

WITH FREE HANDBOOK, "20 BEST VALVE SETS"

# Amateur Wireless

And Electrics

Every  
Thursday 3<sup>d</sup>

Vol. XI. No. 280

Saturday, Oct. 22, 1927

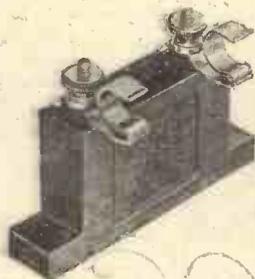
# FREE 32 page HANDBOOK

With This Issue

81  
ILLUSTRATIONS



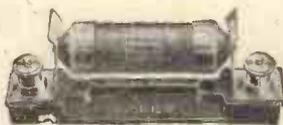
# Condensers and Resistances



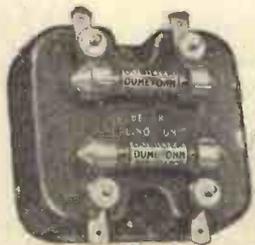
Type 620 Mica Receiving Condenser. 21 standard capacities from 0.0005 to 0.015 mfd.



Dubilier Resistors made in 21 standard values up to 50 ohms. to fit Dumetohm holders.



The Duwirohm wire wound Anode Resistance made in 14 standard values.



The Dubilier R.C. Coupling Unit for use with high amplification factor valves

**D**UBILIER Condensers and Resistances are the outcome of a highly specialised experience. They are designed with a thorough understanding of the functions which each is expected to perform and their unflinching accuracy and reliability have made them famous wherever the science of radio is known. Use Dubilier Condensers and Resistances in every radio set you build and be assured of the satisfactory results which only carefully chosen components can give.

**Type 620.**—This is the famous fixed mica condenser which is the vertical counterpart of the type 610. It is suitable for use as a grid condenser, bypass condenser, etc., etc. Both Types 610 and 620 are made in 21 different standard capacities between 0.0005 and 0.015 mfd and are supplied with the necessary clips for series and parallel mounting of the Dumetohm between 0.0005 and 0.0005 mfd capacities.

Prices from 2/6 to 4/6 according to capacity.

**Dubilier Filament Resistors.**—We supply a complete range of accurate Filament Resistors which clip into the Dumetohm holder as shown. By employing the correct value of resistor you are enabled to obtain the drop in voltage necessary when using say 2-volt valves with a 6-volt accumulator. We shall be pleased to forward a chart enabling you to determine the correct resistor to use in any given case.

Dubilier Resistors, 1/- each. Dumetohm Holders, 1/6 each.

**The Duwirohm,** a Dubilier wire-wound Resistance, is constructed with a special form of non-inductive winding enabling the Resistance to carry a potential of several hundred volts in safety. Graded to a close degree of accuracy it is guaranteed to remain constant indefinitely. Standard Resistances are 10, 20, 30, 40, 50, 60, 70, 80, 90 and 100 thousand ohms at 5/- each, 150 and 200 thousand ohms at 8/- each, 250 thousand ohms at 9/9 each and 300 thousand ohms at 11/6 each. Holder as shown, 1/6 extra.

**The Dubilier R.C. Coupling Unit.**—In this unit is combined our unique experience in the manufacture of Condensers and Resistances. The condenser element contains dielectric of the best India Ruby Mica, the resistances being the famous Dumetohms which, it will be noticed, can be interchanged for values to suit your own requirements.

Many thousands of these units are giving excellent reproduction all over the country.

Price 7/- each.

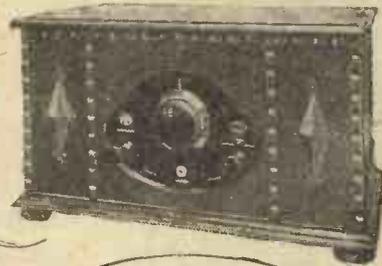
Your  
Dealer  
stocks



Products  
—ask  
him

Adv. of The Dubilier Condenser Co. (1925) Ltd., Ducon Works, Victoria Road, North Acton, W.3 T.C.31

Advertisers Appreciate Mention of "A.W." with Your Order



We illustrate herewith  
the famous

# The Magic of Music

Melodies old and new—songs of the past and the present—a merry dance—an example of orchestral excellence—all are reproduced with life-like fidelity by **MH** Receiving Sets. One has no desire to face the rigours of winter in search of musical entertainment, for amid the cosiness of one's own home an **MH** Receiving Set will reveal, in all its fulness, the Magic of Music.

## **MH** RECEIVING SETS

for 1927-1928 season include a Portable Four-valve and a Portable Five-valve Receiver, which are a revelation in range and quality of reproduction.

To hear the result of a scientifically designed Receiver in conjunction with a first-class loud speaker of the Cone type with which all our Portable Sets are fitted, is to have an entirely fresh standard of performance. Complete revision of the circuits of our popular Dimic Three and Four has been made, with the result that these two receivers are absolutely up-to-date and unique in quality of performance and value for money.

### To the HOME CONSTRUCTOR



Our Home Assembly Dimic Threes will make an irresistible appeal, and a fully illustrated booklet giving complete details may be had on application at the price of 1/-

We are exhibiting at the  
MANCHESTER RADIO EXHIBITION, OCTOBER 24 to NOVEMBER 5

## L.M. MICHAEL LTD

Manufacturers of Wireless and Scientific Apparatus  
WEXHAM ROAD, SLOUGH, BUCKS.

Telephone: Slough 441-442. Telegrams: "Radlether, Slough."  
IRISH AGENTS, B.N.B. WIRELESS LTD., DUBLIN AND BELFAST.

## **MH** DIMIC THREE

Cabinet Type. It is a 3-valve Receiver (1 detector, 2 L.F.) incorporating the acknowledged best coupling for purity of reproduction, viz., one Choke coupling and one **MH** Ferranti Transformer stage.

**MH** Receivers give an unending source of true musical enjoyment.

Price £11 : 0 : 0

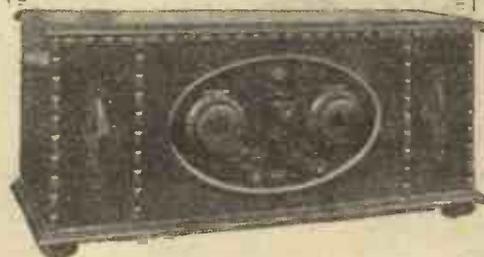
Royalties £1 : 17 : 6 extra

## THE **MH** 1928 DIMIC FOUR RECEIVER

The 1928 Dimic Four (one H.T. one det. two L.F.) embodies many marked improvements. The Components have now been arranged in a dust-proof compartment *underneath the baseboard*, the upper range coils (Daventry, Radio-Paris, etc.) being fixed permanently, but the lower range Dimic Coils being plugged in as required on the *upper surface* of the panel. The re-designed dark oak cabinet contains space for H.T. and grid bias batteries, while two handy terminals connect easily to an exterior accumulator. Extra terminals facilitate connection with a gramophone pick-up attachment, utilising the amplifying valves to reproduce records on the loud speaker.

Price 17 gns.

Royalties £2 : 10 : 0 extra



IN HANDSOME  
DARK OAK CABINET



Peol's Advertising Service, Ltd.

You will Help Yourself and Help Us by Mentioning "A.W." to Advertisers



## KINGS OF THE AIR

**A**FTER four years Cossor still stands pre-eminent among valves. The famous Cossor Kalenised filament—the first ever to operate without visible glow—is still acknowledged to be without equal for strength, long life and economy.

Even if you know nothing about Radio you'll sense Cossor superiority the moment you start using Cossor Valves. Such wonderful tone—such majestic volume—such freedom from irritating background noises that every Cossor user quickly becomes a staunch enthusiast.

Remember this when you buy your next valves—demand Cossor Valves and be satisfied that you'll get valves which will serve you well, which will cost little to run and which will give you the most perfect broadcast music. A full range of types available from 10/6 each.



# COSSOR

*the melody maker*

Adv. of A. C. Cossor, Ltd., Highbury Grove, N.5

CA  
9723

Mention of "Amateur Wireless" to Advertisers will Ensure Prompt Attention

# Amateur Wireless

## and Electric

The Leading Radio Weekly for the Constructor, Listener and Experimenter

Vol. XI. No. 280

Edited by BERNARD E. JONES  
Technical Editor: J. H. REYNER, B.Sc.(Hons.), A.M.I.E.E.

October 22, 1927

### Simple Reinartz Set—Honeyed Words—Crystal Curiosities—Armistice Broadcast— Amateurs Again!—Copyright Troubles

#### A Simple Reinartz Set

USING two ordinary plug-in coils, the one-valve Reinartz receiver described by the "A.W." technical staff in this issue is eminently suitable for loud headphone reception of 2LO and 5GB. With larger size coils 5XX can be received with equal clarity. The original Reinartz circuit incorporated is an old and well-tried arrangement, which gives a good all-round combination of selectivity and sensitivity.

#### Honeyed Words

SIR JOHN REITH has hinted that he is not satisfied with present "non controversial" items and it is possible that the P.M.G. may shortly be approached with a view to slackening restrictions over broadcast talks. Is any radio talk wholly uncontroversial? We doubt it!

#### Copyright Troubles

THE B.B.C. has not yet managed to quash all copyright troubles, for *The Lilac Domino*, which was to have been heard on October 10, was hastily withdrawn owing to a breakdown of negotiations. What a pity that millions should be disappointed because two parties cannot agree.

#### Empire Broadcasting

IN a statement issued recently regarding Empire broadcasting, the B.B.C. reports "satisfactory progress" and sees no reason to revise its prediction that Empire broadcasting may be undertaken with the guarantee of the elementary conditions, prerequisite to service, some time during 1928. Contact is being maintained and developed with the broadcasting organisations of the Dominions and Colonies.

#### A "ROBERTS" FOUR

As announced in the booklet presented with this issue, Mr. C. A. Oldroyd is presenting next week full constructional details of a four-valver which he has specially designed for "Amateur Wireless" readers. As its name implies, this receiver incorporates the essential parts of a circuit developed by Walter van B. Roberts, an American wireless engineer. Readers can undertake the construction of the "Roberts Four" with the reassuring thought that in America this type of circuit is immensely popular owing to its great "D.X." capabilities. The heart of the original Roberts circuit is undoubtedly the H.F. transformer with centre-tapped primary and tuned secondary. This particular system, which enables stable H.F. amplification to be obtained, has largely contributed to the success of several well-known British receivers, including the "Revelation Four" described in the July issue of the "Wireless Magazine." To assist constructors, we are giving away with every issue of next week's "Amateur Wireless" a large Blueprint measuring approximately 27 x 20. Have you ordered your copy?

#### Armistice Day

ON Armistice Day, General Sir Ian Hamilton will read that passage from the Apocrypha beginning "Let us now praise famous men," and Lord Balfour will deliver the wonderful speech which Pericles made, over two thousand years ago, in honour of his country's soldier dead.

#### Amateurs Again!

NOW that arrangements have been made for the erection of a 24-metre "Empire" transmitter at Chelmsford, for

the B.B.C. to test with, it is rumoured that several prominent experimenters in other countries have been appointed to co-operate in the tests. We are glad to say that many of these helpers are well-known amateurs

#### Wembley Woes

MUSIC from a loud-speaker drowned the sounds made by a cat burglar who recently stole £7,000 worth of jewellery from a house packed with art treasures at Wembley. Seems like a case of a too-loud speaking loud-speaker!

#### Crystal Curiosities!

A WRITER in a contemporary American paper claims to have found a means of using crystals for accumulator-charging from A.C. mains. He says that special care must be taken to prevent the crystals from burning out; and from our experience of crystals we should say that most extraordinary care would be necessary! But perhaps they have better crystals over there!

#### Have You Heard That—

"THE Aberdonians have given up buying eggs. They now send the shells to the B.B.C. and have them relayed."—*Daily Mirror*.

#### Too Much of a Good Thing

SOME Continental stations should consider the B.B.C. slogan: "Fewer stations and higher power." France has plans in hand for at least four new small stations, and it is rumoured that the power of Eiffel Tower will shortly be increased to 50 kilowatts. South-coast listeners will have a bad time of it if cross-Channel interference grows worse!

#### PRINCIPAL CONTENTS

Current Topics ..	555	Circuits for You to Try	568
Further Notes on the "Simpler Wireless" Special three ..	556	Without Fear or Favour	571
A Reinartz Plug-in One Valver ..	557	Letters to the Editor ..	572
The Many Uses of Plugs and Jacks ..	559	Capt. Round on Short-wave Subtleties ..	573
On your Wavelength ..	565	Practical Odds and Ends	575
Getting the Best from the Loud-speaker ..	567	The Home-station Three	576
		"A.W." Tests of Apparatus ..	580
		Our Information Bureau	582

## FURTHER NOTES ON

THE "SIMPLER WIRELESS"  
SPECIAL THREE VALVER

By J. F. JOHNSTON

THOSE who build the "Simpler Wireless" three-valve set described in last week's AMATEUR WIRELESS will find that it is a really excellent receiver for general loud-speaker work, provided that suitable valves are used and that the set is properly adjusted. While the receiver makes no pretence of being a "long-range" set (no H.F. amplification being employed), it will be found capable, when used in most parts of the country, of bringing in at least three or four different programmes at full loud-speaker strength and with faultless quality.

**A Test**

As an example of what may be expected, the results of a test carried out ten miles south of 2LO will, no doubt, interest readers. The aerial used was certainly below the average and the electric light supply was 200 volts 50-cycle A.C. An experimental rectifying unit (of which a more practical version will shortly be described in AMATEUR WIRELESS) was used between the mains and the set, the output of this unit being 200 volts 100 milliamps.

Using a Lewcos centre-tapped 100 coil, 2LO, 5GB, and Langenberg could all be received at full loud-speaker strength without any other adjustment than merely rotating the condenser dial. By carefully adjusting the reaction condenser and the potentiometer controlling the grid poten-

tial of the first valve, several other stations could be brought in on the loud-speaker, though none quite so loud as the three mentioned above. A large coil was not available, or doubtless 5XX and Radio-Paris could also have been well received.

**Sharp Tuning**

The tuning was sharp and a very slight movement of the variable condenser completely cut out 2LO. No trouble whatever was experienced from "mains hum" after the set had been correctly adjusted. If the tuning was set so that no station was being received, it was, indeed, possible to detect a *very faint* hum by placing the head close to the loud-speaker, but the faintest station completely obliterated this, and, in any case, it could not be heard any distance away.

**Suitable Valves**

During the test opportunity was taken of trying out different combinations of valves, though, of course, only a limited number of these were available. *Of the valves tried*, an Osram DEL610 proved to be the best detector, and a Cossor Stentor Six the best power valve. In the centre position an Osram DEH610, a Cossor 2-volt .1 amp. R.C. valve, and an Ediswan RC610 all gave excellent results. Many other combinations of valves would doubtless have given good results, but *all* com-

binations were not equally good. With the valves mentioned, a Dumetohm 2-megohm grid leak was used as the anode resistance.

The value of the anode resistance will vary, for best results, in the case of different combinations of valves. When it is of suitable value the potentiometer controlling the grid potential of the last valve (the third potentiometer from the left, looking at the front of the set) should not have to be hard over either to right or left in order to get the best reception. If this potentiometer has to be put right over to the left, a higher value anode resistance is wanted, and if entirely over to the right a lower resistance is required.

The second potentiometer from the left, that controlling the grid potential of the centre valve, will have to be put hard over to the right in the case of nearly all combinations of valves, as the voltage-drop across the L.F. choke coil usually biases the second grid sufficiently.

**Both D.C. and A.C. Mains**

In addition to the above test on rectified A.C., the set has also been tested in different places and on D.C. supplies, always with similar results. The test on A.C. was, of course the most drastic as regards freedom from hum, as the supply-current, after being rectified, was only very roughly smoothed. If any hum is experienced when operating this set, the most probable causes will be incorrect settings of potentiometers, unsuitable value of anode resistance, and unsuitable valves.

Of course, the "cancel-out" effect of the "Simpler Wireless" system only applies to inequalities in the voltage applied to the set. It has no effect in eliminating interference from nearby electric motors or other electrical machinery. If at present such interference is experienced when using a normal set working from the usual batteries, it will not be reasonable to expect that a "Simpler Wireless" set will be immune from it.

**Reports Wanted**

In conclusion it may be stated that reports from readers who build the "Simpler Wireless" Special Three will be very welcome, whether their results be good, bad, or indifferent. If the results are not good, we shall probably be able to point out the reason why and show how they may be improved to the standard of which we know this set is capable.



A picture on the occasion of the Hackney District Radio Society's Annual Dinner and Dance recently held at the Talbot Restaurant, London Wall

# A REINARTZ PLUG-IN ONE-VALVER



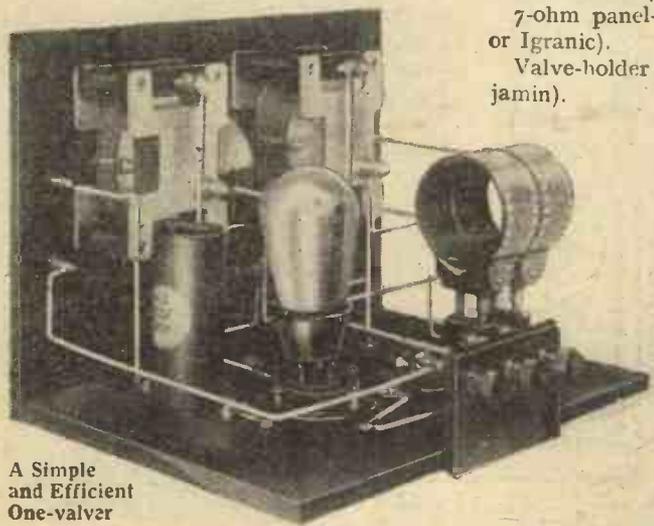
By the "A.W." TECHNICAL STAFF

WHEN the considerable price reductions in British valves were announced, many crystal-set listeners must have turned their thoughts to valve receivers. It was to meet a need for a simple "first valver" that the technical staff evolved the one-valve Reinartz receiver illustrated.

The simplest way to explain the working of the receiver is to discuss the circuit diagram.

There are two coils and two variable condensers indicated. The top coil is tuned with a .0005-microfarad condenser. The lower coil is for reaction, and has one side connected through a .0003-microfarad variable reaction condenser to the anode of the valve. An H.F. choke is necessary between the anode and H.T. + to divert the H.F. component of the rectified signals through the reaction condenser and coil. Note that the aerial is connected to the lower end of the reaction coil, which also serves as an aperiodic aerial winding.

The advantages of the original Reinartz circuit are simplicity of operation, selectivity, and sensitiveness. But to many readers the original circuit suffers from a serious disadvantage in that a specially wound coil is required.



A Simple and Efficient One-valver

This is not so essential as might be imagined, as is demonstrated by the fact that in the practical interpretation of the circuit diagram shown (which is the original Reinartz arrangement) two simple plug-in coils are utilised.

Thus the only adverse characteristic of an otherwise admirable circuit has been eliminated.

The photographic views and drawings show the practical working details of the assembled one-valver. The neat and symmetrical panel layout will be appreciated, whilst the baseboard arrangement is simple and effective. The components required to duplicate the illustrated receiver are as follows. Suitable alternatives are given to indicate the class of component considered as being suitable in this particular case.

Ebonite panel, 10 in. by 7 in. by 1/4 in. (Raymond, Ebonart or Peto-Scott or Radion).

Terminal panel, 3 in. by 2 in. by 1/4 in. (Peto-Scott or Ebonart or Radion).

.0005 - microfarad variable condenser (Ormond or Centroid or Cyldon).

.0003-microfarad variable condenser (Ormond or Cyldon or Centroid).

Two baseboard-mounting single-coil sockets (Lissen or Lotus).

H.F. choke (Lissen or Wearite or Trix).

7-ohm panel-mounting rheostat (Lissen or Igranic).

Valve-holder (Lotus or Lissen or Benjamin).

.0003 - microfarad fixed condenser with series clips (Dubilier or Lissen).

2-megohm grid leak (Dubilier or Lissen or Dorwood).

Seven terminals, one each marked H.T.+, H.T.-, L.T.+, A, E, Phones+, and Phones- (Belling & Lee).

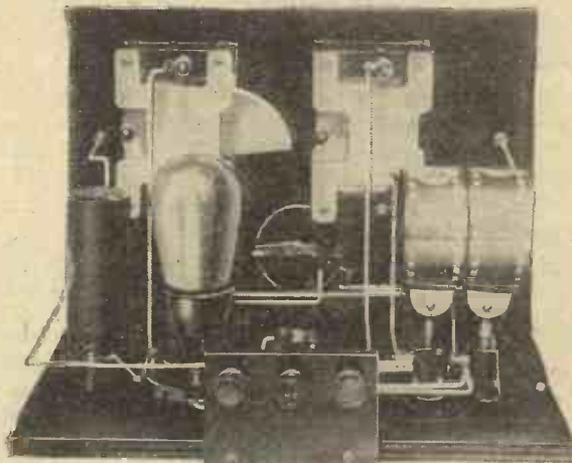
Baseboard, 10 in. by 7 in. by 3/8 in. (Carrington).

Cabinet to take specified panel and baseboard (Carrington).

Connecting wire (Glazite or Junit).

With these parts available, the simple constructional work can be put in hand. The ebonite panel has to be drilled in accordance with the drilling diagram to take the two variable condensers, filament

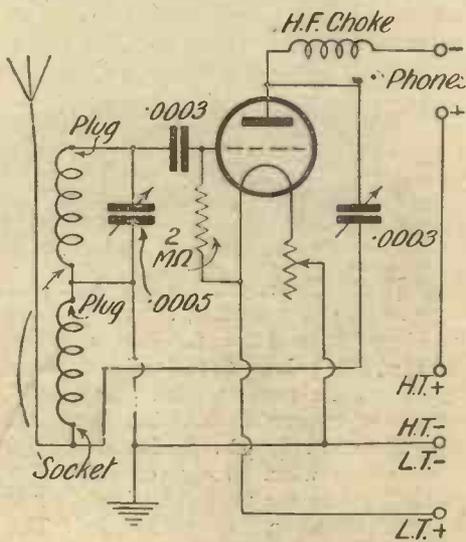
rheostat, and aerial, earth, and phones terminals. The A and E terminals are mounted on the extreme left, and next to them the .0005-microfarad tuning condenser. The .0003-microfarad reaction condenser and phones terminals are fitted



The Wiring is very Straightforward

on the right as indicated. Between the two variable condensers is the filament rheostat.

No difficulty should be encountered in the panel drilling and mounting, provided



The Circuit Diagram

a little care is exercised. Three wood-screws are needed to secure the panel to the wooden baseboard. After doing this, the baseboard components are screwed in the positions indicated.

# A FREE BLUEPRINT NEXT WEEK

*The Largest Ever Presented to the Wireless Public*

**A** FEATURE of the booklet included in every copy of this (October 22) issue is the "centre-spread," pages 16 and 17, devoted to the "All-Wave Roberts Four." The photographs and circuit diagram there shown give some idea of a particularly interesting and useful set which will be described fully and in close detail in next week's AMATEUR WIRELESS, and which will form the subject of a full-size Wiring Diagram and Layout Blueprint, measuring no less than about 27 in. by 20 in.

This Blueprint, which we are presenting with every copy of next week's issue, is not a mere theoretical circuit diagram, but a practical "life-size" working drawing specially produced for the home constructor. We believe it to be the Largest Blueprint of an individual receiver ever given away by any wireless periodical and it shows every detail of the wiring and components absolutely full-size.

**ORDER YOUR COPY NOW!**

**OUR SECOND SPECIAL GIFT ISSUE ON SALE NEXT THURSDAY, OCTOBER 27**

Screwed centrally to the back of the baseboard is the terminal strip carrying the H.T. +, H.T. -, and L.T. + terminals. Note that the L.T. - and H.T. - are "commoned," that is to say, in this case H.T. - serves as both H.T. - and L.T. -. Those who prefer it can, of course, use two separate terminals, in which case a strip 1 in. longer will be required.

Wiring up this simple receiver should be

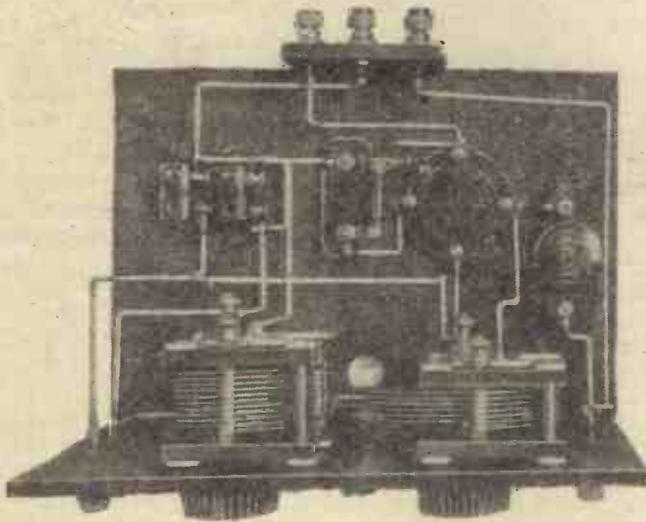
**Testing**

When carefully checked over for correctness in wiring, the initial tests of the receiver can be made.

Insert an "H.F." type of valve and a No. 35 aerial coil and No. 60 tuning coil. With the appropriate H.T. and L.T. batteries connected to the

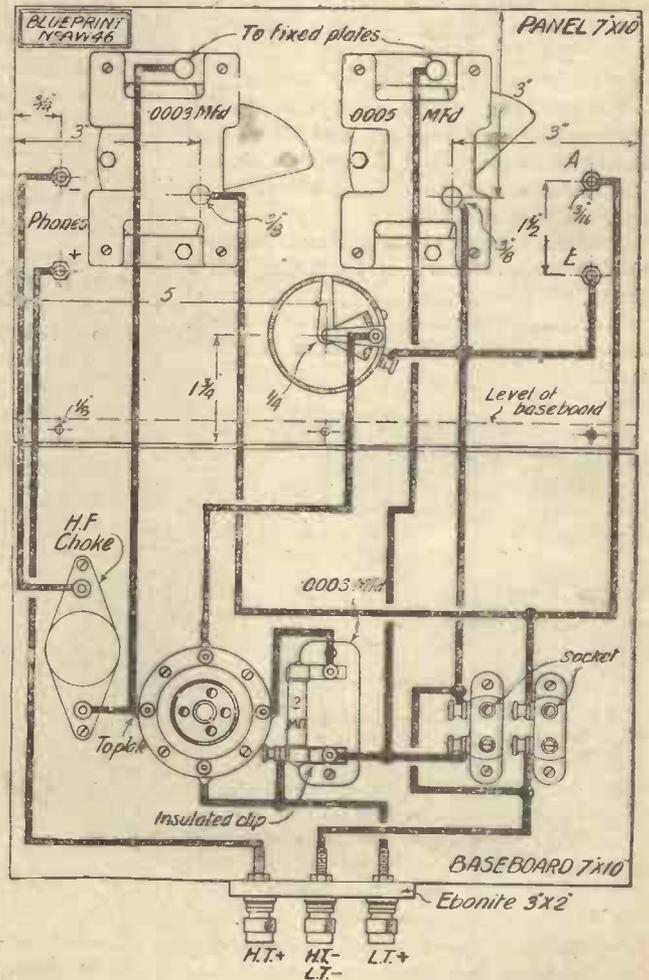
the right until the familiar "hissing" indication of self oscillation is heard.

Quite a number of more distant stations should be heard after dark, and at times, when conditions are specially favourable,



Left: A plan view of the Reinartz Plug-in one-Valver.

Right: The Wiring Diagram (Blueprint available price 1/-)



well within the capabilities of even the inexperienced constructor, especially if the is. blueprint is obtained. This is a full-sized working layout and wiring plans which can be recommended where difficulty is experienced in following theoretical diagrams and reduced reproductions.

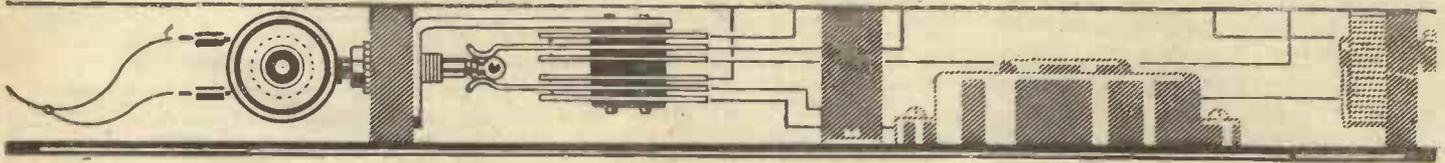
Take care when wiring the coil-socket connections to see that the wires do not foul the coils when these are inserted. The special "series" clip provided with the Dubilier grid condenser makes the grid-leak wiring extremely simple. White Glazite wire was used in the model photographed, and this certainly looks well when the set is finished. Those who prefer bare tinned-copper wire can use Junit wire.

three battery terminals and an efficient aerial and earth connected to the two left-hand terminals, a pair of phones can be attached to their appropriate terminals and the phones donned with a good prospect of something being heard! Start with both condenser dials at zero, then slowly rotate the left-hand one until at one particular point the "local" should be heard. The signal strength can be greatly increased by slowly rotating the reaction-condenser dial on

the "headphone" strength of some D.X. stations will come as a revelation to those multi-valve-set users who have never experienced the joys of the humble one-valve set.

# THE MANY USES OF PLUGS AND JACKS

## THERMION DETAILS THE UTILITY OF THESE HANDY COMPONENTS



**P** LUGS and jacks are so extraordinarily handy upon the low-frequency side of wireless sets that it is surprising that they are not even more widely used than is actually the case.

At A in Fig. 1 is a diagrammatic representation of a section of an ordinary plug.

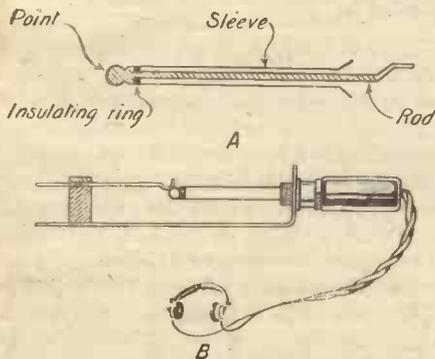


Fig. 1—Working Details of Plug and Jack

As will be seen, this consists of a central rod, ending in a rounded point, which is insulated from the outer sleeve. When the plug is inserted into a single-open jack, such as that seen in Fig. 1 B, its point makes contact with the spring arm, whilst the sleeve makes contact with the body of the jack. If the contacts of the plug are connected to a pair of telephones there is now a way from the leaf of the jack through the phones to the body, and so to whatever component may be connected to this last.

### Simple Uses

The simplest application of the single-open jack is seen in Fig. 2, where it is employed in a single-valve set to enable the phones to be connected by merely pushing in the plug.

This simple jack has quite a variety of uses. If for example, you use sometimes a valve rectifier and sometimes a crystal, you can fit both your phones and your note-magnifier with plugs. You can then attach the note magnifier to either a valve or crystal rectifier instantly by pushing the plug of the former into the jack of the latter. Again you can use a plug and a single-open jack quite well for connecting up your filament battery. In this case a jack is mounted on the receiving set with its body connected to the L.T. - busbar

and its leaf to the L.T. +. The sleeve of the plug goes to the negative terminal of the battery and its point to the positive. The act of pushing in the plug now automatically switches on your filaments.

### Dual-purpose Jacks

By using a slightly more complicated jack we can combine the duty of switching on the telephones into action. Fig. 3 shows how this is done by means of a single-filament jack. When the plug is not inserted the position is that seen in the diagram. Since leaf B, which is connected to L.T. +, makes no contact with leaf A, there is no path for current through the filament of the valve. Similarly there is no path open from the plate of the valve to the positive terminal of the high-tension battery. When a plug connected to the telephones is inserted, its point makes contact with the

with A and the filament circuit is completed.

If you make it a rule to pull out the phone plug when the set is not in use

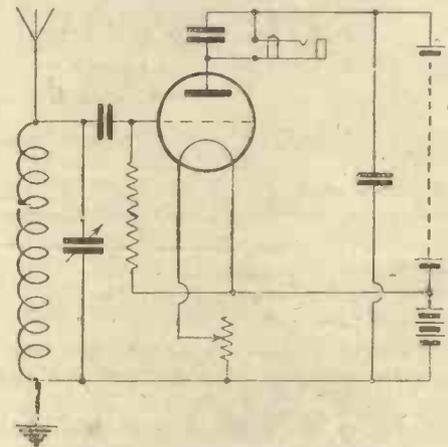


Fig. 2—Single-valve Phone Jack

you cannot possibly leave the batteries switched on. If you should happen to leave the plug in, it is certain to catch your eye as you pass the set.

