

THE "MERRY-MAKER PORTABLE"—PRACTICAL DETAILS

Amateur Wireless

Every
Thursday 3^d

and
Radiovision

Vol. XVI. No. 411

Saturday, April 26, 1930

**EASY-BUILT
CONE
SPEAKER**



CHEAP TO MAKE

ALSO IN THIS ISSUE
The MERRY-MAKER PORTABLE

T.C.C.

**Condensers
cost no more
than ordinary
condensers
and are**

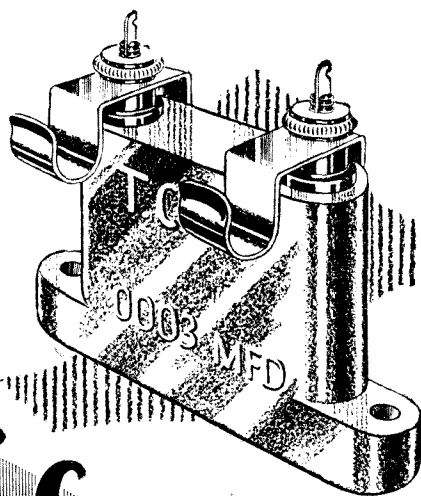
GUARANTEED

WHEN next you want a condenser be sure of its accuracy—be sure that it is dependable—that it will stand up to its job, in other words be sure it is a T.C.C. On this rests the efficient working of your Receiver. Remember that with the new prices you can now get a genuine T.C.C. condenser for the same cost as an ordinary condenser. Give your next Set a fair chance by fitting the “condenser in the green case”—made by the company that has made nothing but condensers for nearly a quarter of a century. Here is the upright mica type—one from the vast range of T.C.C. Condensers.

**T. C. C. MICA
CONDENSERS
Upright Type**

mfd.	s. d.
.0001 to .0009	1 6
.001 to .004	1 10
.005 to .006	2 6
.01	3 0
.02	3 6
.05	5 6
.1	8 0
.2	14 6
.25	18 0

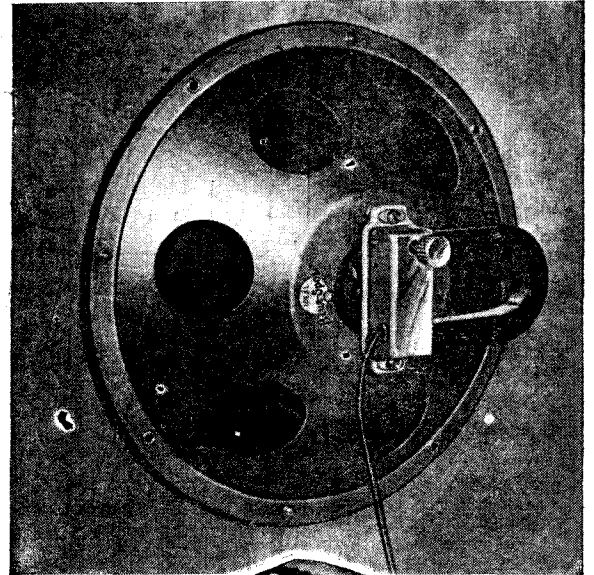
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to work at 2500v. peak.*



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4493

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FOR THE 66K UNIT

Blue Spot 66K is the world's most famous unit and here is the Cone and Chassis that was specially designed for it.

Everyone knows the unit; soon everyone will know the Chassis.

In five minutes you can build yourself a speaker which for quality and sensitivity is unexcelled. Screw the unit to the chassis—the cone is already in position—connect up to your set and you will hear Blue Spot at its best.

66K Unit costs 25/- and is sold under guarantee.

The Chassis is sold in two sizes; The Minor, with 9 1/2" Cone (as illustrated), costs 12/6; the Major, with 13" Cone, costs 15/-.

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A New Short-waver—Trouble in Spain—Eliminators in Court—A Damper on Portables—For the Ladies!—A Question for Sir Thomas!

A New Short-waver—"I have logged the new Vienna short-waver, UOR2, which you referred to in AMATEUR WIRELESS for April 9," writes H. C. (Kingston). "I know it was Vienna because it was relaying the same programme as the broadcast-band station. The wavelength was about 50 metres and the strength was quite good—nearly loud-speaker volume on the 'World-wide Short-wave 3.'"

Incidentally we have had many readers agreeing with the correspondent who said, recently, that he was annoyed at the number of short-wave "stations" which, on resolving the carriers, proved to be only B.B.C. harmonics! Still, it all adds to the fun of working on the wavelets.

Trouble in Spain—Microphones and radio have played their part in the political squabbles which are now going on in Madrid. When Sanchez Guerra, a prominent political anti-monarchist leader, made an important speech in a Madrid theatre, King Alfonso was able to listen in in safety to the bitter attack on himself. It is understood that microphones were hidden in the wings of the theatre and a land-line link was made with the Royal palace.

Eliminators in Court—Many districts are now changing over from A.C. to D.C.,

and the question of responsibility for changing over eliminators is worrying many mains users. A case of considerable interest in this connection was recently decided by Judge Cluer at Shoreditch County Court. An eliminator was bought from a dealer to be used with a set in Bethnal Green district, which is supplied with A.C. The purchaser subsequently moved to Southampton Row district, which is supplied with D.C. The eliminator wouldn't work at Southampton Row, of course, so the purchaser, who was quite ignorant of the technical reasons for this, returned the eliminator to the dealer and sued for the return of his money.

Judge Cluer Says—Judge Cluer held that the dealer was under a legal obligation to provide components which would function in the district for which they were supplied. In this case the eliminator was supplied for Bethnal Green, and the fact that it failed to work at Southampton Row did not entitle the buyer to the return of his money. What happens when the local suppliers of current themselves change the supply from A.C. to D.C. is, of course, quite another matter.

A Damper on Portables—America, where radio-equipped cars are going strong,

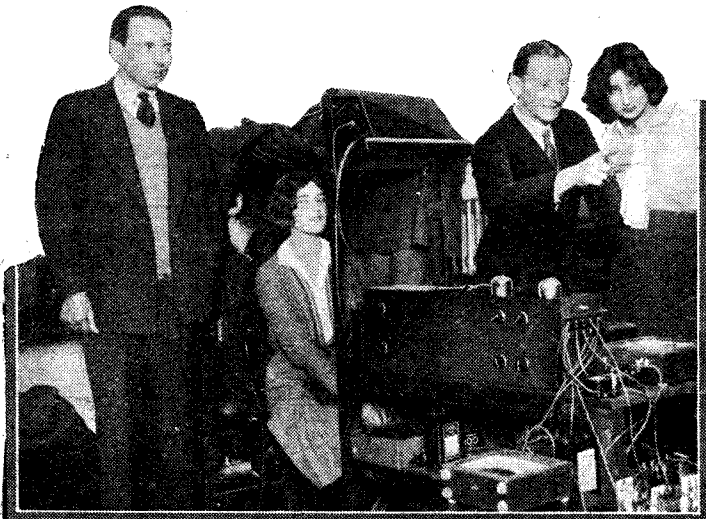
has now taken a sudden turn. In the States of Massachusetts and New Jersey official recommendations have been made that car wireless shall be banned. It is believed that the distraction caused might interfere with driving, and in one or two recent road accidents questions have been raised as to the part liability of wireless. While the politicians are talking about the new road-radio regulations several large car manufacturers who had intended fitting radio sets as standard in some models—the General Motors Corporation, for example—are having to mark time.

For the Ladies!—A women's prison in Barcelona has had installed an A.C. receiver to which is connected a large number of loud-speaker points. Those prisoners with a certain number of good conduct marks are allowed to have a loud-speaker in their cells. This raises the old silly-season topic of "Should we be Kind to Convicts!" And why only the women's prison, anyway? Is the male criminal in Barcelona too tough a nut?

A Question for Sir Thomas!—Should modern conductors be radio "fans"? Leopold Stokowski, the famous conductor, evidently thinks so! He is taking a three-months course of radio engineering with a view to advising on the broadcasting of large orchestras. He hopes that this will lead to a vast improvement in the technique of concert broadcasts. Ask Sir Thomas Beecham, Sir Henry Wood, or Sir Landon Ronald what they think about this—if you dare!

Glowing Loud-speakers—"Why are loud-speakers always 'dead' looking?" asks a reader in Newcastle. "I like the appearance of the new cabinet moving-coils marketed by a well-known company and which have a pilot light glowing inside, facing the cone. I've copied the idea in my speaker—not a moving coil—and the lamp is actually a pilot light in the L.T. circuit. It is a handy reminder, and there is a psychological effect caused by the glowing bulb which compels one to direct attention to the speaker." A good idea, we think.

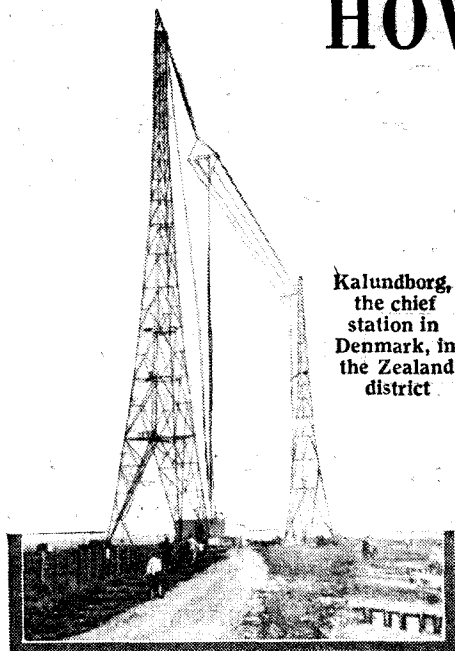
TELEVISION DEMONSTRATED
A fair spectator being televised during the course of a television demonstration held last week at the Television Society's Exhibition in London. The photo cells are in the box above the subject's head, and the cell amplifier is in the foreground



NEXT WEEK: Full Constructional Details of the "Merry-maker" Portable

HOW LISTENERS MIGHT CHOOSE THE PROGRAMMES

In Denmark listeners are asked to ballot for programmes when renewing their licences. Here are the details of this novel scheme, which with advantage could be copied by the B.B.C.



Kalundborg, the chief station in Denmark, in the Zealand district

DENMARK has given a thorough test to a novel scheme for choosing radio programmes to suit listeners, and it certainly might be copied by England. It is virtually a compulsory ballot.

particularly biased in one direction. In other words, the results of the ballots show the opinions of the "extremists," and the average man is neglected.

What an effective idea it would be if the B.B.C. and the G.P.O. were to copy the scheme which has now been worked in Denmark for just over a year; namely, that a programme ballot is requested with the taking-out of a licence.

To see just how the idea is carried out, AMATEUR WIRELESS communicated with the officials in Copenhagen and obtained specimens of the ballot and radio-licence application forms. The ballot form is reproduced herewith.

This *spørge-skema* (questionnaire) has to be filled in by listeners, a cross being put in one of the three columns headed "more,"

and literature, talks on politics and social questions, talks on research and technical matters, special talks on agriculture, horticulture, and domestic economy, discussions, topical events, education (languages), church services, children's hour, boys' hour, communications for listeners, and news.

Unusual Features

There are several items in this list which seem strange to British listeners—the special classification of mandolins, balalaika, and harmonicas, for example. But much solo instrumental music of this kind is given by Continental stations. The *drengetimer* (boys' hour) is a good feature, and is more educational than the ordinary children's hour. *Lyttermeddelelser* which literally means "listeners' letters," is a feature which the B.B.C. might copy, and is the equivalent of the correspondence columns of printed papers. The *Pressens Radio-Avis* is really more than a news bulletin. It is somewhat similar to the *journal parlé* of the French stations, and is virtually a radio edition of a miniature daily paper.

A very critical analysis is made, and a sheet is published showing the number of replies received and the "more," "no change," "less" verdicts in each case. There are sixteen districts, including Copenhagen itself, Zealand (near the Kalundborg station), Jutland, provincial towns, country areas, etc.

Individual Tastes

Those filling in the questionnaire are requested to give particulars about themselves, and statistics are available showing the voting by farmers, traders, fishermen, workmen, Civil Servants, married women, and so on. The figures are rather formidable, but it really does seem that according to this scheme programmes can be chosen to suit various classes.

If, for instance, a workman objects to the Copenhagen programmes, he can be shown the statistics proving that he has been catered for in the programmes in the proportion of the voting given by his class!

Is such a scheme beneficial to Denmark? Undoubtedly, for this little country has a greater percentage of radio listeners than any other. The percentage of listeners to population is 87.95, whereas in England it is only 67.16, in Germany 49.1, and in Italy only 2.06!

SPØRGE-SKEMA

(Udfyldes af Lytterne).

NB. Besvarelse sker ved for hver Linie at sætte x i een af de tre Kolonner.

1. Højere Musik, derunder Symfoni- og Kirkeemusik
2. Lettere Orkestermusik
3. Blæseorkester (herunder Militærmusik)
4. Kammermusik, Piano og Violinsolo
5. Opera, herunder Transmission fra Det kgl. Teater
6. Operetter og Sangspil
7. Kor- og Kvartetsang
8. Solosang
9. Gammel Dansemusik
10. Moderne Dansemusik (herunder Transmission fra Restauranter)
11. Mandolin, Balalejka, Harmonika og specielle Instrumenter
12. Skuespil, Smaastykker og Sketch fra Studiet ell. Teatre
13. Oplæsning af Digterværker, Poesi og Prosa
14. Let Underholdning, Kabaret, brogede Aftener o. lign.
15. Foredrag om historiske, literære, kunstneriske o. lign.
16. Foredr. o. naturvidenskab, geografiske, hygiejn., tekn.
17. Foredrag om sociale, økonomiske, politiske o. lign.
18. Spec. Foredr. (f. Eks. for Landbrugere, Havedyrk., Husdyr)
19. Diskussioner
20. Transmissioner af aktuelle Begivenheder, Møder o. l.
21. Undervisning (Sprog etc.)
22. Gudstjenester, religiøse Udsendelser
23. Børnetimer
24. Drengetimer
25. Lyttermeddelelser
26. Pressens Radio-Avis

	Der ønskes.			
	Mere	Som nu	Mindre	
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Skrivne Ønsker, se Bagenden.

The Questionnaire which has to be filled in by Danish listeners when renewing their licences. A translation is given in the text

Ordinary programme ballots have not proved to be very helpful in England. Several daily papers have from time to time tried to get readers' opinions for the doubtful benefit of the B.B.C., but it has not helped towards better programmes, for one very good reason.

Unless there is some compulsion or special inducement about the ballot it is probable that 50 per cent. of those giving opinions will do so only because they are

"no change," "less." Thus a reasonably close analysis is obtained.

The subjects suggested are, in the order given; classical music, light music, brass bands, chamber music, opera (relayed from the Theatre Royal in the capital), light opera, choirs, songs, old dance music, modern dance music, "mandolins, balalaika, harmonica, and special instruments," plays and sketches, poetry recitals, light entertainment (*cabaret*), talks on his-

An introduction to the first "A.W." portable for this season—

—a simple all-enclosed three-valver with two L.F. stages



The MERRY-MAKER PORTABLE

Great strides have been made in portable set construction in the last twelve months. What really will make the 1930 portable better than its predecessors, though, are first, the new components now available, and second, the regional scheme. Here are preliminary details of the first of the "A.W." 1930 portables

SO many bricks, metaphorically speaking, have been thrown at the regional scheme that it is gladdening to come in the summer time to a phase of it which will enable thousands of listeners to reap some benefit. As though to counteract for the jamming and wipe-out experienced in some quarters during the winter months with home sets, there comes in the portable-set season the great advantages of having, over a large area in this country, two very powerful medium-wave stations giving alternative programmes.

This affects the portable-set user in several ways. For one thing he has not necessarily to bother about building a set with wave-change switches. Though this does not matter very much in the larger home-use receivers, wave changing is often

high-frequency stages will not be necessary, except where very great range is required, or where local conditions are extremely poor. In 1929 a portable-set user in, say, the London district could get 2LO, 5GB, 5XX and Radio Paris as the main stay of his outdoor radio.

There was a good deal of difference, usually, between the strengths of 5GB and 2LO, and this meant difficult searching. 5XX was not worth while worrying about, because it gave the same programme as London, and the reception of Radio Paris involved wave-changing. To get really good strength, both from 2LO and 5GB a high-frequency stage was needed, although the plain detector and two L.F. arrangement would work well provided one relied mainly on the local station.

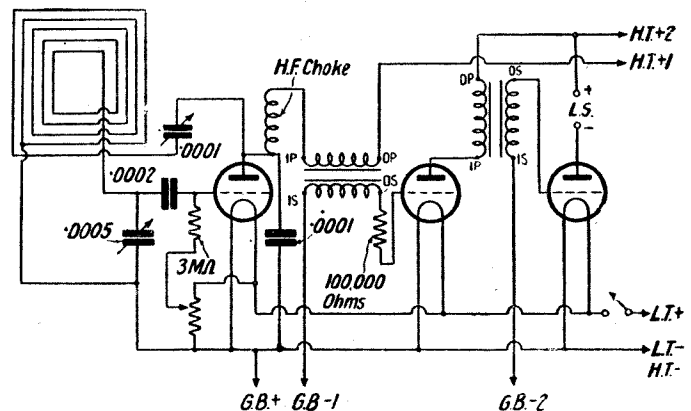
Now, with the Brookmans Park stations working and with the Midland regional station available for listeners in the centre of England, a detector and two L.F. portable should be in its element. The power of the two London stations having been so greatly increased, a good detector arrangement with an efficient frame aerial, and followed by two good low-frequency stages should certainly give all the punch that is needed.

It is because the AMATEUR WIRELESS designers are confident that portable users will experience these benefits from the regional scheme that they have designed the present receiver, which is of the type mentioned, namely, a plain detector with two transformer-coupled low-frequency stages.

The design of the set, and the manipulation, have been very largely simplified by

the fact that no wave-changing switch is incorporated, the purpose of the receiver being to work only on the medium-wave national and regional stations.

