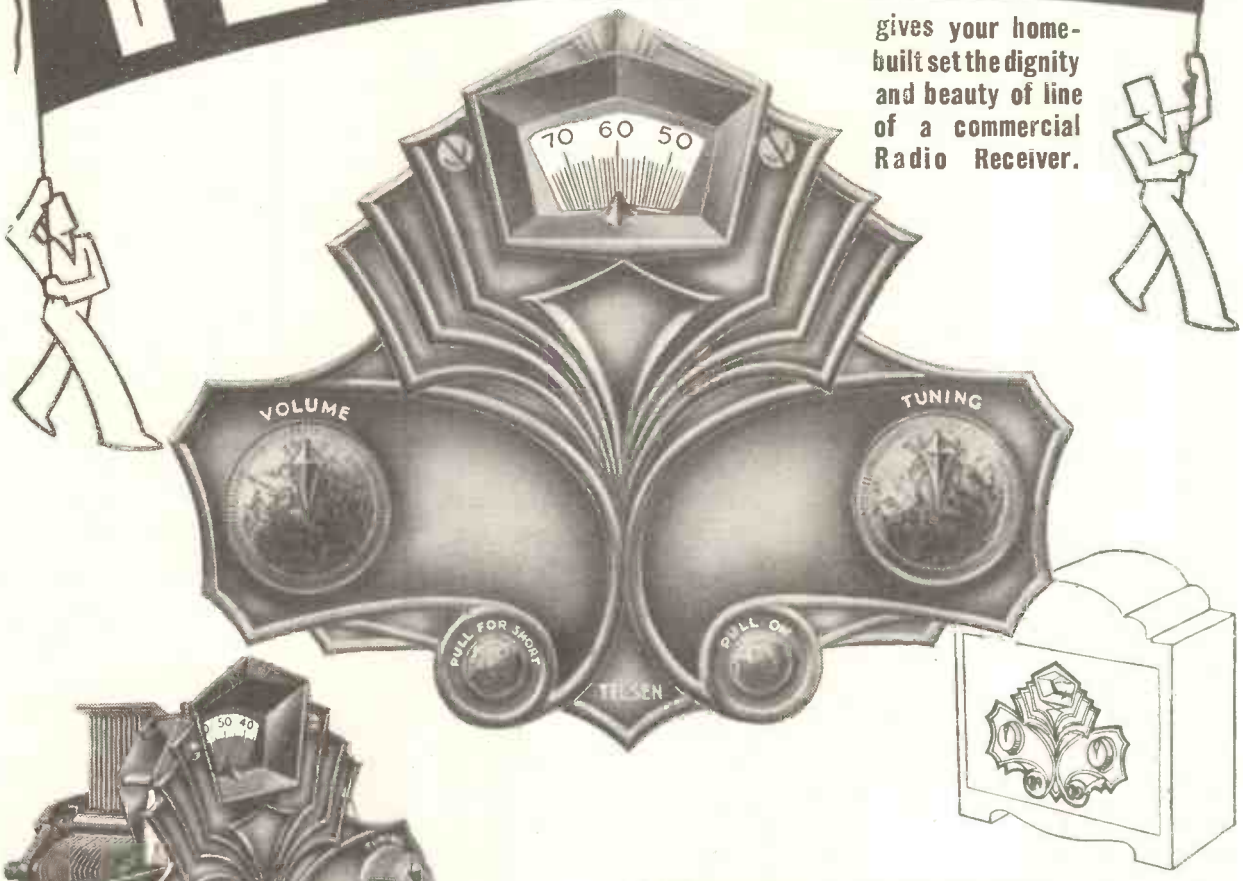
* * *

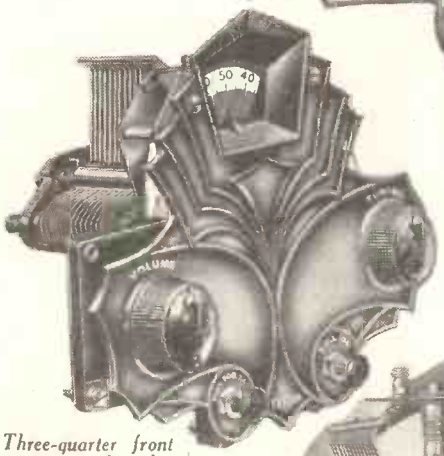
All these stations are "probables," and in addition there are dozens of possible good alternative programmes on the medium waveband, all of real interest from the programme point of view. Add to this the thrill of keeping in touch with the far-distant capitals of Europe, and a good receiver on the medium wavelengths alone becomes an "Open Sesame" to nightly adventure.

TELSEN

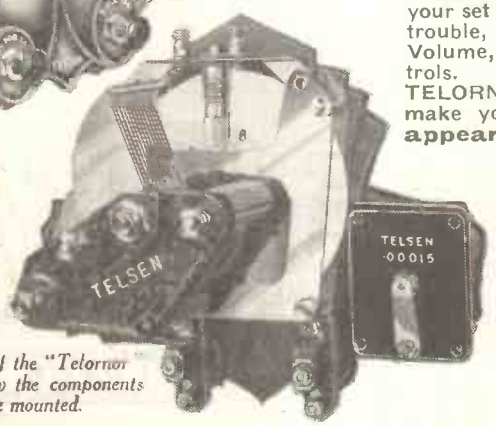
TELORNOR

gives your home-built set the dignity and beauty of line of a commercial Radio Receiver.





Three-quarter front view of the "Telornor."



Back view of the "Telornor" showing how the components can be mounted.

GIVE your home-built set the dignity of an expensive commercial radio receiver with the new Telsen TELORNOR. It makes better sets easy to build! The handsome silver oxidised escutcheon plate, complete with the Illuminated Disc Drive adds immensely to the "good looks" of your set and permits, with the minimum of trouble, a very effective grouping of your Volume, Tuning, Push-Pull and On-Off controls. Ask your dealer to show you a TELORNOR Illuminated Disc Drive. It will make your set a set to be proud of—in **appearance** as well as in performance.

No. W.206.

7/6

TELSEN

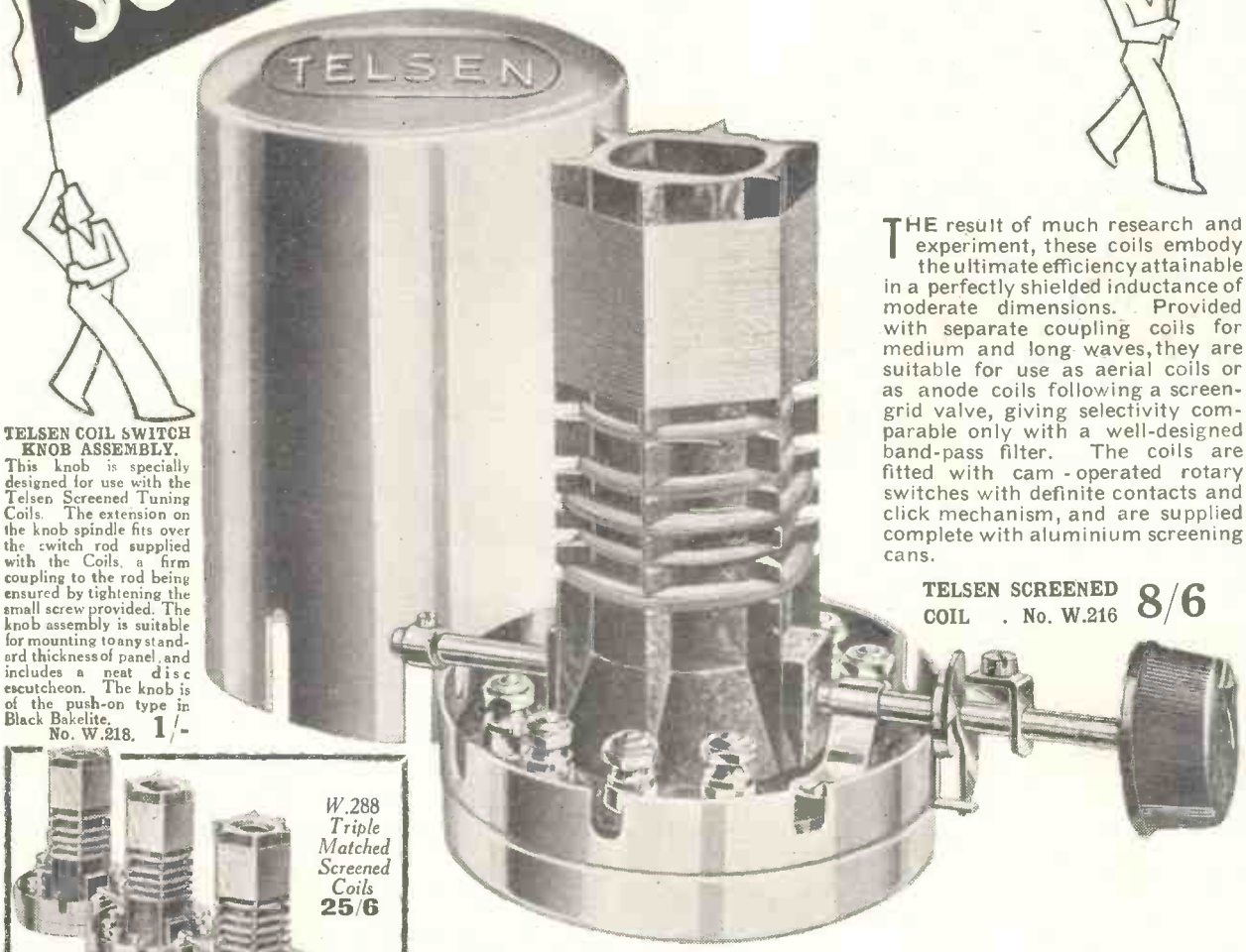
RADIO COMPONENTS

GOOD RADIO IS A JOY FOREVER

ANNOUNCEMENT OF THE TELSEN ELECTRIC CO. LTD., ASTON, BIRMINGHAM.

TELSEN

SCREENED TUNING COILS



THE result of much research and experiment, these coils embody the ultimate efficiency attainable in a perfectly shielded inductance of moderate dimensions. Provided with separate coupling coils for medium and long waves, they are suitable for use as aerial coils or as anode coils following a screen-grid valve, giving selectivity comparable only with a well-designed band-pass filter. The coils are fitted with cam-operated rotary switches with definite contacts and click mechanism, and are supplied complete with aluminium screening cans.

TELSEN SCREENED COIL . No. W.216 8/6

TELSEN COIL SWITCH KNOB ASSEMBLY. This knob is specially designed for use with the Telsen Screened Tuning Coils. The extension on the knob spindle fits over the switch rod supplied with the Coils, a firm coupling to the rod being ensured by tightening the small screw provided. The knob assembly is suitable for mounting to any standard thickness of panel, and includes a neat disc escutcheon. The knob is of the push-on type in Black Bakelite. No. W.218. **1/-**

W.288 Triple Matched Screened Coils **25/6**

W.287 Twin Matched Screened Coils **17/-**

TELSEN COIL SWITCH COUPLING ASSEMBLY

When it is desired to mount two or more of the Telsen Screened Coils in a line parallel to the panel, and to control the wave-change switching by a single knob on the panel, this switch coupling assembly will be found indispensable. The link arms of the coupler are fitted over the switch rods of the coils, and adjusting slots are provided in the link bar to allow for the spacing of the coils varying from 3 in. to 6¾ in. The whole assembly has a neat nickel-plated finish, is perfectly smooth and positive in action and free from backlash.

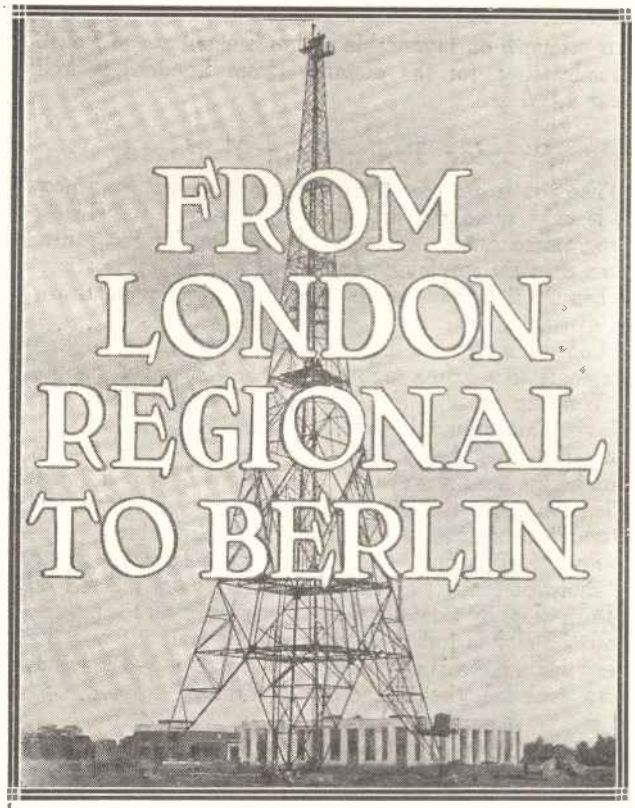
No. W.217 **6d.**

TELSEN

RADIO COMPONENTS

GOOD RADIO IS A JOY FOREVER

ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON, BIRMINGHAM



THE wavelength of the London Regional station is 356 metres, and its dial reading is usually about half-way round—that is, near 50° in the case of a dial marked up to 100, and 90° or so in the case of a dial whose maximum is 180°.

Berlin's wavelength is a little more than 60 metres higher than London's (419·5 metres to be exact), so its dial-reading is near the three-quarters mark. And in this small segment of the tuning range, with dial-readings higher than London's and lower than Berlin's, there will be found an unusually interesting group of stations.

Another "M.W." Conducted Tour, in which we visit Mühlacker, Hamburg, Lwów, Toulouse, Frankfurt, Sottens, Katowice, Dublin, and Berlin.

Getting to Know the Stations

Regular readers of "The World's Programmes" will be familiar with "M.W.'s" conducted "tours" of various parts of the wavebands; but for the benefit of newcomers it may be said that the idea of them is to explore with more than usual care certain parts of the tuning range, stopping at the allotted points long enough to mention items of general interest.

Special stress is laid on station peculiarities, and the "tours" not only help to identify the different stations, but—just as on a real foreign visit—enable us to get glimpses of life abroad. There is no time-limit, no ticket to buy, and no trouble to take apart from the useful pencil and paper to jot down the different dial-readings. If some of the stations are missed there is no harm done, as they can be logged later when conditions are better, or else skipped altogether in favour of others equally interesting.

Let us start by supposing the set is tuned to London Regional, but a talk is beginning which does not appeal, so we decide to go on a tour to Berlin via the chief intermediate stations. Moving the tuning dial (or dials) just a degree or so above the London setting, we come to the powerful German programme emanating from Stuttgart.

It is Germany's Rhineland Regional station, built only a year or so ago and already one of Europe's best-known stations. Originally known as "Mühlacker," from the small town near the actual site, it serves the neighbouring industrial areas of Württemberg, and especially the city of Stuttgart, the name most frequently mentioned in announcements.

From a programme point of view, Stuttgart-Mühlacker's chief feature of note is its music, the concerts from various German centres often being of a very high order indeed. But except on very selective sets, Stuttgart-Mühlacker generally has a background—or sometimes a foreground!—of London Regional's programme, so a better idea of German music can be obtained from Hamburg, which lies some three or four degrees higher up the dial.

A Bad Spot for Interference

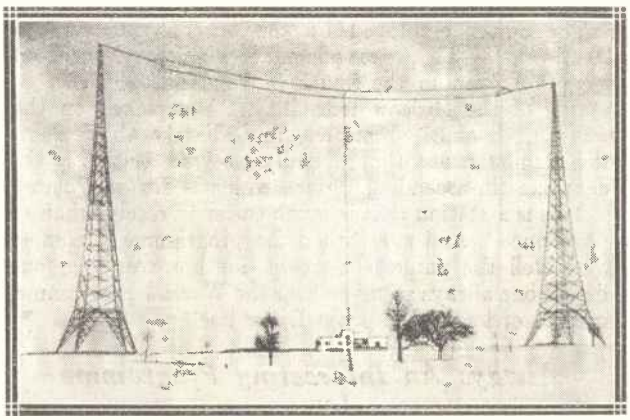
Hamburg's wavelength is 372 metres, and no fewer than seven different stations are packed in between it and Stuttgart! In order of ascending wavelengths, these are Algiers (363·3 metres), Bergen (364 metres), Fredriksstad (367·6 metres), Bolzano, Helsinki, and Seville on 368·1 metres, and Paris (Radio LL) on 370·4 metres.

With the possible exception of Algiers, none of these is easy to receive, but Hamburg is a consistent station that is picked up well in this country.

There are two ways in which Hamburg can be identified easily. One is by its position on the dial relative to the new Scottish Regional (Falkirk), the Hamburg programme being the one immediately below this—not more than a degree away on most sets.

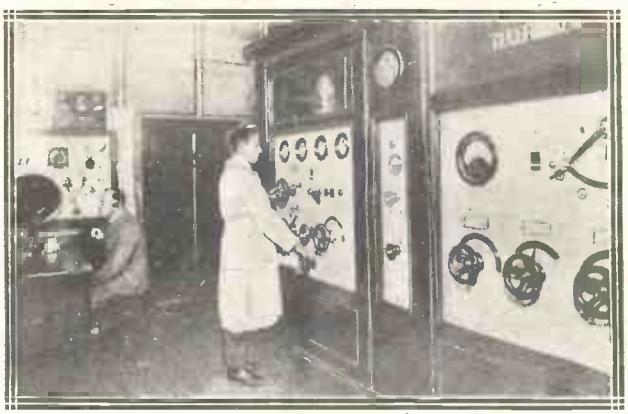
Another way in which Hamburg can be "located" is by its unusual interval signal, the blast of a siren. And those who know Morse will also recognise it easily by the four-short, short-long notes . . . . . —, which represent HA in the Morse code.

"RADIO SUISSE ROMANDE"



Situated at Sottens, north of Lausanne, the "Suisse Romande" Regional station is well placed for long-range transmission, its programmes being well known in this country. (403 metres.)

THE "WORKS" OF WITZLEBEN



A scene in the transmitting hall, which is of typically trim Teutonic appearance.

A curious programme-feature of the Hamburg station is its "Harbour Hour," usually held at 6.15 a.m. or so, on Sunday mornings. On these occasions a "travelling-mike" is taken to the great wharves of the port, and a running commentary is given of the scene—the liners in harbour, the sailing-ships, perhaps, or a snatch of a sea-shanty, giving to listeners a vivid glimpse of the great seaport on the Elbe.

Hamburg is rich in historic associations, having grown up around a fortress built by Charlemagne. It was one of the members of the Hanseatic League, and was made a free city as long ago as 1510, although the King of Denmark claimed to be its overlord until the 18th century.

The New Scottish Broadcaster

Shipping was its chief modern industry before 1914, and even after the paralysis of the war years Hamburg's overseas trade revived with considerable vigour, its magnificent dockyard equipment and fine position 75 miles inland from Cuxhaven making it an ideal port.

Next on our list comes the Scottish Regional, on 376·4 metres (the old Glasgow wavelength). This, the latest of the B.B.C.'s dual-wavelength stations, has a "twin" transmission, giving the National programme, going out from the same station at Falkirk. And, incidentally, by giving such a two-wavelengths-from-one-station service the B.B.C. is leading the world in providing alternative-programmes for listeners.

The power employed by the Scottish Regional is 50 kilowatts—a generous allowance which gives excellent reception even in the South of England.

One of the Moscow transmitters has picked on the wavelength of 378·6 metres, immediately above Scottish Regional, but a more easily-received station is the next one (in ascending order), which is Lwów, Poland.

This is a station that is much easier to receive than to pronounce! And even when the programme is coming over well the name is no help, for however long one listens one always seems to hear the Warsaw programme, instead of local items from Lwów itself.

Always An Interesting Programme

However, the relay of Warsaw is always interesting, the terms "Polskie Radio" and "Varshova" (Warsaw in Polish) serving to identify the transmission.

The fact that Lwow has been picked up recently at fair strength on favourable nights is a tribute to Polish broadcasting, for the distance (from London) is well over 1,000 miles.

Popular Tunes from Toulouse

The power has recently been increased, but even now it is only some sixteen kilowatts, so that the Lwów programme can be considered something of a capture, even on a set employing an S.G. H.F. amplifying stage. When the first valve is the detector the logging of Lwów is, distinctly, a feat!

Continuing up the dial, and about one degree higher, we come to a prime favourite in the form of Toulouse, Working on 385 metres, ringing his gong and often playing his gramophone for the benefit of an English audience, this cheery station is one of the best known on the medium waveband. And about a degree above the setting for the genial Frenchman is to be found a German programme, emanating from Frankfurt.

Frankfurt is one of the south-west Germany group ("Sudwest-funk") and its programmes are relayed on 246 metres, by Cassel. Goethe was born at Frankfurt, and the city is full of literary and historic interest, its very name indicating "Ford of the Franks"—the tribes who founded the Kingdom of France.

Well Received in London

The power rating of Frankfurt is only 1·5 kilowatts; but for some reason he is as good as many much more powerful stations, which is rather remarkable considering he is almost exactly 400 miles away from London.

A point worth remembering about this station is that although he is by way of being a late bird, seldom finishing his programme before midnight, or twelve-thirty a.m., he "goes to bed" early on Wednesdays;

(*Continued on page* 259.)

BERLIN'S LADY ANNOUNCER

She is Frau Gertrud van Eyseren, and you may hear her voice from the Berlin Witzleben station on a wavelength of 419·5 metres.

TELSEN

VARIABLE Air-Dielectric CONDENSERS and DRUM-DRIVE

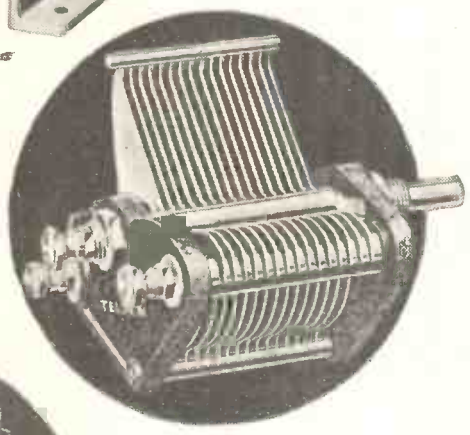
THE Telsen Drum-Drive and Condenser Assembly comprises a complete ganged condenser tuning unit incorporating several distinctive features. Two Telsen ·0005 logarithmic variable condensers with right and left-handed movements, and fitted with compensators, are mounted and ganged together through a rigidly constructed drum-drive control. Mounted on the same spindle axis as the main tuning drive is a trimmer, giving a swinging movement of about 20° to the stator vanes of the right-hand variable condenser, thereby enabling perfect matching of the condensers to be maintained throughout the Tuning Range. Two scales are supplied with the unit, one marked in wavelengths and one in graduations from 0-100. The Scale is illuminated and has the additional advantage of being easily removable when it is desired to fit one of special calibration. The escutcheon is handsomely finished in oxidised silver, and knobs of the push-on type are fitted. Provision is made for panel and baseboard mounting, and a double-ended spanner is supplied free with the unit for fitting the variable condensers. Full instructions for mounting are included with every unit.

No. W.262. Price **17/6**

TELSEN LOGARITHMIC VARIABLE AIR DIELECTRIC CONDENSERS

The Frame is braced by three solid pillars, and the effective clamping of the vanes, each held at three points, makes distortion impossible. The rotor is also built into a rigid unit, the vanes being held at both ends. Generous bearings obviate backlash or end-plate. Models No. 260 and 261 (left hand and right hand movements respectively) incorporate a compensator (max. cap. 60 micro-microhenries) for balancing out stray capacities, thus greatly facilitating ganging.

Model	Cap.	Price
No. 130	·00025	4/6
No. 131	·00035	4/6
No. 132	·0005	4/6
No. 260 (*Left hand movement with trimmer*)	·0005	5/-
No. 261 (*Right hand movement with trimmer*)	·0005	5/-



TELSEN DRUM DRIVE

Follows standard practice generally, but embodies several detail refinements, among which may be instanced the cord drive, arranged to reduce wear to a minimum and to prevent over-run, and the rocking stator trimmer, which gives a variation of 20°, and visual indication of setting. For use with Telsen screened coils, an extra scale, marked in wavelengths, is supplied free of charge. Illustration shows escutcheon, handsomely finished in oxidised silver.

No. W.255. Price **8/6**

TELSEN

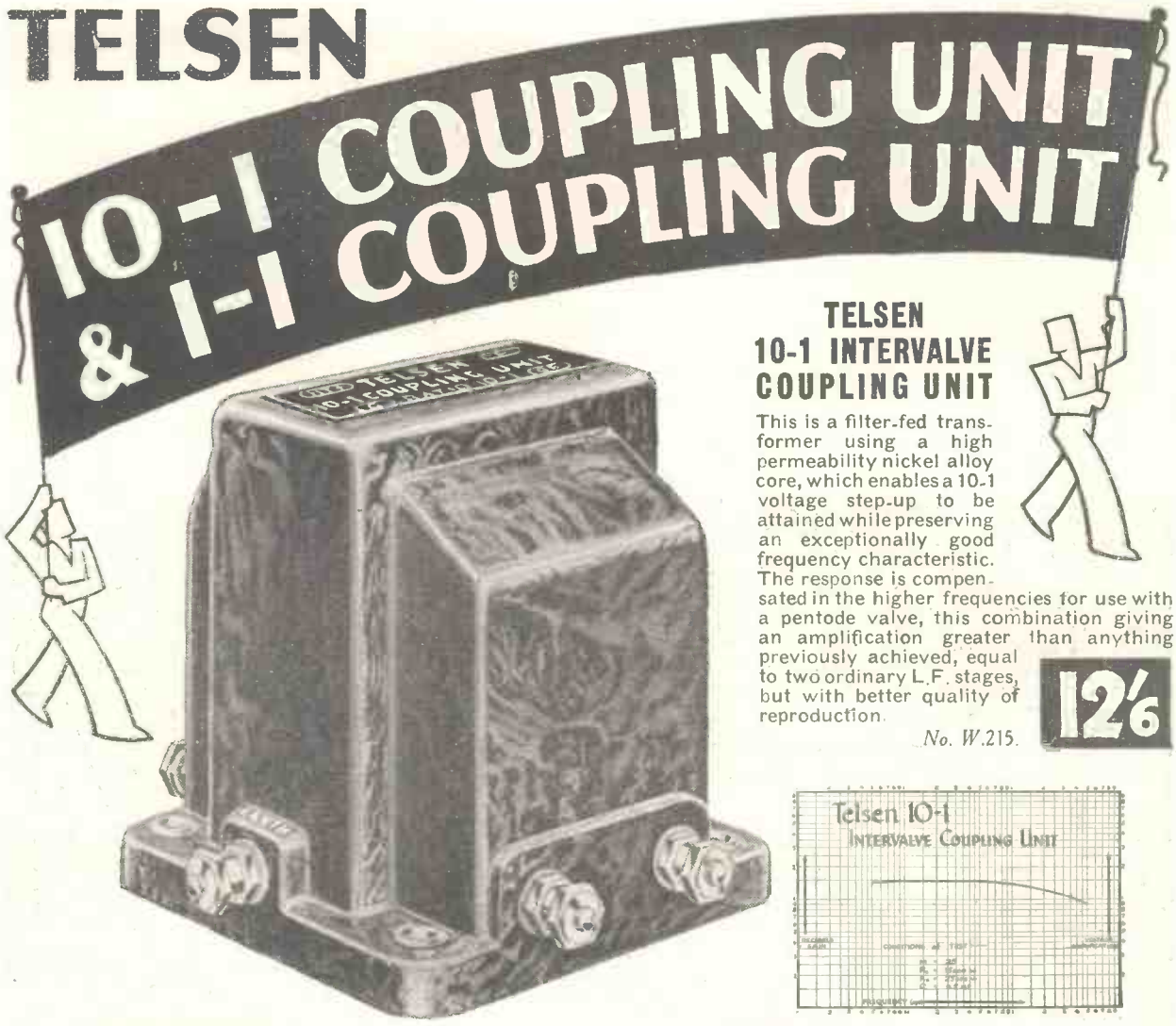
RADIO COMPONENTS

GOOD RADIO IS A JOY FOREVER

ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON, BIRMINGHAM.