So much for the single-valve set. Now let us see what can be done with the bigger type of receiver. In Fig. 4 we have a two-valver consisting of rectifier and a transformer-coupled note-magnifier. Between v 1 (the rectifier) and v 2 (the note magnifier) we use a double-closed jack, whilst a single-closed jack is employed in the plate circuit of v2. This arrangement is particularly useful for sets operated within a few miles of a broadcasting station, for it enables one valve to be used with the telephones, or two with the loud-speaker, as required.

### Further Developments

Suppose, for example, that we wish to use both valves with the loud-speaker, what happens when we plug in to the second jack? Leaves B and C of the first jack are connected to the primary of the intervalve transformer; these are making contact respectively with leaf A, which goes to H.T. +, and leaf D, which goes to the plate of v 1. Hence current can flow from the plate of the valve, through the primary of the low-frequency transformer to the positive terminal of the high-tension battery. The transformer is

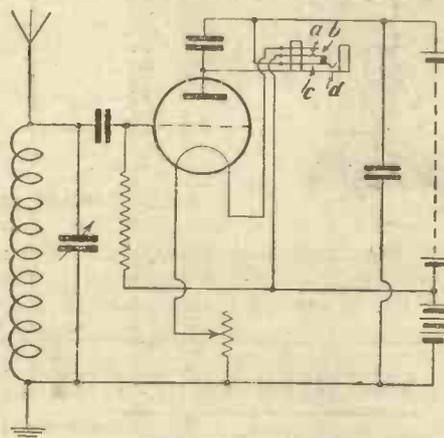
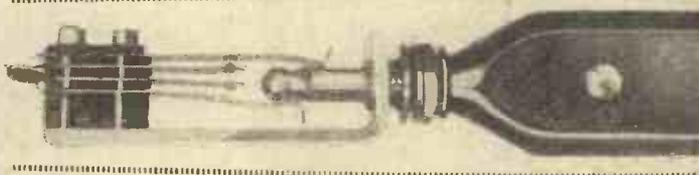


Fig. 3—Filament and Phone Arrangement

leaf C and its sleeve with the body which is marked D in the drawing. There is thus a way through from the plate to H.T. +. At the same time leaf C is raised, taking leaf B with it owing to the small block of insulating material which is fixed between the two. Thus B is brought into contact

therefore, in action and couples  $v_1$  to  $v_2$ . The sleeve of the plug makes contact with the body (B) of the second jack, and its point with the leaf (A); both valves are therefore, in use, and we obtain loud-speaker working.

If we wish to use the telephones we switch off the filament current of the second valve and insert the phone plug into the first jack. By doing so we raise leaf A, breaking its contact with leaf B, and depress leaf C, breaking its contact with leaf D. This

Thus if we insert a plug into the second jack we raise its leaf c and connect both the filament of  $v_4$  and the filaments of  $v_1$ ,  $v_2$ , and  $v_3$  to L.T.+. Since the plate of  $v_3$  is connected to the resistance and the grid condenser by the contact between leaves D and E of the first jack, all four valves are now in action. The withdrawal of the plug from the second jack switches them off.

If we insert the plug into the first jack,  $v_4$  remains disconnected both from the high-tension battery (since there is no contact between leaf c and leaf D) and from the filament battery (since there is no contact between leaf A and leaf B). On the other hand valves Nos. 1, 2, and 3 are brought into action. The raising of the leaf D of the first jack brings leaf A into contact with leaf B, thus completing the filament circuit for the first three valves. The resistance R and the grid condenser are cut out because the contact between leaf D and leaf E is broken. The path for the plate current of  $v_3$  now lies through the windings of the loud-speaker connected to the plug, whose sleeve

together whilst the first three valves are in use. If the plug is not inserted into either jack, then all valves are automatically switched off.

**Distribution**

One last use for jacks. Many people desire to wire various rooms in their houses so that telephones or loud-speakers may be plugged in at will. This is most simply accomplished, as shown in Fig. 6, by the use

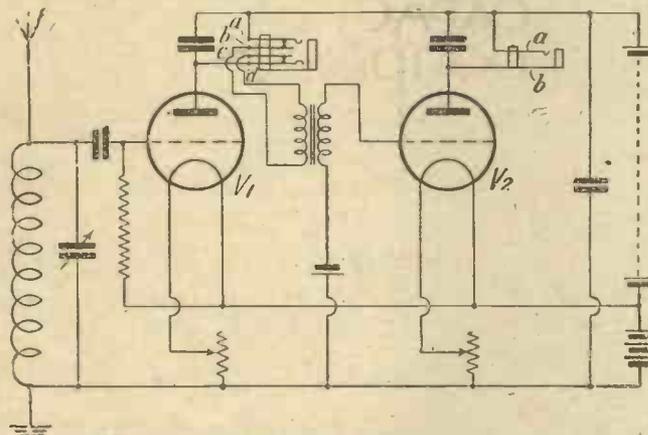


Fig. 4.—Jack Arrangement for using Phones or Loud-speaker

cuts out the primary of the transformer and provides a path from the plate to high-tension positive through the telephones. The second valve is, therefore, out of action and the first only is in use.

Even though these two jacks, the double-closed and the single-open, simplify matters very greatly, we are still doing an unnecessary piece of work in switching off the second valve when we want to use one only with the telephones. I say "unnecessary," because we can make jacks do this for us; we can in fact make them switch on just those filaments that we wish to use. Fig. 5 shows how this may be done with a four-valve loud-speaker set, using a double-filament and a single-filament jack.

The Fig. 4 arrangement would work just as well if there were one or more high-frequency stages in front of the rectifier, and in the same way the Fig. 5 circuit is applicable not only to four-valve sets but to any circuit in which we wish to cut out one low-frequency valve at will. Between  $v_3$  and  $v_4$  in Fig. 5 we employ a double-filament jack which has the terrifying number of six contacts. Despite its fearsomeness at first sight, a short examination of the diagram will show that this jack is very easily wired up.

The plate contact is made by leaves D and E. When no plug is inserted, D is in contact with E, which means that the output of the plate passes through the resistance R to H.T.+, and is transferred as a voltage variation to the grid of  $v_4$ . Now for the filaments. Without the plug, leaf c makes contact with leaf B, B is connected to the filaments of valves No. 2 and 3, whilst c is connected to B of the second jack.

contact between leaf D and leaf E is broken. The path for the plate current of  $v_3$  now lies through the windings of the loud-speaker connected to the plug, whose sleeve

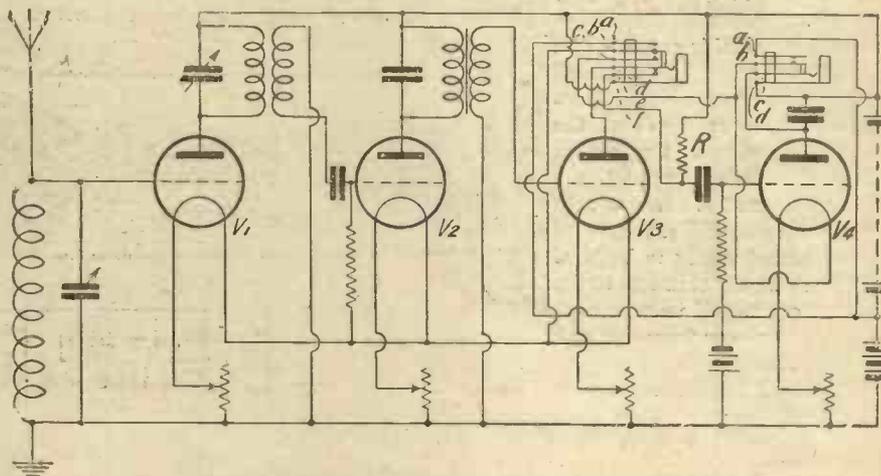


Fig. 5—Switching Arrangements for Four Valves

makes contact with the body (F) of the jack whilst the point makes contact with the leaf (D). Thus  $v_4$  is out of action also.

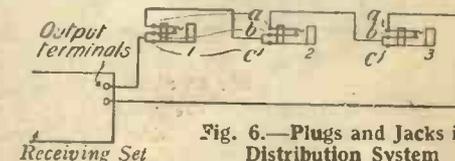


Fig. 6.—Plugs and Jacks in Distribution System

of single-closed circuit jacks. In each jack the lower contact B, and the body C are connected together. A line wire from the plate terminal of the receiving set is taken to this pair in the first jack. The other line wire, from the H.T. terminal, runs to leaf A of the most distant jack. Leaf A of the first jack is connected to the common contact between B and C of the second, leaf A of the second to the common contact between B and C of the third, and so on. When we insert the telephone or loud-speaker plug into jack No. 3 it will be seen that the output of the telephone terminals must pass through the windings via the contacts between leaves A and B of the first two jacks.

**LOUD-SPEAKER RESONANCE**

THERE are times when favourite loud-speakers develop an annoying rattle.

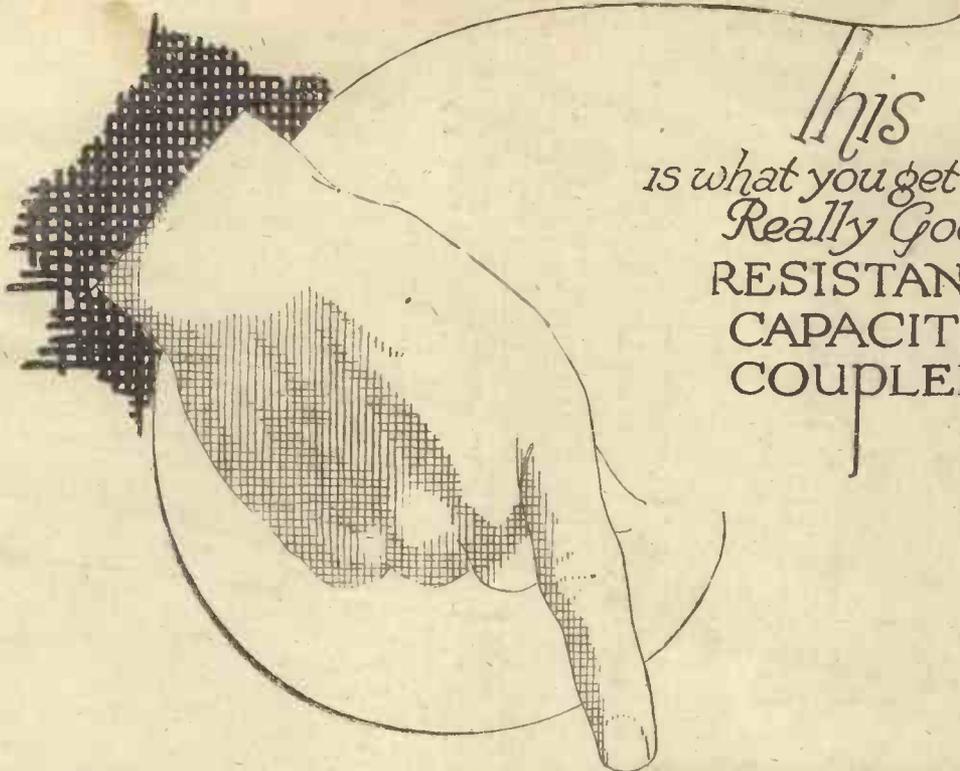
To remedy, carefully remove the diaphragm. Do not suddenly pull the diaphragm away from its seating, as this may have a detrimental effect.

Having removed the diaphragm, smear a quantity of vaseline around the seating and for about a quarter of an inch around the upper side of the diaphragm. Replace diaphragm, seeing that all screws are well home, and the rattle will then be found to have entirely disappeared.

**ANOTHER FREE GIFT**

**DO NOT FAIL TO READ**

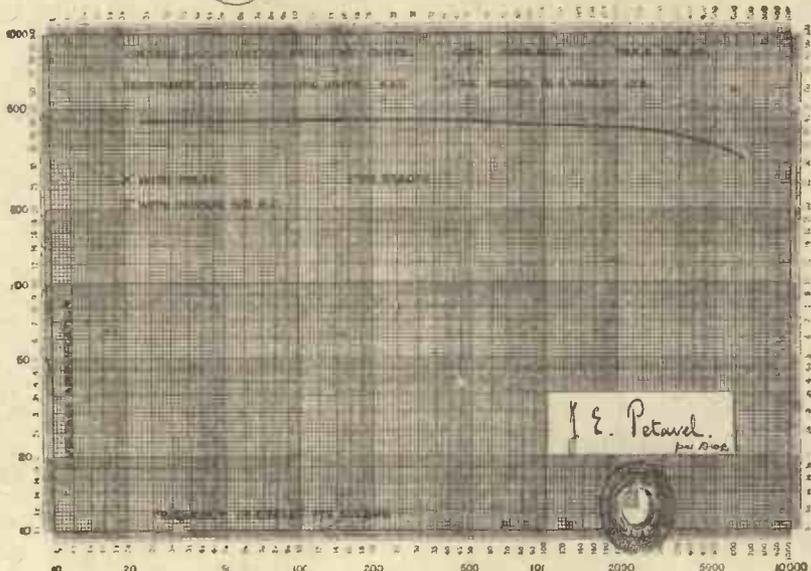
*The Special Announcement on Page 558*



*This*  
 is what you get with a  
 Really Good  
**RESISTANCE  
 CAPACITY  
 COUPLER**



Type A. Suitable for use after Valves with A.C. Resistance (Impedance) of 15,000-40,000 ohms .. 20/-  
 Type B. Suitable for use after Valves with A.C. Resistance (Impedance) of 30,000-100,000 ohms .. 22/6  
 Illustrated leaflet C14 free on application.



VOLTAGE AMPLIFICATION-FREQUENCY CURVE

**Uniform Amplification at all frequencies**

The efficiency of this perfectly designed component is backed by the authoritative seal of the National Physical Laboratory.

The new R.I. and Varley Resistance Capacity Coupler is beautifully finished, and every detail is perfectly matched and accurately balanced. Two of these famous Resistance Capacity Couplers (Type A and Type B) have been chosen for "THE HOME-STATION THREE" described in this issue.

We have specialised in every form of L.F. Amplification, and invite you to write for our Leaflet C17 (free), giving particulars of our new Straight Line Super Transformer.

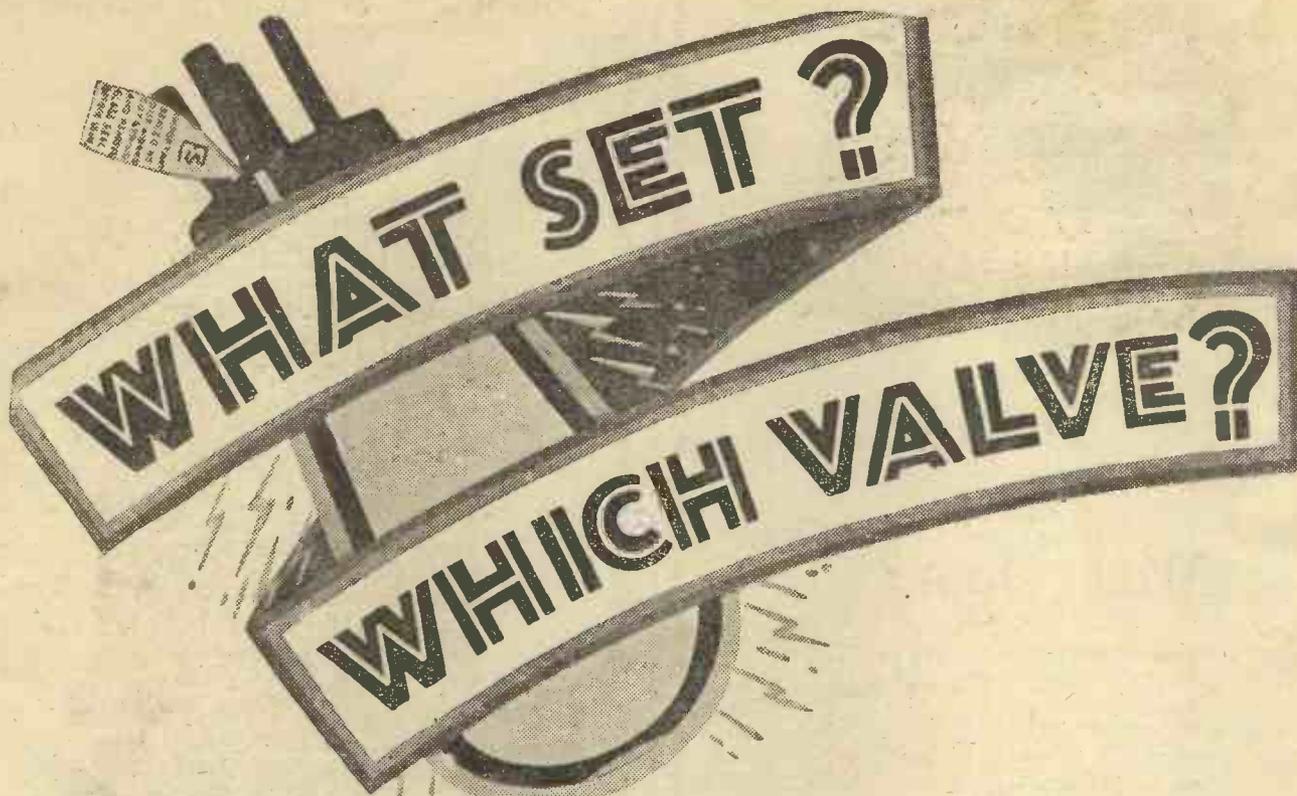
We have just published a 48-page booklet, "Low Frequency Amplification" (price 1s.), which contains a wealth of new and valuable information dealing with all forms of L.F. Intervalve Coupling. The data is absolutely reliable, and is confirmed by independent tests made by the National Physical Laboratory.



**THE MARK OF BETTER RADIO**

Kingsway House, 103, Kingsway, London, W.C.2

Telephone: Holborn 5303



**SAY WHAT SET YOU HAVE-AND WE'LL TELL YOU WHAT VALVE TO USE**

There are over twenty Ediswan valves — each different — each specifically designed to do a certain thing and do it well.

Choosing valves for your set is like choosing instruments for a band. Each must perform in harmony with the other.

Let us help you to get the best out of your set. Describe the set you have (or the set you're going to build) and post it to us with the coupon below. We will send you a copy of the Ediswan Range booklet with the valves you require specially marked. *Just post coupon.*

See that little window in the Ediswan Valve?

Here's the reason. The low-current consumption of Ediswan valves (and especially the Quarter-Watt Point One Economy types) is so low, and the glow is so dull that a window is necessary to tell you if the valve is really operating! Ediswan valves will bring immediate improvement in many sets already good. Ediswan valves in many sets will bring enchantment out of chaos. Prove for yourself how true is the famous Ediswan Slogan:—

**"Clearest, strongest, last the longest!"**

**EDISWAN**



To The Edison Swan Electric Co., Ltd.,  
(Publicity) 123/5 Queen Victoria Street, LONDON, E.C.4.

A.W. 22/10/27

Particulars of my set are attached. Send your valve booklet marked up with the valves you recommend.

NOTE.—If you would like a copy of the "R.C. Threesome" Book and Blue Print also, place a cross here.....)

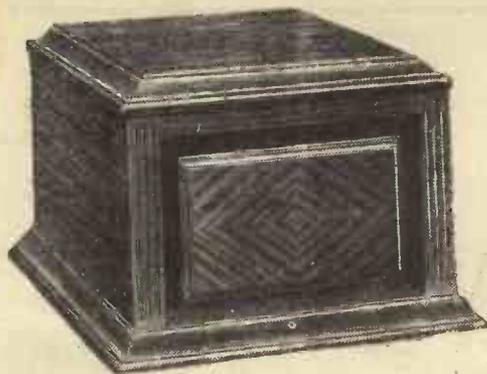
Name.....

Address.....



V 61

Don't Forget to Say That You Saw it in "A.W."



## “Who’s the Musician?”

is a question often asked of the owner of a **Brown Cabinet Loud Speaker**. You see there is something about the reproduction of this **Brown** that is *true*. It does not *sound* like a loud speaker. Neither does it *look* like a loud speaker.

It makes you feel that you have people singing to you in your room, playing to you in your home, or that you are the happy possessor of a magnificent orchestra.

The Cabinet abolishes the idea that some people attach to the horn loud speaker as being out of fashion, and it dispenses with the extremely modern cone, which is becoming so common on the market. It carries an air of refinement wherever it is seen and satisfies wherever it is heard.

The  
**Brown**

CABINET LOUD SPEAKER

costs £6 : 6 : 0

Advt. S. G. Brown, Ltd., Western Ave., N. Acton, W.3.

9734

Please Mention “A.W.” When Corresponding with Advertisers

EVERYTHING

The  
**G. E. C.**  
your guarantee

ELECTRICAL



## L.F. TRANSFORMER FACTS *Performance*

GECOPHONE L. F. TRANSFORMERS give results as near perfect as it is possible to obtain. With a good loud-speaker such as the GECOPHONE CONE, the purity and natural tone is amazing, and sets using them have been given unstinted praise by such famous artistes and musicians as Dame Clara Butt, Miss Edith Day, Albert Sammons, De Groot and many others.

Reduced Prices

Ratio 2-1 ... 17/6      Ratio 4-1 ... 20/-

MADE IN ENGLAND

**GECOPHONE**

L.F. TRANSFORMERS

for volume and purity

Sold by all Wireless Dealers and Stores

Advt. of The General Electric Co., Ltd., Magnet House, Kingsway, London W.C.2

---

---

# THE FERRANTI SPEAKER



**PRICE £3-3-0**

THE SPEAKER WITH THE EXPONENTIAL HORN

FERRANTI ELECTRIC  
LIMITED,  
TORONTO, CANADA

FERRANTI LTD.,  
HOLLINWOOD,  
LANCASHIRE

FERRANTI INC.,  
BUSH TERMINAL BUILDING  
N.Y. CITY, U.S.A.

# On Your Wavelength!

## Coming Valve Surprises

BEFORE it comes to an end, this autumn will have been pretty productive of novelties in valves. There was, first of all, the Round screened-grid type, then the Robinson self-neutralising valve. But there are others of remarkable kinds to follow soon. The screened-grid valves that we have at present are specialised high-frequency amplifiers, able to handle only small grid-voltage swings. The screening principle has been applied also to low-frequency valves and within a few weeks we may expect an extraordinary super-power valve of this kind, able to handle 30-volt grid swings. With an amplification factor in the neighbourhood of 100, this should be something like a power valve.

Another novelty that will attract a good deal of interest really ought to be named the bi-valve, though it is not in the least like an oyster. It is actually two valves in one. No, it is not made on the lines of the Loewe valve, which consists of two or three families of filaments, grids, and plates contained in the same bulb. The bi-valve has only one filament. Electrons emitted from this make their way to two different plates, the flow being controlled by a pair of grids. The "toob" is so arranged that one grid and plate give a medium impedance, the others a high impedance. You thus have a rectifier and a power valve in one and the same bulb, the whole thing taking up no more space than a standard triode valve. The single-valve loud-speaker set becomes a practical possibility. There will probably be other surprises in addition to these.

## Short-wave Quality

Short-wave stations differ a good deal from one another in the quality of their transmissions. I am not alluding now to fading of the ordinary kind, which is due to natural causes and for which therefore the transmitting plant cannot be blamed. I refer to the actual quality of the modulation. Three stations stand out far above the rest in point of excellence in this respect. These are 2XAF, 2XAD, and PCJJ. It is comparatively rare to find speech from any of them unreadable or music sounding gramophony. Others, however, are not quite so good. KDKA, when at his best, is as good as any of them, but KDKA is a curiously fickle station, whose power seems to wax and wane in the weirdest manner.

Radio Malabar, the station in the Dutch East Indies, is sometimes very good and sometimes very bad. His strength is usually all that can be expected, but there are times when speech and music suffer

from queer kinds of distortion. I have an idea that this may be due possibly to slight unsteadiness in the station's wavelength. It is not easy to keep one of these very short-wave transmissions—Radio Malabar's wavelength is 17.3 metres—dead steady unless crystal control is used, as it is by 2XAD and 2XAF. If there is a slight wobbling, distortion will occur. Heterodyne Radio Malabar's carrier for a moment next time you find him distorting, and you will probably notice that the whistle so produced has a quavering tremolo effect.

## The B.B.C.'s Short-waver

The B.B.C.'s short-wave transmitter should be in operation before very long, and though the authorities have not shown any bounding optimism about results, it is likely that its transmissions will be heard in all parts of the Empire. With a power of 25 kilowatts behind them, there should be few countries that they cannot reach, provided that a suitable wavelength is chosen. Mr. Gerald Marcuse has already shown us what can be done in the way of long-distance broadcasting with only 1 kilowatt, whilst the Dutch, American and Australian stations have given proof of the distance-covering powers of transmitters rated at from 20 kilowatts upwards. Somehow it seems to be a little humiliating that, as things are at present, the Empire should hear one of the B.B.C.'s Albert Hall concerts via the Dutch station, PCJJ. Let us hope that before very long the B.B.C.'s own short-waver will be relaying the National concerts. If success is achieved, a number of special *Empire* concerts should certainly be given.

## Improvement in Relays

Without doubt, one of the most successful relays of any programme broadcast from a Continental station was the one carried out by the B.B.C. on Tuesday, October 11. On that evening, for a period of thirty minutes, a concert of Portuguese music given at the Radio-Belgique studio in Brussels was relayed to 2LO, 5XX, and several other B.B.C. transmitters. Apparently since the date on which the ceremony of the dedication of the Menin Gate at Ypres was brought to our ears, considerable improvements have been effected in land-line and cable transmissions, and the recent Radio-Belgique broadcast was remarkable for its exceptionally good quality and purity of tone. Later, during the same evening, the compliment was returned by giving to Belgian listeners an opportunity of hearing a symphony concert performed at the City Hall, Cardiff, a relay which gave equal satisfaction.

## The Use of Land Lines

During the last eighteen months or so experiments have been carried out regularly on the Continent in international relays from one country to another by means of the existing, or, in some cases, new land lines. On several occasions operatic and other performances given at Vienna have been shared by both Poland and Czecho-Slovakia; Frankfurt-on-Main and Stuttgart have both transmitted concerts to Swiss stations by the same means, and this system, as against the wireless link so frequently marred by atmospheric and other disturbances, is being daily put to greater use. Germany, in order to link up its various transmitters with the capital, has now almost completed a network of special pupinised cables.

Any listener to a German transmitter taking a programme from Berlin will have noticed a marked improvement in the signals received over the new lines. Although in the earlier days of broadcasting many attempts were made to give to British listeners half hours of the Continental programmes, it was soon found that transmissions taken by wireless link were liable not only to morse interference, but, in many instances, were also marred by heterodynes inherent to a congested waveband or entirely spoilt by local oscillations set up by heavy-handed condenser twirlers, who were endeavouring to capture the signals at their source.

The use of land lines and submarine cables has obviated these inconveniences, and it is to be hoped that during the coming winter we may be given more frequent opportunities of hearing the programmes provided by other European stations.

## A Universal Spirit

At the last meeting of the Council of the *Union Internationale de Radiophonie*, at Como, many projects for the development of an international spirit in radiotelephony were examined and approved. The broadcasting of national programmes was specially encouraged, and a further series of evenings, each dedicated to a different country, has been fixed for the winter months.

With a view to the transmission of *one single programme* on these occasions, London is now in direct telephonic touch daily with most of the principal Continental centres, and by judicious organisation and co-operation, it should be possible, in the near future, to carry out from, say, either Berlin, Vienna, Prague, Oslo, or other capitals relays of programmes equally successful as the one British listeners recently heard from Brussels.

::                    ::                    *On Your Wavelength! (continued)*                    ::                    ::

### *The Washington Conference*

Things are now happening across the Atlantic which might leave their mark upon amateur radio, and in fact upon all concerns interested in radio for many years to come. The discussions which are now taking place have, for their ultimate objective, the parcelling up of the ether into bands of wavelengths for various services, and a pretty considerable amount of talking is likely to take place before the matter is finally settled to everybody's liking. For instance, I hear on good authority that, in addition to the fighting services, the commercial services, as well as broadcasting services, have designs on the short wavebands, and the amateurs of all nations are also representing that they also want a share in anything that happens to be going in this line.

### *The Amateur*

It is very interesting to note that amateur workers have presented a united front by deputising Messrs. Warner and Maxim, of the International Amateur Radio Relay League, to represent them and hold a watching brief for them when this part of the programme is under discussion. Such a condition of affairs is a good omen for amateurs generally, and it is to be hoped that the moral effect of such solidarity will not be lost upon the "powers that be."

One desirable state of affairs which is likely to mature as the result of the discussions is the disappearance of that annoying heterodyne whistle which has been our almost constant companion of late on the broadcast programmes, for it seems that certain bands of wavelengths might be laid down for various nationalities and times.

### *A Try-out Counterpoise*

As the erection of a permanent counterpoise is rather a business it is a good idea to make tests first of all with something of a temporary nature in order to ascertain whether any improvement is likely to result from doing without a direct earth contact. The least expensive way is to obtain about twenty yards of No. 18 double-cotton-covered wire, baring one end and attaching this to the earth terminal of the receiving set. The wire itself is well distributed in loose coils on the floor below the table on which the set stands. If this gives promising results a further test may be made by stretching the wire immediately under the aerial and six feet or rather more above ground level. Use a couple of good insulators at either end and simply fix the supporting ropes temporarily to a hook driven into the wall of the house and to a hook screwed into the aerial mast.

You will soon be able to see whether noises are reduced. If they are you may

proceed with the erection of a proper counterpoise in the following way. Obtain a larch pole about 2½ in. in diameter and six or eight feet in length. Lash or bolt this to the aerial mast so that it is horizontal and about eight feet from the ground. Close to either end screw in a good strong hook or ring. Fix hooks similarly spaced to the wall of the house, arranging them so that the two wires of the counterpoise are parallel with the aerial. Use two or three insulators at each end. The counterpoise itself may be made of 7/22 aerial wire. It should be stretched pretty tightly to prevent it from swaying in a wind. At the house end take a lead from each of the wires and attach these leads to the outside terminal of a good lead-in tube.

### *The A.C. Problem Solved at Last*

For some time now, there has been a number of battery eliminators on the market, capable of supplying all the current for a wireless set from D.C. mains. But up to the present the man with an A.C. supply has been in a very unfortunate position. Of course, there are a few battery eliminators available, which are capable of working from A.C. mains but, without exception, their cost is prohibitive to the man with limited means. It is comparatively easy to make a H.T. battery eliminator for A.C. mains, but the problem of supplying L.T. from an A.C. supply has seemed unsurmountable. Now, however, "Simpler Wireless," having "eliminated the eliminator" in those cases where a D.C. supply is available, has, true to its name, made it a very simple matter to work a receiver entirely from A.C. mains. I have heard one of Mr. Johnston's "Simpler Wireless" sets, an ordinary D.C. model too, working from a 50-cycle A.C. supply through a "Simpler Wireless" rectifier unit. The reproduction was as free from hum as if accumulators were being used, while the quality was certainly better than could have been given by any set not employing either battery- or direct-coupling between the valves. The cost of the rectifier unit, moreover, is only a fraction of that of the cheapest "H.T., L.T., and G.B." battery eliminator capable of working from A.C.

### *Plug-in Coils*

The plug-in coil market seems to be firming—at least, I believe that is what the bulls and bears and the rest of the "menagerie" on the Stock Exchange call it. What I want to say in plain English is simply that plug-in coils are becoming popular again. The inauguration of the alternative programme experiment has largely been responsible for this, and there is a general movement towards greater simplicity. What started this train of

thought in my mind was a visit to the Igranic Electric Co.'s works at Bedford the other day, when I happened to pass through the coil-winding department and there saw coils being turned out by the hundred.

### *Triple Honeycomb*

They were mainly of the new triple-honeycomb type introduced by that company last season. Most people are familiar with the construction of these coils, consisting, as they do, of three separate coils side by side with a slight spacing, the individual coils being joined in series. I wonder how many people realise that these three coils are all wound together. I, personally, had not thought about it very much, and I supposed that the coils were simply mounted side by side and then connected up. Actually the three coils are all wound at the same time, so that there is no extra mounting to be done at all.

It is quite a fascinating sight to watch these machines (each one having three reels of wire on it) performing their jobs. The girl operator takes a small cardboard cylinder, which she fits on to the machine, takes an end from each of the three reels of wire, and pokes them through appropriate holes in the cardboard centre and presses a button. The machine promptly leaps into activity, winding the three coils side by side to the correct number of turns, automatically stops itself, blows a hooter and pours out the tea. I am not quite sure about the last two operations; but, even if I am mistaken here, I feel sure the machine could do it if it wanted to.