It should not be overlooked, of course, that many of the Continental broadcasters on the medium waveband oft-times come in at about the same strength as the B.B.C. stations, and even without a high-frequency stage, there are always two or three foreigners which can be relied upon to give



The circuit of the "Merry-maker Portable" is straightforward

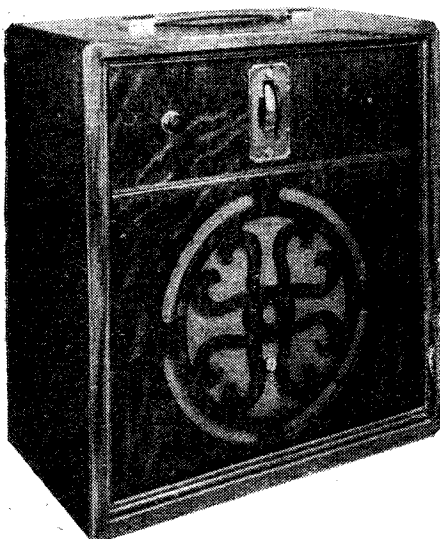
alternative programmes to the Brookmans Parks and the Midland regional.

A set such as this present portable will certainly not quickly go out of date, and by the time the regional scheme is in full working order, there will be a wide gamut of stations all on the medium waveband which can be received.

Components

Low cost is a great feature of this new receiver, thanks to skilful design and attention to such matters as component layout and current consumption. The following is a list of the parts required:—

Portable cabinet (Camco "Carrier").
 .0005-microfarad variable drum-control condenser (Burton, Dubilier, Lotus, Polar, Ormond, Keystone).



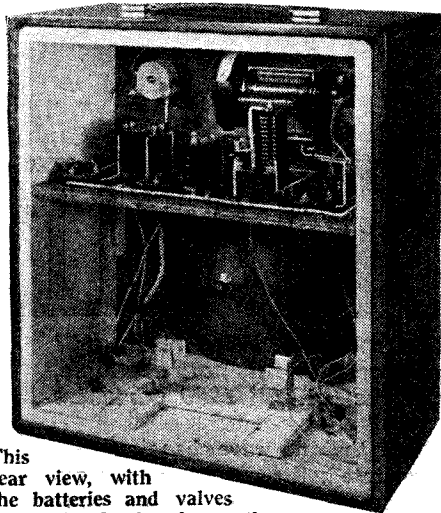
The external appearance is quite pleasing. Note the convenient thumb control

difficult to arrange in a portable set—particularly if an H.F. stage is included, and the high-frequency coil and the frame aerial have simultaneously to be switched on to the long and short waves.

The next point of importance is that

"THE MERRY-MAKER PORTABLE" (Continued from preceding page)

.0001-microfarad reaction condenser (Keystone, Bulgin, Lissen, J.B., Lotus, Burton, Formo, Polar, Ready-Radio).



This rear view, with the batteries and valves removed, clearly shows the simplicity of construction

Filament switch (Bulgin, Benjamin, Lissen, Junit, Lotus, Igranic, Claude Lyons).

Three valve holders (Lotus, Benjamin, Formo, Burton, Brownie, Wearite, W.B., Trix, Junit).

.0002-microfarad fixed condenser with series-parallel clips (T.C.C., Dubilier, Graham-Farish, Lissen, Watmel, Atlas).

.0001-microfarad fixed condenser (T.C.C., Dubilier, Graham-Farish, Lissen, Watmel, Atlas).

Two spade terminals, marked L.T. +, L.T. - (Belling-Lee, Clix, Eelex, Igranic).

Six wander-plugs, marked: G.B. +, G.B. -1, G.B. -2, H.T. -, H.T. +1, H.T. +2 (Belling-Lee, Clix, Eelex, Igranic).

Four-pole balanced armature loud-speaker unit (Lissen, Blue Spot, Watmel, Tunewell).

Piece of cone-paper (Six-Sixty, small size).

10-in. square of brown silk for fret.

Grid-bias battery clip (Bulgin).

High-frequency choke (Lewcos, Lissen, Ready-Radio, Tunewell, Keystone, Igranic, Bulgin, Wearite, Varley, Polar, Sovereign).

Two low-frequency transformers, ratios 3 to 1 and 6 to 1 (Igranic type J, Lissen, Telsen, Brownie, Lotus, Varley, Burton, Bulgin).

100,000-ohm fixed resistance (Graham-Farish, Ready-Radio, Lissen, Dubilier, Varley, Ediswan).

3-megohm grid leak (Lissen, Dubilier, Watmel, Graham-Farish, Igranic).

Fixed potentiometer (Polar, Lewcos).

Panel brackets (Lissen, Bulgin, Keystone).

4 oz. No. 22 d.c.c. wire (Lewcos, Keystone).

2 yards of thin flex (Lewcoflex, Keystone).

Connecting wire (Glazite, Keystone, Konekterkit).

This portable is a portable in the strict sense of the word, for it can easily be carried by hand. It is built in a most attractive wooden case, with a front combined with a loud-speaker fret having a very pleasing appearance. The portable can thus be used indoors as a transportable, and is an excellent piece of furniture. By careful arrangement of the components, the resulting battery space available is very generous (the actual batteries recommended will be dealt with later) and in spite of the fact that the set is entirely self-contained, including the loud-speaker, it is possible to incorporate batteries large enough for prolonged use in the house.

Alternatively, an eliminator or suitable dry batteries can be used for indoor working, the portable batteries being used when the set is taken out of doors.

The Controls

The photographs show that the front of the set is very artistically arranged. The loud-speaker fret occupies the lower part of the set front. Immediately above it and in the centre is the thumb control for the frame aerial tuning condenser. Thumb control is very convenient for portable sets. It provides a very sturdy and easily-manipulated adjustment of what is virtually the only control in the set, except for the reaction condenser: and the type of drum dial used in the present portable has an additional drum control slow-motion device which is very convenient.

To the left of the drum dial is the push-pull on-off switch, and to the right is the reaction condenser knob. The adjusting screw head of the loud-speaker unit is accessible from the front of the set, but is virtually hidden by the fancy fret, and is not at all in the way or unsightly.

The frame aerial box is made in one, as it were, with the front of the set. The cabinet details are clearly shown.

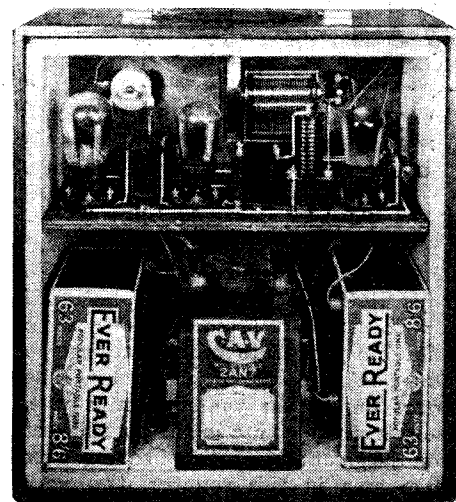
The Components Shelf

The main components of the set are mounted on little baseboard at right angles to the set front, and supported by two L brackets. The loud-speaker employed is of the cone type and is extremely easy to construct. In a simple receiver of this type, it was not considered advisable to incorporate a loud-speaker of, say, the linen-diaphragm type. Although this would give very good results, it would involve constructional work which beginners, impressed by the otherwise straightforward layout of this set might not care to undertake.

At this point it is opportune to mention that the blueprint of the receiver should be studied in conjunction with these notes, by all who want to build the set. A small reproduction of the blueprint will be given and this in conjunction with the list of

parts required and the circuit diagram, will be an aid to construction. All constructors are advised, however, to get a full-size constructional blueprint which can be obtained price 1s., post free, from the Blueprint Dept., 58-61 Fetter Lane, London, E.C.4. The set can be seen, as is the case with all AMATEUR WIRELESS receivers, in the windows of the radio department of Messrs. Selfridge & Co., Ltd.

In next week's issue, constructional notes and full operating details will be given.



The "Merry-maker" ready to work, with the back of the cabinet open to show how the H.T., L.T. and bias batteries are carried

G.B. for S.G.

ONLY those who keep a milliammeter continually in circuit with the negative high-tension lead really know what kind of load is being placed on their high-tension source of supply. I am open to wager that many a user of a multi-valve set would be simply horrified were he to measure his current consumption with the H.T. voltage right up to the mark. One point that probably would surprise him is the amount of current taken by screen-grid valves unless the control grid is biased. Recently I fitted one of the oldest patterns into the set and tried it out first of all before I had had time to install a biasing cell. With 150 volts on the plate and 75 on the screen-grid the total H.T. consumption for this valve alone was over 8 milliamperes, or as much as many output valves take. The introduction of a biasing cell made a considerable economy, and a little juggling with the H.T. voltages produced a condition of affairs in which the valve was giving first-rate amplification and not drawing, all told, more than about 4 milliamperes. For battery users every milliamperes counts, and the same is true of many sets run off the mains. If the eliminator is a small one a big current drain means a heavy drop in the voltage.

THERMION.

BROADCAST ARTISTES IN PICTURE



GLADYS NAISH.—The "Welsh Nightingale." As a coloratura singer and exponent of oratorio, she has long excelled.



BERT COPLEY.—A popular entertainer and humorist of the provinces, Mr. Copley has been heard on many occasions through 5GB. He has a wide repertoire and a capacity for quiet humour and inimitable characterisation.



ISOBEL BAILLIE.—Miss Baillie is heard perhaps to best advantage in the Bach cantatas in the National Sunday programmes; she is equally at home in concert or operatic scores.



HARRY DYSON.—A member of the Belfast station orchestra, Mr. Dyson is one of the best-known flautists in the provinces. He has made a deep study of his instrument, both for solo and orchestral work.



BARBARA FREWING.—A singer possessed of an exceptionally sympathetic contralto voice, Miss Frewing has had wide experience in every class of vocal art.



WALTER GLYNNE.—Mr. Walter Glynn has a repertoire for every type of music; his rendering of the modern British songs of Coates and Quilter are always most artistic.



DAISY KENNEDY.—One of the very earliest of the famous artistes to broadcast. Her exceptional power and technique are particularly suitable for broadcasting.



DE GROOT.—For so many months in the early programmes of broadcast music, with his orchestra at the Piccadilly Hotel, De Groot widened still further his reputation gained both here and on the Continent, for musical values.



GLADYS ANCRUM.—Few operatic artistes have had more difficult rôles than Miss Ancrum, late of the B.N.O.C. Her special rôle is that of Venus in "Tannhäuser."

Winding Your Own

"TALISMAN"

COILS

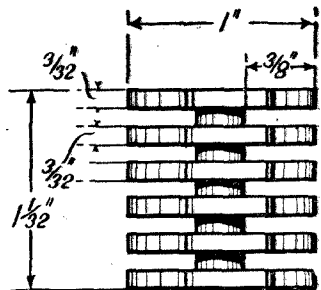
By
L. A. CHAPMAN

IN response to a large number of requests from readers, we give below the constructional features of the "Talisman" coil as originally published in our issue dated May 25, 1929.

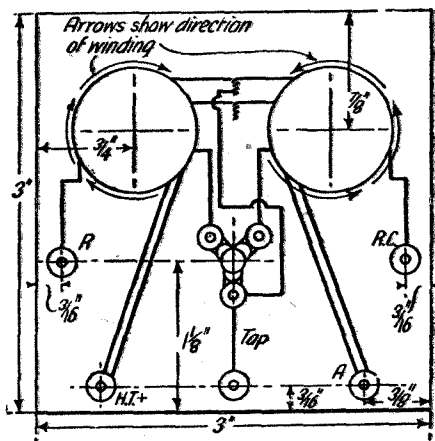
For the construction of the coils, proceed as follows. Having prepared or obtained the grooved formers and the base, mark each former with some distinguishing mark, and then proceed with the actual winding.

Begin with the medium-wave winding, which is at the lower end of each former. Looking at the plan drawing of the complete coil, take the left-hand former and wind on 80 turns of No. 32 d.s.c. copper wire in a clockwise direction in the lowest slot.

In the other former wind a similar number of turns of the same wire in the lowest slot in an opposite direction.



Details of grooved former



Plan of coils on base showing directions of windings

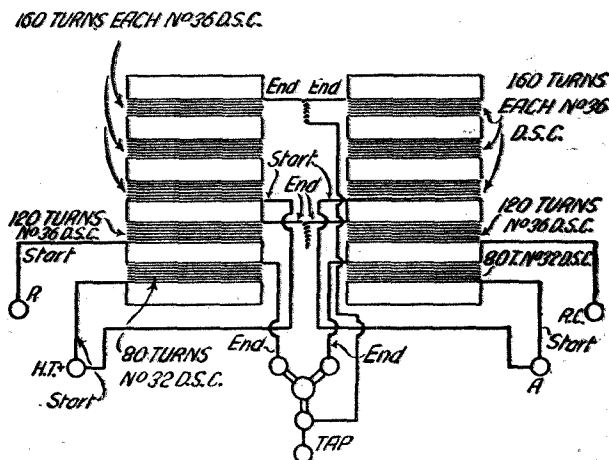
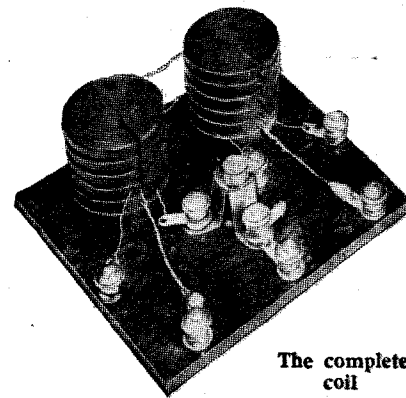


Diagram showing coil connections



The complete coil

The remainder of the coil is wound with No. 36 d.s.c. wire. Returning to the former first wound, wind on in the second slot from the bottom 120 turns of the No. 36 in a clockwise direction, and take care not to get the beginning and ends of each winding mixed up. Now wind on in each of the remaining slots 160 turns of wire without breaking the wire between the third, fourth, and fifth slots.

Mark the beginning and end of this winding.

Attention can now be directed to the winding of the other former. In the second slot are to be 120 turns as a complete

winding for the reaction, and in the remaining third, fourth, and fifth slots 160 turns each, this winding being continuous.

This second former is wound entirely anti-clockwise.

Connections

All that now remains is to connect up the beginning and end of each individual winding according to the drawing showing the detailed connections.

With this particular coil it is possible to tune from as low as 200 metres right up to 600 metres, on the medium waves, and from 1,000 metres or less up to 2,000 metres on the long waves.

OSCILLATIONS THAT LAST FOR DAYS

IF one sets up an oscillation in a tuned circuit consisting of an inductance with a condenser connected across it, the oscillations very rapidly die away, due to the presence of resistance. The current, we say, is "damped out."

Now, one of the things which one learns on first entering the realms of electricity is that the resistance of wire varies with temperature. As one increases the temperature, the resistance goes up, whereas when one reduces the temperature the resistance goes down.

It is quite easy to find the relationship between the resistance of a wire or coil and the temperature, and if this is done

a curious fact is brought to light. The variation is directly proportional to the temperature, and there is a critical temperature at which the resistance theoretically vanishes. This temperature is very low indeed, namely, -273 degrees. Modern science, however, is able to produce extraordinarily low temperatures by liquefying gasses like helium, or even ordinary air, so reaching temperatures within a very few degrees of this absolute zero, as it is called. When this is done it is found that the resistance of the wire really does become extraordinarily low.

The phenomenon is known as "superconductivity," and the resistance of the wire becomes so very small that it can hardly be measured. If one sets up an oscillating circuit consisting of a coil of

wire with a small condenser across it, oscillations, once started, will persist for days and days before they finally die out.

One cannot make much practical use of this, because the expense of maintaining the very low temperature of over -250 degrees is high, but it is an interesting commentary on the condition that is obtained with these low voltages. One often finds laws connecting certain properties, which indicate that at a certain point some apparently very desirable result will take place. Usually, however, before one gets within measurable distance of this point an entire change takes place in the character of the phenomena.

In this instance this is not the case to any appreciable extent. The resistance really does get lower and lower. J.H.R.

On Your Wavelength!

Getting America

HERE is a hint or two on receiving the medium-band American stations, such as WEAf, WLW, WGN, WBZ, WBBM, KDKA, WGY, and WJZ. It is best to use one station as what we may call a "reference" transmission. What I mean is this. Choose a powerful station on a suitable wavelength and try it as soon as the closing down of stations on this side of the Atlantic has cleared the ether in that neighbourhood. If you can't hear anything of it, then it is most likely not worth while going for anything else. If, on the other hand, it comes in even faintly, then it is probable that you will hear something of other U.S.A. stations. The best reference station is WGY, which works on 380 metres. The power of this station is 50 kilowatts, and when conditions are good he is usually by no means difficult to tune in. Now, 380 metres is only one metre less than the easiest of all European stations, Toulouse Midi. Make a very careful note, therefore, of the exact settings required for Toulouse, and you won't have far to search in order to find WGY, if he is coming through.

Keep in Step

It is most important to have the tuned circuits exactly in step when you are searching, and here is a method that I find best myself. Assume that the second dial gives the more selective tuning. Set this at a point, tighten up the reaction a little and move the less selective dial until a slight rushing sound is heard, which means that the set is on the verge of oscillation, or in its most sensitive condition. If no transmission is picked up, advance the second dial a quarter of a degree, and move the first a little, first one way and then the other. Continue the process, advancing the more selective dial a quarter of a degree at a time, keeping the reaction coupling close and twiddling the first dial slowly to and fro. Don't try to pick up carriers with the set in oscillation and then to find the silent point. Silent-point tuning is always a hopeless business.

Don't Forget This

If you contemplate installing a battery eliminator or a mains receiving set and your local current supply is not A.C., don't forget to inform the powers that be that you are doing so. As I understand the position, electrical apparatus has to be altered or replaced free of charge if a change in the nature of the supply is made which renders it useless. If, however, notice of the installation is not given, then the authorities are under no obligation whatever to do anything in the matter. This hint is particularly important for those who at

present have direct-current supplies. All of these will eventually be converted to A.C., and you can safeguard yourself against future expense by taking the simple precaution mentioned. In the case of A.C. sets or eliminators it is not quite so necessary to give notice, for these are, as a rule, fairly easily and cheaply adaptable to changed conditions.

Few Valves or Many?

The ancient controversy between the few-valvers and the multi-valvers is being revived just now, and it is exceedingly interesting in the present state of affairs. Valves are, of course, far more efficient than they were in the early days of wireless, and we have components that will enable us, if we want to, to get an enormous amount of amplification out of them. With a screen-grid valve, for example, carefully picked and used with just the right components, one can probably obtain as much over-all amplification as from two neutralised triodes in cascade. The pentode, again, can do about as much in the way of amplification as a resistance-coupled L.F. stage plus a low-impedance output valve. One can therefore make to-day a three-valve set which is in every way as good in the matter of over-all amplification as the five-valver of yesteryear. We have made big advances, too, in the matter of selectivity, and I have been astonished to find lately what knife-edge selectivity is possible with only one high-frequency stage. Even if we discard the pentode and use a low-impedance output valve in the three-valver, we still have plenty of volume from both home and foreign stations.

