

# IS SELF-ADJUSTING VOLUME CONTROL WORTH WHILE?

# Amateur Wireless

3d  
Every  
Wednesday

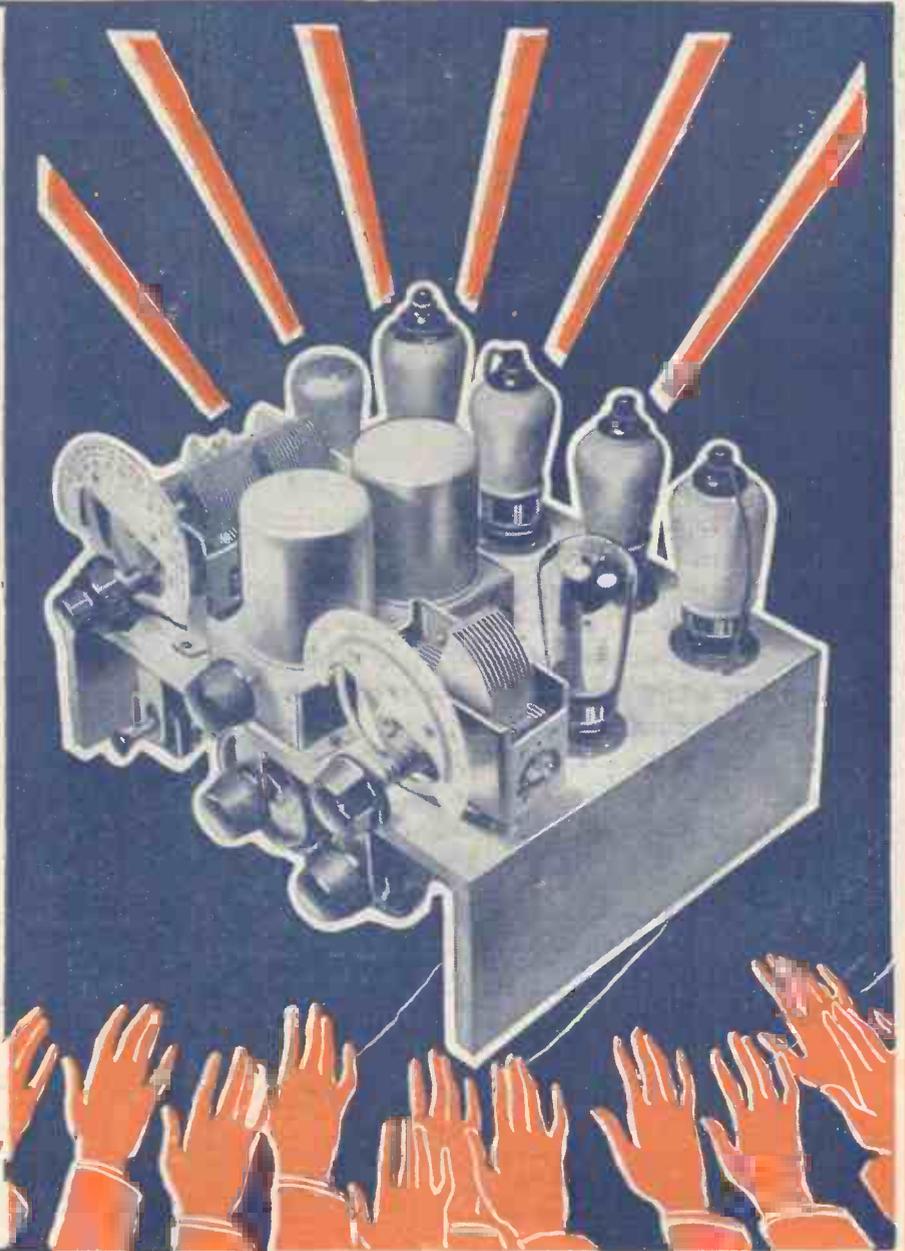
and  
Radiovision

A VISIT TO  
CAFÉ COLETTE  
USING THE NEW  
SCREENED  
PENTODE  
THIS STATIC  
BUSINESS!  
TELEVISION SECTION

*THE SET THAT  
THOUSANDS ARE  
WAITING FOR!*

A  
1934  
VERSION  
OF THE  
FAMOUS  
CENTURY  
SUPER

Brought Right Up-  
to-the-minute by  
*"The Experimenters"*



# B.I. ENAMELLED WIRES

## 8 SPECIAL FEATURES

1. High dielectric strength and free from pinholes.
2. It is tough and will withstand severe handling.
3. Enamel is highly elastic and will not readily fracture.
4. Will resist temperatures which would char any fibrous insulation other than asbestos.
5. Under ordinary conditions, retains all its qualities year after year.
6. The enamel is non-hygroscopic, thus avoiding short circuits where damp occurs.
7. The gauge of the wire, both under and over the enamel, is accurately constant, making it ideal for coil winding.
8. Entirely British made.



The B.I. have been manufacturing enamelled wire since it first came into use, and long experience, constant research, and the use of the finest machinery available have led to the production of B.I. enamelled wires of a consistently high standard of quality. For all fine windings where economy of space is essential, there is nothing to compare with the perfect insulation of B.I. Enamelled Wires, which are made in all usual sizes down to 0.002 in. diameter. Write for full particulars.

**BRITISH INSULATED CABLES LTD.**  
**CABLEMAKERS AND ELECTRICAL ENGINEERS**  
**PRESCOT-LANCS.**

Telephone Nos.: PRESCOT 6571

London Office: Surrey House, Embankment, W.C.2

Telephone Nos.: Temple Bar 4793, 4, 5 & 6

# DON'T TAKE CHANCES



**AN "ATLAS" UNIT FOR EVERY SET**  
 There is an "ATLAS" Unit to convert any battery receiver to mains operation in a few minutes, without alteration to set or valves. Prices from 39/6 cash or 10/- down. **TRY ONE ON YOUR SET**

Ask your dealer for free demonstration and send coupon for free booklet to:—  
 H. Clarke & Co (Mer.), Ltd., Patricroft, Manchester, London Office: Bush House, W.C.2.

## INSIST ON "ATLAS"

### AS EXPERTS ALWAYS DO

**T**HERE'S not a radio designer of note who does not consistently and emphatically recommend and specify "ATLAS" Units for their sets. That is one definite reason why you should insist on "ATLAS." Others are the facts that "ATLAS" are the units to win the Olympia Ballots for two years running; that "ATLAS" gives the highest outputs, greatest voltages, finest smoothing, and best value in the world. A.C. and D.C. models for every set, "Class B" and "Q.P.P." included, and for 25-cycle mains, without extra charge. "ATLAS" is best—insist on "ATLAS."

# ATLAS <sup>®17</sup>

**MAINS UNITS "CLARKE'S ATLAS"**

Messrs. H. CLARKE & CO. (M/CR), LTD.,  
 Atlas Works, Patricroft, Manchester.

Please send me FREE copy of Booklet No. 87, telling me all about the world's Finest Mains Units.

Name .....

Address .....

93/17

**ASK YOUR DEALER — HE KNOWS**

# Giving it away!

MULTITONE BRINGS SOUND TO LIFE!

Multitone are doing more than selling good transformers. They are now giving you a new Complete Guide to Class "B." Whether you are building a Class "B" set or only adding Class "B" to your existing receiver you will find this guide invaluable. It explains the theory of Class "B" amplification and gives full particulars of circuits and components.

Write to Dept. A, for a free copy.

**TOCO TONE CONTROL TRANSFORMER**  
Ratio 1/4  
(saves an extra 30 per cent. H.T.) ... Price **17/6**  
Graded Potentiometer ... .. **3/6**

**BEPU DRIVER TRANSFORMER**  
Ratios 1/1, 1.5/1, 2/1  
High Power Efficiency over 85 per cent. Very low overall secondary resistance 100 ohms. Price **9/6**

**PUCHOKE CENTRE-TAPPED CHOKE**  
For matching any speaker to Class "B" output ... .. Price **9/6**

**CLASS "B" CONVERTER UNIT**  
Those who do not wish to interfere with the wiring of their present set can buy this simple unit. Just plug in adaptor to last valve stage and enjoy Class "B" advantages ... Price **37/6**  
(less valve)

OR IN KIT FORM ... .. **27/6**

If you do not know who is your nearest Multitone Dealer, please write to us



(77)

**MULTITONE**  
ELECTRIC COMPANY LIMITED  
95-98, White Lion Street, London, N.1. Telephone 444, 6

## Why is GROSVENOR the longest-lived battery in the World?

Firstly . . . The zinc cells are the cause of 99 per cent. of battery failures. By the Grosvenor MERCURY process, these vital cells are guarded—scientifically protected against corrosion and deterioration.

Secondly . . . So long do these MERCURY-PROTECTED cells last that Grosvenor fill them with extra chemicals to use them up. Every Grosvenor battery is crammed to the limit with this abundant extra long-lived power. That is why it is no idle claim, but a scientific certainty that Grosvenor are the longest-lived batteries in the world—the batteries that give you more for your money. Insist on Grosvenor next time, and test this for yourself!

**NEXT TIME  
PLUG INTO  
THE BATTERY-**

GROSVENOR Mercury Batteries are made for every Radio need, from 5/6 to 20/-. Ask also for Grosvenor Miscanlite Electric Torches, strong and attractively coloured, from 1/-



**-THAT GIVES YOU MORE**

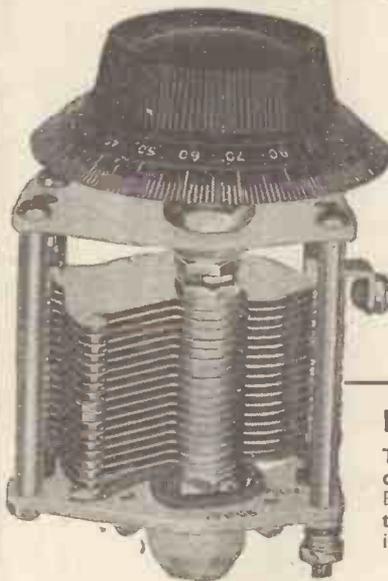
GROSVENOR ELECTRIC BATTERIES LIMITED  
2-3 White Street, E.C.2. Telephone: Metropolitan 6866 (2 lines)



SEND FOR THE NEW POLAR CATALOGUE

# POLAR CONDENSERS

are **STANDARDISED** by Set Manufacturers  
**SPECIFIED** by the Technical Press  
KNOWN THROUGHOUT THE WORLD



because of their **ELEVEN YEARS REPUTATION** for **ACCURACY** and **RELIABILITY**

### POLAR No. 2 S.M.

The Polar fast-and-slow-motion condenser. Made in aluminium. Ball bearings. Robust construction and rigid framework as illustration.

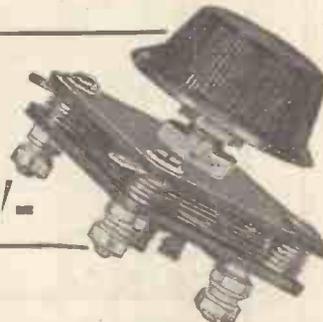
.0005 } **6/6**  
.0003 }

### POLAR DIFFERENTIAL

The condenser with an insulated spindle. Constructed with the highest quality materials. Smooth action. Complete with knob.

.0003, .00015, .0001

**3/-**



**WINGROVE & ROGERS, LTD.**  
188/189 STRAND, LONDON, W.C.2

Works: Old Swan, Liverpool.

'Phone: Temple Bar 2244



*The* **GREATEST THING YOU CAN POSSIBLY GIVE YOUR HOME THIS CHRISTMAS!**

**INTER-COMMUNICATION WITH ALL THE PEOPLES OF THE WORLD!**

At last the day of All-World Radio has arrived, and you can build with your own hands the first receiver to give you not only England and Europe, but America and Australia direct. The Lissen All-Wave All-World "Skyscraper" 4 tunes from 12 to 2,100 metres. It brings two complete new wavelength ranges within reach of the ordinary listener—stations and programmes which before he was never able to receive—Ultra Short and Short-Wave transmissions from the ends of the earth. And remember you get these stations through Double-Balanced Pentode Output giving brilliant reproduction on a Moving-Coil Speaker—as much power as a Mains Set from ordinary high-tension batteries.

Lissen have made this All-Wave All-World Radio available to Home Constructors because it brings back the thrill of conquest to hear America and Australia *direct* on a set you have built yourself, it makes you an enthusiast to realise what a wonderful thing you have created.

**Build with your own hands a set which will receive ULTRA SHORT and SHORT waves as well as ordinary broadcast programmes**

When you see the Great Free Chart of the All-Wave All-World "Skyscraper 4," which tells you how to build it, and how to work it, and why it gives such marvellous results, you will agree at once that it will be wise of you to build for yourself rather than buy a factory-assembled receiver which cannot give you these new and intriguing short-wave stations. The FREE CHART simplifies everything; there are pictures of every part, with every wire numbered, every hole lettered, every terminal identified. YOU CAN'T GO WRONG! But get the Chart and see for yourself—then build the Lissen All-Wave All-World "Skyscraper" 4, the SET THAT SPANS THE WORLD!



**KIT COMPLETE WITH VALVES £5.12.6**

To LISSEN, LTD.,  
Publicity Dept., ISLEWORTH.  
Please send me FREE copy of All-Wave All-World "Skyscraper" Chart.  
Name.....  
Address.....  
A.W.1934

**POST COUPON CHART FREE**



To Ensure Speedy Delivery, Mention "A.W." to Advertisers



Britain's Leading Radio Weekly for Constructor, Listener and Experimenter

Editor: D. SISSON RELPH  
 Radiovision Editor: H. CORBISHLEY  
 Editor-in-Chief: BERNARD E. JONES  
 Technical Editor: J. H. REYNER, B.Sc.(Hons.), A.M.I.E.E.  
 Assistant Editor: ALAN HUNTER  
 Research Consultants: W. JAMES and PERCY W. HARRIS, M.Inst.Rad.E.

Published by BERNARD JONES PUBLICATIONS, LTD., 58-61 Fetter Lane, London, E.C.4. Telephone: Central 4341 (four lines). Telegrams: "Beejapee, Fleet, London." Subscription post paid to any part of the world: 3 months, 4s. 6d.; 6 months, 8s. 9d.; 12 months, 17s. 6d. Published on Wednesdays and dated for the following Saturday

# News from Broadcasting House

By Our Special Commissioner

### In the Christmas Panto

GATHER round, my hearties, and hear more about that old-style pantomime at Christmas. Bertha Willmott will be principal boy.

Noble support will be rendered by Horace Percival as the time-honoured "dame" and by Arty Ash as the funny man.

Let us not forget Betty Huntley Wright, who will take the juvenile lead.

Looks as though Sindbad the Sailor—by the B.B.C. à la Hickory Wood—may be a "high spot" of Christmas broadcasting, doesn't it?

### Stars for 1934

LONG-TERM bookings of famous acts will strengthen the B.B.C.'s light entertainment efforts in the New Year.

Bans or no bans, you will hear—among other stars of the vaudeville world—Will Hay, Layton and Johnson, Doris and Elsie Walters and Lillie Morris.



Betty Huntley Wright

### B.B.C.'s Guide to Lucerne

WHAT is a wave-length? For the correct and true answer see the B.B.C.'s new pamphlet, which has been written to give lay listeners the "low-down" on the Lucerne Plan and its effect on wave-length changes on January 15, 1934.

Really, this latest literary effort on the part of our friends the Engineering Department is produced to nip in the bud any outbursts from Disgruntled Listener.

### B.B.C. Enters the Ring

WHAT did you think of the broadcast commentary on the Big Fight last Thursday night? As I write it has not happened, of course, but I'm intrigued, all the same

For years the B.B.C. has been trying to get into the ring with its microphones, but until this fight it had failed. Seemingly, Ted Broadrib, the boxing promoter, is going to be a friend of broadcasting—and of thousands of boxing-fan listeners.

### Changing the Line

LEEDS has lost some of its former significance in the B.B.C.'s land-line network. Reason being that under the new hook-up Birmingham becomes the main junction.

Repeaters to boost up the wilting signals are installed at Bristol, Birmingham, Leeds, Newcastle, Edinburgh, and Daventry. With the new lines they provide the highest possible quality for inter-station relays.

### Where We Score

LEST you should imagine this digression into painfully technical channels is wanton on my part, I hasten to add that there is a good reason.

I want you all to realise what the B.B.C. has done for you. It has given you land-line relays that for balance and tone-correction are at once the glad joy of the Post Office and the silent pride of the B.B.C.

### Those Bethlehem Bells

MY fellow scribes have done those bells so proud that I hardly like to refer to them again. But I must, you know. For there has been a change of plan.

We are to hear them on Christmas Eve, not Christmas Day. They will be part of a B.B.C.-cum-N.B.C. programme, items being Bethlehem bells, Winchester Cathedral service, and something from lil' ol' Noo Yark.



Bertha Willmott

### Television Progress

WITH so many scare headlines about television progress, I need no excuse for returning to this topic. The B.B.C. continues with 120-line transmissions on the ultra-short waves, but I should emphasise that nothing like a fixed system has yet been arrived at.

Meanwhile, amateurs are exhorted to carry on with the 30-line medium-wave transmissions, four nights a week from London National.

## This Week's Features

	Page
<b>Is Self-adjusting Volume Control Worth While?</b> Ernest H. Robinson asks—and answers—a question of interest to every fan ... ..	1053
<b>X-maspherics</b> Two pages of fun and frolic by "Fishglue" ... ..	1054
<b>Records for Your Radiogram</b> "Recorder" reviews the best of the latest record releases ... ..	1056
<b>I Visit Café Colette</b> An account of London's most secret night club by Leslie Bailly ... ..	1059
<b>Using the New Screer-grid Pentode</b> Useful hints for the experimenter by John Colindale ... ..	1060
<b>This Static Business!</b> J. H. Reyner explains how interference can often be minimised, if not completely overcome ... ..	1064
<b>The 1934 Century Super</b> "The Experimenters" describe their revised version of this famous set ... ..	1068
<b>Amateur Television</b> More information for "picture" enthusiasts, who are growing every day ... ..	1074

### New Saturday Night Feature Coming

WILL it shatter you to hear that "In Town To-night" for Saturday nights will be dropped very soon? Resting in my country retreat, I shall sigh not at the passing of this series.

Denis Freeman, all for our delight, is preparing a new feature. It will be known as "Soft Lights and Sweet Music." Saturday nights, note, from 7.30 until 8 p.m.

### The Name's the Thing!

BEFORE she became such a microphone celebrity, Mrs. Giles Borrett, late of the



Sir John Reith

of this kind is a tribute to impartiality in operation.

"Of this, however, I am more and more convinced, that an active, friendly and sympathetic co-operation between broadcasting

## Sir John Reith Says\*—

Broadcasting is not to be the pawn of any individual or interest within or without its organisation. The success of our operations involves an equal unpopularity with juntas, cliques and political parties, as well as with highly opinionative and self-satisfied individuals. Unpopularity

authorities throughout the world, and in these days perhaps particularly between those of England and America, is not only important but of paramount importance.

"Last year you heard of the projected Empire service. To-day, after twelve months' operation, we may claim considerable progress.

"Next year we hope the new Droitwich high-power station will have made a significant contribution to European broadcasting; the year after that a better service to the Highlands and to the North-east coast of England."

"Ignoring those critics who should be and are ignored, let me tell you that there is no responsible and intelligent critic more dissatisfied with the B.B.C. than the B.B.C. is with itself."

\* Points from a reply to the toast of the B.B.C. at the Radio Manufacturers' Association annual banquet.

London announcing staff, was heard over the air as Shiela Stuart. But she has wisely decided to be known in future as *Shiela Borrett*.

You won't have to tune randomly around the foreign stations hoping to catch her voice again. For she is down to broadcast on December 6 and 7, from London. You will hear her then as the Countess Helga Von Eberhart in *Good Night, Vienna*.

In *The Path of Glory*, on December 15 and 16, Shiela will again be heard—as a maid-servant. Such versatility!

### To Study Yankee Technique

NO sooner has Sir John Reith returned home from his flying trip to New York than I gather the news of Roger Eckersley's intention to cross the Herring Pond early in the spring.

Roger is Director of Entertainment. I cannot help thinking that the idea is to develop Sir John's well-known penchant for interchange of technique between B.B.C. and N.B.C.

### Snappier Presentations?

WE cannot learn much from the Americans about the serious side of broadcasting; on the contrary, the Americans are falling over themselves to emulate us.

But in entertainment—oh, boy! They have forgotten more about presentation than we have ever learned. Let us hope Roger comes back all "pepped up."



Denis Freeman

### Devon Audience Grows

SINCE West Regional came on the air about nine months ago there has been a marked increase in licence revenue from glorious Devon. I hear from a statistically minded official that in three years Devon has doubled its licensees.

Most of this increase is due directly to the inception of West Regional. On the other hand, Cornwall continues to record a very poor licence response. Hardly to be wondered at. Plymouth is not exactly an ether shaker.

### Another Colonel!

AT the B.B.C. these days there is a growing militarist air. I see nothing sinister in it,

personally, but then I am so simple. Which musing is occasioned by the latest arrival at Portland Place—one Colonel Home, straight from the War Office. He has joined Noel Ashbridge's brigade of engineers.

### Hard Luck, Eve!

LOVELY auburn-haired Eve Becke has just undergone a serious operation, which prevented her from appearing in the recent *Follies of the Air* broadcast.

Everyone will wish her a speedy recovery, won't they?

### B.B.C.'s Latest "House"

AFTER all the alarms and excursions about the studio to take the place of the doomed No. 10, I am relieved to be able to record that the old skating rink in Delaware Road, Maida Vale, has all but been purchased.

The B.B.C., as soon as it has signed on the dotted line, will immediately get busy adapting and decorating the building as an enormous studio for the big orchestral broadcasts.

### For the Vaudevilles, Too

WHILE the major part of the new building is in use the B.B.C. will continue behind the scenes to put up dressing-rooms and smaller studios.

## Radio Gossip of the Week

### Century Super—1934!

NO set scored such a triumph as the original Century Super—the super-het that put super-hets on the radio map for the amateur constructor.

Now meet the 1934 version of that famous set! Read how "The Experimenters" have brought in the latest advances without in any way losing the original features.

Read, on pages 1068 to 1070, how self-adjusting volume control of the most effective type has been incorporated.

How this and many other improvements have been included without scrapping the original parts.

Century Super 1934 is history making. Just the set to make the most of the new *Plan de Lucerne*!

### Luxembourg's Error!

THE transmitter at Junglinster is of an up-to-date pattern and its quality is excellent; at times maybe you may find the broadcasts slightly marred by a heterodyne whistle which

Possibly there will be room for a vaudeville studio, complete with gallery for the indispensable "clap hands" gang.

### Giant Exhibition Theatre?

IF the Radio Manufacturers' Association has its way, the B.B.C. will have to prepare exhibition shows on a gigantic scale next year.

As you will recall, the "high-spots" of the Radio Show this year were the shows and vaudevilles in the specially constructed B.B.C. theatre in the Main Hall of Olympia.

For next year the R.M.A. would like to enlarge this canvas theatre to seat four or even five thousand people. Whether the B.B.C. can tackle such a problem is, apparently, not yet clear.



Roger Eckersley

### Malcolm Frost Off Again!

HAD lunch yesterday with that energetic young emissary of Empire, Malcolm Frost. It seems he has hardly landed in England after his tour round the world before he is off again.

This time the fields and pastures new will be in Canada—and possibly across the border into the States.

Malcolm expects his batch of a dozen recorded programmes, which includes our Programme Critic's *Christopher Wren* play, to sell like hot cakes.

### Bethlehem—Latest

JUST as I close these notes for press, I gather further news about the Bethlehem bell's broadcast. Thanks to magnificent spade work by our Post Office, in collaboration with the B.B.C., the routing of the bells is now finally fixed.

Bethlehem-Jerusalem-Cairo-London. Such are the key points in the route, made possible by land-line and radio-telephone links.

The proposed Bethlehem bells broadcast has fired the imagination of the whole Christian world. Europe and America will join in the final hook-up.

is usually caused by Kalundborg, which is not to blame, as Radio Luxembourg is really the interloper.

### What's The Time?

QUESTIONS of Greenwich Mean Time. Central European, Eastern European and Summer Time has puzzled many readers throughout the year, and the fact that Holland, on the same meridian as Belgium, should keep its clock twenty minutes ahead has also complicated matters.