After this, of course, the coil is taken to the bakelising-room, where it is thoroughly impregnated and baked, thus rendering it impervious to moisture. The three coils during this period are still separate, but they are now taken to the final assembly-room, where the separate sections are joined in series, the ends connected to the plug and socket, and the final assembly completed. Quite a number of interesting points about an article which we have come to regard as very ordinary!

### *The London Convention, 1927*

I had the pleasure of being present at the second annual Convention of British Amateur Radio enthusiasts, which took place in the last week of September, and I was astonished at the keenness which was displayed by many of the amateurs who attended. That the British amateur is alive to the possibilities and difficulties of wavelengths of about five metres is evident by the fact that Mr. E. J. Simmonds (the well-known 20D) gave a very interesting discourse on short-wave reflector systems one evening.

THERMION.

# GETTING THE BEST FROM THE LOUD-SPEAKER

By O. J. RANKIN



Fig. 1.—The Complete Unit

THE idea outlined in the accompanying photographs and sketches is a developed modification of a little idea which was in a recent issue of *The Wireless Magazine*, where a writer explained in a very few words how to arrange the fixed condensers of a loud-speaker tone-control unit to the best possible advantage. Only four fixed condensers are used, yet by employing two very simple switches no less than fifteen different capacity values are available; so that, in effect, one has fifteen fixed condensers for the price of four, plus the cost of the switches, etc., which is practically negligible. The four K type condensers are of .001, .002, .004, and .008 microfarad capacity respectively, and the capacity values range from .001 to .015 microfarad. The circuit arrangement is shown in Fig. 1, where it will be seen that each switch has three studs, any two of which may be bridged by the switch arms, or any outer stud engaged singly. Thus, we have a very selective parallel switching arrangement, and before proceeding further it will be well to work out the fifteen different capacities with the aid of the following chart, where the settings for the left-hand switch (studs 1, 2, and 3) are shown in the left-hand column, and the settings for the right-hand switch (studs 4, 5, and 6) in the right-hand column. This chart may be cut out and pasted to the casing of the finished component.

Mfd.	Left Switch.	Right Switch.
.001	Studs 1 and 2	Stud 4
.002	Stud 3	Stud 4
.003	Studs 2 and 3	Stud 4
.004	Stud 1	Studs 4 and 5
.005	Studs 1 and 2	Studs 4 and 5
.006	Stud 3	Studs 4 and 5
.007	Studs 2 and 3	Studs 4 and 5
.008	Stud 1	Stud 6
.009	Studs 1 and 2	Stud 6

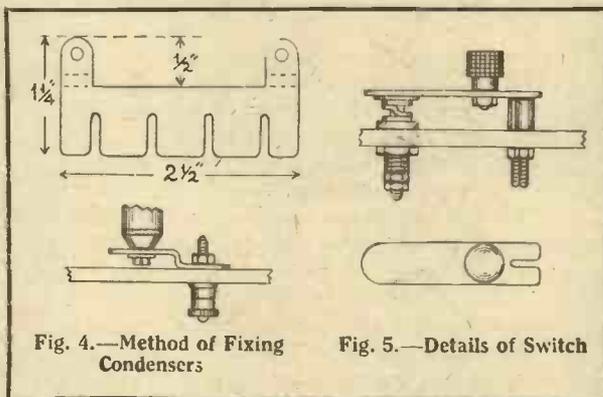


Fig. 4.—Method of Fixing Condensers

Fig. 5.—Details of Switch

.01	Stud 3	Stud 6
.011	Studs 2 and 3	Stud 6
.012	Stud 1	Studs 5 and 6
.013	Studs 1 and 2	Studs 5 and 6
.014	Stud 3	Studs 5 and 6
.015	Studs 2 and 3	Studs 5 and 6

As a simple tone-control unit the terminals A A (Fig. 1) are joined to the output terminals of the receiver, and the terminals B B to the loud-speaker terminals; as a

combined filter and tone-control unit the usual choke and condenser can be externally connected to the terminals A A; and as an experimental condenser unit the component to be shunted is simply connected to the terminals A A, or B B.

All parts are mounted on a 4 in. diameter ebonite disc as shown in Figs 2. and 3. Such discs were once used as end plates in the construction of variable condensers, but should any difficulty be experienced in obtaining one, any turner will make an excellent substitute from a piece of 1/4 in. sheet ebonite about 4 1/2 in. square. A screw hole should be drilled in the exact centre, and the rim should be provided with a flange which fits flush over the top of the casing. The latter consists of a 3 1/2 in. length of 4 in. diameter cardboard coil former.

The upper ends of the condensers are joined together by means of a multiple brass clip arranged as shown in Fig. 4, this being clamped to the disc by means of the two upper terminals A B in Fig. 1. The switch arms, which are of spring brass, and 1 1/4 in. long by about 1 in. wide, are soldered to the spindles and arranged as shown in Fig. 5, where it will be seen that the usual spring washers are placed between the arms and the panel bushes. The lower terminals A B in Fig. 1 are joined together, and also connected to the two

(Concluded on page 578)



Fig. 2.—Under Side of Panel

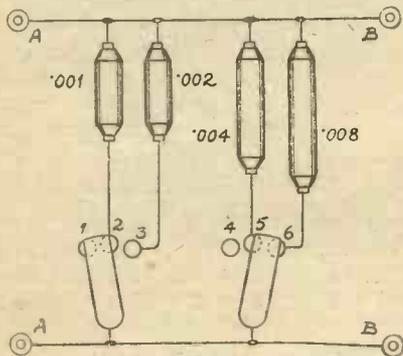


Fig. 1.—Circuit Arrangements

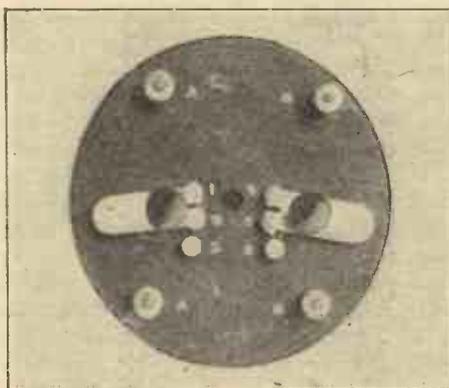


Fig. 3.—View of Top of Unit

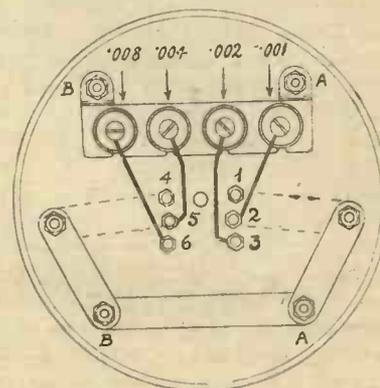


Fig. 6.—Details of Connections

# CIRCUITS FOR YOU TO TRY

The first of a regular series of articles by our Technical Editor which will appear about every

month and contain descriptions of various forms of circuit which can be tried out by the experimenter.

## TWO-VALVE CIRCUITS FOR 2-PIN COILS

I CAME across an interesting circuit the other day, the action of which I do not, at the moment, profess to understand, as I have not had time to look into it. An assistant was experimenting with the circuit shown in Fig. 1, which, by the way, is itself quite an interesting arrangement. The use of a capacity tap for the aerial circuit in this manner gives an increasing

L1 and L2 are a 60 and 35, or something of that order, for the short-wave band, and a 200 or 250, with a 100 or 75 reaction coil, for the longer waves. A simple transformer-coupled amplifier is shown, there being nothing unusual about this.

### Better Selectivity

My assistant was attempting to obtain

use was a 60 coil, tuned with a .0005 condenser.

### A Constant-coupled Circuit

An interesting constant-coupled arrangement has just been suggested by S. A. Jewell, the well-known American writer, in *Radio News* for September. This is intended as a system of high-frequency amplification, and would appear to have

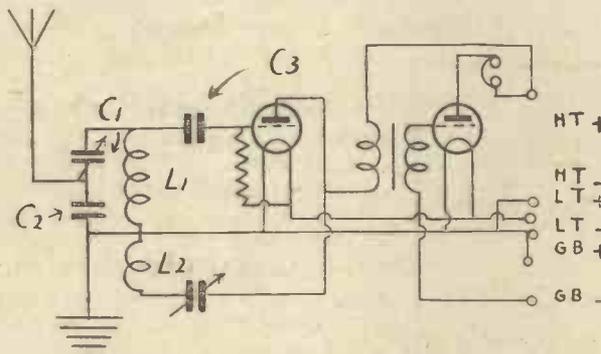


Fig. 1 (left)  
An Interesting Two-valve Circuit

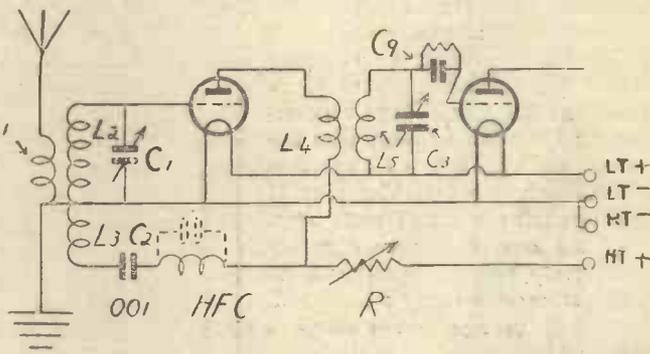


Fig. 3 (right)  
A Constant-coupled Circuit

aerial coupling on the longer wavelengths, and by the suitable choice of a condenser, the dead spot which is often obtained with the usual tapped-coil circuit can be avoided. The smaller the condenser C2 is made, the larger is the effective tapping; but obviously there is a limit, because this fixed condenser reduces the effective capacity of the tuning condenser and, in practice a value of .001 microfarad is about the maximum. A value of .001 to .002 will be

an increased selectivity without losing too much signal strength, and he therefore connected up an auxiliary circuit in the aerial lead as shown in Fig. 2. This, at first sight, appears to be a simple trap of the rejector variety, so that, by tuning this circuit to the local station, the interference can be cut out and the distant stations received. Such an arrangement as this is usually provided with tapings, the aerial being connected across a portion of the trap circuit only, as otherwise the trapping action is usually found to be too severe.

certain possibilities, although its operation appears to depend essentially upon the exact choice of correct values. The circuit is reproduced in Fig. 3, which shows an H.F. valve coupled to a detector valve. This arrangement can be followed by any system of low-frequency amplification.

The high-tension supply to the H.F. valve will be seen to contain a variable

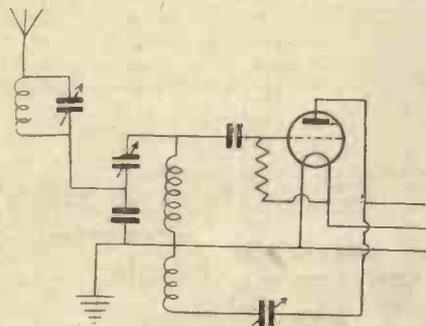


Fig. 2. A modified arrangement of Fig 1

found to give very good results, the actual value depending upon the exact order of selectivity required. Of course, C1 is a standard .0005 tuning condenser, while

In this particular case, however, the action has proved to be just the reverse, the circuit acting as an acceptor arrangement rather than as a rejector. It behaves just as another tuner, and it appears to increase the signal strength obtained. Both this circuit, therefore, and the normal detector circuit have to be tuned to the required station, and the selectivity was found to be markedly improved. The detector tuning was found to be rather broad, indicating that probably the majority of tuning is being effected on the acceptor circuit, thus removing to some extent the effect of the detector valve on the tuned circuit. At any rate, the idea is an interesting one and is worth a little experiment. The coil in

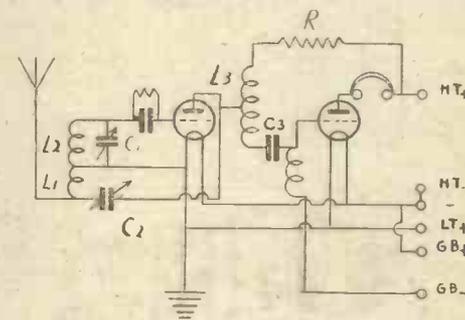


Fig. 4. Two-valve Loud-speaker Circuit

resistance, and at the high-potential end of this resistance two paths are provided, one of which goes to the anode of the valve through the primary of the H.F. transformer, and the other goes through a high-frequency choke and fixed condenser to a

(Continued on page 586)

# EVERY PART PERFECT

## NOT PARTIAL PERFECTION

**R**ELIABLE valves must be perfect in every part. However long and strong a filament may be, it is not of much use if, owing to some defect in the electrode system or an imperfect vacuum, it does not function properly.



B.T.H. 2-volt Valves are good in every part, meticulous care having been exercised in the design and placing of filament, grid and anode. Equally close attention has been paid to the vacuum which in B.T.H. Valves is as perfect as it can possibly be made.

B.T.H. 2-volt Valves have a filament second to none in length, efficiency, long life and low current consumption, and it can be stated quite definitely that there is *no filament which lasts longer.*

There are no weak links in these valves—every point is a “strong point.” Whatever valves you may be using at the moment it is highly probable that the new B.T.H. 2-volt Valves are an improvement on them. They give instant and constant satisfaction.

ASK YOUR DEALER FOR THE NEW B.T.H. 2-VOLT VALVES

Type	Purpose	Fil. Volts	Fil. Amps	H. T. Batt. Volts	Ampl. Factor	Impedance	Price s. d.
B 21	H.F.	2	0.1	40 to 150	16.0	32,000 ohms.	10 6
B 22	G.P.	2	0.1	40 to 100	7.5	14,000 ohms.	10 6
B 23	Power Amp.	2	0.2	40 to 100	6.0	8,000 ohms.	12 6
B 8	Res. Coupl.	2	0.1	100 to 150	50.0	180,000 ohms.	10 6

*The above prices are applicable in Great Britain and Northern Ireland only*



A COMPLETE RANGE OF VALVES

## 2 VOLT VALVES

FOR ALL SETS AND CIRCUITS

B21	{ H.F. or DET }
B22	{ General Purpose }
B23	{ Loud Speaker }
B8	{ R.C. }

2801

If you are interested in R.C. Coupling, write for a copy of the “RESISTOR” Booklet to the Publication Dept., The British Thomson-Houston Co., Ltd., Rugby

Please Mention “A.W.” When Corresponding with Advertisers

EVERYTHING **The G.E.C. ELECTRICAL** your guarantee

Perfect at Every Point

New

# Osram Valves

with the New Filament

## The Perfect Anode



### Generous Proportions

The OSRAM anode is large enough to collect every electron that leaves the filament. It totally encloses the active portion of the filament, reducing valve resistance and increasing the undistorted volume of output given to your loud-speaker.

### Firm & Rigid

The anode is ribbed to increase its strength. A new and patented design incorporating a projecting fin increases the area of the weld between the anode and its support wire. This makes for a much firmer contact, and for greater rigidity than if the round edge of the anode were used.

MADE IN ENGLAND

VALVES TO IMPROVE YOUR LOUD-SPEAKER REPRODUCTION

OSRAM	2-volt DEP 215 DEP 240	4-volt DEP 410	6-volt DEP 610 DE 5A	Price 12/6 each Price 20/- each
-------	------------------------------	-------------------	----------------------------	------------------------------------

Made at the factory with the greatest experience in valve manufacture in the British Empire.

Manufactured from raw material to finished product by the same British Organisation.

Advt. of The General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2

Mention of "Amateur Wireless" to Advertisers will Ensure Prompt Attention

IGRANIC  
TRIPLE  
HONEYCOMB  
INDUCTANCE  
COIL



## IGRANIC COILS set

( a new and higher standard )

Always since radio became popular IGRANIC COILS have led the way. With this new radio season, still more exclusive features have been incorporated in IGRANIC TRIPLE HONEYCOMB INDUCTANCE COILS to keep them well ahead of competition.

Here are the three new features of importance to all radio enthusiasts:

- 1 Self-capacity much lower.
- 2 High-frequency resistance decreased.
- 3 Adjustable extra low-loss plug and socket mounting.

The IGRANIC TRIPLE HONEYCOMB INDUCTANCE COIL is obtainable in seventeen different sizes giving a wavelength range of 100 to 25,000 metres. Prices from 2/9 for a No. 25 to 16/- for a No. 1,500.

Ask your dealer about them.

The IGRANIC RANGE OF COILS includes Tapped Triple Honeycomb Coils, XLLOS (Extra Low Loss) and Centre Tapped XLLOS Coils, Short Wave Coils, and the Unitune Aperiodic Fixed Coupler.

Write for Publication D.65, which describes the entire range.



149 QUEEN VICTORIA STREET, LONDON, E.C.4  
WORKS: BEDFORD.

Branches: BIRMINGHAM, BRISTOL, CARDIFF, GLASGOW, LEEDS, MANCHESTER, NEWCASTLE-ON-TYNE.

# WITHOUT FEAR OR FAVOUR



## A Weekly Programme Criticism by Sydney A. Moseley

WHAT a scream the boxing transmission was! A chorus of screams, in fact. Apparently the B.B.C. employed genial Gene Corri to exclaim "Wonderful!" at frequent intervals and Mr. Bohun Lynch to interrupt these exclamations. The transmission proved, however, that boxing provides the right atmosphere for a transmission; but it was hardly a running commentary. More like a trickle.

It is a strange fact that the B.B.C. has experienced difficulties in finding the right men to transmit descriptions of public events. I was glad to be able to help them so far as racing and football were concerned, but if they had asked me about this boxing contest I should hardly have suggested friend Corri, who is a charming fellow and an excellent referee, but hardly a descriptive journalist. They might just as well have asked Steve Donoghue to broadcast the Derby!

What these outside transmissions really need is somebody with a sense of the ether and somebody whose voice comes over well. Surely the qualifications are not difficult to fill.

According to the programme, Mr. A. J. Alan was given forty minutes for a monologue. When the B.B.C. like a thing they go crazy over it. A good thing that it came late in the evening, for I went to bed. I expect a good many were sent to bye-byes in the course of this serial story.

I thought when Mr. Basil Maine began his talk on the broadcast music by saying he would leave his remarks on the B.B.C. national concerts to the last that he was making a common error of judgment. It is always a good thing, when you have anything particular to say within a given time, to make certain of it by saying it *first*. Mr. Maine's comments on the national concerts would have been appropriate, since the concert itself was to follow his talk. As it was, he was unceremoniously brought to a halt before he had finished what he most particularly wanted to say.

The "Cabaret Kittens" is a concert party of the better class variety. They sing really new numbers and are bright without being vulgar. A bit weak, perhaps, in vocalists.

They are off to South Africa. When they come back I hope we shall hear them again.

Temple Thurston caused a real hit with his autobiographical fragment on a dress shirt. A pleasing voice and a clear diction. The ladies simply loved him.

A correspondent complains that we don't get enough Shakespeare. He cannot have heard the broadcast of *The Taming of the Shrew* from London, which was very ably performed.

What I have repeatedly said about the B.B.C.'s desire for names at the expense of a good broadcast was seen in the first sketch of Mr. A. G. Gardiner, the distinguished journalist. As a writer of essays, A. G. G. is hard to beat, but, unfortunately, he hasn't as good a broadcast voice; and here is an instance where one would have rested content with reading him rather than listening to him. I suspect, too, that Mr. Gardiner suffered from nerves in his first appearance before the microphone, but he shows no such fear in his writings, anyhow.

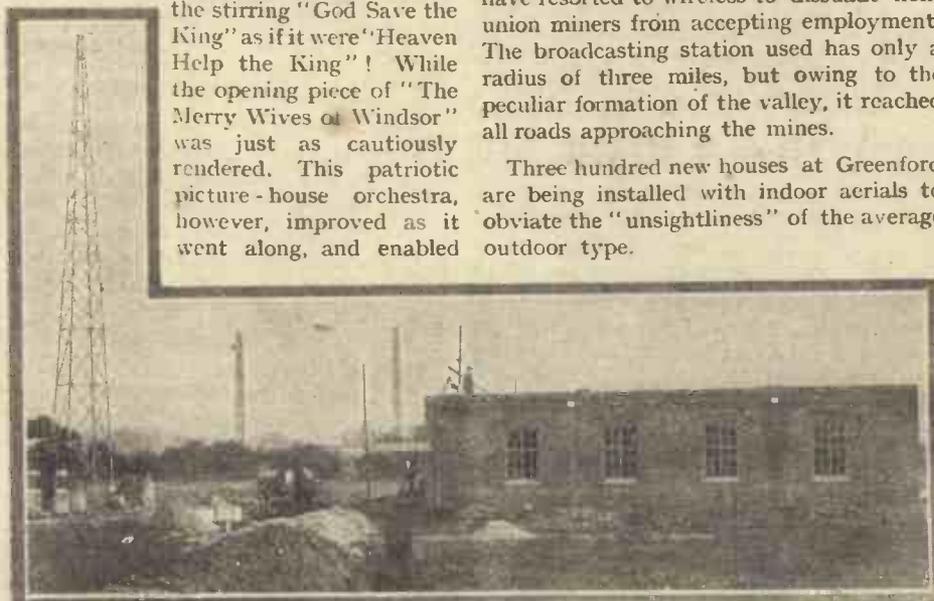
The Lozells Picture House Orchestra from Birmingham believes in taking things slowly if surely. They first of all rendered the stirring "God Save the King" as if it were "Heaven Help the King"! While the opening piece of "The Merry Wives of Windsor" was just as cautiously rendered. This patriotic picture-house orchestra, however, improved as it went along, and enabled

us to hear a pleasing tenor—Harold Green, who sang "The English Rose" just as well as many other better known tenors; with the exception that he mushed the top note in the climax, which he need not really have taken.

The re-broadcasting of *Miss Hook of Holland* was completely justified. The music was brightly tuneful, and once more the ensemble was in excellent fettle. One also understood what the principals were singing about. But—perhaps I am particularly touchy on these points!—I objected to at least one sally of Mr. Huntley Wright's, the old-time comedian. Here again one has to fall back on artistes who have made good in another sphere—artistes who have apparently yet to learn the full requirements of an entertainment which reaches the most devout homes. There should positively not be the slightest cause for criticism on the score of suggestiveness or double entendres. Stage artistes should not forget that they are no longer appealing to a clamorous audience out for a high old time.

Owing to a Federal law prohibiting picketing at Florence, Ohio, striking miners have resorted to wireless to dissuade non-union miners from accepting employment. The broadcasting station used has only a radius of three miles, but owing to the peculiar formation of the valley, it reached all roads approaching the mines.

Three hundred new houses at Greenford are being installed with indoor aerials to obviate the "unsightliness" of the average outdoor type.



AIR MINISTRY'S NEW WIRELESS STATION

A new wireless station is being erected at Mitcham Common for the use of the Air Ministry

# LETTERS TO THE EDITOR



*The Editor does not necessarily agree with the views expressed by correspondents.*

*Correspondence should be brief and to the point, and written on one side of the paper.*

## Grid Swing

**SIR**,—Mr. Reyner, in an article in your issue of October 1, says "this valve will be capable of handling a grid swing of at least 24-volts, and it should consequently be provided with a negative grid-bias of at least 24-volts." It is very confusing that some writers use the word "swing" as meaning the sum of the movements in both directions from the mean position (which seems to me the natural way), and others use it to express the peak amplitude, as Mr. Reyner obviously, from the context, does here. Surely, in the interests of clarity, one or other interpretation should be generally agreed on and standardised.

—A. O. G. (Caergrwle).

## 2XAD

**SIR**,—Apropos of "Thermion's" remarks in No. 271 on the reception of 2XAD, the extraordinary good results were owing to this station experimenting on an aerial output of 100 kilowatts, after midnight, Eastern Standard Time.

With regard to his later remarks on crystal sets. I have a six-valve set, a three-valve set, a short-wave set (15 to 130 metres) using one or two valves, and two crystal sets. All these function excellently, yet I get far more pleasure out of my crystal sets, when opportunity offers, than from my valve sets. There must be many like me: The "sweet simplicity" of the crystal set appeals to me. I have had world-wide listening experience for nearly four years, now, and am "DX-ing" nearly every night, so you see I like searching. The Pacific Coast programmes are the finest in the world. Of European Stations, EAJ7, Madrid is always the last to be lost, and the first to be picked up, with Daventry (1600) a very bad second, and Daventry (491) considerably worse.

—H. R. (s.s. *Limnea*).

## Backgrounds on 5GB

**SIR**,—In a recent issue of AMATEUR WIRELESS there was a paragraph referring to a background of 2LO on 5GB's programme. In my opinion it is due

to "leaky studios," because it only occurs when the programme is from London, and not when from Birmingham. Also, when I listen to Berlin or Langenberg, there is no trace of London or 5GB, so it is not due to an unselective receiver. My set is an M.C.4, and I often hear 2LO as a background to 5GB, but only when the London studio is being used.

—F. G. I. (London, E.).

## H.T. Batteries

**SIR**,—With reference to "Thermion's" notes on bad cells in new batteries of even the best makes, I should like to mention a point which is not so obvious unless a good-class moving-coil meter is used. I refer to reversed polarity. Recently I was called in to see a set which was causing bad distortion.

The batteries were new, as the set had just been overhauled. On measurement, the voltage was quite up to the mark. After various tests, with no better quality, I tested the individual cells with a moving-coil instrument. Result: I found a cell in which the polarity was reversed. If I had tested with a moving-iron meter I would have got quite a normal reading, as most cheap voltmeters give a reading no matter which way they are connected.

—W. W. (Aboyne).

## Russian Transmissions

**SIR**,—Many will be interested to know that a new series of test transmissions will be made by the Radio Laboratory of the Polytechnic Institute at Kiev, Russia, every Friday from now onwards.

These transmissions will be on a wavelength of 42.3 metres, with an input of 300 watts, and will commence at 20.0 o'clock G.M.T. (8 p.m.), with the call, "Ilido de Rikpt."

This transmitter operates on a circuit of the Hartley symmetrical type, with an antenna, 70 ft. high, radiating upwards of 60 watts, and in conjunction with this is used a Schnell-type O-V-2 receiver connected to a separate antenna 50 ft. high.

The well-known international language

(Ido) will be used, and reports should be sent and will be acknowledged in this language. Reports may be sent either direct to Injeniora M. Shaparenko, Lvovskaya 46-3 Kiev, Ukraina, Russia, U.S.S.R., or via the QRA section, Internaciona Ido-Radio-Klubo, Seciono Britania, 12 Kemerton Road, Beckenham, in which latter case reports, if in English, will be translated prior to re-transmission.

—E. H. TURLE,

M.I.E.E., M.I.R.E., M.I.W.T.,  
Hon. Sec., Seciono Britania.

## Hydra Condensers

**SIR**,—I notice in your issue of September 24, page 416, the statement re Hydra Mansbridge condensers. We shall be very pleased if you will kindly bring it before the public at your earliest convenience that Hydra condensers are not made under the Mansbridge system at all, but by a method which is entirely at variance with the Mansbridge system, namely separate filament and special impregnated paper dielectric.

—L. HOLZMAN (109, Kingsway, W.C.2.).

Microphones and loud-speakers are to be installed in the new Nakkuda Mosque, at Calcutta, which, when completed, will hold more than 14,000 worshippers.

A firm in London has brought out a burglar alarm which is operated by radio. When the alarm is set off, it operates a small transmitter which sends out a definite signal to receivers tuned to it. The receivers may be at any distance up to fifty miles.

The General Electric Company of New York has devised a new and more sensitive microphone, which includes not only the "mike" itself, but the voice amplifier.

Branch offices are to be established in various parts of the U.S.A. to keep strict check on the frequencies of broadcasters. These will be under the direction of the Radio Inspection Service of the Department of Commerce.

A Special Announcement of *Another Free Gift* Appears on Page 558

# Captain Round on SHORT-WAVE SUBTLETIES

TWENTY-FIVE years ago a young man entered the New York offices of Marconi's with a strip of tape with morse signs on it. He was a wireless operator from one of the liners, actually one of the Red Star liners I believe, and the tale he told was so far beyond all that had been conceived at that time that he was labelled with four letters and sent back to his ship. The tale,

a bright thought of an engineer suggested using a very much longer aerial wire which went to the top of one mast and then right across to the top of the other mast. As the wavelength was very short, these long aeri- als were tuned to a harmonic, a method which is now the accepted practice for most amateur short-wave long-distance work and when this change was made to the long aerial, the long-distance freak records began to be obtained.

the earth and the Heaviside layer round to their destination.

### How Short Waves Travel

Short waves, however, act in what is really quite a different way. They start off like the long waves but the bit that is trying to slide on the earth very soon gets worn out or attenuated. The part that goes up to the sky, however, gets entangled in the Heaviside layer and if it is of suitable wavelength, is bent round or refracted like light is when it passes from one medium to another and this bending round carries it round the curvature of the earth, bringing it down to earth again at very great distances. The tendency is for short waves to be received best near the transmitter and at great distances, the intermediate distances being almost skipped. Thus, a wavelength of 30 metres at night-time will come down again and be best at two or three thousand miles, but at two or three hundred miles it will be quite weak.

### Valve Action

This Heaviside layer about which I have spoken is situated at a distance of thirty or forty miles above the surface of the earth and it is a place at which the air is so rarefied that it can act like a valve. The so-called vacuum in a valve permits currents of electricity to flow quite easily through it. These currents, of course, consist of streams of electrons produced by the hot filament, and set into motion by the voltages put on the grid and plate. Apparently, the hot sun provides the necessary filament for the Heaviside layer and the signals of the transmitter when they arrive at the Heaviside layer supply the necessary voltage to make the electrons move, and when an

The story of why we went away from these short waves and used longer waves is a little too long to tell here. Fortunately now we are back in the short-wave range and at this date we have gathered a large amount of information about what short waves will do, and we have now of course, far better apparatus for transmitting and receiving. Hard work on the part of many scientists, engineers, and amateurs

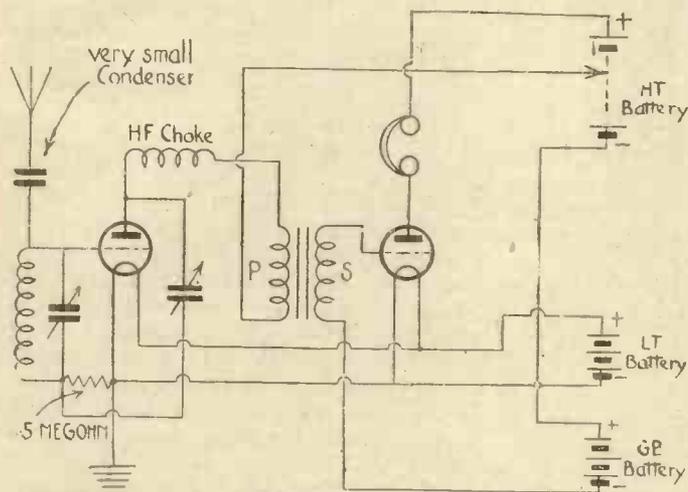


Fig. 1.—A Simple Short-wave Circuit

so he stated, contained the record of the signals from another ship at a distance of two thousand miles, almost right across the Atlantic. Nobody believed this story until a little later another operator came in with a similar piece of tape and a similar story, and then operator after operator came in each with records of signals at these then extraordinary distances.

Ships on the Atlantic and their land-station mates were at that time fitted with spark sets which gave an aerial power of somewhere about two watts and the wavelength in use was about 100 metres, and when we think of the crude receivers, coherers with their tappers and inkers in use at that day, these freak results were very extraordinary. They were, however, the first indications we had of short-wave long-distance working.

### The Reason

It is quite interesting to learn how these results were obtained, because ships had been working on this wavelength for some time before and no one had obtained long-distance results. The reason of these results was apparently due to the use of a new type of aerial on ships. Previously a short, vertical aerial had been used, but

has given us approximate laws which govern the transmission on short waves, and we are now able to use them for commercial work with reliability and a knowledge of their characteristics.

How do short waves differ from the long waves in the way they are carried round the earth? Briefly stated a long-wave transmitter sends out waves which slide over the surface of the earth, expand until they reach the Heaviside layer above and then one might say they slide between

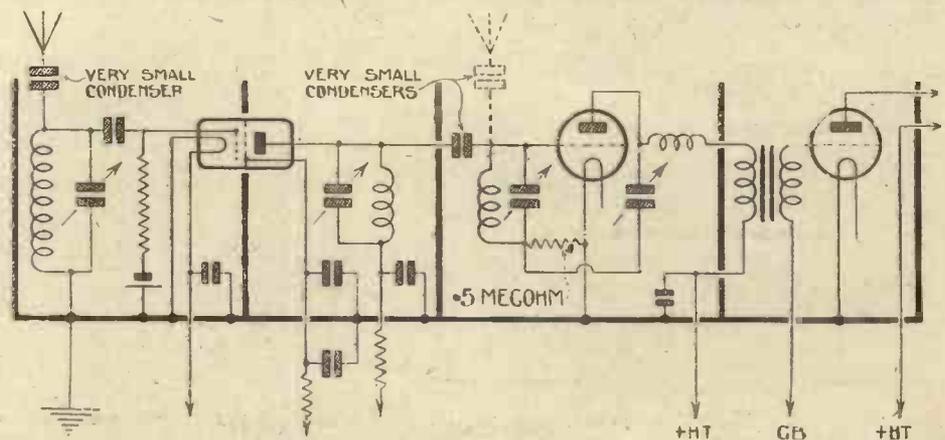


Fig. 2.—A Short-wave Receiver with One Stage of H.F. Amplification using Tetrode Valve

## "CAPTAIN ROUND on SHORT WAVE SUBTLETIES"

(Continued from preceding page)

electron starts moving it can produce an electrical wave. The effect of a mass of electrons moving is to simulate a reflection or refraction, because the actual wave when combined with the electron reaction wave produces a wave in a different direction.