TELSEN

10-1 COUPLING UNIT & 1-1 COUPLING UNIT



TELSEN 10-1 INTERVALVE COUPLING UNIT

This is a filter-fed transformer using a high permeability nickel alloy core, which enables a 10-1 voltage step-up to be attained while preserving an exceptionally good frequency characteristic. The response is compensated in the higher frequencies for use with a pentode valve, this combination giving an amplification greater than anything previously achieved, equal to two ordinary L.F. stages, but with better quality of reproduction.

No. W.215.

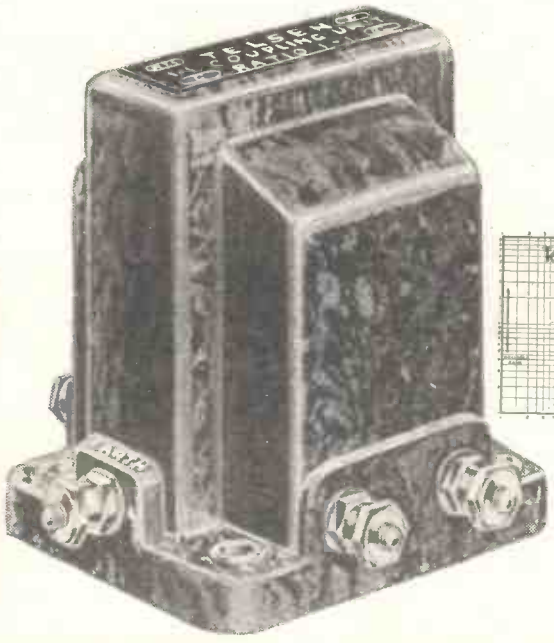
12/6

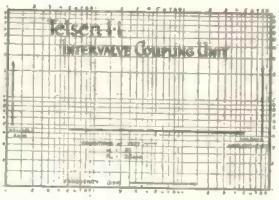
TELSEN 1-1 INTERVALVE COUPLING UNIT

This is a modern development of the one time deservedly popular R.C. units. It incorporates a low pass filter feed in its anode circuit, thus effectively preventing "motor-boating," "threshold howl," and other forms of instability arising out of common couplings in eliminator and battery circuits. Used with an H.L. type valve it will give an amplification of about 20 and a perfect frequency response, at the same time consuming negligible H.T. current.

No. W.214

7/6





TELSEN

RADIO COMPONENTS

GOOD RADIO IS A JOY FOREVER

ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON, BIRMINGHAM

Listen for Katowice on Friday Evenings

(*Continued from page* 256.)

and so on that day it is rarely of use to expect him to be on after 11 p.m.

The next wavelength above Frankfurt's is 394 metres, occupied by Bucharest. And "one up" from this is our old friend Midland Regional.

As we still have three "calls" to make before reaching Berlin, we will not linger over Midland Regional except to say that as 5 G B it was the experimental forerunner of stations at Brookmans Park, Moorside Edge, and Falkirk.

And when the B.B.C. has completed its Western Regional—now under construction at Watchet, Somersetshire—the Midland Regional will be overhauled and improved to bring it into line with the other Regionals which owe so much to 5 G B.

Midland Regional's exact wavelength is 398·9 metres, and on the next wavelength, 403 metres, is "Radio Suisse Romande." This station is often referred to as "Sottens," that being the name of the village where the transmitter is situated.

"Suisse Romande" is another of Europe's new stations, which commenced operations last year. And it bids fair to be a great favourite, the strength in Britain, during the darker months of the year, being remarkably good.

As pronounced the name sounds like "Sweece Romandy," and the words "Lausanne" or "Geneve" are frequently heard, these being the cities where the studios are situated.

From Switzerland we swing right across Germany and Czecho-Slovakia to Poland, the neighbouring wavelength of 408 metres being allotted to Katowice. And for all its 840 miles or so Katowice is a well-received station.

The "gong" which is often heard as an interval signal is not a gong at all, but a hammer striking an anvil, to indicate the busy industrialism of the surrounding district.

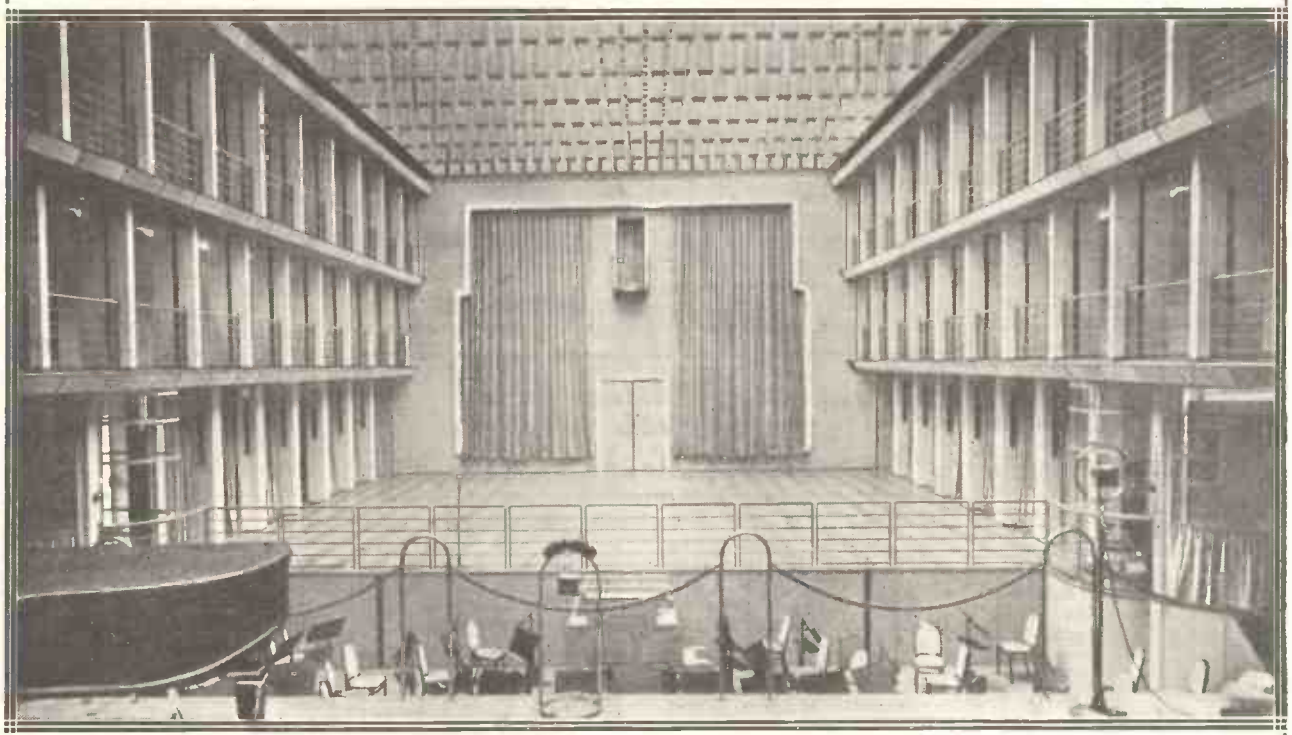
We must now push on a degree or so farther up the dial, to 413 metres. Here is "Dublin"—the inverted commas indicating that it may be the Dublin station itself or possibly the new Athlone station which is to supplant it on greater power.

From the Irish Free State capital we tune to our final station, Berlin, on 418 metres. Berlin is a fairly easy station to recognise, the characteristic German announcements being clearly given; the intervals are sometimes filled up with a fast-ticking metronome, going 240 ticks to the minute, and when the long-wave programme is being shared the words "Konigs Wusterhausen" may be heard.

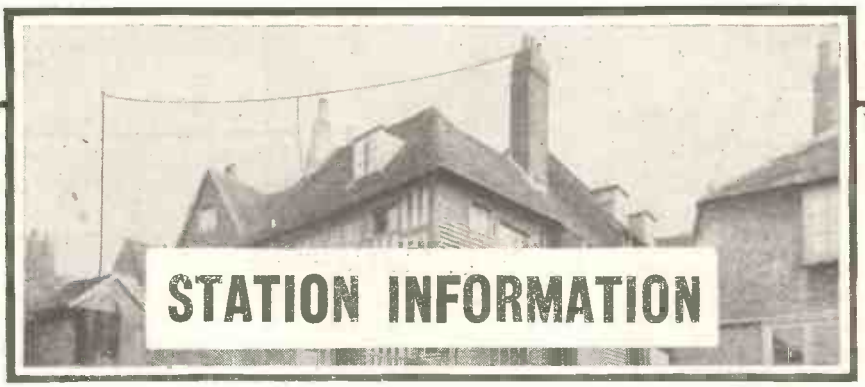
One characteristic of German stations is frequently to be heard from Berlin—the hymn-tune "Austria" at the close of the programmes.

Although we call this tune of Haydn's "Austria," it is, to Germans, the most Germanic of tunes, namely "Deutschland Uber Alles." And it makes a stirring "good-night" and a fitting end to our tour, which thus finishes at a point some 580 miles from London.

HAMBURG'S ADJUSTABLE STUDIO HAS A HYDRAULICALLY-MOVABLE WALL!



Much pioneering work on acoustics and room characteristics has been done by the Germans, and one of their successes has been this compressible studio, the end wall of which can be moved to make a large or small hall.



STATION INFORMATION

Visit Fécamp

New Station for Munich

Tests on Seven Metres

The Olympic Games

BUDAPEST. The site of the new station is Csepel, and that of the main one at present in use is at Lakihegy.

* * *

MADRID. The station on 424·3 metres is really two stations—E A J 2, Radio Espana, and E A J 7, Union Radio. The latter "takes over" at 7 p.m.

* * *

HUIZEN. The programmes radiated by Huizen on 1,875 metres originate at the Hilversum station.

* * *

HILVERSUM. This famous Dutch station on 296·1 metres, which is now radiating the Huizen programme, increases its power from 7 to 20 kw. at 4.40 p.m.

* * *

KATOWICE. The "Radio Circle" 11 p.m. chats to foreign listeners from Katowice (408 metres) on Wednesdays and Fridays are always well worth tuning for. The "circle" must now have a very large membership in this country.

* * *

BERLIN. The ultra-short-wave station in Berlin's "Funk-turm" (radio tower) is principally used for television tests. Wavelengths between 6 and 8 metres only are used.

* * *

LUXEMBOURG. The lady announcer is a German, and is aged 24.

* * *

MOSCOW. The hammer-striking-an-anvil interval signal is intended as an emblem of Soviet industry.

* * *

W 6 F Z A. This is the call-sign of the world's youngest fully-qualified radio amateur. He is Alan T. Margo, of Porterville, California, aged 9½ years.

* * *

"GEORGIC." The new White Star liner "Georgic" has its wireless installation fitted in the vessel's dummy funnel.

* * *

FÉCAMP. Visitors to Normandy may like to know that "Radio Normandie" (Fécamp) welcomes sight-seers on Tuesdays and Fridays from 2.30 to 5 p.m.

PARIS. Radio L L has been dabbling in auto-suggestion for listeners and broadcasting special "Keep Cool and Collected" music on 370·4 metres.

* * *

TROMSO. The scientists investigating radio "echoes" from the Heaviside-Kenelly Layer and the Appleton Layer (the "belts" in the upper atmosphere which reflect radio waves back to earth) are linked with their headquarters at Slough (Bucks) by short-wave radio.

* * *

EAST PITTSBURGH. The very-high-power tests (up to 400 kw.) are conducted under the call-sign W 8 X A R. The wavelength is about 304 metres.

* * *

LOS ANGELES. The Olympic Games athletes are kept in touch with friends all over the world by station W 6 U S A, which is erected inside "Olympic Village."

* * *

COPENHAGEN. The short, tuneful melody played in the programme intervals is taken from an old Danish folk-song.

* * *

BARI. The new high-power station, which was scheduled to be working some months ago, will be officially working in September, failing any unexpected hitch in the arrangements.

* * *

PRANGINS. The British-made League of Nations transmitter, "Radio Nations," at Prangins, near Geneva, can instantly change to either of its four wavelengths by means of switches.

TOKIO. The station working on 38·07 and 19·36 metres daily from 10.30 to noon, is situated at the formidably-named village of Kemikawoa-Cho-China-Ken, near Tokio.

* * *

BROADCASTING HOUSE. The first test of the 7-metre transmitter which was made from the roof of Broadcasting House was received at Chelmsford, although this was regarded as theoretically impossible on such a short wavelength.

* * *

COPENHAGEN The midnight chimes are relayed from the Town Hall.

* * *

HAMBURG. The letters H A in Morse (• • • • • — •) and the blast of a ship's siren are used to identify the Hamburg programmes.

* * *

OHIO. The Crosley Radio Corporation announces the authorisation by the Federal Radio Commission of a 500-kilowatt transmitter. It will be the biggest-powered station in America.

* * *

BAKOU. A 35-kilowatt new station has been put into operation by the U.S.S.R., on about 1,260 metres.

* * *

ZEESEN. Forthcoming programme features are announced (in English) from Zeesen at 4 p.m.

The October "Modern Wireless" will be

ON SALE OCT. 1st. *Order Now.*

MUNICH. The new 60-kw. station is due on the air for tests about the time these words appear in print.

* * *

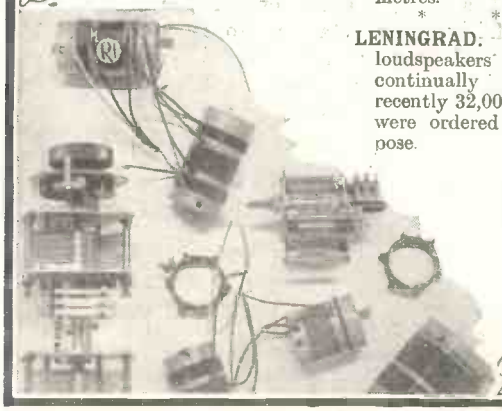
BRESLAU. An extraordinary aerial is to be used by the new Breslau station. It consists of a vertical wire suspended inside a 500-ft. wooden tower.

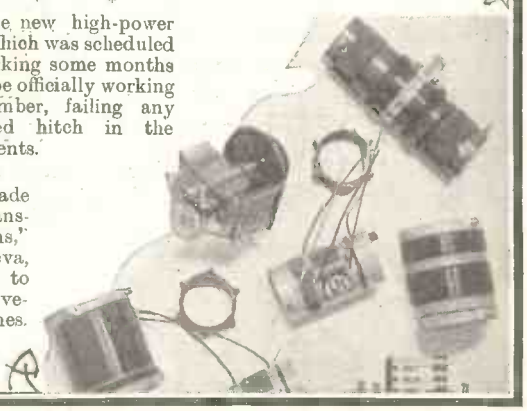
* * *

MADRID. The Aranjuez short-wave station, "Transradio Espanola," now announces in Spanish, English and French, every Saturday, from 6 to 8 p.m., on 30·4 metres.

* * *

LENINGRAD. The use of loudspeakers in factories is continually growing, and recently 32,000 loudspeakers were ordered for this purpose.





The TELSEN AJAX 3

Bigger . . better . . packed with valuable information from cover to cover—the new Telsen Radiomag is undoubtedly the finest radio sixpennyworth ever offered. For it appeals to all—and all can profit by it. In simple language, illustrated by photographs and diagrams, and complete with 3 full size 1/- blue prints, it tells you how to build the latest circuits—how to modernise your existing set . . how to rectify little faults . . how to get the best out of your set in every way.

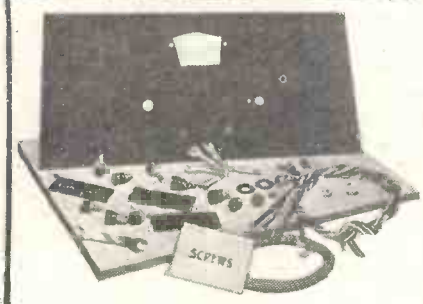
Get a copy NOW!

TOTAL COST OF TELSEN MATCHED COMPONENTS

61/6

FOR BUILDING THE AJAX 3, *including panel, baseboard, terminals, battery cords and all accessories.*

A HIGHLY efficient "Straight Three" circuit, as easy to operate as it is to build, giving an exceptionally brilliant all-round performance, with a low initial and upkeep cost, the range, power, selectivity and general quality of reproduction setting a new standard for receivers of this type. Free full size 1/- blue print, together with full constructional details are contained in the new issue of Telsen Radiomag, which also gives full particulars of the improved and now all-embracing range of Telsen Radio Components at the still lower prices made possible by Telsen's enormous sale. Now on sale at all radio dealers and newsagents. Price 6d.



CONSTRUCTORS' OUTFIT

"TELORNOR"

Contains all the sundry requirements for the construction of the Telsen Circuits using the "Telornor." Of these the "Triple" 3, the "Ajax" 3, and the "Nimrod" 2, are excellent examples. All are supplied neatly packed in a carton together with instructions.

Cat. No. 220

3/6

Included in the Outfit are the following components:

Specially cut and drilled crystalline-finish Panel. 14" × 10" Baseboard. 8-way Battery Cord. Complete set of Wander Plugs, suitably engraved, and Spade Terminals. Terminals for Aerial, Earth and Loud Speaker.

Engraved Terminal Strips. An ample supply of 22 S.W.G. Tinned Copper Wire and necessary Sleeving for wiring up the set. A double-ended Spanner for mounting the single-hole fixing components.

A 4-way Spanner, for tightening up all Terminal Nuts. All the Wood Screws and sundry other small accessories contributing to the complete assembly of the finished Receiver.

TELSEN

RADIO COMPONENTS

GOOD RADIO IS A JOY FOREVER

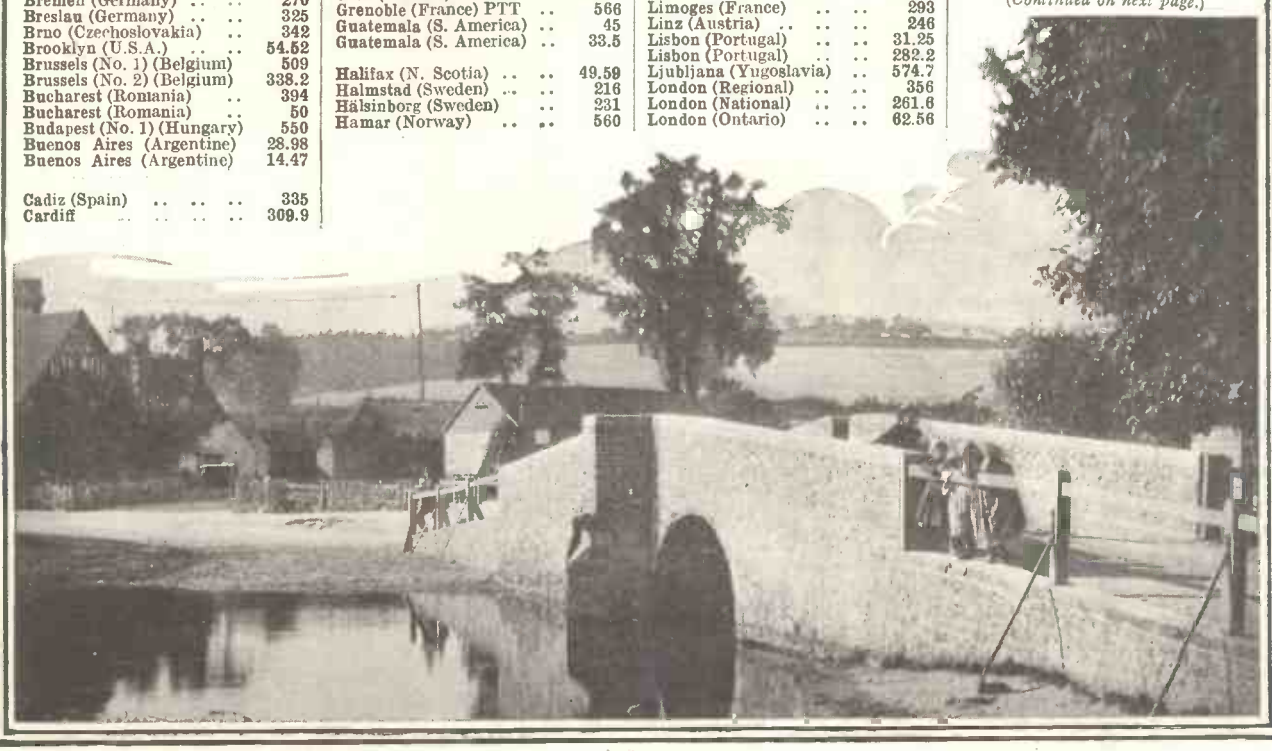
ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON, BIRMINGHAM.

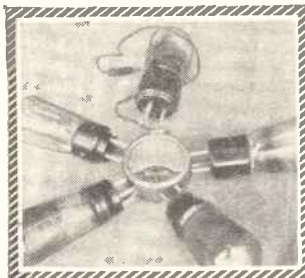
PROGRAMMES FOR YOU

Names and Wavelengths of virtually all the stations receivable in this country.

Name of Station.	Wavelength in Metres.
Aalesund (Norway)	447.1
Aberdeen	214.3
Algiers (North Africa)	363.3
Almeria (Spain), EAJ18	252
Ankara (Turkey)	1538
Archangel (Russia)	390
Augsburg (Germany)	560
Bangkok (Siam)	41
Barcelona, Radio Barcelona (Spain), EAJ1	349
Barcelona, Association National, EAJ15	252
Barcelona (Radio Club)	50
Barranquilla (Columbia)	50
Barranquilla (Columbia)	48.05
Basle (Switzerland)	244.1
Belfast (N. Ireland)	242
Belgrade (Yugoslavia)	430.4
Belgrade (Yugoslavia)	30
Bergen (Norway)	364
Berlin Relay (Germany)	283
Berlin (Witzleben)	419.5
Berne (Switzerland)	246
Beziers, Radio (France)	240
Boden (Sweden)	1229.5
Bodö (Norway)	453.2
Bogota (Columbia)	48.35
Bogota (Columbia)	39.7
Bolzano (Italy), IBZ	368.1
Bombay (India)	49
Boras (Sweden)	207
Bordeaux (Lafayette) PTT (France)	304
Bordeaux - Sud - Ouest (France)	237.2
Bound Brook (U.S.A.)	49.18
Bound Brook (U.S.A.)	46.69
Bournemouth	288.5
Bowmanville (Canada)	49.22
Bowmanville (Canada)	25.4
Bratislava (Czechoslovakia)	279
Bremen (Germany)	270
Breslau (Germany)	325
Brno (Czechoslovakia)	342
Brooklyn (U.S.A.)	54.52
Brussels (No. 1) (Belgium)	509
Brussels (No. 2) (Belgium)	338.2
Bucharest (Romania)	394
Bucharest (Romania)	50
Budapest (No. 1) (Hungary)	550
Buenos Aires (Argentine)	28.98
Buenos Aires (Argentine)	14.47
Cadiz (Spain)	335
Cardiff	309.9
Cartagena (Spain)	246
Casablanca (Morocco)	48
Cassel (Germany)	246
Chapultepec (Mexico)	51.22
Chapultepec (Mexico)	25.5
Chapultepec (Mexico)	20.5
Chatelineau (Belgium)	216
Chelmsford (Essex)	25.53
Chicago (U.S.A.)	49.83
Chicago (U.S.A.)	49.34
Chicago (U.S.A.)	25.34
Chicago (U.S.A.)	16.57
Christiansand (Norway)	235.5
Cincinnati (U.S.A.)	49.5
Constantine (Algeria)	45
Copenhagen (Denmark)	281
Cork (I.F.S.)	224.4
Cracow (Poland)	312.8
Csepel (Hungary)	210
Danzig (Free City)	453.2
Daventry National Stn. (Gt. Britain)	1554.4
Dresden (Germany)	319
Drummondville (Canada)	49.96
Dublin (Ireland)	413
Eindhoven (Holland)	31.26
Eskilstuna (Sweden)	246
Falun (Sweden)	307
Fécamp (Radio Normandie) (France)	223
Flensburg (Germany)	218
Florence (Italy)	500.8
Frankfurt-on-Main (Germany)	390
Fredriksstad (Norway)	367.6
Freiburg-im-Breisgau (Germany)	570
Funchal (Madeira)	26.83
Gävle (Sweden)	204
Geneva (Radio-Geneve) (Switerland)	760
Genoa (IGE) (Italy)	312.8
Gleiwitz (Germany)	253
Göteborg (Sweden)	322
Graz (Austria)	352.1
Grenoble (France) PTT	566
Guatemala (S. America)	45
Guatemala (S. America)	33.5
Halifax (N. Scotia)	49.59
Halmstad (Sweden)	216
Hälsinborg (Sweden)	231
Hamar (Norway)	560
Hamburg (Germany)	372
Hanover (Germany)	566
Havana (Cuba)	49.5
Heilsberg (Germany)	276.5
Helsinki (Finland)	368.1
Heredia (Costa Rica)	29.3
Heredia (Costa Rica)	19.9
Hilversum (Holland)	296.1
Hörby (Sweden)	257
Hudiksval (Sweden)	226
Huizen (Holland)	1875
Innsbruck (Austria)	283
Istanbul (Turkey)	1200
Johannesburg (S. Africa)	49.2
Jönköping (Sweden)	202
Kaiserslautern (Germany)	560
Kalmar (Sweden)	247.7
Kalundborg (Denmark)	1153
Karlskrona (Sweden)	196
Karlstad (Sweden)	217
Kasbah (Tunis)	1350
Katowice (Poland)	408
Kannas (Lithuania)	1935
Khabarovsk (U.S.S.R.)	70.2
Kharkov (Russia), RV20	937.5
Kiel (Germany)	232.2
Kiev (Russia)	1034
Kiruna (Sweden)	246
Klagenfurt (Austria)	453.2
Königsberg (Germany)	217
Königs Wusterhausen (Zecsen, Germany)	1635
Kosice (Czechoslovakia)	293
Kristinehamn (Sweden)	203
Lahti (Finland)	1796
Langenberg (Germany)	473
Lausanne (Switzerland)	680
Leipzig (Germany)	259
Leningrad (Russia)	1000
Leningrad (Russia)	351
Liége (Belgium)	280
Liége Experimental (Belgium)	242.7
Lille (France) PTT	265.4
Limoges (France)	293
Linz (Austria)	246
Lisbon (Portugal)	31.25
Lisbon (Portugal)	282.2
Ljubljana (Yugoslavia)	574.7
London (Regional)	356
London (National)	261.6
London (Ontario)	62.56
London (Ontario)	46.67
London (Ontario)	34.68
Long Island (U.S.A.)	62.5
Long Island (U.S.A.)	34.68
Lodz (Poland) Experimental	235
Lwów (Poland)	381
Lyons (La Doua) (France), PTT	465.8
Lyons (Radio Lyons) (France)	287.6
Madrid (Union Radio) (Spain), EAJ7	424.3
Madrid (Radio España) (Spain)	424.3
Madrid (Spain)	43
Madrid (Spain)	30.4
Magdeburg (Germany)	283
Malmberget (Sweden	436
Malmö (Sweden)	231
Marseilles (France), PTT	315
Maracaibo (Venezuela)	76
Maracaibo (Venezuela)	48.95
Medellin (Colombia)	50.6
Melbourne (Australia)	31.55
Melbourne (Australia)	31.28
Mexico City (Mexico)	49.8
Mexico City (Mexico)	48.65
Midland Regional Stn. (Gt. Britain)	398.9
Milan (Italy)	331.5
Minsk (Russia)	700
Montpelier (France)	286
Moravská-Ostrava (Czechoslovakia)	263.8
Moscow (Russia)	497
Moscow (Old Komintern) RVI	1481
Moscow (Trades Union)	1304
Moscow (Popoff)	1116
Moscow (Experimental)	720
Moscow (U.S.S.R.)	50
Moscow (U.S.S.R.)	45.38
Moscow-Stalin	424.3
Motala (Sweden)	1348
Munich (Germany)	533
Naples (Italy), INA	319
Newcastle	211.3

(*Continued on next page.*)





WHAT THE DISTANT STATIONS ARE DOING

I HAVE two items of news from the East that are important for the DX man.