Will the Three-valver Triumph?

The three-valver is certainly the most popular set to-day, and I think that it may remain so for a long while. The two-valver, however, is making a distinct bid for the favour of the wireless public. And very wonderful are the performances of some of these little sets. I tried out one recently which gave all the volume that one could possibly require from the local and one or two other stations. Its selectivity was remarkable, considering that it had no high-frequency stage, and it was, of course, an exceedingly economical set to use. The reader may say "Well, now that we have the regional scheme with high-power stations, the two-valver will probably come into its own." At first sight there would seem to be a good deal in this, but there is an unsuspected snag which provides the manufacturer with a really difficult problem.

A Queer Problem

Here it is. Within what I call the swamp

area—that is to say, at a range of from fifteen to twenty miles of a regional—there is ample volume to play with, even when an indoor aerial is in use. If you have not an H.F. stage you can increase selectivity only at the expense of a certain amount of signal strength. This does not matter within the swamp area, where there is an ample margin to play with. But if you make your set selective enough for this area it may be too selective and give too little volume in places outside it. Makers cannot afford to neglect the swamp areas, since each of these includes from 700 to 1,200 square miles of thickly-populated country, and to make two models would be unsatisfactory, for a purchaser would be justly annoyed if a set that he had bought when living close to a regional station became of little use if he moved further out and vice versa. The problem is being tackled, but its solution calls for some hard thinking. To my mind, one of the most curious results of the present regional scheme is that it makes necessary not a smaller, but a larger set for good all-round reception.

Radio and the Talkers

I find that all wireless men are interested in the technical side of talkies, particularly those who use gramophone pick-ups a great deal. After all, the problems that the radio-gramophone man has to overcome with his set for reproduction in small rooms are the same as those which, on a larger scale, confront the talking-picture man in the reproduction of sound in large halls. I am particularly taking an interest in the present contest for favour between the disc and film methods of reproducing talking pictures. Readers are already aware of the fact that there are two main systems: one in which the sound is picked up from a disc running in synchronisation with the film, and the other in which the sound is in photographic form on a track at the side of the film picture, and which uses a photo-electric cell for making the transfer of sound impressions from variations of light to electric impulses.

Sound Film Gains Ground

At the commencement of the talking-picture boom, there was no doubt that the disc method gave by far the better quality and more reliable results. Recently, however, the sound-on-film method has gained ground, and the results heard in current releases indicate that the disc is now left far behind, so far as quality is concerned. Two pictures recently released all over the country, *Honky Tonk* and *Fashions in Love*, are interesting demonstrations of the present state of affairs. Both films were recorded with the Western Electric system,

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On Your Wavelength! (continued)

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but *Honky Tonk* used discs and *Fashions in Love* had the sound on the film. So far as quality was concerned, the results obtained in the direct reproduction of sound from film were vastly superior to those from the discs.

Alternatives

I said "direct" reproduction from film, you notice. It is not generally realised that nearly all disc talking pictures have the sound recorded on film in the first place, and that the sound is transferred to disc before releasing the pictures to the cinemas. Picturegoers will find that, as a general rule, the shape of the picture on the screen when a sound-on-film system is being used is almost square, whereas the proportions of height and width of picture for discs is usually the same as for the old silent pictures. In short, disc talking pictures are usually wider than sound-on-film pictures. Many pictures are released with film and disc editions of sound, the latter being made, of course, by transfer. In the case of nearly all so-called "natural colour" pictures, discs have to be used on account of the special colour film base affecting the sound track of sound-on-film and giving crackling noises and distortion. Thus, the coloured sections of *The Great Gabbo* use discs, but the remainder of the picture, which is in black and white, has a sound track on the film. Nearly all cinemas can reproduce from both film and disc.

"A.W." in the Studios

I am occasionally a very privileged person and am permitted to see talking pictures made in one or other of the British studios. The other day, down at Twickenham, I watched some thrilling scenes being shot inside a *Zeppelin* gondola, in which there was a fight for the plans of a new "death-ray." Imagine my embarrassment when I discovered that the "plans" were actually a blueprint of the *Wireless Magazine* "Binowave Four," one of the most popular sets of last season, and still one of the very best! When you see and hear *The Last Hour*, try to spot it!

The Same with a Difference

Broadcasting is said to be a leveller. Certainly on many occasions homage does not appear to be paid to the extent to which we are, perhaps, accustomed. A curious example of this occurred only the other day, and such is the B.B.C.'s mentality on these matters that I have not been able to decide whether the matter was a slip on the part of the typist who prepares the agenda for the announcer or whether it is a deliberate piece of B.B.C.-ism or not.

Now, I think most people have heard of Coleridge-Taylor. His musical setting to Longfellow's *Hiawatha* is a classic, added to which he composed a number of other works

which are popular to a greater or less extent. I have always referred to the gentleman as Coleridge-Taylor and have always heard him spoken of in this manner. That being so, it took me quite a time before I was able to realise what this meant when the announcer the other day said that the band would now play several waltzes by C. Taylor. Can you beat it?

A Curious Fault

By the way, I came across an amusing little fault the other day. It took me nearly an hour to find it, and I laughed heartily when I did find it.

I had hooked up a perfectly simple valve amplifying circuit with which to try out a pick-up. I tried it out, and could get nothing whatever through. I tested the circuit piece by piece and found that the first valve was faulty. I replaced it, and found that the new valve was also faulty. Having done this three times, I began to grow suspicious and tested all the valves in another circuit. They were quite all right! I returned to the attack and made a few further investigations into the circuit. It was not until I did what I should have done right at the start, test the circuit through with a voltmeter, that I discovered no contact between the anode socket of the valve holder and the anode terminal. I therefore yanked out the valve holder and examined it, but could find no fault. The spring was quite in order and everything seemed to be O.K. In fact, when I tested the continuity between the valve socket and the soldering tag I found everything quite satisfactory.

Quite by accident I stumbled upon it. For some unexplained reason, a small washer had been inserted between the soldering tag which was in one piece with the spring and the screw running through the centre which carried the terminal nut. The hole in the soldering tag happened to give a good clearance, with the result that there was simply no contact whatever between the screw and the valve spring itself.

Photo-electric Cell Sensitivity

Television has given a wonderful impetus to the development of photo-electric cells. The activity and sensitivity of a photo-electric cell depend mainly upon the material with which the inner surface of the bulb is coated. All materials are photo-electrically active to a greater or less degree, but the most active ones have been found to be those which chemists call "rare earths," such as caesium, rubidium, uranium, etc.

Now no known photo-electrically active substances are sensitive indiscriminately to all wavelengths of light. Each such substance is affected by a definite band of light waves only, and has its point of maximum

sensitivity at some wavelength within the band. Speaking in general terms, the more active substances have their point of maximum sensitivity within the visible portion of the spectrum, while the less active substances respond best to light in the extreme violet or ultra-violet portion of the spectrum.

Sundry Applications

In the course of some investigations I was making recently, I was struck very forcibly by the multitude of applications to which photo-electric cells have been placed. It would astonish you if I just barely stated the number and diversity of objects in which they play their part; but I will content myself with mentioning a few of the most outstanding. We have talking films, telephotography, detection of dust and smoke in air and gases, optical alarm systems, control of printing and textile machines by means of stencils, control of chemical reactions, of smoke production and colour changes. As time progresses, the applications will extend farther and undoubtedly there will be a marked progress in television itself when the exact working of the cell becomes more perfectly understood and its manufacture thereby improved.

Amateur Television Apparatus

In order to gain a first-hand impression of the efforts made by amateurs in making up television receiving apparatus I paid a visit to the second annual exhibition of the Television Society. Amongst other things, the Society forms a common meeting ground for professional and other workers interested in current research relating to television and other allied subjects. The enthusiasm of the people I came in contact with was unbounded and some of the models which had been made at home displayed great ingenuity. There was a complete transmitter working under the control of three members and this supplied land line signals to those receivers which were capable of showing results. Obviously one did not expect to see as good images as obtained from the commercial product, but since necessity is the mother of invention, the schemes adopted to keep costs within the scope of the average purse were very creditable.

One associate showed what he claimed to be a new television system dispensing with mechanical parts, while there were several working exhibits which emphasised various television principles. Another associate displayed a piece of apparatus of his own invention which he had called the "Televidascope." It was a compact form of television receiver using drum exploring, and steps had been taken to enable more than one observer to see the image at the same time.

THERMION.

THE ADVANTAGES OF MASS-PRODUCTION RADIO

Discussed by the "Set Tester" in reviewing the Kolster Brandes K.B. 163 three-valve battery-operated set

COMPARISONS are often made between the radio of this country and of America. Because the broadcasting conditions are so different, the sets also are different. One of the big differences between American and British sets is that in America mass-production by a few big firms is the rule, whereas in England there are dozens of small firms turning out limited quantities of sets. Whether the ultimate performance, valve for valve, of British sets is inferior to the American sets is debatable.

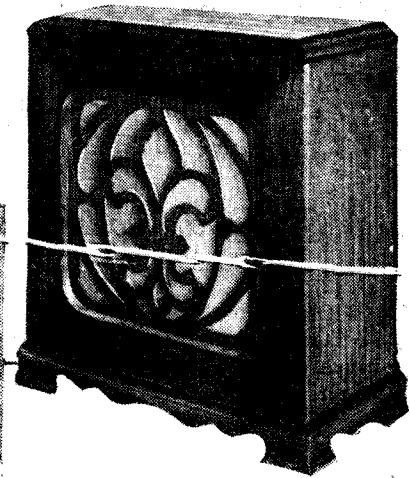
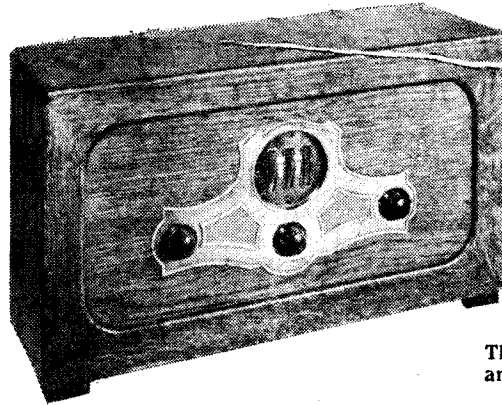
One obvious effect of mass-production in radio is the lowering of the retail price. Many British sets are expensive simply because they are mere assemblies of component parts. An exception is provided by the Kolster Brandes K.B.163 screen-grid battery-operated three-valver.

Simplicity of Assembly

The absence of unnecessary moulding material is notable. The set assembly consists of a metal chassis, stamped out to take the various components. From my tests, I can say that the low retail price of this set is not due to any sacrifice in performance. It is due to the more direct method of achieving the required result. There is much evidence of simplicity of assembly, which goes hand in hand with mass-production. The low-frequency transformer, terminal strips and other parts are either riveted or bolted to the metal chassis. As a result, the whole structure is unusually rigid.

Instead of a control panel on the front of the set, the makers have provided a large oxidised escutcheon plate, on which are mounted the controls. The general arrangement of the controls is good. There are three knobs and three drum-dials. Between the two main drum-dials, one of which is for aerial tuning and the other for the high-frequency coupling tuning, is a vernier drum-dial. This gives a useful auxiliary control of the more selective coupling tuning. In tests, I found this system of tuning very effective.

A clearly-worded instruction booklet is issued with the K.B.163 set. The function of the three knobs below the tuning controls is well explained. These knobs are for the usual wave-range changing, control of volume and control of reaction. I think the volume control would be improved by



The K.B.163 and K.B.72 loud-speaker make an excellent combination. K.B.72 costs five guineas

increasing its resistance, so that loud signals could be reduced more nearly to the point of inaudibility.

Model K.B.163 is designed for modern broadcasting conditions. Judging by the number of stations logged, it is sensitive on the high-frequency side. The tuning is sharp, but not critical. Most of the well-known Continental stations were brought in at good loud-speaker strength, using a 70-ft. aerial in south London. Rome, Oslo and Toulouse were particularly good. The last-named station was received clear of interference from the London Regional.

On the long-waves, model K.B.163 did well. Hilversum and Radio Paris offered good loud-speaker alternatives to Daventry 5XX. The sensitivity is about the same

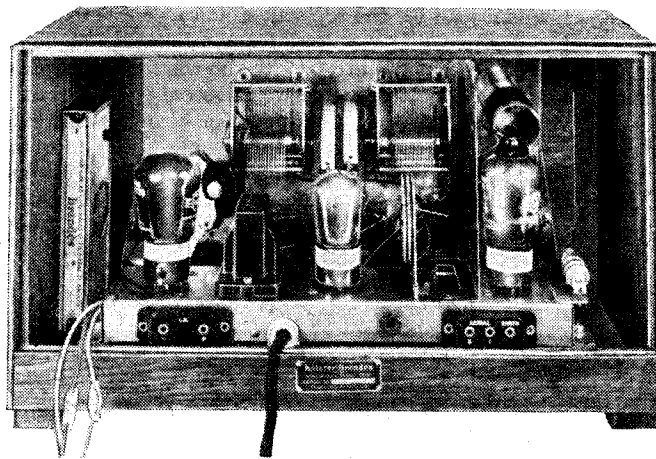
question whether the gramophone amplifying properties are worth while, unless a 150-volt H.T. supply can be provided.

I used three of the 45-volt Columbia super-capacity blocks for the test of reproduction quality. With the Kolster Brandes K.B.72 loud-speaker, quality was quite good. Better results were obtained than from an inexpensive mechanical gramophone. For one thing, the volume was controllable and for another the presence of some bass notes in the reproduction imparted a pleasing roundness of tone.

The makers point out in their booklet the need for large-capacity high-tension batteries for model K.B.163. I found that with the H.T. supply mentioned, the total anode-current consumption was just over 20 milliamperes. This rather high figure is due to the use of a pentode output valve. Double-capacity or super-capacity high-tension batteries are essential.

A Good Set

Provided that the set-buyer is prepared to use such batteries, I consider model K.B.163 is an excellent proposition. We need more of these straightforward three-valve sets for battery operation. After all, there are more listeners without electric light than with it. Further particulars of the set can be obtained direct from Messrs. Kolster Brandes, Limited, of Cray Works, Sidcup, Kent.



Model K.B.163 in the Kolster Brandes range is a good battery-operated three-valver, price £10 15s., including valves

on long and medium waves.

This set is also useful as a gramophone amplifier, provided that sufficient high-tension current is available. As a gramophone amplifier, the detector and pentode valves are brought into circuit by insertion of the pick-up plug. This act also provides the detector with negative grid bias. It is a

A lowbrow who dislikes the Sunday afternoon transmissions of church cantatas has suggested that they should be confined to some place like Heligoland. We suspect, however, that his Bach is worse than his Bight.

IT is a curious fact that, whenever a British radio expert visits America, he comes back either violently for or against everything connected with American radio. America has that effect on most people. Candidly, I came back hating the thought of my country's radio; but a sufficient lapse of time has brought things into a better perspective. In a prominent New York newspaper I made the following somewhat rash statement: "We are left with a feeling of profound regret that our own radio conditions are so remotely different from those prevailing in America." I must have been impressed at the time.

About American sets—are they really better than ours? I still think they are; mass-production, a public with a large purchasing power, and the fact that radio in America is not an institution but really "big business," are contributory causes.

They use electricity more freely in America than we do. All-electric sets naturally predominate because Americans do not have to worry about the total anode-current consumption, the number of valves need not be limited. The average American set has six or seven valves. Two or three of these are high-frequency amplifiers. There is a general assumption that America needs greater selectivity than England. But is this really so? The European ether is just as congested as the American ether.



Money is spent lavishly on American broadcasting; this studio is typical

Our set-makers often seem to overlook the fact that it is quite easy to tap the European ether for broadcast reception, quite apart from the B.B.C. transmissions.

One obvious reason for using more stages of amplification in American sets is that their valves are not so efficient. We cer-



Some Impressions by Alan S. Hunter, obtained during a tour of the States

tainly lead the world in valve manufacture. But more than one American set-manufacturer pointed out to me that the big drawback of making their high-frequency valves more efficient was the resulting deterioration of apparent selectivity.

We have a lot to learn about ease of control. The curse of British sets is their reliance on reaction to bring in distant stations. Foolproof operation of a set is quite impossible under such conditions. Three high-frequency stages, as in American sets, get rid of reaction in the only possible way, by increasing the high-frequency sensitivity. One-knob control is insisted upon in America, and set-buyers get it. What is more, the knob is a control, not a fiddling gadget. Large and easy to grip, the tuning control of an American set has an easy-to-read illuminated dial calibrated in wavelengths.

Portable Sets

One consolation about the British set market is the portable. This type of set is rare in America, except on the dashboards of cars. The necessity for using batteries, and the fact that we have very efficient valves probably explains why we have developed portables so considerably.

One might imagine that with so many people living in apartments, the portable would be much in demand in America. But nearly all the big sets I saw required an external aerial connection. Admittedly a small indoor aerial was quite sufficient. One American set manufacturer told me that portables had been found quite useless

in the big cities, owing to the screening effect of the steel skyscrapers.

Captain Round mentioned, some weeks ago in AMATEUR WIRELESS, that he thought British portables would have "rather a thick time" if worked in the neighbourhood of New York. The portable I took to the U.S.A. had the time of its life! Readers will remember that the basic circuit was later embodied in a very popular set, the "Music Leader." With its two stages of tuning and frame aerial, this British portable had no trouble in separating New York's dozen odd stations. Personally, I think the American set manufacturers have missed a big chance with portables.

On that vexed question of quality, I am still convinced that America has us beaten and will continue to beat us until we have considerably extended our use of electricity. The almost universal use of large power valves in push-pull, with three or four hundred volts on the anodes, accounts for the superior quality of American sets. How can we hope to cope with them when our 120-volt battery has dropped to about 100 volts through hopelessly over-running it?

American Programmes

The average American set is housed in a fine cabinet, which accommodates both the set and the loud-speaker, the latter nearly always a moving coil.

But with all their superior sets American listeners have less scope in reception. No matter where one is located in the North American continent, one is at the mercy of either the N.B.C. or the Columbia chain system. Rival advertising interests have remarkably similar ideas on what the radio public want. I hope they want a high percentage of jazz, because that is what they get!