### Daylight Effects

In the daytime when the sun is playing on the Heaviside layer and giving it a continuous supply of electrons the condition is very different to the night-time when the only electrons present are those that have been left over from the previous day. The result is that the refraction at night will be different to that in the daytime and this shows up very clearly in all our experiments. For instance, the 30-metre wave which at night is best at three or four thousand miles, will now be at its best at about a thousand miles or even less.

Let us see what happens as we change our wavelength, from say, a hundred metres down to ten metres. At night-time the 100 metres will give the best results at 200 miles; thirty metres will give the best results at a few thousand miles, and the very short waves below twenty metres do not seem to travel well at all. It is just possible that the earth is not big enough and that they might be good for several ten thousands of miles.

In the daytime 100 metres will not travel very great distances at all, unless the power is very high, and one is working over sea, but the thirty metres will be good at a thousand miles and still good up to two or three thousand miles, and fifteen metres will be very good at six to ten thousand miles. Even down as low as eight metres signals can be sent in daylight over the extreme possible ranges of the earth.

### Alternative Wavelengths

These laws of transmission which have been found out have resulted in engineers designing their stations with two wavelengths, a very short one for the daytime and a much longer one for the night. Two very suitable wavelengths for working, say six thousand miles, are the forty metres for night time and fifteen metres for the day time, and a good many of the modern expert amateurs use this idea also in their work.

How powerful has the transmitter got to be to enable one to send these great distances? Very much depends on what is wanted. If great reliability is required for a commercial service, great power and the use of beams are necessary, but just to get signals through sufficient on favourable occasions to transmit slowly a message, a very tiny transmitter will work.

Many amateurs have obtained results with transmitters which had no bigger

valves and no more power than a broadcast receiving set. In fact, I know of one case where world-wide distances have been accomplished with the same valve and the same battery for transmitting and receiving. All that is required is exceptional patience and a careful watching for the best hours for working on that particular wave-

once, to use the same wavelength to answer.

### Short-wave Reception

I will not go here into the question of transmitters, but some notes on reception will be perhaps useful. Telephonic reception is not too easy unless the transmitter happens to be a high-power commercial station. All short-wave receivers are comparatively insensitive to telephony compared to their sensitivity for telegraph signals, the reason being that the receiver is used in an oscillating condition for telegraphy and a non-oscillating condition for telephony. As is well known, in the oscillating condition the efficiency of a receiver is the same, however weak the signals are, whereas for telephonic reception the efficiency falls off very rapidly as the signals weaken. Consequently, I advise all those who wish to start on short-wave work to learn a little morse and watch for short-wave morse signals until they are thoroughly conversant with what is going on. A very simple short-wave receiving circuit which, with plug-in coils can be adjusted to give signals on great ranges of wavelength, is shown by Fig. 1, and with care this receiver will give telephonic signals when just not oscillating from the short-wave stations such as 2XAF and WGY.

For telegraphic reception it will be used in the just oscillating condition, and there is no better receiver for sensitivity and ease of operation known. Recently the introduction of the shielded valve has given us some chance of improving a little on this receiver for both telegraphic and telephone working. The simple circuit of Fig. 1, although it is such a wonderful receiver, is highly susceptible to movements and changes in the aerial. It also radiates and, of course, the radiation may carry very great distances. For all you know you may be jamming an amateur in New York with your receiver. Then, again, if you are radiating, any little bit of wire that is in the neighbourhood will receive that radiation and if that bit of wire happens to be rubbing up against another piece of wire, the rubbing contact will cause noises to be heard in the receiver.

### Possibilities of the Tetrode

The four-electrode valve enables us with a slight complication of apparatus to overcome all these three difficulties and on wavelengths down to at least twenty metres there will be a considerable gain of strength due to magnification given by the valve. The circuit of Fig. 2 shows an arrangement which is now being considerably used, which has distinct advantages for telegraphic reception in that it prevents these three troubles occurring because the valve acts as a fairly effective block, preventing the oscillation getting back into the aerial.

## For the Newcomer to Wireless

### "FEEDING" THE VALVES

EVERYONE knows nowadays that when valves are used in a wireless set it is necessary to have some means of supplying electric current—in the first place to heat the filaments of the valves, and in the second to make the plates positive with respect to the filaments so that it will attract the electrons which are emitted from the latter.

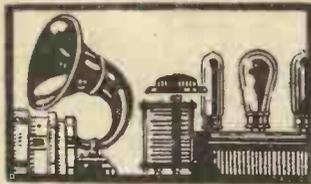
These requirements of the valve call for two distinct sources of electrical energy—in the first case quite a low voltage to send current through the filaments, and in the second a comparatively high voltage to apply to the plates of the valves; they are respectively styled low-tension (L.T.) and high-tension (H.T.).

It is essential that the filament voltage should remain constant and so, in practice, an accumulator is generally used to supply the filament current. Dry cells can be used if only a few valves are employed and if these are of a low-consumption type, but as the voltage of a dry-cell battery falls continually during its life, while the voltage of an accumulator remains constant until it is completely discharged, the latter is much to be preferred.

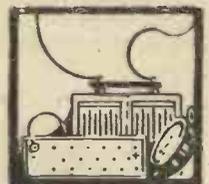
The value of the high-tension voltage varies, in practice, between about 60 and 120 volts. The current which flows through the valve, however, is much less than that required for heating the filament, being of the order of a few milliamperes only. Therefore, a dry-cell battery of the required voltage may be successfully used in the plate circuit of a valve as, owing to the low rate of discharge, the voltage only falls slowly.

But even in the plate circuit of a valve it is an advantage to use an accumulator battery of suitable voltage, and this latter type of battery is rapidly increasing in favour.

length and the usual rule for any amateur I think is that when he picks up a signal from a distant station on a certain wavelength and he wishes to answer back at



# PRactical ODDS & ENDS



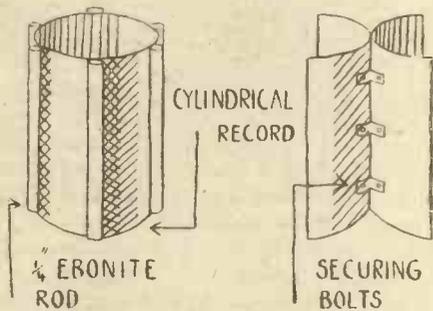
## A Fluxite Hint

EVERY home constructor knows what an untidy mess the Fluxite tin is liable to get into when lying about the bench—apart from the waste that results. A useful tip to overcome this is to bore a 1/4-in. hole in the side of the tin near the bottom and insert in it a match stick. It will be found that enough of the flux can be collected on the end of the match for one joint. When no more can be got from the hole, the lid is removed and the flux moved towards the hole and a piece of wood inserted to make up for the paste that has been removed.

C. M. B.

## Phonograph-record Formers

THE old-fashioned cylindrical gramophone records, which are still obtainable for a few pence, can be put to a very



Phonograph-record Coil Former

good wireless constructional use. The accompanying diagrams show how serviceable low-loss coil formers can be assembled with these records as a basis. Lengths of strip or rod ebonite, about 1/4 in. diameter, can be glued lengthwise along the record, so that the winding is air-spaced from the solid coil former.

If the record is cut down the centre and the two halves joined "backwards," as indicated, a good low-loss former for short-wave coils is available.

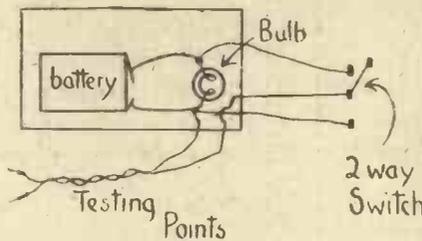
W. R.

## A Simple Tester

HERE is a simple tester for the experimenter's workshop. It can be made very cheaply and will be found most useful. It can be used for testing connections and also for testing 4-volt batteries, the latter being very useful when H.T. is made up of such small batteries.

The diagram of connections is shown in the figure. What the writer claims as original is the manner in which he has the tester arranged on the bench.

The two-way switch is of a simple type, and is mounted on the front of the bench in a handy position; the battery and bulb are fixed on a board, which stands at the other side out of the way; three wires come under the bench to the two-way switch;



A Simple Tester

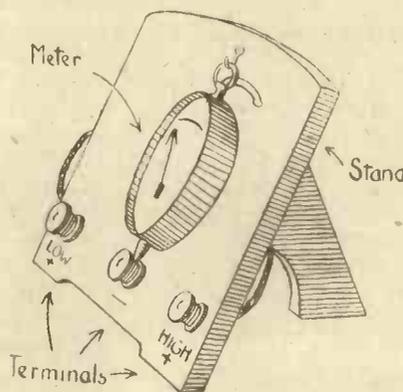
and two others, of such a length that they will reach the points where the testing is done, carry phone tags as the testing points.

N. M.

## Convenient Meter Stand

THE ordinary "pocket" type of voltmeter or ammeter does not readily lend itself to mounting. But it is as well to have the meter in a convenient position for reading purposes. Shown in the accompanying sketch is a simple solution to the difficulty.

A small wooden stand, similar to the familiar watch stand, is assembled on the lines indicated. A small hook mounted near



Convenient Meter Stand

the top of the stand enables the meter to rest in a semi-vertical position, which makes for easy reading.

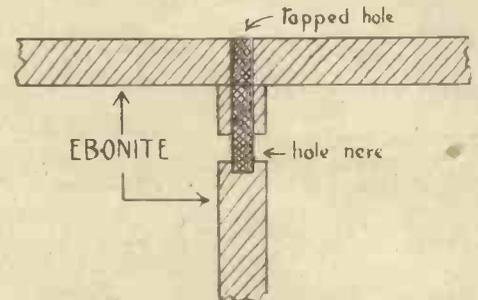
Two or more terminals, according to the nature of the meter, are mounted at either side of the meter as shown, and if desired, the meter leads can be permanently secured under them.

J. B.

## Joining Ebonite Panels at Right Angles

SOMETIMES the experimenter wishes to join one piece of ebonite end on to another piece. This entails tapping a hole which has not both ends open. The result is that the tapping tool may be turned when its point is at the bottom of the hole and the thread is stripped off.

This can be avoided by drilling a hole at some point in the track of the other hole and at right angles to it. Then the progress of the tool can be observed; also this hole will serve as an outlet for the shavings



Joining Ebonite Panels

which are liable to choke the tool and spoil the thread.

B. C.

## Ohm's Law Mnemonic

WHILE it is an easy matter to remember the straightforward form of Ohm's law, namely, that voltage is equal to current multiplied by resistance, those who do not wish to trouble themselves about mathematics are unable to vary the equation to find out, say, the value of a resistance or the current passed by a filament.

A handy tip, in such a case, is the following. Write on a slip of paper

Voltage  
-----  
Current Resistance,

and keep it handy for reference. Place a finger over the factor required, and the process to be carried out is shown by the position of the other two.

Thus, if voltage is covered, the answer is given by current multiplied by resistance. If current is covered, the answer is given by voltage divided by resistance.

B. B.

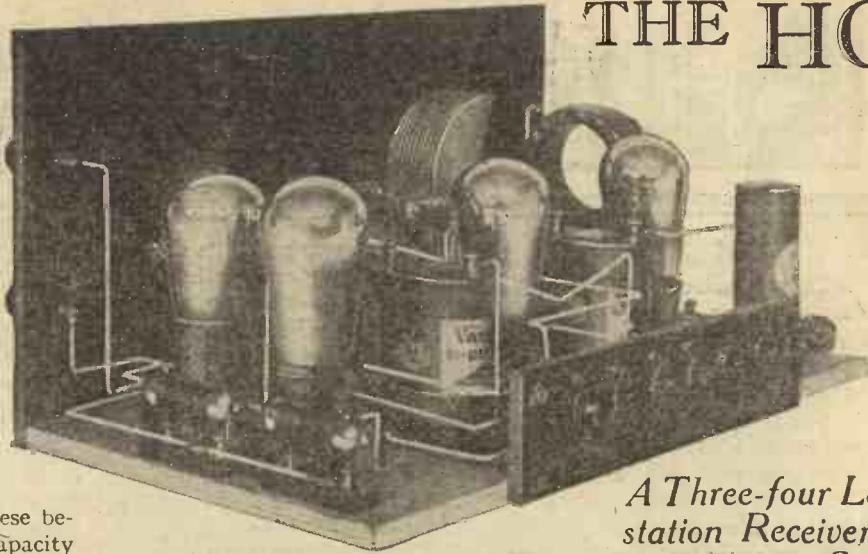
LET "Amateur Wireless" solve your Wireless problems

AS far as "the family" are concerned, there is only *one* really popular transmission, and it is that emitted from the local station. This is quite understandable, because, even if an elaborate receiver is available, it is not yet possible to tune in a remote transmission with the same clarity and absence of "background" as is obtained when receiving the local station.

It was to meet a demand for a "one-station" set giving extremely high-quality reproduction that the technical staff assembled the receiver illustrated and described here.

Great advances have been made in the design of low-frequency coupling units, notable amongst these being the R.I. and Varley resistance-capacity couplers. Two of these devices have been incorporated in the "Home-station Three," and the resulting purity of reproduction furnishes a striking testimony to the excellence of the design and choice of constants in the units.

The circuit of the "Home-station Three,"



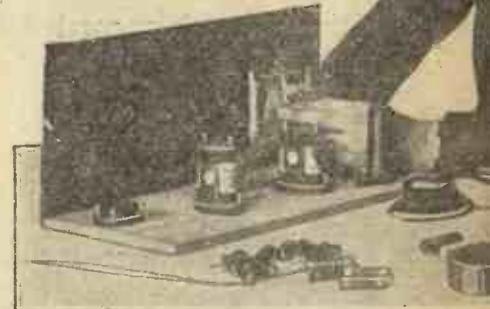
A Back View—Note the Paralleled Valves

which is one of the simplest possible three-valve arrangements, is shown by the theoretical diagram. An anode-bend detector valve is coupled to a two-stage resistance amplifier. No reaction has been

# THE HOME- THE

By THE  
TECHNIC

*A Three-four Local-  
station Receiver in-  
corporating Special  
R.C. Couplers*



incorporated, though this could be added by experienced readers who feel that its inclusion would, in their cases, be essential. The "anode-bend" rectification is obtained by taking the grid return wire *not* to L.T.—, but to a negative tapping on the G.B. battery.

The tuning system is extremely simple; it consists of a plug-in coil and a .0005-microfarad variable condenser in parallel with it. For those with long aerials a .0002-microfarad fixed condenser in the aerial lead is useful, and for this reason a second aerial terminal is provided.

It will be noticed that in series with the anode of the detector valve and the anode resistance is an H.F. choke. Between the anode and L.T.— is a .0001-microfarad fixed by-pass condenser. The inclusion of the H.F. choke and the fixed condenser tends to eliminate the phenomenon of "motor-boating," a low-frequency "rippling" sound which often manifests itself in a resistance amplifier, unless certain precautions are taken.

## Components for the Home-station Three

The necessary components required to build this receiver are as follows:—

Ebonite panel, 14 in. by 7 in. by 1/4 in. (Raymond, Ebonart, Peto-Scott, or Becol).

Terminal panel, 9 in. by 2 in. by 1/4 in. (Ebonart, Peto-Scott, or Becol).

Thirteen terminals: A, A, E., H.T.+, H.T.—, L.T.+, L.T.—, G.B.+, G.B.—1, G.B.—2, G.B.—3 (Belling-Lee).

One .0005-microfarad variable condenser (Cylton, Peto-Scott, or Formo).

One .0002-microfarad fixed condenser (Lissen or Dubilier).

One .0001-microfarad fixed condenser (Lissen or Dubilier).

Single-coil mount (Lissen or Dubilier).  
H.F. choke (Lissen, R.I. & Varley, or Watmel).

Four fixed resistors and mounts (Cylton, Centroid, Keystone or Peerless).  
Type "A" R.C. coupler (R.I. & Varley).

Type "B" R.C. coupler (R.I. & Varley).

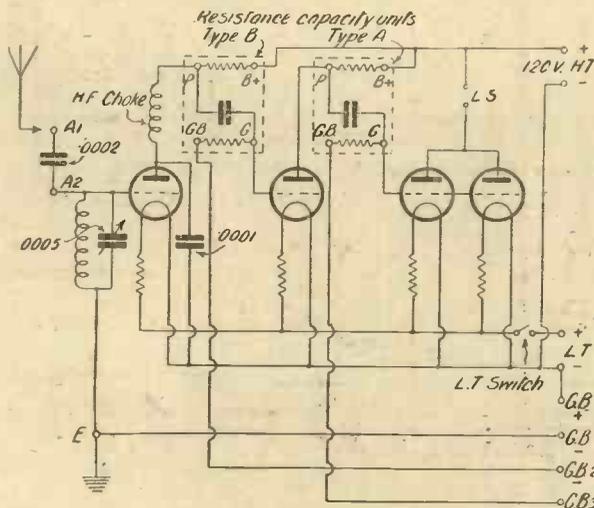
Four valve-holders (Lotus, Lissen, or Benjamin).

On-off switch (Bulgin, Lissen, Wearite or Trix).

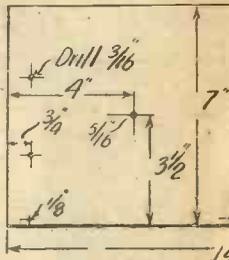
Baseboard, 14 in. by 8 in. (Carrington).

Connecting wire (Glazite or Junit).

*The components actually used and allowed for in the blueprint layout are in each case mentioned first. Suitable alternatives are mentioned afterwards.*



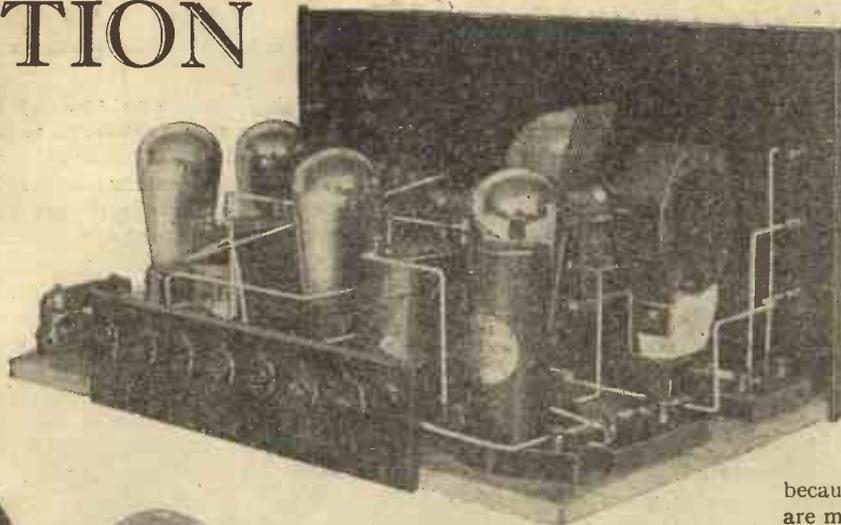
Circuit Diagram of Home-station Three



Drilling Diagram

# STATION FREE

E "A.W."  
AL STAFF



The Special Couplers are seen between the Valves

at close range to a broadcasting station the third valve will be overloaded. Two small power valves, individually incapable of handling the power, will serve admirably when paralleled. (2) There is a still stronger argument in favour of two paralleled valves.

If the receiver is connected to a cone-type loud-speaker, with a low-impedance winding, the impedance of the output valve should also be low. Now, when two similar power valves are paralleled the effective impedance of the combination is equal to half the impedance of the individual valves. With the notable exception of the new DEP240, we cannot call to mind another 2-volt power valve with an impedance of under 4,000 ohms.

It must be emphasised that a power valve which gives satisfactory results with a horn-type speaker may prove disappointing when coupled to a cone speaker, simply because in the first case the impedances are more suitably matched.

It may seem to some that it is needless to mention that to fully appreciate the "even scale" amplification of resistance coupling, a cone-type loud-speaker is essential. Exceedingly good reproduction is claimed by many users of horn-type loud-speakers, and justifiably so, but only by comparison with a good cone speaker can



The H.F. currents in the anode circuit of the detector valve are impeded by the H.F. choke and diverted through the by-pass condenser to earth. In this way the "motor-boating" effects are considerably reduced. The use of anode-bend rectification also assists in its elimination, although the main function of this form of rectification is to give pure reproduction.

The components comprising each resistance-capacity coupling unit are shown in dotted lines in the diagram. The terminal markings indicated are engraved on the units, and no trouble should be encountered in wiring up the units.

So far we have ensured very good purity of reproduction as far as the last valve. In order to maintain this desirable characteristic, it

has been deemed advisable to allow for two parallel valves in the last stage. There are two arguments in favour of such a procedure:

(1) When two "R.C." valves are used in the first two stages there is a danger that

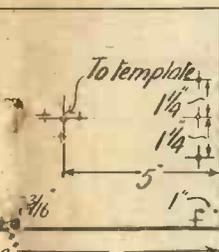
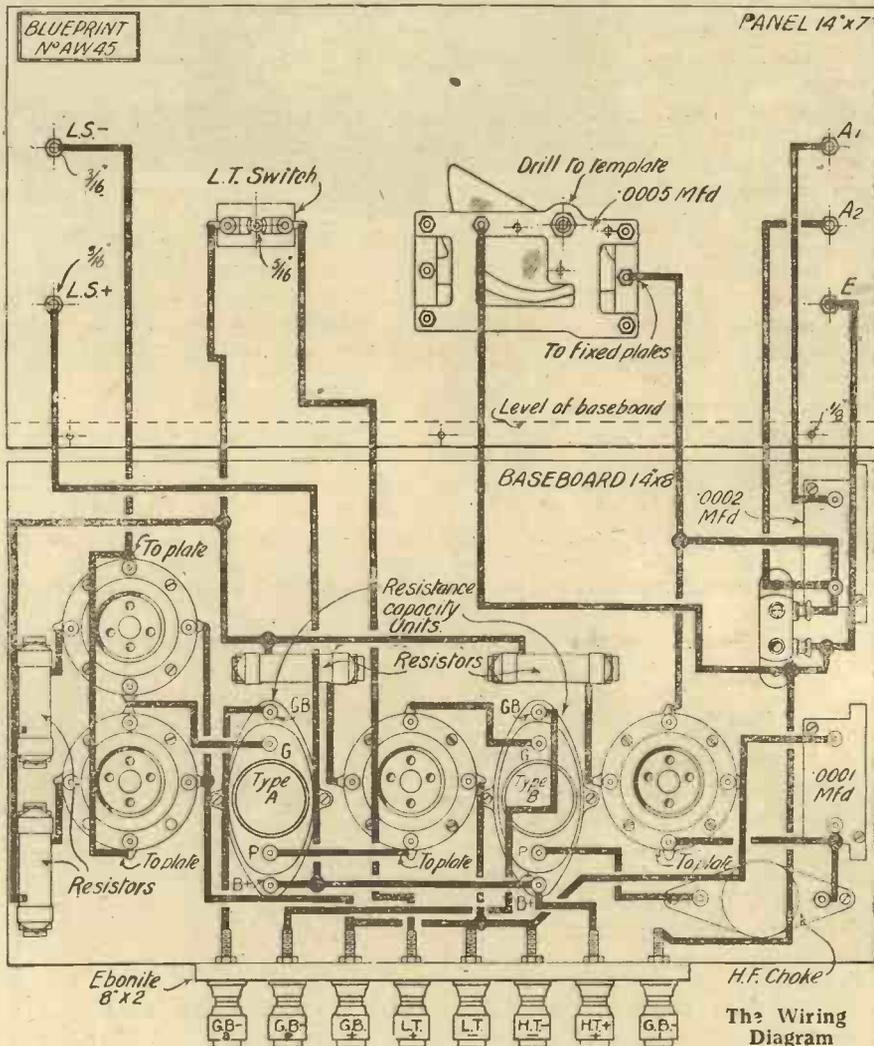


Diagram of Panel

The Wiring Diagram

: : "THE HOME-STATION THREE" (Continued from preceding page) : :

the inherent disabilities of the horn-type speaker be realised.

The simple layout of the "Home-station Three" can be appreciated from an examination of the photographic views and drawings reproduced in these pages.

On the panel are mounted the aerial and earth terminals, the .0005-microfarad tuning condenser, the L.T. filament switch (necessary because fixed resistors are used), and the loud-speaker terminals.

Eight battery terminals are mounted on the terminal strip attached to the back of the baseboard. Note that, for greater ease in wiring, the G.B. — terminal for the anode-bend rectification is mounted on the extreme right (from the back of the set). With the panel and terminal strip fitted as indicated, the baseboard components can be disposed in approximately the same positions as are shown in the reduced reproduction of the full-size blueprint.

There is ample room on the baseboard for the components, but care is needed in fixing them if the same neat layout shown in the photographs is to be obtained.

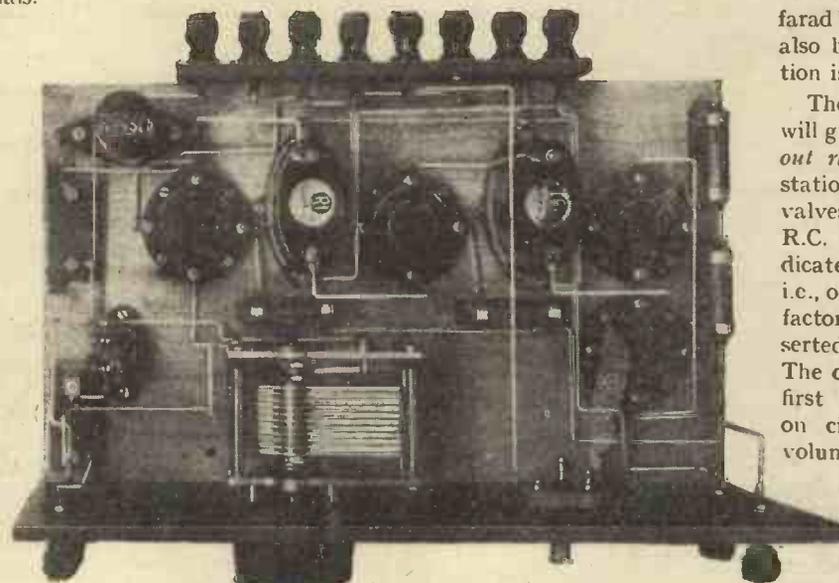
The type "B" R.C. coupler is wired in the first L.F. stage, as the makers specify it as being most suitable after a valve with an A.C. resistance of between 30,000 and 100,000 ohms. Between the second and third valves is connected the type "A" coupler, as this is most suitable when preceded by a lower impedance valve (between 15,000 and 40,000 ohms).

Wiring up this receiver is a perfectly straightforward task, well within the capa-

bilities of all constructors. We used white Glazite wire in the photographed model, but constructors who prefer to use bare tinned-copper wire can use Junit with confidence.

#### Soldering

Except for the terminals, the soldered connections are all made to soldering tags supplied on the components. Although this simplifies the process of soldering, it should



A Plan View of the Home-station Three

be mentioned that the terminals clamping the soldering tags should be well screwed down. A well-soldered tag is no guarantee of a well-connected component!

#### Adding Reaction

As already mentioned, it is a simple matter to add reaction to this receiver. Due to the incorporation of the H.F. choke, the addition is perfectly straightforward. The modification involves the use of an

extra single-coil mount and plug-in reaction coil and a .0003-microfarad variable reaction condenser. The moving vanes of the reaction condenser are connected to earth, and the fixed vanes to one side of the reaction coil. The other side of the reaction coil goes to the anode of the detector valve. If this modification is adopted it will be necessary to alter the panel layout slightly, in order to make room for the reaction condenser. The .0001-microfarad by-pass condensers should also be disconnected if reaction is added.

The receiver as described will give ample volume, *without reaction*, from the local station, provided that suitable valves are used. With the R.C. couplers arranged as indicated, a "high-mu" valve, i.e., one with an amplification factor of over 30, should be inserted in the detector position. The choice of valve for the first L.F. position depends on circumstances. If great volume is required another "high-mu" valve will be necessary, although

in our tests at a distance of 10 miles from 2LO, an L.F. valve gave ample volume. For the last stage a low-impedance power valve is essential.

Only one H.T. + tapping is provided, in spite of the fact that the last valve requires a higher anode voltage than the first two valves. But, due to the voltage drop across the anode resistances, a common 120-volt supply enables each valve to be worked correctly. The 120-volt supply through the detector anode resistance is necessary to ensure correct anode-bend rectification.

#### "Getting the Best from the Loud-speaker"

Continued from page 567

switch arms, *via* sheet brass links which are clamped firmly under the nuts of the terminals and bushes.

The method is clearly shown in Fig. 3, and also in Fig. 6 which represents a practical back-of-panel wiring guide, showing the connections from the lower ends of the condensers to the studs 2, 3, 5, and 6. The studs 1 and 4 are left disconnected. When the panel is turned over and fitted to the top of the casing it should be remembered that studs 1, 2, and 3 will be on the left, and studs 4, 5, and 6 on the right; with the

panel in the position shown in Fig. 2 the studs should be marked downwards (left) 1, 2, and 3, and downwards (right) 4, 5, and 6, and at the same time the terminals should be marked (left) A A, and (right) B B.

The complete panel is attached to the casing by means of a wooden pillar which is screwed firmly to a square piece of three-ply wood previously attached to a thick cardboard disc (forming base of casing).

The ebonite panel is then screwed down to the top of the pillar by means of a fairly long woodscrew which is well countersunk into the centre hole. The casing is then covered with American cloth and provided with the chart as shown in Fig. 7. If the chart shown is used it will greatly add to the appearance of the component.

"Amateur Wireless and Electrics." Price Threepence. Published on Thursdays and bearing the date of Saturday immediately following. Post free to any part of the world: 3 months, 4s. 6d.; 6 months, 8s. 9d.; 12 months, 17s. 6d. Postal Orders, Post Office Orders, or Cheques should be made payable to "Bernard Jones Publications, Ltd."

General Correspondence is to be brief and written on one side of the paper only. All sketches and drawings to be on separate sheets.

Contributions are always welcome, will be promptly considered, and if used will be paid for.

Queries should be addressed to the Editor, and the conditions printed at the head of "Our Information Bureau" should be closely observed.

Communications should be addressed, according to their nature, to The Editor, The Advertisement Manager, or the Publisher, "Amateur Wireless," 58-61 Fetter Lane, London, E.C.4



# BE A RADIO MISER

THE IMPULSES your aerial receives from foreign stations are doubly precious because of their weakness. You must arrange your receiver so that none of the energy is lost. You must guard against leakage. You must be miserly in the way you save each minute portion. This means more than using good radio parts—it means using the one make of parts that have been conspicuously notable for their low loss qualities for many years—LISSEN

## ECONOMISES H.T.

By putting a Lissen 2 mfd. Mansbridge Condenser across your H.T. Battery (1 mfd. will do, but larger size is better) you will lengthen its life by 10 per cent.

### LISSEN Mansbridge Type Condensers

	2 mfd. 4/8	1 mfd. 3/10	
	Other capacities		
.01 ..	2/4	.25 ..	3/-
.05 ..	2/4	.1 ..	2/6
.025 ..	2/4	.5 ..	3/4

A specially moulded solid insulating case totally encloses each Lissen Mansbridge Condenser.

## STRONGER SIGNALS



There is not a square inch of superfluous ebonite in this Lissen Valve Holder. That means low capacity, and therefore stronger, clearer signals. Shown ready for baseboard mounting, but can also be used for panel mounting by bending springs straight. Patented. Previously 1/8. NOW 1/-

## NEVER LEAK or VARY

Lissen fixed condensers are accurate to within 5 per cent. of their marked capacities. They never leak, they never vary. Less than a year ago they were being sold at twice the price—and since then they have been still further improved. You can't buy a finer condenser.