Possibly within a month or so this little incongruity may be altered, as the Dutch Government is willing to consider the adoption of both Greenwich Mean and British Summer time.

Central European—namely, one hour ahead of us—must remain. Of course, countries working to it do not make any alteration in the summer months.

Jay Coote tells you all the rest of the foreign-station news on page 1072.

# IS SELF-ADJUSTING VOLUME CONTROL WORTH WHILE?

Asks ERNEST H. ROBINSON

**W**ITHIN the last month or two I have had through my hands a considerable number of the latest commercial receivers, both all-mains and battery-operated. They were all super-hets and in most cases were fitted with self-adjusting volume control (or A.V.C.).

As a result of these tests I am beginning to ask myself whether self-adjusting volume control is really worth while.

### Two Great Advantages

When this latest addition to the growing complications of wireless burst upon an eager world, we were told that it had two great advantages. One was that all receivable stations could be tuned in at equal volume, and therefore in searching for distant stations our ear drums would not be split when the pointer of the tuning dial passed over local and other powerful stations.

The other was that the device would prevent, or at any rate greatly reduce, that bugbear of long-range listening—fading.

What is the truth? In all the commercial sets I have handled there is a manual sensitivity

of view, therefore, self-adjusting volume control has not fulfilled the promise originally made for it.

It does minimise fading to a very considerable extent, but we have to pay for this convenience. Speech and music from a distant station certainly come through with little volume fluctuation, but all the time there is a background of hissing noise which rises and falls in a most annoying way.

Personally, I cannot listen with patience to any programme which is not free from background noise and undistorted so far as the ear is concerned. I am not alone in this. I find that the majority of present-day listeners have the same tastes as I have.

They may like to hear Continental programmes when there is nothing to their taste coming from the local station; but the quality and general effect must be something nearly approaching that which is obtained from the local station.

"D.X. fans" who do not care anything about quality, but only about distance and the number of stations logged, are a very small minority.

Don't make any mistake. I am not crabbing distant listening, but I do think that the number of distant stations which are worth listening to on any particular night is very limited and that for the ordinary listener, with some musical taste and regard for quality, self-adjusting volume control is not the least help.

I have compared these latest sets with the

*"The Experimenters" explained how to add self-adjusting volume control to the Etherdyne in the November 4 issue*



Wireless Magazine Seventy-seven Super and the more recent AMATEUR WIRELESS Etherdyne Super, and in my opinion the commercial sets cannot compare with them as regards quality of reproduction on a reasonable number of stations on any particular evening.

I admit that both these home-constructor sets are outstanding achievements and that they have not had to be designed to commercial requirements. The point is that neither of these receivers is fitted with automatic volume control and that the Etherdyne particularly will bring in everything there is to be brought in.

Self-adjusting volume control might make the Etherdyne a better receiver for the man who must hear speech at an intelligible level from some distant station given to violent fading, but for the ordinary listener it would only complicate the set without making it one jot better.

My conclusion, then, is that for commercial operators who have to take traffic from distant stations; for short-wave receivers where quality counts for nothing and intelligibility is everything and fading occurs on almost every station received; self-adjusting volume control even in its present form, is of the utmost importance.

For the ordinary everyday listener to broadcast entertainment it adds no stations of real programme value to the list that can be received at any particular time, and is an unnecessary complication and addition to expense.

The more complications that are put into a receiver the more places there are in which faults can occur. All we want is the utmost simplicity combined with first-class quality.



*Completing the assembly of a set in an up-to-date factory*

control. This is an absolutely necessary fitment because, if the circuit is worked in such a state of sensitivity that distant stations can be brought in, the local and powerful stations still come in with a deafening roar.

On the other hand, when sensitivity is reduced to a degree which allows of distortion less reception on the local station, distant stations cannot be received or are heard at such low volume level as to be valueless. From this point



*A modern factory equipped with continuous bands to make assembly easy*

# X-MASPHERICS

by "FISHGLUE"

PEACE on the earth, goodwill 'wards men,  
(I'll wait 'till the Editor's dined, and then),  
When the nuts have flowed, and the wine is red,  
And cigars and balloons have reached his head,  
And the Yule-log's cheery warmth has dulled,  
The brain that the Christmas punch has mulled,  
Then:  
I'll snatch my pen and scrawl a line,  
(Trusting to get it off in time),  
And sneaked past Ed. and into Press,  
(My usual vacuous verbose mess),  
Indited solely, with wish sincere,  
That your wireless, health, and Christmas cheer  
Prove better, and better, and better, this year,  
Than ever!

THAT, just by way of introduction, Christmas simply thrills me to the *n*th kilocycle, and I've just got to burble about it to someone, or burst.

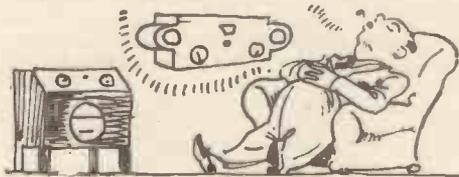
I've been asking Santa Claus repeatedly, for some weeks now (on short waves, of course) for a Fishglue Super, to be deposited complete with extra loud-speaker, and very remote control, as near to my stocking as possible, and I hope he's had the decency to listen carefully to my list of prescribed additional equipment.

The Fishglue Super is a set I designed specially:

- (a) For Christmas.
- (b) To annoy Mr. James.

I was inspired to its conception by a cock-tail party and a lobster supper, and if you'll be good enough to give me the wire when Bros. James, or Reyner, come near, I'll spill the beans, or, to translate into modern English "I'll give you the whole woicks."

First of all, remembering that someone on



Inspired to its conception by lobster supper, etc.

the technical staff once impressed on us the importance of  $\frac{2\pi}{d}\sqrt{1cn}$ , I designed some

cylindrical spaces, and wrapped wire round the outside, in various layers, to taste.

Don't forget that, in my black print I specify green wire, but any other flavour may be substituted without deleterious deviation from the author's specification (wait 'till Mr. James sees that bit—you'll see it on all his Farnyard Nine's, and Dog-fight Sixes, next year!).

These inductances, and their corresponding bottles, were then divided up into stages, first defective, second defective, mixer, etc., by simply—well, simply by dividing them into stages, of course, silly!

Naturally, these must be tuned. In order to approach the tuning from an original point of view (and to approach any problem from a new angle is indubitably a *sine* of the times) I decided to achieve the KA effect, by simply

rotating spaces between fixed moving, and fixed fixed, vanes. These rotating spaces, of

course, must not be semi-circular, but must have knobs on, in order to give a S.L.F. effect.

Putting knobs on spaces involving only two dimensions, is undertaken by a very costly plant, installed for me by Professor Einstein, at great personal expense, and available only to AMATEUR WIRELESS readers, on receipt of the free coupon which Ed. is sure to forget to include in this issue.

Having disposed of the tuning arrangements, we will now discuss the valve sequence. First, we have an S.G. combined detector



Having disposed of tuning arrangements

oscillator, and that will be very nice, thank you. For want of something better to do, this is coupled by a transformer to two movable-mu S.G. valves, followed by a double-diode-distorter for A.V.C. (whatever that is).

Then follows a stage of L.F. (S.G.), magnetically coupled to two pentodes, with space allowed to push-pull. The other valves (two up, two down, and two in the H.P. agreement), are high-power rectifiers. The output is in the region of 2 watts (undistorted, mark you, not anode dissipation), and is sufficient to fill a small hall.

(Ghost of Mr. Hamlet Turner—"Sez you!")

The quality is all that can be expected, providing, of course, that you know what to expect: a moving-coil loud-speaker of brilliant design rendering faithful reproduction of all frequencies, down to, and including, the infra red.

The output valves, and rectifiers, are provided with small grills for roasting chestnuts (vegetable ones—I am not referring at the moment to the modulated ones proceeding from the loud-speaker).

All the knobs are chromium plated—a large one for the lady, and a small one for the baby. The invisible ultra-violet rays (which can be seen when any I.H. pentode warms up) are utilised for curling the baby's hair. For this purpose, hold the baby, noisy end down, over the loud-speaker grill.

All surplus heat from the set is collected in a funnel-shaped deflector, and deflected back, through lenses of appropriate focal length, directly on to the heaters. This produces further heat, giving greater emission, resulting in still more heat, which is again deflected back on to the heaters. After five minutes of this, the L.T. can be switched off, and the current thus saved can be used to drive the mangle.

The whole set can be folded flat, and disguised as an aspidistra, when not in use, and on pressing button A, your money is returned and it changes into a folding bedstead. (The set, of course, not the money!)

I do so hope Santa will bring me one, 'cos just look at the fun Uncle Fishglue can have on Christmas Day, getting America (and Jay Coote too darned full of stuffing—or whatever

his particular weakness happens to be—to call him a liar).

For a moment, just allow me to give you an impression of what a Yankee sponsored Christmas programme would probably be like:

"Say folks, this is the Cow and Cud Chewing Gum Corporation, Inc., who represent tired teeth and intelligent chewing. We will now make a break with 'Get a load of This,' by the Herald Angels (who, in their spare time, chew nothing but Cow and Cud Chew Cobs). They're good, folks, and you're gonna like 'em! Here they are!"

Moan:

I gotta date, I met my fate  
With the cutest sheikh in town;  
I waited late, at the garden gate,  
But the bum simp lemme down.

Yowl:

That's where you get off,  
You've never had a break,  
You're gonna be the talk of the town.  
Yeah, sister!  
You're gonna be the talk of the town!

Both:

He's got me cryin' again,  
For him I'd got great big yen;  
He said, s'elp him,  
That he,  
Was nuts,  
On me.  
My Hiram swore that he'd be trew,  
My green eyes seemed to him like blew;  
He fairly handed me the dope,  
I was full of hope,  
Everything was OK;  
Then he left me flat,  
And did me brown;  
Now I'm gonna be the talk of the  
Town

Moan:

Vo do deo do

Yowl:

Mlowww

[If any lines in the above should, by mischance, scan, or show any sign of a legitimate rhyme, I offer my sincere and abject apologies to American song writers.]

"Say folks, you'll sure be glad to hear that this concert is being put on the air by the Cow and Cud, etc.

"To finish our Christmas broadcast we're gonna have a little song that will sure pull at your heartstrings. The melderly is the latest Krawl Charleston, invented by a professional contortionist whilst having treatment for fits, and was inspired by St. Vitus. It will be crooned for you by Bing Carlisle, the world's nastiest noise.

"Here it is, and it's called 'You crept into



"Say folks, this is the Cow & Cud Chewing Gum Corporation, Inc."

my heart in your stockin' feet, but you won't come into my arms."

After staggering through that, I've just about got sufficient strength left to twiddle the doodlems, and here we are, quite free from

interference, Königstannerhausen, Germany.  
 "Heil!  
 "Achtung!  
 "Deutschesfunk und udder bunk . . . etc."

**Orders for the Day:—**

Under the Nasti régime, no stockings will have been hung up in good German homes, until the aryan descent of Santa Claus can be definitely established by the Schlußtag.

No Christmas dinner shall cost more than zwei marken.

Christmas parcels will be provided by the State. These will contain:

- Clean brown shirts;
- A new Swastika;
- A book of approved Deutche dances.

Every—  
 (Here, that's enough of that.—ED.)

Tut! Tut! Let's switch it off for a while then, and pass the nuts. Oh, by the way, before I forget, Mr. Whitaker-Wilson has asked me to review a few records for him—he's been overworked lately. (Joke!)

I appreciate the honour, and assure you that I shall do my best to review them in the approved style. Here we are, here's the first:

**Bungophone XD6**

"She Was Only a Watchmaker's Daughter" and "Sandi in the Bath." Sung by Sandi Trowel.

Sandi, please do not be vulgar! I believe Mr. Wilson has had to speak to you before, about this. "Old Geyser" is certainly no



One of the most soul-stirring passages

tarn to apply to a lady! This record is not even funny. I don't like it.

**J.M.D. XQ769**

Two foxtrots: "I'll Send Her My Kisses by Radio" and "Rhapsody in Scarletina." Played by Charlie Plonk et son orchestre.

This record is bearable if played with a soft needle. I will admit that the first side hurt me less than most foxtrots do. I noticed with pleasure the verve with which a C-sharp minor was rendered by the third piccolo, but it would have gained by being a little more *non alle troppo*. Buy this record if you like this sort of thing.

**Kitchenphone DB707**

"I Took my Harp to a Party" and "I Threw the Darn Thing Away."

Hambone and His Storytellers. A very foolish record. Perhaps permissible at Christmas, but not where there are children about. Kitchenphone, this is not up to your usual standard.

**Columbophone PX397**

"Der Schlofterstinkenspeil," 6p: 99, part 3 of Die Hamundtungen Suite, by Von Lisztstrauss, and "Overture to Vladivostok," by Ripsky Pantzoff. Both sides played by the Czeko-Lithuanian Symphony Orchestra.

Side number one is a magnificent rendering of one of the most soul-stirring passages of the composer's typical classical German style. The abandon and restraint fill me with nothing but amazement. The strings are, perhaps, a shade too prominent (just notice that, and see

if you can agree with me—just three bars from the first crack in the record), but the tonal wealth of the tympani more than counterbalances. A record to be cherished. Buy two of them.

In the "Overture to Vladivostok," the conductor, Sir Pillsky Timber has made a very good attempt at a difficult subject. This psycho analytical work of the abstract Russian school calls for an interpretation, at once, subtle, and bold, and a keen perception of the



Free from interference

composer's finer feelings. The whole side is admirably rendered. Buy another two!

Having just been sacked as a musical critic, I should like to deal with one correspondent, before 10.30—I mean, closing.

"Worried Willie," of Sloshport, writes:

"Dear Fishglue,  
 My wireless set wot I got in my stocking, won't work. Why?"

WILLIE."

"Dear Willie,  
 I don't know. If in any further doubt, ask me again.

FISHGLUE."

We'll conclude with a golden Moonsong,  
 Whilst the purple shadows fall  
 Don't blame me for the crimson phoolery  
 'Cos I got it from Henry Hall

Mickey Mouse's wedding was at Sundown,  
 In a little green hollow, to-day;  
 Phyll Robbins took her harp to the party,  
 But wasn't allowed to play.

And the night shall be filled with music  
 And the noises infesting the air,  
 With rhythmic verse, shall be fifty times worse,  
 'Till you're "ga-ga," and tearing your hair.

And that's that!  
 She-who-must-be-obeyed has just intimated  
 That I must drop the pen, pick up the screw-  
 driver, and mix the mincemeat.

With the best of Christmas Wishes.

Yours, for nuts and nonsense,

FISHGLUE.

**Mythical Moments from Broadcasting House**

**Henry Hall Arranging a Few Numbers**



**Tit-bits from My Test Room**

By BOSP HOR PRONZ

**THE PIP RESTORER (MARK U)**

A NEAT little invention which supplies a long-felt want, namely, the restoration of the missing pip in the six-pip time signal from Greenwich and other such places.

As its name so clearly implies, this novel component restores the sixth or missing pip in the time-signal whenever that pip has become stuck in a B amplifier or has otherwise become lost in transit. The cheaper model, which requires winding once a week, sells at 2s. 4d. There is also a self-winding model which sells at 3s. 9d.

**WHISKER CHART**

TO the constant listener, wherever he may live and listen, this chart is, absolutely indispensable. It tells at a glance the place of birth, the age, the name of the first perpetrator and the length of whiskers on each one of the best known and most frequently broadcast jokes. Accurate to a tenth of an inch; it supplies information which acts as an unfailing antidote against the most severe cases of repetitive nausea.

Printed in black at a price of 1s., or in specially soothing colours at a price of 1s. 9d., this whisker chart makes an ideal Christmas present for a cantankerous relative.

**THE AUTOMATIC STOPPER**

IT is not generally known that over ten per cent of those admitted to the looney-bins of this country in 1932 had been driven potty by hearing the same piece of music time and time again on the wireless. Disturbing as this figure undoubtedly is, there is no further cause for alarm. Your wireless set simply cannot drive you potty if you connect to it one of the new automatic stoppers or looney lickers.

In its simplest form the automatic stopper, connected across the filament terminals of the detector valve, will blow that valve on the third repetition of any one piece of music in any one day or evening.

A type of the automatic stopper, which will prove most popular, is one which blows the detector valve on the pronunciation Indiah, Africah or Orstrayleeah by a B.B.C. announcer. Price 13s. 6d. inclusive of the new valve required.

**THE MACADAM-NOYES FILTER**

THOSE who are troubled regularly with electrical interference from trams, lifts, violet-ray apparatus, implements at a short-at-the-back-sir-establishment, etc., or with acoustical interference from a yodelling milkman, a screeching hawker, a love-sick dog, a prowling cat or from people who talk when the wireless is on, will hail with delight the new Macadam-Noyes Filter, the product of much research on much mush and the like.

Briefly, this filter acts as a counter-irritant. In the case of either electrical or acoustical interference, the filter, in allowing the interfering noise to pass, automatically selects and sets up a noise of a balanced and opposite type.

# RECORDS FOR YOUR RADIOGRAM "RECORDER"



## ORCHESTRAL

Gounod in Vienna, 2s. 6d.

Columbia DB1201

I am quite prepared to defend this record against the purists who will probably howl at a desecration. It is nothing of the kind, and is as far removed from the usual clumsy attempts to "jazz" the masters as can be. It is the superimposition of the Viennese idiom on a number of well-known Gounod airs and the result is quite delightful. The playing of the Orchestre Raymonde is perfect, too; so you have one of the best records of light music for quite a time.

Lazy Pete and Gipsy Moon, 1s.

Winner B5602

Splendid performances of both by the Commodore Orchestra. I have never heard these consistently good players better.

Gipsy Baron—Fantasy, 2s. 6d.

Parlophone R1662

Naturally, you would expect a good performance of this from Edith Lorand's Viennese Orchestra. A very spirited and pleasing record.

Cheeky Sparrows and Knight on the Hobby Horse, 2s. 6d.

Parlophone R1663

Two exceedingly bright little tunes embellished with some excellent xylophone work. Quite a record to enliven the party.

Die Meistersinger—Overture, 6s.

H.M.V. DB1924

This performance, by the B.B.C. Symphony Orchestra under Dr. Boult, contains all the elements which Wagnerians will look for. There is tremendous breadth in the playing, which is opulent to a degree. This record will create a great deal of interest and discussion.

Zampa—Overture, 2s. 6d. Decca K701

Here is a distinguished presentation by the orchestra of the Scala, Milan. Zampa was a great favourite some years ago. It has some pleasant and (very pompous) passages. I could wish for a little more strength in the violins here; everything else is quite in order.

Selections from the Film, "Waltz Time," 1s. 6d. Broadcast 3349

A very fine performance by the Commodore Orchestra, who are delightfully at home with it. There is some music in this well worth having.

Memories of the Ball, 1s. 6d. Decca F3679

A very pleasantly played medley of pre-war waltzes by the Campoli's Salon Orchestra. They're all there, "Salome," "Nights of Gladness," "Valse Septembre," etc. So there is a real welcome awaiting these good old tunes.

Symphony No. 8 (B Minor) (Schubert), 12s. Columbia DX551-3

Better known as the "Unfinished" and probably the best known of them all. The performance is by the London Symphony Orchestra, under Sir Henry J. Wood, and it is a very notable performance indeed. These three records will appeal to thousands, for it is really easy to understand, and in no way

structurally complicated. There is just a short main theme which each section of the orchestra takes up in turn, with some picturesque supporting music as it goes along. The recording is very good, every instrument being heard with extreme clarity. In fact, the "new recording" claimed for this set could not show itself off to better advantage than in the "Unfinished."

## BANDS

Scottish Fragments and The Triple Trumpeter, 1s. 6d. Regal-Zono MR1082

From the Scottish section of their list. The Govan Burgh Band are the performers, and they are very good indeed. The cornet solo in the second is as skilful a bit of work as you will ever hear.

Sweet and Low and And the Glory of the Lord, 4s. H.M.V. C2607

By the massed bands at the Crystal Palace Festival. A very impressive performance indeed, but Barnby's lovely piece is hardly suited to the occasion. But the record is a remarkable example of the skill of our bands.

Gleneagle March and Chorale—Belle Vue, 2s. 6d. H.M.V. B8028

The players are above. I like this better, for the pieces played are more in keeping with brass band technique.

Colonel Bogey on Parade, 2s. 6d.

Columbia DB1249

It is quite impossible to get rid of him. Here he interrupts a medley of marches by the same composer, most stirringly played by the B.B.C. Military Band.

## INSTRUMENTAL

Scherzi (Chopin) (No. 1 in B Minor, Op. 20; No. 2 in B Flat, Op. 31; No. 3 in C Sharp, Op. 39; No. 4 in E Major, Op. 54), 6s. each. H.M.V. DB1915-18

It is difficult to find sufficient laudatory terms to describe the superb playing of Rubinstein in these Scherzi. He interprets every gamut of human emotion with which these pieces are so clearly bestrewn, with the understanding of genius. We are told that *Scherzo* and *jest* are synonymous. Obviously there are jests here, gay and irresponsible, but the sudden changes to a bitter railing or to a disturbed muttering takes the picture into the world of tragedy rather. It would require pages to describe verbally the language of the Scherzi: you must hear these wonderful records for yourselves. You will certainly never hear a more masterly recital than these by Chopin's countryman.

## VOCAL

Auprès de ma Blonde and My Normandy, 2s. 6d. Parlophone R1668

You will have heard Reda Caire on the wireless (November 13). He sings these, an army marching song and a simple ballad, very attractively. The first tune is quite haunting.

Rendez-vous and Hearts and Flowers, 2s. 6d. Columbia DB1203

Two charming little vocal settings to two

equally charming old tunes, sung by Anona Winn. Her voice is of just the quality to make a real little gem of this record.

March of the Cameron Men and Kirconnel Lea, 2s. 6d. Columbia DB1274

An admirable performance by Hector Cox, a Scottish baritone with a fine voice. If you would hear these as they *should* be sung, get this record.

A Brown Bird Singing and I Love the Moon, 4s. Parlophone RO29231

One of Tauber's *very* best. His English (now greatly improved) makes these very good songs positively enchanting. If you have no Tauber records, but mean to buy one some day, get this; it is a real treat.

Fortune Hunter and Leanin', 1s. 6d. Decca F3665

A splendid record by Roy Henderson. There is tremendous depth and power in his voice and he has quite captured the spirit of these two simple ballads.

Good Friday Music in a Catalonian Church (Schindler), 4s. Columbia DX545

The title would appear to make this record unsuitable for Christmas, but actually it seems remarkably in keeping. This is an exceedingly beautiful piece of choral work by the B.B.C. Wireless Chorus in English and Latin. A very unusual record indeed.

A Lowland Love Song and Molly Branigan, 2s. 6d. Columbia DB1225

The first of these two is a little triumph for Norman Allin. Our best bass singer is perfect in both accent and presentation. The Irish song is well sung, but the brogue is wisely evaded.

Love Will Find a Way and My Hero, 2s. 6d. Columbia DB1226

Ina Souez is unquestionably a fine soprano and these two songs are revived in a very brilliant fashion.