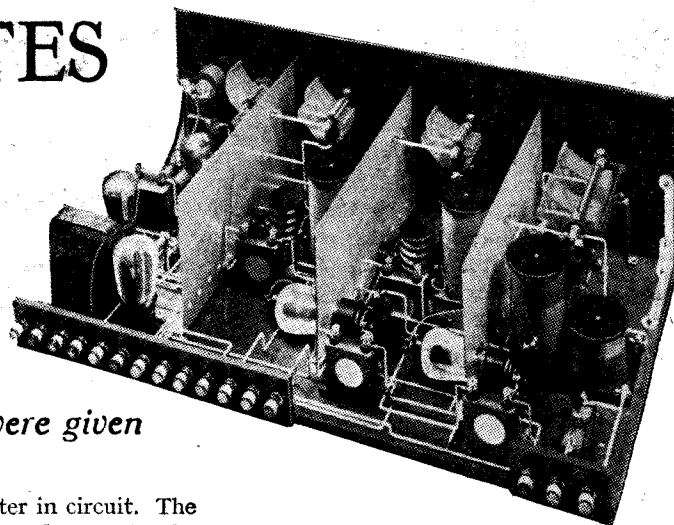
Those who compare the B.B.C. programmes with American programmes sometimes overlook the fact that their comparison is incomplete. To get a fair idea, we ought to compare American programmes with those of the whole of Europe, including the B.B.C.'s. With a modern British set, by which I mean a recent one, I have been able to get far more varied entertainment from the ether of Europe than could possibly be conceived by an American listener.

Tom, Dick, and Harry have been writing to the B.B.C. protesting against the dance orchestras playing while the announcer introduces the various artistes in the vaudeville programmes. We trust that this has not caused Jack pain.

OPERATING NOTES

on *The JAMES*

'QUALITY' FIVE



Full constructional details of this receiver were given in our two preceding issues

THE selectivity of a receiver depends not only upon the number of tuned circuits, but upon their arrangement. Thus, when the coils have too low a resistance, the tuning is very sharp and the higher notes are lost.

Stray couplings in the set may also produce this effect. They have the effect of lowering the apparent losses in the circuits and, therefore, tend to produce instability.

It is therefore necessary so to arrange the coils and other parts of the circuit that stray couplings are the minimum, and the coils ought not to be so low-loss that high notes are lost. If, on the other hand, the coils are made of too high a resistance, the combined tuning may be broad, although distortion will be the minimum.

The magnification also depends to an extent upon the design of the coils, for if they are of high resistance we obtain but little amplification as well as broad tuning.

Detector Anode Current

It is a difficult matter to obtain the best results by using single tuning circuits. The selectivity and magnification may naturally be so balanced that very good results are obtained, as with many three-valve sets having a shielded valve stage. But with an aerial filter circuit, as used in this set, the tuning is not only much better, but the quality is preserved.

I have tried to show this below. Here are three sets of curves. They show how the anode current of the detector varies with the aerial tuning. A milliammeter was connected in the anode circuit of the detector. This is of the leaky-grid type; therefore the current falls as a signal is received. The extent of the reduction is an indication of the strength of the signal applied to the detector, but the output from the set depends upon the degree of modulation.

The change in the current is a good indication of relative strengths. Sets of readings were taken for the London National, Regional, and 5GB stations, first with the tuned aerial coil connected to the first valve, and then

with both coils of the filter in circuit. The only other adjustment made was to the high-frequency volume control, the initial strengths of the signals being set, as shown by the current passing through the detector at equal values.

If this had not been carried out, the detector would have been overloaded. The current was noted for various settings of the dial of the aerial-tuning condenser, a large 180-degree dial being used.

You will see that the curves are peaky and have wide bases when only the single tuned aerial coil was used. London Regional and National interfere, and the 5GB can also be heard when tuned to 5GB.

Very different results are obtained when the filter is connected. The tuning is much better. The curves show a flatter top with steep sides.

Interference is prevented and the quality is much better. Actually, the curves dip at their tops, but this cannot be shown with the scale used.

There is a marked difference in the results when the filter is connected. Distant stations are heard more clearly and little volume is lost. Tuning is not very different when the filter is used and is, if anything, rather easier.

The tuning of the set, as a whole, is soon mastered. There are the three tuning condensers, the volume controls, and the reaction. First put the two volume controls full on. This means that the filament

resistance must be turned on, and the compression type resistance used in the low-frequency circuit adjusted to have its greatest resistance.

Tune in a station in the usual way, and then adjust the H.F. volume control. Notice that the tuning appears to be a little sharper as this control is turned down. The H.F. amplification is, of course, reduced, but, owing to the fact that the impedance of the valves is increased, their damping effect is decreased. By operating the reaction condenser and the H.F. control you will find that the selectivity and magnification can be varied over a wide range.

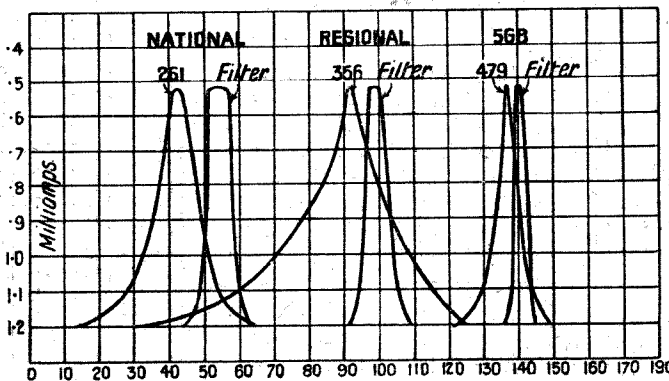
L.F. Volume Control

The low-frequency control does not distort in any way, as it comprises a resistance connected across the primary of the L.F. transformer and its effect is to vary the amount of the L.F. magnification. With a little practice, both controls will be found of great value not only for the purpose of regulating the signal strength, but for adjusting the apparent selectivity.

I have explained that a reasonably high anode voltage is advisable in the interests of good quality of reproduction and adequate volume. As separate terminals are provided, a mains unit may easily be fitted, but those having batteries will be able to connect the terminals for high-tension to the shielded valves as well as the first L.F. and power valves.

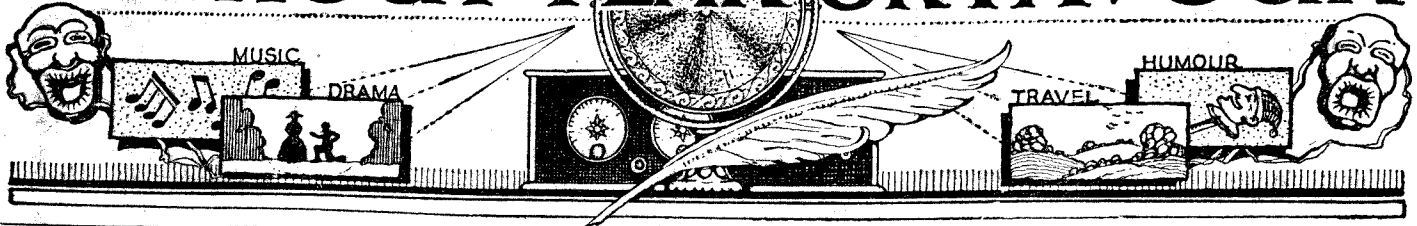
H.T. Values

The performance of some shielded valves is so greatly affected by the voltage of the shield that it is advisable to adjust this voltage with care. Commence with the value suggested by the makers and then try others about this value. The valves used in my tests were Cossor and Osram. Both function very well, and no doubt the other makes do as well, although I have not tried them.



Curves showing how detector anode current varies with tuning

WITHOUT FEAR OR FAVOUR



The Dance Bands Again Chamber Music

A Weekly Programme Criticism by Sydney A. Moseley

A Referendum? Programme Timing

THE old but ever-fresh controversy of dance bands. Several listeners have raised the question with me, and foremost among them has been "Harold," who has been researching. Apparently he has sacrificed his much-needed beauty sleep and stayed up late at nights listening to dance bands and studying their different technique.

I am afraid I cannot deal with his pages of comments. I should require a volume. But apparently he agrees with a member of one of the biggest bands which used to broadcast, whose opinion—rather piquant in the circumstances—is that the bands which have succeeded his are too small.

"They don't do enough of their own orchestration," he said, "but play from the standard band parts, which makes them all sound alike."

Another plaint of his is that the style of the average broadcasting dance band to-day is about four years old. They still have the "oom-pah oompah" rhythm, which died long ago. Up-to-date "hot" bands don't seem to be popular with the B.B.C.

His opinion of Jack Payne's ensemble was almost blasphemous. "It isn't a dance band at all!" he declared. "It's a stunt band, fit for a (censored!). They haven't a ha'porth of rhythm and they make every foxtrot sound like a barn dance."

One usually does not take much heed of the views of a band that has been "ousted," but others of my friends seem to endorse what this ex-broadcaster says.

As for me, even if Jack Payne's is a "show band," I should like to know what dance bands are not. Incidentally, compliments are offered to the West Endians, of Birmingham. "Although a little old-fashioned in style, they have plenty of pep and go."

"Antipo," of Hove, writes a charming letter stating that he always agrees with most of my views, but supports a correspondent who rather "went" for chamber music. As a sort of "middleman listener"

of seven years' experience, who has sat still under considerable pressure, chamber music has at last broken his resolve "and I am writing to you."

"Melody and rhythm," he writes, "whether in high-brow or low-brow music, is delightful; but in chamber music the concatenation of caterwauls, which generally characterises these pieces, accompanied by such ear-splitting shrieks and wailings all out of tune with each other, renders the whole an inharmonious caricature of true music. To many of us it sounds like the individual members of an orchestra 'tuning up' their instruments, each regardless of what notes the others are playing."



An impression of Miss Dorothy Black

Herbert Blair (South Shields) tells me that he thought of the suggestion of the referendum over three years ago. He is not expecting a knighthood, but thinks we ought to know.

Any counter claims?

Mr. Duff Cooper's talk on Egypt was interesting, although I am not prepared to follow him *all* the way in his arguments. Egypt is a land of paradoxes.

Admitting Mr. Duff Cooper's argument that people would rather be badly governed by themselves than well governed by

foreigners, the fact remains that a good many friends of Egypt (who would agree to evacuate) are afraid that if we do so some other big power will step in, thereby threatening our gateway to the East.

Generally speaking, the B.B.C. programmes keep very well to time. Occasionally, however, the items have to be chopped off, and it is naturally irritating to find that often these items are just what you have been waiting to hear.

Frederick A. Dudley, of Twickenham, for instance, complains that Marcel Dupre was cut off at 10.10 p.m. on Saturday evening without concluding his recital, "which seems rather strange, in view of the fact that only the news and closing down were to follow."

My correspondent goes on to point out other instances, and finished up by saying: "It is disappointing in the extreme to have this frequently happening, and if the Programmes Department were to exercise greater care it would surely not be so exceedingly difficult to time items more successfully."

I listened to Phillip Ridgeway's "music-hall" series with interest. First of all, the effort to recall the good old songs is commendable. It is thrilling to hear again those rousing choruses. But the effects were *not* good. Our music-halls were never the uproarious places Ridgeway would have us believe. Hearty applause, yes; and an audience-join-in chorus once every while; but surely it wasn't done on such a scale as portrayed by Ridgeway!

Then, the talking between the acts; if anything ever maddened me it was those silly women! One gets them, sometimes, but surely never so raucous and so inane. To sum up, the old-time songs were welcome, and I hope we haven't heard the last of them; but the effects needed toning down badly—they were sadly overdone.

Savoy Hill perseveres in giving us modern music, and although we have got to like some of it, I fear that the majority is pretty well hopeless. Schönberg brought forth a protest from one of the daily newspapers. As if the B.B.C. didn't know before.

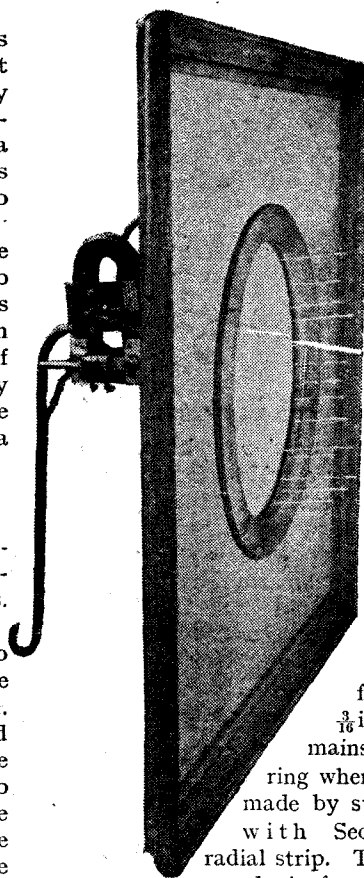
THE loud-speaker described in this article is not new in style, but represents the development of very simple construction. The majority of home-constructed loud-speakers consist of a baffle-board or a cabinet, a cone, a chassis and a driving unit. These are assembled to form the complete speaker. These components may all be purchased but, with the exception of the driving unit, it is by no means essential to success that these parts be bought. From the following description it will be clear that with the exception of the unit a loud-speaker can be entirely home built which will have a very wide frequency response and will handle quite a large power.

The Cone

The cone is best constructed out of good-quality, stiff drawing paper. The rough-surfaced variety gives the best results. Glazed paper is not so good.

A suitable angle for the cone is 120 degrees, and this forms the basis of the calculation of the size of paper required. An average size of hole in the baffle-board for the cone is 10 in. in diameter. Too large a cone gives a boomy bass tone, while too small a cone means that the low notes are practically lost. The size chosen therefore represents a working compromise. The diagram shows the size of paper required. The sizes given can readily be calculated by the mathematically-minded.

Having cut out the development of the cone the next operation is carefully to crease it around the dotted line shown $\frac{1}{16}$ in. inside the edge. This should be carried



The
EAS
CONE

You can build this speaker in an trifling and it will

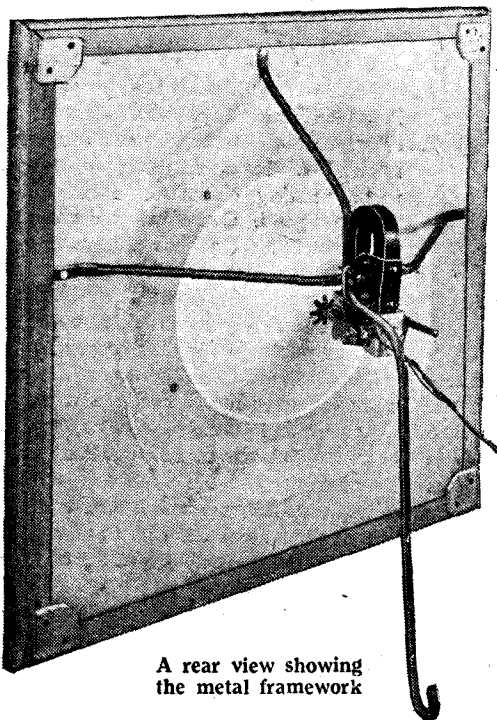
out only so far that the $\frac{3}{16}$ in. margin remains as a flat ring when the cone is made by sticking down with Seccotine the radial strip. The flat ring so made is for the purpose of a glueing strip for the support of the cone.

Cone Mounting

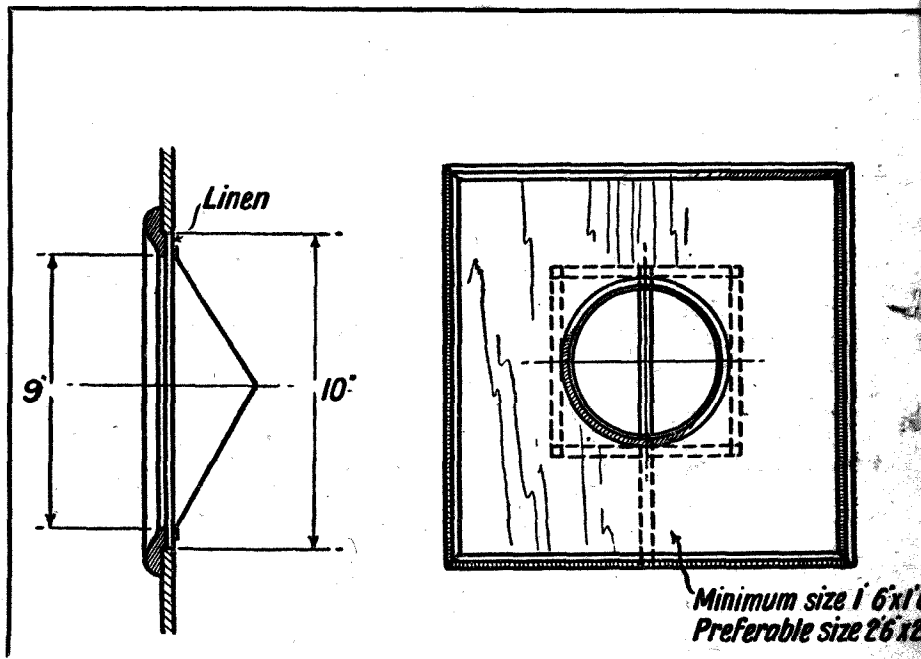
While the cone is being left to set the cone surround can be proceeded with. This consists of ordinary thin linen. Tracing linen, washed out, makes an excellent supporting cloth. The linen should be cut to a 13-in. circle. That is, an overlap of

$1\frac{1}{2}$ -in. is allowed. The baffle-board dimensions are given in the diagram and here a little latitude is allowable. A large size is preferable, as the larger the baffle the deeper becomes the tone of the speaker and the better its response to the low notes. Plywood is quite satisfactory as the material, and if of the mahogany- or oak-faced variety, it will have a fine appearance when polished.

The hole in the centre requires careful cutting, but it will be found that the majority of shops which sell plywood boards are also able to supply them with a 10-in. hole cut. The approximate position of the linen mounting should be marked with pencil on the back of the baffle-board and then the area marked out should be covered



A rear view showing the metal framework



Minimum size 1'6"x1'6"
Preferable size 2'6"x2'6"

Y-BUILT SPEAKER

hour or so. No special materials are required, its cost is give exceedingly good quality and volume.

with Seccotine. This material forms an excellent adhesive for jobs of this type, because it is dry within a few minutes and the whole process of mounting can be carried out and finished in quite a short time. As soon as the Seccotine is on, the linen should be pressed and stretched. As far as possible the linen should be pulled equally in all directions so that no creases remain. When this shows signs of being set, the glueing surface of the cone should be covered with Seccotine and then pushed on to the linen mounting. No difficulty should be experienced in centring the cone; a few pencil marks placed $\frac{1}{4}$ in. in from the 10-in. circle will serve as a guide to correct positioning.