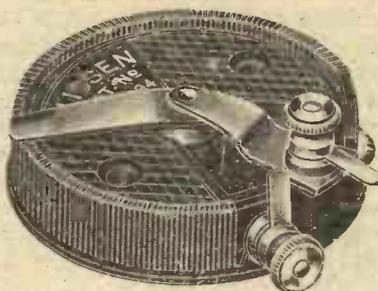


### LISSEN Fixed Mica Condensers

.001 to .001, 1/- each (much reduced).  
.002 to .006, 1/6 each (much reduced).  
A pair of clips is included free with every grid condenser.

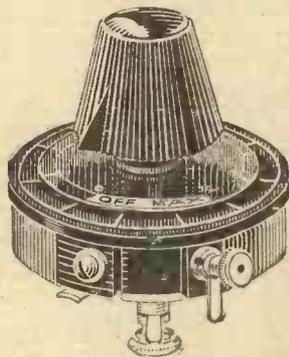
## NOW COSTS

1/- LESS



The baseboard type of Lissen Resistor is now reduced from 2/6 to 1/6. This type has, of course, no knob, dial, or pointer, but is provided with 2 holes for screwing to baseboard. 7 ohms Rheostats : 400 ohms Potentiometer, each, 1/6. (Previously, 2/6).

## ALSO REDUCED



### LISSEN PANEL TYPE RHEOSTATS

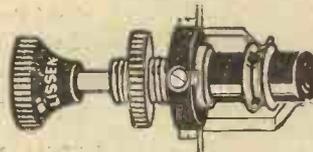
The wires do not loosen, the arm keeps in perfect contact—nothing ever goes wrong.  
Rheostats 7 and 35 ohms .. .. 2/6  
(Previously, 4/-).  
Potentiometer 400 ohms .. .. 2/6  
(Previously 4/6).  
Dual Rheostat 35 ohms .. .. 4/6  
(Previously 6/-).

## ABSOLUTELY SILENT



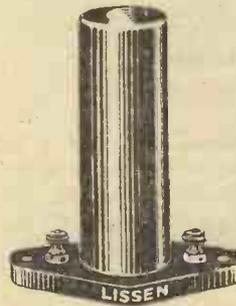
Lissen Leaks are absolutely silent in use; their resistances never alter. This was proved some time ago by exposing them to the rain and sun on our factory roof. All resistances. Previously 1/8. NOW, 1/-

## SAVE CURRENT



Energy is often lost at the switch points. These Lissen SWITCHES are designed to prevent energy leaking away while they do their work efficiently. There is one for every switching need—each one is very neat. Now  
LISSEN TWO-WAY SWITCH .. 1/6  
(Previously 2/9).  
LISSEN KEY SWITCH .. 1/6  
(Previously 2/6).  
LISSEN REVERSING SWITCH .. 2/6  
(Previously 4/-).  
LISSEN SERIES PARALLEL SWITCH 2/6  
(Previously 3/9).  
LISSEN FIVE-POINT SWITCH .. 2/6  
(Previously 4/-).  
LISSEN D.P.D.T. SWITCH .. 2/6  
(Previously 4/-)

## HERMETICALLY SEALED WOUND IN 30 SECTIONS LISSEN H.F. CHOKE



Previously 10/- NOW 5/6

**WHENEVER RADIO PARTS ARE WANTED USE LISSEN**

LISSEN LIMITED, 8-16, Friars Lane, Richmond, Surrey

Managing Director: THOMAS N. COLE L. 259a

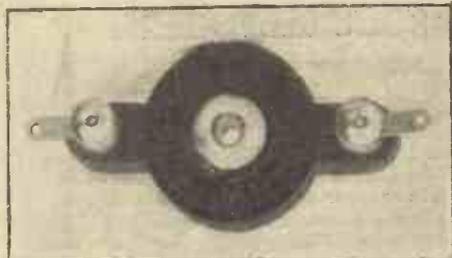
You will Help Yourself and Help Us by Mentioning "A.W." to Advertisers

## "A.W." TESTS OF APPARATUS

Conducted by our Technical Editor, J. H. REYNER, B.Sc. (Hons.), A.M.I.E.E.

### CDM Fixed Condenser

THE CDM fixed condenser is a neat component of attractive design. The plates of the condenser are circular in shape and are mounted inside a bakelised casing, whilst the tags from the plates are



CDM Fixed Condenser

taken out to terminals on either side of the case. The component is then sealed with a moisture-proof material, so that the capacity and insulation of the terminals always remain constant.

For fixing to the baseboard or panel, a screw is provided which runs through the centre of the condenser plates: when fixed in position, the head of the screw is supported by a metal disc which obviates damage when fixing in position.

A sample which we tested had a stated capacity of .002-microfarad; on test, this proved to be .0019-microfarad. This neat and efficient article should appeal to readers. It is marketed by C. D. Melhuish, 8 Great Sutton Street, Goswell Road, E.C.1.

### Nomast Aerial

AN interesting aerial has been received from the Nomast Plate Aerial Company, 110 Singleton Avenue, Birkenhead.

This consists of a plate of perforated copper, coated with a protective covering to prevent oxidation and having a long length of insulated wire connected thereto.

In cases where a horizontal portion is impracticable, the effective height may be somewhat increased by increasing the capacity at the top of the aerial by adding a plate or network of wire or some similar arrangement, and such an aerial is definitely better than a simple vertical wire.

The Nomast Plate Aerial belongs to this class, the upper capacity of the aerial being increased by the presence of the plate and the system gives excellent results in confined areas.

Indeed, in certain cases, the selectivity of the set may be noticeably improved by the use of an aerial of this type and this particular aerial can be recommended

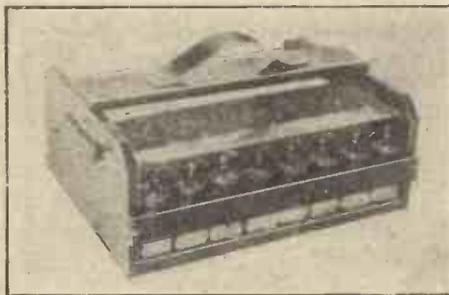
### Tromba Wet H.T. Battery

THE Tromba Wet H.T. Battery, illustrated, consists of 48 cells, giving a normal voltage of 60; tappings can be taken at 30, 40 and 50 volts as desired.

Each cell consists of a small glass-jar, inside which there is the positive sac element and surrounding this a negative semi-circular zinc. Insulation between the zinc and the sac is obtained by three rubber bands which surround and hold in position thin cardboard strips. The cells should be filled with sal-ammoniac solution.

On test the battery gave satisfactory results and could withstand, for long and continual periods a discharge of 7-milliamperes; this value could be increased to over 10-milliamperes for considerable periods, without appreciable drop in the voltage.

Throughout our test no trouble was experienced, whilst a constant voltage



Tromba Wet H.T. Battery

was maintained even after a continuous discharge. The Tromba battery is manufactured by The Tromba Electrical Co., 13 High Road, Kilburn, N.W.6.

### Ediswan HF210

AN Ediswan HF210 valve has been sent in for test by The Edison Swan Electrical Co., Ltd., 123 Queen Victoria Street, London.

The valve with a medium high-impedance and a high amplification factor, has recently become popular, since it is not only suitable in resistance-capacity-coupled amplifiers, but will also operate efficiently in conjunction with tuned anode high-frequency circuits and some H.F. transformer circuits, whilst such a valve will form an efficient rectifier if followed by resistance capacity coupling, or a transformer having a high-impedance primary winding.

On test, the Ediswan HF210 proved to have characteristics suitable for the above mentioned purposes since it has only a moderately high-impedance and an amplification factor of over 20.

The characteristics shown below speak for themselves; we can recommend the valve for general use.

Fil. Volts.	Fil. Amps.	Anode Voltage	Impedance	Amplification Factor
2	0.1	60	49,000	20
2	0.1	80	41,000	21

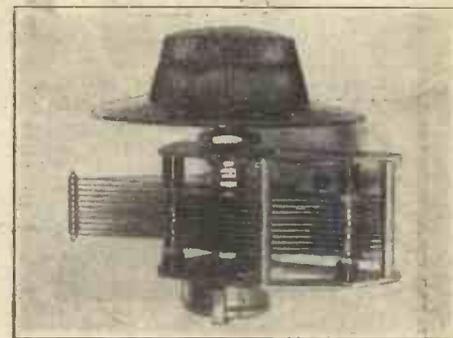
### Dubilier K.C. Condenser

CONSIDERABLE interest has been aroused by the news that the well-known firm of Dubilier were placing on the market a variable condenser with slow-motion dial at a popular price. We recently had the opportunity of testing this condenser, the Dubilier K.C., which is without doubt a high-class product. Constructed with an S.L.F. characteristic, the instrument is particularly suitable for tuning circuits where it is desired to separate the various stations evenly over the dial.

The rotor runs on ball-bearings at one end whilst there is a large bearing surface at the other. The motion is therefore pleasantly smooth. The outer knob is attached to an inner spindle and controls the vernier mechanism; this operates on an ingenious principle involving two discs separated by a metal ball.

The vernier dial operates the outer disc and causes the ball to rotate with it; but on account of a deep groove, cut in the outer disc a small amount of drive is applied to the inner disc which is rigidly fixed to the spindle. In this way a reduction of about 240 to 1 is obtained.

On test, the minimum capacity of the condenser proved to be .000021, whilst the



Dubilier K.C. Condenser

maximum was exactly .0005. This condenser is made on robust lines and should give continual service. We have no hesitation in recommending this component to readers. The K.C. condenser is manufactured by the Dubilier Condenser Co., Ltd., Ducon Works, Victoria Road, North Acton, W.3.

# LISSEN TRANSFORMER



**B**ESIDES being the most efficient transformer on the market, the new LISSEN can be used with equal success as an L.F. Choke. You merely connect the O.P. and I.S. terminals together.

Acclaimed by tens of thousands as the finest amplifying transformer and preferred by LISSEN themselves (all the previously high-priced LISSEN transformers were withdrawn in its favour), it has only been possible to sell the new LISSEN for 8/6 because—

**FIRSTLY** : The immense facilities of LISSEN have been concentrated on the production of this one type.

**SECONDLY** : This transformer, like all LISSEN products, is sold direct to the retailer, and so wholesalers' profits are cut out.

**WE MAKE THIS OFFER.** If within 7 days of purchase you can find any transformer or choke—at any price—which you prefer to LISSEN, you can return the latter and your money will be refunded.

*Turns ratio 3 : 1. Resistance Ratio 4 : 1.*

Amplifies fully every note, every tone, every overtone, every harmonic. Guaranteed for 12 months.

*You can use 3 in cascade.*

**LISSEN LIMITED, 16-20, FRIARS LANE, RICHMOND, SURREY.**

*Managing Director:  
THOMAS N. COLF.  
L.281*



**RULES.**—Please write distinctly and keep to the point. We reply promptly by post. Please give all necessary details! Ask one question at a time to ensure a prompt reply, and please put sketches, layouts, diagrams, etc.; on separate sheets containing your name and address: See announcement below:

**Measuring Amplification Factor.**

**Q.**—What instruments are required, and how should they be used, to measure the amplification factor of a valve?—T. P. (Birkenhead).

**A.**—You will require at least a milliammeter reading up to about 20 or 25 milliamps, a voltmeter reading up to about 15 volts, and a voltmeter reading up to 100 or 120 volts. The milliammeter is to be used for measuring the anode current, the high-reading voltmeter for measuring the H.T. voltage, and the low-reading voltmeter for measuring the grid bias applied to the valve. To proceed, light the valve at its normal brilliancy and apply a normal H.T. voltage to the plate of the valve. Then apply sufficient negative grid bias to bring the operating point of the valve to somewhere about half-way from the lower bend of the curve to the point where it crosses the zero-grid volts line. Note the anode current flowing, and alter the grid bias by a definite amount and make a note of the change in the anode current. Now apply the same grid bias as at first, and alter the H.T. voltage until the same change of anode current has taken place. Then the amplification factor can be found by dividing the alteration in the H.T. voltage by the alteration in the grid-bias voltage.—N. F.

**"Simpler Wireless."**

**Q.**—I understand that, when using the "Simpler Wireless" system, it is possible to use valves requiring different voltages in the same

alongside of, say, 6-volt valves?—H. L. P. (Hove).

**A.**—In a "Simpler Wireless" set all the valve filaments are connected in series with each other, and in the filament circuit is included sufficient resistance to limit the current flowing to that required by the valves. In the case of .1 valves, for instance, the resistance of the filament circuit is made equal, in ohms, to ten times the supply voltage in volts. There is then one-volt drop across each 10 ohms resistance of the filament circuit, and the current flowing through every part of the filament circuit is .1 amp. Now, the resistance of a 2-volt filament passing .1 amp. is 20 ohms (from Ohm's Law), that of a 4-volt .1 amp. filament 40 ohms, and that of a 6-volt .1 amp. filament 60 ohms. Now, if .1 amp. is passed through a filament having 20-ohms resistance a voltage of 2 exists across the filament, if the filament resistance is 40 ohms the voltage across it is 4, if 60 ohms the voltage is 6. So that all the operator has to do is to see that the total resistance of the filament circuit is correct for his particular supply, and all the valves automatically receive the correct filament voltage and current, even though 2-, 4-, and 6-volt valves are used in the same set.—J. F. J.

**When Asking Technical Queries**

**PLEASE write briefly and to the point**

A fee of One Shilling (postal order or postage stamps) must accompany each question and also a stamped, addressed envelope and the coupon which will be found on the last page. Rough sketches and circuit diagrams can be provided, but it will be necessary to charge a special fee (which will be quoted upon request) for detail layouts and designs.

set, providing that all the valves need the same filament current. Could you please explain why a 2-volt valve would not be burnt out if used

**SAY "VARTA"**

when ordering a Radio Accumulator

ONE "VARTA" LINE:—

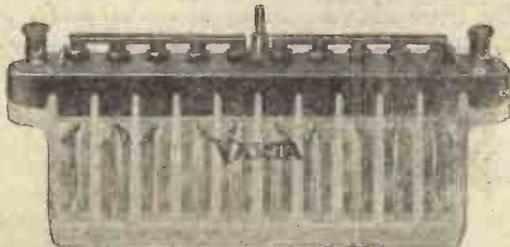
20 VOLT. H.T. MONOBLOCKS

The "VARTA" was the FIRST Monoblock H.T. Accumulator, and it has been imitated, but UNSURPASSED.

20 VOLTS — 9/-

DROP A POSTCARD FOR LIST:

A.F.A. Accumulators Ltd.  
120, Tottenham Court Road, London, W.1.



"If it's VARTA it's dependable"

**Build a Loudspeaker worth 5 guineas FROM 27/6**

IT IS MUCH CHEAPER, and if you use GOODMAN'S components results and appearance will equal in every way those of the most expensive instruments. Do not be afraid of unforeseen difficulties—without any previous knowledge or skill, if GOODMAN'S components are used, it is a simple matter to build a highly efficient and attractive reproducer. Essential parts are the Vibratory Movement and the Diaphragm. For the best results use our Seamless Moulded Conical Diaphragm with either of our Units. Our new Unit (the Junior) is a fixed Unit actually designed for the sole purpose of driving large diaphragms of the cone, pleated disc, or similar type. It is a converted earpiece or gramophone attachment. Housed in a strong brass case, finished bronze by electrolysis, every part interchangeable, with six screws provided at back, for fitting either to GOODMAN'S Backstays and Frames, or to those made by the constructor. Adjustable by heavily-plated knob at back. (One bushes and strong leads (for set connections) are supplied with each Unit. Noteworthy features are the specially designed pole piece and bridge, built up from quantities of laminations—not solid. Three heavy magnets are incorporated in each Unit. The ample proportions of all parts render this Unit capable of handling considerable volume without overloading or distortion. Its general appearance and finish is equal to that of the most expensive instruments. Price 14/6.

THE ORIGINAL GOODMAN DOUBLE ACTING REED UNIT 27/6

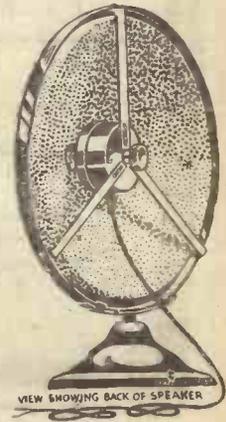
The total cost of the parts shown in the illustration, i.e., Diaphragm, complete with Frames, Backstays, and Vibratory Movement, is only 27/6 for the 12-in. Cone, or 32/6 for the 15-in. Cone. Stands, 6/6 extra. Complete sets of parts also stocked for BROWN'S or LISSENOLAS.

WRITE FOR ILLUSTRATED LISTS (L3), FOR FULL PARTICULARS

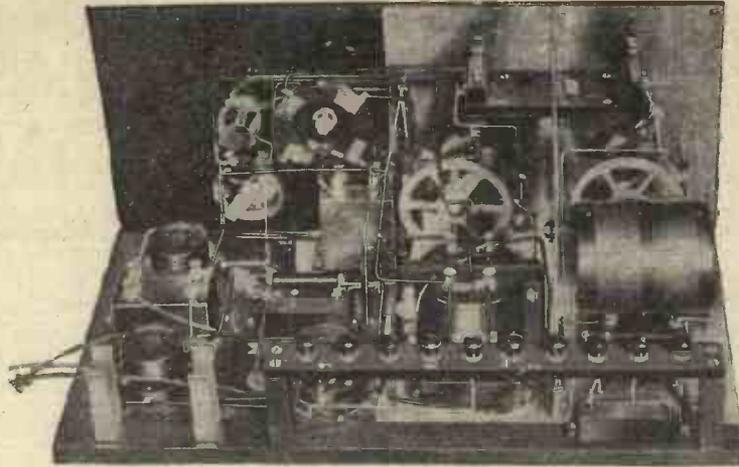
If you are interested in COIL-DRIVEN SPEAKERS, see our Lists (C.D.S.) of COIL SPEAKER UNITS, etc. Quality and finish are of the usual high GOODMAN standard, and prices as low as possible, consistent with perfect workmanship. If you have any difficulty in obtaining locally, send direct to us, enclosing your Dealer's name and address.

GOODMANS, 27, Farringdon Street, E.C.4

Original unsolicited testimonials can be seen at our office:  
From Cardiff.—"I must write and tell you how pleased I am with the instrument (27/6 Unit and Seamless Cone). The tone is excellent, and superior to most and equal to any other, irrespective of price. I am surprised at the splendid volume, and in this respect it is equal to a large and sensitive horn loud-speaker I have."  
From Goolle.—"No praise can be too high. I was positively astounded... the roundness and fullness of tone, neither soft or crisp speech and the drums are all there, provided the set delivers them... This is quite unaltered praise."



Have you had your **FREE** circuit yet? **6** from which to choose



SIX SPECIAL CIRCUITS by the Marconiphone engineers are offered to the home constructor. Each one, designed for a particular purpose, incorporates the very latest developments in radio. Four circuits are for receivers to operate direct from the mains; two show how to get the best results from the Marconi S625 Shielded Valve.

**FREE CONSTRUCTIONAL BOOKLET**, including blueprint and full details will be supplied for any one of these receivers. Booklets, including blueprint of the other five receivers, 6d. each.

**DISTANCE WITH THE MARCONI S625 SHIELDED VALVE** is achieved to perfection with these two circuits.

T.1, 4-valve receiver, including 1 H.F. stage, with S625 valve.

T.2, 5-valve. Two H.F. stages, with S625 valves. Stations hundreds of miles away can be tuned in with complete stability.

*You can easily build a receiver like this from the clear instructions given in the FREE booklet. The set illustrated is the T.1, a 4-valve receiver, incorporating one Marconi S625 Shielded Valve. It is a revelation in H.F. efficiency.*

Here are the circuits for operation :

**ENTIRELY FROM THE MAINS**

K.1 (for A.C. Mains), 3-valve receiver employing the famous K.L.1 valves.

K.2 (for A.C. Mains), Similar to K.1, but in addition incorporates an H.F. stage.

D.P.1 (for D.C. Mains), 3-valve receiver—simple to construct.

D.P.2 (for D.C. Mains), similar to D.P.1, but gives greater range and selectivity by means of a neutralised H.F. stage.

# MARCONIPHONE

SEND THIS COUPON NOW

TO THE MARCONIPHONE CO. LTD., (AND REDUCED) 210-212, TOTTENHAM COURT ROAD, LONDON, W.1:

Please send me free constructional booklet, including blueprint for circuit.....

I am also enclosing.....for the following booklets.....

Name.....

Address.....

Town.....

County.....

AW

No 439

## Amateur Wireless HANDBOOKS

each 2/6 net.

Loud-speaker Crystal Sets and How to Make and Manage Them.

Wireless-controlled Mechanism for Amateurs.

The Wireless Man's Workshop.

The Practical "Super-het" Book.

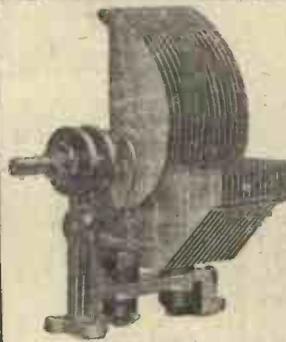
Perfect Broadcast Reception.

The Short-wave Handbook.

The Practical Wireless Data Book.



Of all Newsagents and Booksellers or by post, 3d. extra, from Cassell & Co., La Belle Sauvage, E.C.4.



## LOG (or Mid-line) CONDENSER

The most scientific Condenser ever produced. Perfect in every detail of construction and performance. For mounting either Panel or Baseboard.

**THE FORMO COMPANY**

Crown Works, 22 Cricklewood Lane, N.W.2

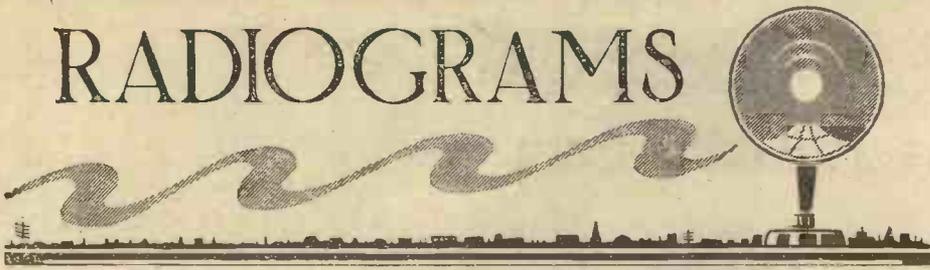
Telephone: Hampstead 1787

Full Catalogue free on request.

.00035 .00025 .0005

Price 10/6 each.

# RADIOGRAMS



ON October 20 the Manchester station will relay from the Winter Gardens a concert, in which the majority of prize-winners at the Blackpool Musical Festival will take part.

A new musical radio entertainment entitled, *Voices*, of which the author, Derek McCulloch, is well known to listeners as one of the 2LO announcers, will be broadcast from the London station on October 22. The cast includes such popular radio artistes as Florence Oldham, Dorothy Monkman, Harry and Ewart Scott, and others.

A radio version of the play, *Old Heidelberg*, has been prepared for broadcast from 2LO and 5XX on October 31.

To celebrate the fiftieth season of the Peoples' Concert Society, which was founded half a century ago to give the public the best classical music at a penny a ticket, the B.B.C. will relay a symphony concert from the Battersea Town Hall on October 30.

Two well-known music hall entertainers are to be heard by Bournemouth listeners; Talbot O'Farrel will broadcast from that station on October 27, and two evenings later Norman Long will come forward with a song, a story, and a piano.

A novel programme is being prepared by the Cardiff station for November 3; it is entirely concerned with Eastern music, and will be entitled, *Palms, Pigtales and Patchouli*. The entertainment will include Oriental songs from most of the popular musical comedies.

On the same evening, through 5GB, listeners will be given from the Birmingham studio a programme with a decidedly nautical flavour. *The Waterman*, a light ballad opera, by Charles Dibden, is to be followed by *The Blue Peter*, a one-act comic opera, by A. P. Herbert, with music by Armstrong Gibbs.

From the London studio, on November 5, we are promised a variety programme, to include a Guy Fawkes sketch.

An invention enabling messages to be received and transmitted simultaneously on the same aerial has just been perfected by Dr. Gabriel Veyre, of Casablanca, Morocco. The invention is reported to have been tested with satisfactory results.

Senator Marconi, who is at present studying the latest radio developments in New York, has stated that in laboratory

experiments with "beam" wireless he has achieved a transmission speed of 2,000 words a minute—the present speed is 250 words a minute! The device, he added, has now only to be adapted for commercial use.

### DO YOU KNOW?

1. What is the "depolarising" element of an H.T. battery?
2. For what purpose a quartz crystal is used in some transmitters?
3. Who was the first amateur transmitter to receive P.O. permission to provide Empire broadcasting?
4. What is an audion?

Puzzle your friends with these queries; the answers will be given in next week's issue of "A.W."

Answers to Last Week's Queries: (1) A 21% solution of caustic potash. (2) A small oscillator controlling the frequency of a transmitter. (3) Soviet Russia. (4) 72,000.

The new Polish relay station at Kattowitz is expected to begin testing during the next few days; work on the Vilna transmitter is also progressing and it is expected that this station will be added to the Polish broadcasting system by the end of 1927.

Now that the Kalundborg (Denmark) high-power transmitter is in daily operation, a new relay station is to be built in the centre of the city of Copenhagen; its power will be roughly 1½ kilowatts or double that of the present broadcaster. All programmes are given in the capital studio. The Soro transmitter has reverted to its former military duties.

Owing to interference between the Kiel

and Bremen broadcasting stations, the latter during the past week has been experimenting on 272.7 metres. If tests are successful it is expected that Bremen will exchange wavelengths with Cassel.

*Radio Vitus*, Paris, has lowered its wavelength to 302 metres.

The Stamboul transmitter has reduced its wavelength to 1,180 metres; the new Angora station, which is rapidly nearing completion will carry out its first tests on 1,800 metres.

The new Dutch transmitter which has been erected at Huizen on the banks of the Zuider Zee, has been carrying out tests on both 1,840 and 1,950 metres. The station will be officially opened by the Dutch Minister of Transport and Waterways at 7.40 p.m. G.M.T. on October 22. From that date the transmitter will work nightly up to 7.10 p.m. on 1,840 metres, but from that hour onwards on the higher wavelength.

In view of interference caused by the Radio Telegraphy station of Manilla to the PCJJ (Eindhoven) transmissions, the latter experimental station has now increased its wavelength to 31 metres.

Sweden at present is the country possessing the largest number of broadcasting stations in Europe, namely, thirty. Of these, the largest has a power of 30 kilowatts, the smallest 100 watts only. The number of licence-holders now totals 300,000 or 5 per cent. of the population.

Although but little is heard of the new Finnish high-power station, now under construction at Lahtis, it is hoped to complete the work by the end of the present autumn. In the meantime, a wireless association at Abo has obtained official authority to erect a relay transmitter in that city. For Helsingfors, where the broadcasting company up to the present has been utilising plant belonging to the Military W.T. Corps, a station of some 2 kilowatts in power, is to be built in the vicinity of Sandham. It is to broadcast, as at present, on a wavelength of 375 metres.

Why not place a regular order for "Amateur Wireless" by filling up this Order Form?

To.....(Newsagent)

Please supply me every week, until further notice, with "Amateur Wireless" published by Bernard Jones Publications Ltd.

**ORDER FORM**

(Signed) .....

(Address) .....

*Six-Sixty "every time!"  
says the Constructor*



"I want certain results," says the constructor, "and I know that with Six-Sixty I shall get them. Firstly, it is a well-known fact that each Six-Sixty Valve is tested under actual broadcasting conditions before being passed on to the public. This is the most exacting test that any valve can undergo. Then, again, what further proof of the excellence of Six-Sixty Valves do I need, when I know that most of the leading Set Manufacturers in the country standardise Six-Sixty in their Receivers? A.J.S., The Langham Portable, General Radio Company's Receivers, McMichael, Truphonic, are but a few of those universally known Receivers in which Six-Sixty are standardised. Manufacturers know the best valve, and their choice is mine. They are the experts, and what they select is bound to be the best, so I say 'Six-Sixty every time.'"

"Then remember that eight of the famous range of Six-Sixty valves consume only .075 amp. filament current.

"I recommend fellow constructors to write for the most attractive booklet describing in detail the full range of Six-Sixty Valves. (They range in price from 10/6.) It is sent post free on receipt of a post-card."

**SIX SIXTY  
GLOWLESS VALVES**

THE ELECTRON CO., LTD., 122-124 CHARING CROSS ROAD, LONDON, W.C.2.

## "CIRCUITS FOR YOU TO TRY"

(Continued from page 568)

reaction winding coupled to the first grid circuit.

The action of the circuit is a little peculiar. Any high-frequency current flowing in the anode circuit will produce a voltage across the variable resistance  $R$ , and this will produce a reaction effect by causing currents to flow through the reaction circuit. With the H.F. choke short-circuited, this reaction effect is sufficient to cause continuous oscillation, but the value of the choke is so adjusted that oscillation is checked. The function of the .001 fixed condenser is to prevent the high-tension from short-circuiting back to H.T.

The inventor claims that by gradually reducing the number of turns on the H.F. choke, and by correspondingly varying the value of the resistance  $R$ , it is possible to obtain a condition of affairs where the circuit remains just on the point of oscillation over the whole of the normal tuning range. On the short wave a certain feed-back due to the valve capacity comes into operation and assists in the oscillation, while on the long wave the oscillation is obtained through the medium of the resistance  $R$  in the anode circuit.

### Values

The values of the circuit are more or less normal.  $L_1$  would be a 20 or 30 coil,

$L_2$  a 60 and  $L_3$  a 30 or 40,  $P_1$  being a .0005 condenser.  $L_4$  again would be a 20 or 30 coil,  $L_5$  a 60,  $C_3$  being another .0005 condenser. The value of  $R$  depends upon the type of high-frequency choke employed.

Although I have not actually tried out the arrangement, it would appear that one could obtain the necessary balance by shunting the high-frequency choke with a condenser instead of winding a special choke and gradually reducing the number of turns until the required balance is obtained. This, at any rate, is a point which can easily be settled by a little experiment, and the circuit is one which is probably worth spending a little time with. I shall certainly look into the matter and give further particulars in future articles.

### A Quality Circuit

Fig. 4 shows a simple two-valve circuit which is capable of giving loud-speaker results within reasonable distance of a broadcasting station with particularly good quality. The detector circuit is a simple Reinartz arrangement, about which little comment is necessary, the values being quite normal.  $L_1$  would be a 60,  $L_2$  a 30 or 40,  $C_1$  a .0005, and  $C_2$  a .0003.  $L_3$  is a high-frequency choke.

The L.F. coupling arrangement is a true-scale system using the Formo True-Scale couplers. The anode circuit contains a tapped choke giving a step-up of 2-1, the voltage being transferred through the con-

denser  $C_3$ , which should have a capacity of .01 or .1 microfarad on to the grid of the L.F. valve, while an impedance leak is used instead of the usual resistance. A somewhat similar system is employed in the Watmel Auto choke, but this employs a resistance leak. The impedance leak gives a greater freedom from choking and improves the quality appreciably.

The particular point about the circuit, however, is the insertion of the resistance  $R$  in the anode circuit of the detector valve. This avoids the use of a tapping on the H.T. battery, since the full 120 volts can be applied to both valves, the resistance  $R$  serving to cut down the H.T. current consumption and to reduce the voltage on a detector valve to something like 60, in which case the reaction is usually found to be smoother.

Not only this, but the presence of the resistance keeps the amplification high at the low frequencies, since the arrangement is a combination between a direct coupling and a transformer coupling, and therefore the resistance helps to keep the cut-off point lower than it would otherwise be. The value of the resistance should be about equal to that of the valve in use. For example, using a high-frequency valve having an impedance of 30,000 or 40,000 ohms, a resistance of 50,000 would be quite satisfactory, and this is the combination which can be recommended in this particular circuit.

STANDARD MODEL



Price 10/6

## As near Perfection as Possible

—is achieved by using Powquip Transformers, which reproduce music, song or speech without the slightest distortion. The unequalled performance of Powquip Transformers brings radio entertainment up to the highest pitch of perfection.

Co-efficient of coupling for first stage is .982. For a perfect transformer this should be 1. This means a loss of only .018 or .18 per cent. Thus it is seen that a POWQUIP Transformer is as near perfection as possible.

# POWQUIP

## TRANSFORMERS

Guarantee Good Results

MANCHESTER MODEL



Price 12/6

THE POWER EQUIPMENT CO. LTD., KINGSBURY WORKS, THE HYDE, HENDON, N.W.9

REFINEMENT IN RADIO

## L & P VARIOHM BASEBOARD VARIABLE RESISTER



Price 4/4

1. Suitable for all present day Valves.
2. Calibrated in ohms, enabling accurate setting.
3. Instantly re-set if Valve or Accumulator changed.
4. Off-position for Neutralising purposes.
5. Wire-wound, of best quality resistance wire.
6. Resistance floating on springs, ensuring even contact.
7. Unconditionally guaranteed.