## TWO MORE ABRIDGED OPERAS

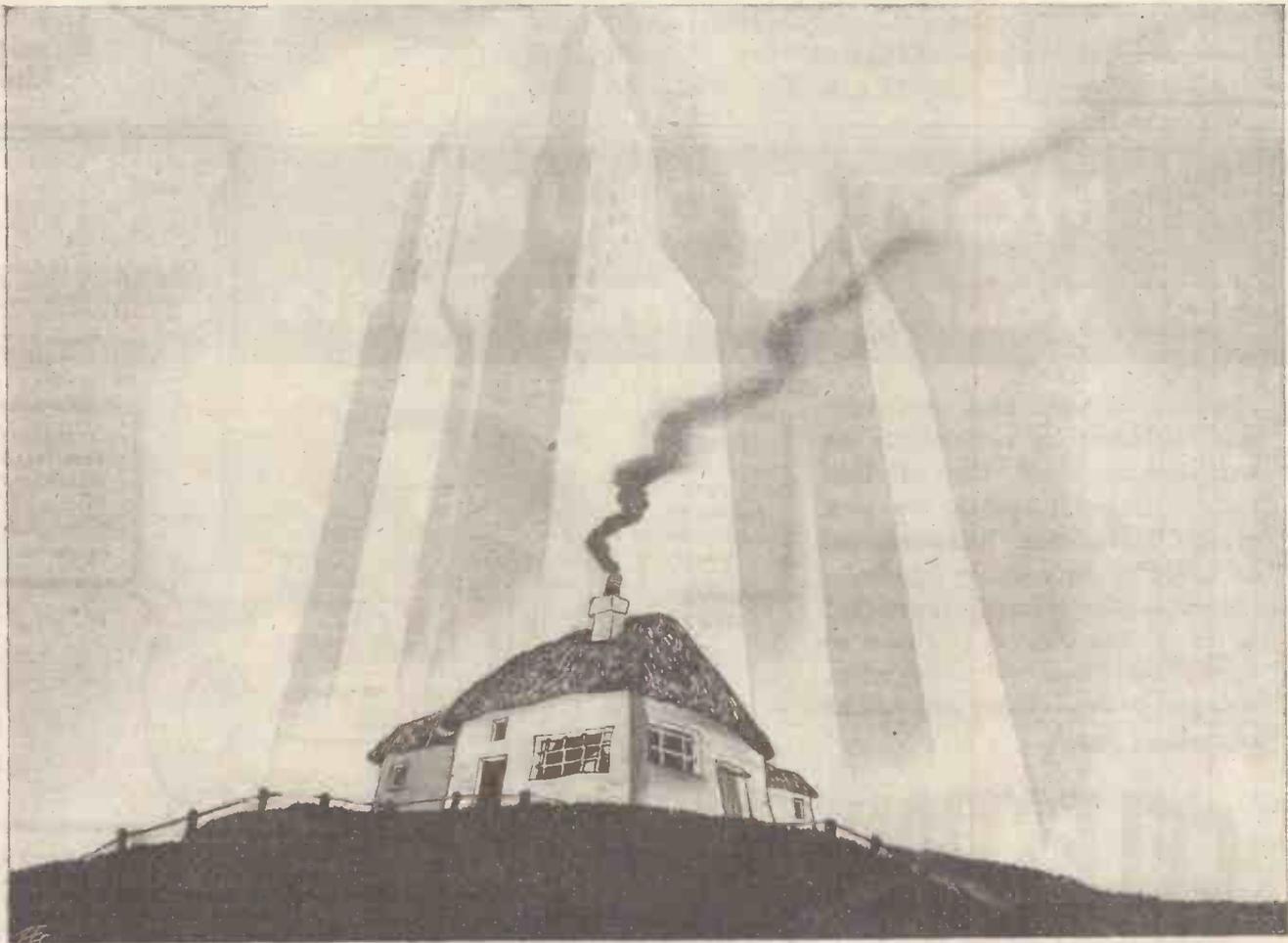
This very laudable movement of Columbia has now produced *Rigoletto* and *Tosca* in the same series of six 12-in. records. The numbers are DB530-35 and DX524-29 respectively. As before, the performances are by Milan Scala artists, with the Milan Symphony Orchestra.

Both are uniformly excellent, the casts (different for each) being very strong.

In *Rigoletto* the name part is by Stracciari and Gilda is played by Mercedes Capsir. It would not be fair to pick out any airs, for all are so well done. The powerful acting of Stracciari is a delight and his singing is superb. In *Tosca* the three leads are Bianca Scacciati (Tosca), A. Granda (Cavaradossi), and E. Molinari (Scarpia). Here, again, singing and the dramatic art are finely blended. *Tosca* is, of course, an operatic adaptation of Sardou's play, with some of the horrors left out. Either of these operas may be safely bought on sight and enjoyed for years to come, for the series contains, as before, the plums of each.

# THIS CHRISTMAS . . .

. . . in cottage or in castle, in city or the wilds of wooded countryside; when the turkey has fulfilled its plump and satisfying task; when the pudding remains no more than a luscious memory; when spirits are warm and goodwill to all men swells in each British heart . . . when, in short, Christmas festivities are just needing a gentle twist upon a knob to find completion in a flow of satisfying entertainment—then it is that Mullard Master Valves will assure you of radio as perfect as good radio can be. • Are you depending on the valves which you depended on last Xmas — or the Xmas before? Fit new Mullard Master Valves — and be sure, this Christmas.



*The Mullard Wireless Service Co., Ltd., Mullard House, Charing Cross Road, London, W.C.2*

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

# The CENTURY SUPER REVISED

Regd. Trade Mark  
with **WEARITE** COMPONENTS

**COUPON**

To Messrs. Wright & Weaire, Ltd.,  
740 High Road, Tottenham, N.17.

Please send me a copy of full-size blueprint and constructional details showing how to build the "WEARITE-TEAMSTER" 4-valve Receiver. Also your Booklet No. A12 together with literature on Class "B." I enclose 3 penny stamps to cover cost and postage.

Name.....

Address.....

A.W. 9/12/33 .....

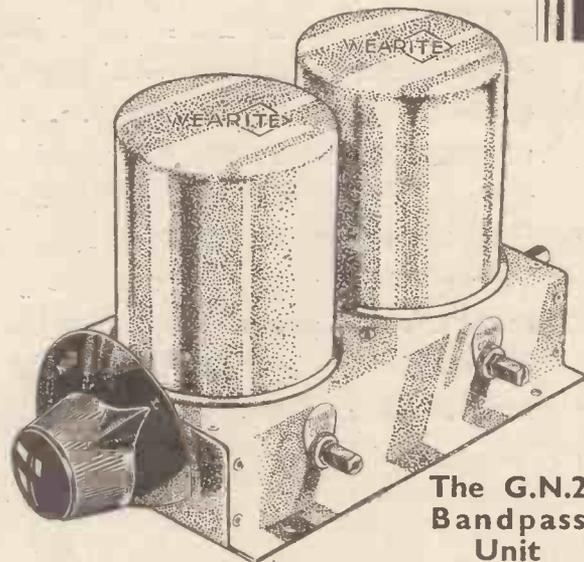
The tuning arrangements of the Century Super have been brought up-to-date to meet modern conditions, and again, as with the first Century Super, Wearite Coils are specified.

The new G.N.2 Bandpass Unit has been specially designed to modernise the Century Super. Revise your Super—the same way as the designer—use Wearite Coils.

**The WEARITE COILS FOR THE UP-TO-DATE CENTURY SUPER**

- One G.N.2 Bandpass Unit ... Price 21/6
- One O.2 Oscillator Coil ... Price 18/6
- Three O.T.1 I.F. Coils, each ... Price 10/6

Before you start on any set fill in the coupon and receive details of the latest developments in component design.



The G.N.2 Bandpass Unit

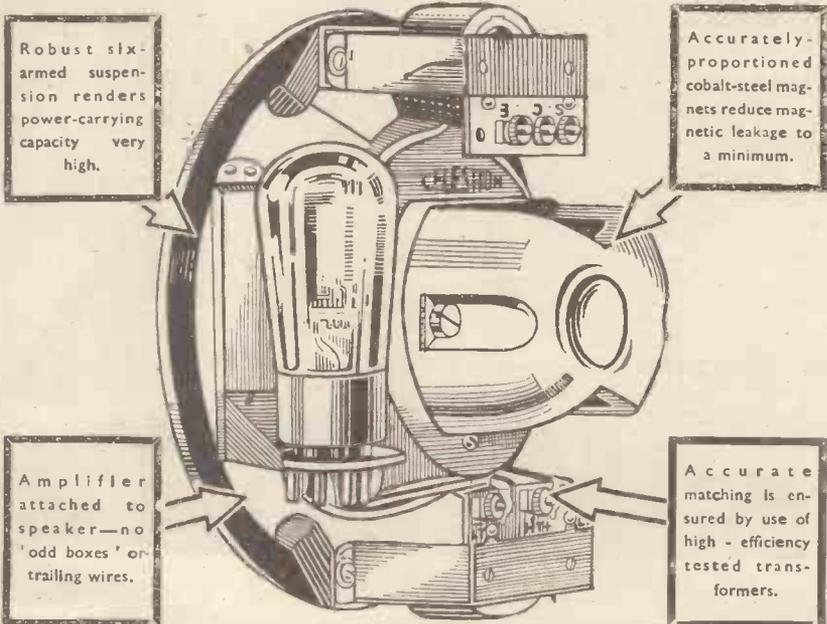
4179

## MORE VOLUME for your Christmas Radio

Get more volume from your radio this Christmas by substituting the Celestion Combined 'Class B' Unit and Moving-coil speaker for your present loudspeaker. It is connected as easily as an ordinary speaker—the amplifying apparatus is attached to the speaker chassis—you have no untidy 'odd boxes' or trailing wires. You get 'Mains' quality and volume at no extra cost.

**CELESTION**  
The Very Soul of Music

CELESTION LTD., London Rd., Kingston-on-Thames.  
Showrooms: 106, Victoria St., S.W.1.



Ask your dealer to demonstrate Celestion 'Class B' Speaker-Amplifiers, either in chassis or cabinet form.

- \* B' Stage 9 Chassis £2/15/0
- \* B' Stage 19 Chassis £3/7/6

**FOREMOST NAME IN SOUND REPRODUCTION**

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

# I Visit the Café Colette

London's Most Secret Night Club . . . . . By Leslie Baily



Walford Hyden

I HAVE been to the Café Colette. Possibly you have listened to its music, relayed on the wireless.

It is the strangest and most secret night club in London. Its name appears in neither the street directory nor the telephone directory and if you ask even a man-about-town about the Café Colette he will shake his head and walk away.

But I found it.

It is not easy to penetrate into the Café Colette. Many have tried; few succeeded. Having discovered the building, the way lies through a labyrinth of doors and passages—and they are all closely guarded. At the first door I was challenged by a uniformed janitor, who scrupulously examined my credentials before he allowed me to pass.

A silent-footed page escorted me along a silent corridor to a silent lift, which shot me up eight floors from the ground.

studios, and never have I seen such abandon under Sir John Reith's roof.

Only one member of the band remained calm, a mysterious and beautiful woman, with jet-black hair and a Moza Lisa face and nothing to do.

The music ceased with a howl of joy from the laughing players, and a swarthy man stepped to the microphone and spoke in broken English. When I heard him talking later, after the concert, it was still broken English, so I suspect it was genuine.

A piano struck up—there were two in the studio—and to a second microphone at the other end of the Café Colette a slip of a Hungarian girl in a décolleté black gown sang the remarkable request: "Take your kisses now; if you delay it may be for ever." The microphone was quite unmoved.

Then the band leapt into some wild Spanish thing and the leading violin swayed about on

his feet and threw his head to and fro, his long, dark hair danced over his forehead in errant locks, and the band worked itself into a superb frenzy, and the beautiful dark-haired woman sprang into activity with a pair of sparkling castanets, and at the end Walford Hyden cast off his waistcoat.

Then a Cossack choir sang. They were real Cossacks (I heard one speak—in broken English), all in real costume, high black boots, red cloaks, and little white astrakhan hats.

And finally the band hurled itself at a hectic fox-trot, everyone sang and stamped (myself included), the castanet lady gleamed with laughter, and the little

had gone out, signifying that the world had ceased to listen to us, and when everybody clutched hats, coats, and music, the handsome Cossacks passed the lady of the castanets on their way to the door and each of them paused and clicked his heels, bowed, and kissed her lovely hand.

Which seemed to me a suitably romantic ending to the Café Colette.

You see, it's not all make-believe. [This article is of topical interest, for the next "relay" of Café Colette will be made from London Regional on December 11 at 9.30 p.m. It should be worth hearing.—ED.]

## Modulation Hum

WHEN a receiver employing one or more stages of high-frequency amplification suddenly develops modulation hum for no known reason, it is well to suspect at once some slight defect in the electrodes of the high-frequency valve. The trouble is, that as modulation hum is only apparent when a station is tuned-in, no tests by isolating any portion of the high-frequency circuit will give useful results.

It is, of course, possible to cut out the high-frequency stage altogether and attach the aerial to some portion of the coil in the detector grid circuit, but we all know that some kinds of modulation hum are only apparent on very loud signals.

In such cases it will usually save a good deal of time and bother if the high-frequency valve is taken out and replaced with another one. In ninety-nine cases out of a hundred a cure will be effected. E. H. R.

## Whitaker's Radialmanac for 1934

**JANUARY.**—A case of sabotage at Broadcasting House. Eric Maschwitz tampers with the mains and nearly electrocutes three variety artists for perpetrating stale jokes in a vaudeville. When charged, Eric says it would be a Marvell if he couldn't Masch their Witz together and produce one comedian out of the three.

**FEBRUARY.**—Val Gielgud writes a drama for the Eight Step Sisters called "All My Life I'll be Your Valentine."

**MARCH.**—The Eight Step Sisters reprimanded for allowing their only brother to dance with them. Against regulations to have one over the eight.

**APRIL.**—S. P. B. Mais goes on a world tour to collect comedians who can be relied on to say something new. Brings back Epstein and Einstein.

**MAY.**—A. J. Alan tells a story so simply that Vernon Bartlett calls on Mussolini in Rome and tells him the ending in Italian before we know it over here.

**JUNE.**—The month goes by without any comedian referring to Teddy Brown's weight.

**JULY.**—The month goes by without anybody imitating Sybil Thorndyke or Cicely Courtneidge.

**AUGUST.**—John Snagg arrested in the Queen's Hall Prom for calling "In-out-in-out" in time with Sir Henry's conducting.

**SEPTEMBER.**—Canonisation of Stainless Stephen and St. Lloyd James.

**OCTOBER.**—The vaudevilles leave listeners so cold that there are records of their constantly turning to Stone.

**NOVEMBER.**—An announcer sacked for saying he didn't care if the news bulletin was late.

**DECEMBER.**—Dance-band vocalist heard singing in English. W.-W.

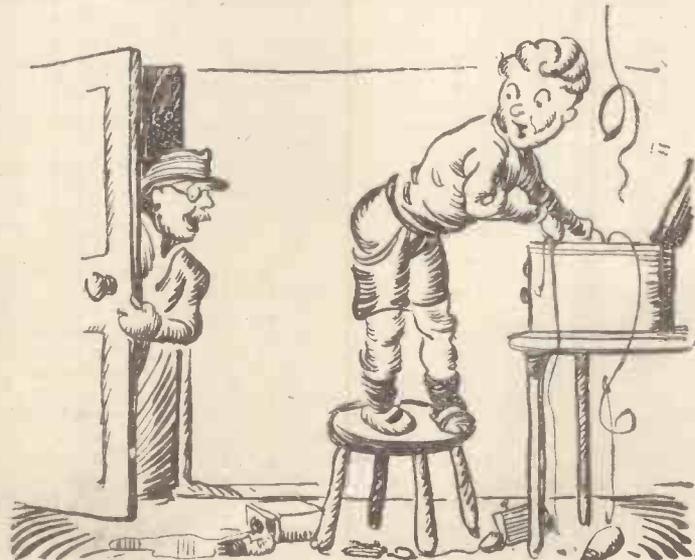
And there I found the Café Colette—on the top floor of Broadcasting House. In Studio 8A. This is a large room decorated in modernist style, its ochre walls picked out with strips of gleaming chromium plating, and here a dozen excited musicians were blowing and sawing and hammering and strumming at their throbbing instruments. All were in shirt sleeves; their conductor—Walford Hyden, one-time conductor for Pavlova—had taken off his collar and as he slashed the vibrant air with his baton the perspiration streamed down his face.

I have spent ten years in and out of B.B.C.

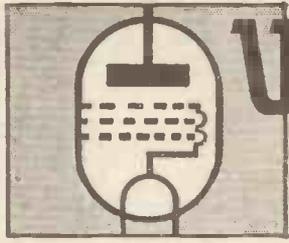
Hungarian girl stood at the microphone and sang and made eyes at us all and laughed and looked what the French call *gamine*.

Here's life, me-thought. Under Sir John's roof . . .

And at the end, when the red light



CALLER: "Hullo, Johnny! Is Daddy in?"  
JOHNNY (our over-enthusiastic radio constructor): "Now, does it look as though he's in?"



# Using the New Screen-grid Pentode

By  
JOHN COLINDALE

WHEN a new and a spectacular departure in radio technique is introduced, and bids fair to supersede some already well-established principle, the serious student of radio experiences an immediate urge to try it out at once. But if he is wise he will first make certain that he thoroughly understands the principle upon which the new development operates, and also rub up

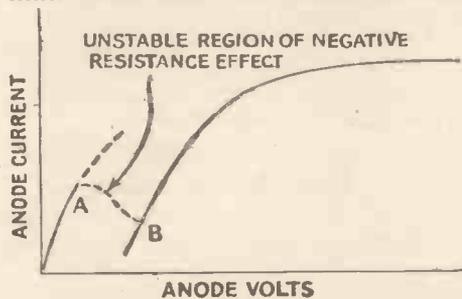


Fig. 1.—Form of anode volts/anode current characteristic of a tetrode. With large anode-voltage swings the region AB is entered and the valve becomes unstable

his knowledge of the older technique, in order to be able to assess at its full worth the new improvements, and to apply them to the best possible advantage.

A case in point is the high-frequency screened pentodes which were recently released.

Up to now, even advanced amateurs have been perfectly satisfied with the stage gains obtainable with well-designed high-frequency amplifying circuits employing screen-grid valves, while the more recently introduced multi- $\mu$  feature has provided adequate safeguard against overloading with the consequent distortion and cross modulation when listening to powerful programmes.

A good screen-grid stage, carefully designed and adjusted, can be relied upon to give an overall amplification of at least 150, while the multi- $\mu$  control enables this to be reduced to a 1:1 ratio—that is to say, the signals passed through the high-frequency stage without magnification—or even, by pushing the negative bias still further, a negative gain that is an actual reduction instead of amplification can be obtained.

## Pretty Good Going

This, we have considered, was pretty good going, and a well-designed mains set with a couple of screen-grid valves ranked very little inferior to a super-het of advanced design on the score of sensitivity, and was much cheaper to construct and easier to adjust for optimum results.

The one disadvantage of the screen-grid valve was that for stability of operation the positive screen voltage had to be maintained within fairly close limits, while for optimum results the adjustment of the case of some types might even be termed critical.

The reason for this is that for certain values of screen voltage and anode voltage, the relation between anode current and anode voltage does not follow the usual regular curve, increases in anode voltage at a fixed screen voltage resulting not in an increase of

anode current as would be expected, but in a decrease. Actually, the anode volts/anode current curve of an ordinary screen-grid valve can be considered as composed of parts of two similar curves, but with an unstable region between them, as indicated in Fig. 1.

One of the great advantages of the new screened pentodes is that this unstable portion is bridged over, and the anode volts/anode current curve is of the form shown in Fig. 2. This means, in effect, that the high-frequency pentode may be operated with a larger anode voltage amplitude than a tetrode, and that therefore the fullest possible use can be made of the very extraordinary amplifying properties of the new valve.

The modification of the characteristics resulting in this stable operation is brought about by the addition of a third grid situated between the screen and anode and connected to the cathode of the valve. It will thus be seen that the high-frequency pentode is a true pentode having control, auxiliary and "earth" grids; but at the same time it must be considered more as a modification of the screened grid valve than as a development from the output pentode.

For this reason, the term "screened pentode" which the Mullard Company apply to these new valves is particularly apt.

It may be of interest to examine the electrode system of the screened pentode, a photograph of which is reproduced in Fig. 3. The anode in this case is of cylindrical shape and composed of wire gauze. The three grids can clearly be seen, and also the very rigid structure from which the various elements are carried.

As already mentioned, the most important feature from the practical point of view concerning these screened pentodes is their enormous amplification factors. For instance, the Mullard type VP4 has an amplification factor of approximately 5,000 and is of the multi- $\mu$  type; and type SP4 has an amplification factor of 2,700. This valve has so-called "straight" characteristics, that is to say, it is not of the multi- $\mu$  type.

Now although the amplification factors of these valves are so greatly in excess of those of ordinary screen-grid valves, this does not necessarily mean that the stage gains obtained in actual practice will be increased in the same proportion.

For example, a VP4, having an amplification factor of 5,000, will not under ordinary working conditions give an overall amplification five times as great as, say, an S4VA having an amplification factor of 1,000. The reason is that the overall amplification depends on other factors besides the amplification factor of the valve—notably the efficiency

of the load in the anode circuit—in other words, of the high-frequency coupling.

Readers of AMATEUR WIRELESS will have seen time and time again the well-known formula connecting the overall amplification or stage gain with the electrical properties of the amplifying valve and of the following coupling. This formula is restated below:

$$\text{Stage gain} = m \times \frac{Z_o}{Z_i + Z_o}$$

where  $m$  = amplification factor of the valve;  $Z_o$  = dynamic resistance of the external anode circuit; and  $Z_i$  = internal impedance of the valve.

## Large Dynamic Resistance

It is clear, therefore, that the dynamic resistance of the high-frequency coupling should be large compared with the valve impedance if maximum stage gain is to be obtained. Unfortunately, however, there are practical considerations which limit the dynamic resistance obtainable in commercial apparatus. A perfectly-tuned parallel circuit having no losses whatsoever, has an infinitely great dynamic resistance; but a perfectly tuned circuit cannot exist. Every coil possesses some ohmic resistance and therefore dissipates some energy; a certain amount of energy is lost through unwanted capacity and inductive effects, however great the care taken in screening and shielding.

It is, however, quite possible to design tuned couplings having a dynamic resistance well over 100,000 ohms, while with care in design and manufacture, and with very accurate tuning, a dynamic resistance of .25 megohm or perhaps a little more can be obtained.

Now the special construction of the high-frequency pentode results in rather high anode impedances for the valves, so that the proportion of their amplification factor which can be usefully employed, as represented by the fraction

$$\frac{Z_o}{Z_i + Z_o}$$

is not quite so high as with the screen-grid valve. Actually, with an A.C. screen-grid valve the fraction of the amplification factor representing the overall stage gain with coils of average efficiency is about one sixth, but with a valve like a VP4, having an internal impedance of about 2 megohms, the fraction is about one twentieth.

But even this represents a considerably increased stage gain in view of the much higher amplification factor of the valve, so that it can be truly stated that a screened pentode will give greater magnification when substituted for an ordinary screen-grid valve, without making any alteration to the circuit.

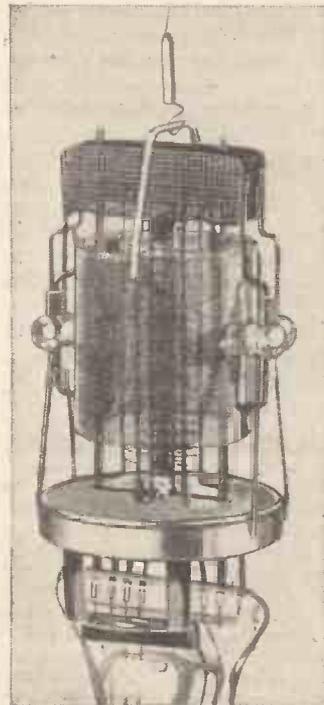


Fig. 3.—Electrode system of Mullard screen-grid pentode, type VP4

On the other hand, because the screened pentode is perfectly stable in operation with big anode voltage swings, tuned couplings of higher dynamic resistance than 100,000 ohms can be employed without risk of oscillation. Thus, with a tuned circuit having a dynamic resistance of .25 megohm, one ninth of the valve's amplification factor can be realised in the case of the VP4 and this represents a stage gain of something over 500, or about twice that obtainable with a screen-grid valve pushed to the limit of stability.

These calculations are based upon tuned-circuit efficiencies quite easily obtainable in

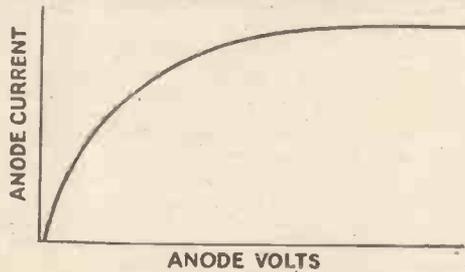


Fig. 2.—General form of characteristic curve of high-frequency pentode

ordinary practice, but it is not too much to hope that coil manufacturers and designers will in due course produce still more efficient coils. Such coils are not difficult to design or to produce, but owing to the limitations of the screen-grid valve imposed by the stability question there has been little demand for them. Now that high-efficiency coils can be used, there is no doubt that they will shortly be forthcoming.

There is nothing strikingly novel regarding the circuits for use with high-frequency pentodes. They are in every case identical with those for screen-grid valves in similar positions,

but, for best results, circuit values should be correctly chosen.