The first is that the popular Java stations P L E and P L V are to discontinue their Tuesday concerts owing to the depression. The other is that a new Japanese station has been opened in the amazingly named village of Kemikawoa-Cho-Chiba-Ken (near Tokio). This station is working daily between 10.30 a.m. and 12 noon, and employs two wavelengths, 19·36 and 38·07 metres.

So far I do not think it has been received in Great Britain.

Tokio and Rugby

At the present time the well-known Tokio station, J 1 A A, is testing with G B P, Rugby, and has been received at good strength. This station has been employed to re-broadcast concerts to various parts of the world, principally the United States, and has provided both excellent and entertaining reception on these occasions.

A station that was heard extremely well in this country recently is now broadcasting regular monthly concerts to Germany.

U.S.A. to Germany

This station is W 2 X B J, Deal, New Jersey. Re-broadcasts of one or other of the American stations are made through this station upon every second Friday of the month. These concerts are broadcast for the benefit of the German broadcast authorities. A wavelength of 20·49 metres is employed and the station is received at excellent strength in this country.

It is frequently relayed by W E N on 40·54 metres, W M A on 22·3 metres, and other Rockey Point stations.

Record Making

The reason for this is that there are several channels through which the programme can be received in Berlin, and if one of these fades, or is interfered with, the operator at the receiving end merely fades one station in and the other out, so that the programme is kept at constant strength and interference is practically nil.

Readers have doubtless observed that on many of the] occasions when re-broadcasts are made from America to Germany, no German station is taking the programme.

What actually happens on these occasions is that a record of the programme is made at the receiving end and this is "played back" to the listeners at a convenient time.

Medium-wave reception has been excellent, although I have not received America (upon this band) during the month.

Static has been rather troublesome when listening to very faint stations. It has, however, been extremely quiet when listening to the more powerful broadcasters and has only once or twice been really troublesome.

On these occasions a small amount of thunder has soon followed them up and cleared the ether.

Strained Relations

Giant stations are now being built in America in anticipation of the Federal Radio Commission raising the power at which a transmitter may operate. At present no broadcast station may use, during broadcasting hours, a power exceeding 50,000 watts.

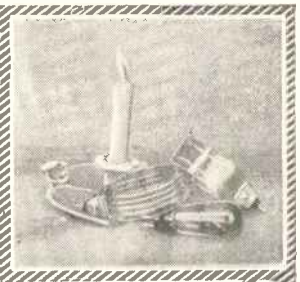
I really doubt whether broadcasting stations in the United States will ever be allowed to employ, for regular work, a power of over 100,000 watts, owing to the fact that, unless some new principle is employed, interference would be so great that it would be likely to lead to strained relations with neighbouring countries, besides making the lot of the listener most unpleasant.

Conditions Improving

There has been a really noticeable improvement in long-distance listening lately, on both the long and the medium waves.

Zeesen, which is not distinguished for regular strength as a rule, has been logged at excellent volume; while on the medium band, Florence, Prague, Heilsberg and Milan have all been reliable on most evenings.

L. W. O.



THE WORLD'S MOST POWERFUL BROADCASTS

PRIOR to the coming of Luxembourg, Europe had two transmitters which could claim to be super-power broadcasting stations—Prague on 488·6 metres, and Warsaw No. 1. on 1411 metres. Both used an aerial power of 120 kilowatts.

America is now to have a super station at Cincinnati, Ohio, using 500 kilowatts.

The highest-powered *regular* broadcasts in America, however, are on a power of 75 kilowatts, which is employed by the Villa Ancuna station (X E R), in Mexico.

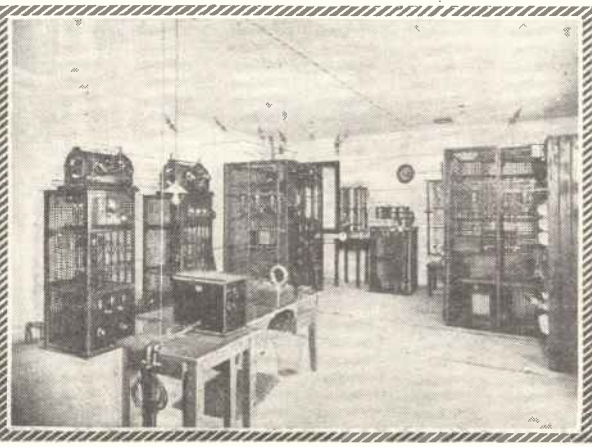
The Limit Reached ?

Although there have been many rumours of extremely high power to be employed at other U.S.A. stations, the Federal authorities have not yet given permission for such schemes, and it is doubtful if there is any demand for them.

PROGRAMMES FOR YOU

(*Continued from previous page.*)

NAME OF STATION	Wavelength in Metres.
Nice (Juan-les-Pins) (France)	249
Nijni Novgorod (Russia)	761·4
Nimes (France)	237·2
Norrköping (Sweden)	232·2
North National Stn. (Gt. Britain)	301·5
North Regional Stn. (Gt. Britain)	480
Notodden (Norway)	447·1
Novosibirsk (Rusia) RA33	1260
Nuevo Laredo (Mexico)	39·4
Nürnberg (Germany)	239
Odessa (Russia)	450·4
Örebrö (Sweden)	237·2
Ornskoldsvik (Sweden)	206
Oslo (Norway)	1083
Östersund (Sweden)	770
Oviedo (Spain)	267·6
Palermo (Italy)	542
Paris (Ecole Supérieure) (France), PTT	447·1
Paris (Eiffel Tower), F L E	1445·7
Paris (Eiffel Tower)	32·5
Paris (Radio Colonial)	25·63
Paris (Radio Colonial)	25·2
Paris (Radio Colonial)	19·68
Paris (Poste Parisien)	328·2
Paris (Radio LL)	370·4
Paris (Radio LL)	33
Paris (Radio Paris), C F R	1725
Paris (Radio Vitus)	312·8
Petrozavodsk (Russia)	778
Philadelphia (U.S.A.)	49·5
Philadelphia (U.S.A.)	31·3
Pietarsaari (Jakobstad) (Finland)	291
Pittsburgh East (U.S.A.)	48·86
Pittsburgh East (U.S.A.)	25·27
Pittsburgh East (U.S.A.)	19·72
Plymouth	288·
Pori (Björneborg) (Finland)	218
Porsgrund (Norway)	453·2
Poznan (Poland)	335
Poznan (Poland)	335
Prague (Czechoslovakia)	488·6
Prague (Czechoslovakia)	58
Quito (Ecuador)	52·5
Quito (Ecuador)	47
Rabat (Morocco)	416
Rabat (Morocco)	32·26
Rabat (Morocco)	23·28
Rennes (France)	272
Reykjavik (Iceland)	1200
Richmond Hill (U.S.A.)	49·02
Riga (Latvia)	525
Riobamba (Ecuador)	45·31
Rio de Janeiro (Brazil)	31·58
Rjukan (Norway)	447.1
Rome (Italy), IRO	441
Rome (Italy)	48·2
Rome (Italy)	25·4
Rostov/Don (Russia)	848·7
Säffle (Sweden)	246
Salamanca (Spain), EAJ22	453·2
Salzburg (Austria)	218
San Sebastian (Spain), EAJ8	453·2
Schenectady (U.S.A.)	31·48
Schenectady (U.S.A.)	19·56
Schweizerischer Landessender (Beromünster) (Switzerland)	459
Scottish Regional	376·4
Sebastopol (Russia)	476
Seville (Spain), EAJ5	368·1
Singapore (Straits Settlements)	41.7
Skamlebaek (Denmark)	31·51
Smolensk (Russia)	565
Sofia (Rodno-Radio) (Bulgaria)	319
Springfield (U.S.A.)	31·35
St. Quentin (France)	175
Stavanger (Norway)	240·6
Stettin (Germany)	283
Stockholm (Sweden)	436
Strasbourg-Brumath (France)	345
Stuttgart (Mühlacker) (Germany)	360·5
Suisse Romande, Radio (Sottens) (Switzerland)	403
Sundsvall (Sweden)	542
Swansea	288·5
Sydney (Australia)	31·28
Tallinn (Reval) (Estonia)	298·8
Tampere (Tammerfors) (Finland)	291
Tananarive (Madagascar)	52·7
Tarfu (Estonia)	465·8
Tashkent (Russia)	1171·5
Tegucigalpa (Honduras)	49·96
Tenerife (Canary Is.)	41·6
Tiflis (Russia)	1071
Tiraspol (Russia)	356·3
Toulouse (France) PTT	255
Toulouse (Radio du Midi) (France)	385
Trieste (Italy)	247·7
Trolhättan (Sweden)	252
Tromsö (Norway)	453·2
Trondheim (Norway)	493·4
Turin (Italy)	273·7
Turku (Abo) (Finland)	246
Uddevalla (Sweden)	229
Umea (Sweden)	231
Uppsala (Sweden)	453·2
Valencia Radio (Spain)	267·6
Vancouver (Brit. Columbia)	49·43
Varberg (Sweden)	249·6
Vatican City (Italy)	50·26
Vatican City (Italy)	19·84
Vienna Experimental (Austria)	1237
Vienna (Rosenhügel) (Austria)	517
Vienna (Experimental)	49·4
Viipuri (Viborg) (Finland)	291
Warsaw, No. 1 (Poland)	1411
Warsaw, No. 2 (Poland) Experimental	214·2
Wilno (Poland)	563
Winnipeg (Canada)	48·8
Winnipeg (Canada)	25·6
Zagreb (Yugoslavia)	307
Zeesen (Germany)	31·38
Zeesen (Germany)	19·73



The TELSEN JUPITER S.G.3

TOTAL COST OF TELSEN MATCHED COMPONENTS **77/-**

FOR BUILDING THE JUPITER S.G.3, *including panel, baseboard, terminals, battery cords and all accessories.*

Utilising a brilliant circuit arrangement devised by Telsen technicians, ensuring the highest amplification under all conditions, with extreme selectivity, exceptionally wide range and superb quality of reproduction. Free full-size 1/- blue prints of this and other Telsen circuits, together with full instructions and a wealth of interesting and valuable information, including particulars of the improved and now all-embracing range of Telsen Radio Components at the still lower prices, made possible by Telsen's enormous sale, are contained in the new, bigger and better issue of the Telsen Radiomag. Get a copy NOW—price 6d. from your radio dealer or newsagent.

CONSTRUCTORS' OUTFIT —DRUM DRIVE AND CONDENSER ASSEMBLY

This is an invaluable accessory to the Constructor building up any of the Telsen Circuits employing the Drum Drive and Condenser Assembly (e.g. the "Jupiter" S.G.3). The various components and accessories included are shown in the illustration above. Cat. No. 219 **3/6**

TELSEN

RADIO COMPONENTS

GOOD RADIO IS A JOY FOREVER

ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON, BIRMINGHAM.

TELSEN

H.F. CHOKES

TELSEN STANDARD H.F. CHOKE

The Telsen Standard H.F. Choke utilises the minimum baseboard space. It is designed to cover the whole broadcast band, has very low self-capacity, and is highly suitable for reaction circuits. The inductance is 150,000 microhenrys and the resistance 400 ohms. It has proved very popular and has been incorporated by set designers in many of the leading circuits.

No. W.75

2/-

TELSEN BINOCULAR H.F. CHOKE

In H.F. amplification the performance of a choke is of supreme importance. The Telsen binocular H.F. Choke is called for wherever the highest efficiency is required. It has a high inductance of 250,000 microhenrys, low self-capacity, and a negligible external field, due to the binocular formation, making it the ideal choke for a high class circuit.

No. W. 74.

5/-

TELSEN

RADIO COMPONENTS

GOOD RADIO IS A JOY FOREVER

ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON, BIRMINGHAM.

THE WIRELESS FIEND ON HOLIDAY

THE FERRANTI SUPER-HETERODYNE

A highly selective seven-valve all-mains receiver of outstanding capabilities, tested in the "M.W." Laboratories.

BY AN "M.W." TECHNICIAN.

WHEN the super-heterodyne principle was first applied to the reception of broadcasting some years ago receivers of that type achieved a certain, but somewhat brief, measure of popularity at the hands of the more ambitious experimenter.

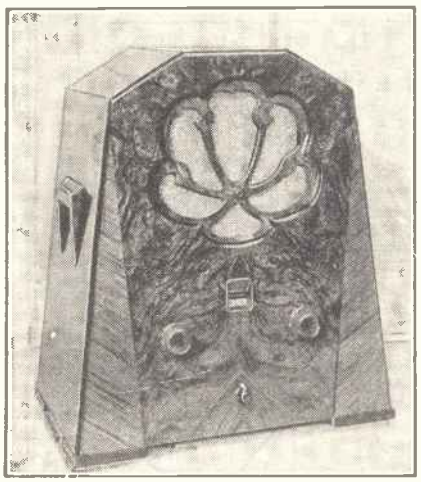
The return to "straight" circuits was due to factors not connected with the principle itself. The difficulties which beset the designer were mainly caused by the inability to obtain stable amplification—there were no screened grid valves in those days—for dull emitters were a variable quantity, and no two were alike in their characteristics.

A Sound Principle

The writer well remembers his early struggles with super-hets. employing from eight to ten valves, and how, one day when in conversation with that well-known physicist and radio expert, Dr. James Robinson, he queried whether the super-heterodyne would live or die. Unhesitatingly the answer came: "It will live."

This has proved to be perfectly true, and the recognised advantages of the super-heterodyne principle have now been rendered practicable by the recent developments in valve and tuning circuit design.

IT IS A "GOOD LOOKER"



The Ferranti super-het. is housed in a very handsome cabinet, which also accommodates a moving-coil loudspeaker. With the exception of the aerial and earth it is entirely self-contained.

The latest Ferranti receiver—which is priced at twenty-two guineas—still further enhances the maker's enviable reputation, and—as will have already been gathered—a super-heterodyne circuit is employed. There are seven valves, including the mains rectifier, and the receiver is "all electric"; that is to say, it plugs straight on to the A.C. mains, no batteries whatever being needed.

The first valve is an H.F. amplifier magnifying the incoming oscillations prior to rectification by the first detector, which incidentally operates on the anode bend principle. Both of these valves are of the indirectly-heated, variable-mu type (Osram V.M.S.4), and the aerial and H.F. circuits are fully tuned.

The separate oscillator valve is a Ferranti D4 indirectly-heated triode employing a tuned grid circuit, with a grid leak and condenser to ensure the correct grid potential; and the aerial, H.F., and oscillator tuning controls are "ganged" so that the whole of the tuning operations are carried out with a single control.

The intermediate amplifier comprises band-pass coupling and a third V.M.S.4 variable-mu valve. Then follows the second detector consisting of a D.4 valve arranged for grid detection.

Simplicity of Control

The low-frequency stage is transformer coupled to a Ferranti type P.4 directly-heated valve, giving a maximum undistorted output of approximately one watt, and the secondary of the transformer is decoupled.

Included in the grid circuit of the second detector are two sockets to enable a gramophone pick-up to be used if desired.

Turning to the controls, there are three only. First we have the tuning knob which operates the three-gang condenser unit, and is provided with an illuminated scale calibrated in wavelengths. Next there is a volume control, arranged so as to vary the grid bias on two of the screened-grid variable-mu valves. Then we have the "on," "off" and wave-change switches actuated by the third knob.

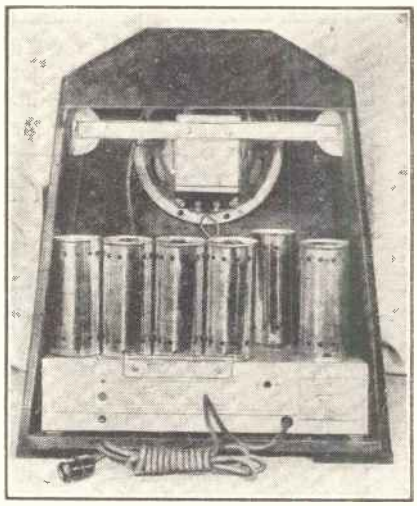
The receiver is intended for use with a conventional aerial, but provision is also made for the use of a mains aerial, a valuable feature in the case of flat dwellers.

Moving-Coil Loudspeaker

The loudspeaker is a mains energised moving-coil, and the makers have incorporated a tone control enabling the higher frequencies to be cut off when desired, thus giving a mellow tone to the reproduction.

When connected to a normal outside aerial the sensitivity was such that the majority of British and continental broadcast programmes could be brought in at full volume.

THOROUGH SCREENING



There are no components in the receiver that are not very thoroughly screened, and even the valves are enclosed in special metal "cans."

The delightful ease of control given by the single tuning control has to be experienced to be appreciated, and this Ferranti super-heterodyne is definitely a musical instrument capable of providing genuine entertainment at the hands of the non-technical listener.

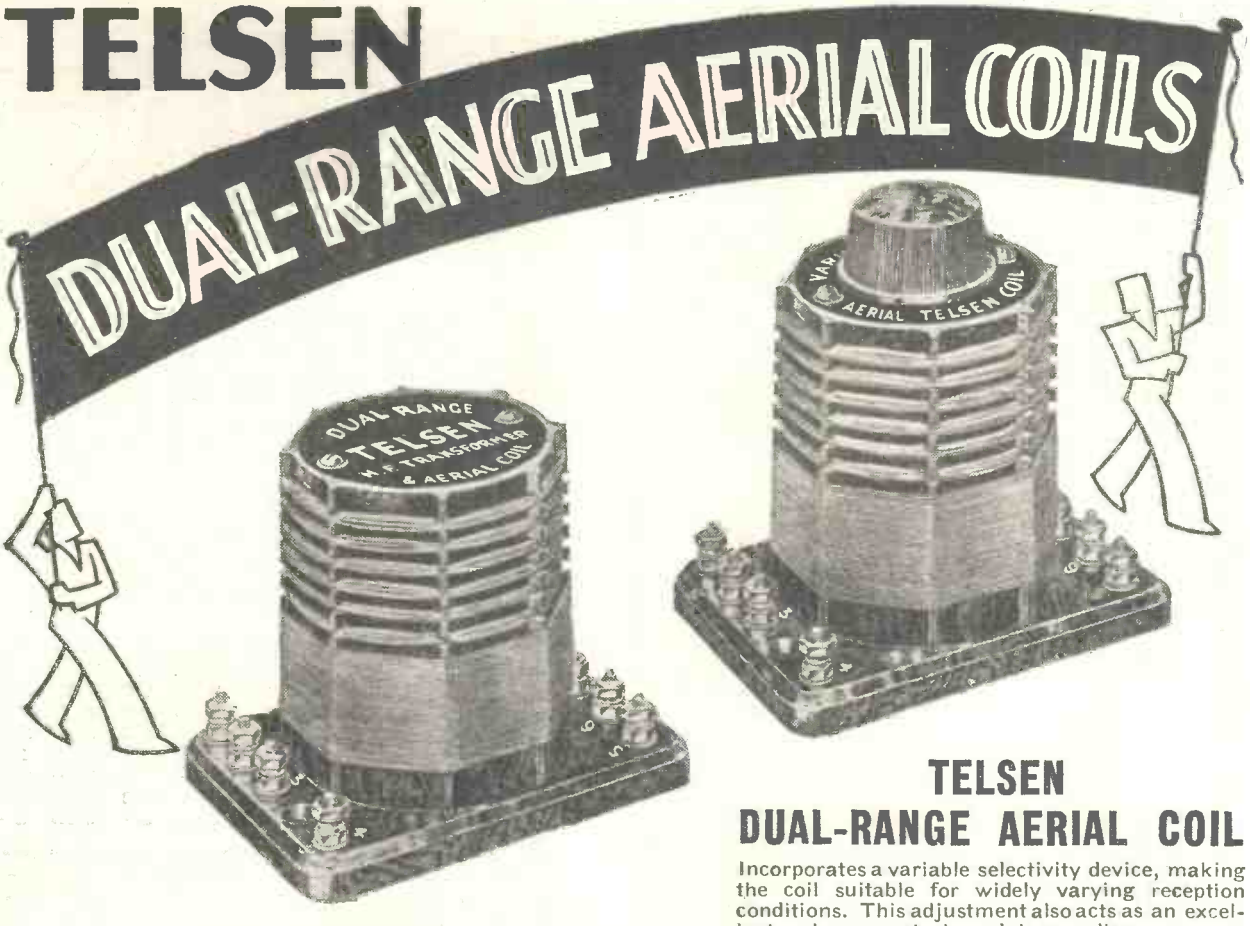
Adequate Selectivity

The selectivity is adequate for all practical purposes, and it could not be increased without detriment to quality.

The tuning control has that sharp cut-off effect which all true band-pass circuits should (but rarely do) give, and the output from the loudspeaker possesses that crispness and clarity which is the hall-mark of the faithful reproducer.

TELSEN

DUAL-RANGE AERIAL COILS



THE TELSEN H.F. COIL

May be used for H.F. amplification with Screened-Grid Valve, either as an H.F. Transformer, or alternately as a tuned grid or tuned anode coil. It also makes a highly efficient aerial coil where the adjustable selectivity feature is not required. No. W.154

5/6

TELSEN DUAL-RANGE AERIAL COIL

Incorporates a variable selectivity device, making the coil suitable for widely varying reception conditions. This adjustment also acts as an excellent volume control, and is equally effective on long and short waves. The wave-band change is effected by means of a three-point switch and a reaction winding is included. No.W.76

7/6

TELSEN COMBINED DUAL-RANGE SHORT-WAVE COIL UNIT

This unit, for the first time, brings the construction of short-wave receivers into line with the simplicity of modern practice. When tuned by a Telsen ·00025 Condenser, a wave range of 20 to 80 metres can be covered by the operation of a switch, as in ordinary broadcast practice. The unit incorporates windings for aerial, tuning and reaction circuits, all coils being wound with stranded wire. The coil is also suitable for use with sets covering all wave-bands with a ·0005 Tuning Condenser. In this case the Dual-range feature is not employed. No. W.174

4/6

TELSEN

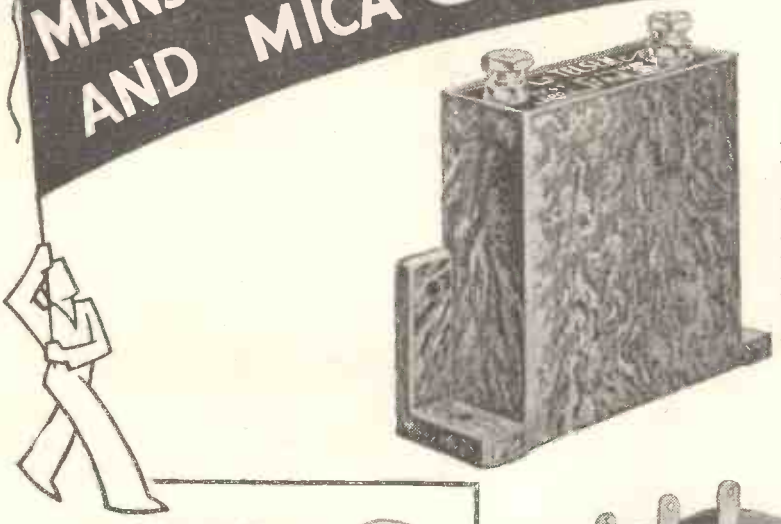
RADIO COMPONENTS

GOOD RADIO IS A JOY FOREVER

ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON, BIRMINGHAM.

TELSEN

MANSBRIDGE AND MICA CONDENSERS



TELSEN MANSBRIDGE TYPE CONDENSERS

These are made by the most advanced processes from the finest materials it is possible to obtain, and subjected during manufacture to a series of stringent tests under laboratory conditions. They are of the true Mansbridge type, self-sealing, non-inductive and hermetically sealed. They are offered in two types, the capacities from ·01 to 2 Mfd. in Bakelite cases, and in blocks of 4, 6, and 8 Mfd. in metal cases with soldering tags.