From all good Dealers or direct from:—

LONDON & PROVINCIAL RADIO  
COMPANY LTD., COLNE, LANCs.

THERE IS NO SUBSTITUTE

## GENTROID SCREEN BOXES

Complete with lid and base

ALUMINIUM

6½" x 6½" x 6"

5/- each.

11" x 6" x 7"

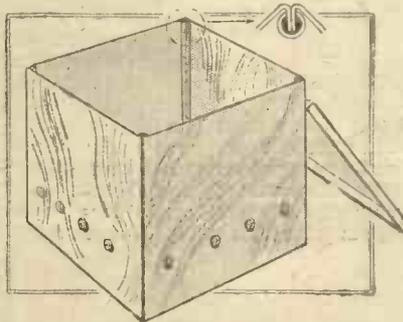
9/6 each.

COPPER

6½" x 6½" x 6"

10/6 each.

Postage 6d. extra.



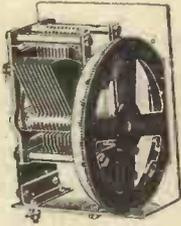
Collapsible

Assembled in 3 minutes.

WRITE for list of other GENTROID COMPONENTS

Camden Engineering Co. Ltd., Bayham Place, Camden Town, N.W.

**CYLDON THUMB CONTROL CONDENSERS**



Semi-Shielded Models (as illus.)  
Single :

.0003 .. ..	£1 2 0
.0005 .. ..	1 1 0
.0025 .. ..	1 0 6
.0002 .. ..	1 0 0

Also Two-, Three-, and Four-Gang.

Totally Enclosed and Shielded Models (as illus.)

SINGLE :

.0003 .. ..	£1 7 0
.0005 .. ..	1 6 0
.0025 .. ..	1 5 6
.0002 .. ..	1 5 0



Also Two-, Three-, and Four-Gang.

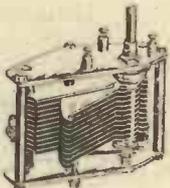
**CYLDON BEBE CONDENSER**



.0001 .. ..	7/6
.00015 .. ..	8/-
.0003 .. ..	8/6
.00025 .. ..	9/6
.0003 .. ..	10/6

Prices include small graduate Bakelite Knob dial, 2 in. in diameter.

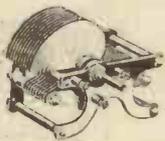
**CYLDON STRAIGHT LINE FREQUENCY CONDENSER**



.0003 .. ..	15/6
.00025 .. ..	15/-
.00025 .. ..	14/6

With large 4-in. Dial, 2/- extra.

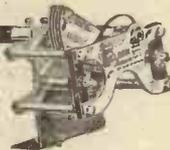
**CYLDON STRAIGHT LINE WAVELENGTH SQUARE LAW VARIABLE CONDENSER**



.001 .. ..	19/-
.0005 .. ..	15/6
.0003 .. ..	14/6
.00025 .. ..	14/-
.0002 .. ..	13/6

Large 4-in. Dial, 2/- extra.

**CYLDON SHORT-WAVE CONDENSER**



.0001 .. ..	14/6
.00015 .. ..	15/-
.0002 .. ..	15/6
.00025 .. ..	16/-

Complete as illustrated.



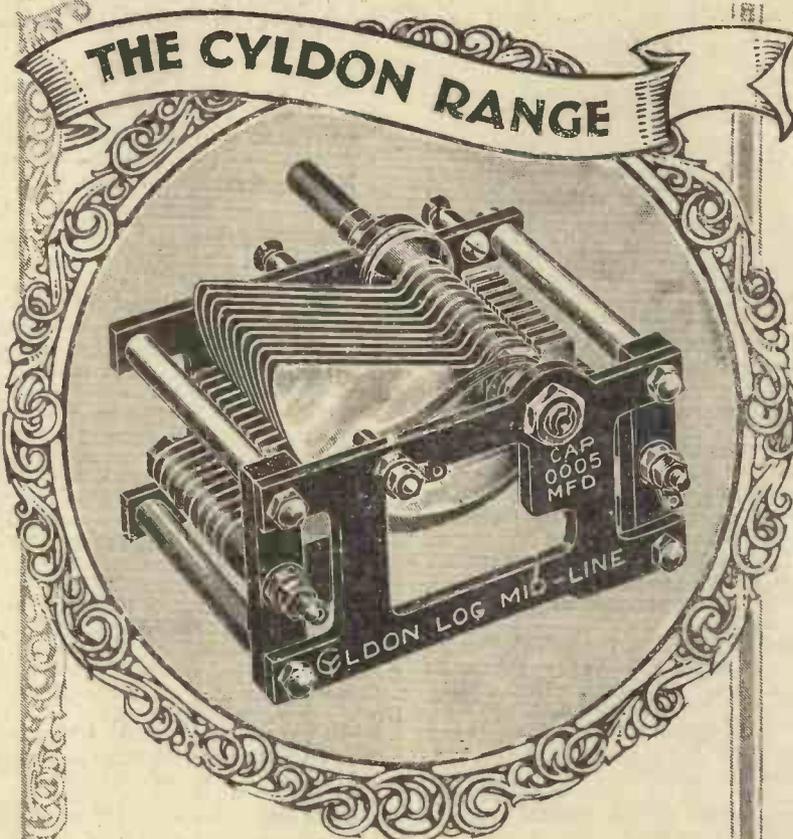
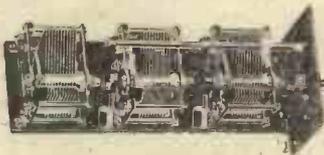
**CYLDON TEMPRYTES**

Temprytes .. ..	1/6
Moussé .. ..	1/-
Shorting Plugs .. ..	3s.

**CYLDON GANG CONDENSERS**

	Two-Gang	Three-Gang	Four-Gang
.0005 .. ..	£3 10 0	£3 10 0	£4 10 0
.0003 .. ..	2 2 6	3 2 6	4 2 6
.0025 .. ..	2 0 0	3 0 0	4 0 0

Dial extra.



**CYLDON LOG MID-LINE CONDENSER**

as illustrated above, should be used for all capacities of variable condensers. The following are only a few of the advantages :-

- (1) Spreads all stations evenly over whole dial.
- (2) Prevents stations "falling out of step."
- (3) Dial readings in multi-tuned circuits using individual condensers made the same.
- (4) Thick aluminium plates.
- (5) Large, adjustable, non-wearing bearings.
- (6) Pig-tail connection to rotor.
- (7) Extremely well made; electrically efficient; precision movement.

**PRICES :**

.001 .. ..	19/-	.0005 .. ..	15/6
.0003 .. ..	14/6	.00025 .. ..	14/-
		.0002 .. ..	13/6

With 4-in. Knob Dial, 2/- extra. In the case of gang condensers, Log Mid-line are a necessity, not a luxury.

Recognised pre-eminent as the pioneers of the logarithmic condenser, the now acknowledged necessity in all multi-tuned circuits, Sydney S. Bird & Sons, Ltd., like all pioneers, have not escaped the unwelcome attention of the "Cheap Jack" inventor. But the resultant imitations far from being flattering, are but inferior forgeries, though in appearance nearly enough resembling the original to deceive the unsuspecting. Every genuine "Cyldon" product bears the registered trade mark, a guarantee that the world's best brains and manufacturing resources have gone to its making.

See us at Stand No. 5, Manchester Wireless Exhibition, October 24 to November 5.



**CYLDON WORKS**  
**SARNESFIELD RD., ENFIELD TOWN, MIDDLESEX**

Contractors to the B.B.C., H.M.R.A.F., H.M.O.W., and all the leading manufacturers of quality receivers.  
Sole Australian Agents: E. V. Hudson, 53-7 Charlotte Street, Brisbane, Queensland.

# BROADCAST TELEPHONY



NOTE.—In the following list of transmissions these abbreviations are observed: con. for concert; lec. for lecture; orch. for orchestral concert; irr. for irregular; m. for metres; Kc. for kilocycles and sig. for signal. Unless otherwise stated, all times are p.m. (G.M.T.).

## GREAT BRITAIN

London (2LO, 361.4 m. (830 Kc.). 12 to 2.0, con.; 3.15 to 4.0, transmission to schools; 3.30 to 5.45, con. (Sun.); 4.15, con.; 5.15 to 5.35, children; 6, dance music; 6.30, time sig., news, music, talk; 8.10, music; 9.0, time sig., news, talk, con. Dance music daily (exc. Sundays) from 10.30 until midnight.

Aberdeen (2BD), 500 m. (600 Kc.). Belfast (2BE), 306.1 m. (980 Kc.). Bournemouth (6BM), 326.1 m. (920 Kc.). Cardiff (5WA), 353 m. (850 Kc.). Glasgow (5SC), 405.4 m. (740 Kc.). Manchester (2ZY), 384.6 m. (780 Kc.). Newcastle (5NO), 312.5 m. (960 Kc.). Much the same as London times.

Bradford (2LS), 252.1 m. (1,190 Kc.). Dundee (2DE), 294.1 m. (1,020 Kc.). Edinburgh (2EH), 288.5 m. (1,040 Kc.). Hull (6KH), 294.1 m. (1,020 Kc.). Leeds (2LS), 277.8 m. (1,080 Kc.). Liverpool (6LV), 297 m. (1,010 Kc.). Nottingham (5NG), 275.2 m. (1,090 Kc.). Plymouth (5PY), 400 m. (750 Kc.). Sheffield (6FL), 272.7 m. (1,100 Kc.). Stoke-on-Trent (6ST), 294 m. (1,020 Kc.). Swansea (5SX), 294 m. (1,020 Kc.). Daventry (25 kw.), high-power station, 1,604 m. (187 Kc.). Special weather report, 10.30 a.m. and 10.25 p.m. (weekdays), 9.10 (Sun.); relays 2LO.

Daventry Experimental (5GB), 491.8 m. (610 Kc.). 15 kw., from 3.0 onwards.

## IRISH FREE STATE

Dublin (2RN), 319.1 m. (940 Kc.). Daily 6.0; (Sundays, 8.30) until 10.30 p.m. Relays Cork.

Cork (6CK), 400 m. (1 kw.). (750 Kc.). Relays Dublin (exc. Sundays).

## CONTINENT

### AUSTRIA

Vienna (Radio Wien), 517.2 m. (5 kw.) and 577 m. 6.30 con.

Relays: Graz, 357.1 m. (750 w.); Klagenfurt, (750 w.) 272.7 m.; Innsbruck, 294.1 m. Linz (under construction).

### BELGIUM

Brussels, 508.5 m. (1.5 kw.). 5.0 orch. (not daily), 8.30, talk, 9.0 con., news.

## CZECHO-SLOVAKIA

Prague, 348.9 m. (5 kw.). Con., 7.0 (daily).  
\*Brunn, 441.2 m. (3 kw.). 6.0, con. (daily).  
\*Bratislava, 300 m. (500 w.).  
\*Kosice, 1,865 m. (kw.). 6.30 con., testing.  
\*Relays Prague.

## DENMARK

\*Copenhagen, 337 m. (700 w.). Sundays, 9.0 a.m. sacred service; 7.0, con. Weekdays: lec., con., news; dance to 11.0 (Thurs., Sat).  
\*Relayed by Kalundborg (7 kw.) 1,153 m.

## ESTHONIA

Reval, 408 m. (2.2 kw.) from 7.0, con.

## FINLAND

Helsingfors, 375 m. (1.2 kw.), from 5.0 con.

## FRANCE

Eiffel Tower, 2,650 m. (8 kw.). 6.30 a.m., markets (exc. Sun. and Mon.); 11.20 a.m., time sig., weather; 6.0 talk; 7.10 weather, con.; 8.15 lec.; 10.20 weather, T.S. Relay PTT, Paris, Sat., 9.10 to 11.0, and weekday afternoons.

Radio-Par's (CFR), 1,750 m. (about 5 kw.). Sundays: 12.0 sacred service; 12.45, con.; news; con.; 8.15, news, dance. Weekdays, 10.30 a.m., news, con., 12.30, con., markets, weather, news; 4.30, markets, con.; 8.0 time sig., news, con.

L'Ecole Sup. des Postes et Telegraphes (PTT), Paris, 460 m. (5 kw.). 1.15 to 3.0 (relay of Sorbonne University); 9.0 con. (daily).

Le Petit Parisien, 340.9 m. (500 w.). 9.15, con. (Tues., Thurs., Sat., Sun.).

Radio L.L. (Paris), 370 m. (250 w.). Con. (Sun., Mon., Tues., Wed., Sat.), 9.30.

Biarritz (Côte d'Argent), 200 m. 7.0, con. (Irr.).

Radio Vitus (Paris), 302 m. 9.0, con.

Radio-Toulouse, 391 m. (3 kw.). 8.45, con.

Radio-Lyon, 291 m. (1.5 kw.). 8.20, con.

Strassburg (8 G.F.), 268 m. Con., 9.0 (Irr.).

Radio Agen, 297 m. (500 w.). 8.30, con.

\*Mont de Marsan, 400 m. (300 w.), con. 8.30.

Bordeaux (Lafayette), 279 m. (1½ kw.).

Con. 5.0, 9.0 (weekdays), 2.30 (Sun.). Relays

PTT, Paris, 8.30 (Sat.). No transm. on Mon.

\*Lyon-la-Doua, 478 m. (1 kw.).

\*Lille, 286 m. (600 w.). Own con. (Tues., Fri.).

\*Marseilles, 300 m. (500 w.).

\*Grenoble, 278 m. (500 w.). (Wed. and Sats.).

\*Toulouse, 260 m. (500 w.) (exc. Sun.).

\*Rennes, 320 m.

\*Limoges, 273 m.

Montpellier, 252.1 m. (1 kw.). 8.45 (Wed.,

Fri.). For news, relays Marseilles.

Beziers, 158 m. (700 w.). 9.0 (weekdays only).

Juan-les-Pins, 230 m. Temp. closed down.

Bordeaux (Radio-Sud-ouest), 238 m. (1 kw.).

7.25 con. (Thurs.).

\*Relays of PTT, Paris.

## GERMANY

Berlin, on 483.9. Throughout day. Relayed by Stettin (236.2 m.).

Königswusterhausen (LP), 1,250 m. (8 kw.).

10.30 to 1.50 a.m., con. (Sun.); 2.0, lec. (daily).

7.30, relay of Berlin (Vox haus) con., or from other German stations (daily).

Breslau, 322.6 m. (4 kw.). 6.0 lec.; 7.30, con. Relay, Gleiwitz, 250 m.

Dortmund, 283 m. (1½ kw.). See Langenberg.

Frankfort-on-Main, 428.6 m. (4 kw.). 5.0 to 5.15 a.m. (exc. Sun.), physical exercises; 7.30 a.m., sacred con. (Sun.); 3.30, con.; 7.0, lec., con., weather. Relay: Cassel, 252.1 m.

Hamburg, 394.7 m. (4 kw.). Relayed by Bremen (272.7 m.), Hanover (297 m.). Kiel (254.2 m.). Sundays: 8.15 a.m., sacred con.; 5.0 con.; 6.0 con. Weekdays: 4.45 a.m., then from 8.0 a.m. throughout day.

Königsberg, 329.7 m. (4 kw.). 7.0, con. Relay: Danzig, 272.7 m.

Langenberg (Rhineland), 468.8 m. (25 kw.). Relays Muenster, Dortmund, Cologne or Dusseldorf (daily). Throughout day.

Leipzig, 365.8 m. (4 kw.) Relays Dresden (275.2 m.). 7.15 con.

Munich, 535.7 m. (4 kw.). Relayed by Nuremberg, 303 m. (4 kw.) and Augsb., 566 m. 5.30, con. (weekdays).

Muenster 241.9 m. (1.5 kw.). See Langenberg.

Norddeich (KAV), 1,800 m. 10.15 a.m., 9.30.

Stuttgart, 379.7 m. (4 kw.). 10.30 a.m., con. (Sun.); 5.30, time sig., news, lec., con. (daily);

Relay: Freiburg, 577 m. (1½ kw.).

## GRAND DUCHY OF LUXEMBURG

Radio Luxemburg, 217.4 (250 w.). Con. 1.0 (Sun.), 9.0 (Tues.). (Irr.).

## HOLLAND

Hilversum (ANRO), 1,060 m. (5 kw.). Sun-

days: 8.10 a.m., sacred service; 12.10 and 1.10, con.; 5.35, church service; 7.40, weather,

news, con. Weekdays: 11.40 onwards.

Scheveningen-Haven, 1,950 m. (2½ kw.). Throughout day. Markets, Stock Ex.

Eindhoven (PCJJ), 31.2 m. (Tues., Thur.). 6 p.m.—midnight.

Huizen, 1840 1950 m. (5 kw.). Testing.

## HUNGARY

Budapest, 556 m. (3 kw.). 7.0 con.

## ITALY

Rome (IRO), 450 m. (3 kw.). 7.30, news, weather, con.; 9.15, late news.

Milan, 315.8 m. (4 kw.). 7.15 to 10.0, con.

Naples, 333.3 m. (1½ kw.). 7.30 to 10.0, con.

Como, 500 m. (5 kw.). 7.0 to 10.0 (temp.).

## NORWAY

Oslo, 461.5 m. (1.5 kw.). 6.15, con.

Bergen, 370.4 m. (1 kw.). 6.30, news, con.

\*Fredriksstad, 434.8 m.

\*Porsgrund, 502 m. (1½ kw.).

\*Tromsø, 500 m.

\*Hamar, 566 m.

\*Relays Oslo.

## POLAND

Warsaw, 111.1 m. (10 kw.). 7.30.

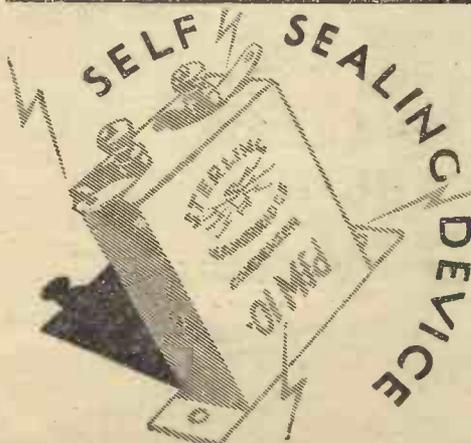
Cracow, 422 m. (4 kw.). 7.30.

Posen, 280.4 m. (1.5 kw.). 7.30.

## RUMANIA

Bucharest, about 1,600 m. (5 kw.). Testing.

(Concluded on page 590).



## QUALITY FIRST AND SAFETY ALL THE TIME

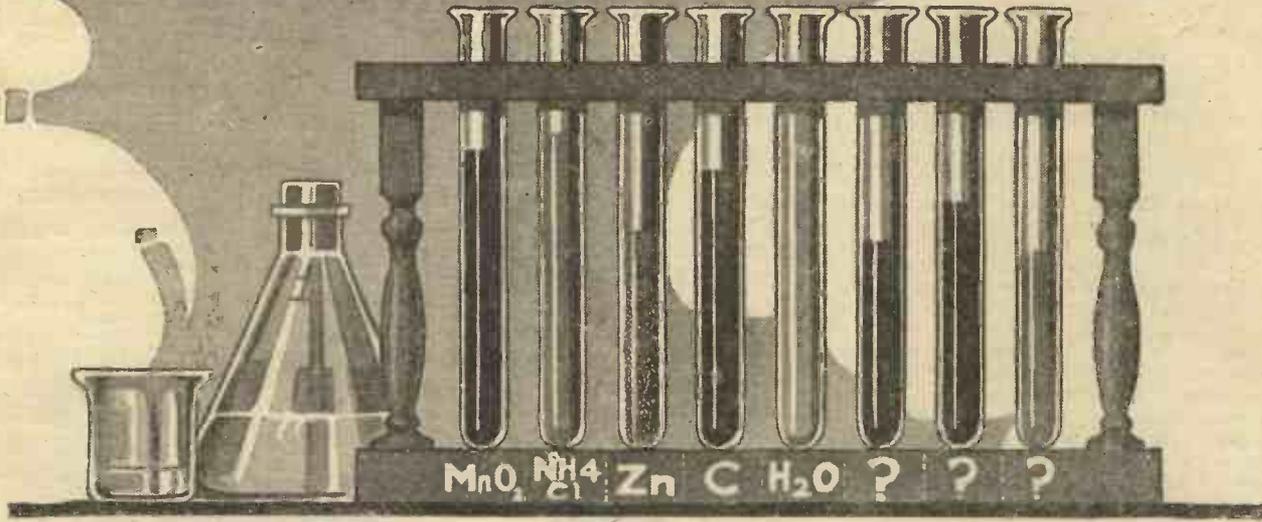
Not only is a Sterling the best Mansbridge-type Condenser you can buy—but it is protected against dielectric breakdown by the patent self-sealing device. Should the dielectric be punctured, you only need to let the condenser stand idle for a few hours and it is automatically sealed.

Prices from 2/6 for 01 mfd., to £1.0.0 for 10 mfd., from your dealer, or full particulars on request.

THE MARCONIPHONE COMPANY LTD. (AND REDUCED)  
Head Office: 210-212 Tottenham Court Rd., W. Regd. Office: Marconi House, Strand, W.C.2

# STERLING MANSBRIDGE CONDENSER

# THE SECRET IN THE TEST TUBES



## What are the secret chemicals ?

YOU KNOW THAT TEST TUBES and the minds of chemists have held secrets which have baffled discovery, but you may not know there have been none more sought after by battery makers than the one so jealously guarded inside each cell of the LISSEN New Process Battery, which makes each cell yield oxygen for your valves in a way *no other cell* does or has ever done before. Copious does not adequately describe this oxygen liberation of the LISSEN New Process Battery.

Since this new energy became available for valves tens of thousands of loud speakers all over the country are reproducing radio broadcast with a freshness of tone and a clear volume which is adding delight to radio. Whenever there is fine music to be heard by broadcast see that you have a LISSEN New Process Battery in your set and *hear your loud speaker voicing its appreciation.*

*You pay shillings for this battery which many others would pay thousands of pounds for, yet 10,000 dealers are selling it at a price which has been made low to bring it within the reach of all.*

The next time you want a good battery get a LISSEN New Process Battery. Take no other and you will be rewarded for your insistence by a new power smoothness and new tone clarity in your loud speaker.



# LISSEN

## SECRET PROCESS BATTERY

60 volts (reads 66) 7/11  
 100 volts (reads 108) - 12/11  
 9 volts (grid bias) - 1/6

*Now 10/6  
7/11*

LISSEN LIMITED, 16-20 FRIARS LANE, RICHMOND, Surrey

L 412

Please Mention "A.W." When Corresponding with Advertisers

**BROADCAST TELEPHONY**

(Continued from page 588)

**RUSSIA**

Moscow (RDW), 1,450 m. (15 kw.). 4.30 p.m., con. News. 10.0, chimes from Kremlin.  
 Moscow Popoff, 675 m. (5 kw.). 4.30 daily.  
 Leningrad, 223.9 m. (10 kw.). 5.0 and on 1,000 m.  
 Kharkov, 477 m. (4 kw.). 8.0 daily.

**SPAIN**

Madrid (EAJ7), 375 m. (3 kw.). Con., daily. 9 or 10 con.  
 Madrid (Radio Espana), 400 m. (2 kw.). Irr.  
 Madrid (Radio Madrilena) (EAJ12) 297 m.  
 Barcelona (EAJ1), 344.8 m. (2 kw.). 6.0 to 11.0 (daily).  
 Barcelona (Radio-Catalana) (EAJ13), 462 m. (2 kw.). 7.0 to 11.0, con., weather, news.  
 Bilbao (EAJ9), 438 m. (500 w.). 7.0 con.  
 Bilbao (Radio-Vizcaya) (EAJ11), 418 m. (500 w.). 8.0 to 12.0, con. (daily).  
 Cadiz (EAJ3), 344.8 m. (550 w.). 7.0 to 9.0, con., news. Tests daily (exc. Sun.), midnight.  
 Cartagena (EAJ16), 300 m. (500 w.). 8.30 to 10.0 con. (daily).  
 Seville (EAJ5), 400 m. (500 w.). 9.30, con., Oviedo, 280 m. (0.75 kw.). 9.0.  
 San Sebastian (EAJ8), 297 m. (2 kw.). Relays Madrid (EAJ7).  
 Salamanca (EAJ22), 405 m. (500 w.). 9.0 con (daily).  
 Almeria (EAJ18) (1 kw.), testing 319 m.  
 Saragossa, 566 m. (500 w.). 9.0 p.m.

**SWEDEN**

Stockholm (SASA), 454.5 m. (1½ kw.). 12.0 a.m., sacred service (Sun.); 5.0, sacred service; 6.0, lec.; 8.15, news, con., weather. Dance (Sat., Sun.), 8.45. Relayed by Motala. 1,320 m. (40 kw.) and some 28 small stations.

**SWITZERLAND**

Lausanne (HB2), 680 m. (600 w.). 7.0.  
 Zurich, 588 m. (600 w.). 10.0 a.m., con. (Sun.); 5.15, lec., con., dance (Fri.).  
 Geneva (HB1), 760 m. (750-w.). 7.15, con.  
 Berne (411-m. (1.5 kw.). 7.30, con.  
 Basle, 1,100 m. (250 w.). Relays Berne.  
**TURKEY**  
 Constantinople (Radio Stamboul), 1150 m. (7 kw.). Con., 7.0 p.m.  
 Angora 1800 (15 kw.), testing shortly.

Mr. John L. Baird has announced that he has arranged with the British postal authorities to attempt transmission of visual impressions across the Atlantic on the Governmental beam system. He added that the Columbia Gramophone Company has succeeded in translating the electrical impulses of television into impressions on a phonograph record. Mr. Baird also predicted the development of a phonograph record with two needle tracks, one reproducing the voice of a singer, and the other the singer's features.

Musical listeners in Scotland are protesting that the B.B.C. should pay closer respect to its published time-tables. Complaint is made that, owing to lecturers and other speakers overstepping their time allowance, musical selections have to be cut down or played quick tempo. It is suggested that "long-winded" speakers might be allowed to continue to talk, but the transmission cut off and switched over to the microphone in the studio, in which the musicians are waiting.

**CHIEF EVENTS OF THE WEEK**

- LONDON AND DAVENTRY (5XX)**  
 Oct. 23 Albert Sandler and the Grand Hotel, Eastbourne orchestra.  
 " 24 Military band programme.  
 " 25 Variety programme.  
 " 26 *La Traviata* (Verdi), S.B. from Manchester.  
 " 27 Orchestral concert by the Halle orchestra, relayed from Manchester.  
 " 28 Debate between G. Bernard Shaw and G. K. Chesterton, relayed from the Kingsway Hall.  
 " 29 Light music by Paul Lincke, the wireless orchestra, conducted by the composer.
- DAVENTRY (5GB)**  
 Oct. 23 Light symphony concert.  
 " 25 Ballad concert.  
 " 27 Symphony concert, relayed from the Winter Gardens, Bournemouth.
- BOURNEMOUTH**  
 Oct. 27 Talbot O'Farrell  
 " 28 Wine, Women and Song: instrumental and vocal programme.  
 " 29 Norman Long
- CARDIFF**  
 Oct. 24 *A Disturber of Traffic*, a play in three acts, by Herbert Swears.  
 " 25 *Erin-go-Bragh*, orchestral and vocal programme.  
 " 29 First concert of the Bristol Choral Society, relayed from the Colston Hall, Bristol. *The Flying Dutchman*, an opera in three acts by Wagner.
- MANCHESTER**  
 Oct. 25 Concert relayed from the Manchester Wireless Exhibition at the City Hall.  
 " 26 *La Traviata* (Verdi).  
 " 27 Orchestral concert by the Halle Orchestra, relayed from the Free Trade Hall, Manchester.
- NEWCASTLE**  
 Oct. 25 The Hebburn Colliery Prize Band and vocalists.
- GLASGOW**  
 Oct. 24 *The Chink and the Child* (first performance of a grand opera founded on the story by Thomas Burke).  
 " 29 *A Man of Ideas*, a play by Miles Malleston.
- ABERDEEN**  
 Oct. 24 *The Return*, a play of Russia by Gertrude Robons.  
 " 25 *The Treasure Hunt*, a farcical comedy by C. Stewart Black.
- BELFAST**  
 Oct. 29 A masque programme.

**SIX-SIXTY Cone Speaker Paper**



**Used exclusively throughout America**

Six-Sixty Cone Speaker Paper is the material that everyone has been waiting for. Used by the leading Cone Loud-Speaker Manufacturers in America, and now marketed in this country and on the Continent by the makers of the famous Six-Sixty Valves, Six-Sixty Cone Speaker Paper ensures, by the unique processes in its manufacture, tonal qualities unobtainable with any other material. If you are making your own loud-speaker, ask your dealer for Six-Sixty Cone Speaker Paper and be sure of first-class results. If you have any difficulty in obtaining it from your dealer write direct to us, enclosing your dealer's name and address.

The Northern Electric, in Canada.  
 The Western Electric.  
 Ferrand.  
 Fada.  
 O'Neil Manufacturing Co.  
 Canon, Miller & Co.

Sall of Chicago.  
 Vitalatone.  
 Brandes.  
 Palhe.  
 Radio Foundation.  
 Groebe.

All these well-known Loud-Speakers incorporate Six-Sixty Cone Speaker Paper.

All incorporate Six-Sixty Cone Speaker Paper.

Sold in attractive envelopes with full directions for cutting and mounting  
 Washers for fixing to cone, 3d. extra.  
 2/6 (approx. diameter, 12 in.)  
 3/6 size also supplied (approx. diameter 19 in.)

THE ELECTRON CO., LTD., Dept. A.W., 122-124, Charing Cross Road, LONDON, W.C.2.



**AUNT ETHEL SAID IT WAS LIBEL**

George is an announcer. At Binghampton, we believe. He's Aunt Ethel's favourite nephew. When she heard him on Cousin Dick's set one evening she said, first of all, that George had croup.

Then she said it was a scandal.

And after that she talked a lot about solicitors and libel actions and things.

For George, as you've probably gathered, was a victim of "valve distortion." When Aunt Ethel told him what he sounded like on Cousin Dick's set, he said that was the *worst* of Dick, he would go experimenting, and that Marconi Valves ought to be made compulsory by law. . . .

Seriously, though, that is one outstanding thing about Marconi Valves. They don't "twist." Moreover, they're very economical on power and they last a tremendously long time. You see, they're MARCONI, which means that everything—filament, grid, plate, vacuum, *everything*—is designed for the purpose of making a better VALVE.

You have a 2-volt accumulator?—then these are the Marconi Valves you need:—

- Marconi D.F.H. 210—for the H.F. stage (Price 10/6)
- " D.E.L. 210—for the detector stage (also for general purposes) (Price 10/6)
- " D.E.P. 215—for the Power stage (Price 12/6)

Full particulars of all Marconi Valves and all Marconi Sets are to be found in an amusing and informative free booklet called "Back Chat." Secure your free copy by sending off the coupon (below) *now*.

**MARCONI VALVES**  
—do everything that a valve should do

The Marconi Phone Co. Ltd. (and reduced) 210-212, Tottenham Court Road, London, W.1.

Please send me copy of "Back Chat." Thank you.

Name.....

Address.....

A.W.3

hd. stamp if unsealed.

**Buy Best Batteries**

"Cordesia" Pocket Lamp and High Tension Batteries are specially manufactured for the purpose for which they are required.

In the Composition of the Mixture and Electrolite, the greatest possible care is taken to obtain the maximum storage capacity. In these their own patented mixture of Manganite plays an important part. Result—Under strict Union Tests "Cordesia" Batteries have proved "The Best." An Eight Weeks O'd Battery, under continuous Test of 6,000 ohms, having given 390 Hours Effective Power equivalent to 296 m.a.h.

**Maintained Prices**

4.5 POCKET LAMP BATTERY	
5d. each	4/6 dozen

**High Tension**

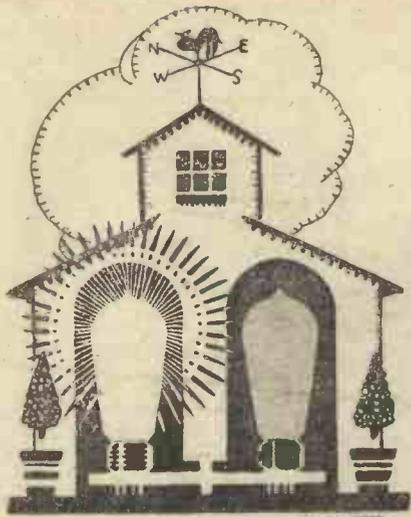
Grid Bias	1/3 each
S.T. 60 volt	7/3 ..
S.T. 100 volt	12/- ..
T.C. 60 volt	7/6 ..
C.S. 60 volt	8/6 ..
C.S. 90 volt	12/- ..
C.S. 100 volt	13/6 ..
S.C. 60 volt	14/6 ..
S.C. 72 volt	17/- ..