Dealing with the Mullard multi- $\mu$  screened pentode, type VP4, Fig. 4 shows the essential connections for obtaining the correct screen, anode, and the biasing voltage. It is assumed in this diagram that 250 volts high-tension is available. The valve can be employed in two ways, either as a "long grid-base" valve, when a range of bias control of about 40 volts is available, or as a "short grid-base" valve, when the controlling bias range is restricted to about 20 volts.

A rather higher effective amplification is obtained when the full 40-volt grid base is used, but the 20-volt grid base gives more rapid gain control.

The screen voltage is obtained by a fixed potentiometer R1, R2, alternative values of which are given in the accompanying table, the screen voltage of 100 volts being for the 40-volt grid base working and 65 volts for operation on the 20-volt grid base. R3 is the variable biasing resistance, and R4 a permanent bias resistance which applies just sufficient bias to avoid grid current distortion when the valve is adjusted to its most sensitive condition, that is when R3 is reduced to zero. The voltage dropping resistance R5 is calculated to give 200 volts at the anode.

The resistances given in the table below have been carefully calculated to maintain the screen voltage substantially constant for all settings of the variable bias resistance R3.

Resistance	Value in ohms	
	V aux = 100	V aux = 65
R1	20,000	30,000
R2	20,000	12,000
R3	8,000	3,000
R4	200	400
R5	8,000	16,000

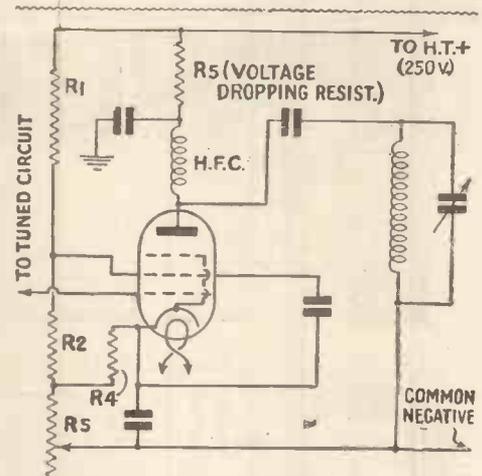


Fig. 4.—Recommended circuit for obtaining screen-grid bias voltage for VP4 screened pentode

The second Mullard screened pentode, type SP4, has been designed primarily for use as first detector or as frequency changer in super-het receivers. It can, however, be used as an ordinary speech detector in straight sets. The anode-bend principle is recommended, and the valve should be operated at an anode voltage of 200, screen voltage 40 volts, and with a grid bias resistance of 5,000 ohms. For resistance-capacity coupling an anode resistance of .25 megohm is recommended.

While not primarily intended for use as a high-frequency amplifier, the SP4 can be used with success provided some form of input signal control is provided such as a differential condenser or potentiometer across the aerial circuit, in order to avoid over-loading on powerful signals.

## Radio and the Law-breaker

By Fraser Brodie

A WONDERFUL demonstration, showing how the New York Police use radio as an aid to the arrest of criminals, was a feature of the radio exhibition recently held in that city.

At the stand allotted to the police radio-patrol system, a transmitting room, furnished and equipped in a similar manner to that at police headquarters, was on view. There, officers specially detailed for the purpose performed the routine of receiving and dispatching imaginary calls, just as they would do in a genuine case.

On a table built in the shape of the letter U, large-scale maps of the five city boroughs appeared, each borough being divided into divisions and precincts, which were, in turn, sub-divided into smaller areas known as "sectors." In each sector lay a small brass disc to represent a radio car cruising in the neighbourhood; 400 of these cars being in operation in New York, which gives an average of slightly more than one car per square mile.

### Special Radio Repair Cars

Radio repair cars, as well as cars set apart for the use of detectives and divisional commanders, are also shown on the maps, coloured spots on the brass discs being used for easy identification.

When a telephone call is received by the officer on duty at the table, he picks out the location on his maps, and notes the numbers of radio cars nearest to the seat of the crime. Speaking into the microphone, he orders certain cars to proceed to the scene, and gives information regarding what has happened, and a description of the criminals, car number, etc., if known.

All radio cars within range of the transmitter can, of course, pick up the message, only the cars specially ordered, however, proceed to the location. Three transmitting stations are in operation at present and, should the criminals escape from the scene of the crime, a description is broadcast from all stations, which enables the crews of the 400 radio cars to be on the alert throughout the city.

No secrecy is attached to the police broadcasting; radio manufacturers, in fact, advertise sets with special attachments for receiving the calls. The cars, too, are not disguised in any way and are even fitted with a large blue light over the wind-screen, which entitled them to the right-of-way in traffic.

New York radio patrol cars are of the coupé type, carry a crew of two men, and are fitted with a short-wave receiver and loud-speaker. In addition to the cars, a number of motor

cycles equipped with receivers on the handlebars are used in special circumstances.

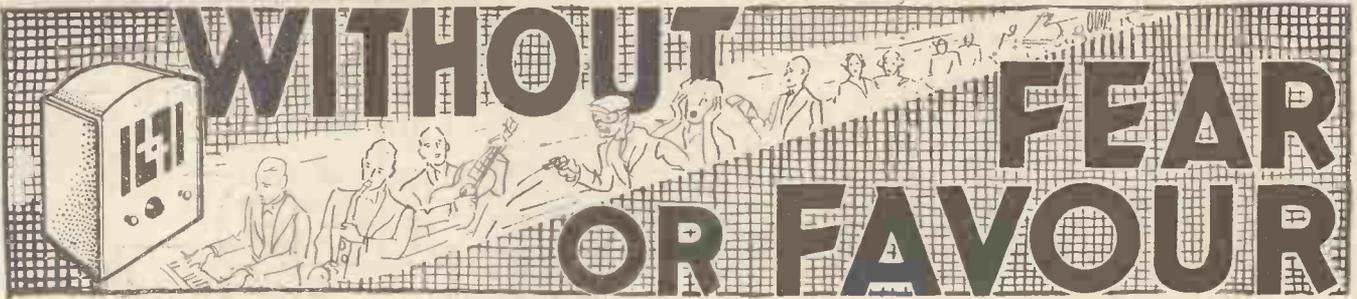
Broadcasting is carried out over a waveband of 175 metres.

During the past twelve months, property to the value of over £250,000 has been recovered by crews of the radio cars. Last year 3,200 arrests were made, and an average of seventy alarms transmitted daily.



"All you need is a screwdriver"

Programme Criticisms by WHITAKER-WILSON



Leslie Bridgewater

**Monday**

**B**ILLY MAYERL has a distinct muse of his own. I was attracted to *Carminetta*, though why the announcer was so mysterious about *Jazzavistrix* I could not understand.

I switched on just as it was ending and heard him say the secret was that it is written, not for *one* piano, but *three*. Well, it said that in the programme, so why

make a fuss about it?

At eight o'clock I had the choice of Helen Perkin's piano or Edith Penville's flute recital. I decided to take the one who began first. Helen it was. That wretched interval signal was still ticking so I listened to Helen playing Schubert. She interested me for some time, and then I suddenly thought of poor Edith on the other line and raced round to hear how she was getting on.

The flute is a good broadcaster. Not a bad idea to have oboe, clarinet, and even bassoon recitals occasionally. Listeners will get used to the sound of these members of the wood wind family. Very useful for those who are keen enough on good music to follow symphony concerts.

Now tell me that's highbrow!

A few minutes later I found the Roosters crowing away merrily enough. They have improved their show a great deal. They have made it topical and there is not too much noise. Also I liked their singing. Some of their humour was rather elementary but I suppose they want it to be. Anyhow, a much brighter show.

Brother Bartlett was absorbing on the subject of Turkey. He saves me a lot of reading one way or another.

To end my evening's listening I went back to the Regional because that nice French tenor Reda Caire was singing again. The announcer said he was going to sing a group of two songs. Surely, you must have three songs for a group? Anyhow, I liked my tenor-man. Ask him again, please!

**Tuesday**

I haven't changed my opinion about Dulcima Glasby's play *Obsession*. It is written with a sound knowledge of the technique of broadcasting and in many respects is a fine drama. All the same, I stick to my first thoughts regarding it—*too human*.

Don't you agree with me that there is a limit to sadness in broadcast plays? If you go to a theatre and weep most of the time you don't seem to mind so much. After all, you probably knew what you were in for before you stood in the queue.

In the home it is rather different. Broadcasting is primarily to entertain, secondarily to instruct in an entertaining way. It must never harrow.

**Wednesday**

My electric clock lost a second this week and I was annoyed. I switched on the pips at lunch-time to-day and heard some quite pleasant playing with a spot of echo behind it.

This I found to be the Western Studio Orchestra relayed from the National Museum of Wales. I liked the orchestra and I liked the echo. Both helped to digest a lonely lunch which, I imagine, was what they were intended for. Try that orchestra next week if you are at home in the middle day. If not, tell the "missus" about it!

If you missed Gregor Piatigorsky's 'cello playing in the symphony concert, you can't say I didn't warn you. Next to Casals I think he is the finest 'cellist I have ever heard.

Sir Thomas Beecham might be described as a lightning conductor. At all events he made the drums thunder in Tchaikovsky's *Francesca da Rimini*. I am not alone in thinking the B.B.C. Orchestra has never played as they played to-night. Did you hear the ovation at the end? Not all for Sir Thomas.

**Thursday**

Is it necessary for the opening music in light shows to drown the announcer's voice? Mrs. Borrett was inaudible when trying to tell us what the *Consequences* were going to be.

All I liked of that show was Mark Lubbock's music. The dialogue was very poor stuff. If it is true that we are to have these musical shows more often in the future I do hope we shall get some witty lines as well. They won't do like this.

After half an hour I had had enough and switched into the Regional just in time to hear Percy Pitt's *English Rhapsody* which concluded the little programme given out of respect to his memory on the anniversary of his death. Charming! written.

Unable to bear any more consequences, I

picked up the Blackpool Arcadian Follies broadcasting from Peterborough via the Midland Regional. A very good show, with some excellent patter.

Wouldn't it be a good plan to relay more of these provincial shows rather than tie us down to the tame stuff we have been getting from the studios recently?

If companies like the Blackpool Arcadians produced the anæmic patter served up in some of the B.B.C. shows, they would simply beg their bread before the end of the season. Noise doesn't help. It only annoys.

**Friday**

I don't know how many people actually read this journal, but I am pretty certain not one per cent heard the Schönberg concert right through to-night.

No one can love music more than I do, but there was nothing in that concert I could remotely tolerate. It seemed to me waste of time. Had I been in the concert hall at Broadcasting House I might have survived some of it, but as a wireless transmission it was an incoherent jangle of displeasing sounds.

After trying it two or three times I waited until Leslie Bridgewater came on in the National programme. How reasonable the *Nell Gwynn Dances* sounded!

Also, there was a pleasant diversion when Florence McHugh sang five quite charming songs by Martin Shaw.

**Saturday**

The second of the *In Town To-night* shows turned out to be a sort of mutual admiration society, didn't you think? Tom Webster might have spared us his "Listen, Chicks," and somebody might have told Len Harvey to stand further away from the microphone.

Easily the best turn was Alec Templeton's. I thoroughly enjoyed his burlesque of opera.

The Music Hall struck me as being above the average. Frank Coleman can certainly claim to having a voice in a million. I doubt whether there is another male singer who can reach the high soprano B flat. He sang like a perfect little lady.

The Café Colette orchestra is miles above anything I have recently heard of that nature. Good tone and rhythm.

Billy Merson handled the audience so well that, for once, its presence helped rather than hindered the turn. That's where experience comes in.

If there is anything more to be said about that show, it must concern Marie Lloyd, jun., who sang her mother's pet songs in a style the former Marie would have approved.



Billy Merson

**Average Listener says —**

"These 'effects' are a bit overdone, aren't they?"

"What I mean is this: if it's a windy day I like to hear the wind and the rain, especially when I'm comfy by the fire myself, but I'm hanged if I want a full-blown gale made out of it."

"I can't hear what they say half the time."

"If the man who pays the gentleman in the Effects Department would give them more money to make less noise, we might get on better. That's how I look at it. I'm not complaining too much, am I?"





Henry Hall



Jack Payne



Lew Stone



Ambrose



Roy Fox



Charlie Kunz



Harry Roy



Jack Jackson



Billy Cotton



Jack Hylton



Sidney Kyte



**YOUR  
CHRISTMAS  
DANCE  
MUSIC!**



Components of the K.B. Rejectostat system, which is most efficient in use

# This Static Business

By J. H. REYNER, B.Sc., A.M.I.E.E.

striking an aerial will set up oscillations in all the tuned circuits of the receiver, irrespective of where they are tuned. In other words, you cannot get rid of atmospheric disturbances by using a highly selective receiver.

Fortunately, the background of noise and mush is not all due to atmospheric causes. A good deal of it, particularly in towns and cities, arises from what is often called "man-made static." Such interference is produced by electrical machinery, and this form of trouble can be almost entirely overcome.

The amount of interference which can be tolerated depends on circumstances. When listening to a local station, which is already fairly strong, interference can be tolerated provided it is not more than about one-twentieth of the strength of the wanted signal, but when one is listening to distant stations interference becomes much more noticeable and it is necessary to reduce the interfering signal to something like one-hundredth of the strength of the station being picked up if the reception is to be satisfactory.

When one remembers that 100 microvolts in the aerial is quite a strong distant station it will be seen that the interference must be reduced to the order of 1 microvolt. That means that the voltage picked up on the aerial from any electrical machinery nearby must not be more than one-millionth part of a volt—one/two millionth of the voltage of your 2-volt accumulator!

You may object that you have no electrical machinery near you. Are you sure? If you do not run a vacuum cleaner yourself, your neighbour may do. Many refrigerators cause quite a lot of interference. If you have any neon signs within 100 yards you may count on some interference, particularly if you have a sensitive set, while any factories running electric motors are almost certain to cause trouble.

The interference arises in two ways. It may be radiated through the air like a wireless signal, in which case it is picked up on your aerial. The second entry is via the mains themselves, for some of the high-frequency currents are carried along the mains wires and proceed to run all round your house. If you are running a mains set they are actually fed into your set along with the electric current which works the set.

The disturbances are set up by sudden changes in current. In an electric motor, for instance, the current is continually being connected to a succession of coils on the rotating part or armature, through a special form of rotary switch, called a commutator. Every time the connection is changed there is a sudden change of current, and this produces the short, sharp oscillations (already discussed) which cause the interference.

In flashing signs it is somewhat worse, for the current which is switched on and off is often quite considerable, and with the gradually increasing sensitivity of the modern sets there are a hundred and one possible sources of interference of this nature.

There are two types of remedy. One is applied at the set itself. We can first of all introduce a filter in the mains lead to the set (if this is of the mains type). The most effective filter is a simple condenser filter of the type shown in Fig. 1. The high-frequency

Has your set got a background of noise and mush? This is often due to interference from electrical machinery in the neighbourhood—perhaps in your own house. The subject was discussed at a recent meeting of the Institution of Electrical Engineers, where it was shown that the trouble can very often be completely overcome

disturbances are by-passed to earth by the condensers before they reach the set.

This does not overcome the interference which is picked up on the aerial by actual radiation from the electric wiring in the house. The seriousness of this trouble depends upon the type of installation. Where the wiring is enclosed in metal-sheathed conduit or is run in lead-covered cable, the surface of which is efficiently earthed, the interference is small; but, even so, it may still be appreciable and the only remedy here is to shield the lead-in wire from the aerial.

The most effective portion of the aerial is the top, which collects electrical charges from the wireless waves passing by. The lead-in wire

It is funny how a name continues to be used long after it has any real meaning. The background of mush and interference which is often picked up on a wireless set is very generally referred to as "static." The word means nothing to the average radio user and its technical significance is equally obscure.

In the early days of wireless, trouble was experienced with atmospheric disturbances, which were often known as atmospheric or X's. These were thought to be due to electrical charges which accumulated on the aerial due to the electrified state of the air—a theory which was supported by the fact that the disturbances became worse in thundery weather—and as these charges are electrostatic in character the whole type of interference was referred to as "static."

We now know that atmospheric disturbances are not of this character at all. They are really wireless signals of very short duration, and it happens that this type of oscillation is very liable to cause interference.

If you drop a heavy weight in a room where there is a piano, the sudden shock of the weight falling will set all the strings jangling. In the same way an atmospheric disturbance

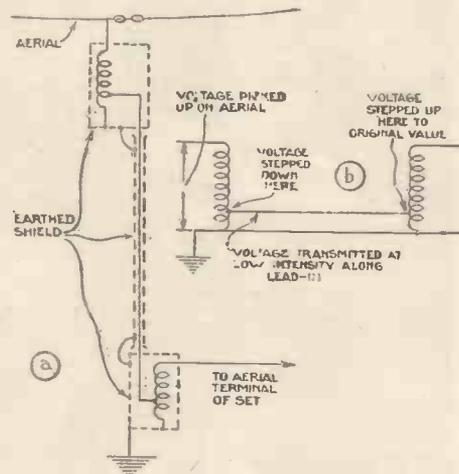


Fig. 2—(a) Arrangement of shielded lead-in and (b) the principle of impedance matching

serves to conduct these charges down to the set and the aerial will still continue to operate satisfactorily if the lead-in wire is itself enclosed in a metal tube which is connected to earth.

Such a shielded lead-in wire prevents interference to a large extent. It must be so constructed that it does not have a large capacity to earth or otherwise the currents picked up by the aerial proper will leak away through the capacity before they ever reach the set.

Consequently various types of wire have been put on the market, in which there is a centre wire surrounded by a relatively large diameter metal sheath, usually made of braided wires so that it is flexible.

Even with such a construction there is quite an appreciable loss of signal strength in many cases and the latest idea is to use what is

Continued on page 1067

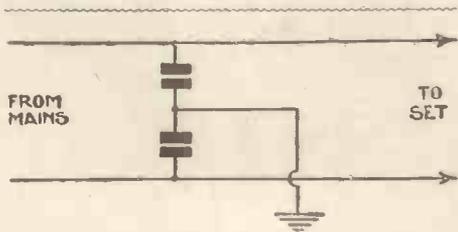


Fig. 1—Simple system of filter condensers

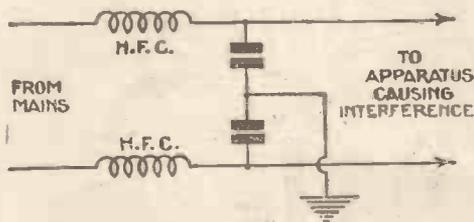


Fig. 3—More complex form of filter

# On Your Wavelength

By Thermion

## The Prince on Wireless

THE PRINCE OF WALES had some amusing things to say about wireless at the annual banquet of the Radio Manufacturers' Association the other night. Incidentally, he showed by his remarks that he is a keen listener and that he keeps himself very much up to date with the developments of the greatest of hobbies.

He has evidently a fellow feeling for those who are not too enthusiastic about the topical talker. The Prince has discovered one of the most important uses of the tuning knob.

If, he remarked, you get tired of a speaker, just give it a fraction of a turn and you can fade him out and go on to something else. "I only wish," he added, "that all other matters of our life could be disposed of as easily." Yes, if only we could tune out those letters that begin: "Dear Sir, Unless . . ." and tune in those which start: "Dear Sir, I have pleasure in enclosing . . ."!

## Some Battery!

A READER goes for me over my remarks about cheap batteries. He tells me that with his set (a three-valver with screen-grid, detector and output valves) a twelve-and-sixpenny 99-volt battery lasted only twelve weeks. Then, after some further experiments, he bought a 100-volter for five shillings which lasted for thirteen weeks.

He now has a five-shilling 120-volter which has been in use for ten weeks and, he assures me, is not half done yet. And what is more, his set is in use not for three hours or so, but for no less than seven hours a day. This sounds the kind of battery that we have all been looking for.

## Cold, Hard Watts

OPINIONS, of course, differ as to when a high-tension battery is done. Considering, though, that he uses a screen-grid valve, we shall be on the generous side if we allow an average voltage of 70—which means a "run-down" voltage of 50 or so—for the 100-volt battery.

The average current cannot be less than, say, 6 milliamperes and we may take it that not less than seven hours a day is in round figures fifty hours a week.

Multiplying 70 volts by .006 ampere, we have .42 watt; and multiplying this again by 650 service hours contained in thirteen weeks, the result is 273 watt-hours. To find the watt-hours per cell we divide the total number of cells—sixty-six in this case—into the watt-hours and the answer is 4.14.

This is just about double the amount that most first-class standard-capacity batteries will give. The only conclusion I can come to is either that the set takes much less than 6 milliamperes or that the average voltage is considerably below 70. However, my correspondent doesn't live far from me and I have asked him if I can run over in the car with a voltmeter and a milliammeter.

## Fruitful Nights with America

DURING the last week I have twice had to be up beyond midnight and on each occasion I have improved the shining (?) hour by doing a little knob-twiddling in search of

American stations. Many of them were coming in with astonishing strength and on the two nights I was able to identify no less than fifteen, a good many others being heard as well.

The best patch now is that between 272.6 and 394.5 metres—not a very wide band to search. Stations well received in this band included WPG (Atlantic City, 272.6 metres), WTAM (Cleveland, 280.2 metres), WTIC (Hartford, 282.8 metres), WBZ (Springfield, 302.8 metres), KDKA (Pittsburgh, 305.9 metres), WABC (New York, 348.6 metres), and WGY (Schenectady, 379.5 metres).

There are numerous stations to be heard between 230.6 metres and 272.6 metres, as well as above 379.5 metres, but their strength is not quite so good as those in the waveband just mentioned.

## New Tuning Scales for Old

THOSE who have sets with tuning scales marked off with the names of stations to suit the present order (or should one say disorder?) of things need have no fears that their apparatus will become obsolete—several readers have written to me almost tearfully on the subject—on January 15, when the Lucerne Plan is due to come into force.

Almost all makers are providing new scales which in the great majority of cases can be fitted in place of the old ones with very little trouble. If, though, you will take my advice you won't badger your own particular manufacturer to supply you with the new scale at once, if not sooner. Wait until things have settled down a little.

It is more than likely that swaps will have to be made between numerous stations before satisfactory working is obtained. Anyhow, most scales have a wavelength calibration as well and you can use that in the meantime.

## Radio Storm in a Teacup

SOME of the lay papers have been working sup alarms and excursions amongst their less technical readers by suggesting that, quite apart from the station-name dial business, the Lucerne Plan will render present receivers out of date. Of course, it will do nothing of the kind.

Your telephone does not become obsolete and useless if a friend's number is changed.

Except possibly on the long waves, the need for selectivity will be just about the same as it is now, though naturally increased selectivity will be desirable in the future as more and more stations go on to high power. That, though, has nothing whatever to do with the Lucerne Plan.

One of the most priceless things that I have come across was the suggestion that Budapest was jeopardising good reception of millions of British listeners by erecting a 700-ft. aerial mast. No station has ever been less guilty than Budapest of causing interference with others and since the station will continue to work right up at the top of the medium waveband there is no need for any one of the six million hearts to miss so much as a beat.

## The Extension Loud-speaker

MANY owners of wireless sets want to fit a second, external loud-speaker to their apparatus. The terminals are there often enough, but makers are but seldom helpful by stating in the instruction book what impedance and what transformer ratio are required for the second speaker.

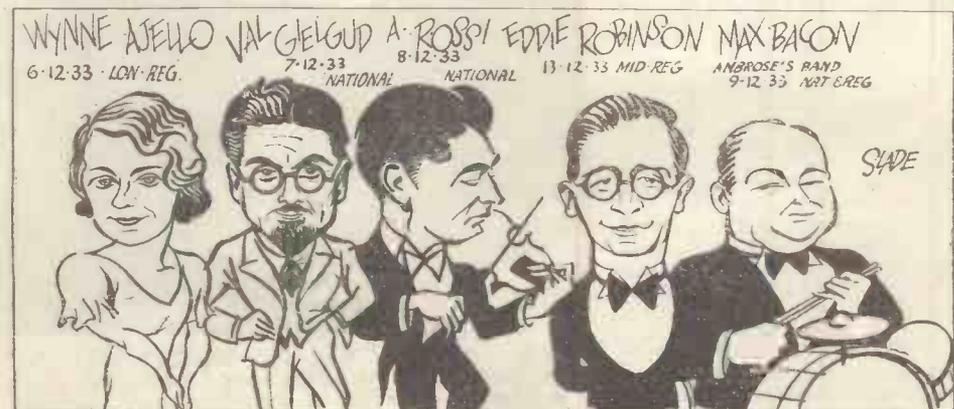
Unfortunately, there is no standardisation at present. Hence a loud-speaker that would work perfectly as an addition to one set may be hopeless with another. One enterprising firm of loud-speaker manufacturers has brought out an instrument in which the impedance can be adjusted to any required value by means of a simple switch arm. This loud-speaker is guaranteed to work well with any wireless set on the market. It is an excellent idea and I am sure that it will be welcome.