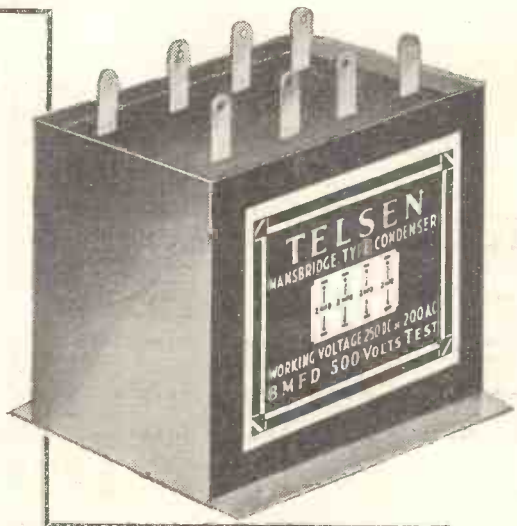
CAP. MFD.	500 Volt Test NO.	PRICE	1,000 Volt Test NO.	PRICE
·01	W.232	1/6	W.239	2/6
·04	W.230	1/9	W.237	2/9
·1	W.231	1/9	W.238	2/9
·25	W.229	2/-	W.236	3/-
·5	W.228	2/3	W.235	3/3
1·	W.227	2/3	W.234	3/6
2·	W.226	3/-	W.233	5/-

TELSEN TAG CONDENSERS

This type is of extremely compact and sturdy construction. It may be mounted on either insulated or metal panels by utilising the two baseboard screw holes in the neatly designed moulded casing. The tags enable the condenser to be connected to any other component, either directly or by soldering. H.F. losses are negligible. The capacity is stamped on the soldering tag.

CAPACITY.	NO.
·0001	W.207
·0002	W.208
·0003	W.209
·0004	W.210
·0005	W.211
·001	W.212
·002	W.213

6D.



TELSEN MANSBRIDGE BLOCK CONDENSERS

These are contained in metal cases finished in brown and with fixing holes. As with the other types of Telsen Mansbridge Condensers, they are self-sealing, non-inductive and hermetically sealed. Three types, each made having total capacities of 4, 6, and 8 mfds., each type being divided into 2-mfd. sections, so that several arrangements of capacity may be obtained. Neat and substantial soldering tags are provided for each section.

CAP. MFD.	500 Volt Test CAT. NO.	PRICE
4	W.175	5/6
6	W.176	8/-
8	W.177	10/6

1,000 Volt Test. CAT. NO.	PRICE
W.178	9/6
W.179	14/6

TELSEN "MICA" CONDENSERS

The New Telsen "Mica" Condensers represent an important advance in technique: H.F. losses have been practically eliminated even in the larger capacities. In order to distinguish them from the earlier type, now to be discontinued, the new condensers are enclosed in a redesigned case, which, while possessing all the adaptability of the previous one as to flat and vertical mounting, is of more attractive appearance. Grid-leak clips may, as heretofore, be mounted in series or in shunt and are supplied at no extra charge with capacities ·0001, ·0002, and ·0003 mfd.

CAP. MFD.	NO.	PRICE
·0001	W.240	1/-
·0002	W.241	
·0003	W.242	
·0004	W.243	
·0005	W.244	
·001	W.245	
·002	W.246	
·006	W.247	1/3

TELSEN PRE-SET CONDENSERS

Very low minimum capacity, giving a wide range of selectivity adjustment when used in aerial circuit. Substantially made, easily adjusted and provided with locking ring. High insulation and low loss.

MAX. CAP. MFD.	MIN. CAP. MFD.	NO.	
·002	·00025	W.149	1/6
·001	·000052	W.150	
·0003	·000016	W.151	
·0001	·000005	W.152	

TELSEN

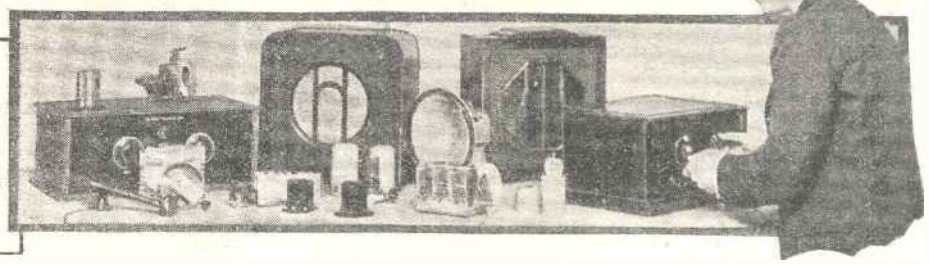
RADIO COMPONENTS

GOOD RADIO IS A JOY FOREVER

ANNOUNCEMENT OF THE TELSEN ELECTRIC CO. LTD., ASTON. BIRMINGHAM

AT YOUR SERVICE

by OUR TRADE COMMISSIONER



The Radio Exhibition

ONCE again we have reached the beginning of a new radio "season." Not that the industry is dead during the summer, but like most it fixes a time when it becomes more than usually alive, and introduces with due regularity every year new components and fresh set designs.

Like the motor trade, the radio industry has its show, and this is held each year to usher in the new products at the most propitious time—just before the winter, when there is undoubtedly more interest in broadcast entertainment than in the summer months.

Beneficial Effect

This year the show is earlier than usual, it being believed that the extra month that is thereby allotted to the "live" period will have a beneficial effect upon the trade. Whether this will be so remains to be seen, but it is indisputable that at the time of writing, and increasing in intensity to the time of the exhibition itself, the whole radio trade is at it hammer and tongs getting out the new lines and finishing off fresh sales matter and advertising programmes.

Radio receivers are cheaper on the whole, though the decrease in prices is not so marked in the case of sets as it is in the loudspeaker department. Here the most notable thing is the rapid development of the small moving-coil unit, with a correspondingly rapid reduction in price.

Sets More Attractive

Sets are more attractive than ever, and for the first time H.M.V. have entered the battery-set market. The receiver which inaugurates this departure is a super-het transportable, with an anode current consumption of only 10 milliamps. and a remarkable performance.

The Radio Exhibition this year is bigger than ever, and in spite of its being in August, it is expected that a most successful attendance will be obtained.

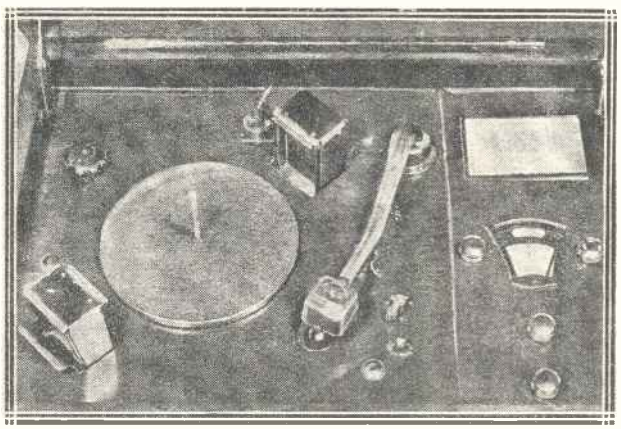
Nearly 300 stands have been allotted to the numerous manufacturers that have taken space in the vast hall at Olympia, and this year the large hall is being used for the first time.

Varied news of the trade that should interest all readers, whether or not they are connected with the radio industry.

Standard Telephones

It is announced that the radio and sales department of Messrs. Standard Telephones and Cables, Ltd., is now at The Hyde, London, N.W.9, the establishment being adjacent to the Hendon aerodrome. 'Phone Colindale 6533. The main registered offices are at Aldwych, in Connaught House.

NON-STOP VARIETY



A close-up of the motor board, showing the automatic record changer of the new H.M.V. Super-het Auto Radio-gram. Many improvements have been made in the mechanism, which is now even more simple to use than before. Either 10 or 12-inch discs can be accommodated, and eight records can be played, giving a non-stop "variety" (or classical music) programme of half an hour or more.

A Magnificent Gift

Few more generous actions have been witnessed than that of Mr. Macnamara, Managing Director of Telsen Electric Ltd., when he recently presented the General Hospital at Birmingham with a cheque for £25,000. Previously he had given £1,000 to the Birmingham hospitals during the special opera week, but this larger gift is in the nature of a special thankoffering and acknowledgment of treatment he received many years ago from the hospital.

The £25,000 will go a long way to the realisation of the sum that has been the subject of a special appeal by the mayor.

The "Bloodhound" of Radio

That is the intriguing name applied to the "All-in-One" Radiometer by its patentees, Messrs. Pifco Ltd., High Street, Manchester.

Practically every part of a radio set can be tested in a few minutes with this instrument. Valves (filament, anode and grid circuits), batteries, accumulators, speakers, transformers, condensers—any component in fact gives an instant account of its state when "vetted" with an "All-in-One" Radiometer.

There are two types of this instrument — the Standard Model price 12s. 6d. and the "De Luxe" Model at £2 2s. The former is intended only for battery sets, but makes possible the most thorough and searching test of such sets, even by a novice.

ROUND the TURNTABLE

By "TONE-ARM."

About a valuable handbook dealing with all aspects of radio-gramophones and some interesting facts concerning the production of radio-grams and pick-ups.

I HAVE just had handed to me a most interesting and informative book issued by "The Gramophone." It is the official handbook of that journal, and contains some very useful information for gramophone enthusiasts.

A great deal of the acoustic section is of no practical value to the owner of a radio-gramophone, but it is nevertheless very interesting and well worth reading.

The rest of the book, with its particularly informative chapter on record faults, is by itself a good return for the shilling asked for this publication.

The "miscellaneous hints" chapter is also of particular value to radio-gram users, though perhaps there are not many of them who use a fibre or non-metallic needle, and so the parts dealing with that type of reproducer, and its effects, will not be of other than theoretical interest.

Very Wide Scope

From cover to cover the handbook contains 120 pages, and almost every important aspect of the reproduction of "canned" music is dealt with.

An interesting chapter of queries is provided at the end of the book, while the section devoted to needles should be carefully read by all. The "Pick-up Connections" chapter is also of great value to every practical man, containing, as it does, numerous figures showing the arrangement of volume controls and radio-gram switching methods which cover practically everything likely to be required by the average home constructor or listener.

For those interested in theory the chapter is essential in its subject matter; to all who would experiment with radio or electrical record reproduction we commend pages 88 to 97 inclusive.

Easy to Follow

They deal extremely well with the most important of all electrical laws, the famous Ohm's Law, and all sorts of applications are quoted in a most simple fashion, so that everyone can not only follow the working, but can see how important is the law in all electrical practice.

I could go on for a long time describing the various sections of the handbook, but space forbids. I do, however, most strongly commend the book to my readers who want to dig deeper (but not by any means out of their depth) into the working of the gramophone.

The subject is a fascinating one, and "Gramophones Acoustic and Radio" will do a great deal to further their knowledge of the science.

Facts and Figures

Manufacturing facts and figures are always interesting, and these concerning the H.M.V. factories at Hayes will be particularly so to our radio-gram readers, so here goes!

The vast H.M.V. factories cover nearly 60 acres, and in these every part of "His Master's Voice" radio receivers and radio-gramophones are made. Most exhaustive tests are carried out on models before they are put in production, and it is of interest to know that besides testing the instruments in the large Research Laboratories at Hayes, a large amount of experimental work is also carried out at Dawley House, a private mansion in large grounds near Hayes, which the company purchased recently and which is nick-named the "Hush-Hush" House.

When an experimental set is in more or less its final form it is tried out on at least twenty supply currents in all parts of the country, and in the case of the larger instruments experimental models are sent to "His Master's Voice" associated companies abroad, where further

(*Continued on page* 305.)

ROUND EUROPE ON A DISC

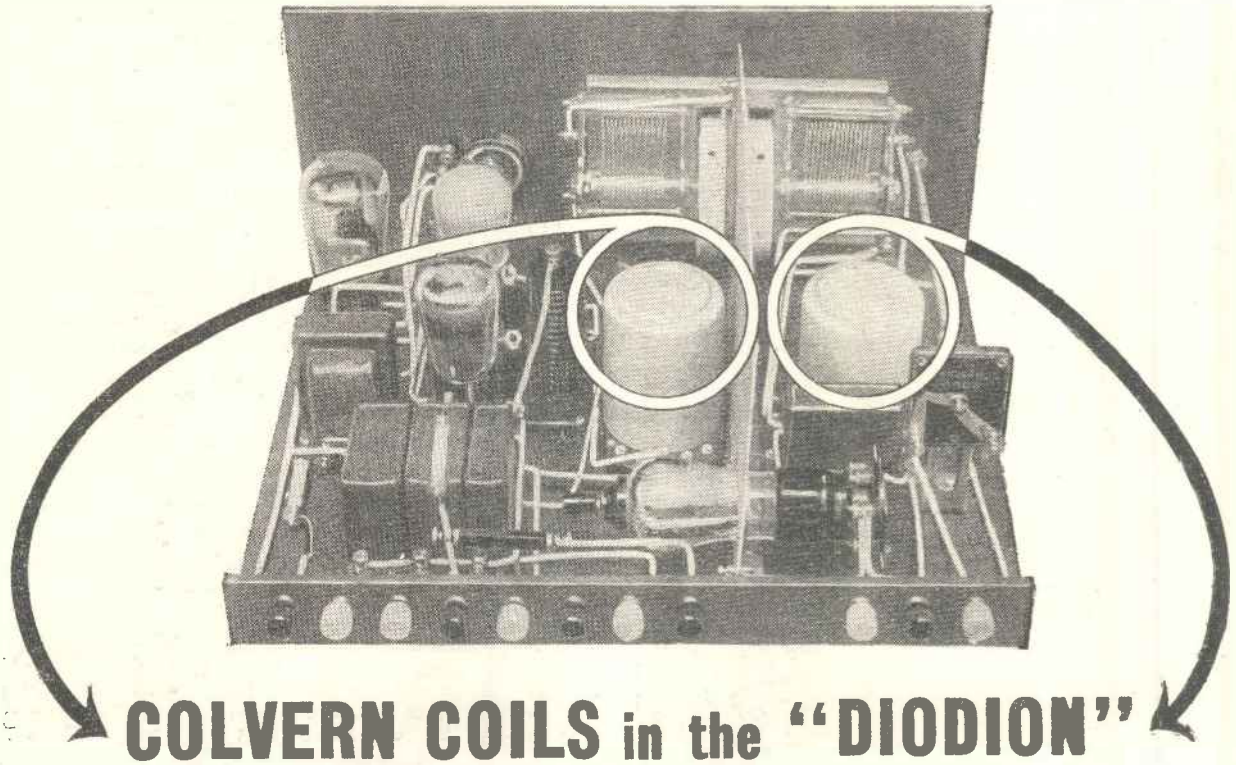
A group of artistes at the H.M.V. recording studios during the making of a unique "Round Europe" record. This particular scene represents a cabaret which is visited by the compères of the records.

PROGRESS

Whenever advances are made in receiver design, COLVERN COILS will be available.

COLVERN COILS

They were the choice of the designers of the "DIODION"... make them your choice



COLVERN COILS in the "DIODION"

2 Dual-Range Screened Coils
Type TD 8/6 each

COLVERN COILS are available for Modern Receivers

Our 1933 Booklet R.L. No. 10 is now available and free on request

Stand No. 245 Radio Exhibition, Olympia
August 19th-27th

COLVERN LIMITED, MAWNEYS ROAD, ROMFORD, ESSEX

Radio

NEW RANGE OF LOUD SPEAKERS

GECoPHONE ALL-ELECTRIC RADIO RECEIVER for A.C. Mains.

"SUPER-HETERODYNE" Model.

Cat. No. BC3358.

PRICE including OSRAM VALVES and Royalty **26 GNS.**

HIRE PURCHASE: Deposit £2 5s. 0d. and 12 monthly payments of £2 5s. 0d.

SUPERB QUALITY yet competitive in price

By choosing a GECoPHONE you assure to yourself the utmost enjoyment from modern broadcasting. Qualities which have made GECoPHONE famous — reliability, real engineering construction and simplicity of operation—are brought up-to-date to meet present day conditions. G.E.C. offers the best investment in efficient, trouble-free and economical home entertainment—all the best broadcasting programmes delightfully rendered and gramophone reproduction as you never heard it before.

GECoPHONE ALL-ELECTRIC RADIO RECEIVER for D.C. Mains.

"NOMAD" Model.

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PRICE including OSRAM Valves and Royalty. **23 GNS.**

HIRE PURCHASE: Deposit £2 0s. 0d. and 12 monthly payments of £2 0s. 0d.

NATIONAL RADIO EXHIBITION

See the complete range of G.E.C. Radio Products on the G.E.C. Stands.

GECoPHONE ALL-ELECTRIC RADIO RECEIVER for A.C. Mains

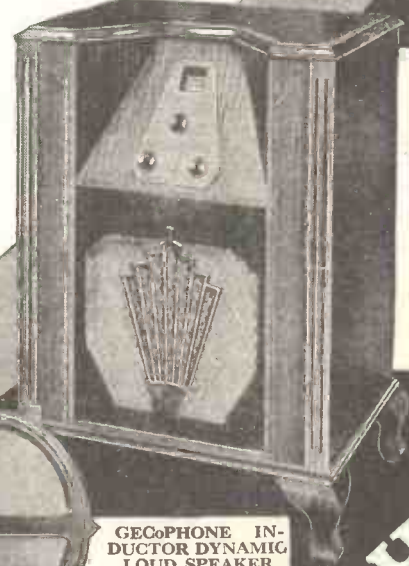
"CONSOLE" Model.

Cat. No. BC3244

REDUCED PRICE

including OSRAM VALVES and Royalty **24 GNS.**

HIRE PURCHASE Deposit £2 2s. 0d. and 12 monthly payments of £2 2s. 0d.



Sold by all Wireless Dealers

GECoPHONE PERMANENT MAGNET MOVING COIL LOUD SPEAKER

Cat. No. BC1825.

PRICE £3.15

Chassis only, Cat. No. BC1820.

PRICE 45/-

GECoPHONE INDUCTOR DYNAMIC LOUD SPEAKER CHASSIS

(Farrand Inductor Patent)

Cat. No. BC1850.

PRICE

£3.10

COUPON

Please send me Folder No. B.C. 6312 giving particulars of GECoPHONE Radio Receivers and Loud Speakers

Name .....

Address .....

The General Electric Co. Ltd., Magnet House, Kingsway, London W.C.2 MW

Cut out and paste on a postcard, or enclose in unsealed envelope. ½d. postage.

— G.E.C. Radio

Branches and Public Showrooms throughout Great Britain

HOW TO OBTAIN BETTER RADIO

A new feature for all listeners, providing numerous practical hints and tips for maintaining a radio receiver in good order, and showing how time, trouble and money can be saved in its use and operation.

THE contents of this new section will conform to no set schedule nor to any particularly hard and fast rules. Its limits are the boundaries of home radio, and anything which lies within them may be dealt with.

The guiding principle to which the compilers will work is indicated by the title "Better Radio," and they will aim at including as wide a variety of information as they can in each instalment.

There will be numerous hints and tips of an entirely practical nature for listeners who do not know the slightest thing about the theory of radio, or who have had no previous experience at all of manipulating a set.

And mechanically-minded enthusiasts and those who desire to "tinker" intelligently and with good results will also be catered for. We hope to make "Better Radio" the most useful and popular feature in wireless journalism.

CONSERVING YOUR H.T.

Because the grid-bias battery is small in size and the current drawn from it minute in character, it is regarded by many as an unimportant accessory.

CURRENT SAVING

By adjusting the grid-bias-battery's tappings as explained on this page it is possible to add hours of active life to your H.T. battery

In actual fact its work is almost as vital as that of the H.T. battery, and it should be changed as soon as ever its voltage falls seriously. A voltmeter test of the grid-bias battery should be made every time the H.T. battery is tested.

The grid-bias figures given by the makers of valves are those which enable the valve to give its greatest undistorted output for a given H.T.

But some may not want a volume representing such an output, and if you are one of these "quiet" listeners, try giving your L.F. valves a little more G.B. If you can do so without distortion occurring you have a clear gain, for there will be less H.T. current consumed—a great advantage where dry batteries are concerned.

MORE PROGRAMMES FROM PORTABLES

Portable sets operate at a serious disadvantage; their aerials are so small that they cannot compare in efficiency with even a few yards of wire stretched across a room.

In order to achieve sensitivity, therefore, a portable has to employ more valves than would otherwise be the case. This means, other things being equal, a greater L.T. and H.T. battery drainage.

Lightening the Load

And when such a set is used indoors, within easy reach of an ordinary aerial, it is a pity that this cannot be taken advantage of. It is true that many portables have terminals for external aerials, but it is not always the greater range so much as a lighter load on the batteries that is needed. (We will deal with the range question later.)

It is not at all a difficult matter to connect up an external aerial and, at the same time, cut out a valve or two. Then you have approximately the same power with a lighter use of the batteries.

But it is a job which requires some fair knowledge of radio, and we do not advise the tyro to attempt it. However, there is no reason why he should not approach his local dealer and ascertain if and for how much he could do the work for him.

A terminal should be fixed accessibly for the aerial, and another for the earth connection. It should be necessary only to pull out the unwanted valves in order to do the switching.

Quite a different matter is the extension of the range of a portable by adding either or both an external aerial and earth to it.

Remarkable Reception

Sometimes by quite simple expedients a set can be made to perform what are striking feats of reception in comparison with its normal condition.

You can connect a wire to its L.T. or H.T. battery negative terminal and run this wire to a water-pipe or a fireguard or other mass of metal.

The wire need not necessarily be short, and anything up to twenty or thirty feet will prove suitable.

An aerial can be brought into use with a portable in several ways. Here is one: Take the lead-in and, if it is not long enough to give you a spare length of, say, about 6 ft., connect some extra wire to it.

AN EASY ADDITION

A short external aerial or an earth connection may greatly extend a portable set's range of reception.

Now wrap this lead-in round the portable; just loop it over the top, down the sides, and under the base, so that you get two or three complete turns of the wire enclosing the set.

You do not connect the end of the wire to anything. Join up an earth as above in addition if you can.

A more efficient method is to connect the aerial to the grid-terminal of the first valve through a small variable condenser. One having a maximum capacity of ·0002 mfd. would suit.

But don't try this unless you are certain you know the point referred to and have easy access to the interior of the receiver.

Of course, if there is an aerial terminal on the set there is no need for an improvisation of the above character.

CUTTING OUT THE LOCAL

There are two schemes for improving the selectivity of a set which can be tested by any listener.

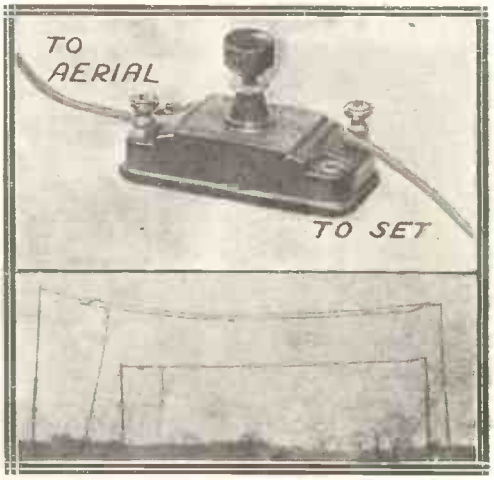
The first and simplest is merely to shorten the aerial. Instead of having, for example, an 80-ft. double-wire aerial, a single wire of only 60 ft. in length could be tried. (Reductions to as low as 30 ft. may be practicable.)

Little Power Lost

You will often be agreeably surprised at the increase in station-separating powers given to the set by this, and the very little power that is lost in the process.

The other scheme is to buy one of those so-called compression condensers (they cost only a couple of shillings or so each) having a maximum capacity of ·0002 mfd., and join this between the aerial and the set in the manner indicated in the accompanying photo.

SEPARATING THE STATIONS



Two easily-applied methods of increasing the selectivity of a set.

How to Use Two or More Loudspeakers

In the case of a very powerful receiver you may find it advantageous to dispense entirely with the outdoor aerial and use instead a few yards of wire concealed within the same room as the set.

Particularly does this apply during the autumn and winter, when the stations come over in the evenings so well.

But in the summer, and with less powerful sets, the loss of power occasioned by the elimination of an outdoor aerial may be too much.

STOPPING ACCUMULATOR SPRAYING

An accumulator is liable to bubble and froth during, and for a short period after, charging, and it is the minute particles of acid which are thrown up by this activity which tend to get on to the terminals and cause corrosion.

A Little Oil

The fact that the cells are almost entirely enclosed does not prevent this happening, for so long as the vitally necessary vent-hole is there, acid vapour can result in a "creeping" of acid over the terminals.

But the spraying and creeping can be reduced to negligible proportions by pouring some hard mineral oil, such as chemically pure paraffin, into each cell. There is a special oil known as "Blancol" which is actually made for the purpose. A layer of an eighth of an inch or so above the acid will suffice.

LOUDSPEAKERS IN DIFFERENT ROOMS

Judging from our correspondence it would seem that quite a number of listeners imagine that a special set is needed to drive more than one loudspeaker.

As a matter of fact, practically any receiver, even a small two-valver, will operate at least three loudspeakers fairly comfortably, and in many cases there will be hardly any appreciable loss of volume on the original instrument.

Series Connection

In most instances it is advisable to join the loudspeakers in series. Supposing it is desired to operate a second loudspeaker:

Disconnect one lead of the old loudspeaker's pair and join this to one lead from the new instrument; connect the remaining lead from this latter to the vacated loudspeaker on the set.

An easy way to remember what a "series" arrangement indicates is to think of the "juice" from the set as passing through each loudspeaker in turn.

The only complication you are likely to come up against is that your existing loudspeaker may be of low resistance, and there might be an output transformer in the set which is stepping-down the voltage of the output to a degree unsuitable for the average high-resistance loudspeaker.

When the original loudspeaker has a transformer built in it or in its cabinet, there is no need to worry—you can be sure your set's output is suitable for all normal speakers.

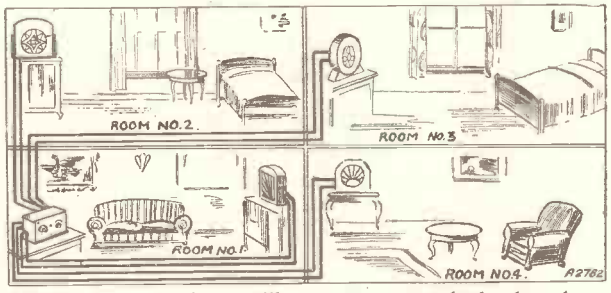
Filter Desirable

If you desire to run long leads from the set in order to operate loudspeakers in other rooms, it is most desirable that there should be a choke-capacity or transformer output in the set itself, even though the loudspeakers incorporate transformers of their own. (In a future instalment of "Better Radio" we will describe how such a modification can be made.)

With a "plain" output the H.T. current will follow these long leads and special insulating precautions will be needed.

However, with a "filter" output you have great freedom. Quite thin wire can be employed, and it does not matter, within reason, how and where you run it.

MUSIC ALL OVER THE HOUSE!



Almost any receiver will operate several loudspeakers effectively, and it is by no means difficult to wire them up for working in different rooms.

You will find it better all round, though, to keep it as near floor level as possible, for there are greater facilities for concealment down there.