**BUY BEST BATTERIES CORDESIA**



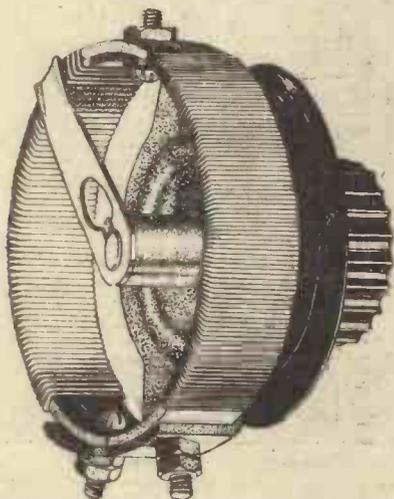
You will Help Yourself and Help Us by Menticing "A.W." to Advertisers



**BRIGHT OR DULL-**  
*The* **PEERLESS**  
**DUAL RHEOSTAT**  
**AFFORDS**  
**PERFECT CONTROL!**

The Peerless Dual Rheostat is specially made to meet the demand for a Rheostat covering needs of both bright and dull emitter valves. Has two windings, a resistance of 6 ohms, with a continuation on to a 30 ohm strip winding. Resistance wire wound on hard fibre strip under great tension and immune from damage. One-hole fixing, terminals conveniently placed. Contact arm has smooth, silky action. All metal parts nickel-plated. Complete with ebonite knob and dial.

**PRICE 3/-**



**The Bedford Electrical and Radio Co., Ltd.,**  
 22 Campbell Road, Bedford.

# LISENIN

## POSITIVE GRIP TERMINALS ARE ABSOLUTELY IDEAL



Pat. No. 215540

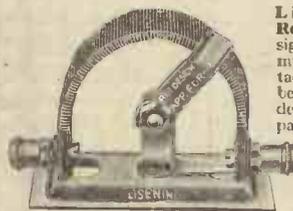
The ends of the leads are so gripped that they cannot possibly come adrift. Pressure is so distributed that a break is practically impossible. (See illustration.) Further, the ragged ends of the flex covering are covered up, and one's leads look and behave, as they ought to behave when fitted with Lisenin Positive Grip Terminals, as used in

**"RADIO for the MILLION"**  
 "Wireless World," "Modern Wireless," "Wireless Constructor," etc., sets. Follow the lead of experts.

Plugs and sockets, with two nuts and indication disc ... 4 1/2 d.  
 Spade Ends ... 4d.  
 Wander Plugs ... 2d.



Look for this Showcase on your dealer's counter, and refuse to be put off with substitutes.



**Lisenin Pre-set Resistor** (Regd. design). Occupies minimum space and the contact finger can readily be adjusted to give the desired resistance. Capacities, 5, 10, 15, 20, 30 and 50 ohms. As used in the **COSSOR MELODY MAKER**. Price 1/9 each. Postage 2d.

**Lisenin Plug-in Resistor** (Patent pending). The neat little base screws down near the valve-holder, into this you simply plug in a resistance element to suit the valve in use. The whole thing is so handy, so compact, and so completely fool-proof. Capacities 5, 1, 5, 2, 3, 4, 6, 7, 10, 12 and 20 ohms

Price 2/- each. Postage 2d.

As used in the **HALE ONE VALVER**



**Lisenin H.F. Choke**. Interchangeable. Made in wavelengths: No. 1, up to 100 m.; No. 2, up to 1,000 m. and No. 3, up to 6,000 m. Price 4/6 each. Postage 3d.

Ask your Dealer for them, but refuse substitutes



7 in. x 4 in. **BAKELIN FORMERS** for the **COSSOR MELODY MAKER**, 2/6 each  
 Coils wound to specification, 7/6 each

**THE LISEININ WIRELESS CO.**  
 1, EDGWARE RD., LONDON, W.2

# Blueprints

Full-size Blueprints, each one being a photographic contact print, from the draughtsman's original design, and produced on stout paper, are now available of the following sets.

ONE-VALVE SETS	No.	Price, post free.
		s. d.
One-valver for Frame Aerial	W.M. 4	1 0
One-valve All-wave Reinartz	A.W. 2	1 0
All-in-all One-valver	A.W. 13	1 0
Hartley DX One-valver	A.W. 27	1 0
Alpha One*	W.M. 26	1 3
Reinartz Plug-in One-valver	A.W. 46	1 0
TWO-VALVE SETS		
All-broadcast Two*	W.M. 5	1 3
Safeguard Two	A.W. 3	1 0
Two-valver, embodying K.L. 1 Valves	A.W. 5	1 0
One-control Two	A.W. 6	1 0
Wide-world Short-wave Two	A.W. 11	1 0
All-wave Two-valver	A.W. 15	1 0
Loftin-White Two*	W.M. 20	1 3
Reinartz Two	A.W. 21	1 0
Remote-control Two	A.W. 23	1 0
One-dial Two	W.M. 23	1 0
Empire Short-wave Two	A.W. 28	1 0
Screened-trap Two	A.W. 31	1 0
"Next-step" Receiver	A.W. 34	1 0
Girdle Two*	W.M. 30	1 3
Centre-tap Two	A.W. 42	1 0
THREE-VALVE SETS		
One-knob Three	W.M. 3	1 0
Continental Three	W.M. 7	1 0
Shielded Searcher	W.M. 8	1 0
Victory Three	A.W. 9	1 0
Regulator Three	A.W. 12	1 0
M.C. Three, with copy of "Amateur Wireless," giving full instructions...	A.W. 1	0 7
Hi-mu R.C. Three*	W.M. 9	1 3
M.C. 3 Star	A.W. 16	1 0
Wave-catcher Three	W.M. 19	1 0
Excelsior Three	A.W. 20	1 0
Split-primary Three	A.W. 21	1 0
Lighthouse Three	A.W. 29	1 0
Purity Three-valver	A.W. 33	1 0
A Modern Tuned-anode Three	A.W. 35	1 0
Tetrode Three, for Shielded Valves	A.W. 36	1 0
Alternative-programme Three	A.W. 38	1 0
A "Mains" Three-valver	W.M. 34	1 0
Screened-grid Three	W.M. 23	1 0
"Simpler Wireless" All-from-the-Mains Receiver	A.W. 41	1 0
"Simpler Wireless" Special Three-valver	A.W. 44	1 0
"Home Station" Three	A.W. 45	1 0
FOUR-VALVE SETS		
Paradyne Four	W.M. 2	1 6
M.C. Four	A.W. 8	1 6
Distance Getter	A.W. 10	1 6
Household Four	A.W. 17	1 6
DX Four	A.W. 18	1 6
Revelation Four	W.M. 24	1 6
Auto-selector Four	W.M. 35	1 6
"A.W." Gramo Radio	A.W. 40	1 6
All-purpose Four	A.W. 43	1 6
FIVE-VALVE SETS		
1027 Five	W.M. 6	1 6
Two-valver's Five	W.M. 11	1 6
Individual Five	A.W. 25	1 6
Exhibition Five	W.M. 33	1 6
SIX-VALVE SETS		
Nomad Six	W.M. 31	1 6
SEVEN-VALVE SETS		
Simpladyne Seven (Super-net.)	W.M. 23	1 6
AMPLIFIERS		
All-broadcast Amplifier	W.M. 10	1 0
Two-valve D.C. Mains Amplifier	W.M. 16	1 0
PORTABLE SETS		
Springtime Portable Two-valver	W.M. 12	1 6
Countryside Four	W.M. 17	1 6
Motorists' Portable Four-valver	A.W. 14	1 6
M.C. Three Portable	A.W. 22	1 0
Handy Three	W.M. 27	1 0
Holiday Portable (three-valver)	A.W. 32	1 0
Club Portable (three-valver)	A.W. 30	1 0
CRYSTAL SETS		
Crystal Set for the R.C. Enthusiast	W.M. 13	0 6
Fonotrol Crystal Set	W.M. 14	0 6
Hi-lo Crystal Set	W.M. 18	0 6
Two-programme Crystal Set	W.M. 25	0 6
Alternative-programme Crystal Set	A.W. 39	0 6
MISCELLANEOUS		
Loud-speaker Tone Control and Filter Unit*	W.M. 1	1 3
Heterodyne Wavemeter	A.W. 7	1 0
Made-to-measure Wave-trap	A.W. 19	0 6
Gramophone Amplifier	W.M. 32	1 0
New Current Supply Idea	A.W. 26	1 0
DX One-valve Unit	A.W. 37	1 0

\* With a copy of "Wireless Magazine" complete.

Send a Postal Order to-day to **BLUEPRINT SERVICE**  
**AMATEUR WIRELESS**  
 58-61 FETTER LANE, LONDON, E.C.4

**HEAD NOISES**

**CURED**

**WITH**

**FLUXITE**

it simplifies soldering

All Hardware and Ironmongery Stores sell FLUXITE in this price 8d., 1/4 and 2/4. Another use for Fluxite—Hardening Tools and Case Hardening. Ask for leaflet on improved methods.

FLUXITE Soldering Set—Complete 7/6

FLUXITE, Ltd. (Dept. 326) Rotherhithe, S.E. 16



Use **REDFERN'S** **Ebonart** REG. NO. 469456  
NON-METALLIC SURFACE EBONITE  
**RADIO PANELS**

for

easy working, positive insulation, beautiful appearance, and an entire freedom from surface leakage. In black and beautiful mahogany grain, in nine standard sizes and prices. The "Ebonart Station Log Chart" given with each panel.

**Redfern's "Fernelite" Dial Knob**  
(Regd.)

A beautifully finished moulded 4-in. Dial Knob, scale 0° to 180°, complete with fixing screw. This Dial Knob is made in black for use with black panels, and in mahogany for use with mahogany panels.

Black ... .. 2/- each  
Mahogany ... .. 2/3 each  
Send for **The Book of Ebonart.**

OBTAINABLE FROM ALL REPUTABLE DEALERS  
**REDFERN'S RUBBER WORKS, LTD.,**  
HYDE, CHESHIRE

For "a round £3."

You can buy a loud speaker for a round £3 which, if your receiving set will work at loud speaker strength at all, will absolutely ensure the most perfect reproduction obtainable therefrom. It is the speaker which makes a poor set good and a good set better—it has a world-renowned name and a wonderful reputation. It is known as the

*Ethovox*  
REC'D

You have heard its name of course—NOW HEAR IT. We will demonstrate it at any time at our showroom 15, BEDFORD ST., STRAND, LONDON, W.C., or if you will write us to Blackheath we will arrange a demonstration with your local dealer.



**BURNDEPT**  
WIRELESS APPARATUS  
BLACKHEATH  
LONDON, S.E.3

# Kits for the Cossor "Melody Maker"

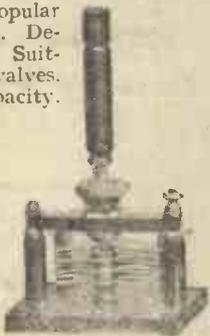
- Red Triangle Panel Polished and Mat back 21 x 7 x 1/4 (Drilled Free) 9/6
- Red Triangle Terminal Strip, 21 x 1 1/2 x 1/4 (Drilled Free) 2/3
- Engraved 2/1 extra
- 4" x 7" Pertinax Tube 2/9
- 2 Reels wire for winding Green Silk 3/6
- Complete Coils ready wound 7/6
- Polished Oak Cabinet as specified 30/-
- Base board 2/-

We supply all the parts from stock  
**INSIST ON**  
**KEYSTONE COMPONENTS**  
"Copied by many—  
equalled by none"

## Keystone Neutralising Condenser

Used in all the popular circuits this season. Designed by experts. Suitable for all types of valves. Low minimum capacity. The wide spacing of the vanes renders accidental "shorting" impossible. Very well made from best quality material and beautifully finished.

Board mounting, 5/-  
Panel mounting, 6/3

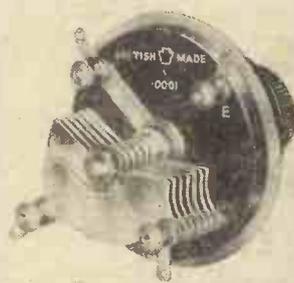


## COPEX 6-PIN BASE

Standard spacing with terminals arranged for easy accessibility. For use where the standard 6-pin coils are utilised without the actual screen. Price 2/9



## Keystone "Midget" Reaction Condenser



Ideal for the many positions where a small capacity condenser is required. An aluminium shield prevents hand capacity effects, and a special taper bearing gives a beautifully smooth movement. Accurately designed and rigidly

constructed, this Keystone condenser is backed by the usual Keystone guarantee of efficiency. Capacities: .0005 (7 plate) & .0001 (17 plate) Price 5/6

Send for illustrated Catalogue "A" describing these and many other components.

**PETO-SCOTT CO., LTD.**  
77, City Road :: London, E.C.1  
Branches:—LONDON—62, High Holborn, W.C.1  
LIVERPOOL—4, Manchester Street  
P.S.0764

## You can't burn off the tinning!



Impossible you say! Well, take your "Peerpoint" Soldering Iron and place it in the gas flame or fire and then leave it as long as you like. When you take it out red hot the tinning will be intact—Why? The tinned portion of this wonderful iron is not inserted in the flame at all. The Junit "Peerpoint" Soldering Iron is fitted with a sheath which is well tinned and which is removed when the bit is placed in the flame and then replaced for the actual soldering operation, the heat travelling from the copper bit to the tinned sheath instantaneously. Thus you have the fool-proof soldering iron which is always clean and well tinned, and which makes all types of soldering the easiest thing in the world.

Price 3/6  
(Patented)

Junit Self-soldering Wire is specified in every circuit in the famous P.M. publication "Radio for the Million." Is your set wired with it? If not, you have wasted unnecessary energy, time and temper in the wiring of your set.

Sold in attractive packets each containing five 2 foot straight lengths.

1/- per packet.

Ask your dealer for these Junit Products, and if he is unwise enough not to stock them, write direct to us.

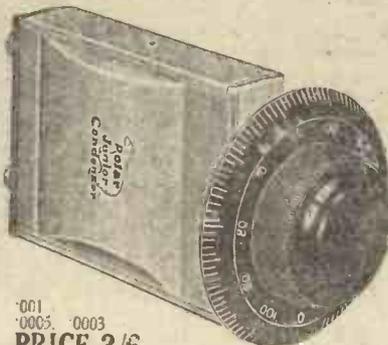
**THE JUNIT MANUFACTURING CO., LTD.**  
21-27, HIGH HOLBORN - LONDON, W.C.1



are guaranteed

## The "Polar" Junior Condenser

Low minimum capacity and true straight line frequency scale make the Condenser ideal for general purpose use. Single hole fixing. Dust proof metal case. Weight about 2 ozs. Moulded knob and dial.



.001  
.0005 .0003  
PRICE 3/6

Your Dealer will supply.

**Wingrove & Rogers Ltd.**  
Arundel Chambers, STRAND, W.C.2  
LIVERPOOL, MANCHESTER, GLASGOW, NEWCASTLE

even the  
Critics are  
enthusiastic

60 vcs labelled in  
BLUE SPOT

**F. A. HUGHES & Co., Ltd.,**  
204-206, Great Portland Street, W.1

Telephone: Museum 8630 (3 lines)  
Telegrams: Distancing, Wesdo, London

Manchester Office:  
6, Booth Street East, C. on M., Manchester  
Telephone: Ardwick 3709.

Don't Forget to Say That You Saw it in "A.W."

# Central Station Works House Lighting

## PLANTE BATTERIES FROM 6 to 5,000 AMP. HOURS

For the First time in the World's History of Battery Manufacture all Tungstone's Pure Lead Pasted Negative and Plante Positive Plates are by One Automatic Patented Machine Operation

FIRST CHARGING RISKS ENTIRELY ELIMINATED

*Battery Troubles Solved*

10 HORSE POWER STARTER KICK

The ONLY Car Starting Portable Storage Battery in the World

**TUNGSTONE**

With Plate Grids and Paste made of Pure Lead

*Accumulator*

Telephone Central 856 (4 Lines)      Telegrams City Fleet London

3, ST. BRIDE'S HOUSE, SALISBURY SQ., FLEET ST. LONDON E.C.4

*Revolution of 50 years Stagnation OF THE World's Battery Practices*

NO SULPHATION. All Parts Replaceable

FIRST CHARGE ONLY

*Four Hours*

For any STORAGE BATTERY from 6 to 5,000 amps.

### High Pressure Die Cast.

First Charge from 6 to 5,000 amps. only **FOUR HOURS.**

Can be Discharged for Light ONLY during First Charge.

### A World's Revolution in Battery Practice

Important Announcements in this Booklet on Exclusive Patented Features incorporated for First time in any Central Station Works House Lighting Batteries.

**POST FREE for ASKING.**

TUNGSTONE ACCUMULATOR CO., LTD., The Independent Battery of the British Empire  
3, St. Bride's House, Salisbury Square, London, E.C.4.

Please Mention "A.W." when Corresponding with Advertisers

**HALF & HALF**

Only half the weight of others! Only half the size!—Daimon L.T. Batteries. No battery of the same size as a Daimon has a lower internal resistance. No battery gives quieter reception background, recoperates easier or lasts longer. But then, Daimon are made by the oldest battery manufacturers in Europe.

60 volts 9/6 100 volts 15/6 Grid Bias (9 volt) 1/10 L.T. 1/10 and 1/- each

All good dealers or direct

**S. D. H. MANUFACTURING CO.**  
 Colindale Avenue, Hendon, London, N.W.3  
 See us at the Manchester Chronicle Radio Exhibition, Oct. 24—Nov. 5  
**STAND 61**

**daimon**

**C.D.M.**

**FIXED CONDENSERS**

Manufactured under true scientific principles, are being incorporated in many sets requiring components of good British make.

Patent No. 275800

Outer cases are of best Brown Bakelite, fitted with two convenient sized terminals and solder tags for making connections. Best Ruby Mica used for insulation, and one-hole fixing for which screw is provided. Each Condenser is tested and we guarantee to be correct to within 5%.

Above reproduction is the actual size.

**QUALITY TELLS!**

**BY TEST - THE BEST!**

.00005 to .002 - - - - - 2/- each.  
 .0025 to .006 - - - - - 2/6 "

Grid Condenser and 2 meg. leak - 2/6

Send for catalogue of our guaranteed products  
 If your dealer does not stock, write direct to the sole manufacturer

**C. D. MELHUISE**  
 (Late Director and Works Manager Watm: Wireless Co., Ltd.)  
 8, Gt. Sutton St., Goswell Road, E.C.1  
 Phone: Clerkenwell 7494

**WORTH WRITING FOR**

**S. A. LAMPLUGH LTD.**, of King's Road, Tulseley, Birmingham, have sent in a complete price list of their products, together with particulars of a new panel Plate Tuner unit.

**Lewcos Radio Products.**—The demand for Lewcos radio products has been so enormous that it has quite outstripped the manufacturers' ambitious programme. There is delay in delivering certain lines, but they are increasing their production daily, installing additional manufacturing and testing plant, and will very shortly be in a position to meet all demands.

**DEPENDABLE BATTERY ELIMINATORS**

**REGENTONE**

for AC and DC MAINS

**BEHIND EACH REGENTONE INSTRUMENT THERE LIES 4 YEARS' SPECIALISED EXPERIENCE.**

MAINS UNITS, MAINS RECEIVERS, FROM 27/6  
 16-page ILLUSTRATED CATALOGUE FREE.

**REGENT RADIO SUPPLY CO.**  
 Offices and Demonstration Rooms:  
 21 BARTLETT'S BLDGS., HOLBORN CIRCUS, E.C.1  
 CENT. 9661

**That book you want!**

FOYLES can supply it. 1,250,000 Volumes (Second-hand and New) on all Technical subjects, Applied Science, and on every other conceivable subject in stock. If unable to call write for Catalogue of Dept. 7 (free), mentioning requirements and interests. Books sent on approval.

INSTALMENT PAYMENTS can be arranged if desired (Gt. Britain only).

**A SPECIAL OFFER.**

**EXPERIMENTAL WIRELESS STATIONS.** By EDELMAN.

The best modern practice in simple language. Complete instructions. 400 pages. Profusely illustrated. Published 8/6. Offered at 3/6 (postage 6d.) on approval. Quote Offer 104.

**FOYLES FOR BOOKS**  
 119-125 Charing Cross Road, London, W.C.2

**AMPLIFIERS: 1-VALVE 19/-, 2-VALVE 30/-**

**2-VALVE ALL-STATION SET £4. APPROVAL WILLINGLY**

Wet H.T. Batteries, Jars, zincs and sacs complete, 3/6 per doz. (18 volts), post 9d. extra. Sample 6d. 3 doz. upwards in divided cartons. **Bargain List Free**

**A. TAYLOR, 57, Studley Road, Stockwell, London**

**BANISH H.T. BATTERY TROUBLE THIS WINTER**

**The Tested**

**TRIX**

**H.F. CHOKE**

With every **TRIX H.F. Choke** is a copy of Certificate granted by the Faraday House Testing Laboratories. High efficiency is always obtained on both high and low wave-lengths. Can be mounted either vertically or horizontally. Test **5/6** this tested Choke for yourself.

**ERIC J. LEVER (TRIX) LTD.**  
 33 Clerkenwell Green, London, E.C.1  
 Phone: CLERKENWELL 3014/5

**THE DIX-ONEMETER**

is a precision instrument of universal use, with an ingenious system of multipliers which enable full-scale readings of any value to be made over a wide range. One millivolt to 2,000 v., or 50 ohms to 50 megohms. Mirror scale, jewelled knife edge. A £10 de luxe model for **55/-**

**THE VIOLINA LOUD-SPEAKER** is constructed on cabinet lines, and gives wonderful reproduction over the complete tonal range. This loud-speaker de luxe is of beautifully polished mahogany. Price, complete with Reed producer and cord, **25/-**

**DISTANT CONTROL SWITCH RELAY.**—This is the most efficient method of distant control for all who use valve receivers. Simple to connect up and easy to operate, only two connections to L.T. battery, and two to control circuit. Can be used in all L.T. circuits of 2 to 8 volts up to 5 amps. Indoor type, which is enclosed in a fine polished oak case, **15/-**. Outdoor type, in watertight brass case, **17/6**.

Our new **72-PAGE CATALOGUE** is now ready. Over a thousand bargains are listed and hundreds illustrated. Send 4d. in stamps to

**ELECTRADIX RADIOS**  
 218 UPPER THAMES STREET, LONDON, E.C.4

**COMPLETE SETS, LOUD SPEAKERS, COMPONENTS, Etc.**

Send list of requirements, and best monthly terms will be quoted by return.

**EVERYTHING WIRELESS ON EASY PAYMENT TERMS**

Best British Batteries,  
 6/- v. 8/-, 108-v. 15/- Post free.  
**THE P.D.P. COMPANY (Dept. A)**  
 41, GREAT TOWER STREET, LONDON, E.C.2

This "STANDARD" Wet H.T. Battery will solve all the difficulties you experienced last winter, and will end the everlasting expense of experimenting to find a better battery. No charging required — HOME ASSEMBLING — IMPROVED RECEPTION — SILENCE — PERMANENCY are a few of the important factors of this WONDERFUL BATTERY. OUR BOOKLET GIVES FULL DETAILS IN SIMPLE FORM, AND IS FULL OF INTERESTING HINTS.

Prices of Popular Models:

60 cell 90 volt No. 1 cell (7 milliamps) Battery, with detachable terminals	21 5 1
72 cell 108 volt No. 2 Sac Battery (14 milliamps) with detachable terminals	21 17 3
84 cell 126 volt No. 3 Sac Battery (50 milliamps), with detachable terminals	23 9 6

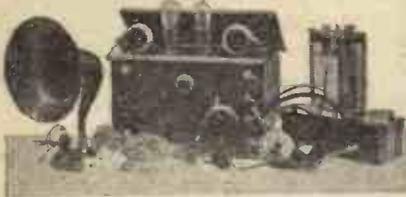
Trays for above, 7/-

Free advice given as to best battery for your set on hearing number and type of valve.

**SPECIAL:** Carriage paid on orders of 10/- or over. Deferred terms arranged.

**WET H.T. BATTERY CO.,**  
 12-13 BROWNLOW ST., HIGH HOLBORN, W.C.1

**INSTRUCTIONS FOR USE AND MAINTENANCE**  
 PRICES OF COMPLETE SETS & COMPONENT PARTS  
**STANDARD WET H.T.**



### THREE-VALVE LOUD-SPEAKER SET

NOTE THE WONDERFUL VALUE. TRY ONE OF THESE!

(The set shown is two-valve)

Gets Local, Daventry, and many Continental stations.

**THIS MAGNIFICENT 3-VALVE SET (D. & L.F.)** £ 5/19/6

Includes Handsome Polished American-type Cabinet (all parts enclosed), 3 Dual Emitter Valves, Tuning Coils, H.T. & L.T. Batteries, Aerial Equipment, Leads, Loud Speaker or Phones. Tax paid.

NETT.

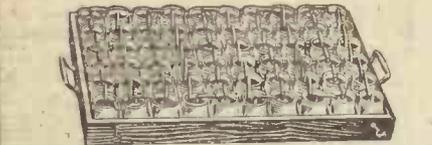
JUST THINK of a 3-valve Set at £5/19/6! CARRIAGE FORWARD.

It sounds unbelievable, doesn't it? CASE. 2/-

### TWO VALVE SET

EXACT TO ABOVE SPECIFICATION

£4 19 6 Tax paid. Carr. forw'd. Case 2/-



### WET H.T. BATTERIES

60 v. 90 cells

Complete 21/-

Tray 7/- Carriage forw'd.

Separate parts stocked. Booklet free.



This illustration shows you a set made in one of our American Cabinets.

(Prices elsewhere)

### SET OF THE SEASON

### COSSOR MELODY MAKER

COMPONENTS FOR SAME:

2 Ormond .0005 S.L.F. at 6/-; 2 Do. Slow Motion Dials at 5/-; T.C.G. Condensers, .0001, .001, .0003, .002, 2/4, each; 2 mfd., 3/10; 2 Grid Leak Clips, B.B., 9d.; Dubilier, 3, 4, and .25 meg., 2/6 each; 3 W.B. V.M. at 1/9; 1 Ferranti A.F.3, 25/-; 2 Bulgin P.S. at 1/6; Paxolin, 7 x 4, 3/-; Terminals, Glazite, Systoflex, 3/-; Variable Resistance, B.B., 3/-; 9-v. Grid Bias, 2/-.

20 and 32 D.S.G. Wire stocked. Handsome American Type Cabinets, baseboard, hinged lid, solid oak, for 21 x 7 panel, 27/6. Ebonart, Resiston, Parfait Panels, Mahogany or Black Polished, from 5/-.

COSSOR VALVES FOR ABOVE:

210 D	410 HF	610 HF	10/6 each.
210 RC	410 RC	610 RC	10/6 each.
210 P	410 P	610 P	12/6 each.

WE STOCK ALL LINES IN GENERAL DEMAND. SPECIAL WEST-END AGENT FOR BURNE-JONES (MAGNUM.)

See All Wireless Publications Week Ending October 15th, for Usual Callers & other Radio Goods.

IGRANO TRIPLE-HONEY-COMB INDUCTANCE COILS. 30, 2/9; 40, 2/9; 50, 2/9; 60, 3/-; 75, 3/3; 100, 3/6; 150, 3/9; 200, 4/-; 250, 4/6; 300, 4/9; 400, 5/6; 500, 7/-; 750, 9/6; 1,250, 14/-; 1,500, 16/-.

ALL PARTS STOCKED.

R.I. VARLEY Latest L.F. Transformer, 15/-; Multi, 25/-; Straight Line, 25/-; Choke, 9/6. Anodes, all capacities. R.C. Coupler, 20/- (Red, 22/6). Tuner Model "A", 37/6; "B", 37/6; Standard, 39/6.

CRYSTALS—Shaw's Genuine Sealed, Hertizite, 1/-, 1/6; Wyray, 1/6; Superzite, Long Range, 1/6. Cited Crystal Detectors. Micrometer, fitted Crystal, 2/6. No post.

TRANSFORMERS (L.F.)—Geophone, 2-1, 17/6; 4-1, 22/6. Formo, 5-1, 3-1, 10/6 each. Igranlic, 3-1, 15/-; 5-1, 16/-. Teisen Radiogrand, 12/6. "Ace", 8/6. Marconi Ideal, 2-7-1, 4-1, 6-1, 25/- each. Pye, 2-3-1 and 4-1, 17/6; 6-1, 20/-.

PETO-SCOTT BAL. CONDENSER 7/6. Neutralising, 5/- (Panel, 6/9). Screen and Base, 8/6. Binocular, screened, and usual lines stocked.

BOWYER-LOWE VALVE-HOLDERS, White Line, 2/3; Antipohz, 2/-; Popular .0003 and .0005, 10/6. Screening Boxes, 6/-.

DUBLIER, K.C. variable, 12/-; S.M. 200-1. Wire-wound resistances, Leaks, Condensers, Mansbridge Condensers, R.C.C. units, all in stock.

LISSEN Valve-holders, 1/-; Fixed Con., 1/-, 1/6; Leaks, 1/-; Switches, 1/6, 2/6; Latest 2-way Cam Vernier, 4/6; Rheostat, 2/6; B.B., 1/6; Lissenola, 13/6; L.F. Transformers, 8/6; 100-v. H.T., 12 1/2; 60-v., 7 1/2; Coils, 90X, 6/4; 250X, 9/8. Stats, minor, major.

MANSBRIDGE CONDENSERS, 2 mfd., 2/6; 1 mfd., 2/6. Other sizes. L.F. Chokes, 5/6. Phones, 8/6.

CARBORUNDUM. Detector only (No. 30), 5/-; Stabilising Detector Unit, with No. 30 Detector, 12/5. R.C.C. Unit, 8/6.

LEWCOS C.T. COILS, 35, 50, 75, 2/6; 150, 2/0; 250, 5/3 each. Binocular Coils, Split Primary Aerial, H.F.T. S.S. list prices. Litze wire stocked.

BENJAMIN.—Battery Switch, 1/-; Valve Holder, 2/-, with Grid Leak, 5/3. With Condenser and Leak, 7/-; Rheostat, 2/9.

BRETWOOD.—Grid Leak de Luxe, 3/8, with condenser, 4/6. Anode, 3/6.

BURNEPT ETHO-VERNIER DIAL (with Catalog Station Indicator, 18-1, 9/-).

J.E. Condensers, T.T. Friction Ver., .0005, 16/6; .00035, 15/6; .00015, 15/-; S.L.F. .0005, 11/6; .00035, 10/6; .00025, 10/-; .00013, 10/-; Sp. Law, .001, 9/6; .0005, 8/-; .0003, 7/-; Neutralising, 3/6.

ACCUMULATORS.—2-v. 40, 7/11, 8/6, 8/11; 4-v. 40, 15/-; 15/11, 16/6; 2-v. 80, 10/-, 11/6; 4-v. 80, 18/11, 19/11; 2-v. 80, 12/6, 13/6, 14/6; 4-v. 80, 23/6, 24/6; 6-v. 60, 28/11, 30/-, all best quality. Carriage, 1/- and 1/6 each. Exide, 3 star stocked.

JACKS & PLUGS.—Lotus S.C.O., 2/-; S.C.C., 2/3; D.C., 2/6; F.S.C., 2/6; F.S.D., 3/-; Jack Plug, 2/-; P.F.J.S., S.P.D.T 3/3; D.P.D.T., 4/-.

IGRANO PADENT 61, 2/-; 62, 2/3; 63, 2/6; 64, 2/6; 65, 2/6; 66, 3/-, etc., Univ. Plug, 1/6.

ASHLEY S.C.O., 1/3; S.C.C., 1/6; D.C., 1/9; F.S.C., 1/9; F.D.C., 2/3. Phone Plugs, 1/6.

H.F. CHOKES.—Wattmel, 5/-; T.J.S., 4/6; McMichael, 9/-; R.I. Varley, 9/-; Split Coil type, 12/6. Success, 10/6; Cosmos, 6/8; Bowyer-Lowe, 9/-; Lissen, 5/6; Climax, 8/6; Special for Eliminators, 10/6; Wearite, 6/6. R.C. UNITS—Ediswan, 7/-; Dubilier, 7/-; Cosmos, 8/6; (with V.M. 10/-; Magnum, 10/-; R.I. Coupler, 25/-; Graham Farish, 3/6.

FERRANTI.—A.F.3 25/-; A.F.4 17/8; Output, 20/- and 22/6.

HELLESEN—(post free), 66-v., 12/6; 99-v., 21/-; Grid Bias, 9-v., 2/-; 41-v., tapped 11-v., 1/2.

PANELS.—Grade A, cut to size. 1d. sq. inch, 3/16, or 1d. for 1 in. Reduction Large Sizes.