## Bakelite or Wood Cabinets?

THERE is a great deal to be said for bakelite as a cabinet material and there is no doubt that it is very popular nowadays. With it you can produce a pleasing appearance more cheaply than you can with wood, but it has one rather serious drawback unless special attention is paid to design.

This is that thin bakelite, unless adequately supported, has a rather marked tendency to warp. To be satisfactory a moulded cabinet

## Listen to These Broadcasters - - - - - By Slade

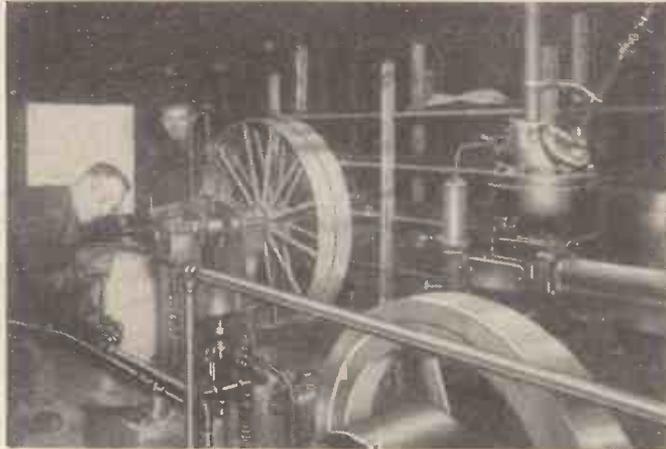


requires good, hefty buttresses at certain points in order to prevent warping.

Only the other day I removed the back from a bakelite cabinet in order to get at the batteries within and then found that owing to the distortion that had occurred I wanted a shoe horn or something of the kind to get the wretched thing into place once more.

### Valve Prophecies Come True

THOUGH I say it myself, I have made a pretty useful number of prophecies in these columns that have come true in course of time. I remember, when the pentode first made its



"It may interest you to know that the popularity of the circuits published in your pages has made us so busy that, notwithstanding the fact that we are working twenty-four hours a day, a still greater output is required. Here you see new hydraulic machinery being put in for the production of bakelite mouldings, from which we anticipate an increased production of nearly 50 per cent.," says Mr. Graham Farish

appearance at Olympia, asking the head of one valve firm when we were going to have a high-frequency pentode. "Never, I should say," was his reply—I wonder if he recalls the conversation now?

Anyhow, I was bold enough to foretell the coming of the high-frequency pentode and, though it took some years to mature, it is very much with us now. Another successful prediction was that of the non-microphonic valve designed specially for detector purposes, and I could tell you several more. Of course, there have been one or two prophecies that came unstuck, or shall we say have not yet met with fulfilment?

### Are Listeners Growing Wiser?

THIS year there seems to be a much smaller crop of the catch-penny something-for-nothing wireless devices that one used to see so extensively advertised, though not in "A.W." or "W.M." Probably the listener is becoming a wiser bird and less ready to believe that you can charge a 100-volt high-tension accumulator from your 2-volt filament cell, or restore to life dead H.T.B.'s of the dry-cell kind by means of some gadget which "incorporates a principle entirely new to science."

One of the most delicious things in the way of high-tension battery restorers that I ever came across was sold a good many years ago for several shillings. It consisted of a small bag of sal ammoniac and instructions to the effect that the bottom of the cardboard case should be removed and two or three holes pierced in the bottom of each

cell exposed to view in this way. A solution of the sal ammoniac was then to be made in a pie-dish and the complete battery placed in this. Think it out!

### Tip About Gadgets

MOST wireless gadgets that have any claims to be of any real use find their way to the AMATEUR WIRELESS Testing Department, where they are put thoroughly through their paces. If you are attracted by announcements of a device which is guaranteed to perform the impossible, or even the improbable, my advice to you is to follow the test reports in "A.W."

If no report of this particular marvel appears, your money is probably better in your own pocket. Myself, I have quite an interesting little museum of the flat-catchers of years gone by.

### Look Out for WLW

I HEAR direct from WLW, the famous broadcasting station at Cincinnati, Ohio, that tests with the new 500-kilowatt transmitter, working on 428.3 metres, will begin within the next few weeks. Authority to use full power with the new plant has been given by the Federal Radio Board for the hours between 1 a.m. and 6 a.m. Eastern Standard Time, which mean 6 a.m. and 11 a.m. with us.

Since American stations are now very well heard in the early mornings it is a matter of certainty that the new WLW, with ten times the output power of any of the rest of them, will come through with pretty good strength. Even with its present 50 kilowatts, WLW is often well heard, so you can expect something worth tuning in when the second nought is added. Between seven and eight o'clock in the morning should be a good time.

Although long-distance reception on the short waves is a matter of course, even the most hard-boiled fan must get a thrill from long-distance working on the medium waves.

### "Molly and Co."

MOLYBDENUM—usually called "molly" for short by those familiar with it—is the best metal for making anode and grid electrodes and the supporting wires inside a valve, because it has the peculiar property of absorbing very little gas.

It is, therefore, more easily cleaned up during the final "gettering" process for removing the last traces of gas from the bulb. Unfortunately, it is a good deal more expensive than nickel, and for that reason is not so widely used as it should be.

Cobalt is the rarest of the three truly magnetic elements, the other two, of course, being iron and nickel. Iron-cobalt alloys are commonly employed for making the magnets in the permanent-magnet type of moving-coil speaker, but it has recently been found that pure cobalt has certain high-frequency properties which make it particularly valuable as a substitute for the powdered-iron core used in the new type of high-frequency tuning-coils.

### New Form of Power Supply

NOWADAYS one is either on the mains or else on batteries—the only other alternative being a crystal set. But listeners in the country seldom have electric current—unless they generate their own supply—so most of them have to depend on batteries to drive a loud-speaker. This is not always a very happy position—particularly if one lives in the really wide open spaces—because there the problem of replacing high tension and recharging low tension can at times become distinctly awkward.

Some years ago—before the all-mains receiver had solved the battery problem so far as the towns are concerned—designers were giving serious attention to the development of a thermo-electric unit which, when heated by an oil burner, would produce sufficient current to run a multi-valve set.

I hear that the inventive pendulum is again swinging in this direction, and I believe there is still a good market for a dependable outfit of the kind—if one can be produced.

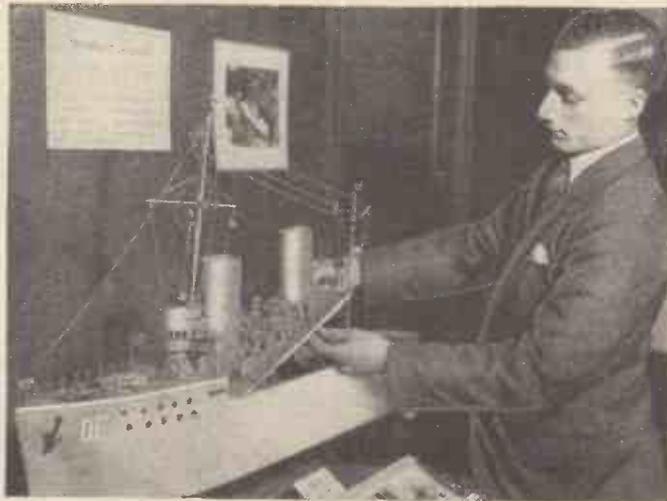
### Armstrong versus De Forest

TALKING about inventors, it is said that one of the most expensive forms of litigation in this country is to fight a patent action. That may or may not be true, but I do not think things can be quite so bad over here as they are in America.

The use of "reaction," for instance, is a famous bone of contention in the U.S.A. patent courts. The trouble first started in 1917 as a fight for priority between Armstrong and De Forest. After a long succession of trials and appeals, lasting over seven years, judgment was given in favour of Armstrong.

The case was, however, re-opened almost immediately on new grounds and occupied the lawyers, on and off, until the beginning of the present year, when the courts changed their mind and held De Forest to be the true and first inventor. The very latest development is an "as you were" judgement which hands the palm of victory back to Armstrong. And now, I suppose, they will start off again on another trip round the mulberry bush.

It is time to say that as far as making a fortune out of patents is concerned—you never can tell!



At an exhibition of apprentice's free-time work in Berlin this interesting wireless commanded and steered ship was shown. The young man who built it made everything himself. For that reason he used a coherer instead of valves at the receiving end

# Programmes for Your Entertainment

## Wednesday, December 6

**NATIONAL.**—B.B.C. Symphony concert relayed from Queen's Hall.

**London Regional.**—*Good Night, Vienna* returns to the microphone after two years. Written by Holt Marvell, music by George Posford; Val Gielgud, producer.

**Midland Regional.**—Concerts by Nottinghamshire artists, including Roy Henderson (baritone) and Ida Sargent (entertainer).

**West Regional.**—*The Banns of Marriage*, a West Country play by Charles Lee.

**North Regional.**—The Skipton Male Voice Choir (Yorkshire) from the Leeds studio. They have won an amazing number of prizes during their twelve years of singing.

**Scottish Regional.**—Choral concert relayed from St. Andrew's Hall. Items include Overture, *William Tell*, two *Hungarian Dances* by Brahms, and three of Tchaikovsky's dances.

**Belfast.**—Variety programme.

## Thursday, December 7

**National.**—*Good Night, Vienna*. Children's Hour includes a play—*All-British Family Robinson*, by Arthur Davenport.

**London Regional.**—Gaelic choral programme.

**Midland Regional.**—A village broadcast. Colonel Markham is compiler and compère. One of those taking part is the village wheelwright, well known for his hermaphrodite carts (carts with two wheels which can be converted to four-wheelers).

**West Regional.**—A Welsh evening. Music by the Swansea and District Male Voice Choir, a debate on "Is an all-Welsh daily newspaper practicable?" and more music by Ronald Harding (violin/cello).

**North Regional.**—Hallé Concert relayed from the Free Trade Hall, Manchester. Henry Holst, Professor of Violin, is to be the soloist.

**Scottish Regional.**—Musical Memories.

**Belfast.**—String orchestral concert.

## Friday, December 8

**National.**—Memories of the old Lyric at Hammersmith. Soloists will be Olive Groves, George Baker, Tom Purvis and Samuel Dyson.

**London Regional.**—Orchestral concert, relayed from Vienna.

**Midland Regional.**—The Regional Revellers, concert party programme.

**West Regional.**—Military-band programme.

**North Regional.**—Orchestral concert.

**Scottish Regional.**—*Bandit*, a play by Andrew Stewart; it is based on a holiday incident.

**Belfast.**—*Brighter Ballymulcaghey*, an Ulster comedy by Ethel Lewis.

## Saturday, December 9

**National.**—Music-hall programme. Many favourites are taking part—Gracie Fields, Hutch, Walter Williams and Percy Hayden, Elsie Sterndale, Harold Ramsay (eight-piano symphony), Eight Step Sisters, and the B.B.C. Theatre Orchestra.

**London Regional.**—*Orpheus* (Gluck), Act 2. Relayed from Sadler's Wells. The cast includes Mary Jorrel, Sybil Crawley and Olive Dyer.

**Midland Regional.**—A talk on coal-mining by F. M. T. Bunney with "noises off" from the pit. The Children's Hour includes stories of Robin Hood in Sherwood Forest.

**West Regional.**—Musical comedy and an orchestral concert.

**North Regional.**—*Orpheus* (Gluck), Act 2. Running commentary on Rugby League match between Salford and Leigh by Lance B. Todd.

**Belfast.**—Running commentary by Captain H. B. T. Wakelam on the Rugby match, relayed from Ravenhill Park.

## Sunday, December 10

**National.**—*Julius Caesar*. Robert Donat as Brutus, Fabia Drake as Portia, Ralph Richardson as Mark Antony, Shayle Gardner as Caesar, and Ronald Kerr as Cassius.

**London Regional.**—Orchestral concert (No. 8).

**Midland Regional.**—Orchestral concert relayed from Leamington Spa.

**West Regional.**—Cardiff Musical Society's first concert in the 1933-34 season. Artists will be Betty Bannerman, Elsie Suddaby, Edward Reach and Owen Bryngwyn.

**North Regional.**—Orchestral concert (No. 8), from London.

**Scottish Regional.**—Chamber music. Jackie Davie sings again. By the way, Jackie is only 15 years old.

**Belfast.**—*Julius Caesar*, from London.

## Monday, December 11

**National.**—Scrapbook for 1913, medley dealing with twenty years ago. Arranged by Leslie Baily. The pages will be turned by Bransby Williams. A gramophone record of Marie Lloyd's voice will be played in this programme.

**London Regional.**—The orchestra of the Café Collete in a programme of Continental dance music (see special article on page 1059).

**Midland Regional.**—*Then and Now*, a potpourri of songs and music by Horatio Nicholls. From 10.30 to 10.45 p.m., commencing to-night, a series of surprise items called "Stop Press."



Dorothea Wieck, famous for the part she played in the film "Mädchen in Uniform," enjoys a little radio relaxation

**West Regional.**—Café Collete music from London.

**North Regional.**—Orchestral concert.

**Scottish Regional.**—The Maxwell Singers. Another Studio Cedilidh. James MacPhee will be the "host."

**Belfast.**—Orchestral concert.

## Tuesday, December 12

**National.**—*By Royal Appointment*, a revue with music. It is written round the kingdom of Molkavia. The B.B.C. Theatre Orchestra will be conducted by Mark H. Lubbock.

**London Regional.**—"By the Fireside," an indoor anthology, written and arranged by M. H. Allen.

**Midland Regional.**—*The King's Double*, a musical comedy.

**West Regional.**—"The Plays Evolves," a dramatic survey by Ivan Kyrle-Fletcher.

**North Regional.**—Liverpool Philharmonic Society's concert relayed from the Central Hall, Liverpool.

## This Static Business! Continued from page 1064

called an impedance-matching transformer. This sounds very grand, but it is really quite simple. The voltage picked up at the aerial is stepped down through a small transformer to a much smaller intensity.

Now the capacity leakage from the lead-in wire to the earthed covering of the cable depends upon the voltage. With small voltages the leakage effect is much less serious. Consequently, the currents are transferred at this low voltage with much less loss. At the receiver end they are stepped up again by another small transformer to approximately the original value where they operate the set in the ordinary way.

All these remedies are only partly effective. They are satisfactory if the interference is not too close, but if the machinery is on the premises or nearby the only remedy is to cut out the interference at its source. This is done by fitting filters on the machines themselves.

The type of filter shown in Fig. 1 is usually effective, but in this case it is connected across the electric supply leads to the motor or sign or whatever it is. Sometimes a more complex form of filter, such as that shown in Fig. 3, has to be used. This is similar to Fig. 1, but it contains two high-frequency chokes.

In general, one or other of these two types of filter, properly proportioned, will eliminate the trouble altogether and the difficulty is not how to get over the trouble, but how much you are prepared to spend to get over it.

The Post Office engineers, working in conjunction with the B.B.C., have found that they can overcome interference from every type of apparatus except the electro-medical apparatus such as violet-ray equipment. They have found from experience that owners of interfering machinery are in general quite willing to fit interference suppressors and the Post Office is prepared to advise on the apparatus necessary in any case.

Consequently, if your personal efforts fail to cure your trouble, apply to the B.B.C. or to the General Post Office, and an engineer will come and see you free of charge and will suggest suitable remedies. This is part of the facilities provided by your licence.

The Post Office engineers will not supply the equipment. They will only tell you what equipment to get, but most sufferers will find that their reception can be improved to a tremendous extent by taking advantage of this service.



0-1934-100-1934-100-1934-100-1934-100-1934-100  
 4-100-1934-100-1934-100-1934-100-1934-100-1934-100  
 0-1934-100-1934-100-1934-100-1934-100-1934-100  
 0-1934-100-1934-100-1934-100-1934-100-1934-100  
 0-1934-100-1934-100-1934-100-1934-100-1934-100  
 0-1934-100-1934-100-1934-100-1934-100-1934-100  
 0-1934-100-1934-100-1934-100-1934-100-1934-100  
 0-1934-100-1934-100-1934-100-1934-100-1934-100  
 0-1934-100-1934-100-1934-100-1934-100-1934-100  
 0-1934-100-1934-100-1934-100-1934-100-1934-100

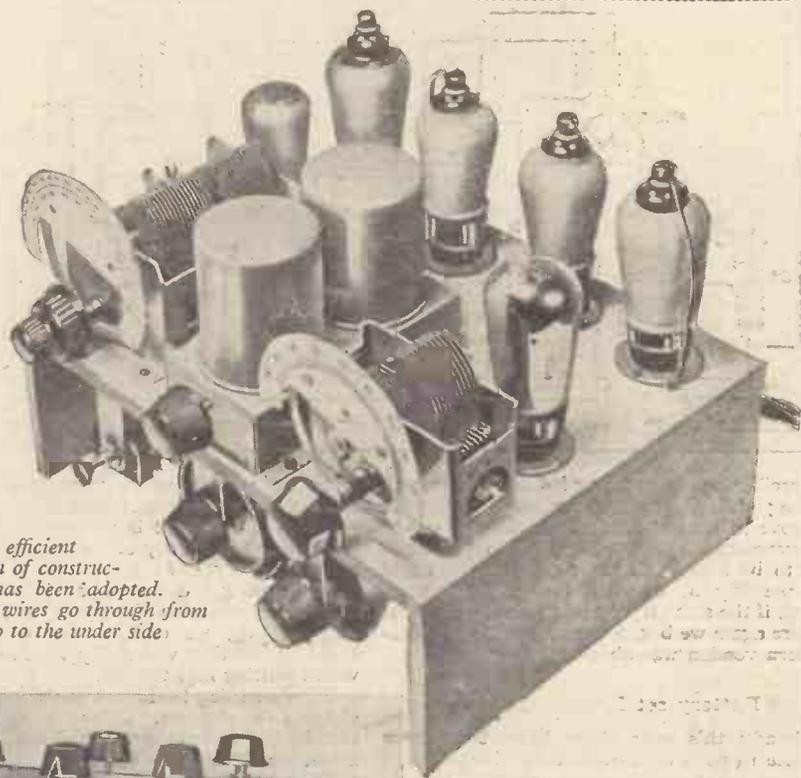
structor sets of all time right up-to-the-minute  
 self-adjusting volume control; a pentode that  
 and a single high-tension supply point; and an  
 e-build your old Century Super on these lines!

the contrary, it produced more heterodyning and  
 very bad second-channel interference.

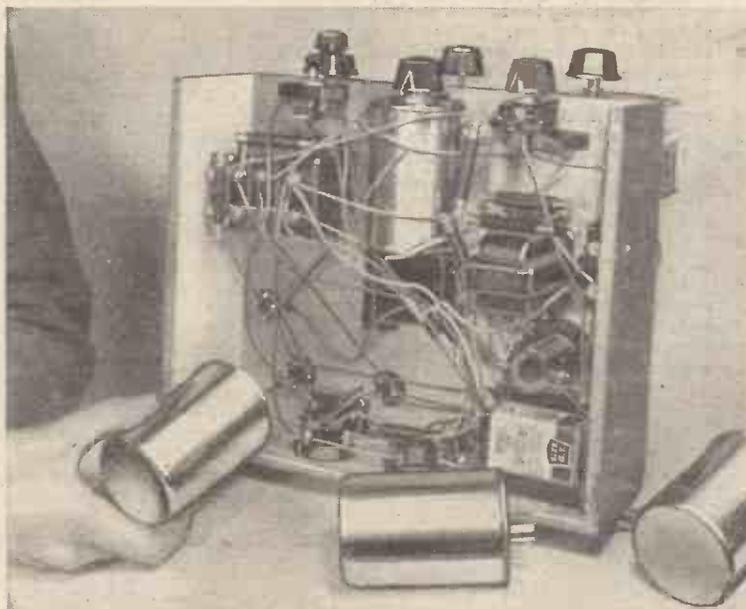
The receiver was, by that time, quite incapable of  
 separating stations close together in wavelength,  
 because the aerial circuit was comparatively flatly  
 tuned and, in fact, the whole of the detector-oscillator  
 circuits wanted redesigning.

The second-channel problem was even more acute.  
 Every other little station that came in on the loud-  
 speaker seemed to have a second setting; that is to  
 say, a station like Hilversum on 298 metres could be heard  
 a second time round about  
 380 metres, which meant  
 that should the second read-  
 ing coincide with the first  
 reading of another station  
 there would be a frightful  
 howl and both stations would  
 be blotted out.

As the transmitters im-  
 proved in performance and  
 their service area increased,  
 this problem became worse,  
 so that before long it was  
 quite obvious that the re-  
 ceiver would have to undergo  
 a complete overhaul.



Note the efficient  
 chassis form of construc-  
 tion that has been adopted.  
 Only a few wires go through from  
 the top to the under side.



In those days it was quite fashionable and  
 technically correct to use four or even more  
 high-tension tapplings, because as the average

that the frame aerial was discarded, as it is admittedly very inefficient and,  
 to some, unsightly.

This meant a new first-detector valve and a different circuit to prevent

means of high-tension supply was from  
 a dry battery, one was able to plug  
 into the right tapping without any  
 difficulty. The more general use of  
 mains units presented another prob-  
 lem: how to obtain four different  
 high-tension voltages when there are  
 only one or two tapplings on the mains  
 unit. This meant joining two or three  
 of the tapplings and breaking down the  
 voltage by means of separate fixed  
 resistances, quite a business for a non-  
 technical reader, so that it invariably  
 meant a trip to the local dealer for  
 advice.

**Using New Valves**

After a year or so many readers  
 wished to take advantage of the new  
 valves and components that were then  
 being developed, such as variable-mu  
 valves, high-efficiency low-frequency  
 transformers for better quality, and  
 pentode valves to increase the volume.  
 Some decided that it was about time

your friends  
 this revised  
 version!

**—NEEDED FOR "THE EXPERIMENTERS'" 1934 CENTURY SUPER**

**RESISTANCES, FIXED**

- 1—Graham-Farish 5,000-ohm, type Ohmite (or Lissen, Telsen).
- 1—Graham-Farish 15,000-ohm, type Ohmite (or Lissen, Telsen).
- 1—Graham-Farish 20,000-ohm, type Ohmite (or Lissen, Telsen).
- 1—Graham-Farish 30,000-ohm, type Ohmite (or Lissen, Telsen).
- 1—Graham-Farish 50,000-ohm, type Ohmite (or Lissen, Telsen).
- 1—Graham-Farish 150,000-ohm, type Ohmite (or Lissen, Telsen).
- 1—Graham-Farish 1-megohm, type Ohmite (or Lissen, Telsen).
- 2—Graham-Farish 2-megohm, type Ohmite (or Lissen, Telsen).

**RESISTANCES, VARIABLE**

- 1—Igranic 1-megohm, type Megostat.

**SUNDRIES**

- 3—British Radiogram 2-in. metal mounting brackets.
- 1—Bulgin four-way battery cord.
- 1—Bulgin six-way battery cord.
- 1—Siemens 1.5-volt cell.
- Connecting wire and sleeving (Lewcos).
- 3 ft. screened sleeving (Lewcos).
- 1—J.B. escutcheon.

**SWITCH**

- 1—Telsen four-point, type W153.

**TRANSFORMERS, INTERMEDIATE-FREQUENCY**

- 3—Wearite, type OTr.

**TRANSFORMER, LOW-FREQUENCY**

- 1—Lissen, type Hypernik (or Graham Farish, Telsen Ace).

**WHISTLE FILTER**

- 1—Kinva type B (or Bulgin type LF20).

**ACCESSORIES**

**BATTERIES**

- 2—Lissen 60-volt high-tension, type super power LN2005 (or Drydex, Ever Ready).
- 1—Lissen 16-volt grid-bias (or Drydex, Ever Ready).
- 1—Lissen 2-volt 40-ampere-hour accumulator (or Fuller, Ever Ready).