Don't be misled by the inviting picture rails, if you have these runinng round the room. They are fine for getting the wire across the room, but when you get to the doorway or to the point where you wish to bring the lead down again, then you will find it most difficult to hide the evidences of your handiwork.

No, stick to the floor, and when there is no convenient linoleum or carpeting, don't be put off by that, for floorboards are by no means difficult to raise.

If you have noted where the gas, water and electric light wires have been run, you will probably find that the way has been nicely prepared for you, for plumbers and gas-men nearly always only lightly nail those boards which they might at any time have to raise in order to execute repairs.

The problem of getting the leads from one room to another is easily solved in this manner in most houses. But keep your wires as far away from the pipes and power lines as you can.

Sometimes it is rather difficult to get the wires from one floor to another, and it is here that stairways come in very useful.

Another Way Out

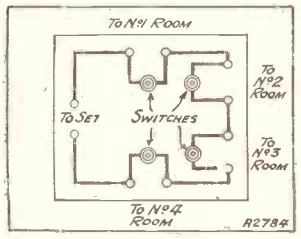
Generally, the undersides of stairs are quite accessible from cupboards or a cellar, but if they are not, then it may be possible to take the leads up or down under the material which covers the stairs. However, you must not forget to see that they are not cavalierly treated when the carpet or oilcloth comes up for cleaning operations.

When three or four loudspeakers, each situated in its own room, are being worked by the one set, it is desirable to have a small switchboard so that any one speaker can be turned on or off as desired. The plan of such a switch is shown on this page.

Easily Made

It consists of ten terminals and four simple, single-pole switches of the type used for switching a set on and off. These items can be mounted on a small ebonite panel, though a piece of hard wood will do quite well.

SIMPLE SWITCHING



An easy-to-make switch-board for switching four loudspeakers.

CONCEALING THE WIRING.

It is easier to connect loudspeaker leads when they run at or below floor level. Floorboards are often quite simple to remove, and in any case, thin wires can be run beneath carpets and linoleum.

As you will see, the terminals are arranged in series, i.e., the energy will go through each loudspeaker in turn. The switches are wired so that the loudspeakers not required are "shorted" out of action.

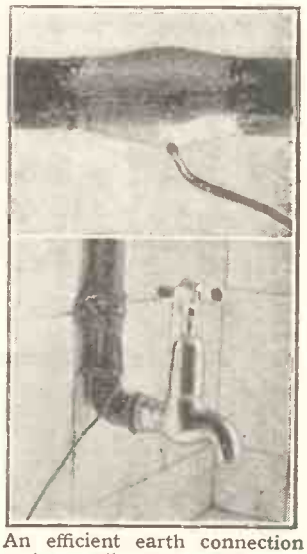
MOVING-COIL MAGNETISM

The magnets used in moving-coil loudspeakers are very powerful and in many instances there will be a strong field of magnetic influence surrounding them.

This may have a serious effect on clocks and watches should these be brought close to them. There is not likely to be any danger beyond a distance of a foot or so, but if you wear a wrist-watch it will be advisable for you to take this off when lifting the speaker or doing anything in its immediate vicinity.

It is extremely easy to magnetise a watch, but most difficult to repair the damage.

WORTH DOING



An efficient earth connection makes all the difference between unreliable and consistently good results.

THAT EARTH CONNECTION

A great deal has been said of late regarding the damaging effects a wireless earth connection can have on a water-pipe. Indeed, it has been suggested that some of the water companies are contemplating action to prevent listeners using water-pipes for earthing purposes.

It is not the fact that it is a connection to a radio set which is causing alarm, the wireless part of the business is of no moment.

Electrolytic Action

The damage is due to an electrolytic action which is always likely to be set up when two dissimilar metals are kept in contact. The conditions are absolutely favourable when, for instance, a copper wire is wrapped round a lead pipe.

But it is not in the listener's own interests that he should allow an electrolytic, corroding action of this kind to take place, because the result can only be a bad earth connection.

There'll be Another Instalment of "Better Radio" Next Month

The soundest method of ensuring a first-class joint between the earth wire and the water-pipe is to get a plumber to "sweat" the wire on.

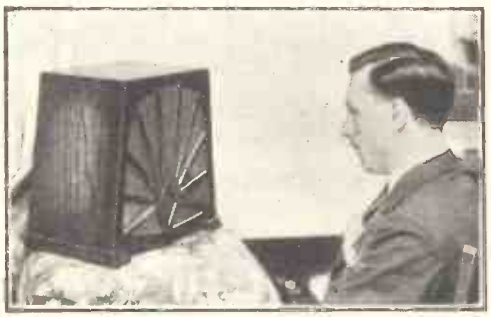
Alternatively, there are clips to be obtained similar in pattern to those employed by Post Office engineers for making earth connections for telephone systems. Quite a number of the other kinds of clips, however, are by no means as satisfactory as they should be.

PLACING YOUR LOUDSPEAKER

When someone is speaking to you you look in his direction, and if you hear a sudden and unexpected noise you will probably quite automatically turn in the direction from which it comes.

Sight and sound are, as it were, natural allies. Therefore, you will find your radio listening easier if you

BEST AT "EAR LEVEL"



You will discover that the best listening results when the loudspeaker is at "ear level" and you are directly facing the instrument.

arrange your loudspeaker so that, without twisting your head, you can rest your eyes on it.

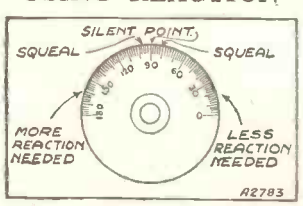
It should also be at "ear level," because certain of the notes are emitted by the average loudspeaker in a directional manner—like a somewhat broadening beam from a searchlight.

SOME TIPS ON TUNING

There are many receivers which are so designed that the reaction control can be used as freely as desired without fear of causing interference to neighbours. In general these are sets having screened-grid H.F. valves and sets of the super-heterodyne type.

Where there is no H.F. amplification at all, it is fairly certain that every time the reaction is overworked squeals are generated in neighbouring installations.

USING REACTION



A pictorial guide to the most effective use of the reaction control (see text).

But if you must squeal, and accidents do happen, cut the period down as much as possible. Not that we consider "oscillation" can be defended on the grounds of expediency; we don't, but we believe there would be fewer squeaks in the ether if the operation of reaction were more generally known.

The Silent Point

The first thing a listener should learn is how to locate the "silent point" of a station.

This lies between two points on the dial where, when reaction is over-applied, there will be squeals.

Supposing the reaction control is "full in." You turn the tuning dial slowly, very slowly, until you hear a high-pitched squeal. Continuing to rotate the dial extremely slowly, the pitch of the squeal falls until it becomes a mere grunt. Then it vanishes altogether, though a further slight dial movement, still in the same direction, brings back the grunt which rises to a squeal, higher, higher and higher in pitch until it disappears.

The fact that you have passed a point where there is no squeal must not mislead you into thinking that the set stops oscillating. What happens is that the reaction is feeding energy back at the same frequency as the station itself, in short, you are dead in tune.

A slight movement of the tuning dial in either direction results in a discrepancy between your oscillation and that of the radio station, and the difference is exactly represented by the pitch of the squeal you hear.

If the station has a wavelength of 300 metres, that equals a frequency of 1,000,000. Should your set be tuned to a frequency of either 999,000 or 1,001,000 you will hear a squeal having a frequency of 1,000.

It is bad practice to "sit" on the silent point because, though your set's sensitivity is very great, there is bound to be distortion. But a knowledge of how to find the condition is very useful for rapid station-searching with S.G. sets. On the short waves it is almost indispensable.

But ease the reaction back until the set stops oscillating, and when doing this it may be necessary very slightly to alter the tuning, for reaction generally affects the tuning to a small degree.

"Backlash" is Serious

Most sets oscillate more easily on the lower dial readings, so, as our diagram illustrates, it might be necessary to apply more reaction for the longer-wave stations.

You will now no doubt see why it is that "backlash" on tuning dials is a serious fault. "Backlash" is a mechanical ailment. It shows itself in this way.

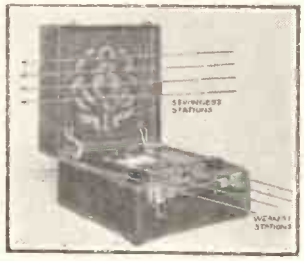
Rotating the dial in one direction carries the vanes of the condenser steadily rotating, but when the dial is moved in the opposite direction the vanes remain stationary for a period before they are "taken up" and set moving.

Thus you can have a movement of the dial which is quite misleading, for there has been no capacity change corresponding with it. It is the understanding and application of the knowledge of such points which make all the difference between successful and poor long-distance reception.

SELECTIVITY WITH A PORTABLE

The position of a portable determines its sensitivity to a particular station because frame aerials (and these figure in most portables) have highly directional qualities.

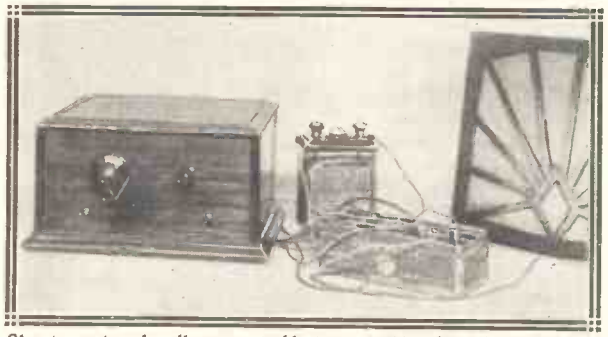
WHICH DIRECTION?



Although the reception of a station is loudest when the portable is in line with that station, this position may not be advisable if you find it difficult to separate two or more adjacent programmes.

Our photo indicates the two extremes of strongest and weakest results. If you have difficulty in separating two or more programmes with a portable these directional qualities can be used with great advantage.

UNTIDY WIRES ARE DANGEROUS



Short, neat and well-separated battery and loudspeaker leads are essential if you want to avoid short-circuits and other troubles.

You should aim not so much at the greatest power from the desired station as the obtaining of the weakest "pick-up" from the station or stations which are not desired.

And if you wish to discover the appropriate direction from which any one station's transmission is coming, work on its weakest, not its strongest results when you shift the set round, using it as a direction finder.

THOSE CONNECTING LEADS

Always join up the battery lead of a set so that the live ends of the leads are never loose. That is to say the wires should be connected to the set first and to the batteries last.

Do not employ cheap cotton covered leads, but obtain a high-grade rubber-covered flex.

A two-volt accumulator cell may look a harmless enough article, but it is able to provide as much power and more than is needed to run a bright ceiling light.

True its voltage is very low, but it can supply plenty of current, and it is current which melts wires.

If the two L.T leads come into contact with each other a dangerous fire could quite easily be started, because an L.T. short-circuit can result in even thick wires glowing white with heat.

Indeed, the L.T. battery is possibly more dangerous than the H.T. battery from the conflagration point of view.

If the L.T. and H.T. leads are mixed, the valves may get burnt out.

In any case, untidy leads do not make for "better radio." The least that is likely to happen is that distortion and knocking might follow from a confusion of loudspeaker, battery and other leads.

Aim at making all the wires as short as possible and keep them well separated. There is nothing against those combination battery cords, indeed, they make for tidiness and ensure that the battery feeds are well away from the aerial and loudspeaker wires.

TESTING A MAINS UNIT

A voltmeter tests the difference of potential, the degree of electrical pressure, existing between two points.

But when you use a voltmeter you should be careful you do not apply a voltage difference to two parts of your body!

You would not feel an L.T. and G.B. voltage, but quite a hefty shock can be given by a large H.T. battery or a mains unit—particularly the latter.

Some of you may be able to stand as much and more voltage than is present, but on others the effects might be rather serious.

'WARE SHOCKS!

Great care is necessary when testing mains unit voltages.

BROADCAST

OWING to the fact that we have to go early to press this month it is impossible to give a full review of the various Broadcast records for September. Those for August appeared in our last issue, and up to the time of going to press the pre-release of details concerning many of the September discs has not been made.

Here are a few of the latest Broadcast records, however, which have just come to hand as this page is being written.

On With The Show 1932 (881) is one of the most attractive small discs that we have heard for some time. It is played in dance rhythm by Harry Bidgood's Holiday-makers, and is a really refreshing piece of work.

Many of the most popular numbers are included, and the record forms good entertainment.

The Rhythm Rascals on 883 are full of vim in **When The Band Goes Marching By** and **It's That Little Extra Something That The Others Haven't Got.** Is this latter, by the way, anything to do with the advertisement for a well-known brand of motor spirit? Anyhow, it's a good tune, and its companion number is also worth hearing.

Mellow and Rich are two vocalists who have become, deservedly, popular through their bitumen broadcasts. This month they are to be heard on 880 in **Why Be So Unkind To Me?** and **Wand'ring By An Old Cathedral Garden.** (Where do they dig out the titles?)

As one might expect, the sentiments of the songs fit the titles (or vice versa), but that is not the fault of the duettists.

The Paradise Alley's Seaside Jaunt is a good idea. The atmosphere of the holiday resort is excellently portrayed even up to the—but why let the cat out of the bag? You must hear the record to get the full sniff of the sea.

As we write this, we feel to the full the truth of the title of 882 (side A), **The Sun Has Got His Hat On.** He sure has—and he has come out to-day! The other side is more soothing on a day like this, and we wish, with the vocalist of the number, that we were **Singing In The Moonlight,** or if we were not actually doing the "vocalisms," that we were there listening to him. The record is by the Rhythm Rascals, and is very good indeed.

So much for the smaller fry of the Broadcast lists. Now for the Super Twelves. Here Singin' Sam is to be found again—this time in **Hummin' to Myself** and **Cabin in the Cotton** (3226). This American artist has a confidential and intimate way of putting over his stuff that makes him a success whatever the material with which he works. If you have not heard him don't delay any longer—he is an artist.

An Old Violin and **The Violin Song** are effectively played on 3222 by Victor Olof, with vocal assistance by Thea Philips. The result is tuneful and soothing if you like that sort of number.

If You Were Only Mine and **Bahama Mama** by the Blue Mountaineers on 3228 are excellent. The latter number is becoming very popular, and its rhythm makes good entertainment, whether or not you feel like dancing. By the way, does the crooner really mean that the lady in question is shared by a number of gentlemen, or is he particularly fervently wishing that she *were* his? The word "only" is in an unfortunate position.

COLUMBIA

One of the best sellers among the light orchestral records this month will undoubtedly be that of the Squire Celeste Octet re-recording the famous **Liebestraume** of Liszt (No. 3) and the almost equally famous if not quite so popular Chopin **Nocturne in E flat.**

They are excellently recorded on DX362, and the quality of the strings is wonderfully portrayed. Mind you, it needs a good instrument to play it on, for if the quality of reproduction of the radio-gramophone is faulty the record will sound horribly thin and unnatural. Given the good reproducer, however, you will be delighted with the results.

The Orchestre Symphonique of Paris has made another disc, following up last month's success with the overture from **If I Were King** (DX361). The tone of the horn and the harp is worth noting in this disc, which is as successful technically as was the last month's recording of this orchestra.

Albert Sandler is still busy at the recording studios, and his latest disc contains **Gipsy Moon** and **Bird Songs At Eventide** (DB853). Both pieces are of the strictly "salon" type, which none play better than Sandler and his famous orchestra. The piano part in the latter-named item is one that stands out with uncommonly fine effect, imparting delightful colour to the whole piece.

Heddle Nash is one of the finest recording tenors we have, and his records are always worth getting. His diction is invariably good and his sense of interpretation is one with which we at any rate nearly always agree. This month he has taken two popular airs and imprisoned them for all to hear on DB863. The airs in question are **Eily Mavourneen** (from Lily of Killarney) and **I Know of Two Bright Eyes** (from the memory repertoire of everybody). You should get them!

Lovers of gipsy music will be fully pleased with DB872, which contains Colombo and his Tzigane Orchestra playing a selection of Central European airs under the title of **A Night at The Hungaria.** The Hungaria is the London rendezvous for those fond of this type of music, and the selections chosen for this disc will gratify the tastes of practically all.

A brief selection from some of the records released during the month. Only a few are discussed, but they are representative of the many brought out by the various gramophone record companies.

Several humorous records need mention this month. Notable among them is a second disc of Haver and Lee (who made the Smash and Grab Raid record some time ago) and also one of Horace Kenney.

The former pair have chosen **Horse Sense** as their subject, though we doubt the second word of the title as in any way applying to the screamingly funny situations the famous comedians get into. Their wisecracks and adventures must be heard to be believed (DB858).

The other record is **The Channel Swimmer,** and relates the lugubrious account of an interview between a reporter and the doleful Mr. Duck (Horace Kenney) who is to attempt the Channel from Land's End. Another record that should not be missed (DB865).

Of Henry Hall's numerous discs the one we prefer this month more than any other is **Lullaby of the Leaves** (CB472). It suits his straight type of playing more than some of the comedy numbers and quick steps he also records and broadcasts. We are having a lot of Henry this month "on the air" and readers are getting excellent opportunities to compare the broadcast and recorded versions.

H.M.V.

A feast of excellent but easily digested music is offered by the latest H.M.V. list. That greatest of all ballad singers, John McCormack, has given us another disc of charming vocalisation. He has recorded **The Irish Emigrant** and **By the Short Cut to the Rosses,** two songs that are sung with rare artistry. Both are full of character, and the disc is one that certainly should not be missed by any lover of fine ballad music (DA1234).

Peter Dawson has also made a further addition to his ever increasing list of records. This one (B4219) contains **Hills of Devon** and **Devil-May-Care,** two tramping songs that are excellent fare.

Mischa Elman plays two popular melodies: **Le Cygne** (from Saint-Saëns' Carnival of the Animals, and Tschaikovsky's **Melodie,** Op.42, No. 3. Both are fine melodies, the former being so well known that it needs no description from us. It is perhaps one of the most expressive of all the minor tone poems (DA1143).

The **Favourites of Yesterday** series is well worth close examination, for it contains records that perpetuate melodies that are old, so old that many of us do not care to remember their date, but that will surely live for ever. Tom Jones, Monsieur Beaucaire, Maid of the Mountains, Katja the Dancer, are among the famous musical comedies that are recorded in excerpt form in this fine series by well-known artistes and orchestras.

We cannot go into further description of the series now, but we do strongly commend it to your notice; you are sure to want at least one of the eight discs it contains.

Lullaby of the Leaves bids fair to rival our old friend "Auf Wiedesehen" in popular appeal, and in the H.M.V. list we have a choice example of Derickson and Brown singing it on B4211; an excellent disc.

Of the dance music it is impossible to give any adequate description. It is most varied, ranging from Ambrose to Coon Sanders and McKinney's Cotton Pickers. Notable examples of the syncopated art are **Soft Lights and Sweet Music** (B6205) by Ambrose and his Orchestra, and **Let That Be a Lesson to You,** by Coon Sanders (B6198).

They are of quite different character, for the latter band is an exponent of "hot" playing, while the former, though by no means in the Sunday school class, expresses itself with less use of the brass percussion instruments.

The "cotton pickers," organised by McKinney, give an even hotter rendering of modern dance music with their **The Way I Feel To-day,** which on B6204 is included in the special Hot Rhythm series.

The band is a coloured one, and the leader, Don Redman, is one of the finest exponents of saxophone playing in the States, besides being noted as an arranger of hot dance music. He himself sings the refrain in this number, providing a remarkable contrast to his saxophone lead.

On the other side of this disc is a recording by Irving Mills and his Modernists. The number chosen is **At the Prom,** and the title of the band gives a very good start to one's impression of its playing. It is a white organisation, and dance band enthusiasts will find the brilliant saxophone section and the hot playing of the three violins quite irresistible. It is a fine record of its type and should be heard by all dance record users, whether or not they are of the advanced or more sedate and tuneful type.

ZONOPHONE

Here are some of the outstanding discs sent to us from the Zonophone factory during the last few days Again you will note the inclusion of **Lullaby of the Leaves,** which is being featured by nearly every dance band and recording company at the moment. It is sure to be plugged hard, too.

On Zonophone it is excellently sung by Sam Browne, coupled with **When Work is Through** (6154), making an attractive disc of no mean merit.

But here goes with the main items on the list this month:

6150. **Just one of my Dreams,** and **Roses at Dawning.** These are charming ballads which are admirably suited to Birrell O'Malley's voice, and are greatly enhanced by the Grand Organ accompaniment.

6152. **Please Don't Mention It,** and **'Leven Pounds of Heaven.**

6153. **The Flies Crawled Up the Window,** and **I Want to Cling to Ivy.** Both by The Blue Lyres. "'Leven Pounds of Heaven," the popular foxtrot with a splendid vocal refrain. No. 6153 contains two outstanding numbers from the Jack Hulbert/Cicely Courtneidge film—"Jack's the Boy." Both records are excellently played by the Blue Lyres, who have also turned out a really fine rendering of our old friend "Yuba" on 6151.

6156. **Sing, Brothers,** and **Hoch, Caroline,** by the International Accordion Band.

Two big tunes from Bobby Howe's Show, "Tell Her the Truth." The record is full of vim and vigour and the male quartette in "Sing Brothers" is very attractive.

6160. **The Back Porch**—Parts 1 and 2, by Carson Robison and His Pioneers.

That versatile artiste—Carson Robison—has, with the assistance of his Pioneers, made a sketch—"The Back Porch"—which contains some very amusing material, together with some of his best known Hill Billy songs.

THE BIG LISSEN RELEASE!

The LISSEN SKYSCRAPER KIT 3

The Lissen Constructor's Kit! Up-to-the-minute in design—a year ahead in several of the specially created Lissen parts. What will it do? The metallised Screened-Grid stage is so stable that you can push it to the limits of radio range—the Lissen Economy Pentode output valve brings up the volume of distant stations until they sound like the local station. Shielded coils, matched and balanced—metal chassis with modern under-baseplate wiring—hairbreadth tuning with geared ball bearing condensers—all these points and many more combined for the first time in a complete kit ready for assembly.

Many sets before this have given you a selection of stations—but never before has there been a home constructor's set to give you the Europe-wide, almost world-wide, range of the Lissen Skyscraper, and the mighty power of its pentode output—never such a set for ***getting entertainment value out of radio!*** So many alternative programmes are at full loudspeaker strength.

POINTS THAT MAKE IT THE GREATEST KIT SET EVER PRODUCED!

1 METALLISED S.G. VALVE

The Lissen Metallised Screened-Grid Valve employed in the Skyscraper has such a small inter-electrode capacity that it provides an almost perfectly stable H.F. stage, with a magnification figure in excess of 1,000. The extreme range and stability of the Skyscraper is due to this valve and its perfect screening.

2 PENTODE OUTPUT

The Lissen Power Pentode Valve gives to the Skyscraper its brilliant tone, its amazing power—yet it uses no more high tension current than an ordinary power valve. The current consumption of the Skyscraper is less than many ordinary 2-valve receivers.

3 SHIELDED COILS

These Lissen Shielded Coils are the result of months of research. They make the Skyscraper exceptionally selective, and one of the few sets free from "long-wave break-through."

4 ALL METAL CHASSIS

Notice the most expensive of commercial radio receivers to-day and you will see that they have metal chassis—so does the Skyscraper at half the cost!

PUT IT IN THIS CABINET—COMPLETELY SELF CONTAINED!

89/6

INCLUDING METALLISED S.G., DETECTOR AND PENTODE VALVES

You can buy the Skyscraper Kit, complete with valves, ready to build up and put into a cabinet of your own choice with perhaps your existing batteries and loudspeaker.

The price is then 89/6 complete with valves.

Better still, Lissen have provided a beautiful walnut Consolette Cabinet which contains not only the chassis and loudspeaker, but batteries and accumulator as well . . . making your Skyscraper a real self-contained receiver comparable in appearance with any expensive factory assembled set, and in performance easily outstripping previous receivers.

Price, complete with walnut cabinet and loudspeaker, as illustrated .. £6 5s.

1/- CONSTRUCTIONAL CHART FREE.

A two-colour, lavishly-produced Chart giving instructions down to the last detail for building the Skyscraper 3 has been published, price 1/- GET YOUR COPY FREE! Write direct to the factory, or ask your nearest radio dealer to get it for you.

EVERYTHING YOU NEED!

LISSEN LTD. WORPLE RD. ISLEWORTH. MIDDLESEX

TROUBLE TRACKING

JUST recently I have noticed a "more than usual" number of queries dealing with hum in A.C. mains receivers of the home-constructed variety.

In the majority of these cases the querist has carried out his own design instead of building one of the excellent published sets, and, in consequence, has fallen into one of the many traps that we who are engaged in research have learnt to avoid.

The Essentials of Design

Bad layout is one of the common troubles in mains receivers (and in battery sets, too). The arrangement of the components often shows that the constructor lacks a knowledge of the essentials so necessary in design work.

So we frequently see the mains apparatus mixed up with the early amplifying stages, with the result that large quantities of hum are injected into the receiver circuit and amplified up by the various stages.

The mains portion should be treated as a separate unit, and it can with advantage (this is not always necessary) be screened from the receiver proper.

Another important factor is to see that all zero potential points in the equipment are connected to earth. This includes such items as the cores of the smoothing chokes and mains transformer. The mid-point of the heater winding of the transformer should be joined to the common H.T. negative earth wire, although occasionally better results are obtained by taking this lead to one side of the heater winding instead of to the centre-tap.

The biasing resistances in series with the cathodes of the valves should be by-passed with a large fixed condenser and it is desirable to employ screened wire for the heater circuits.

Hum can also be due to inadequate smoothing, and therefore only high-quality smoothing chokes should be used.

Every month the Chief of the "M.W." Query Department discusses some of the common difficulties which can often be so troublesome. This time he deals with hum in mains-driven receivers.

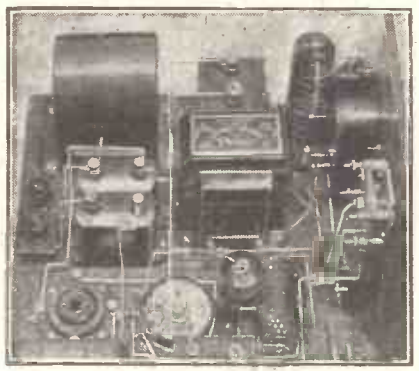
Many of the chokes employed are unsuitable for the job, bearing in mind that they have to carry a considerable anode current.

It is useless to use a choke which possesses a relatively high inductance when the current is only a few milliamps. What is wanted is a choke that has an adequate inductance at the *normal* working current.

There are plenty on the market to choose from.

The smoothing condensers should be large ones. Nothing less than 4 mfd. is likely to be of much use.

WATCH THE CHOKE'S POSITION



It is most important that low-frequency chokes be kept well away from such components as L.F. transformers if hum is to be avoided. All such chokes must be capable of carrying the necessary milliamps without saturation.

What of the Short Waves?