### OAK CABINETS.

American type, opens at back, compartment underneath for batteries, etc. 12 by 8 by 9 in. deep 18/11 16 by 8 by 9 in. " 25/11

Case and Carriage 2/6

Solid Oak, glass finish, beautifully made.

LOTUS REMOTE CONTROL.—Complete Outfit for Wiring two rooms: 1, "Lotus" Radi-Relay, 2 "Lotus" Relay Filament Control Wall Jacks, 2 "Lotus" Jack Plugs, 21 30/- yards of Special 4-strand Wire. Each additional Room, 7/6.

### THE NEW No. 3

### ORMOND

### S.L.F. CONDENSER

.00025, 5/6. .00035, 5/9. .0005, 6/- With 4-in. Dial. With Friction 55-1 4-in. Dial, 6/- each extra.

ORMOND, Square Law Low Loss, .0005, 9/6; .0003, 8/6 (1/3 each less no vernier); Friction Geared, .0005, 15/-; .0003, 14/6; .00025, 13/6. Straight Line Frequency Friction Geared, .0005, 20/-; .00035, 19/6. S.L.F. .0005, 12/-; .00035, 11/-.

FILAMENT RHEOSTATS, Dual, 2/6; 6 ohms or 30 ohms, 2/-; Potentiometer, 400 ohms, 2/6. .0001 Reaction, 4/-; Air Dielectric, 2/-; Neutralising, 4/-; Neurodyne, 2/-; Twin Gang, .0005, 35/-; Triple, 40/-; H.F. Choke, 7/6. Geared Dial, 5/-.



### 2-WAY GEARED

### COIL STANDS

3/6, 3/11, 4/3

All Ebonite

WESTOCK IGRANIC, CLIMAX EVEREADY, HELLESEN SIEMENS', FORMO, FERRANTI, WEARITE, ORMOND J.B. BENJAMIN, LOTUS MULLARD, DUBLIER, LISSEN, LEWCOS, UTILITY MAGNUM, PETO-SCOTT, PEARLESS, BURNEPT, PYE, MARCONI, MEMICHAEL, COSMOS, CARBORUNDUM R.I. VARLEY, GAMBRELL BROWN'S, STERLING, AMPLIONS, IN FACT EVERYTHING IT IS POSSIBLE TO STOCK.



WATTS' UNIVERSAL TEST METER, L.T. & H.T. Also READ'S, from 1 to 36 milliamps. A really wonderful instrument.

Post Free 8/6 U.K.

USE BRITISH VALVES

New reduced prices.

MULLARD 10/6 COSSOR MARCONI 12/6 P. B.T.H. EDISWAN 20/- S.P. COSMOS

### IMPORTANT.

### IT IS IMPOSSIBLE TO ADVERTISE ALL THE WIRELESS PARTS NOW ON SALE BUT IF YOU WANT THEM TRY RAYMOND'S FIRST! BE SURE YOU VISIT THE Bargain Window

### LOUD SPEAKERS (All makes stocked)

Amplion, A.R.38, 38/-; A.R.65, 65/-; Oak Flare, 18/6 extra; Case A.C.S., 75/-; A.C.T., 52/6; Jacobson Oak A.C.T., 26 10s. Celestion, £5 10s. to £25. B.T.H. C3, 60/-; Sferling Mellovox, 45/-; Geophone, all metal, 35/-.

UNITS and PICK-UPS, all makes.



LOG-MID-LINE

Try our NEW VARIABLE CONDENSERS, made on the Log-Mid-Line principle. .0005 or .0003, with 4-in. Triolite Dial, the best you can buy, for the moderate price of 5/11 Post free.



LOW LOSS SQUARE LAW

This variable Condenser is simply marvelous value. It cannot be equalled in price or quality.

By Post 5/11 price or quality With VERNIER, 1/- extra.

### PERSONAL SHOPPERS.

### WE ARE OPEN ALL DAY SATURDAY ALL DAY THURSDAY ALL DAY EVERY DAY

2 Shops, if one is closed the other is open.

Hours 9 a.m. to 8 p.m. Sat. 9 a.m. to 9 p.m. Sunday morning 11-1

### NOTE WONDERFUL OFFER BELOW!

### STUPENDOUS BARGAINS

### BE SURE YOU ARE AT RAYMOND'S!

These SPECIAL LINES ARE SOLD TO CALLERS ONLY who are purchasing their regular wireless supplies at the same time. ALL BRAND NEW. YOU CAN ONLY BUY THESE AT RAYMOND'S WHEN BUYING OTHER GOODS. NOT SOLD AT THESE PRICES ALONE OR BY POST.

MANSBRIDGE CONDENSERS, brand new, 4/11, 6/11, 12/6, 15/-, 21/-; SEEING IS BELIEVING. (List prices double and treble.)

63-v. BATTERY CASES, complete with Clips, 1/- (List, 2/6 each.) All brand new.

4-in. EBONITE DIALS, extra quality, 6d. (List, 1/8).

250 CT. COILS, 1/3. (List, 3/-).

AMERICAN CABINETS, various sizes, 6/11, 8/11, 10/11, 12/11. Oak polished.

ACCUMULATORS, 2-v. 40-a., 5/11. (List, 8/6).

HEADPHONES (4,000 ohms), brand new, 1/11, 2/6, 2/11. (List prices treble.)

109-v. H.T. BATTERIES, 4/11. (List, 10/5.) 5/11 (List, 11/9). Brand new. Tested.

H.F. CHOKES (List, 5/-), 1/11 and 2/6. Brand new.

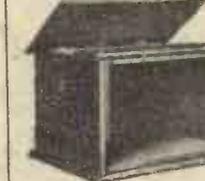
VOLTMETERS, double reading, dead beat, 3/11 (List, 6/11). Brand new. TRY ONE!

INDOOR AERIALS, with insulators and lead-in, 8d. (List, 1/6)

GLASS 2-volt CELLS, 2/6.

### HUNDREDS OF OTHER BARGAINS.

### PLEASE READ TERMS OF SALE FOR ABOVE GOODS. NO POST.



CABINETS

Large stocks of really useful cabinets kept, or made to order Solid oak, Glass Finish American type, hinged lid baseboard.

10 x 8 x 8	8/11
12 x 8 x 9	11/6
14 x 8 x 9	13/11
16 x 8 x 9	16/11
18 x 8 x 9	19/11
20 x 8 x 9	22/6
21 x 7 x 9	25/-
24 x 7 x 9	27/6

Carriage and Packing, 2/- each. Mahogany, 5/- each extra.

SPECIAL SIZES MADE TO ORDER IN OAK OR MAHOGANY AT VERY REASONABLE PRICES. HIGH-CLASS PANELS, 1d. sq. inch. Grade 4A. PANELS IN STOCK FOR ALL CIRCUITS.

## K. RAYMOND

27 & 28a, LISLE St., LONDON, W.C.2.

Phone: Gerrard 4637.

COME TO LEICESTER SQ. TUBE (Important)

Ask for back of Daly's Theatre This address is opposite.

**ANNOUNCING**



the  
**"GEM"**

This is the British-made Loud-Speaker that created a wonderful impression at the National Radio Exhibition, Olympia

The "GEM" is a full-size model of pleasing appearance, which gives splendid reproduction. The "GEM" has a base mechanism of generous construction with sensitive diaphragm adjustment, and handles good volume without rattle, tinniness or distortion. The "GEM" is finished in chocolate enamel, has moulded Bakelite base. Height, 19 in. Flare, 10 in. Resistance, 2,000 ohms.

It is not a "Junior" or a "Baby," but a full-size Loud-Speaker.

THE **"GEM"** 30/- THE **"GEM"**  
Fully Guaranteed.

STOCKED BY ALL DEALERS who will demonstrate free to you.

There are three other models of "Orphean" Speakers: the "De Luxe," the "Standard," and the "Oriel." Write for Illustrated Folder.

Sole Manufacturers:

LONDON RADIO MAN'G. CO., LTD., Station Road, Merton, London, S.W.19

A few Districts available for Representation by Traders.

**Preventing Short Circuits**

IN most wireless sets the low tension negative lead is connected to earth and a certain number of metal parts are also earthed. This means that a short circuit will be produced if either a high or a low tension positive lead comes into accidental contact with an earthed part.

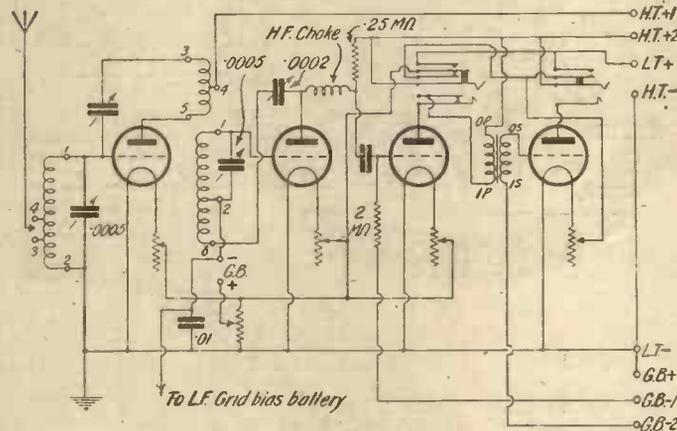
In sets which employ coil screens or condenser screens the risk of a short circuit is considerably increased owing to the large bare surfaces of earthed metal. It is a common practice to earth the shrouds or

the frames of low-frequency transformers, and here again we have possibilities of a short circuit.

An excellent tip is to cover all exposed surfaces of earthed metal parts with a thick coating of shellac varnish or ordinary stove enamel.

Either of these are good insulators, and their use in no way detracts from the appearance of the inside of the receiving set. Two coats should be given in either case to ensure that the surface of the metal is effectively covered.

R. W. H.



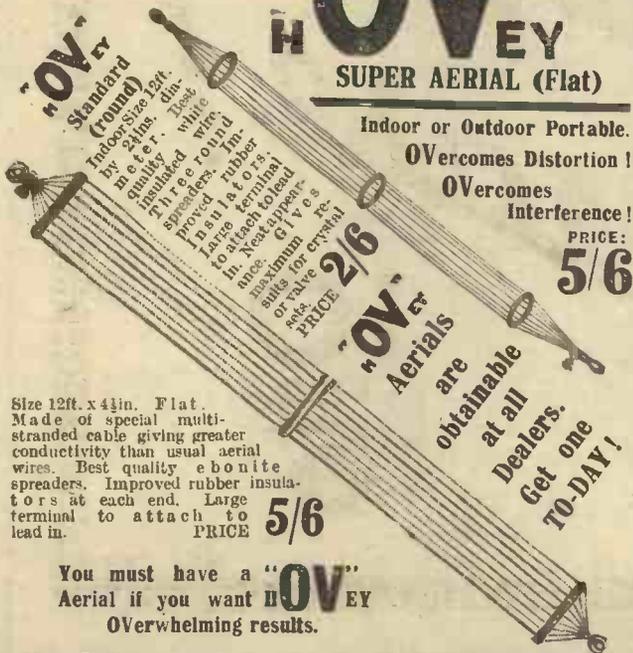
The revised theoretical circuit diagram of the "All-purpose Four" which was described in A.W. No. 278

**"ALL-PURPOSE FOUR"**

Owing to a draughtsman's error, which was overlooked in checking the theoretical diagram of the "All-purpose Four," in AMATEUR WIRELESS No. 278, the wiring of the double-spring jack was incorrectly given. The correct theoretical diagram is shown herewith. It should be noted that the blueprint wiring, as shown in the reduced reproduction which accompanied the article, is quite correct, and constructors can follow this, or the revised circuit herewith, with every confidence.

**SAFETY FIRST.**—An Aerial ready to fit in a moment. **NO DANGER.** Efficient and Safe. Get a **"OV"** Aerial to-day.

**"HOVEY"**  
**SUPER AERIAL (Flat)**



Indoor or Outdoor Portable.

Overcomes Distortion!

Overcomes Interference!

PRICE: **5/6**

**"OV"** Aerials are obtainable at all Dealers. Get one TO-DAY!

Size 12ft. x 4 1/2 in. Flat. Made of special multi-stranded cable giving greater conductivity than usual aerial wires. Best quality ebonite spreaders. Improved rubber insulators at each end. Large terminal to attach to lead in.

You must have a **"OV"** Aerial if you want **"HOVEY"** Overwhelming results.

The HOVEY Aerial Co. 8 Red Lion Passage, W.C.1

Satisfaction Guaranteed or money refunded

**RIDLEY**  
for  
**RADIO**

- .0005 S.I.F. Variable Condensers .. each 5/-
- .0005 Atlas Square Law Condensers .. each 3/6
- 60-v. M.A.L. Batteries H.T. each 4 11
- 160-v. M.A.L. Batteries H.T. each 8/6
- 4.5-v. Flashlight Batteries doz. 3/6
- Panana Plugs and Sockets, each 2d.
- 2-v. Triotron Valves, each 3/9
- 2-v. Power Valves, each 6/-
- Croix Transformers, 3-1 and 5-1 .. each 3/9
- Induction Coils 35 each 1/2
- " " 50 " 1/4
- " " 75 " 1/6
- " " 100 " 1/9
- " " 200 " 2/6
- " " 250 " 2/9
- Centre Tapped, 1/- extra.
- Loud-speaker Horns for Lisensols Unit .. each 7/6
- 4 1/2-in. Condenser Dials .. 1/9
- 2-way Coil Holders .. 1/6
- 2-way Coil Holders, back of panel .. each 2/6
- 3-v. Grid Bias Batteries, each 1/-
- Slow Motion Dials each 4/6
- Base Board Coil Plugs .. 8d.
- H.F. Chokes .. 4/6
- Variable Grid Leaks .. 6d.
- Anti-Phonic Valve Holders, each 1/-
- Pulleys .. 4d.
- Rheostats, 6 ohm-30-ohm 1/-
- 2 MFD Condensers each 2/3
- 2-v. OVD Carriers .. 8d.
- Insulated Tinned Wire for wiring .. for 20 ft. 1/6
- 16-Gauge Tinned Wire, per 1/2 lb. 1/-
- Aerial Wire, Copper, per 1/2 lb. 1/9
- Red and Black Flex yard 1/6.
- 60-v. Battery Boxes each 1/11
- Loud-speaker Plugs and Sockets for room wiring, each 1/6
- Feeries Rheostats, 30 and 60 ohm .. each 2/6
- 2-v. Metal Valves, 06 .. 8/-
- 2-v. Metal Power Valves, 7/8
- SPDT Switch-on, Porcelain, each 8 1/2
- DPDT Switch-on, Porcelain, each 1/3
- Loud-speaker Cords each 1/-
- Galvanized Earth Tubes, each 2/6
- Ultra Phones .. 11/6
- Six Pin Coil Bases each 1/3
- Six Pin Coil Formers .. 4/-
- Cleartron Valves Half Price Coil Plugs .. each 4d.
- Lead-in Tubes, 6 in., 9 in., 12 in. .. each 1/-
- Bell Wire .. yard 6d.
- 26 DCC Wire .. 1/2 lb. 1/-
- 28 DCC Wire .. 1/-
- Neutron Crystal .. each 1/3
- Screwed Rod, 4BA, 2BA, length, 2d.
- Permanent Detectors each 2/6
- Ebonite Knobs .. 2d.
- Screw Drivers .. 3d.
- Large Shell Insulators .. 3/4
- Bell Insulators .. 2 a 1d.
- Headphones (1 year guarantee), pair 3/11
- Wooden Accumulator Carriers each 2/6
- Derwin Leather Accumulator Carriers .. each 1/9
- Voltmeters, 0/15 .. 2/9

**FREE**  
To every purchaser of goods to the value of 20/- a Worthmore Coil Winder, value 5/-, will be given Free.

POST ORDERS. Goods value 20/- sent Post Free. Money returned if goods not satisfactory if returned within seven days.

**CECIL RIDLEY**  
**"RADIO HOUSE." MIDDLESBROUGH**

PLAYER'S  
NAVY CUT.  
REGD. NO. 154011

OK

PLAYER'S  
NAVY CUT

Player's  
please!

10  
FOR  
6<sup>D</sup>

N.C.C. 265

Advertisers Like to Know That "You Saw it in 'A.W.'"

**RADIO CATALOGUES FREE**  
FULLY ILLUSTRATED  
CONTAINING  
**OVER 200 COMPONENTS**  
WHICH ARE OBTAINABLE  
FROM ALL THE BEST DEALERS

**A.F. BULGIN & Co**  
RADIO MANUFACTURERS  
9-10-11 CURSITOR ST LONDON, E.C.4

7 x 5. 1/-	6 x 6. 1/-
7 x 6. 1/3	8 x 5. 1/2
8 x 6. 1/4	9 x 6. 1/7
10 x 8. 2/1	11 x 8. 2/3
10 x 9. 2/4	12 x 8. 2/6
12 x 10. 3/-	12 x 9. 2/10
14 x 12. 4/-	14 x 10. 3/5
14 x 7. 2/7	16 x 9. 3/6
16 x 8. 3/2	1 ins. thick. Post Free

**GROXSONIA**  
PANELS

have a higher electrical resistance than ebonite. Compare these prices! Why pay more for a less efficient article?

"AMATEUR WIRELESS" says:  
"It is not affected by heat or damp. Its electrical properties are good. The surface leakage and the insulation resistance were both found to be infinite and the material, therefore, can be used without hesitation as an insulating panel."

Panels cut to any size. Call, write, or phone Clerkenwell 7853, for quotations. Samples and prices post free to Trade.

**GROXSONIA CO., 10 South St., Moorgate, E.C.2.**  
Agents—John Henry Smith, 130 Anlaby Rd., Hull.  
L. H. Helyar, 82 Chamberlin Rd., Norwich.  
A. Stradwick & Co., 27 The Market, Chatham.

# REPAIRS

to HEADPHONES, LOUDSPEAKERS, TRANSFORMERS, COILS.

First-class workmanship only. That is just the vital difference. We are specialists with almost 30 years' experience in every form of intricate and accurate coil winding, and we guarantee that work entrusted to us will be returned to you as good as new, if not better. This is no idle claim, but the unsolicited opinion of scores of satisfied clients.

**THE VARLEY MAGNET COMPANY**  
(Proprietors: Oliver Bell Control, Ltd.)  
BLOOMFIELD ROAD, WOOLWICH, S.E. 18.  
Telephone: Woolwich 0888.



**EVERYTHING RADIO ON EASY TERMS**  
WOOLDRIDGE RADIO CO. LTD.  
26 LISLE ST, LEICESTER SQ,  
LONDON. W.C.2.



**The LORIOSTAT**

1, 2, 3, 4, 5 or 6 valves perfectly and independently controlled by one unit.

A multiple unit superseding the fixed Resistor can be used in any circuit to control any number of valves. For downright efficiency use a LORIOSTAT in your set.

1 way 2/-	4 way 7/3
2 " 3/0	5 " 9/-
3 " 5/0	6 " 10/3

**A. W. STAPLETON, 18a, Lorrimer Buildings, Lorrimer St., Waiworth, S.E. 17**

**REPAIRS**

Phones, Speakers, Transformers, Sets, Chokes, etc. All kinds of winding carefully carried out. Send work for price by return. Write for List 'A'. No obligation. **KNIGHT & Co., 6 Chapel St., London, E.C.2.** Phone Clerk. 4715.

# WIRELESS MAGAZINE

for November - - 1/-

Will be on sale on  
Tuesday, October 25th

Sets described—  
**DOMINIONS SHORT-WAVE THREE,**  
**FIVE-GUINEA THREE,**  
**ALL-FROM-MAINS TWO,**  
**A RANGE EXTENDER.**

Make sure of your copy by ordering yours NOW!

## D.V. Consultations Daily.

If you cannot call, send by post. We guarantee to cure all ailments. Send all your Dud Valves to the **NORTH LONDON VALVE Co., Ltd., 22 Casenove Road, London, N.16,** the Leading Doctors of Valves, and we will send you a Pro-Forma invoice so that you can see the cost to repair same.

**B.E. 3/- D.E. '25, 5/9 D.E. '06, 6/-**  
Price List on Application.



**"CONWAY" JACOBAN OAK CABINET**

This popular model has real twist legs. Top compartment for set and bottom compartment for batteries. Fitted with lock and key. Other Pedestal Cabinets from 56/- to £12.

**£5.76**

Write for illustrated Price List. Let us quote for your own designs.

**F. DIGBY, 9 Banbury Road, South Hackney, E.9**  
Phone: Clissold 5458



**REVOLUTION IN WIRELESS — AERIALS —**

No POLES, PULLEYS, OR WIRES REQUIRED. FIXED IN FEW MINUTES. CANT BLOW DOWN OR SWAY AND CAUSE FADING SIGNALS. SAVES HOURS OF WORK. GUARANTEED TO IMPROVE RECEPTION. TESTED BY MANY INFLUENTIAL JOURNALS.

**PARTICULARS FREE.** Send stamped envelope. **GARR. PAID 27/6 FROM "NOMAST" PLATE AERIAL Co. 110 SINGLETON AVE. BIRKENHEAD. - PATENT No 260089.**

**PREPAID ADVERTISEMENTS.**

Advertisements under this head are charged **THREEPENCE PER WORD,** minimum charge **THREE SHILLINGS.**

**DEPOSIT SYSTEM.**

As the Publishers cannot accept responsibility for the bona fides of advertisers in this publication, they have introduced a system of deposit which it is recommended should be adopted by readers when dealing with persons with whom they are unacquainted. It is here explained.

Intending purchasers should forward to the Publishers the amount of the purchase money of the article advertised. This will be acknowledged to both the Depositor and the Vendor, whose names and addresses must necessarily be given. The Deposit is retained until advice is received of the completion of the purchase, or of the article having been returned to and accepted by the Vendor. In addition to the amount of the Deposit, a Fee of 6d. for sums of £1 and under, and 1s. for amounts in excess of £1, to cover postage, etc., must be remitted at the same time. In cases of persons not resident within the United Kingdom, double fees are charged.

The amount of the Deposit and Fee must be remitted by Postal Order or Registered Letter (Cheques cannot be accepted), addressed to

"AMATEUR WIRELESS,"  
ADVERTISEMENT DEPARTMENT,  
58/61, FETTER LANE, LONDON, E.C.4

**WOOD HORNS FOR ALL SPEAKER BASES AND GRAMOPHONE UNITS.**—See AMATEUR WIRELESS Oct. 1st for illustration of cheapest wood horn on the market. List H. Maddison, 2a, Ronald's Road, N.5. Manufacturer of the "Allwoodhorn."

**REPAIRS.** Transformers, (L.F.), Headphones, Loud-speakers repaired to maximum efficiency. Don't discard if burnt out. All one price. 4s. post free. Prompt service. A 3 months' guarantee accompanies each repair. Trade invited—Service, 115 Links Road, Footing, London, S.W. 17.

**MARCONI OFFER 12/6** a valve if you exchange your set. We offer to double the allowance in part exchange for any new set. (Class, Redwell, Ltd., London Bridge, E.C., or branches at Waterloo Station, R.E.; 78a Commercial Road, E.14; 50 The Mall, Easting, W.6; 31 Watbrook, E.C.4.)

**GOOD QUALITY VALVES** 4 and 6 Volt .06 amp. 3/6 each. 4 and 6 Volt .25 amp. power, 5/- each. Postage extra. Money refunded if dissatisfied. **Dukes, 18, Beer Lane, E.C.3.**

**D-XELLENT!**

# DX IN COILS

From 1/- **D X COILS, LTD., London, E.8**

## EASY PAYMENTS

We supply for 10% down (balance in 10 monthly payments), apparatus of the following brands:—

- BRANDES LISSEN OLDFAM DUBILIER
- MICHAEL EVEREADY BENJAMIN LOPUS
- HART S.G. BROWN FORMO EUREKA (VALVE)
- BELLING-LEE BURNEPT SILVERTOWN ALL BRITISH

Send list of requirements to  
**LONDON RADIO SUPPLY CO., 11, OAT LANE, LONDON, E.C.2.**

**A FREE Booklet for YOU**

Here is a free offer to all Battery users which shouldn't be missed. Just send a 1d. stamp to the address below and receive by return a valuable 20 page booklet dealing with the wonderful ETON primary H.T. Battery. This offer is only for a limited period so write off TO-DAY to the  
**ETON GLASS BATTERY COMPANY, 45 St. Mary's Road, Leyton, E.10.**

IN YOUR TETRODE THREE USE THE

## "PAREX" Valve Holders

(Pat. appl. for—Regd. Design)  
**THE ONLY PRACTICAL HOLDERS FOR THE NEW SCREENED VALVES**

As supplied to the Valve Manufacturers.  
Price per set: 3/6 Highly Polished 4/6  
**E. PAROUSSI, 10 Featherstone Buildings, High Holborn, London, W.C.1** Phone: Chancery 7010

## SILENT H.T. SILENT H.T.

Small Capacity up to 8 milliamps.  Large Capacity up to 16 mill'am's.

Complete Batteries, ready wired, in mahogany case with glass covers, from 14/- All parts supplied for making any size of battery. As reported on by Mr. J. H. Keyner in this issue. Send 1/2 stamp for list, 6d. for sample cell, or 1/- for full range of samples in all capacities.

Note New Address—  
**TROMBA ELECTRICAL CO. 13 High Road, KILBURN, N.W.6**  
Phone: Maida Vale, 1669.

## Jones pays as he listens!

**L**UCKY man! He owns a brand-new two-valver and pays for it so gradually he doesn't notice it. Don't envy Jones! Use our instalment system yourself. Deferred payments whether you buy the largest Set or the smallest accessory. For our brochure send a P.C. to Desk 'A'.

**New Times SALES CO., 77 City Rd., London, E.C.1**



# Amateur Wireless

**COUPON**  
Available until Saturday,  
Oct. 29th, 1927



**Prize  
Winning  
LOW LOSS  
FORMER**

Be sure to specify Becol original Low Loss Former used in sets that have taken 1st, 2nd, 3rd and 4th prizes and gold medal. Packed in carton 3", 4", 6" lengths up to 36" lengths.

**THE LATEST**  
Apply for particulars of 4 and 6 new design contact formers with bases.



Registered Trade Mark.

New Standard sizes in 3 finishes, guaranteed panels made by the Ebonite Experts.



**THE BRITISH EBONITE COMPANY, LTD.  
HANWELL, LONDON, W.7.**

## THE BEST IN THE WEST

Do not fail to call at our showrooms to hear a demonstration of the MOVING COIL LOUD SPEAKER.

All parts in stock. Complete set - £6 16 3

It will also pay you to hear a demonstration of the marvellous apparatus for electrical Gramophone reproduction.

Every type of pick-up can be demonstrated upon request. Brown, Igranic, Marconi, Celestion, etc.

### NEW LINES IN STOCK.

THE NEW DUBILIER K.C. CONDENSER 12/-

THE NEW BURTON S.L. F. CONDENSER .0005 6/- .0003 5/9

SPECIAL BURTON VERNIER DIAL - 5/-

SPECIAL TYPE PAREX VALVE HOLDERS FOR CAPT. ROUND'S SCREENED VALVE - 4/6

A FEW ONLY LEFT. AMPLIFEX AERIAL LOOPS.

The finest Loop Aerial ever devised (originally £3 10 0). To clear 30/-

**WILL DAY LTD. (Dept. A.W.)**

19, Lisle St., Leicester Sq., LONDON, W.C.2.

Telephone: Regent 4577. Telegrams: "Titles, Westrand, London."

# Delivery of LEWCOS (Regd. Trade Mark) Radio Products

Difficulty may have been experienced in obtaining some of our products from your local Radio Dealer.

The truth is that the demand for LEWCOS Radio Products has been so enormous that it has quite outstripped our ambitious manufacturing programme, with the result that we are somewhat behind on delivery.

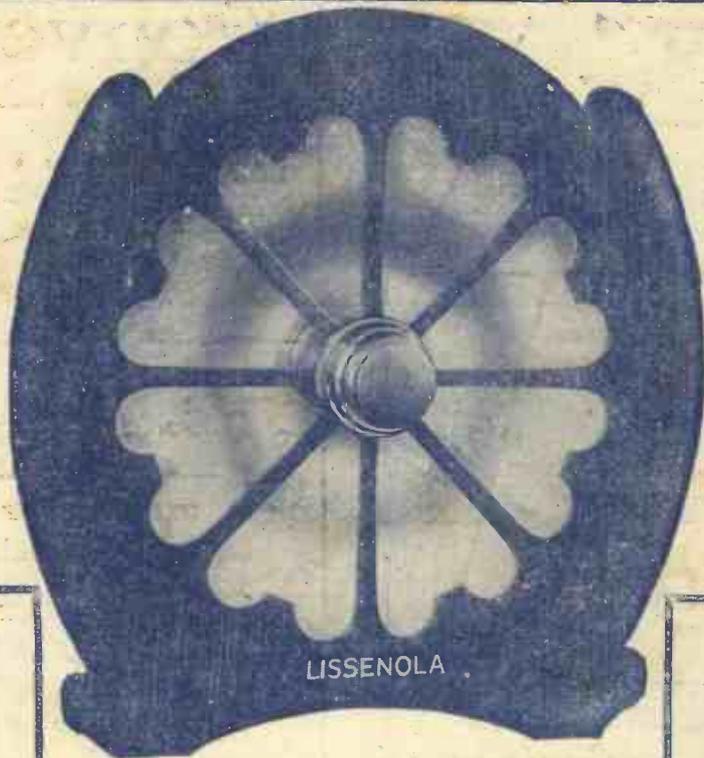
We are increasing production daily, installing additional manufacturing and testing plant and training new labour, and expect shortly to be in a position to supply the trade promptly with all their requirements.

Meanwhile we ask your kind indulgence.

*The*  
**LONDON ELECTRIC WIRE  
CO. & SMITHS, LTD.**

Playhouse Yard, Golden Lane : London, E.C.1

# NEW LISSEN LINES



**LISSEN REVOLUTIONISING CONE**  
A combination of horn and cone in the same loud-speaker.

**29/6**

*Fills in the missing note.*

## LISSEN RESISTANCE CAPACITY COUPLING UNIT

Provides a complete Resistance Capacity Coupling Unit. Includes two LISSEN Fixed Resistances and one LISSEN Mica Condenser. Values incorporated have been selected as the most suitable for general use, but the resistances are easily interchangeable. May be mounted upright or flat. **4/-**



## LISSEN HEADPHONES

Never before was it thought possible commercially to make headphones so light and, at the same time, so sensitive. These headphones are so light they may be worn throughout an evening without the wearer realising they are on the head. Cords will not twist or tangle, but will always hang straight down, no matter how the head may be turned, moved, or twisted. The two earpieces are extremely sensitive and both are exactly matched in impedance. They settle at once into comfortable positions, and may be secured there by the single movement of a special 8/6 ball joint.

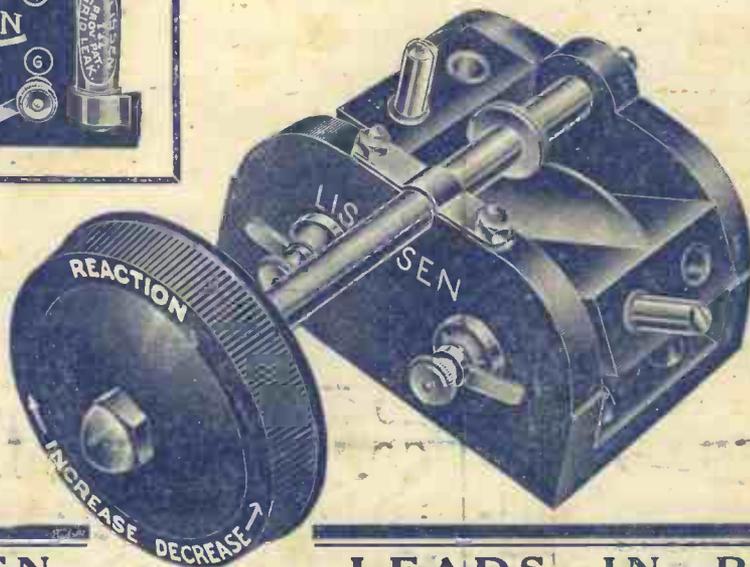


## LISSEN COILHOLDER

Fine degree of control to permit of extremely selective tuning. Gear ratio selected as the best for all practical purposes. Big knob for comfortable finger grip and wide range of movement with one turn. No slip or backlash, coils will not move as the result of their own weight. No flexible connections to break. Moving block on the right-hand side, but may easily be changed over to left-hand side by following the simple instructions enclosed with each coilholder.

Model A, with 2-in spindle **4/6**

Model B, with 5-in. spindle (2-way) **5/6**



## LISSEN LIMITED

Friars Lane  
RICHMOND

Surrey

*Managing Director: Thos. N. Cole*

**LISSEN**

**LEADS IN RADIO PARTS**