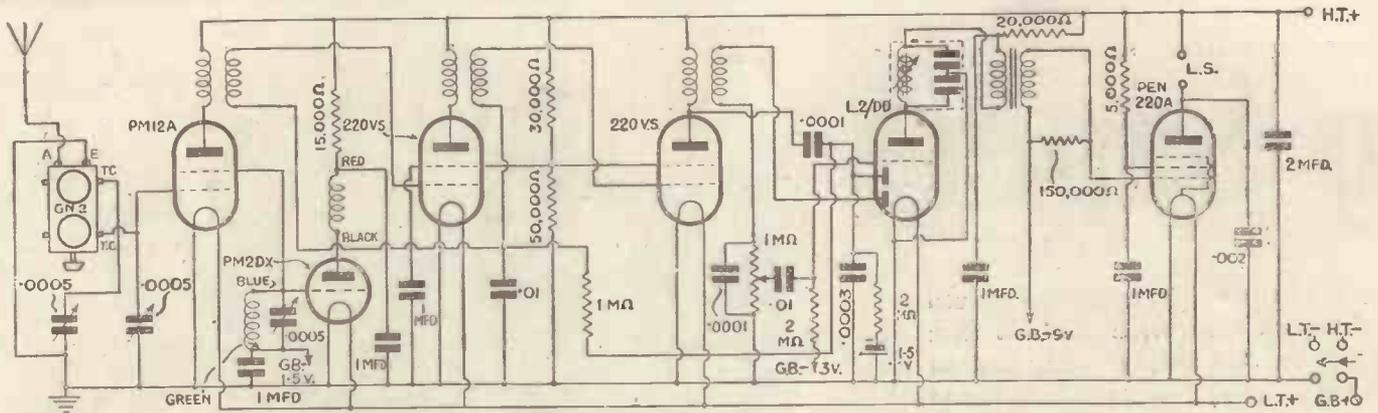
**EARTH**

- 1—Fillt earth connector.

**LOUD-SPEAKER**

- 1—Blus Spot 45 PM (or W.B. type PM4A, Igranic, Rola with pentode transformer).

**HANDS OF LISTENERS HAVE BEEN WAITING FOR!**



Circuit of the 1934 Century Super, of which the valve combination is first detector, oscillator, two intermediate stages, second detector and pentode

the oscillations from being fed into the aerial, causing interference to nearby receivers; moreover, if second-channel interference was to be overcome a selective band-pass input stage had to be used. All these components could not possibly be crowded into the old base-board, if the same layout was to be adhered to, so here again we began to realise that an ultra-modern version was about due.

**Battery-set Improvements**

Already this year there have been more definite steps towards improving battery sets than ever before—there are whistle filters to prevent heterodyning and variable- $\mu$  screen-grid valves to operate in conjunction with self-adjusting volume control circuits.

Practically every valve has been improved out of all recognition. Battery pentodes to give 1,000 milliwatts with a comparatively low high-tension current, double-diode-triodes to provide almost perfect rectification and self-adjusting volume control. To use all of these developments the circuit had to undergo rigorous pruning, all unwanted components being cut out, and the difficulties and defects of all previous types of super-hets overcome.

There is still a fallacy, which cannot be completely dispelled, that with a super-het the quality cannot be really good. It is believed amongst non-technical listeners that the selectivity of the super-het causes poor reproduction because the top notes are completely cut off.

With the 1934 Century Super the selectivity is approximately 9 kilocycles; that is to say, stations 9 kilocycles apart can be separated and received without mutual interference. According to the Lucerne Plan, which comes into operation in the middle of January, nearly all of the European stations will be separated by at least 9 kilocycles. This means that to you with a Century Super all stations will be receivable free of interference.

It also means that the quality will be really good. As the selectivity is 9 kilocycles, the top frequency that can be heard is half that, or 4,500 cycles. How

many of you listen to your radio without having the tone control to cut the top notes off, particularly if it is a radiogram, because the average frequency of the needle scratch is about 5,000 cycles?

When we got down to the job of making this set the sensation of the year, as it undoubtedly will be, we decided to include every development that was really worth while and worth putting into the set.

The first thing to do was to prevent second-channel interference. After trying numerous circuits and variations of first-detector arrangement, we decided to use a screen-grid valve with a separate three-electrode oscillator. This screen-grid first detector was coupled to the aerial by means of a band-pass circuit.

It has been our experience that ganging presents difficulty to all but the expert, so that we decided to embody a double-gang condenser with a trimmer to be operated from the front of the panel, to overcome the need of ganging, or at any rate, very accurate ganging.

During the whole of our experiments we continually kept in mind that the set must be easy to handle and would work well even if some of the components were varied by the readers. The biggest cause of complaint in the old receiver was four high-tension tappings, all of which required almost the exact voltage applied to them. To overcome this we have jointed together all the high-tension connections, but

in each separate circuit have included fixed resistances.

Expense is always of major importance, so we decided to use the original intermediate-frequency coils. The pigtails were not wanted so the live ends were insulated with some tape. These are fixed to the body of the can by means of two rubber bands.

**Second Detector**

Now the second detector valve was not disposed of in such an easy manner. A screen-grid valve gave good sensitivity, but overloaded very easily on a strong signal. An ordinary power grid detector was quite suitable, gave good quality, but hardly sufficient volume.

Then came along the Mazda double-diode-triode, the ideal valve for the job. This valve is really three valves in one, and we believe it is the first time it has been used in a set for home constructors. It consists of two separate diodes and a triode valve, all with a common filament.

One diode is used as a rectifier, giving perfect quality but negligible output. The second diode provides the automatic volume control voltage, while the triode portion amplifies the small output from the first diode before feeding it into the low-frequency transformer primary.

If components other than those specified are used it may be necessary to revise the layout. An excellent idea is to use a Bulgin whistle filter in the loud-speaker circuit; this filter is connected between the loud-speaker connections in the set and the two terminals on the actual loud-speaker.

The filter itself can be screwed inside the loud-speaker cabinet. The Bulgin filter is ultra-efficient and at the same time will affect a considerable saving in space in the receiver itself.

You can see from this that the new Century Super is going to be a winner. It smoothes out all the troubles of previous super-hets, and as it does not require meticulous adjustments and accurate ganging, even the most disinterested radio listener can rest assured that if this set is built up to specification it will work well.

To be continued next week



Making a test of the 1934 Century Super in the AMATEUR WIRELESS laboratories



# MILLIWATTS OUTPUT *from* BATTERY RECEIVERS

If you want to get Mains volume from an ordinary battery set, replace your power valve with a Lissen Power Pentode, type P.T.2A. Immediately you will notice a tremendous increase in volume on all stations, a new brilliance of tone, a power in your set that will amaze you. There is no need to alter your receiver at all. Simply replace your existing power valve with a Lissen Power Pentode and you get the *extra* power immediately. It does not increase the current consumption of your set, yet it gives you an output that will drive a moving-coil speaker at full volume and with that characteristic Lissen pentode tone which puts a genuine verve into stringed instruments, blare into brass, majesty in the organ and sincerity in the human voice.

### FOR Q.P.P. OUTPUT!

Use two of these Lissen P.T.2A Valves for Q.P.P. output—they are the **ONLY** valves for which you will require no expensive electrical measuring instrument in order to obtain exact matching. All Lissen P.T.2A valves are sent out matched. The exact voltage required is printed on each valve, so that all you have to do is to set the wander plugs on the H.T. battery to the voltage indicated on the valve, in order to secure perfect Q.P.P. output.

Send for full particulars, telling you how to build a modern Q.P.P. receiver, to LISSEN LIMITED, Worples Road, Isleworth, Middlesex.

PRICE  
**12/6**

# LISSEN

## P.T.2A

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

# Listeners' Letters

## ORGAN MUSIC

To the Editor, "Amateur Wireless."

SIR,—I wonder how many of your readers are partially disappointed by English organists (not cinema organists)? I sit down well disposed to a pleasant recital and so often the organist drowns away, occasionally waking up and holding a note as though he dare never let it go, or as if he were giving the organ an endurance test.

The fault is not so much in the music played as in the manner of playing. Many Continental organists, and those cinema organists who have played on concert or church organs, render the same music in a beautiful and interesting way.

If only English organists could obtain a few hints from the best Continental cinema organists, they would do much to popularise, without spoiling the grandeur, of organ music in England. For what can compare with an organ as a soloist's instrument?

F. COLLINS.

Wallington, Surrey.

## SHORT-WAVE RESULTS

SIR,—With reference to the letter of D. A. Pinfield, I should like to state that on November 5, between 12.30 p.m. and 7.30 p.m. I received the following stations, all of which are below 1-kilowatt power:—

LH2PA, W2GOQ, W2CP, W2FF, W2BYU, W2AOE, W2VOQ, W1VW, W3EAQ, W1VAY, and W1OW.

I also received W3XL testing with the Graf Zeppelin, and the stratosphere balloon.

The set was a straight two-valver, made by myself, and used on an indoor aerial. I might add that I am also fifteen years old. Can any reader identify the two amateur stations ZE4EA and SORT?

R. STOKES.

Coventry.

SIR,—I read with interest the letter of D. A. Pinfield in "A.W." dated November 25, regarding his claim for a record of short-wave reception. Whilst not wishing to dishearten our young fellow DX enthusiast, may I point out to him that W3XL uses a

power of 18 kilowatts, and not 1 kilowatt, hence the "milk in the coconut."

However, I hope your correspondent will persevere and ultimately produce a DX log which will widen the eyes of us older listeners.

I would like to mention that I have frequently heard with a two-valve hook-up VK2ME (12 kilowatts), VQ7LO (500 watts), YV3BC (100 watts), and many others. I employ two receivers, one the Century Super, and the hook-up.

I have verifications of reception from about forty short-wave stations, including YV1BC, YV3BC, PRBA, W1XAL, W8XK, W1XAZ, W2XE, W3XAU, W2XAF, W2XAD, W3XL, VE9DR, VE9BJ, VE9DR, CGA, PLV, etc.

FRANCIS A. BEANE.

Ridgewell, Essex.

SIR,—I see in your issue of November 25 a letter from D. A. Pinfield, who asks if he has the record for short-wave reception. Early last month I logged W3XL and listened to Mr. Henderson's speech from Geneva, and W3XL was calling up HBL and seemed afraid that the latter station would be late in starting, which proved to be the case.

After the broadcast, W3XL changed his call sign to W2XBJ and called up DEENE (Graf Zep.), and was a long time being answered.

I used a perpendicular aerial of 30 ft. and that station came through at moderate loud-speaker strength. The set was a home-made straight three, and I made my own coils.

P. E. WATKINS.

Chwilog, North Wales.

SIR,—On reading the letter by D. A. Pinfield, I thought it might be of interest to say that I, too, received station W3XL trying to get in touch with the Graf Zeppelin, and have written for confirmation.

My reception was on one valve with an indoor aerial, which, I think, constitutes a greater achievement than that of the above reader. I, too, am fifteen years of age.

Wishing your paper continued success.

W. E. BARTHOLOMEW.

Watford.

## USELESS TUNING DIALS

SIR,—The numerous letters received by Thermion complaining of the uselessness of the new styles of tuning dials only illustrate the point that in their eagerness for a new fashion, manufacturers are often apt to overlook the fact of *practical utility*. Great ingenuity and cleverness may be exercised in the design of a set whose selectivity may be advertised as "hair-line," but the tuning dial will show gaps of  $\frac{1}{4}$  in. to  $\frac{1}{2}$  in. of open spaces between two division lines!

Of what use is the supreme selectivity claimed? The user cannot make use of it since he is unable to identify and locate the same spot on the dial a second time. Wireless sets are for practical use and not for admiration from a distance like an oil painting.

A. ATWEE.

Liverpool.

## HEADPHONE RECEPTION

SIR,—It is to be hoped that manufacturers will take due note of the article in your issue of November 18 entitled "Headphones Are Staging a Come-back!"

There would unquestionably be a substantial sale for phones having a wide frequency range, provided they were light and otherwise comfortable to wear, and the present seems the right moment to introduce them, for correspondence in the daily press shows there is a growing intolerance of the loud-speaker (its very name half damns it!) and there must be many listeners who would willingly accept the slight inconvenience of the headphone in order to enjoy their programmes without feeling that others are compelled to endure what is not to their taste.

Personally, my loud-speaker is used very rarely, owing to divergent tastes, and I have employed headphones for some twelve years.

I find that a marked improvement in bass response is obtained by pressing them firmly to the ears—a rather painful procedure if continued for long and one which would not be necessary with a moving-coil receiver.

Worthing.

E. K. BERRY.

## How the Foreigners Are Coming In By Jay Cooté

APPARENTLY it is a secret no longer; the gaff has been blown by a Paris paper in connection with a query regarding the Eiffel Tower. On January 15 the only alterations to be effected in wavelengths are those affecting the stations working in the *medium waveband*; other transmitters operating on channels between 1,000 and 2,000 metres will carry on as usual until further notice.

The reason is a simple one; no agreement in respect to "long" waves was reached at the last Amsterdam Conference, and as such stations as Radio Luxembourg will persist in using an unauthorised channel and Holland maintains its right to 1,875 metres, until some alteration can be made, part at least of the Lucerne Plan becomes unworkable. In these circumstances, seeing that there is no give-and-take policy on the part of the dissenting states, France will continue to use Eiffel Tower on its present channel as a high-power relay of the P.T.T. programmes and for its own studio entertainments

Radio Paris has now been transferred to the State, and will, in consequence, provide an alternative wireless programme. For the present at least, we cannot expect any better allocation of transmitters on the long waveband.

Slight adjustments will be made, no doubt, with a view to as much improvement as possible until—well, until the new stations in that portion of the band come into action.

As it is, the 20-kilowatt transmitter at Brasov will be heard testing within the next few days—it may have already done so—on 1,875 metres and will probably cause interference with Kootwijk on that channel. We can only wait and see and hope for the best.

No doubt, by now, you will have heard Radio Budapest; it is the latest newcomer on the ether and provides powerful signals. Hungary, so far, has given us very good programmes, and I am informed that with this new giant at its disposal the Budapest studio

expects to go one better. Vienna also can now be heard at greater volume and, notwithstanding the difference in distance, is received at much better strength than Brussels No. 1.

It seems somewhat of a pity that Radio Toulouse, in possession of a brand new 80-kilowatt, should be compelled to cut down its output to one-tenth of the power, but no permit to do otherwise has been obtainable.

If you care to tune in to that station on Friday evenings at 9.30 p.m. you will pick up a performance given at the Medrano Circus at Paris. I have heard two broadcasts and found them quite amusing now that Radio Paris has suspended the "Cirque" it was in the habit of "faking" in its own studios every Sunday.

As this Paris station has now been taken over by the P.T.T. officials, if you want the English broadcasts on Sundays you must switch over to Radio Luxembourg on 1,190.5 metres.



The Pilot Kit SERVICE was founded in 1919

# 1934 CENTURY SUPER PILOT AUTHOR KIT EXACT TO SPECIFICATION



See the PILOT on the carton. It's a real guarantee.

£8-16-6

CASH - C.O.D.

OR YOURS FOR 16/- DOWN

These are the Parts the Author used :-

	£	s.	d.
1 PETO-SCOTT Metaplex chassis	3	0	0
1 WEARITE bandpass unit, type GN2	1	1	6
1 WEARITE oscillator coil (type C2)	10	6	
7 GRAHAM FARISH fixed condensers: (2) .0001-mfd., (1) .002-mfd., (2) .0002-mfd., (2) .01-mfd.	8	0	
5 T.C.C. 1-mfd. fixed condensers	12	6	
1 T.C.C. 2-mfd. fixed condenser	3	6	
1 J.B. .0005-mfd. variable condenser, type Nugang A1	17	6	
1 BRITISH RADIOPHONE 2-gang variable condenser, .0005-mfd., type 48A	1	1	0
6 CLIX valveholders, chassis mounting type: (4) four-pin, (2) five-pin	4	2	
3 W.B. midjet four-pin valveholders	1	6	
4 BELLING-LEE marked wander plugs	1	9	
2 BELLING-LEE spade terminals	4		
7 GRAHAM FARISH Ohmite resistances (capacities as specified)	10	6	
3 GRAHAM FARISH Ohmite resistances, 2-meg.	4	6	
1 GRANIC Megostat variable resistance, 1-meg.	3	6	
3 BRITISH RADIOGRAM 2-in. metal mounting brackets	1	6	
1 BULGIN 4-way battery cord	1	3	
1 BULGIN 5-way battery cord	1	6	
1 SIEMENS 9-volt S.G. cell	1	3	
Connecting wire and sleeving and 3 ft. screened sleeving	3	0	
1 YELSEN 4-point switch, type W153	1	3	
3 WEARITE, type CT1, intermediate-frequency transformers	1	11	6
1 LISSEN Hypernik L.F. transformer	12	6	

KIT "A" CASH or C.O.D. £8 16 6

**KIT "A"** Author's Kit of first specified parts, including Peto-Scott Metaplex chassis, but less valves, cabinet and speaker. CASH or C.O.D., Carriage Paid, £8/16/6. Or 12 monthly payments of 16/-

<b>KIT "B"</b> —As Kit "A" but with valves only. CASH or C.O.D. Carriage Paid, £13/2/0. SEND ONLY 24/- Balance in 11 monthly payments of 24/-	<b>KIT "C"</b> —As Kit "A" but with Valves and Peto-Scott Universal Console cabinet with baffle board assembly. CASH or C.O.D. Carriage Paid, £14/6/6. SEND ONLY 26/3 Balance in 11 monthly payments of 26/3
---	--

Blue Spot 45 P.M. Speaker if required £2/5/0, or add 4/3 to each monthly payment.

5-GUINEA S.G. 3

**KIT "A"** Author's Kit of first specified parts, including Metaplexed Baseboard, with all necessary wire, screws and flex, but less Valves, Cabinet and Speaker. CASH or C.O.D. £2/2/0 Or 12 monthly payments of 4/- Carriage Paid

<b>KIT "B"</b> —As for Kit "A" but with Valves as specified. CASH or C.O.D. Carriage Paid, £3/13/3. Or send only 6/9. Balance in 11 monthly payments of 6/9.	<b>KIT "C"</b> —As for Kit "A" but with Valves and specified Peto-Scott "Kompact" Cabinet and Speaker. CASH or C.O.D. Carriage Paid, £4/12/9. Or Send only 8/6. Balance in 11 monthly payments of 8/6.
--	--

**IMPORTANT**—Parts, Kits, Miscellaneous Components, Finished Receivers or Accessories for Cash, C.O.D. or H.P. on our own System of Easy Payments. Send us a list of your wants. We will quote you by return. C.O.D. orders value over 10/- sent Carriage and Post Charges Paid.

## PILOT CLASS "B" FOUR KIT

GUARANTEED MATCHED



PROVED TESTED

WITH COLVERN SCREENED COILS

Single-dial tuning; screened coils; built on Metaplex. Comprises Variable-tun S.G. detector, Class "B" power-driven and Class "B" output valves. Complete Kit (less valves) includes detailed "simple to build" instructions and Assembly Blueprint. A superlative Class "B" Kit with matched and tested components guaranteed for 12 months by Peto-Scott.

**KIT "A"** CASH or C.O.D., Carriage Paid, or 5/- deposit and 12 monthly payments of 6/-

**KIT "B"** As Kit "A" detailed above, but including 4 PETO-SCOTT matched and tested Valves. CASH or C.O.D., Carriage Paid, £5/2/6. Or 12 monthly payments of 9/6.

Recommended PETO-SCOTT SPEAKER if required, add 22/6 to Cash Price, or 2/- to each monthly payment.

**ETHERDYNE**

**KIT "A"** Author's Kit of FIRST SPECIFIED Parts, including Peto-Scott METAPLEX Chassis, but less valves, cabinet and speaker. CASH or C.O.D. Carriage Paid, £7/17/6. Balance in 11 monthly payments of 14/6. SEND ONLY 14/6

<b>KIT "B"</b> As Kit "A" but with Valves only. CASH or C.O.D. Carriage Paid, £11/7/6. SEND ONLY 20/9 Balance in 11 monthly payments of 20/9.	<b>KIT "CC"</b> As Kit "A" but with Valves and Peto-Scott Etherdyne Walnut Console Cabinet, with Baffle Assembly without Speaker. CASH or C.O.D. Carriage Paid, £13/0/6. SEND ONLY 24/- Balance in 11 monthly payments of 24/-.
---	---

**KIT "CB"** As Kit "A" but with Valves and Peto-Scott Etherdyne Radiogram Cabinet, including full Gramo Equipment, less Speaker, or deposit, £2/13/6. CASH or C.O.D. Carriage Paid, Balance in 11 monthly payments of 30/- £17:13:6

## XMAS ORDER COUPON

PETO-SCOTT Co., Ltd., 77, City Rd., London, E.C.1  
Telephone: Clerkenwell 9407.  
West End Showrooms: 42 High Holborn, London, W.C.1.  
Telephone: Holborn 3448.

Dear Sirs,  
(c) Please send me.....  
(b) I enclose Cash/Deposit.....  
NAME.....  
ADDRESS.....  
A.W. 9/2/33.

## MOVING COIL SPEAKERS

**LATEST RELEASE BRITISH RADIOPHONE KIT "MATCHED PERFECTION SEVEN"**

Detailed list of Parts with complete PILOT AUTHOR KIT Prices and FREE BLUEPRINT

**SEND POSTCARD TO-DAY**

**NEW LISSEN SKYSCRAPER FOUR ALL-WAVE CHASSIS MODEL**, complete kit comprising all components, including set of Lissen Valves. Cash or C.O.D. Carriage Paid, £5/12/6. Balance in 11 monthly payments of 10/3. Send ONLY 10/3

**NEW LISSEN 7-VALVE SUPER-HET** (Chassis Model), complete with Lissen Valves in Sealed Carton. Cash or C.O.D. Carriage Paid, £8/17/6. Balance in 11 monthly payments of 16/6. Send ONLY 15/-

**NEW W.B. P.M. 4.A. MICROLODE PERMANENT MAGNET SPEAKER** complete with switch-controlled multi-ratio input transformer. Cash or C.O.D. Carriage Paid, £2/2/0. Balance in 7 monthly payments of 5/9. Send ONLY 5/9

**NEW BLUE SPOT 99 P.M. PERMANENT MAGNET MOVING-COIL SPEAKER**. Complete with tapped input transformer. Cash or C.O.D. Carriage Paid, £2/19/6. Balance in 10 monthly payments of 6/-.

**NEW BLUE SPOT 45 P.M. MOVING-COIL SPEAKER** with input transformer. Cash or C.O.D. Carriage Paid, £2/5/0. Balance in 7 monthly payments of 6/-.

**NEW BLUE SPOT CLASS "B" OUTPUT STAGE**. As advertised, less Speaker. Complete with Osram B21 "Class B" Valve. Cash or C.O.D. Carriage Paid, 43/6. Balance in 11 monthly payments of 4/-.

**FERRANTI CLASS "B" SPEAKER AMPLIFIER**. Comprises M.C. speaker, Class "B" power output transformer, complete with Class "B" valve. Cash or C.O.D. Carriage Paid, £4/4/0. Balance in 11 monthly payments of 7/9.

**ROLA FR6 PM23 CLASS "B" SPEAKER** with input transformer. Cash or C.O.D. Carriage Paid, £1/19/6. Balance in 8 monthly payments of 4/6.

**PETO-SCOTT PERMANENT MAGNET MOVING-COIL SPEAKER** Complete with input transformer for power or pentode output. Cash or C.O.D. Carriage Paid, 18/6. Balance in 6 monthly payments of 4/-.

**Class "B" Model** Cash or C.O.D. Carriage Paid, £1/2/8. Or Send only 2/6. Balance in 6 monthly payments of 4/-.

**R. & A. "CHALLENGER" PERMANENT MAGNET MOVING-COIL SPEAKER**, with special Ferranti multi-ratio input transformer. Cash Price, Carriage Paid, £1/15/0. Balance in 5 monthly payments of 6/6.

**NEW GARRARD MODEL 202A**, 12-in. turntable. Electric motor for A.C. mains. Cash or C.O.D. Carriage Paid, £2/10/9. Balance in 8 monthly payments of 6/-.

**ATLAS C.A.25 ELIMINATOR**, for mains, Class "B", and Q.P.P. Four tappings: 40/80, 50/90, 120, 150; 25 m.p.a. Cash or C.O.D. Carriage Paid, £2/19/6. Balance in 10 monthly payments of 6/-.