I am sometimes asked whether A.C. mains receivers can be used on the short waves. Now, an essential factor on the very high frequencies is absence of background hum. Everyone who has worked on these wavelengths knows that the reception is critical. A certain amount of juggling is necessary in order to achieve decent results. Operating skill counts for more on the short waves than on the medium or long.

And it is found that any noises in the speaker due to hum or some internal defect in the receiver tend to spoil the results entirely. Thus, provided the A.C. set is a good one and silent in operation, it is quite conceivable that it will give satisfactory reception on the short waves. But the design must be good.

I now want to say something about battery receivers. It concerns the position of the fuse. Here is a very common query: "I have just fitted a fuse bulb in the H.T. negative lead of my set, and when I switch on the bulb lights up. Moreover, the receiver will not work until I disconnect the fuse altogether. Why is this?"

He Fits a Fuse

An investigation usually reveals this fact.

The receiver is one in which the L.T.— and H.T.— terminals on the terminal strip have been connected together, and for convenience in wiring the L.T. negative filament lead has been joined to the H.T. negative terminal.

A little thought will show that this is precisely the same as connecting the lead direct to the L.T.— terminal, since H.T.— and L.T.— are joined together.

The scheme is perfectly sound until Mr. Listener suddenly decides that he will fit a fuse, so he breaks the lead joining the L.T.— and H.T.— terminals and inserts his fuse bulb.

And when the bulb lights up he is surprised! What has he done? Why, this. He has joined the fuse in series with his L.T.— filament lead and in consequence the L.T. is trying to flow to the valve filament through the fuse.

What he should do is to remove the L.T.— filament lead from the H.T.— terminal, transferring it to the L.T.— terminal, after which he will find that the bulb no longer lights up, the set works normally and the fuse "is doing its stuff."

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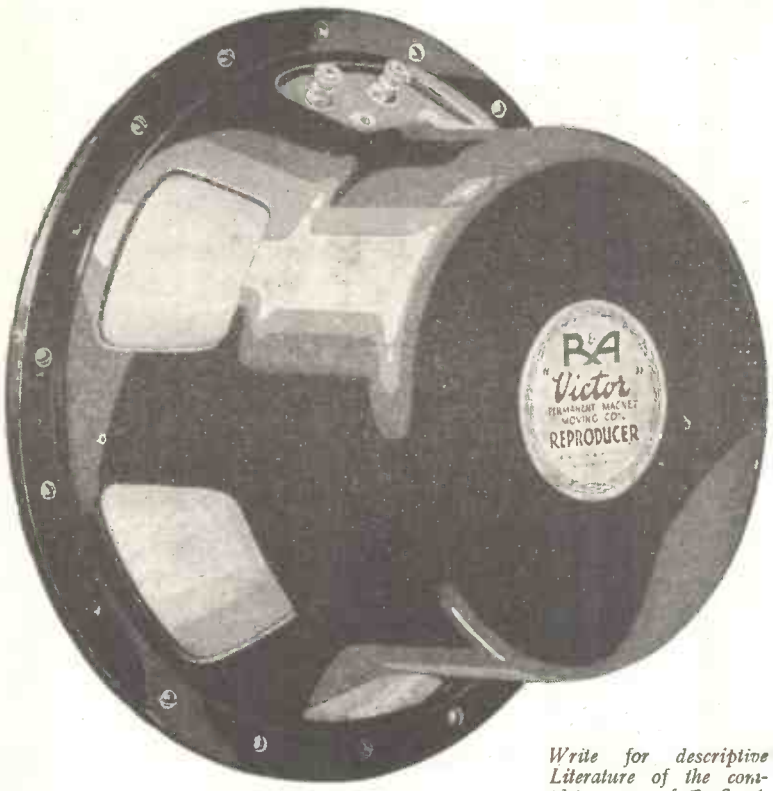

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If you are interested in quality reproduction, we invite you to a demonstration on our Stand No. 69, Olympia. We should like your candid opinion of the 'VICTOR,' and to this end we invite you to state briefly on a sheet of notepaper your impressions, after having inspected it and heard its performance.

We will present a 'VICTOR' in de-luxe Cabinet, or cheque for 5 guineas, at entrant's option, to the writer who sends what, in our opinion, is the most apt, comprehensive and *impartial* criticism, limited to 100 words, provided the entry form at the foot of this page is attached thereto.

Criticisms must reach us not later than the 5th September, and the result will be published in the 'Wireless World,' 16th September issue.

The staff and employees of R. & A., Ltd., and the company's Advertising Agents are excluded from this invitation.

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FREDERICK STREET, WOLVERHAMPTON.

This portion to be attached to your criticism of the 'VICTOR.'

Post to reach us not later than 5th September.

(MODERN WIRELESS)

SPOTLIGHTS ON THE PROGRAMMES

On with the Dance!—How soon we get tired of them—Poor children!—Audiences must go—A critic tries his hand.

BESIDES being one of the most popular of broadcasting personalities, Christopher Stone has a marked sense of humour.

Last month he arranged a programme of gramophone records under the title of "Mainly Dance Music." Listeners took off their coats and prepared to tread a not too stately measure. Christopher Stone had the last laugh, however, since "The Dance" was interpreted by him to mean Ballet.

Not many of us can imitate Pavlova impromptu and in our own drawing-rooms.

"Inimitable Be Blowed!"

We forgive him, though, for so far as broadcasting goes, Christopher Stone certainly has that little something some others haven't got.

Incidentally, what with one thing and another, there is probably no other regular broadcaster who has so much nonsense talked about him.

"Inimitable," "Whimsical," "Incomparable"—these are but a few of the adjectives applied to this gramophone favourite.

Stone hates it all, too.

"Inimitable be blowed," was his reply to one of the more than usually fatuous introductions to the microphone.

Always Welcome

Before we leave Christopher Stone (whose smiling face you see on this page), has it ever struck you how few regular broadcasters there are of whom you never get tired?

Gershom Parkington and his Quintet, Quentin Maclean at the organ, James Agate, the B.B.C. Theatre Orchestra, A. J. Alan (though he is hardly a "regular")—you can almost count them on the fingers of one hand.

Short and Sweet

A few singers, still fewer talkers, and an orchestra or two seem to have remained in favour for several years, but the others come and go with alarming rapidity.

The "life" of a regular broadcaster

CHRISTOPHER STONE

who gives "life" to his record broadcasts by carefully thought-out themes and apt remarks.

is probably not much longer than that of the average gramophone record.

Summonsed in a London police-court the other day, a man contended that his wife had driven him from home by insisting on having the wireless on all day and every day. "It nearly drove me to suicide," he complained.

Now hear the other side.

Writing to a certain B.B.C. contralto, a London man says:

"I was suffering from suicidal depression when your voice came through, but the charm of it made me realise the folly of taking my life, so I live to hear you sing again."

Now what is one to say about that?

Not Good Enough

Apparently the children's hour is not considered important enough nowadays to warrant any trouble being taken with it.

On a recent afternoon, Derek McCulloch (best of wireless "uncles"—only they mustn't be called that any more) apologised for the absence of the now famous J. K., who was taking an afternoon off, and of "Elizabeth," who was taking her holiday.

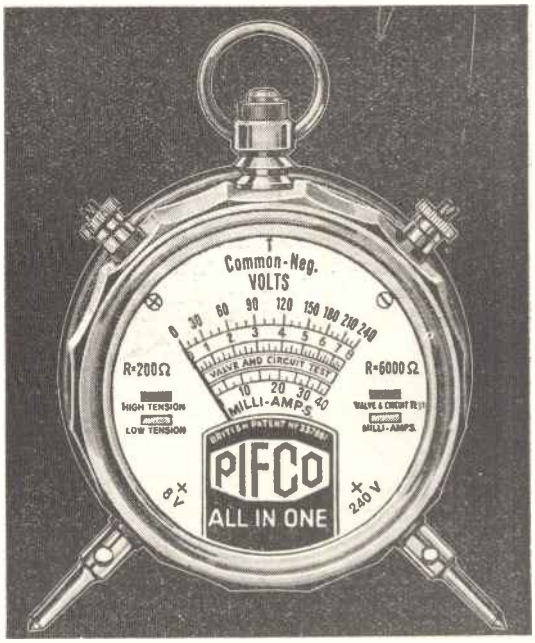
For the rest of the hour McCulloch and Mario de Pietro undertook the entertainment of the thousands of children who were, presumably, listening.

Few Children Listen

I tremble to think what will happen when this happy-go-lucky spirit invades other parts of the programmes.

It is possible, of course, that those responsible for the children's hour have realised that, as the natural result of a policy of condescension very few children now listen to their own part of the day's entertainment.

It is positively painful to hear Henry Hall, for instance, excuse some



● *Standard Model "All-in-One" Radiometer for Battery Sets only (shown above) Price* **12/6**

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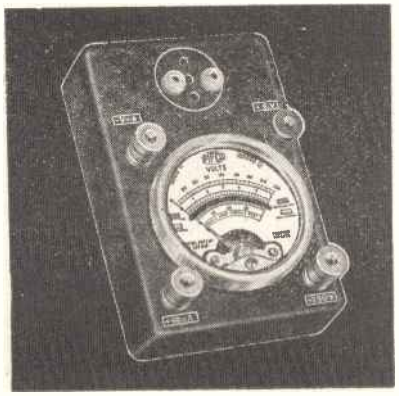

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If any difficulty write direct to:
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Helping "Stars" to Feel at Home

of the more futile numbers in his repertoire by announcing that he is playing them "for the kiddies." What have the children done to deserve this of the B.B.C. ?

Misguided Effort

Radio vaudeville is not going to get any better until someone does away with that studio audience.

I simply cannot see any good reason for it. When I make inquiries at Portland Place I am told that it "helps the artistes to get the correct stage atmosphere and to feel at home."

For the same reason, Broadcasting House has been fitted with a specially built variety theatre, with limelights and dressing-rooms, with grease paint and stages—all in a misguided effort to make poor, nervous theatrical "stars" feel at home.

Vice Versa

It's all nonsense, say I, because if a radio artiste cannot adapt his personality to the medium which he is using—in this case the microphone—he has no business to be broadcasting at all.

We don't hear all this nonsense about broadcasting favourites who perform in the theatre.

When I hear of a theatre manager fitting a microphone on his stage and limiting the audience to about fifty so that some wireless comedian may "feel at home," then I will pay more attention to the policy of the B.B.C. in the matter.

On Thin Ice

How loyal we journalists are! There has been a decided—and a very just—tendency lately to decry the revues and light variety entertainments produced at Broadcasting House. Last month an ex-radio critic wrote a revue for the B.B.C. It was probably the worst specimen of a revue which has come through the microphone for many a long day.

Yet the author's colleagues on the newspaper which he used to represent did everything in their power to praise the show. They gave every excuse for the failure of the revue except the true one—that it was poor stuff.

Radio critics who take to writing plays or revues for the B.B.C. are treading on very thin ice! Especially when they tackle the medium which they have attacked most strongly.

A word of congratulation to Leslie Bridgewater and his orchestra for the best hour's broadcast of the month. The programme chosen to express "The Modern Idiom in Light Music" (the title might have put anyone off!) was a perfect example of balance, interest and entertainment, and it gave representation to the light music of all the nations.

Albert Ketelbey also deserves a special word of congratulation on having conducted a programme of his own works without including either "In a Monastery Garden" or "In a Persian Market."

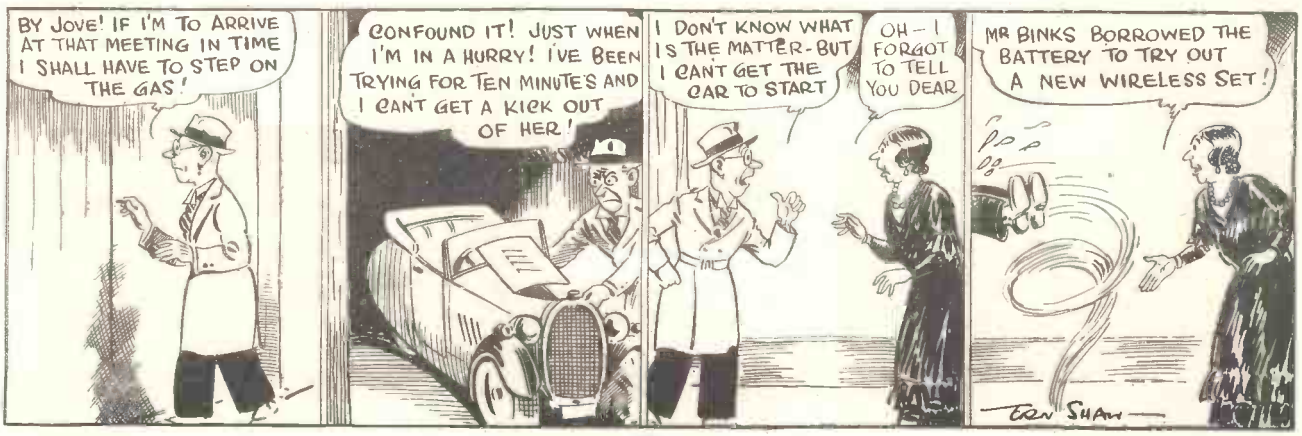
P.C.

THE GERSHOM PARKINGTON QUINTET

They are among the regular broadcasters of whose music we never grow tired however often they play.

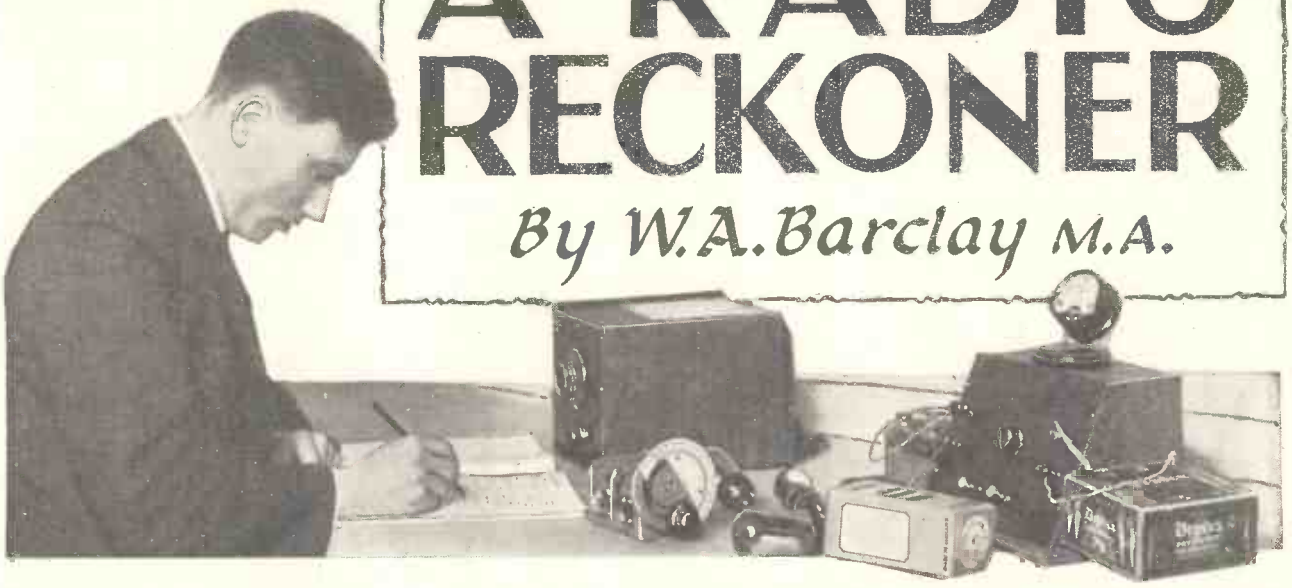
ASSAULT AND—BATTERY!

By ERN SHAW



A RADIO RECKONER

By W.A.Barclay M.A.



One of the most important functions of the valve is that of amplification, and this month Mr. Barclay discusses the principles involved. Included with his article are two very useful N-diagrams which show what percentage of a valve's amplification factor is available under different conditions.

THIS month we propose to discuss a little more fully the question of "amplification" by means of radio valves. As all readers of MODERN WIRELESS know, valves have two main functions in receiving sets, namely, "detecting" or "rectifying" the wireless signals, and also "amplifying" them.

Unwanted Oscillation

There is, indeed, a third use which is met with in the super-heterodyne type of receiver, in which a valve is made to "oscillate," but this need not concern us just now. In straight sets oscillation is always unwanted, whether caused by instability in the H.F. circuits or by undue use of reaction.

This is, however, a painful subject, and may be best dismissed in the immortal words of Capt. Eckersley: "Don't do it," and, again, "Please, don't do it."

Easier to Understand

As between detection and amplification it is hard to say which is the more important, the truth being that both are equally necessary if good loudspeaker reproduction is desired. The amplification process is, however, considerably the easier to understand, and in this instalment we shall consider the valve in its rôle of amplifier, leaving to a future occasion the discussion of valve detection.

First, then, what do we mean by "amplification"? Here it will be well to distinguish between two kinds of amplification which are often confused with each other, though each is really quite distinct. There are two different things which are capable of amplification, viz., *voltage* and *power*.

It seems almost superfluous to point out that a device which magnifies a small input voltage into a greater output voltage is a "voltage amplifier," while one which is actuated by a small input power and provides a greater output power is a "power amplifier." It is true, of course, that one and the same circuit may actually operate both as voltage amplifier and as power amplifier; nevertheless, the two functions are quite distinct.

In this article we shall discuss voltage amplification only.

THE "BARE BONES"

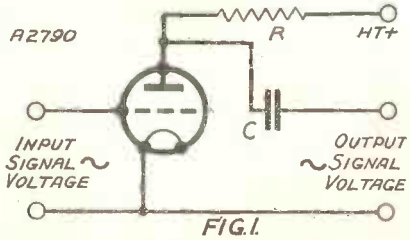


FIG.I.

The essentials of an R.C.C. amplifier are indicated here, and the author explains in detail how such an arrangement functions.

It was seen last month that to speak of a valve as amplifying or magnifying a voltage is, strictly speaking, incorrect. What is really meant is that the small variation in voltage which is applied to the grid reappears in the anode circuit as a considerably larger voltage variation across the load in that circuit.

Just What We Want

Thus what is magnified is actually the voltage variation due to the received signal, and this, of course, is just what is wanted to secure a large signal output for our sound reproducing mechanism.

The question now arises how much magnification can we expect by using a given valve? The answer to this depends, as we have already seen, not merely upon the valve itself, but also upon the way in which it is used.

Circuit Affects Amplification

In other words, *the circuit in which the valve operates has also an effect upon the degree of amplification which will be secured.* Fortunately for the circuit designer, it is possible to assign fairly accurately how much of the magnification obtained in any case is due to the valve and how much to the circuit.

In the preceding article we discussed the factor due to the valve;

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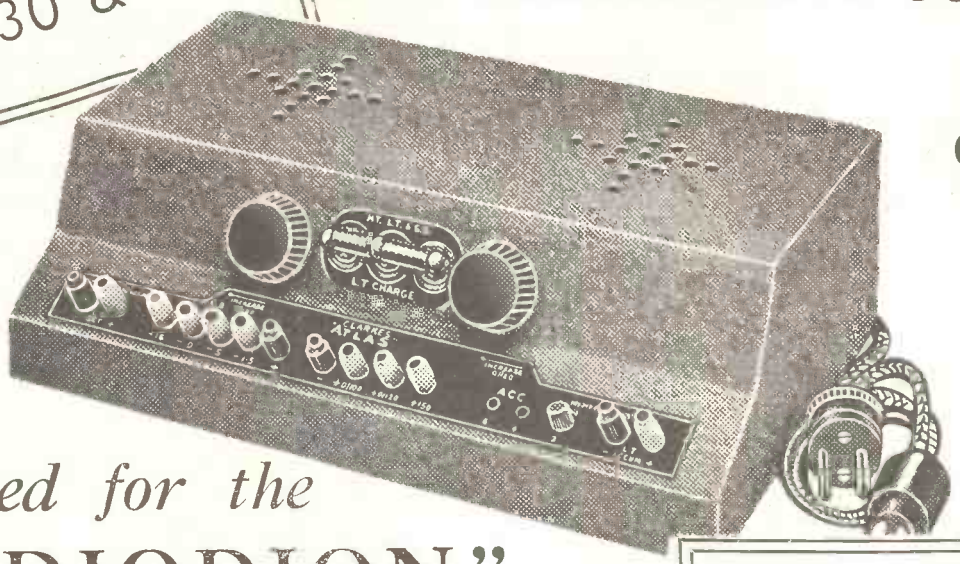

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M.W.9

Are You Making the Most of Your Valves?

this is the well-known "amplification factor" which is quoted by all manufacturers for their valves, and is denoted by the Greek letter μ.

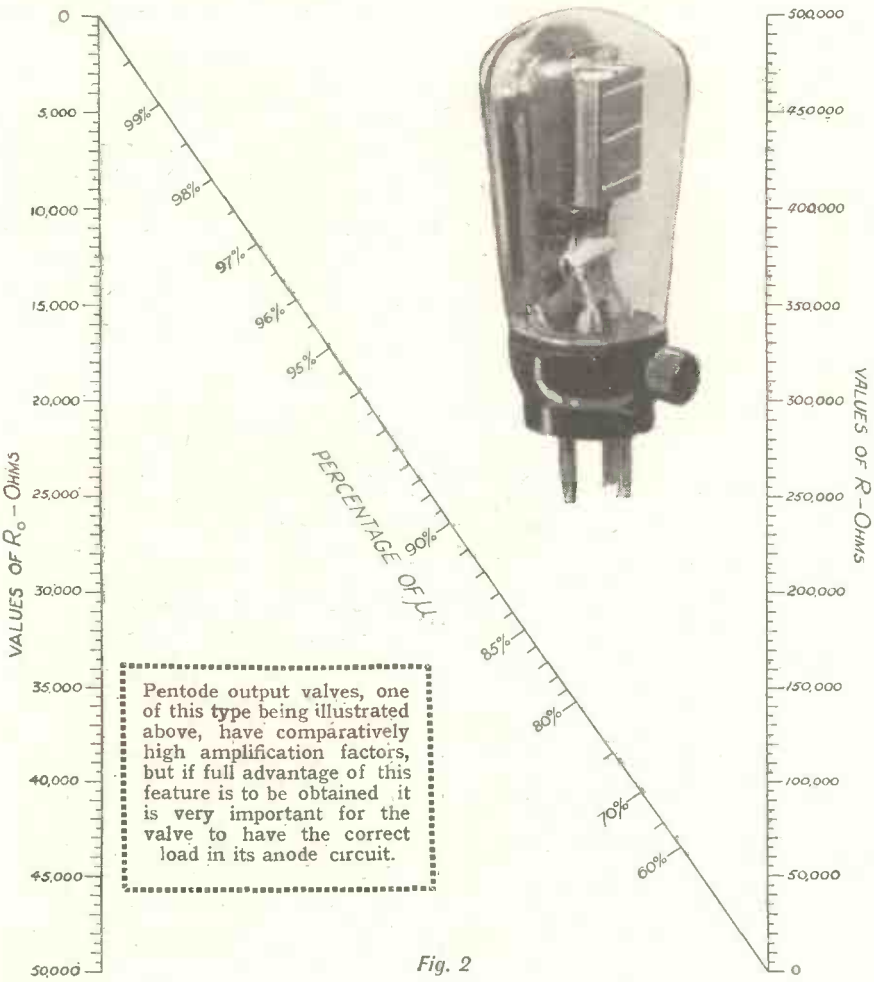
They Don't Amplify!

We are now to look briefly at the part of the magnification which is contributed by the circuit.

capacity" method, is a case in point.

The "bare bones" of this method are illustrated in Fig. 1, which is a simplified diagram from which all irrelevant details have been omitted. The small variable voltage due to the ether waves is impressed at the input terminals of the amplifying valve;

PERCENTAGE MAG. AT A GLANCE



Pentode output valves, one of this type being illustrated above, have comparatively high amplification factors, but if full advantage of this feature is to be obtained it is very important for the valve to have the correct load in its anode circuit.

Fig. 2

N-DIAGRAM.

In practice, the actual percentage of the amplification factor of a valve that is available depends upon the relation between the external anode circuit impedance and the internal impedance of the valve in question. This N-Diagram will enable you to find how much "mag." you really do get, without the need for complicated calculations.

Beginners are often surprised to learn that many of the circuits used in connection with valves for voltage amplification do not in fact amplify at all, but rather take away from such amplification as the valve has already provided.

The very simplest of all amplifying circuits, known as the "resistance-

that is, between its grid and filament.

In the anode circuit of the valve is placed a resistance of considerable ohmic value—usually some hundreds of thousands of ohms—and this is connected between the anode and the positive terminal of the H.T. supply. As was explained in the previous instalment, when the incoming waves are received, a variable potential is developed across this resistance, R, and since the H.T. battery end of this resistance is held at a fixed voltage value, we may regard the whole of the amplified voltage variations as taking place at the anode.

By connecting the anode to the grid of a subsequent valve we might hope to continue the process of amplification were it not for one fatal drawback. By such a course the positive potential of the H.T. battery would also be impressed on the grid of the second valve, and the resulting flow of grid current would completely paralyse its amplifying action.

Overcoming the Difficulty

This difficulty can, however, be very simply overcome by the expedient of inserting a condenser, C, in the position shown between the anode and the following grid. If this condenser is of a good make it will effectively insulate the second grid from the positive potential of the anode.

At the same time, its value must be chosen with care so that the desired oscillations of signal voltage may pass it easily. Into the question of choosing such a condenser it is hoped to return in a future article.

We have now seen how an amplified voltage may be obtained from the circuit of Fig. 1. We must not expect to find, however, that the actual magnified input voltage obtained is μ times the original input voltage. In all cases of resistance-capacity amplification the actual degree of magnification is somewhat less than μ.

Only a Fraction

The reason is, of course, that the circuit, unlike the valve, is contributing nothing at all to the actual voltage amplification, but is merely a device for utilising what magnification the valve gives to the best advantage. Under such circumstances there must be some loss, and the result is that with this type of coupling only a percentage of μ is actually secured. If the circuit is well designed, however, there is no reason why the amplification should not be 90 per cent of μ, or even more.