When the cone has dried on to the linen,

the central circle of linen covering up the cone can be cut away with a razor blade or sharp knife. Owing to the fact that the linen is under tension a clean cut is easily made.

The Chassis

The cone is now in position and all that is required is to mount the driving unit. The photographs show a bent metal construction—copper tubing in fact, $\frac{1}{4}$ in. external diameter which is quite easy to bend and drill. As an alternative for those who do not care for working in metal, a wooden construction is shown by the drawings. Either may be varied to suit your own circumstances. The exact position of the driving unit is best found by trial and error. After

the unit has been mounted it is a simple matter to secure the cone to the driving rod.

The Unit

The unit used in the construction of this speaker and shown in the photographs is a Hegra, but there are many makes on the market such as the Blue Spot, Triotron, etc., from which a selection can be made. The performance of the speaker depends on the unit and the care taken. Make sure that the driving rod is not strained or bent. The moulding round the edge of the speaker is merely for ornament and may be omitted, but the central ring is very desirable.

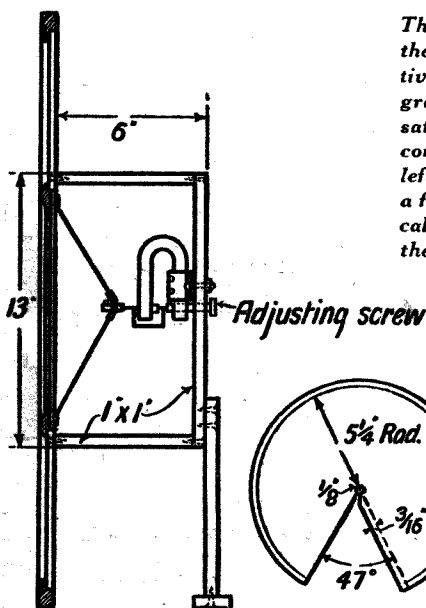
Such rings are usually available at shops that supply plywood.

Suggestions for Improvements

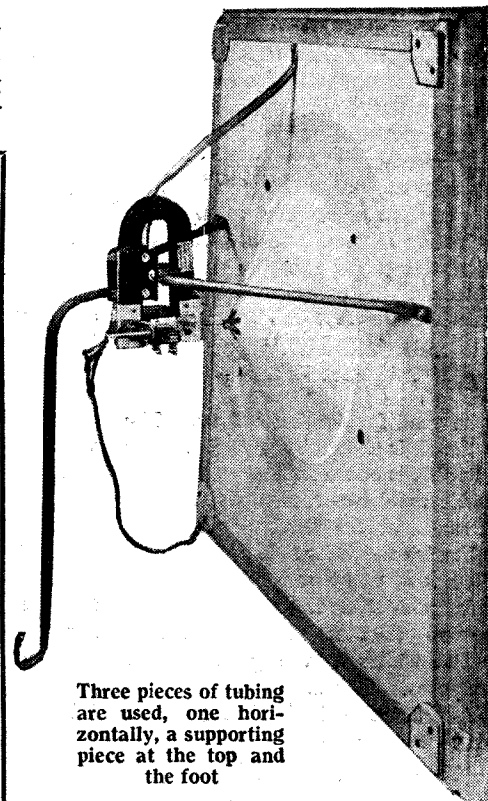
The speaker described is thoroughly satisfactory and as stated earlier will handle considerable volume. Those who wish to try to make improvements should experiment on the lines of making the cone more rigid and yet not substantially heavier. The more a loud-speaker diaphragm acts as a true plunger the better becomes the reproduction. Additional stiffening rings of paper on the inside, and radial stiffeners on the back are therefore suggestions which may be tried out.

The central hole in the baffle may, of course, be covered in with some ornamental gauze.

A. McDONALD.



These drawings show a wooden construction for the unit supporting framework as an alternative to the metal frame shown in the photographs. Either method will be found quite satisfactory, and the choice can rest with the constructor. The drawing on the extreme left shows how the cone is mounted; next is a front elevation of the baffle and then a vertical section through the speaker. Below are the details of the paper cone.



Three pieces of tubing are used, one horizontally, a supporting piece at the top and the foot

MY WIRELESS

Weekly Tips,
Constructional and Theoretical—

"Slow-motion" Troubles

LATELY I seem to have had an amount of trouble with slow-motion dials. The dials used have been new ones and are, no doubt, of average finish. But a proportion seem to be faulty.

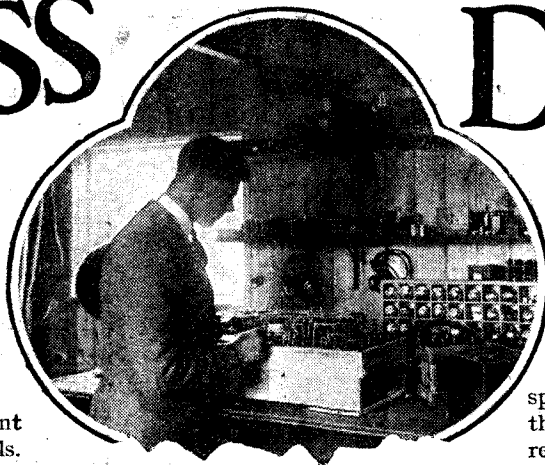
Some are harsh and others slip. Dials having faults of this nature are of no great value, and it is, therefore, as well to examine with care a new dial that is being purchased. The scales of some types are very poor, being small and not easily read.

I feel that a proportion of the slow-motion dials issued are poor amateurish affairs, not worth fitting to a good set. It is time, surely, for manufacturers to attend to this all-important component.

Mains H.T. for Portables!

I note with interest that a firm is manufacturing mains units for portable sets. Not long ago many people would have said that operation from a mains unit was not possible, yet to-day excellent results are being obtained.

There is no hum and no noise. Results are, as a rule, better than when dry batteries are fitted, because of the higher and more uniform voltages available. It seems to me that a mains-driven portable set is a satisfactory arrangement, which is more than I would say of most dry-battery-operated portables. At the same time, when the set is needed out of doors the H.T. battery may be fitted.



DEN

By
W. JAMES

For the
Wireless Amateur

The mains unit is a very compact job, being smaller than many dry batteries, but I believe there is absolutely no room to spare inside the case. To obtain hum-free working without using an earth is something of an achievement.

When it Whistles

Have you ever heard a high-pitched whistle from the loud-speaker when the detector valve has been pulled out?

I had this experience only a day or two ago. The set was of the S.G., detector, power type with a transformer low-frequency coupling. Reproduction was a little high-pitched, but was not really faulty, and the batteries were in good order.

To what, then, was the high-pitched whistle due? I found it could be stopped by placing the fingers across the secondary terminals, and therefore concluded the transformer had a peaked characteristic. The whistle was produced by the feed-back through the power valve, which had a loud-speaker in its anode circuit and the transformer connected to its grid.

It was not produced when another loud-

speaker was tried, which seems to show that the loud-speaker itself had a strong resonance point. The whistle stops when the detector valve is fitted, because of its damping effect, it being equivalent to a resistance, equal to the impedance of the valve, connected across the primary.

A Good Resistance-feed Idea

A question often asked is whether it is worth while to resistance-feed a transformer from a detector valve. The method has been described before in these notes, and consists of connecting a resistance between H.T. and the anode of the detector, and joining a condenser between the anode and the primary coil of the transformer.

By this means the steady anode current passes through the resistance, and not through the transformer. Only speech-frequency currents pass through the windings of the transformer and are stepped up in the usual way.

The advantages of the method are, first, that the quality of the reproduction can, to an extent, be adjusted by proportioning the values of the coupling condenser, resistance, and transformer, and, secondly, the transformer may be of a type which will not deal with a large primary current. For most purposes the method is more expensive than the results would justify, and for this reason the scheme is not greatly used in the detector circuit.

"A.W." Solves your Wireless Problems

"DESIGNING A D.C. POWER AMPLIFIER"

(Continued from page 586)

may also be used for further valves. The complete circuit is shown by Fig. 3. Across the 6-volt point is connected a 4-volt valve in series with a resistance, which is adjusted to drop 2 volts, at the particular filament current taken by the valve. This is usually either .1 or .075 of an amp. The 2-volt resistance is included on the negative side of the valve so that it gives us a bias of -2 volts which is the position for normal purposes. The anode voltage supplied to this first valve, is obtained through a smoothing circuit and then a resistance feed to the anode. The low-frequency currents are passed through a condenser on to the primary of the transformer using the customary parallel-feed circuit.

The smoothing is necessary because a

small amount of ripple, which may be tolerable in the last stage, is quite sufficient to give trouble in the earlier stages, but here it does not matter if we lose a certain voltage because we have to reduce the voltage on the anode of the valve anyhow. Actually the choke shown is an H.T.4 having an inductance of 130 henries, while a 50,000-ohm resistance serves to provide the necessary impedance for the parallel feed.

Parallel feed is not essential; one could arrange the circuit in a conventional manner, merely using a resistance to reduce the voltage on the first valve to some 60 or 70 volts.

The only other point in the circuit requiring comment is the use of a pick-up transformer. This is desirable in order to boost the strength of the input to a value great enough to load the amplifier fully. It is usually found that a pick-up alone does not apply sufficient voltage, and a

step-up of 2 or 3 to 1 makes a considerable difference. It will be remembered that a pick-up transformer was shown in the original amplifier for the same purpose.

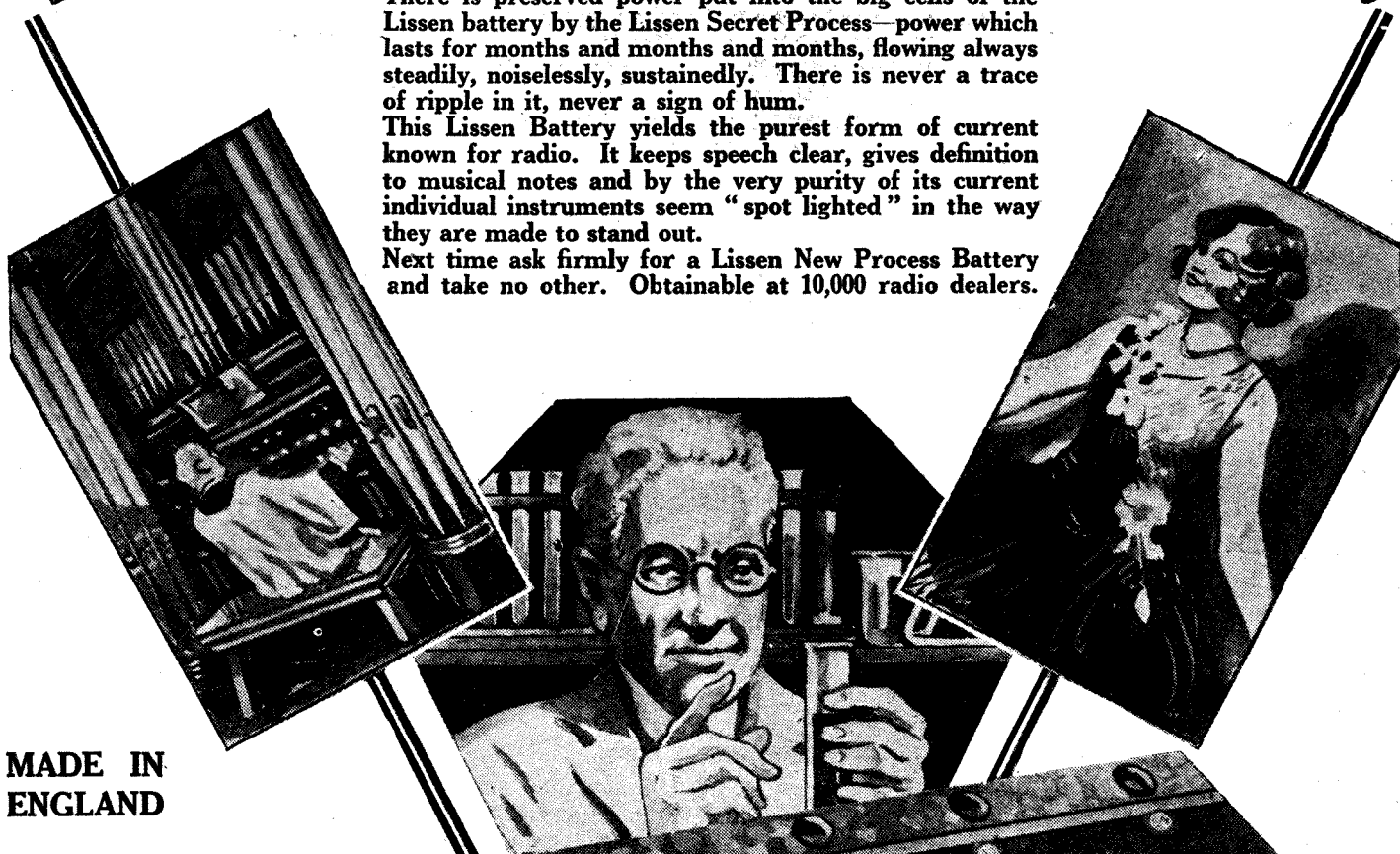
The arrangement shown can be altered in several particulars. It merely serves to indicate a possible method of using push-pull satisfactorily with D.C. working. Provided one has from 220 to 250 volts on the mains, one can obtain good results. For example, with 250 volts we can afford to drop 10 volts in the smoothing circuit prior to the amplifier, leaving 200 volts on the anode and 40 volts grid bias. The smoothing system used in actual practice was a Wearite L.T. 2 choke which only caused a voltage drop of about 1 volt with ½ ampere flowing, although the inductance is relatively small, being only 0.25 Henries. A 4-microfarad smoothing condenser followed. The arrangement was satisfactorily silent even during the quiet passages.

PURE LISSEN POWER

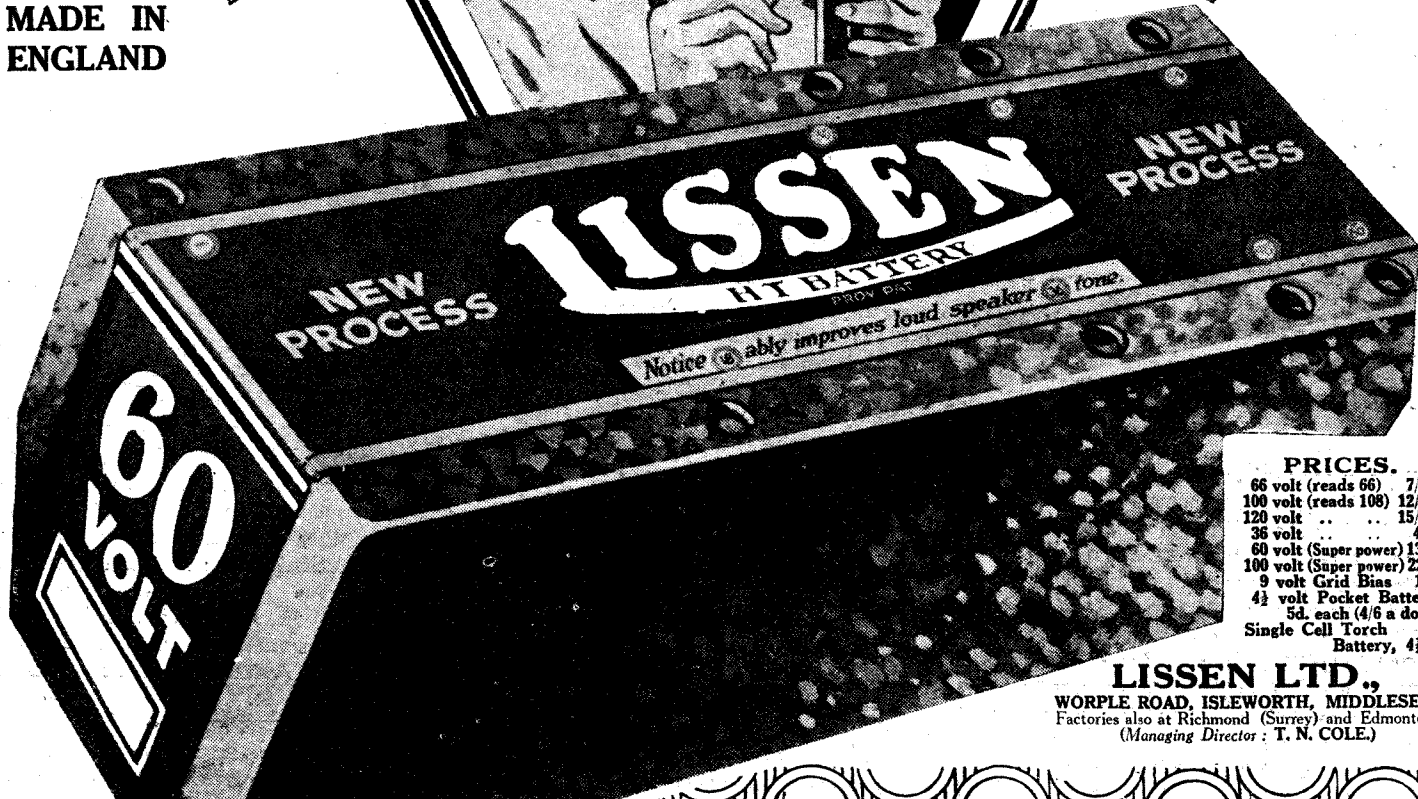
There is preserved power put into the big cells of the Lissen battery by the Lissen Secret Process—power which lasts for months and months and months, flowing always steadily, noiselessly, sustainedly. There is never a trace of ripple in it, never a sign of hum.

This Lissen Battery yields the purest form of current known for radio. It keeps speech clear, gives definition to musical notes and by the very purity of its current individual instruments seem "spot lighted" in the way they are made to stand out.

Next time ask firmly for a Lissen New Process Battery and take no other. Obtainable at 10,000 radio dealers.



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66 volt (reads 66)	7/11
100 volt (reads 108)	12/11
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36 volt	4/6
60 volt (Super power)	13/6
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4 1/2 volt Pocket Battery	5d. each (4/6 a doz.)
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LISSEN LTD.,
WORPLE ROAD, ISLEWORTH, MIDDLESEX.
Factories also at Richmond (Surrey) and Edmonton.
(Managing Director: T. N. COLE.)

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

THE grid-bias battery has for long become a recognised part of the wireless receiving equipment, and by now its functions may be generally considered to be understood as

CONCERNING GRID BIAS

centage variation in anode current produced by the former case of fixed grid volts.