SEND DIRECT to AVOID DELAY — CASH, C.O.D. or EASIWAY

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

# AMATEUR TELEVISION

SPECIAL SECTION FOR EXPERIMENTERS — CONDUCTED BY H. CORBISHLEY.

## More Hints on Using the Disc Television Receiver

Adapting the Receiver to Your Set :: Working from D.C. Mains or Batteries :: Obtaining Correct Modulation :: Interference Effects

VARIOUS methods of connecting the disc television receiver to the wireless set were described in the issue of AMATEUR WIRELESS dated November 25, and though these will cover most requirements there may be some special cases to which these are not applicable. As it is not possible to deal with these in detail, perhaps a general explanation will provide sufficient information to enable readers to overcome any difficulties.

The chief point to remember is that the

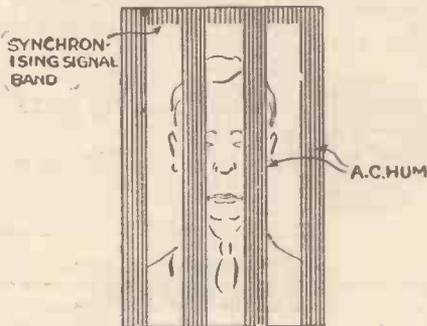


Fig. 1—This sketch gives an idea of the appearance of the picture when interference from A.C. mains is being experienced

neon lamp simply takes the place of the loud-speaker, the only difference being that usually a higher value of high-tension voltage is required before the lamp will "strike"—or, in other words, light up. The striking voltage is approximately 180 volts and the lamp must light up irrespective of any signals that are being received. This, then, is the first condition to secure and a test should be made by switching on (but not tuning) the set and noting that the lamp lights brightly, after which the incoming signals, whether speech or music, will modulate the light produced by the lamp.

### Obtaining Correct Modulation

This modulation can be obtained from speech or music so there is no need to wait for the television transmissions for testing out the receiver. It cannot, however, be seen unless the disc is running, as the light variations are too rapid for the eye to follow. With the disc running it is possible to see the different characteristics of various

sounds; speech, for example, will appear different from music and outstanding passages in the latter will be clearly discernible. In fact, a very entertaining time can be spent, if the loud-speaker is placed in series with the lamp, in noting the differences which are sometimes so clearly defined that they are recognisable after a little experience.

Assuming that the lamp will not light when connected to the wireless receiver then the reason will be that the voltage which is applied is insufficient and this must be added to by some such scheme as was outlined in the earlier article to which reference has already been made. The whole purpose of these arrangements is to enable a larger value of high-tension to be applied to the lamp without increasing the voltage on the anode of the last valve of the wireless set.

### Working from D.C. Mains and Batteries

Operation of a receiver of this type is always a little more difficult from direct-current mains or batteries, though it will work quite well from either. The difficulty in these cases lies in getting the speed of the disc correct for there is no stroboscopic effect available as there is with A.C. operation. Success, however, is just a matter of a little practice, for once the correct speed has been arrived at it becomes more simple on future occasions if a note be taken of the general effect, such as the sound of the motor and the appearance of the screen,

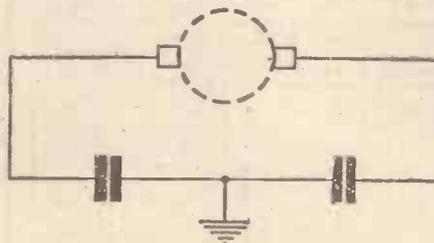


Fig. 2—A couple of fixed condensers shunted across the motor brushes, as shown above, will prevent trouble due to sparking

etc. For operation from direct-current mains the value of the resistance controlling the motor will have to be greater; 550 ohms will be suitable for 200-volt mains and 760 ohms for 240 volts. In any case, it is

not necessary to have the whole of the resistance variable and a fixed resistance in series with one that is variable will answer quite well, providing that an approximately correct value for the total is secured.

Under certain conditions a "mirror-reverse" picture may be produced—that is, lettering, for instance, would appear as though viewed in a mirror, or a violinist would seem to be holding the violin at the wrong side. This indicates that the disc is placed on the motor spindle the wrong way, so it should be taken off and reversed.

### Interference

Interference is, of course, observable in the picture, and this may possibly be somewhat pronounced where A.C. mains are used unless steps are taken to eliminate it. A.C. mains interference is discernible as four dark and four light vertical bands on the picture, the strength of the bands corresponding to the amount of interference. As the speed of the disc varies, the bands will slowly drift from side to side. This fault lies in the receiver, and ordinarily it would reveal itself as A.C. hum. It is therefore here and in the aerial system that a cure must be found, though, incidentally, it is advisable to keep the leads to the neon lamp as short as possible in order that there will be no pick-up here.

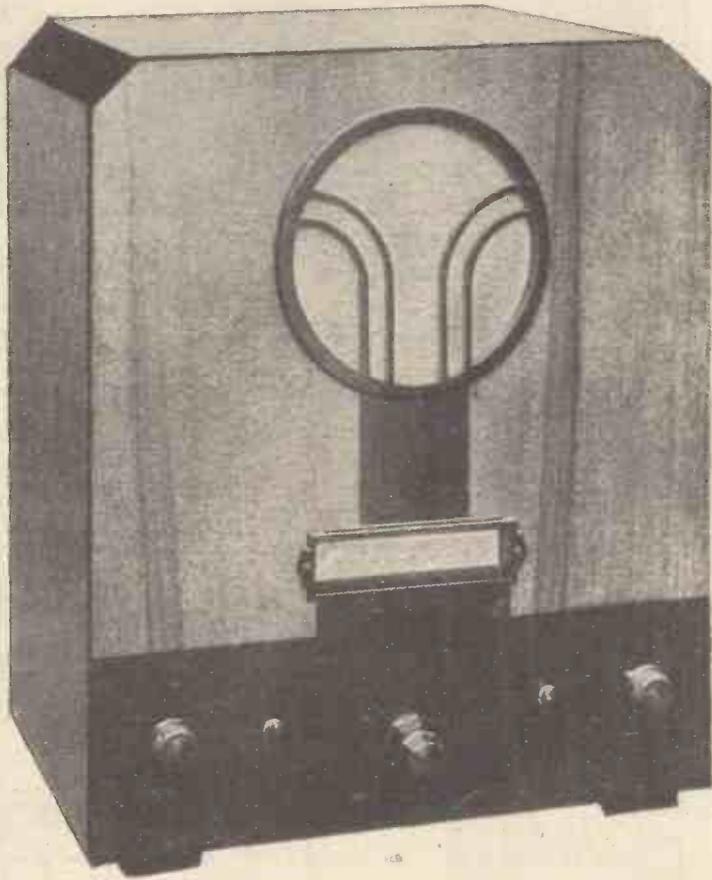
A heterodyne whistle is visible as a fine grain or pattern which covers the whole of the picture. Motor interference may result if there is sparking at the motor brushes. It produces splashes of light and spots and streaks as is noticeable when a damaged film is used at a cinema. Attention should first be given to the motor commutator and brushes.

See that the latter press firmly, but lightly, and that the commutator is quite smooth and bright. A slip of fine sandpaper held lightly against the commutator as the motor is running will effect an improvement, though if the commutator is only dirty, and not rough or burnt, a small piece of cloth dampened with turpentine will do all that is necessary; do not use emery cloth on the commutator.

A filter across the motor brushes, as shown by Fig. 2, is a useful refinement, and in cases where sparking is not very bad it will eliminate any trouble in this respect. Condensers of 1 to 2 microfarads will be suitable with the centre point connected to earth as shown.



# E.M. PLUS 4



Great New  
Development  
on the famous

## “EVERYMAN FOUR”

You remember the “Everyman Four”? Its amazing performance was obtained by using the most efficient coils that could be designed. Until now these coils have never been excelled or even equalled.

We set ourselves the task of adapting “Everyman” Coils to suit modern valves, and we succeeded. We claim, without fear of contradiction, that E.M. Plus Four Coils are the most efficient coils obtainable for modern H.F. amplification.

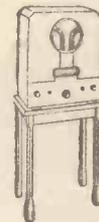
E.M. Plus Four Coils cost eight times as much to manufacture as any standard commercial coils. But, owing to their remarkable efficiency, the remainder of the set is simplified and the total cost is extremely low.

### BETTER THAN A SUPER-HET

Compare the E.M. Plus Four with any other battery-operated straight set or super-het, using four, five, or even six valves. The E.M. Plus Four gives superior results without any of the usual super-het disadvantages.

Every valve contributes its full efficiency, so that signal strength is amazing whilst absence of complications prevent loss of quality.

Ease of handling, selectivity, signal strength, quality of reproduction, appearance, reliability—judge the E.M. Plus Four by any of these standards; compare it with any other set costing even twice as much, and you will choose the E.M. Plus Four.



Although the E.M. Plus Four is easy to build and operate, it is the only set that fully responds to the skill of the operator. The E.M. Plus Four is not only a set for domestic use; it is the set which every true constructor needs for serious work. Its scope is unlimited.

### COILS OBTAINABLE SEPARATELY

For the benefit of constructors wishing to modernize their present sets, E.M. Plus Four Coils can be supplied separately at 27/6 per pair

**FULL-SIZED WIRING CHART FREE**  
**GO TO YOUR DEALER, OR POST COUPON NOW**

## E.M. PLUS 4 MATCHED KITS

(Complete kit, less valves, including everything you need to build the E.M. Plus Four exactly to specification, with full-size chart and instructions.)

**£4.17.6**

OR **9/6** DOWN

and 11 monthly payments of 9/6

### SPECIFIED MULLARD VALVES:

P.M.12V., P.M.2DX, P.M.1H.L., P.M.202 (or P.M.2).

### CABINETS

E.M. Plus Four Oak Console Cabinet with Moving-Coil Speaker - - £2.0.0.  
In Walnut, with Moving-Coil Speaker as Illustrated - - - - £2.10.0.  
E.M. PLUS FOUR Pedestal, as Illustrated, 15/- extra.

# READY RADIO

**EASTNOR HOUSE,  
BLACKHEATH, LONDON,  
S.E.3**

Telephone: Lee Green 5678.

To **READY RADIO, Ltd.**, Eastnor House, Blackheath, London, S.E.3  
Please send me a copy of the E.M. Plus Four Wiring Chart.

Name .....

Address .....

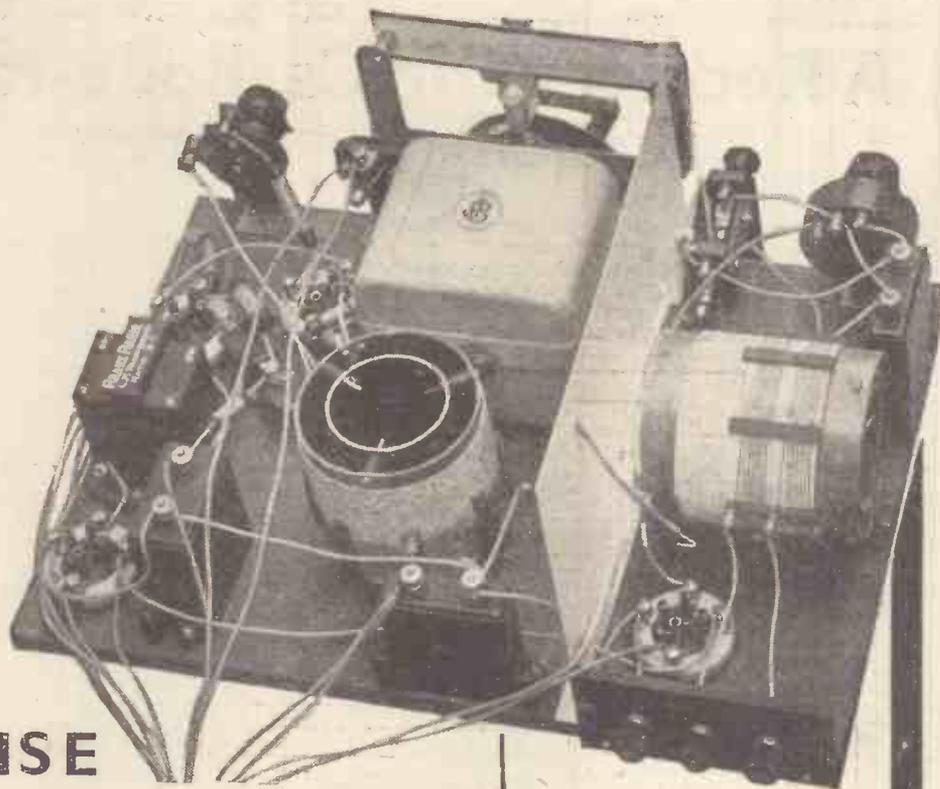
A.W.1 Please enclose 1½d. stamp for postage, etc.

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

# KIT

A serious  
contribution  
to radio  
progress

## SHEER COMMONSENSE



1. The length of a coil should not be greater than the diameter.

2. Small coils mean small single-strand wire and increased D.C. resistance and "skin effect."

3. Increased resistance means lower signal strength and selectivity.

4. Shields increase the distributed capacity and resistance.

5. Losses in metallic cores increase as frequency increases. (Therefore, heaviest on medium-wave band.)

6. Band-pass tuners do not pass all the applied voltage, and losses are often as much as 50 per cent.

7. In band-pass and multi-range circuits slight discrepancies of tuning cause peaks of unequal strength with consequent loss of signal strength.

8. By compressing the long-wave coil into small dimensions the losses and distributed capacity are increased enormously.

9. Maximum voltage amplification is obtained with a tight magnetic coupling of low capacity.

1. E.M. Plus Four Coils are 3 ins. in diameter with a winding length of  $2\frac{1}{2}$  ins.

2. E.M. Plus Four Coils are wound with 27/42 gauge Litz wire, giving 90 per cent. greater efficiency than small single-strand wire.

3. E.M. Plus Four Coils introduce so little damping that signal strength and selectivity are extremely high.

4. E.M. Plus Four Coils are so designed that shields are unnecessary.

5. E.M. Plus Four Coils are air-cored, on low-loss formers, and give maximum efficiency on medium waves.

6. E.M. Plus Four selectivity makes band-pass tuning unnecessary, and maximum signal voltage is maintained.

7. The E.M. Plus Four special trimming device gives constant accuracy at every setting.

8. The Long-wave sections of E.M. Plus Four Coils are plain solenoids of large diameter.

9. The primary windings on E.M. Plus Four Coils are air-spaced and supported on ribs over the secondary windings.

The set with the  
widest wave-  
length range:

**185—620 Metres**  
**850—2100 Metres**

Whether you built  
a set last year or last  
week you will build  
the E.M. Plus 4  
sooner or later . . .

*The set for the man  
who wants some-  
thing better. The  
only set for the keen  
constructor and  
true experimenter.*

## FULL-SIZED WIRING CHART FREE

Our E.M. Plus Four folder contains full details of the complete set, with complete building instructions and full-sized chart. Ask your dealer for your free copy. If he is out of stock ask him to get you a copy. In case of difficulty post coupon.

Demonstrations at  
159 Borough High St.,  
London Bridge, or ask  
your radio dealer.



from the potentiometer to the aerial input as shown, to reduce the signal strength at the aerial simultaneously with increase of grid bias. The signal handling capacity of the second screen-grid valve needs to be

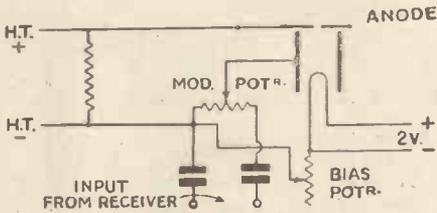


Fig. 2.—This diagram shows the inclusion of a potentiometer in the shield circuit to modulate the beam of the picture signal. The condensers shown here are in the receiver

slightly higher than that of the first, to avoid distortion due to overloading, and a Cossor 220 VSG can be used in this stage. The grid base of the 220 VSG is 18 against 9 of the S.215.VM.

No reaction has been included, to avoid trouble due to oscillation. The use of R.C. coupling, particularly in the output stage, ensures that there will be no distortion of the picture due to phase shift.

The H.F. signal is rectified by the L.2/DD valve, the two anodes of which are coupled to act as a plain diode detector. The use of this valve has the advantage that the circuit can be modified to provide A.V.C. if required for long-distance reception. In the anode circuit of the L.2 triode is a 10,000 ohms. resistance which is

capacity coupled to the terminals marked "Modulation." The modulating potentiometer is connected here and provision will have to be made in the exciter unit for this potentiometer which is inserted in the shield bias lead. (Fig. 2.)

A note about the .25-mfd. coupling condenser. The chassis or -ve L.T. of the set is earthed in the usual way, and to avoid any risk of breakdown between the live shield-cathode circuit of the tube and the earth terminal, this condenser should be capable of withstanding 1,000 volts safely. As an extra precaution, another .25-mfd. condenser may be connected as shown by the dotted lines, thus effectively isolating the tube circuit from the receiver.

The synchronising valve is a Mazda L.2, the grid of which is connected in parallel with that of the L.2/DD.

The synchronising potentiometer has already been connected in the circuit of the second time base, so it will only be necessary to connect this to the terminals on the receiver marked "SYNCHR."

### A Television Lecture and Demonstration

A lecture entitled "The Progress of Television" followed by a demonstration of apparatus is to be given under the auspices of the Institute of Patentees in the Central Hall, Westminster, London, at 9 p.m. on Friday, December 15. The lecturer is Mr. R. W. Corkling, F.P.S., A.M.I.R.E. Admission is by ticket only which may be had free of charge upon application being made to the General Secretary of the Institute of Patentees, 36 Victoria Street, Westminster, S.W.1, not later than December 12.

### Name-Calibrated Dials

OWNERS of Ekco sets will be interested to learn that the manufacturers have prepared for the Lucerne Plan changes. They produced their receivers with scales which are easily removed and have supplies of replacement scales calibrated according to the Lucerne Plan.

It is pointed out, however, that the changes are most trifling and as the present scales are calibrated in metres as well as station names, possibly many users may consider the new scales hardly worth the trouble of fitting. But for those who like their sets "just so" the scales are ready. They will be supplied at a nominal charge and can be fitted with ease.

Listeners in the Bournemouth and Plymouth areas have expressed some alarm at the proposed changes in wavelength of their local stations. Users of Ekco sets need not worry, for their sets will tune down to 200 metres.

A range of four new indirectly heated A.C./D.C. valves is announced by the Triotron Radio Co., Ltd. The filament voltage is 20 and the current consumption .18 ampere. Following are the designations and types of the valves available: S2034N, variable-mu high-frequency pentode, 12s. 6d.; S2035N, high-frequency pentode, 12s. 6d.; A2040N, special detector type, 8s. 6d.; and P2020N, output pentode, 12s. 6d.

A Bradford listener has received seventeen American stations in one evening. This remarkable log was made on November 4 at 3 a.m. in the space of thirty minutes. The set on which this Yorkshireman obtained this log was the McMichael Twin Supervox, using an aerial 25 ft. long. No earth was used.

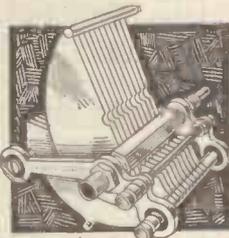
# for the 1934 Century Super



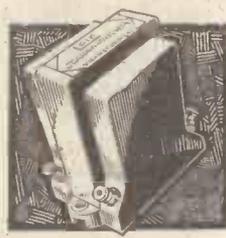
FIXED CONDENSERS. . . from 1/-



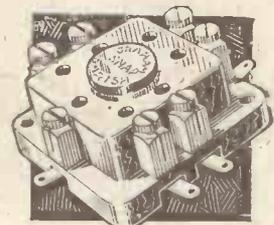
NON-INDUCTIVE CONDENSERS  
1/2 mfd., 1/6      1 mfd., 2/-  
1/4 mfd., 1/9      2 mfd., 3/-



ZEOS VARIABLE CONDENSER 5/-



PIP TRANSFORMER . . . . . 6/6



VALVE HOLDERS . . . 1/3



FILTRONIC PERCOLATIVE EARTH. . 2/6



H. M. S. CHOKE . . . . . 2/6



LITLODS DIFFERENTIAL CONDENSER  
Price 2/- + 2220



DISC CHOKE . . . . . 2/-



POTENTIOMETER VOLUME CONTROL  
from 5/6

Send a Postcard for our New Catalogue which describes all our Products

All Products obtainable from your Dealer or Post Free from:—Graham Farish Ltd., Masons Hill, Bromley, Kent

Conducted by J. H. Reyner, B.Sc., A.M.I.E.E.

# We Test for You



The Siltit earth cartridge, with a bunch of wires, that are spread out fan-wise to make a good earth contact

### SILTIT CHEMICAL EARTH

THIS new chemical earth consists of a piece of copper tubing 1 in. in diameter and 5 in. long, which is perforated by small holes at regular intervals. From one end of this tube comes the copper connecting wire, which is of 7/22 aerial type and about 6 ft. long. From the other end of the tube, and firmly soldered into the end, extend, for a length of about 4 in., fourteen strands of No. 18-gauge copper wire. These strands are intended to be spread out fan-wise to give a very large contact area with the surrounding soil.

**Test Results.**—The earth tube appears to be perfectly satisfactory in practice and there seems to be no reason why extended satisfactory service should not be obtained. The fact that there are no screwed or soldered joints to be made to the earth is a

good point as the formation of bad connections here are frequently the source of many obscure troubles in the operation of a receiver. The large contact area is also a

good point in its favour. **Makers: No-Mast Patent Aerial Co. Price: 3s. 6d.**

### BULGIN JUNIOR HIGH-FREQUENCY CHOKE

THIS choke is available in two forms, one in an iron screening case and the other in a moulded-

bakelite case; it is the latter model that we are reporting on here. The choke is of the iron-cored variety, which allows a high inductance to be obtained, while keeping the self-capacity relatively low, due to the lower number of turns.

The choke is very neat in appearance, the bakelite housing being finished in the familiar Bulgin mottled green. Two terminals are provided for connection, these being fitted with soldering tags. The overall height of the choke is roughly 2 in., while the maximum diameter, that is of the flange forming the base, is just under 2 in. The rated inductance of the choke is 190,000 microhenries and the



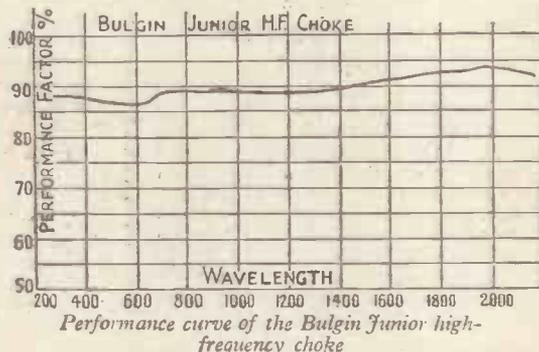
Bulgin Junior high-frequency choke

self-capacity approximately 4 picofarads.

**Test Results.**—The choke was tested in accordance with our usual practice and the results are shown plotted on the chart accompanying this report. It

will be seen that the performance factor is extremely level over the whole working range and there are no unwanted absorptions. The performance factor is generally somewhat lower than the average, but considering the very low price this component is good value.

The inductance was found to be very close to its rated figure, the actual value being 180,000 microhenries, while the self-capacity was measured and found to be approximately 6 picofarads. **Makers: A. F. Bulgin & Co., Ltd. Price: 2s.**



**NEW WATMEL WIREWOUND RESISTANCE**

The **HYWATT**

Here is Watmel's contribution to the 1934 Wireless Season. A new resistance that is a definite advancement to anything else on the market: because

- (a) For closer tolerance than the carbon type, due to the element being wire. This means a fixed resistance value and makes it unchangeable in operation.
- (b) Will stand very high overloading as each turn is insulated.
- (c) Noiseless, due to welding of lead wire, and absolutely moisture proof.

The Hywatt Resistance has the advantage of a wire-wound element of high wattage rating, designed for use in voltage dropping, decoupling, biasing, etc., and costing no more than resistances of far less reliable design and composition.

Made in all values from 1—50,000 ohms.

WRITE for a copy of the Hywatt leaflet, which gives full particulars, to:—**WATMEL WIRELESS CO., LTD.**, Imperial Works, High Street, Edgware, London. Telephone: Edgware 0323.