Thus if we are employing a valve whose μ is 30 with a resistance-capacity coupling giving 90 per cent efficiency, the overall amplification realised by the stage would be 90 per cent of 30; that is, 27 times. All that

Anode Circuit Impedance Is Very Important

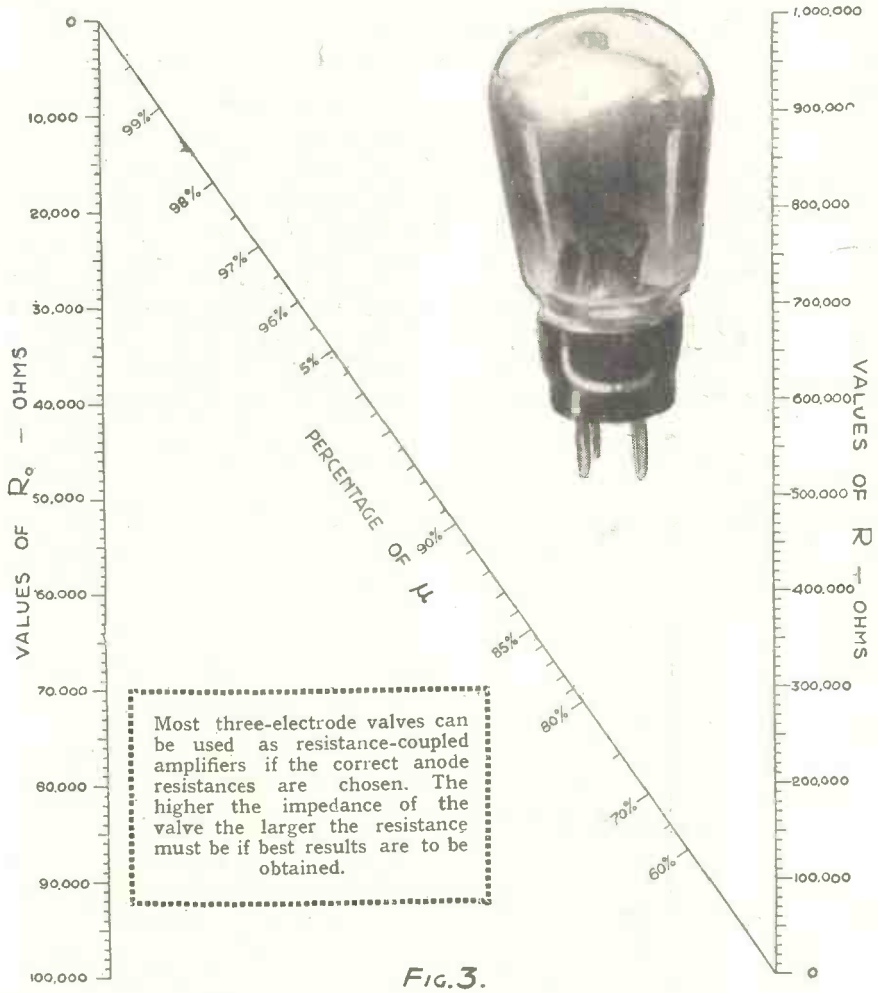


FIG. 3.

N-DIAGRAM

To make use of these diagrams, you take a straight line from the point on the left-hand upright, corresponding with the internal resistance of the valve, to the point on the right-hand upright that represents the value of the anode resistance. The actual percentage of amplification is then read off on the diagonal ordinate.

remains now is to inquire how this "percentage" value may be found for any given valve and circuit. The answer is contained in the formula:

Percentage of valve magnification $= \frac{R}{R+R_o} \times 100$;

where R is the ohmic value of the anode resistance and R_o is the value of the valve A.C. resistance.

The two N-diagrams presented herewith have accordingly been designed as a substitute for the above formula.

By their means it is possible to gauge simply and accurately the percentage of μ which will be obtained from a resistance-capacity-coupled circuit when the values of R and R_o are known. The upright scales of Fig. 2 provide for values of R_o up to 50,000 ohms and for values of R up to 500,000 ohms.

The corresponding scales of Fig. 3 are intended to accommodate values of R and R_o up to twice these amounts. An example of the use of Fig. 2 will provide all the illustration necessary.

Suppose our valve is one of 35,000 ohms A.C. resistance, while its magnification factor, μ, is 36. If a resistance of 400,000 ohms is used in the anode circuit, we can find the actual magnification as follows.

Placing a ruler between 35,000 and 400,000 ohms on the outer scales of Fig. 2, the percentage value is read off on the diagonal scale as 92 per cent. The actual voltage amplification is thus 92 per cent of 36; that is, the input signal voltage will be amplified just over 33 times.

RECONDITIONING ACCUMULATORS

Some useful hints on keeping your batteries up to scratch.

By C. P. ALLINSON.

VERY often when an accumulator has got old it is found that it will not hold its charge, even though there are no signs of sulphation, and, to the eye, the battery seems to be in quite good condition. The plates may look a bit dirty, but otherwise all right.

What usually happens is that the plates get hard, and in order to get them back into good condition we have to get out of them a lot of sulphuric acid that they have absorbed.

Hardens the Plates

You have probably noticed that the specific gravity of an accumulator very often gets steadily less, notwithstanding the fact that no acid has been spilt.

Absorption is the cause, and its effect is to harden the plates.

To get the plates back into condition, the acid should be emptied out and the accumulator filled with distilled water. The battery is now charged in the ordinary way, and after charging it is slowly discharged about half-way. The distilled water will now be found to be strongly acid, its specific gravity having risen considerably.

Empty this away and refill with fresh, distilled water. The above procedure of charging and partially discharging the battery should now be repeated.

Empty and refill again, and continue doing this till the distilled water shows practically no change in density, which may not happen till you have gone through the above process four or five times.

You can now fill the accumulator with fresh acid of the correct density, and it can be charged in the normal manner. You will find that the battery will hold its charge, and not only is its performance greatly improved, but its working life is extended.

ON THE TEST BENCH

By the Technical Editor.

This month we deal with Ediswan, Goltone, Loewe, Dubilier, Epoch, Milnes, and Becker products.

Inexpensive Power

AT one time it seemed as though the foreigner would have it all his own way in the inexpensive battery market. And a sad state of affairs that was, too, for a large percentage of the cheap Continental batteries were of a very poor quality.

"NEW PROCESS" CELLS

A first-class H.T. battery which retails at a low price.

Indeed, it is no exaggeration to say that the lives of these batteries were, generally speaking, hazardous to the extreme. We well remember correspondence from listeners whose H.T. batteries succumbed after periods as short as a week.

And the worst of it was that in many instances the H.T. batteries themselves were not suspect—it was often thought that the sets with which they were used had developed voracious H.T. appetites.

Fortunately, the conditions to-day are very different. And Ediswan, for example, are doing a great service to the industry as a whole with their latest "new-process" H.T. batteries.

These are marketed at competitive prices, the 60-volter of standard capacity selling at 6s. 9d. and the 120-volter at 13s.

We have had samples of these Ediswan New-Process H.T. batteries on test for a period of some weeks, and are able to say that they are reliable, first-class products.

A life-test reveals the fact that their capacities well exceed those laid down as being the minimum for high-grade standard cells, and the cells discharge with consistent evenness.

They provide outstanding evidence of the progress that has been made in the design and manufacture of "dry" batteries in this country, and should command ready sales this coming season.

Matching a Speaker

It is only comparatively recently that the necessity of matching a loudspeaker with the output of a set has been regarded as a prime necessity by the listener as well as the amateur experimenter.

The popularisation of the moving-coil speaker is the cause of this new "matching consciousness." But the principle is almost as important when other types of speakers are considered. That is, if the greatest undistorted power is required.

And inasmuch as most of the smaller

(*Continued on page* 298.)

ON THE TEST BENCH

—continued from page 296

battery sets have initial restrictions placed upon them by their output valves (which have limited outputs, anyway), the advisability of correct speaker matching is obvious.

The Loewe "Varitone" is an electro-magnetic type of speaker which enables this to be done. There is a switch control accessibly placed at the back with which a choice can instantly be made between three impedances.

This is accomplished by an ingenious series and paralleling of the coils used in the speaker mechanism. The advantage of a switch over the more usual terminals is that immediate comparisons can be made.

We have always considered that much of the advantages of any "tone" adjustment are lost if it is necessary to undo terminals and alter leads in order to change from one condition to another. But you do not have to do that with the "Varitone."

It is a sensitive speaker, and its response is of a decidedly good quality. The finish is excellent and it bears a handsome appearance.

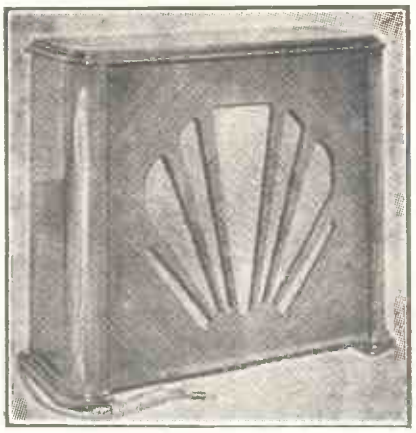
For Mains Sets

Messrs. Ward & Goldstone have sent us some pieces of their new iron-braided sleeving. It comprises a varnished, insulating tubing covered with a flexible, tinned iron-braiding which is both mechanically protective and provides first-rate shielding.

The material is designed for covering the leads to the heaters of A.C. and D.C. valves, and is, of course, a great improvement over ordinary lead-covered flex.

We commend it to the attention of all those interested in mains set construction. It costs only 9d. per yard for the single-way type, or 1s. per yard for that suitable for two wires.

THE "VARITONE" SPEAKER



A new addition to the Loewe range

Electrolytic Condensers

Among the most interesting of the new season's lines is the Dubilier electrolytic condenser. It is built into one of those inverted aluminium containers, and is, therefore, particularly suitable for chassis sets of the "all-metal" type which are now so popular among manufacturers.

By the way, it is curious how consistently the British radio industry has taken the lead from America in manufacturing systems and methods. The all-metal chassis was introduced in America four or five years ago.

But not until this year have British manufacturers as a whole adopted the scheme, though having once tackled the new line of construction they are able at once to equal, if not to beat, the Americans. Some of the British

(Continued on page 300.)

IMMEDIATE DELIVERY—CASH—C.O.D. or H.P.

DEMAND A PILOT AUTHOR KIT for your DIODION

—it puts you on the Royal Road to Success

EXCLUSIVE FEATURES OF PILOT AUTHOR KITS

- Complete down to the last screw and piece of wire.
- Chosen and first specified by the Technical Editor and actually as used by the Author.
- Officially approved by an established technical authority you can trust implicitly.
- Backed by Peto-Scott with 12 years' radio experience and a world-wide reputation.
- Enables Authors' sets to be duplicated in every respect.
- Panels and Terminal Strips ready drilled to specification.

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● It fits the Diagram! Exact to the published specification.

PETO-SCOTT FOR

EVERYTHING RADIO CASH, C.O.D. or H.P.

ORIGINATORS OF CONSTRUCTOR KITS IN 1919

—the Largest Radio-by-Mail House in the World.——Send for latest lists.

COMPLETE KIT PRICES

KIT "A" **Author's Kit** containing ready drilled panel, screen, and terminal strips, less valves and cabinet.

CASH or C.O.D. **£5:14:0**

or 12 monthly payments of 11/5

KIT "B" WITH VALVES **Author's Kit** containing **ready drilled** panel, screen, and terminal strips, less cabinet.

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KIT "C" WITH VALVES AND CABINET Complete **Author's Kit** containing **ready drilled** panel, screen, and terminal strips.

CASH or C.O.D. **£8:8:3**

or 12 monthly payments of 15/5

KIT-BITS

Specially selected C.O.D. lines. You pay the postman — we pay post charges on orders value over 10/-.

	£	s.	d.
1 Cyldon Double Drum Drive Junior Synchratune Condenser	1	10	0
1 Red Triangle ready drilled panel 14"x7"		4	6
2 Colvern Screened Coils (Type T.D.)		17	0
1 Lissen Hypermite L.F. Transformer		12	0

AUTHOR'S PART LIST

Any parts supplied separately. If value over 10/- sent C.O.D., post charges paid. Cash with order, carriage paid.

	£	s.	d.
1 Baseboard 14" x 10"		1	6
1 Red Triangle ready-drilled panel, 14" × 7"		4	6
1 Cyldon Double-Drum Junior Synchratune condenser	1	10	0
1 Telsen ·0003-mfd. series aerial condenser with switch		2	3
2 Telsen 2-point on-off and wave-change switches		2	0
1 Telsen 3-point wave-change switch		1	3
1 Graham Farish 800-ohm "Ohmite" resistance		1	6
1 Graham Farish ·5-megohm resistance		1	6
1 Dubilier 200,000-ohm resistance (1-watt type)		1	0
1 Dubilier 20,000-ohm resisatnce (1-watt type)		1	0
1 Igranic ·5-meg. potentiometer		6	0
4 Dubilier ·0001-mfd. fixed condenser, type 665		2	0
2 Telsen 1-mfd. Mansbridge condensers		4	6
2 Telsen 2-mfd. Mansbridge condensers		6	0
1 Lissen valve-holder, horizontal type		1	3
3 Lissen valve-holders (new rigid type)		1	1½
2 Colvern screened coils, type T.D.		17	0
1 Telsen H.F. choke		5	0
1 Lissen Hypernik L.F. transformer		12	6
11 Belling-Lee indicating terminals (including two plain)		2	3½
1 Standard S.G. screen, ready drilled for screened-grid valve, 10" × 6"		3	0
1 Aluminium bracket, 7½" × 1" drum rod		2	6
1 Red Triangle ready-drilled terminal strip, 14" × 1½"		1	3
Connecting wire, sleeving, flex, screws		2	0
3 Belling-Lee wander plugs			6
2 Belling-Lee spade terminals			4
KIT "A" Cash or C.O.D.	**£5**	**14**	**0**

ACCESSORIES

Selected essential accessories sent C.O.D. You Pay the Postman—We pay post charges on orders value over 10/-.

	£	s.	d.
4 Valves, M.S.22, H.L., PM.1.H.L., Mazda P.220	1	19	3
1 Peto-Scott Cabinet, 14"×7"×10"		15	0
1 Exide 2-volt L.T. 40/80 Accumulator		13	6
1 Exide H.T. 120-volt type Super Battery	1	4	0

PETO-SCOTT CO. LTD.

77, CITY ROAD, LONDON, E.C.1

Dear Sirs—Please send me CASH / C.O.D. / H.P.

DIODION KIT A/B/C

for which I enclose £ : : CASH / H.P. DEPOSIT.

Name.....

Address.....M.W. 9/32.

West End Showroom: 62, High Holborn, London, W.C.1

Buy by Post—it's Quicker

ON THE TEST BENCH

—continued from page 298

chassis are superb specimens of mass craftsmanship.

To return to the Dubilier electrolytic condenser. This is of the high-

Two of the new Dubilier high-voltage type Electrolytic Condensers.

voltage variety and can, in fact, withstand "peaks" of 450 volts. Our sample has a capacity of 8 mfd., and we consider it a particularly neat and compact component. On test it proved perfectly satisfactory.

A First-Class Speaker

One of the latest moving-coil speakers of the "junior" class is the Epoch Type 20C, a permanent-magnet model which retails at 35s., complete with input transformer.

This transformer provides no fewer than five ratios, viz., 15, 20, 30, 35 and 50 to 1, so that extremely close matching is possible, although for all normal conditions the straightforward choice of "power," super-power," and "pentode" tappings will prove ample. However, there are many radio enthusiasts who appreciate wide flexibility and these are well served.

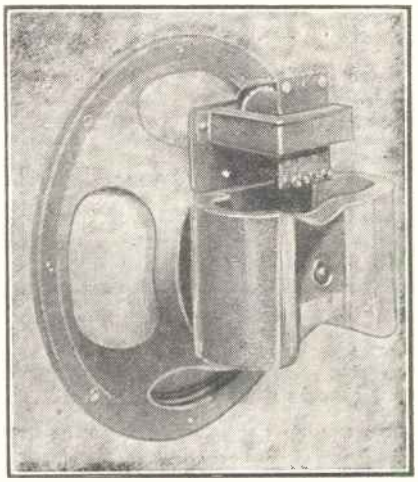
Although this Epoch "Twentieth Century" Model is small in price and size, it can handle more power than the average listener requires.

We have tested it with a 3-watt output and even under these conditions the instrument operated without the slightest distress.

On the other hand, the sensitivity of the speaker is such that good results can be obtained with nothing more than a two-valve set. Indeed, we believe it is the most sensitive speaker of its type we have met—it is quite equal to an ordinary electro-magnetic in that respect, and, of course, it is superior in regard to quality of response.

Its reproduction reveals no appreciable flaws from about 40 to above 5,000 cycles, and its transient-

BANISHES BOOM



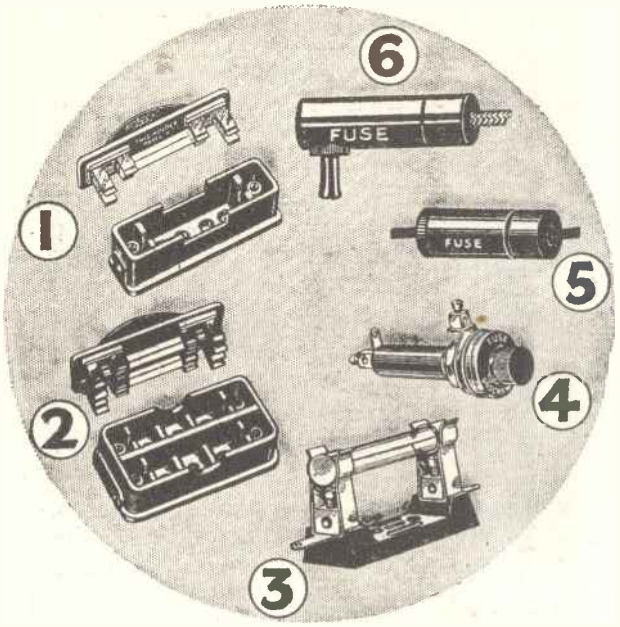
The Epoch Type 20C moving-coil speaker.

handling qualities are obvious from the "brightness" it achieves; its "attack" and absence of "boom" are well above the average.

(Continued on page 302.)

FUSEHOLDERS

Programme 1932—33



1 SINGLE SAFETY BASEBOARD FUSEHOLDER.
Fuse carried on lid, making shocks impossible. Complete with 1 amp. fuse **1/6**

2 TWIN SAFETY BASEBOARD FUSEHOLDER.
Fuses carried on lid, rendering shocks impossible. Complete with two 1 amp. fuses **2/6**

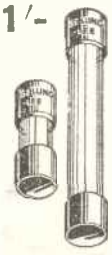
3 SINGLE OPEN FUSEHOLDER.
With 1 amp. fuse . . . **9d.**

4 PANEL FUSEHOLDER.
For panel mounting. With 1 amp. fuse **1/6**

5 FLEX FUSEHOLDER.
With 1 amp. fuse . . . **1/-**

6 WANDER FUSE.
With 150 m/a fuse . . . **1/-**

SPARE FUSES—*Shown Actual Size.*
LONG FUSE. All ratings, 60, 150, 250, 500, 750 m/a., 1 amp., 2 amp., 3 amp. SHORT FUSE. For WANDER-FUSE only, 60 and 150 m/a.



Dealers will fit other ratings in any of these holders at the time of purchase.

BELLING-LEE

Advt. of Belling & Lee, Ltd., Cambridge Arterial Road, Enfield, Middlesex.

DUBILIER INTRODUCE A DRY ELECTROLYTIC CONDENSER WITH 6 STAR FEATURES

In the new Dubilier Dry Electrolytic Condenser you have a component of outstanding features. Read for yourself of its six great advantages . . . and think how completely this Dubilier Electrolytic Condenser fills your every demand in this type of condenser. Then remember . . . it is made by Dubilier. And that means that it is as efficient as the finest craftsmanship in the industry can make it. It has already been adopted as a standard by leading set makers.

CONSTRUCTION.
★ The condenser consists of a positive and a negative electrode with a separator impregnated with the electrolyte. The whole is mounted inside a sealed aluminium container fitted with a moulded terminal insulator.

VOLTAGE RATING.
★ The maximum peak voltage (D.C. and A.C.) peak on these condensers should not exceed 450 volts. The actual A.C. ripple voltage impressed may be as high as 70 volts r.m.s.

OVERLOADS.
★ If Dubilier Electrolytic Condensers are subjected to a transient over-voltage, they reform on restoration of normal voltage.

LEAKAGE.
★ The D.C. leakage current of these condensers is very low. It drops quickly to a fraction of a milliampere after a short period on load. The recovery after a period of rest is also very rapid.

POWER FACTOR.
★ The power factor of these condensers is about 8%, which is less than half that of the aqueous types.

TEMPERATURE RANGE.
★ The electrolyte in these condensers contains no free water, and since it is not liquid there can be no splashing or creeping of electrolyte from them. It will not freeze and the condensers are undamaged by exposure to any extremes of cold.

4 mfd. Price 4/6
6 mfd. Price 5/-
8 mfd. Price 5/6

DUBILIER CONDENSER CO. (1925) LTD.
Ducon Works
Victoria Road
North Acton, W.3

ON THE TEST BENCH

—continued from page 300

Altogether it is a most attractive instrument.

An H.T. Alternative

We have had the opportunity of observing a Milnes H.T. Supply unit on test. It comprises a bank of nickel-iron type secondary cells which can be charged from an L.T. accumulator when this is not working the set.

The unit has been giving excellent service and there are no signs of depreciation. It appears to be a most attractive alternative to the better-known methods of obtaining H.T.

Becker Radio Switches

The snap type of switch, a miniature edition of the wall pattern used in connection with electric lighting, is becoming increasingly popular.

And it is not surprising that this should be the case, for if there is one thing above all others that is expected of a switch it is that it should have a sharp, clean action.

Among the latest concerns to produce a switch for radio sets embodying this "snap" lever principle is George Becker Ltd.

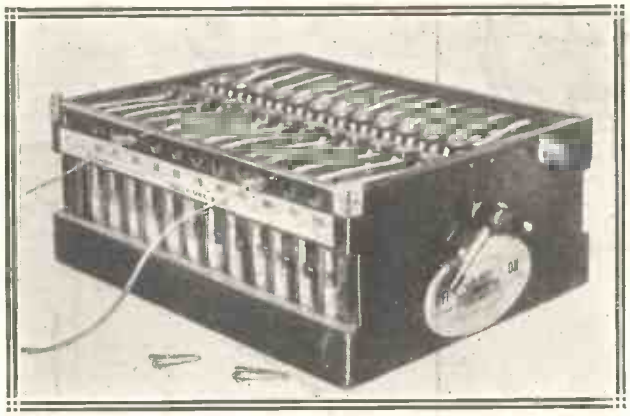
It is a particularly satisfactory product, too, and comprises a good bakelite moulding and has self-cleaning phosphor-bronze contacts. Single-hole panel-mounting is arranged for.

To Handle High Voltages

The design is such that it can handle high voltages and currents up to four amperes.

There is a single-pole model for mains and battery on-off switching, and a change-over model for radiogram switching.

THE MILNES H.T. SUPPLY UNIT



An H.T. battery of nickel-iron cells which can be charged by an L.T. accumulator. The single switch on the side makes the necessary inter-cell rearrangements.

The New "Atlas" Mains Unit

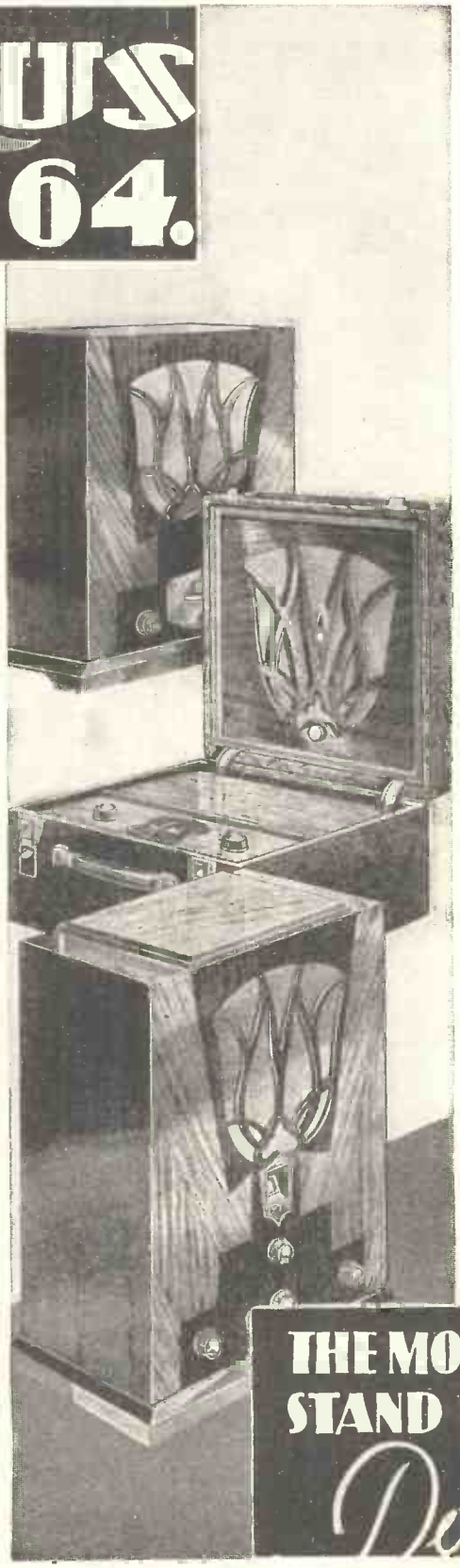
In regard to the "Five-Grid" Four, a full description of which appeared in MODERN WIRELESS last month, we should have included the "Atlas" A.C.300 in our list of recommended H.T. units.

Although the "Atlas" A.C.300 is rated at 25 milliamps., it should be noted that it supplies this current at 150 volts, and is capable of giving 30 milliamps. at 120 volts.

Therefore it is perfectly suitable for use with the "Five-Grid" Four whatever combination of valves is used for this set.

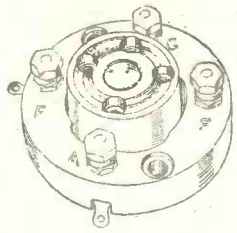
LOTUS STAND 64.

OLYMPIA



2 VALVE "BUD" RECEIVER

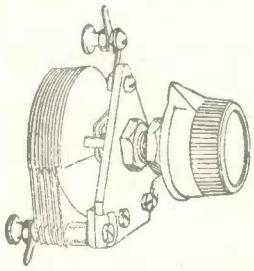
2-VALVE LOTUS "BUD" RECEIVER, an all-electric set of exquisite tone—incorporating a Moving Coil Speaker. Gives ample volume and many alternative programmes. For D.C. Model 11 Gns., or 21/9 down. A.C. Model 10 Gns. or 19/9 down.



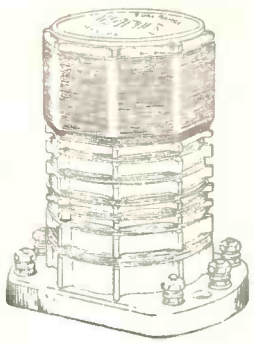
LOTUS VALVE HOLDERS in all types 4 and 5 pin, rigid or antimicrophonic, with or without terminals. Prices from **6D.** each.

3 VALVE RECEIVER

LOTUS BAND PASS 3—an all-electric receiver for A.C. Mains of exceptional selectivity, sensitivity and TONE. One of the outstanding sets of the season. Fitted with Magnavox Moving Coil Speaker. Royalty £1. Price 16 Gns. £1 11s. 6d. down.