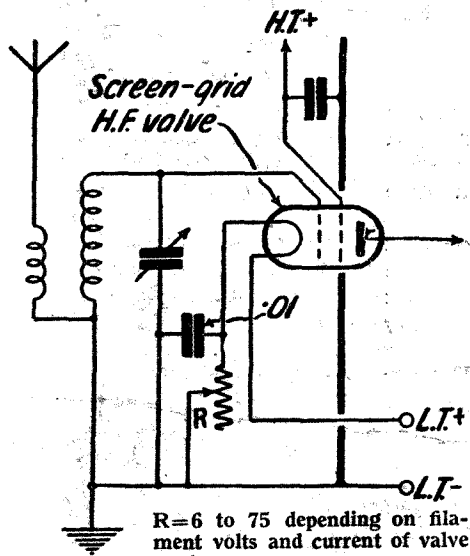
loudest signals are being received, that is, when most grid bias is needed to prevent grid current, the resistance will be greater and the grid bias therefore increased.

In mains screen-grid valves, such as the MS4, a negative grid bias becomes advisable from the point of view of reduction of hum, and essential from the life preservation point of view. When operated at maximum anode and screen voltages, a negative grid bias of from 1½ to 3 volts is very necessary if the normal emission life is to be maintained.

In detector valves, it is usual to apply a small positive bias in the case of leaky-grid detectors, but with those valves which show grid current at zero volts, this positive bias may be omitted, e.g., MH4, MHL4, etc.

With anode-bend detectors, negative grid bias should be applied to prevent the flow of grid current, even on the strongest input, and as the anode-bend detector operates best with a strong input, the type of valve best suited for this purpose is one with a moderately low value of "amplification factor" (i.e., large grid swing for a given anode voltage), and a steep slope. The actual negative grid bias applied here depends upon the strength of the input signal, the best value usually being such that rectified signals produce a rise of about one milliamp in the anode circuit (assuming moderate impedance valves and fairly low anode resistances are used).

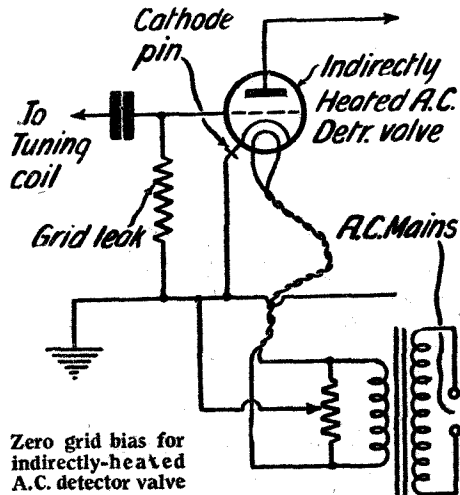
It is particularly important to bear this in mind when two or more of these large power valves are to be used in parallel circuits.



R=6 to 75 depending on filament volts and current of valve used.
e.g. R for S625 type=6 ohms approx.
R for S215 type=6 ohms approx.
R for S610 type=75 ohms approx.

Negative grid bias for H.F. valve

(1) a means of keeping the anode current of a valve down to safe operating conditions and



Zero grid bias for indirectly-heated A.C. detector valve

(2) a means of avoiding grid current and subsequent distortion.

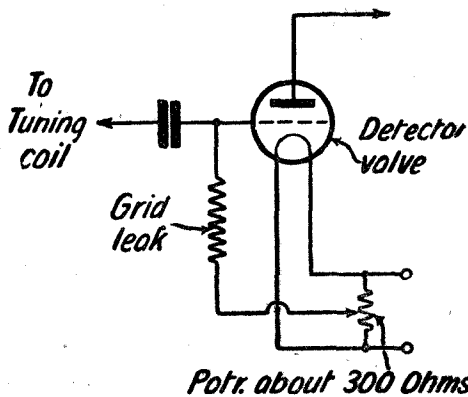
In H.F. amplifying valves a negative grid bias is very advisable and may even become necessary with certain valves. As we may now take the screen-grid valve as almost universally employed for modern H.F. amplifiers, a negative grid bias of a little less than 1½ volts is generally to be recommended and, in battery-operated valves, may conveniently be obtained by inserting a filament resistance in the negative filament lead. This resistance, if variable, also acts as a convenient volume control and has the advantage that when

Power Valves

With power amplifying valves, the question of negative grid bias attains first importance; here, it should be carefully noted that, although figures are published for the approximate values of negative grid bias to obtain given anode currents, these values of bias must be taken as only approximate.

With valves of low amplification factor dealing with high anode voltages, it is very difficult from the manufacturing point of view to ensure that they are as consistent as the smaller classes. Moreover, such big valves have usually a watts dissipation limit on which depends the maximum permissible anode current.

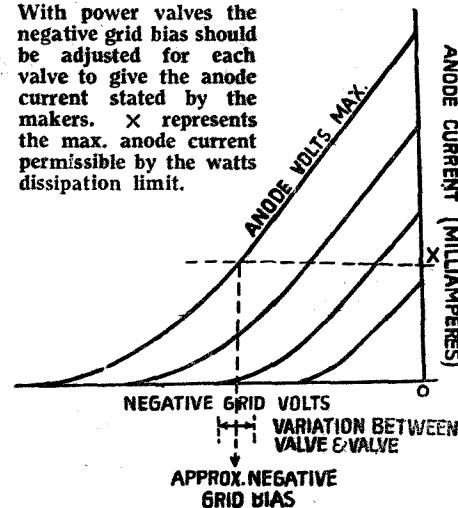
The negative grid-bias values given for such valves (e.g., LS5A, LS6A, etc.), are usually given by the makers merely as a guide and should be adjusted for each individual valve, so as to provide the required anode current and to limit this to the maximum permitted. Although almost universally adopted, it is really incorrect practice to fix the grid bias and expect all valves to conform exactly in anode current. The correct method is to decide on the anode current from the maker's published figures and then vary the grid bias for each valve to produce this. In the latter case, the percentage variation in grid volts required is very much smaller than the per-



Positive bias for detector valve

To do this, obviously requires a milliammeter and the advantages of the possession of one of these extremely useful little instruments cannot be over-estimated.

With power valves the negative grid bias should be adjusted for each valve to give the anode current stated by the makers. X represents the max. anode current permissible by the watts dissipation limit.



A good milliammeter, intelligently used, can be made to serve many most useful functions, and when adjusting grid bias for power valves, becomes a necessity, if we are to get the most out of the valve.

F. E. H.

"Things advertised in the B.B.C. timetables do not start to time," is the burden of yet another complaint. No worse than those advertised in the A.B.C. timetables.

Which of the Uncles was it who suggested that Big Ben should broadcast at half-past kissing-time? Warning: don't oscillate when you osculate.

A gramophone record of the *Anvil Chorus* is announced as being sung by the *Apollo Choir*. Mythologically inexact, surely? It should have been the *Vulcan Choir*.

Use a **NON-SPILLABLE** battery in your home ~

It is so fatally easy for a few drops of acid to spill when changing over ordinary low tension accumulators. You may already have experienced the vexation of discovering damage to carpet or furniture on which acid has dropped.

The C.A.V. Non-spillable accumulator contains acid—but in a jellied form. You cannot spill it, and it does not flow so you can use it in any position.

Because of its advantages over the free-acid type of non-spillable accumulator, its compactness, its safeness, it is the ideal battery for portable receivers. It is also the battery to relieve you of all anxiety. Why not use one with your home receiver?

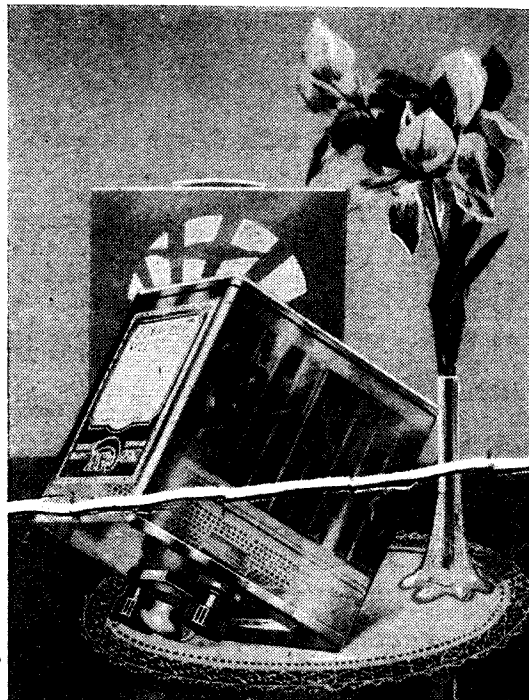
Our latest Radio Battery catalogue No. P. will gladly be forwarded upon application.

May we send you details of the C.A.V. rechargeable high-tension accumulators?—built like car batteries.

CAVandervell & Co. Ltd.
ACTON, LONDON, W 3



2AN7 2 Volts.
30 Amp. (20 hr. rate)
Price - - - 16/-
This battery was selected for operating the "Merry-Maker Portable" described in this issue.

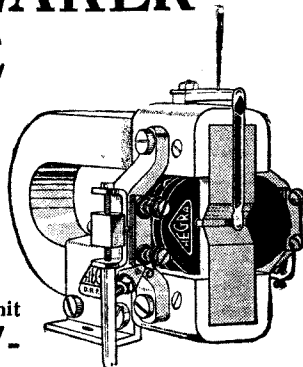


All Position-Non Spillable Batteries

The Original Jelly Acid Battery

Perfect for Portables

The "EASY-BUILT" CONE SPEAKER USES THE HEGRA UNIT



Hegra C. Unit
Price 19/-

The Hegra Adjustable Balanced Armature Unit has been specified for use with this speaker because it is thoroughly reliable.

It will handle considerable volume without chatter and the reproduction on all frequencies is truly wonderful. The Hegra has passed every test with flying colours. If you want the best results you *must* use a Hegra Unit.

Obtainable from **HEGRA** any Dealer.

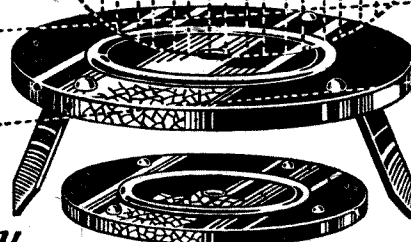


M.C. 5

The **BENJAMIN** Turntable with folding legs is unique

A NEW ball-bearing turntable combining several new features, folding legs, which can be opened out for outdoor use, considerably reducing capacity of set to earth, and folded up for indoor use. Fitted with rubber buffers—preventing damage to the polished receiver or article on which the receiver is placed. The smooth running ball bearings make "direction finding" easy.

Price 7/6 complete



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BENJAMIN and buy the Best!

THE BENJAMIN ELECTRIC LTD.
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"A.W." TESTS OF APPARATUS

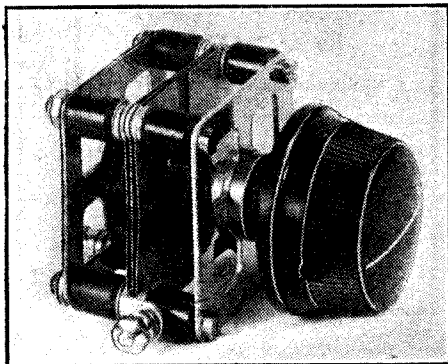
Conducted by our Technical Editor, J. H. REYNER, B.Sc.(Hons.), A.M.I.E.E.

A Differential Reaction Condenser

MAGNUM components, made by Messrs. Burne-Jones, are well known to readers, and have now held for many years a reputation for reliability and efficiency of design.

This week we have received for test a Magnum variable reaction condenser, having a rated maximum capacity of .0001 microfarad. It is a neat little component and due to the simplicity of design sells at the reasonable price of 4s. The fixed aluminium plates are mounted on a single ebonite end plate to which the metal bush for the rotating spindle is fixed. The length of this bush is sufficient to prevent rock in the operating spindle, a matter of some importance when a single bearing only is used. The motion is suitably damped by a spring washer, which also affords good electrical contact between the terminal and the moving plates.

Some idea of the compactness of the component may be gathered from the fact that it occupies a total panel space of 2 in. square and a depth of 1½ in.; it may, therefore, be fitted with ease into every type of set. A single hole only is required for fixing and the condenser is supplied complete with black moulded knob and three terminals.



This differential reaction condenser, the Burne-Jones, will simplify reaction control

An Efficient L.S. Gadget

ONE of the small, but by no means unimportant parts in a linen-diaphragm speaker assembly is the chuck adaptor and spindle for connecting the unit to the diaphragm. Those who have made these speakers will realise the importance of having a convenient arrangement for holding the apexes of the cones together and transmitting the drive from the unit.

Messrs. Moore & Co., Liverpool, the makers of Aptus parts for linen diaphragms, have submitted for test an Aptus centre

combining a four-inch spindle with adjustable chuck for connecting to the operating unit; and in addition two sets of cone washers held together by adjustable chucks. Each pair of washers includes a celluloid and a brass washer. The object of using different materials is to prevent rattle.

Fitting together this assembly is quite simple, the washers placed each side of the diaphragm are locked together by screwing one of the central chucks into the other. Then by rotating the ends of the chucks they may be fixed at any required portion of the spindle.

This device sells at 2s. 6d., and may be recommended.

Brownie Wavetrap

AN interesting and practical selectivity device has been submitted for test by The Brownie Wireless Co., Ltd. Its application is dual, since it may be used as a wavetrap or coupled selectivity circuit, according to the method of connection.

In this component the inductance is placed on two separate formers, one of which is tuned by a small paper dielectric variable condenser. Two extra tappings are taken on the other coil, and these together with the ends of the windings are connected to six metal sockets. When used as a normal wavetrap the aerial and aerial terminal of the set are connected to the tapped coil, whilst the second coil, which is closely coupled to the first, is tuned to the station to be rejected. It is, therefore, a modified version of the well-known series-rejector, and according to the number of turns used in the aerial circuit, so the trapping effect is increased.

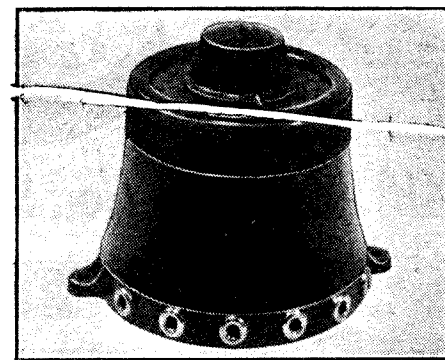
It is also possible to use this device as a tuned coupled circuit, thereby increasing the steepness of the overall tuning characteristic, and considerably improving the selectivity. When used in this capacity, the two windings are connected together in the form of an auto-transformer, the transformation ratio and, therefore, the selectivity being controlled by the additional tapping points provided. The tuned winding is placed across aerial and earth, but on test did not appear to have any appreciable effect on the normal tuning of the circuit.

With a single-circuit tuner, the selectivity was greatly improved; under these conditions, however, it is necessary to adjust the control simultaneously with the main tuning condenser. Using the device as a wavetrap, we were able to cut out either Brookmans Park station completely with the largest number of turns in the aerial circuit. Those who are a greater

distance from Brookmans Park will find advantage in using a smaller number of turns.

This device is quite neat in appearance, the inductances and condenser being housed in a brown moulded case with a scale for setting the condenser knob. The six tapping points are arranged towards the base of the instrument.

We can recommend the Brownie trap to those who are suffering from lack of selectivity.



A useful aid to selectivity—the Brownie wavetrap

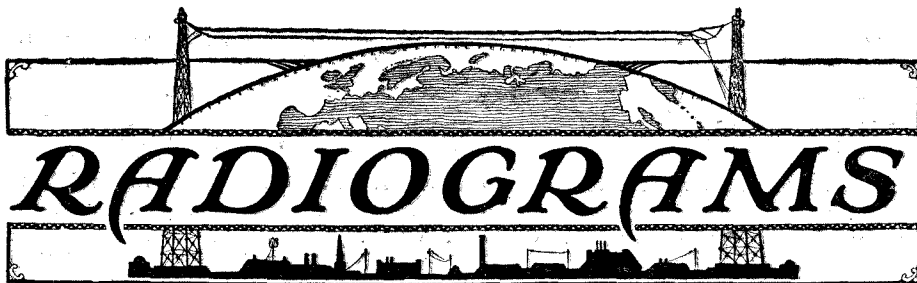
THE NEW DETECTORS

SOME of the new detector valves, having an impedance of about 10,000 ohms, pass a very heavy anode current, and should therefore be used with care. I can quite understand a listener replacing his present detector with one of these and wondering why the results are so different.

If the same value of high tension is used the current will be much greater. Reaction will probably be fierce and the volume may be a little less. Many people use an R.C. type valve for detection, and if they fitted one of the new detector valves the results would be quite different.

The new valves will deal with a strong signal with little distortion if the grid condenser and leak values are suitable, and make good anode-bend detectors. W. J.

Riding the Air Waves—“Horace Live-right, N.Y. City” is an interesting account of a youthful experimenter’s experiences in world-wide amateur short-wave transmission. We find interest in the book because members of the “A.W.” Staff, when in New York last summer, visited the station of the author, Eric Palmer, Jr., and proved his DX claims. It is a brightly-written, typically American book. The price is two dollars.



ON April 24 Mr. Lloyd George will celebrate the fortieth anniversary of his election to Parliament and a presentation in commemoration of this event is to be made to him at the Pavilion, Carnarvon. The ceremony including the Liberal leader's speech will be relayed to Daventry 5XX.

H. A. Harding and Denis Arundell have prepared a special dramatic version of *Robin Hood* for broadcast on May 1 by the National transmitters.

During the Grand Opera Season at the Royal Theatre, Covent Garden, the B.B.C. will effect weekly relays of performances beginning with the opening night on April 28.

The National vaudeville programme for broadcast on April 28 will give listeners an opportunity of hearing Greta Keller, the Berlin studio radio star who sings in English, French, and German. Ann Penn, in impersonations, makes a welcome re-appearance before the microphone on her return from the United States, and other turns include George Doshier, one of the Four Harmony Kings, the Stanley Holt Quintet, and a musical poem entitled *Six Little Ballet Girls*, with words by Harold Simpson.

Mozart's *Requiem*, as performed at the Battle Church, Battle Abbey, under the direction of John R. Shernan-Dare, will be relayed to London Regional on April 29.

In celebration of Empire Day, on May 24, and as part of the special programme to be broadcast to the United Kingdom and overseas, community singing will be relayed from Hyde Park, London.