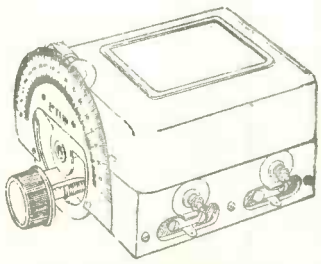
LOTUS REACTION CONDENSER in two capacities, type R.C.13 ·00013 and R.C.34 ·00034, both at **4/-** each. Suitable for all reaction needs, may also be used for series aerial condensers.



LOTUS DUAL RANGE AERIAL COIL. D.R.50. This is a new component giving an extremely high degree of efficiency and selectivity. Price **5/6.** Covers the medium and high wavebands. D.R.60 new Dual Range High Frequency Coil. Price **5/6.**

S.G.4 PORTABLE

LOTUS S.G.4 PORTABLE. Screen grid, detector, amplifier and power valves. A compact set of ample power and range. Fitted with the world famous Celestion Speaker. Complete with all batteries. Price 12 Gns. or 23/8 down.



LOTUS 2 GANG CONDENSER. PC2. An extremely accurate component—suitable for practically all modern circuits. Is strongly made and is provided with a dust proof cover. Price **19/6.** Also in 3 Gang type PC3, Price **29/6**

THE MOST INTERESTING STAND IN THE SHOW.

Don't miss it

See also the latest "Lotus" Models: Band Pass De Luxe 3-Valve Battery Set and the De Luxe 4-Valve Receiver.

LOTUS RADIO LTD., MILL LANE, LIVERPOOL

THE DAYS OF MY YOUTH

—*continued from page* 240

When I was sixteen I was appointed one of the first violins at the Rotterdam Opera House. After the evening's performance was over I would play at dances for a fee of two or three shillings and my supper.

It was a far better supper than I could have hoped to have got at home. The struggle to keep our heads above water was becoming more and more intense, debts were pressing on us, and often a meal at home merely consisted of bread, butter and cheese.

Princely Salary!

After a time I was made leader of the opera orchestra and my salary raised to £2 a week. We began to exist again! Two years later I was offered an engagement in Belgium. As by this time my father was also able to play again, I was able to insist on him as well as myself being offered a contract.

Our next move was in 1903, when myself, my father and the uncle who had declared that I should never make a violinist were engaged as part of an orchestra of twenty-five to play at the Paris Exhibition for three months. The expenses of the journey were heavy, and our finances were almost depleted when we arrived in Paris.

"Your Orchestra is Rotten!"

Then, four days after we had opened, our manager decamped, leaving us and the orchestra stranded. We discovered that we possessed some fifteen francs amongst the lot of us! Although I was by far the youngest of the party, the others seemed to regard me as their leader and, in fact, as one said, looked to me to pull them through!

I realised that twenty-five was far too unwieldy a number for the practical purposes of the orchestra, and with ten picked men I went from restaurant to restaurant in the Exhibition grounds playing to managers until I succeeded in inducing one to engage us.

All went well for a few days, then I was called for and told by the manager: "Your orchestra is rotten. I don't want it any longer. But if you like to stay, you can—and for as long as you like." When I replied that I refused to play without the rest of the orchestra, the manager said: "Very well, you can go with them."

I did.

This incident, with slight variations, repeated itself at several other restaurants. Then we could find no work to do at all. Things became desperate. We got hungry.

One morning I went alone, except for my violin, to the Exhibition. In the grounds I began to play. A few people stopped to listen, they were joined by others and soon there was a large crowd.

When I stopped, coins, copper, and even silver, were thrown to me. I picked them up and ran off to join the other members of the orchestra and the collection was soon exchanged for food.

Fares to Holland

For four months, and in this fashion, I was able to keep the orchestra going. Meanwhile they gradually diminished in numbers as individuals managed to scrape together the money for their fares to Holland. So, when they had all gone, we followed them.

My uncle and his two sons came to England. Not long after this I was

(*Continued on page* 305.)

THE DAYS OF MY YOUTH

—continued from page 304

handed two telegrams. One of them was from Germany and contained the offer of a post as leader of an orchestra.

The salary suggested was a large one and, moreover, the post carried with it a pension. The other was from my uncle telling me to come to London at once. A job at two guineas a week was waiting for me.

I was twenty then. I had always wanted to come to England, and the whimsical strain in my character prompted me to take advantage of the lesser offer. So, after first borrowing my fare from a fellow musician, I landed, some thirty-one years ago, in the country which I have since adopted as my own.

My first thought was to repay my passage money, and in order to do this I lived as frugally as possible for the first four weeks of my stay.

The first night I played in London my salary was advanced to five guineas. At the end of the week I was made conductor of the orchestra, and a fortnight later my salary was doubled.

Another Bad Spell

But there followed another spell of desultory employment, and during this time I was glad enough to accept engagements at skating rinks, cinemas and hotels. Better luck came with an engagement to play in the orchestra of the opera.

I had now been able to establish my finances sufficiently to send for my father and mother, who came to London to live with me. But hardly had my father arrived when he was taken seriously ill and had to go to a hospital.

Whilst he was lying there I was negotiating with the management of the Piccadilly Hotel for the leadership of their orchestra—a post I was to have for twenty years. The morning on which the contract was signed I rushed to the hospital to tell my father the great news. He was as excited as I.

My last words to him were : " Our bad days are over. Never again shall we have any anxiety over money. You needn't worry any more."

Alas, my words were only too true ! A few hours after I had left the hospital my father had a relapse and died.

With him passed the days of my youth and struggles for fame.

ROUND THE TURNTABLE

—continued from page 272

exhaustive tests are made and any necessary modifications carried out before any model is placed in production.

The factories employ over 7,000 workers, of which it is necessary to employ 40 per cent female labour, owing to the fact that there are numerous manufacturing processes which can only be satisfactorily accomplished by members of this sex.

As Large as Two Halfpennies

Over 1,100 miles of wire are used each day for making coils, and one operation in the manufacture of a gramophone pick-up coil involves the winding of 11,000 turns of wire, half the width of a human hair, in a space of three-quarters of an inch by one-eighth of an inch. The coil when completed is no larger than two halfpennies placed face to face.

It takes months of training to enable a girl to carry out this work, and costs on an average £50 per worker before she is able to produce a coil that can be used. Girls have a natural aptitude for fine work which could never be mastered by a man.

Production has recently been simplified by the installation of over three miles of conveyors, and these are so arranged to move at speeds varying from 3 in. to 10 ft. per minute.

" His Master's Voice " has always been renowned for cabinet work, and it is of interest to know that the factories use over 4,000 trees 50 ft. by 6 ft. each year for the cabinets, and 3,000 gallons of stain to give the rich ground colour.

Enough to Light a Town

It takes 120 working hours to manufacture a medium-priced radio-gramophone which is composed of 2,461 separate parts. These parts are all made at Hayes, and those which are not carried from place to place on the conveyors are transported by 40 electric trucks, all of which have to be licensed because a public road runs through the factories, and the trucks have to cross the road.

In the power house, huge generators produce more electricity per day than is used in a town the size of Reading. And here is a final figure. The rubber buffers on a pick-up are compressed and released about one million times during the playing of a record. Some hard work !

IN PASSING

A Portable on "Puffin"

Our discursive contributor goes rambling this month, and his adventures on Puffin Island are told with quiet charm and humour that are as soothing as a real ramble should be.

THE original conception was like a picture in oils, pleasing enough maybe, or at any rate reasonable when considered from a distance, but unattractive as a "close-up."

In principle, I was to carry a portable receiver to the top of Snowdon to introduce the eagles to the B.B.C. But when I saw Snowdon I realised at once that the proposition had been evolved from fallacious premises and that my own private and personal

SNOWDON'S SUMMIT

"Out of the mist there crawled into view the Perfect Hiker."

twelve-stone-three would be all I should ever be likely to take to a height of 3,560 feet.

There was the mountain railway, but the dream had already vanished; besides, coward as I was, lazy as I might have been, I was not going to do my mountaineering with the aid of Puffing Billy. All the puffing was to be mine.

The man who measured the height of Snowdon was far too modest. He must have been several miles out in his calculations. I know perfectly well that when I register that "twenty miles feeling" I have walked at least ten miles, and I have had more experience of that feeling than he of height-measuring. Hence if he cares to correct his error he should turn his 3,560 into 8,739·314. I can say truthfully that I have paced it out.

A Rude Reminder

About half-way up I lost the count, because I reached my tailor's telephone number and began to plan my autumn outfit—on the usual terms. However, when I recovered consciousness it did not seem worth while to descend and begin afresh, so I paced the remaining distance and doubled the result.

The decimal fraction was due to the last step up the cairn on the summit, a piece of meticulous accuracy which ought to inspire confidence in my figures.

The summit was occupied by one sheep which, like Dr. Johnson, collected orange peel. What the Doctor ultimately did with his specimens not even the pertinacious Boswell could discover, but my sheep ate his collection forthwith, for lack of pockets. Presently a terrier arrived like an arrow from nowhere and my sheep vanished downward into the abyss at a velocity of 500 miles an hour. Probably the terrier was the reincarnation of Boswell—an apt one, indeed—and wanted to know about the orange peel.

Shrouded in Mist

The summit was shrouded in mist, which was impenetrable beyond a few yards. I think that someone must have been talking Welsh there and that the resulting haze had not cleared off. Out of this mist there crawled into view the Perfect Hiker, a lanky, sandy youth in shorts, bony of knee and hairy of leg. I had a momentary impression of the legs of plucked turkeys hung up in the Christmas shops!

Like the lad in the poem *Excelsior*, this youth bore "a banner with a strange device"; to be precise I should say that it was a small yellow poster announcing a Sports Meeting to be held at some Lancashire village.

He told me that for a bet he had come up there in order to place this poster on the wall of the hut which dispenses welcome and costly cups of tea but effectively blots out the best view, when there is a view. What a publicity agent he would make!

AS USUAL!

"——got aboard with one shoeful of water."

I asked him—"What's the matter with Mont Blanc?"

"Oo-er! That's in Switzerland, though."

"No," I said. "In France."

He took this lying down, probably feeling that his geography had gone all to bits on account of the rarefied air, etc.

This incident reminded me of the exploit which I had abandoned for 8,739·314 good reasons and I went behind the cairn to blush. But at the very extremity of my abasement the germ of another and greater idea began to stir with life; before I had grown cool under the collar it had blossomed and the fruit of it you shall know if the ink lasts long enough.

IN PASSING

—*continued from page* 306

Between Great Orme's Head and the point of Anglesea nearest to it, Trwyn-du, lies the islet named Ynys Seiriol, or Priests' Holm, commonly called Puffin Island. You may come to it by boat from Beaumaris, passing by way of Midlake Swatch between the Dutchman's Bank and the Spit, but beware of the reef when the tide runs strongly and there is any sea, lest your boat be battered and stove in upon it!

Now, when I first saw this gem afar off, lying blue and shimmering in the haze of a hot July afternoon, I knew that it is one of the Islands of the Blest, where dreams come true.

I knew that it was said to be uninhabited, and I recaptured for one sweet moment the pure thrill which had rippled across me when first I stared, together with Jim Hawkins and the Squire, at the blue bulk of Treasure Island. Such precious moments come to a man as rarely as he digs golden coins of the past from some workaday pit.

"Puffin's" First Portable

So as I stood in the mist on Snowdon I remembered Ynys Seiriol and being aflame with the worldly spirit of vulgar contest I vowed that I would be the first to plant a wireless set on that solitary spot. In such spirit men would try to floodlight Venus or perform sky-writing on the dome of Heaven.

The next day saw me ferrying across to Anglesea and making my way with all speed to Trwyn-du, for I had no mind to be exploited by the Beaumaris motor-boat owners; besides, Jim Hawkins *rowed* ashore to Treasure Island.

So to Trwyn-du I came, perspiring freely under my load, for even portable wireless sets are subject to the influence of gravitation.

Complete with Impedimenta

There on the rocky shore I saw a boat, and in a cottage near by I quickly found its owner, one Williams, a nice man and godly withal, for he confided to me that he cherished above all else the divine services broadcast by the B.B.C. Also he had somewhat to say about the neglect of the Welsh language by the B.B.C., but I was intent upon Puffin Island and do not recall the precise point of his grievance.

(*Continued on page* 309.)

IN PASSING

—continued from page 307

Having explained my desire to be put ashore on Puffin Island, together with my impedimenta, I crawled down some rocks, dumped rucksack, camera and portable in the boat, helped Mr. W. to heave the boat over some twenty yards of beach, and got aboard with only one shoeful of sea water.

After a few dozen strokes we slithered up the weed and jumped ashore. Lugged the boat up the beach some ten yards, for the tide was rising, and tied the painter to a boulder. I picked up stick and camera, and decided to leave the rucksack.

Well Populated

"What about this?" asked the skipper, indicating the portable. I looked at the Population, listened to their remarks and recalled that first fine rapture. "We will leave it," I replied, and set off up the slope in the same rose-coloured haze of romance that enveloped Jim Hawkins during his first walk ashore.

Puffins and gulls, razorbills, cormorants and guillemots, there they sat on the rocky ledges, screaming and squawking like the contents of a girls' school at play.

The age-old turf was torn to pieces with the incessant burrowing of rabbits, the birds—or some of them—had rested in the older burrows and the ground was strewn with feathers and egg-shells. Far down the cliff, on an inaccessible ledge, sat the black cormorants on their nests.

"Click," went the camera. I operated it, cursing the nettles, whilst the skipper held me manfully by the ankles and prayed to his Cymric deities that my shoes would not slip off.

A Natural Burlesque

Presently the skipper worried about his boat. "Go and sit in the darned thing and leave me here to soak in—er—all this," I said. He disappeared over the brow of the slope and I was left alone to smoke and dream.

It must have been at the third pipe when the scales fell from my eyes and I saw that before me was being enacted a natural burlesque which might well be called "A Mirror of Broadcasting."

To my right was a large and severe-looking bird sitting in his Directorial Chair, aloof, immovable despite the outcries and the flapping of wings, and quite clearly he was keeping one eye on the puffins and the other on the rabbits. It was obvious that the rabbits represented the "listeners."

They would sit up on their hinders giving every appearance of approval, while the Ynys Seiriol Male Puffin Quintette rendered some "hot" part songs. Some popped into their burrows, switching off, as it were, during a short play by the "Guillemots Grand Guignol Company."

Unfavourable Comment

Another "turn" which caused much unfavourable comment was that given by a Razorbill, who was a "comeback," having performed in the Shetlands, the Orkneys and on Lundy Island as far back as 1893. His jokes about his egg-in-law, and about a red-nosed rabbit fell very flat, and when he obliged with a sob-song called, "She was only a Scotch Grouse's Daughter but she Wouldn't Feather Her Nest," several rabbits refused to nibble and went into their burrows backwards.

On a ledge twenty feet down I saw an "audition." A raven was trying to put over a song called, "Never More." He was introduced as "the bird who snores in his throat." I gathered that he was not booked up, because he grabbed his hat and gloves in a hurry and was hustled off the premises by ninety gulls.

The gulls were the Announcers; they hovered benignly over the whole business, keeping clear of the Big Cormorant on his twiggy chair, except when he made one of his dictatorial remarks, when they went into vertical spins, some looping the loop or doing the "falling leaf" evolution.

"The Missing Engineers!"

Their pronunciation was correct, but their intonation plaintive, and their shirt fronts were immaculate. Most of them were graduates of Bangor University, and the rabbits were forbidden to refer to them as "Uncle Taffy."

What puzzled me was the complete absence of the engineers, but as I was being pulled back to Anglesea the skipper said: "There used to be a few goats on the Island, but you don't see much of 'em. They don't like the cormorants."

"By gum!" I said, slapping my knee. "*The missing engineers!*"

Anyhow, I shall go down in history as the first man who deliberately refrained from working a portable on Puffin Island and yet heard broadcasting there.

RADIO NOTES and NEWS of the MONTH

That Press "War"

It was reported in the "Daily Herald" recently that the B.B.C. was likely to "declare war" against the wireless technical press, the result being that one of the B.B.C.'s publications would enter into direct competition with "M.W." and its contemporaries.

How this silly rumour started it is difficult to understand—but rumour it is and nothing else. There will be no "war" between the B.B.C. and the technical press. In fact, peace and sweet reasonableness reign surpreme. Will the "Herald" please note!

Hannen Swaffer at Broadcasting House?

The radio gossip writer in the same newspaper seems to be very keen on emulating his well-known colleague—Hannen Swaffer. The radio gossip paragraphs which grace the "Herald's" pages once a week certainly give the impression that the writer is *persona grata* at Broadcasting House, and that his weighty words are eagerly read by trembling officials of the B.B.C.

Really Funny!

We wonder what Mr. Lance Sieveking and Mr. Val Gielgud *really* think about this Swafferish criticism?

Possibly they don't think about it at all—if they are as wise as we think they are; but, on the other hand, if they have a sense of humour they will certainly get a great kick out of the gratuitous advice more or less regularly dished out to them by the "Herald's" radio man. Some of it is really funny.

The Dublin Exhibition

The Irish Wireless and Gramophone Exhibition is to be held in the Mansion House, Dublin, from September 19th to 24th. Arrangements have been made for a really representative display of up-to-date wireless and television apparatus. All the available space in the building has been secured by the promoters—the Irish Radio Traders' Association, Ltd.

B.B.C. Appointments

The B.B.C. announces that, in preparation for the introduction of the Empire broadcasting service, Mr. C. G. Graves has been appointed Director of the Empire Department. Mr. G. C. Beadle, Station Director, Belfast, becomes Assistant Director of Programmes in place of Mr. Graves; and Mr. G. L. Marshall, Station Director, Newcastle, succeeds Mr. Beadle as Station Director, Belfast.

The post of Station Director at Newcastle, vacated by Mr. Marshall, will be filled at a later date.

Brighton Experiments

Experimental tests were made the other day at Brighton with a new kind of portable receiving set which may soon be included in the policeman's equipment. The set weighs less than a couple of pounds and measures only 6 in. by 4½ in. by 1¼ in.

At a recent test a sergeant wore a special kind of tunic inside which was fitted a little receiver attached to a bell.

(*Continued on page* 311.)

RADIO NOTES AND NEWS OF THE MONTH

—continued from page 310

Walking Wireless!

Various wires sprouting about the policeman's uniform were used as an aerial. A message was sent from Brighton Town Hall, which actuated the bell, thus warning the policeman that a message was awaiting him. He successfully tuned in and received instructions. The day when London policemen will be walking wireless sets is obviously not far distant.

Train Radio

I hear that, following the successful installation of receiving sets on the L.N.E.R. express between King's Cross and Leeds, two Scottish trains running between London and Edinburgh have been fitted with complete radio-gram apparatus, and from now on passengers will be able to listen to the B.B.C. programmes by means of headphones plugged into sockets in the carriages. The charge for the hire of the 'phones will be 1s. per time. What I should like to know is—does one 10s. licence fee cover the use of an installation on one of these trains?

If so, there is a curious anomaly here, for in a large block of flats, where one central set supplies a number of rooms, each "point" for flat inmates should, by rights, be licensed at 10s. a time. There looks like being a nice test case here, for on the face of it every point fed by radio or a train should also need a 10s. licence fee.

Cardiff's New Bye-Law—

Cardiff City Council recently approved the making of a new bye-law to this effect:

"No person shall in, or in connection with, any shop, business premises, or other place which adjoins any street or public place, and to which the public are admitted, operate, cause or suffer to be operated, any wireless loudspeaker or gramophone in such a manner as to cause annoyance or disturbance of occupants or inmates of any premises."

—And a Problem

Here's a nice little problem for a test case! What constitutes annoyance? X, living next to a radio shop, might complain that he finds the loudspeaker an annoyance; while Y, living the other side of the shop, might affirm that there was no annoyance at all as far as he was concerned. What is the yard-stick for "annoyance"? The answer is: watch the courts and see what our local law guardians decide in the long run.

Ether Advertising

According to a recent issue of "The World's Press News," there is an uneasy feeling in the newspaper world on the question of broadcasting advertisements, and, according to a correspondent to that journal, advertising via the ether will come in due course, for the B.B.C. will be forced into it in sheer self-defence.

The P.O. Attitude

It is pointed out in the article that the listener, because he pays 10s. licence fee to the B.B.C., is wrong in thinking that he has a legal right to get the kind of radio entertainment that pleases him. In actual fact, he pays 10s. to the Post Office for the privilege of being allowed to install and operate a receiving set.

The Post Office is under no obligation to broadcast programmes, and the B.B.C. is only licenced by the Post Office to perform that service. Consequently, in view of this arrangement, last year the B.B.C. received only a fraction of the amount paid by listeners.

"It's a Gift!"

There is nothing in the B.B.C.'s Charter to preclude it from broadcasting sponsored programmes; but there is a clause to the effect that it is prevented from accepting money for broadcasting programmes; but if, say, a big stores in London offered to provide a programme as a gift, there is nothing to prevent the B.B.C. from accepting. And, of course, the big store, in making the offer of a gift programme, would stipulate that the name of the store should be mentioned two or three times during the broadcast.

A Treasury Rumour

This principle, of course, is already in force, especially in connection with the broadcasting of gramophone records, etc. Some months ago the rumour arose that the Treasury was preparing a scheme by which all revenue from wireless licences should be eventually absorbed by the Exchequer, leaving practically nothing for the B.B.C.

If this rumour ever matures and becomes actual fact the B.B.C. will be forced to derive its income—or a very large part of it—from sponsored programmes.

(Continued on page 312.)

RADIO NOTES AND NEWS OF THE MONTH

—continued from page 311

The Altitude Record

When Professor Piccard ascends in his balloon to explore the Stratosphere he will take with him a short-wave transmitting wireless set which will broadcast messages on two wave-lengths—one between 38 and 40 metres, and the other between 75 and 80 metres.

Probably by the time this issue of MODERN WIRELESS is on sale Professor Piccard will have commenced his experiments, and the Editor will be interested to receive any information regarding messages from Professor Piccard's set picked up by readers.

In the Balloon

The transmitter will have a power of 50 watts, and Professor Piccard will also take with him a four-valve short-wave receiver.

Professor Piccard states that he does not aim at beating his own world altitude record of 15,781 metres, but intends to study the Cosmic rays with elaborate and sensitive measuring instruments.

Where Do They Come From?

The modern theory is that Cosmic rays originate in the Stratosphere of between 200 and 300 miles altitude, although some scientists believe that these rays come from inter-sidereal space, and it is Professor Piccard's hope to bring his own contribution to the solution of this interesting and fascinating problem.

Richer Than Millionaires!

Mr. J. H. Whitley, the Chairman of the B.B.C., recently addressed the delegates of the Summer School for the Training of the Wireless Group Leaders at New College, Oxford, and incidentally gave them some valuable advice on listening.

"We send out each week-day some fourteen hours of broadcasting," remarked Mr. Whitley. "I wonder," he continued, "how many hours I should advise people to listen. I would be inclined to suggest two hours a day.

"You should take the programme and use the blue pencil as to what you should listen to during the coming week."

B.B.C. as University

Mr. Whitley went on to picture the man or woman who paid 2½d. a week for a wireless licence and 2½d. a week for the hire of books, who would sit at the fireside and possess the treasures of both. "Who shall deny that such a man or woman will be far richer than most millionaires?" he asked. He was not certain whether the B.B.C. was not going to be the greatest University of all in the years to come.

Where Have They Gone?

The "Daily Mail" raised the pertinent question the other day: "What has happened to Britain's crystal sets? Where have they all gone?"

A correspondent made enquiries of a number of well-known firms in order to solve this mysterious disappearance problem. The G.E.C. stated that they gave up making crystal sets in 1927, although a few years before that they were sold in tens of thousands. The Marconiphone Co. stated that they gave up making them about 1926, although prior to that date they had manufactured two types, one at about £4 and another at about £9.

A Marconiphone official pointed out that considering that listeners can now get a complete self-contained two-valve set for about £4 19s. 6d., the cause of the disappearance of the crystal set is fairly obvious.

Dead Stock!

The Brownie Wireless Company stated that although they once sold hundreds of thousands of low-priced crystal sets each year, the sales had now dropped to practically nothing. A few crystal sets were kept in stock, but the Brownie Company consider them as dead stock.

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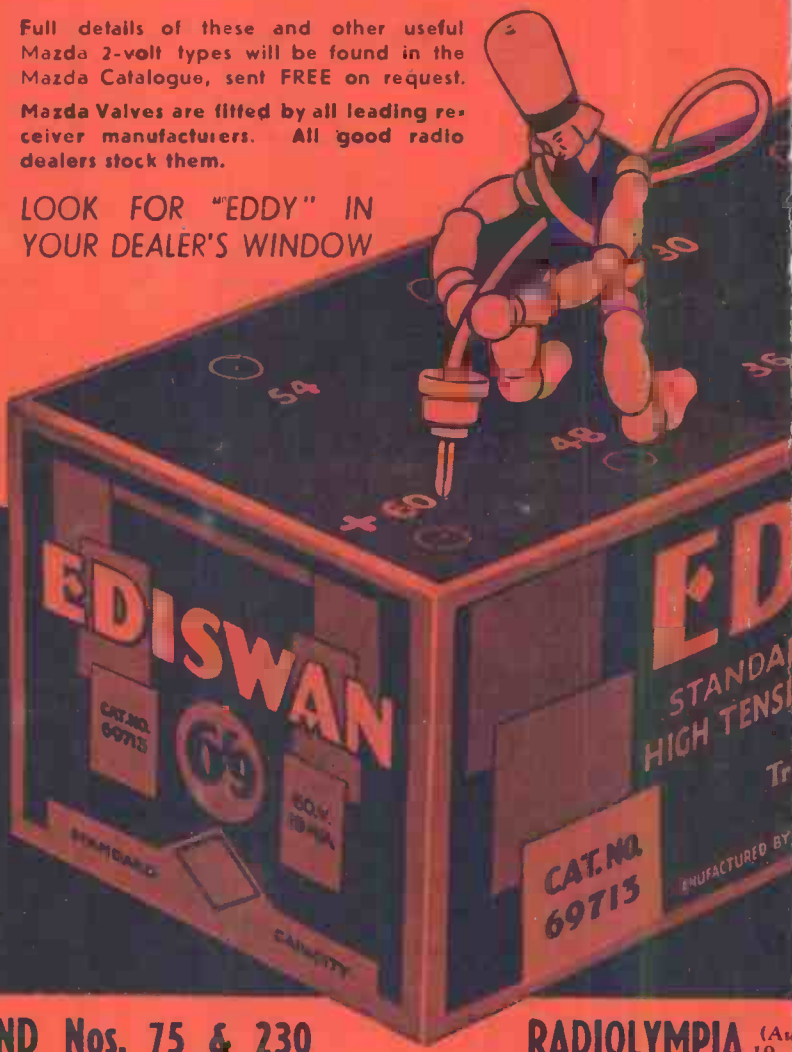

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