Relays of international sporting events are assuming greater importance in the European programmes. A German running commentary on the German-English tennis matches for the Davis Cup will be taken by the Rhineland and other transmitters on April 24 and 26. Langenberg, Cologne, and the associated stations will also relay from Amsterdam the Germany *v.* Holland hockey match on April 27.

A special short-wave transmitter to be operated by the League of Nations has now been authorised and tenders are to be put forward for its construction at Prangins, in Switzerland. It is not expected that it can be finished before the spring of 1931, and in the meantime, should the necessity arise, the existing transmitter at Prangins, working on the broadcast band, would be placed at the disposal of the authorities for official communications.

For the new Scottish headquarters the B.B.C. has acquired a building in Queen Street, Edinburgh, which was formerly the Queen's Hall, and has since been occupied as the Embassy Dancing Club. The Queen's Hall was formerly one of Edinburgh's concert-halls, and was also used for public meetings. After the necessary structural alterations are made the administrative staff at present in Glasgow will be transferred to Edinburgh.

Mr. M. H. Aylesworth, president of the National Broadcasting Company in America, in his annual report stated that President Hoover spoke thirteen times over the N.B.C. networks last year.

Thousands of listeners throughout the United States complain that the B.B.C. announcers lack loquacity. Recently the National Broadcasting Company of America picked up and rebroadcast a service from Westminster Abbey, but the radio audience was left to guess the identity of the speaker. Another example

of the "cold mike" was when King George addressed the opening session of the Naval Arms Limitation Conference. On that occasion a voice described what was to take place, and then there was silence for a few moments. Then a voice was heard, and it was several minutes before it was realised that the King had started speaking.

According to a recent report of the Federal Radio Commission, the yearly total broadcasting time for all radio stations in the United States is 1,252,802 hours.

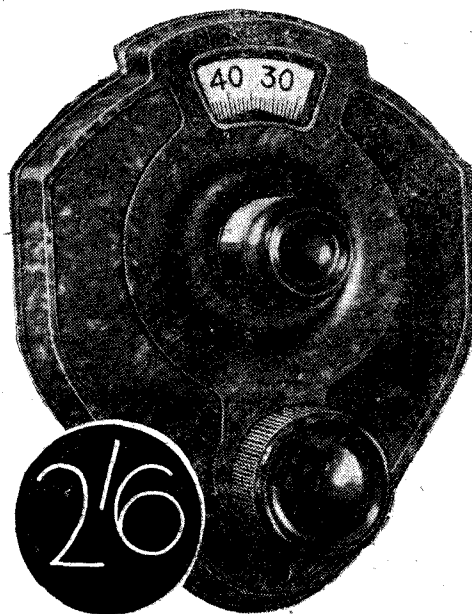
Broadcasting stations WJZ and WEAJ, both in New York, have contracted to pay £7,400 each for the use of copyright songs of the American Society of Composers, Authors, and Publishers during 1931.

Station WKRC (Cincinnati) is shortly to commence television broadcasts. It is to operate in conjunction with a new short-wave station of the Ohio Television Corporation and will synchronise its sound programmes with the sight programmes of the short-wave station.

Broadcasting station WJR (Detroit) claims to have only two rivals in the United States as regards time on the air. It operates continuously from 6 a.m. to 1 a.m., with an additional hour on Sundays.

A German scientific society, Aeroartic, suggest that wireless stations be placed in remote regions and made automatically to transmit weather information in all parts of the world.

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FOR the JAMES QUALITY FIVE described in this issue, three Brownie DOMINION Vernier Dials have been specified. Only Brownie's huge production enables them to offer this really splendid dial for 2/6. The special non-backlash design makes hair-breadth tuning a matter of delightful ease, while its handsome appearance (black or beautifully grained mahogany bakelite) will add vastly to the good looks of the set that you build.

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THE CUP FINAL BROADCAST

THE F.A.'s POINT OF VIEW—By FRANK ROGERS

AFTER the threatened ban on broadcasting the Cup Final, the B.B.C.'s attack on the Football Association and the latter's subsequent offer to the B.B.C., I think most listeners will appreciate an explanation of the position.

The F.A. is incorporated under the Joint Stock Companies' Acts with a capital of £100, upon which no dividend may be paid. That is to say, no shareholder can derive profit from his holding. It is clear, then, that whatever fee might be charged for this broadcast would bring no private gain to any individual member.

The function of the F.A. is to govern the game, both the amateur and the professional sections, and to protect their interests. It also helps to spread the game all round the world by sending representative teams abroad. Its attitude on any vexed question, such as the recent one, is parental.

Now consider this broadcast. There are two professional clubs taking one-third each of the receipts, and the F.A. the remainder. It is definitely a money-making game. Broadcasting cannot harm these receipts, because the tickets are over-applied for regularly every year. Thousands of pounds are, in fact, returned annually to disappointed applicants. On the surface, then, it seems as though all three parties are giving nothing away when they permit the B.B.C. the same privileges as the Press.

The F.A. Constitution

But as soon as we examine the position we find a different situation. The F.A. does not represent one club only, but all clubs, and its fear is not that spectators will stay away from Wembley, but from grounds in Bournemouth, Bristol, and Accrington Stanley.

Speaking personally, I know the fear is justified. I, for one, stayed at home last year to listen-in to the Cup Final, and

there were thousands more like me. To the F.A. we absentees are represented as so many shillings lost to the game. Clubs all over England were all down in their gate money, and they will be again this year. Who has not promised himself all this week the thrill of hearing the cheering as Jackson, of Huddersfield, or Lambert, of Arsenal, crashes an unstoppable shot into the "box"?

League Clubs

It is plain that practically every professional club in the land will be sacrificed for our pleasure, and that, therefore, the F.A. had to consider whether it could afford it and whether the publicity given to the game as a whole would ultimately balance things.

There is now the position of professional league clubs to be considered before we can appreciate their financial strength. First of all, they are not allowed to declare an annual dividend in advance of $7\frac{1}{2}$ per cent.; so that they can scarcely be called a paying investment. Directors are not allowed any payment for their services, and when a manager was offered a thousand a year, a little while back, everyone gasped.

Of course, £10,000 transfer fees which are noised about from time to time do convey an impression of wealth, but it must be remembered that this money stays in the game. It cannot go into anyone's private purse. Further, the impression of wealth is a false one. The average professional club goes closer to making a loss than it does to declaring $7\frac{1}{2}$ per cent.

There are plenty of clubs working on an overdraft at the bank. Clubs are continually offering their players for sale because they need the money. The wealthy ones are in a decided minority, and we can see that, speaking generally they need every penny they can get. Their difficulty is not to satisfy dividend-seeking share-

holders, but to try somehow to balance their accounts and keep their teams together.

I think it is plain that many of them cannot afford the sacrifice of the Cup Final broadcast unless they can be sure the publicity it gives to football as a whole will bring more patrons to their turnstiles. They certainly cannot afford to be generous and invite the public to share their big show of the year out of kindness.

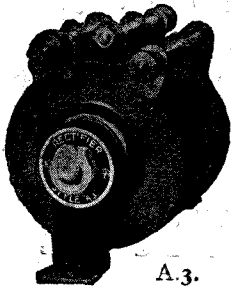
It boils down, then, to the publicity value of this broadcast, and here we are on slippery soil. Will non-footballers start to visit the less prosperous grounds because of what they hear? Will their resolution to become regular patrons of the game retain their strength until next season starts, because there is not a great deal of this one left?

Publicity Value

Presumably the B.B.C. says the publicity will do this. We know that the microphone is extremely persuasive. Theatrical managers said so very definitely some months ago when they objected to one critic having a monopoly. But many football clubs still remain to be converted to this view. They say the public already knows of the thrills and fascination of the game.

This is the crux of the whole matter. The F.A. has now withdrawn its ban. In fact, it has invited the B.B.C. to Wembley unconditionally. This decision has every appearance of a splendidly generous gesture. It followed very closely upon an appeal from the Bishop of Buckingham, who was concerned for the unfortunate people whose disablements prevent them from going out to watch football matches.

The West of Scotland is not pleased at the forthcoming transfer of the B.B.C. Scottish headquarters from Glasgow to Edinburgh.



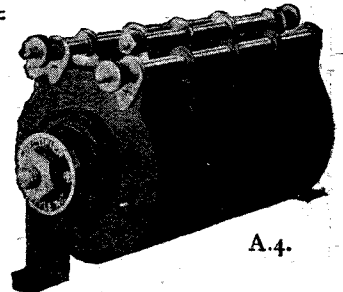
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1 Filament switch (Bulgin)	1	6	
3 Valve holders (Lotus)	3	9	
1 0002 fixed condenser, series-parallel clip (T.C.C.)	2	4	
1 0001 fixed condenser (Graham-Farish)	1	0	
2 Spade terminals, named (Belling-Lee)	1	9	
6 Wander plugs, named: G.B.+1, G.B.-1, G.B.-2, H.T.-, H.T.+1, H.T.+2	1	9	
2 Grid-bias battery clips	5	9	
1 H.F. choke (Bulgin)	5	6	
2 L.F. transformers, ratios 3/1 and 6/1 (Igranic J.)	1	15	0
1 100,000-ohm resistance (Graham-Farish)	2	3	
1 3-meg. grid leak (Dubilier)	2	6	
1 Fixed potentiometer (Polar)	2	0	
2 Yards thin flex and 10 ft. Glazite	1	0	
	£3	15	10

1 P.B.R. oak portable cabinet complete with Blue Spot cone speaker and frame aerial	2	18	6
3 Valves, HL210, L210, P215	1	13	6
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Complete Set, ready for use (Royalties ex.)	£10	12	6

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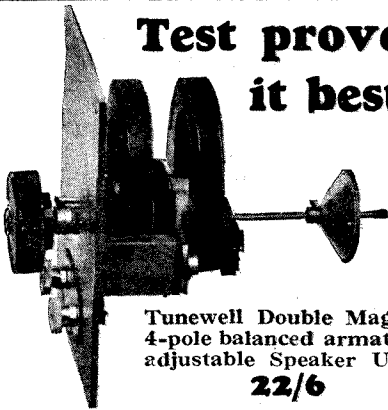
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AMERICAN TELEVISION PESSIMISTS

At a time when we, in England, are hoping that television is now getting into its stride, by the co-operation of the Baird Company and the B.B.C., a pessimistic statement has been received from the Bell Telephone Laboratories of New York. Dr. F. B. Jewett, president of these laboratories, says: "The question whether, after a period of further development, television will take its place with the telephone, telegraph, and radio broadcasting, as public necessities, will depend on its ability to render services that will warrant the inherently large expenses."

"For the transmission of the television images so far demonstrated, facilities are required equivalent to approximately one thousand telegraph channels, or thirty commercial telephone channels or ten adjacent channels of radio broadcasting."

Commercial Aspects

Dr. Jewett points out that new communication channels, whether wire or radio, have a money value, a fact often overlooked by television experimenters not familiar with the communication industry. These transmission requirements, the doctor points out, coupled with the inevitable expense of apparatus, constitute a severe limitation to ultimate commercial use. He goes on to make a statement that will be contested by many readers.

"Those who look forward to a time when television will displace the stage and screen theatre, by bringing their offering direct to the home, must recognise that television would then have as its competitor the home sound-motion-picture projector."

It should be explained that home "talkie" machines are already available in small quantities in America, giving good results. This machine bears a somewhat similar relationship to television, as does the gramophone to ordinary broadcasting.

"At present," says Dr. Jewett, "the apparatus and transmission facilities required for television appear appalling, both as to complexity and as to cost. The ultimate verdict must come from the public."

When Asking Technical Queries

PLEASE write briefly

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 for the usual query fee. Any drawings submitted should be sent on a separate sheet of paper. Wiring plans and layouts cannot be supplied.

Queries cannot be answered personally or by telephone.

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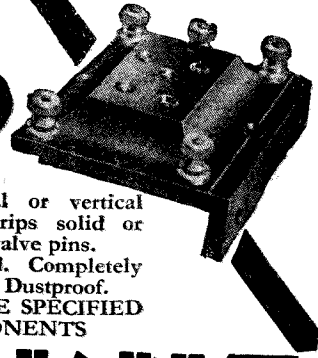
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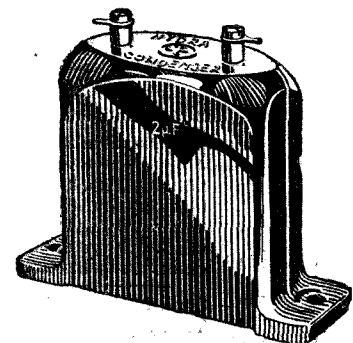
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For the Newcomer to Wireless : VOLUME CONTROLS

I AM in rather a difficulty. You see, I am within comparatively short-range of Brookmans Park, and when only one transmission was taking place I got all that I wanted with my "quality" set without any high-frequency amplification. Then the shorter-wave transmission started and I saw it stated that a high-frequency stage was the best means of separating them.

That is, of course, owing to its filtering effect.

Yes, but what now happens is that I get far too much strength.

I see; and you don't find detuning satisfactory?

No. It doesn't improve the quality, and if I detune a good deal, I may find that I am getting both transmissions.

It is a problem that quite a number of others are faced with. Naturally, you don't get proper selectivity and therefore no chance of separating stations unless your set is so arranged that you can tune in either fairly sharply.

How can that be done without overloading the set?

What you need is a volume control.

As a matter of fact, I've bought one and I'm thinking of fitting it into the grid circuit of the first note-magnifying valve.

That valve is transformer-coupled, if I remember rightly. You intend, I suppose, to connect the sliding contact of the control to the grid of the valve and the other two terminals to I.S. and O.S. of the transformer?

Yes, that's what I thought of.

If I were you, I wouldn't.

Why not?

If you think it out you will see that what the control does in that position is to regulate the voltages applied to the first low-frequency valve.

Yes, I see that.

But how about the detector?

What do you mean, exactly?

If signal strength is very great the odds are that you are overloading your detector valve, and a volume control placed *after* this valve won't help.

I hadn't thought of that; but, now you mention it, I do see that there's a good deal in it.

A great deal more than many people

suspect! The volume control in a set designed for the regional scheme should certainly be so arranged that it regulates the voltage swings reaching the grid of the detector valve. Obviously, you can't expect good reception if your detector is overloaded.

How can one arrange it in this way?

With the grid-leak detector, wire the volume control in this way. Connect the slider to the grid side of the grid condenser, one of the other terminals to the grid and the other to low-tension positive, you don't need any grid leak.

Just what happens?

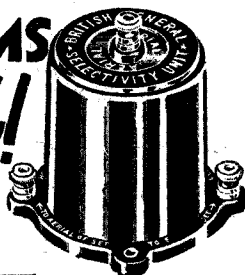
When the knob is turned so that the slider is at the end of the resistance connected to the terminal attached to the grid, then the grid is, so to speak, straight through to the condenser and the whole of the resistance is connected as a leak. Move the slider away from this point, and more and more resistance is brought into play between the grid condenser and the grid. The result is to reduce the voltage swings.

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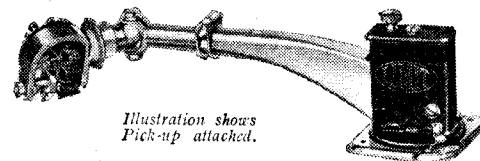


Illustration shows Pick-up attached.

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Broadcasting stations classified by country and in order of wavelengths. For the purpose of better comparison, the power indicated is *aerial energy*.

Metres	Kilo-cycles	Station and Call Sign	Power (Kw.)	Metres	Kilo-cycles	Station and Call Sign	Power (Kw.)	Metres	Kilo-cycles	Station and Call Sign	Power (Kw.)				
GREAT BRITAIN															
25.53	11,751	Chelmsford	(5SW) 15.0	255	1,175	Toulouse (PTT)	1.7	*525	572	Riga	7.0				
*200	1,500	Leeds (2LS).....	0.13	265	1,132.2	Lille (PTT).....	0.5	*1,935	155	Kovno	7.0				
*242	1,238	Belfast (2BE) ...	1.0	268	1,121	Strasbourg	0.5	304	825	Algiers (PTT) ...	16.0				
*261	1,148	London Nat. ...	30.0	*272	1,102	Rennes (PTT)....	0.5	416	720	Radio Maroc	(Rabat) 10.0				
*288.5	1,040	Newcastle (5NO) 1.0		*280	1,049	Radio Lyons ...	0.5	1,250	240	Tunis Kasbah ...	0.5				
288.5	1,040	Swansea (5SX) 0.13		293	1,022	Limoges (PTT) 0.5		304	824	Bergen	1.0				
288.5	1,040	Stoke-on-Trent (6ST) 0.13		304	986	Bordeaux (PTT) 1.0		385	779	Frederiksstad ...	0.7				
288.5	1,040	Sheffield (6LF) 0.13		309	970	Radio Vitus ...	1.0	445	674	Rjukan	0.18				
288.5	1,040	Plymouth (5PY) 0.13		*316	950	Marseilles (PTT) 0.5		448	669.7	Aalesund	0.3				
288.5	1,040	Liverpool (6LV) 0.13		328.2	914	Poste Parisien... 0.5		453	662	Tromsø	0.1				
288.5	1,040	Hull (6KH) ...	0.13	328.2	914	Grenoble (PTT) 0.5		453	662	Porsgrund	0.7				
288.5	1,040	Edinburgh (2EH) 0.35		369	812	Radio LL (Paris) 0.5		*493	603	Oslo	60.0				
288.5	1,040	Dundee (2DE) 0.13		*381	788	Radio Toulouse 8.0		214	1,400	Warsaw (2)	2.0				
288.5	1,040	Bournemouth (6BM) 1.0		447	671	Paris (Etat) ...	3.0	234	1,283	Lodz	2.0				
288.5	1,040	Bradford (2LS) 0.13		464	640	Lyons (PTT) ...	5.0	*313	659	Cracow	0.5				
*301	995	Aberdeen (2BD) 1.0		1,446	207	Eiffel Tower ...	12.0	*335	896	Pesnaa	1.2				
*310	968	Cardiff (5WA) ...	1.0	*1,725	174	Radio Paris ...	16.0	385	779	Wilno	0.5				
*356	842	London Reg. ...	30.0	GERMANY											
*377	797	Manchester (2ZY) 1.0		*215.3	393	Flensburg	0.5	385	779	Lemberg	2.0				
*399	753	Glasgow (5SC) 1.0		*227	1,319	Cologne	4.0	*408	784	Katowice	10.0				
*479	626	Midland Reg. ...	25.0	*232.2	1,292	Kiel	0.35	1,411	212.5	Warsaw	8.0				
1,554	193	Davenport (5XX) 25.0		*234	1,283	Münster	3.0	ROUMANIA							
AUSTRIA															
*246	1,220	Linz	0.5	*239	1,256	Nürnberg	2.0	*701	761	Bucarest	12.0				
*283	1,058	Innsbruck	0.5	*246	1,220	Cassel	0.25	RUSSIA							
*352	851	Graz	7.0	*253	1,184	Gleitwitz	2.0	720	416.6	Moscow (PTT)	20.0				
*453	666	Klagenfurt	0.5	*259	1,157	Leipzig	2.5	824	304	Sverdlovsk	25.0				
*517	581	Vienna	15.0	*270	1,112	Kaiserslautern 0.25		933	320	Moscow-Stelchikovo (C.C.S.P.)	100				
BELGIUM															
206	1,460	Antwerp	0.2	*276	1,085	Königsberg	2.5	1,000	300	Leningrad	20.0				
216	1,391	Verviers	0.85	*283	1,058	Magdeburg	0.5	1,060	243	Tiñis	10.0				
220	1,364	Charleroy	0.25	*283	1,058	Berlin (E.)	0.5	1,105	272	Moscow Popoff	40.0				
244.7	1,226	Ghent	0.25	*283	1,058	Stettin	0.5	*1,301	230	Kharkov	25.0				
250.9	1,197	Schaerbeek	0.25	*315.8	951	Bremen	0.35	1,380	217.5	Bakou	10.0				
338	837	Forest	8.0	*320	937.6	Breslau	0.25	1,481	202.5	Moscow (Kom)	40.0				
*500	590	Brussels	1.0	*325	923	Breslau	1.5	SPAIN							
CZECHO-SLOVAKIA															
*263	1,139	Moravska-Ostrava 10.0		*360	873	Stuttgart	1.5	250	1,202	Almeria	0.5				
*279	1,076	Bratislava	12.5	*372	806	Hamburg	1.5	266.5	1,125	Barcelona (EAJ19)	10.0				
*293	1,023	Kosice	2.0	*390	770	Frankfurt	1.5	*341	860	Barcelona (EAJ1)	8.0				
*342	878	Brno (Brno) ...	2.4	*418	716	Berlin	1.5	368	815	Seville (EAJ5)	1.5				
*487	617	Prague (Praha) 5.0		*453	662	Danzig	0.25	424	707	Madrid (EAJ7)	2.0				
DENMARK															
*281	1,067	Copenhagen (Kjbenhavn) 0.75		*456	657	Aachen	0.35	462	649	San Sebastian (EAJ8)	0.5				
1,153	260	Kalundborg.....	7.5	*473	635	Langenberg	15.0	SWEDEN							
ESTHONIA															
*296	1,013	Reval (Tallinn) 1.5		*533	563	Munich	1.5	231	1,301	Malmö	0.8				
FINLAND															
*221	1,355	Helsingfors	10.0	560	536	Augsburg	0.25	*257	1,160	Hörby	10.0				
*1,796	707	Lahti	50.0	*560	536	Hanover	0.35	299	1,003	Falun	0.5				
FRANCE															
20.70	10,180	Radio Experimental (Paris) ...	1.2	569	527	Freiburg	0.35	*322	932	Göteborg	10.3				
175	1,714	St. Quentin	0.1	*1,635	183.5	Zeessen	37.0	*436	689	Stockholm (tests)	60.0				
187	1,605	Radio Flandres	0.25	1,649	182	Norddeich	10.0	*542	554	Sundsvall	0.6				
195	1,539	Tourcoing (F5BH) 0.2		HOLLAND											
210	1,410	Radio Savoye ...	0.3	31.28	9,599	Eindhoven (PCJ) 30.0		*770	389	Ostersund	0.6				
212	1,415	Beziats	0.1	*293	1,004	Hilversum (until 6.0 p.m. B.S.T.) 6.5		1,200	250	Boden	0.6				
212.8	1,410	Fécamp (Radio Normandie) 0.5		*1,071	280	Hilversum)	6.5	*1,348	222.5	Motala	30.0				
235	1,274	Bordeaux (Radio Sud-Ouest) 1.0		*1,071	280	Scheveningen-Haven 5.0		SWITZERLAND							
240	1,250	Nîmes	0.25	(from 11.10 a.m. to 6.0 p.m. B.S.T.)				*403	743	Berne	1.0				
249	1,204	Juan-les-Pins ...	0.5	*1,875	160	Huizen	6.5	*459	653	Zurich	0.63				
GERMANY															
210	1,430	Budapest (Csepel) 1.0		550	545	Budapest	20.0	060	454.6	Lausanne	0.6				
550	545	Budapest	20.0	ICELAND											
IRISH FREE STATE															
*225	1,337	Cork (IFS)	1.0	210	1,430	Budapest (Csepel) 1.0		700	395	Geneva	0.25				
*413	725	Dublin (2RN) 1.0		550	545	Budapest	20.0	1,010	297	Basle	0.25				
ITALY															
291	1,039	Turin (Torino) 7.0		TURKEY											
*332	905	Naples (Napoli) 1.5		*1,200	250	Reykjavik	16.0	(under construction)		250	Istanbul	5.0			
385	779	Genoa (Genova) 1.0		*225	1,337	Cork (IFS)	1.0	1,961	153	Ankara	7.0				
*411	680	Rome (Roma) ...	50.0	*413	725	Dublin (2RN) 1.0		YUGOSLAVIA							
453	662	Bolzano (IBZ) 0.3		291	1,039	Turin (Torino) 7.0		366.7	97.8	Zagreb (Agram) 0.7					
*501	599	Milan (Milano) 7.0		*332	905	Naples (Napoli) 1.5		431	695	Belgrade	2.5				
LATVIA															
*525	572	Riga	7.0	385	779	Genoa (Genova) 1.0		574.7	522.3	Ljubljana	2.5				
LITHUANIA															
*1,935	155	Kovno	7.0	NETHERLANDS											
NORTH AFRICA															
304	825	Algiers (PTT) ...	16.0	NETHERLANDS											
416	720	Radio Maroc (Rabat) 10.0		NETHERLANDS											
1,250	240	Tunis Kasbah ...	0.5	NETHERLANDS											
NORWAY															
304	824	Bergen	1.0	NETHERLANDS											
385	779	Frederiksstad ...	0.7	NETHERLANDS											
445	674	Rjukan	0.18	NETHERLANDS											
448	669.7	Aalesund	0.3	NETHERLANDS											
453	662	Tromsø	0.1	NETHERLANDS											
453	662	Porsgrund	0.7	NETHERLANDS											
*493	603	Oslo	60.0	NETHERLANDS											
POLAND															
214	1,400	Warsaw (2)	2.0	NETHERLANDS											
234	1,283	Lodz	2.0	NETHERLANDS											
*313	659	Cracow	0.5	NETHERLANDS											
*335	896	Pesnaa	1.2	NETHERLANDS											
385	779	Wilno	0.5	NETHERLANDS											
385	779	Lemberg	2.0	NETHERLANDS											
*408	784	Katowice	10.0	NETHERLANDS											
1,411	212.5	Warsaw	8.0	NETHERLANDS											
ROUMANIA															
*701	761	Bucarest	12.0	NETHERLANDS											
RUSSIA															
720	416.6	Moscow (PTT)	20.0	NETHERLANDS											
824	304	Sverdlovsk	25.0	NETHERLANDS											
933	320	Moscow-Stelchikovo (C.C.S.P.)	100	NETHERLANDS											
1,000	300	Leningrad	20.0	NETHERLANDS											
1,060	243	Tiñis	10.0	NETHERLANDS											
1,105	272	Moscow Popoff	40.0	NETHERLANDS											
*1,301	230	Kharkov	25.0	NETHERLANDS											
1,380	217.5	Bakou	10.0	NETHERLANDS											
1,481	202.5	Moscow (Kom)	40.0	NETHERLANDS											
SPAIN															
250	1,202	Almeria	0.5	NETHERLANDS											
266.5	1,125	Barcelona (EAJ19)	10.0	NETHERLANDS											
*341	860	Barcelona (EAJ1)	8.0	NETHERLANDS											
368	815	Seville (EAJ5)	1.5	NETHERLANDS											
424	707	Madrid (EAJ7)	2.0	NETHERLANDS											
462	649	San Sebastian (EAJ8)	0.5	NETHERLANDS											
SWEDEN															
231	1,301	Malmö	0.8	NETHERLANDS											
*257	1,160	Hörby	10.0	NETHERLANDS											
299	1,003	Falun	0.5	NETHERLANDS											
*322	932	Göteborg	10.3	NETHERLANDS											
*436	689	Stockholm (tests)	60.0	NETHERLANDS											
*542	554	Sundsvall	0.6	NETHERLANDS											
*770	389	Ostersund	0.6	NETHERLANDS											
1,200	250	Boden	0.6	NETHERLANDS											
*1,348	222.5	Motala	30.0	NETHERLANDS											
SWITZERLAND															
*403	743	Berne	1.0	NETHERLANDS											
*459	653	Zurich	0.63	NETHERLANDS											
060	454.6	Lausanne	0.6	NETHERLANDS											
700	395	Geneva	0.25	NETHERLANDS											
1,010	297	Basle	0.25	NETHERLANDS											
TURKEY															
*1,200	250	Istanbul	5.0	NETHERLANDS											
1,961	153	Ankara	7.0	NETHERLANDS											
YUGOSLAVIA															
366.7	97.8	Zagreb (Agram) 0.7		NETHERLANDS											
431	695	Belgrade	2.5	NETHERLANDS											
574.7	522.3	Ljubljana	2.5	NETHERLANDS											

All wavelengths marked with an asterisk have been allotted according to the Plan de Prague.

WIRELESS WIT

Deluded Dad: "I'm spending a lot of money on my daughter's singing lessons." Sophisticated ditto: "That's silly. A wireless set's cheaper and you get music as well as screeching from it!"

A little boy had a troublesome, but not serious, cough; and the doctor called and tested him with a stethoscope.

When father came home, the little boy said:—

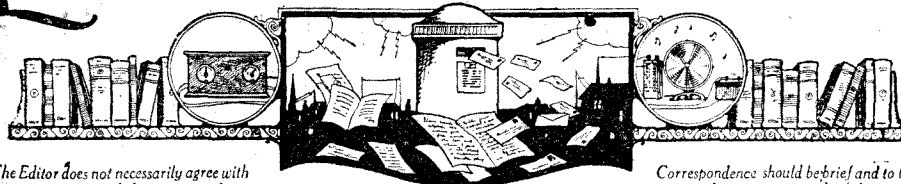
"Daddy, the doctor put the wireless on my tummy and listened in!"

American, boarding bus at St. Paul's Cathedral: "I want your 2LO studios." Conductor ignores him while taking another's fare.

American (snappily): "Yep. I want your 2LO, and I want it quick!"

Conductor: "All right, guv'n

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.

Short-wave Sets and Screening

SIR,—In your issue of April 5, your correspondent "K" (Evesham), attempts to dispel the idea that metal and similar materials in a short-waver are useful.

I entirely disagree with the views of your correspondent. I have working at present a three-valve short-waver of my own design. Besides having the detector and tuning portion screened from the L.F. side, I have a sheet of copper covering the baseboard, which acts as a common earth, and so eliminates much of the usual wiring. Your correspondent also asserts that a well-spaced layout is an advantage in a short-wave set. I disagree here also. I have built the set referred to above eighteen times, before arriving at what I think is as-near-to-perfect construction as is possible. The outstanding points now, as the set stands,

are, short wiring, elaborate shielding, and compactness.

Every inch of wire in a short-wave set means extra capacity, and surely this is a thing to avoid whenever possible. The most important points in a short-wave set are, I believe, the incorporation of good condensers with thick vanes, a smooth-working choke, and a transformer with a good high primary inductance.

H. L. W. (Hillsborough, Co. Down).

Is Mr. Moseley High-brow?

SIR,—I am a regular reader of AMATEUR WIRELESS, and when reading Mr. Moseley's page I notice how plainly he shows his "high-brow" views (though he has "without favour" on top), and seems only too ready to condemn anything that is light and cheerful. Now we have the two programmes there is plenty of serious matter (music and talks) being broadcast. Therefore, I respectfully suggest that he confines his criticism to these, they being more suitable for him.

S. O. B. (Battersea).

Is the Regional Scheme Wasting the Ether?

SIR,—May I be permitted to make one or two comments on the article by Mr. Alan Hunter, "Is the Regional Scheme Wasting the Ether?" As Daventry 5XX is so well received throughout the country generally, why not raise its power to some 50 or 100 kilowatts? Why use a chain of low-powered transmitters for the National programme as he suggests and thus waste the available ether further?

When the Regional scheme was first contemplated, I understood that the programmes would be given by local artistes from each of the Regional transmitters,

and thus we should have a good choice. The curse of simultaneous broadcasting is the long land-line distortion. Now anyone who has a real quality receiver with a moving coil speaker can test the difference by tuning in the station nearest the studio and then the others, as at present it means constant knob-twiddling to receive the best.

One other point which is not the least which your contributor has not mentioned, is that Daventry 5XX does not transmit from 11 to 12 in the morning now; thus it is impossible for the trade to give demonstrations to prospective customers. The Regionals are off the air from 3 p.m. till 5.15, and then we have no alternative to the dance music at night. The truth is that it is only a partial alternative programme as at present. "ZODIAC" (Brighton).

Linen-speaker Excellence

SIR,—I have a linen-diaphragm loudspeaker, AMATEUR WIRELESS design, 22-inch, and, like your reader V. D. (Sidcup), am delighted with the results which it gives. The reproduction of the bass notes and the rolling of the drums being particularly fine.

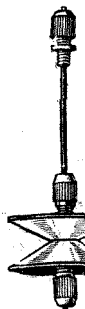
The first linen split, so I bought a better quality, and after it was tacked on the frame, I button-holed it twice round, the second time a little longer stitch than the first. Since then it has been quite all right.

A. M. H. (Coventry).

Cinema Orchestras

SIR,—While having the greatest admiration for "Thermion's" technical knowledge in the realm of wireless, I cannot allow his remarks *re* cinema orchestras to pass by without comment. They are a gross libel on a body from whose ranks some of our finest orchestras have been recruited. How long has "Thermion" been qualified to act as musical critic? Does he realise that at least 50 per cent. of our wireless programmes are made up of "alleged orchestras" and that the "hideous noises" he refers to give pleasure to millions of listeners? The majority of cinema orchestras were really excellent, and their loss is to be deplored by all music-lovers. "Thermion" is obviously not one of the above. S. W. (Preston).

"APTUS" LINEN DIAPHRAGM TRIPLE CHUCK ADAPTER FITS ALL UNITS



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DOPE BRUSH .. 6d.
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RUBBER DRAUGHTING 6d. yd.
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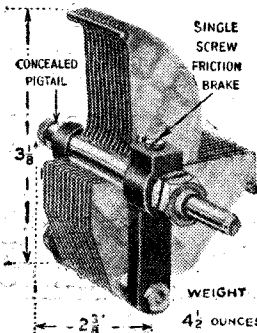
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In four Capacities:

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4/6 each

WEIGHT 4 1/2 OUNCES
*Double spacing of vanes for Ultra Short-wave work.

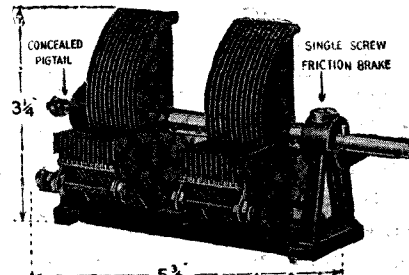
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CAPACITY .0005 MFD.
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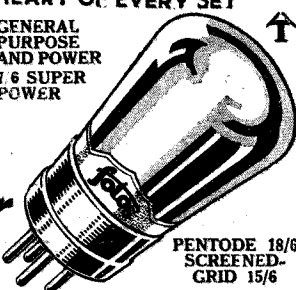
Good valves are expensive—the exception is FOTOS. Everyone is marvelling at the price. They are cheaper and better than most good valves.

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IN PASSING

Jottings From My Log

By JAY COOTE

APPARENTLY it is not only the difficulty of separating the Brookmans Park Twins which has given listeners trouble during the last week or so, but also the minor accidents and mishaps which beset wireless receivers during the Spring cleaning period when the "char." with the full authority of the housewife is let loose to sweep, dust, and generally clear up to her heart's content.

All kinds of things happen. Aerials are disconnected, earth leads broken, wander plugs taken out of H.T. and G.B. batteries and replaced in a haphazard way with dire results, upset accumulators in portables and many other minor annoyances which might be avoided with care and a little attention.

Small troubles? Yes, to the man who knows, but I have been struck with the remarkable ignorance displayed by the majority of many of my acquaintances in all matters wireless. So far as I could see, their entire knowledge consisted in pulling out a switch and in turning the condenser dials to two different positions for the National and Regional programmes. Prior to the advent of the Twins, this ignorance did not matter to the same extent as it does to-day; all was plain sailing and nobody worried. Now, some care must be taken if the programmes are to be received in a way to be enjoyed, and the average possessor of the purchased receiver finds that a complication has been added to his daily worries.

In this, the eighth year of broadcasting such a lack of knowledge should not exist; yet, to whom is the general public to turn? From experience we know that in most instances the local electrician or the suburban dealer in radio components are of very little assistance where a breakdown—however slight—has occurred. As a matter

of fact, where the ignorance of listeners is flagrantly patent, advantage is often taken of their gullibility.

Now, the man who is interested in wireless reads the technical papers and is not misled in this manner, but there exist thousands who evince no interest in radio matters apart from actually listening to the programmes. You will continually hear your friends say: "I know nothing about this radio business and it cost me so much to get the thing put right." These are the people who suffer.

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SITTING ROOM
BED ROOM
KITCHEN

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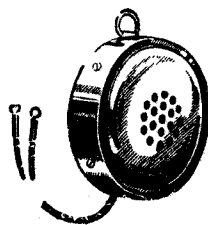
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 Wide World short-wave Three (HF, D, Trans) AW207
 Everybody's Three (SG, D, Trans) AW211
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 Short-wave Link (D, RC, Trans) WM142
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 Brookman's Three (SG, D, Trans) WM161
 Community Three (D, RC, Trans) WM164
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 Dominions Four (2SG, D, Trans) WM134
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 Arrow (SG, HF, D, Trans) WM154
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