**Watmel COMPONENTS**  
GET THE BEST OUT OF ANY SET  
C.R.C.98

**PIX**

**INVISIBLE AERIAL**

**AN INSIDE AERIAL THAT'S AS GOOD AS AN OUTSIDE AERIAL—**

AT THE SAME HEIGHT

**2 1/2**  
DOUBLE LENGTH  
3/6

**PRESS IT AND IT STICKS ANYWHERE**

A revolutionary idea in aeriels. You just unroll it and press it up in position around the room or anywhere you like. No danger whatever from lightning, reduces static interference—increases selectivity.

Obtainable anywhere.

**BRITISH PIX CO., LTD., LONDON, S.E.1**  
**THE BEST AERIAL FOR FLATS**

**THE POPULAR PAIR**

"We're Fluxite and Solder—the reliable pair; Famous for Soldering—known everywhere!"

For Wireless RECEPTION we've done our share! So NOW we're announced as "THE POPULAR PAIR!"

See that Fluxite and Solder are always by you—in the house—garage—workshop—anywhere where simple, speedy soldering is needed.

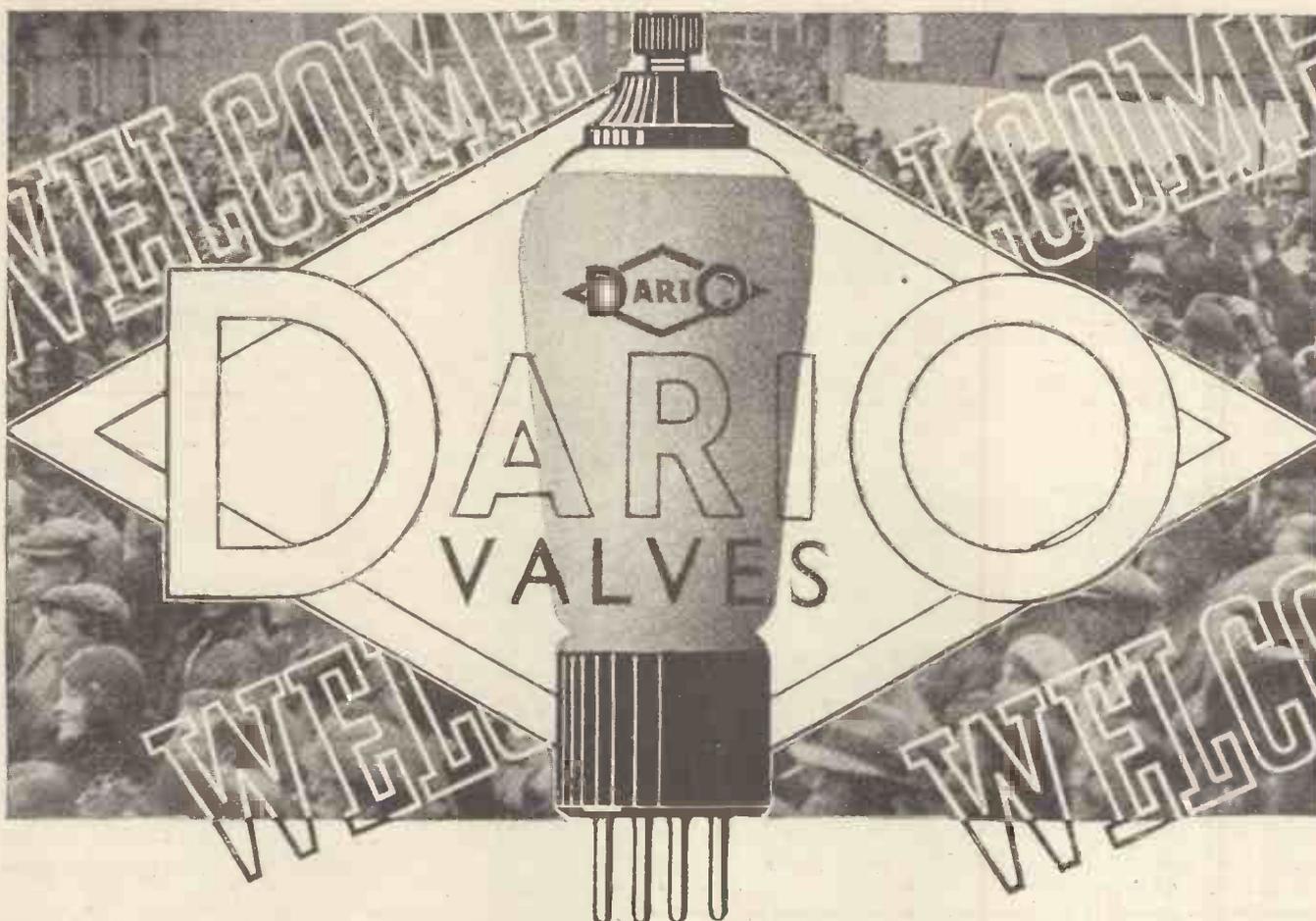
**ALL MECHANICS WILL HAVE FLUXITE**

**IT SIMPLIFIES ALL SOLDERING**

All Ironmongers sell Fluxite in tins: 4d., 8d., 1s. 4d., and 2s. 8d. Ask to see the **FLUXITE POCKET SOLDERING SET**—complete with full instructions—7s. 6d. Ask also for our leaflet on **HARDENING STEEL** with Fluxite.

**FLUKITE LTD.,**  
(Dept. 326), **ROTHERHITHE, S.E.16**

**FOR ALL REPAIRS!**



# -to the new Dario range

Insist on DARIO Valves next time. You will be rewarded with increased volume, wider range, faultless reception and perfect quality of tone. There is a DARIO Valve for every purpose and every make of set, at exceptionally moderate price.

EVERY NEW TYPE

## DARIO VALVES

EVERY IMPROVEMENT

### 2-VOLT BATTERY

Screened Grid and Variable Mu S.G.	- - - 10/6
H.F. and Detector	- - - 5/-
Super Power	- - - 6/6
Class "B" Output	- - - 10/6
Pentode	- - - 10/6

### DIRECTLY HEATED A.C. MAINS

Output Pentode	- - 12/6
----------------	----------

### INDIRECTLY HEATED A.C. MAINS

Screened Grid and Variable Mu S.G.	- - 12/6
Screened H.F. Pentode	- - 12/6
Diode Tetrode	- - - 13/6
General Purpose	- - - 8/6
Output Pentode	- - - 12/6

### POST THIS COUPON TO US

We will be pleased to send you our catalogue of the latest DARIO Valves. You will be astonished both by the completeness of the range and the very low prices.

Name..... A.W.

Address .....

To IMPEX ELECTRICAL LTD., 47, Victoria St., Westminster, London, S.W.1. Telephone: VIC. 3914. Telegrams: Dariolect, Sowest, London.

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

Sets of the Season Tested

## Ready Radio E.M. Plus 4 Kit

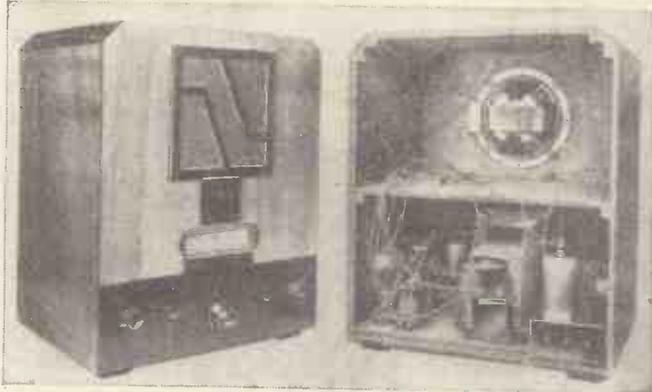
ONE is rather apt to forget that some of the most efficient receivers in the past have used Litz-wound coils of generous dimensions, with a primary winding to give a high degree of selectivity. The Litz-wound coil had apparently gone out of favour so completely that we were very surprised to hear that Ready Radio, Ltd., were marketing a kit using this type of coil.

In the E.M. Plus 4 kit we are pleased to see that the medium-wave windings of the coil are wound with Litzendraht wire on a 3-in. former, with the primary winding spaced off about  $\frac{1}{4}$  in. This coil is one of the most efficient we have tested for many years and can bear comparison with almost any of the modern

iron-core coils. Incidentally, the inductance of these coils is approximately 280 microhenries, as compared with about 160 microhenries for the average air-core coil and 170 for an iron-core coil.

Often an efficient home-constructor kit can beat the average low-priced commercial receiver because the efficiency can be so much greater. When a cheap receiver is being mass-produced the variations in components are liable to cause inconsistency. This E.M. Plus 4 is, in our opinion, a good example of a highly efficient home-constructor kit. Should the receiver be a trifle unstable, variations can be made to anode voltages to ensure their stability to give maximum results.

The circuit consists of a high-frequency amplifying stage, using a Mullard PM12V variable- $\mu$  screen-grid valve, coupled to a PM2DX as a leaky-grid detector. This is followed by a resistance-capacity coupling unit to a PM1HL, which is in turn transformer-coupled to a PM202 power valve. There are four high-tension positive tapings—H.T.+1, to which is applied 80 volts; H.T.+2, 60 volts; H.T.+3, 110 volts; and H.T.+4, the maximum tapping supplying the power and



Two views of the Ready Radio E.M. Plus 4 kit completely assembled and ready for use

### BRIEF SPECIFICATION

Makers: Ready Radio, Ltd.

Price: £4 17s. 6d., or £6 17s. 6d. with moving-coil loud-speaker.

Valve Combination: PM12V high-frequency amplifier, PM2DX detector, PM1HL as the first low-frequency valve, and a PM202 as the final power amplifier.

Power Supply: Dry batteries, high-tension mains unit or high-tension accumulators.

Type: Table cabinet.

Remarks: This is an unusually sensitive receiver, and simple to construct. The moving-coil loud-speaker is in the same cabinet as the receiver, while space has been left for the batteries and accumulator.

screen-grid valves. I find by my tests that this tapping requires 120 to 150 volts for the best results.

By having these various tapings it is possible to vary the voltage applied to each stage slightly to obtain maximum volume, complete stability, and good quality—a very desirable feature.

### Good Sensitivity

The receiver was tested out about thirty miles north of London. The first test was made before lunch, when it was immediately obvious that the sensitivity was, if anything, slightly better than that of an A.C. four-valve superhet that was being tested at the same time. There was absolutely no background noise on the E.M. Plus 4 kit, while stations such as Fécamp, Lille, and Hilversum were tuned in at full loud-speaker strength. Lille, by the way, uses 1.5 kilowatts and is a very second-class station.

With a 50-ft. aerial connected to the "flat"

## GET REALITY at Christmas

Your set this Christmas can give reproduction more vivid and lifelike than you ever thought possible. Thousands of W.B. users have been astonished at the improvement the "Microlode" has made in the performance of their sets.

Unique features evolved in the W.B. laboratories place this speaker in a different class from all other moving-coil reproducers. ● The 'Microlode' feature, giving more perfect matching to the set than before possible, brings an evenness of response, obtainable in no other way. ● The 'Mansfield' magnetic system, W.B. engineers' famous method of obtaining greater strength from the magnet, brings sensitivity, crisp attack, and clear brilliant top notes. ● Hear one at your dealer's to-day and realise what you have been missing!

And here is a new way of obtaining radio in another room.

The "Equilode," just released, uses an adaptation of the Microlode principle. It is the ONLY extension speaker that will work perfectly from ANY set. It embodies also a volume control and "extension off" switch. As a Christmas present to yourself or a friend, it is ideal. Price 33/6. Or in handsome walnut-finished cabinet, 48/6. Write for the folder.

**'MICROLODE'** PM4A - 42/-  
PM6 - 32/6

Regd. Trade Mark



PM4A

## The improvement will AMAZE you

Whiteley Electrical Radio Co., Ltd., Dept. A, Radjo Works, Mansfield, Notts.

Sole Agents in Scotland: Radiovision Ltd., 233 St. Vincent St., Glasgow, C.2. Sole Agents in I.F.S.: Kelly and Shiel, Ltd., 47 Fleet Street, Dublin

**Ready Radio E.M. Plus 4 Kit**

tapping on the aerial coil, the local station could be tuned out with the greatest of ease and in daylight a large number of stations could be picked up. For a set of this kind the selectivity is really remarkable, while the daylight range is much better than that of the average set.

After dark all of the more worth-while continental stations could be picked up without difficulty.

**Daylight Range**

We feel that it would not be too optimistic to say that in normal conditions practically all of the long-wave stations can be tuned-in in daylight on the loud-speaker, while Langenberg on the medium waves at 11 a.m. is a good loud-speaker signal. This is proof of the great selectivity of the set.

You would expect that a set of this kind would be difficult to tune but, on the contrary, it is quite simple. The tuning dial is of the new full-vision type and the receiver is tuned by means of a single knob, with an adjustable panel trimmer to make quite sure that it has been correctly ganged. There are only two other controls—the volume control, varying the grid voltage to the variable-mu valve, and the knob on the extreme right, which is a simple reaction control. The variable-mu volume control is particularly useful, as it prevents the detector valve from overloading when the set is tuned to the local or any other powerful station.

**Simple Switching**

A simple push-pull switch is provided for cutting off the low tension and high tension, while a double push-pull switch is used for wave-changing. Adequate space is provided in the cabinet for a moving-coil loud-speaker, high-tension and grid-bias batteries, and the low-tension accumulator, so that the whole set can be made entirely portable with the exception of the aerial and earth.

A 120-volt high-tension battery will last a considerable time, as the current consumption is extremely low. This is due to the fact that three out of the four valves are negatively biased, so as to keep anode current to a minimum.

We can recommend any reader who is keen on building his own set to consider this kit, as it will give him results comparable to many commercial receivers at the price.

**News for the Set Buyer**

MCMICHAEL RADIO have released a D.C. version (200-250 volts) of their famous Twin Super-vox. It is a straight set with band-pass input to two high-frequency stages, incorporates a whistle filter and gives an undistorted output of 2.5 watts. The cabinet is of the modern horizontal type with the controls in the centre and two matched loud-speakers, one at each end of the cabinet. The price is £18 18s.

Philco have released a new five-valve super-het, which has been called the "5-Star Mezzo Grand." It is really a de-luxe job housed in a highly polished horizontal cabinet which can only be compared to the rich patina so highly prized by antiquarians. The Philco feature of a sloping panel with an 11-in. diaphragm auditorium loud-speaker has been incorporated.

The Harken Electrical Co., Ltd., of 18A South End, Croydon, Surrey, have just marketed a new short-wave battery receiver with class-B output. It has been designed to cover wavelengths of from 13.6 to 75 metres and from 220 to 550 metres. Five valves are used—one variable-mu high-frequency stage, detector, low-frequency stage, transformer coupled to the driver and class-B valves.

- 1. GANGED CONDENSERS
- 2. FIXED CONDENSERS
- 3. O.M.B. SWITCHES · POTENTIOMETERS
- 4. SINGLE TUNING CONDENSERS
- 5. VALVE HOLDERS
- 6. I. F. TRIMMERS
- 7. RADIOPAK
- 8. SLOW MOTION DISC DRIVES

# QUALITY TELLS!

## Make your set 100% by using Radiophone Components

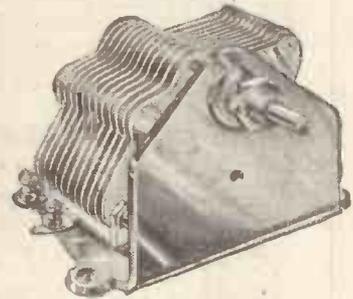
You can always tell a "quality" set from a poor one. You cannot get more out of a set than you put into it. Choose Radiophone components and you'll get quality. You'll get it no other way.

Why shouldn't you give your set the best there is? Your work and time are worthy of the best. Why choose the wrong components now and wish, later on, you'd used better material. Start right. Buy Radiophone—your set will thus be as good as quality can make it. Don't ever believe that there's anything "just as good" as Radiophone. Manufacturers, traders, designers, all acknowledge Radiophone to be the leader in the industry and they know. Don't take chances. Insist on Radiophone.

**RADIOPHONE  
SINGLE TUNING CONDENSER**

The very best made. One hole fixing to baseboard or panel. No pigtail. Two pre-set condensers for fine adjustment. New style smooth action bearing. Guaranteed accuracy. Highest quality materials. And the price - - - only

**6/6**



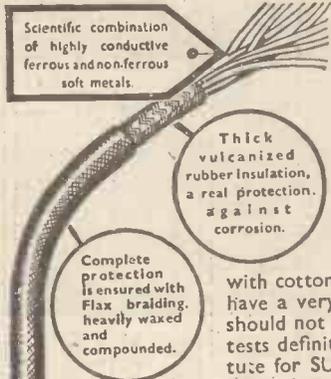
# RADIOPHONE

## MATCHED PERFECTION

**BRITISH RADIOPHONE LTD.,  
ALDWYCH HOUSE, ALDWYCH, LONDON, W.C.2**  
Telephone: HOLBORN 6744

**CUT OUT THIS FOR CATALOGUE**

Write your name and address in the margin. Post in open envelope (½d. stamp). Illustrated catalogue No. A.W. 11 full of information post free by return.



# SUPERIAL

is definitely the **BEST AERIAL!**

The resistance offered by SUPERIAL to incoming signals is negligible because of the unique surface or skin of each strand. All-copper aerials, particularly those covered with cotton, after exposure to the air, become corroded and definitely have a very large resistance to the incoming waves of energy, which should not be confused with the ordinary electric current. Laboratory tests definitely prove this. Other aerials are being offered as a substitute for SUPERIAL. Do not be misled by extravagant claims and so suffer disappointment. SUPERIAL is the best aerial obtainable at any price and every coil is sold under a full guarantee of satisfaction.

**£500**  
FREE  
**LIGHTNING**  
**INSURANCE**  
FOR 2 YEARS

THE AERIAL WHICH MADE BROADCASTING POPULAR  
**SUPERIAL**  
ELECTRON'S SUPER-AERIAL  
100 ft., 3/6 : 75 ft., 2/6 : 50 ft., 1/9 : 25 ft. 1/-

From Dealers everywhere.

## MAKE YOUR SET SUPER-SELECTIVE

VARIAL is a marvellous invention which will give aerials every desired degree of selectivity, cutting out interference from other stations. Can be used with any set on any aerial. Fixed in a few moments and requires no alterations.

Can be supplied already attached to a coil of SUPERIAL—the only self-contained variable aerial.

100 ft. 75 ft. 50 ft.  
4/6 3/6 2/9

In this form it is the world's most selective aerial.



**1/6**  
EACH

FROM WIRELESS SHOPS EVERYWHERE

## ELECTRON INSULATOR PINS FOR INDOOR OR INVISIBLE AERIALS

Don't mess up your walls with sticky adhesive so-called invisible aerials. Fix one little ELECTRON INSULATOR PIN on each corner of the room and run a proper wire aerial (SUPERIAL) through them. The only efficient indoor or invisible aerial properly insulated and kept away from the walls. Three colours, OAK, MAHOGANY, BLACK, in boxes of six for 6d.

All the above can be obtained from any wireless shop or direct from:

The **NEW LONDON ELECTRON WORKS Ltd.**  
89 EAST HAM LONDON E.6

**6d.** PER BOX OF SIX



YOU CAN RUN YOUR AERIAL ROUND THE PICTURE RAIL OR ON THE WALL

## Short-wave Notes

By Kenneth Jowers

I SAID last week that I would do some listening on Sunday afternoon to see whether the reception of VK2ME Sydney was as simple as readers were trying to make out. Sure enough, reception was simple, signal strength being about R5 to 6 for a little over an hour between 2.45 and 3.45 p.m.

Fading was bad, but as it was not deep fading only very quick, all the announcements could be heard quite well, while I was able, at times, to hear the gramophone records on the loud-speaker.

This last week-end has been very satisfactory in many ways. Distant reception has taken a distinct turn for the better, in fact, signal strength all round has shown a definite increase. On Saturday afternoon a little after 3 p.m. W3XAL, on the 16-metre band, was coming through at a good R7 on the loud-speaker. Although it was about 10 a.m., Eastern Standard Time, the programme consisted of crooners and a dance band—with a cookery talk sandwiched in between.

### 19-metre Band

W8XK, on the 19-metre band, was first picked up about 4 p.m., but at very poor strength, although by 5 p.m. it was coming through on the loud-speaker, whereas W3XAL was then only moderate phone strength.

The wavelengths used by the Post Office for their South American telephone service seem to be getting lower and lower. I picked up Buenos Aires on a wavelength of 13.9 metres, but I couldn't identify which station it actually was, as it is not down on any of my lists. Before this, the lowest commercial telephony station that I had heard was about 14.2 metres. I listened for half an hour or so to a talk on unemployment and progress of the U.S.S.R. from the second harmonic of Moscow, on 25 metres. The signal strength was R9 and the quality very good indeed, although the substance of the talk had to be taken with a pinch of salt.

I have not been able to pick up the 16- or 19-metre Empire stations for the past month or so. During the evening, GSC is my best station, closely followed by GSA round about midnight.

On Sunday afternoon I was very surprised to hear VE2GB coming over at about R4, a little after 2 p.m. This is very early for the Canadian 20-metre stations to come over (VE2GB is situated in Berthierville, P.Q.).

### American Amateurs

Soon after the American amateur stations were coming in at very good strength; from 3 until 4.30 p.m. I was able to pick up over a dozen of these stations at varying strength. W9BLD, from Illinois, could be heard with the volume control set at 9 o'clock. I was able to hold, for some ten minutes or so, the entire conversation of WIGE, of Portland Main, calling ON4AU, of Peruwelz, Belgium.

Quite a number of the old familiar 160-metre English amateur stations seem to have migrated to the 80-metre band. I don't know whether this is permanent or just a temporary move, but on Sunday morning the 160-metre band was almost deserted. G5AR was working G6KV, of Laidon, and G2KT, of Rayleigh, while G2LZ was working G6KV, although I am not so sure that I wasn't picking up the harmonic of G2LZ, on 80 metres.

Trawlers on about 170 metres, although they only test and communicate with the base at, I believe, Hull, are worth listening to.

## EASY PAYMENTS

"There's no place like HOLMES."

The first firm to supply Wireless parts on easy payments. Eight years advertiser in "Amateur Wireless." Thousands of satisfied customers

After visiting the show you will undoubtedly choose the finest speaker.

**EPOCH** 11-in. super 4/11  
45/- cash. 9 payments of 4/11

	De-posit	Monthly	Paym'ts
LISSEN SKYSCRAPER Kit	89/6	8/3	11 of 8/3
TELSEN 325 Star Kit	39/6	5/5	7 of 5/5
EXIDE H.T. Accum. 120v.	43	6/-	9 of 6/8
EKCO Eliminator A.C. 13	67/8	7/5	9 of 7/5
CELESTION M.C. P.M.	35/-	4/10	7 of 4/10
B.T.H. Pick-up	25/-	4/8	5 of 4/8

Parts for any Kit Set. Any make of Speaker. New Goods Obtained for Every Order. Send us a list of the parts you require and the payments that will suit your convenience, and we will send you a definite quotation. Anything Wireless.  
**H. W. HOLMES, 29 FOLEY STREET, Gt. Portland Street, London, W.1.** Phone: Museum 1414.

**Piano Tone RADIO GRAM CABINETS**  
*As supplied to B.B.C.*

**65/- Polished 35/- Cabinet for**

**No Middle Profits!**  
Famous maker offers finest Radio Furniture. As supplied to B.B.C. A Quality and Value impossible to better. Beautifully hand polished! **GUARANTEED** Piano-Tone Acoustically.

**Trial Will Delight You!** (Cash or 10/- Monthly.)

LIST FREE! From Makers—

**PICKETT'S**  
*Piano Tone*

Cabinet (A.M.) Works, Albion Rd., Brxleyheath, Nr. London

**RADIO SUPPLIES**

Send your list of Radio needs for our quotation. Kits, Parts, Sets, etc. Everything in Radio stocked. Prompt delivery: seven days' approval. Catalogue free. Taylor and Standard. Wet H.T. replacements stocked.  
**A. TAYLOR, 9 GROVE ROAD, BALHAM, S.W.12.**

# ROLA

*the World's Finest Reproducers*



**ROLA CLASS B  
SPEAKER AMPLIFIER UNIT**

## The Mighty Voice of Radio Realism

Five seconds spent in connecting this unit brings the magnificent volume of the All-Mains set to the owner of the battery receiver. With output and sensitivity increased at least five times all the realism of the studio can be enjoyed in the comfort of your home. Let the Christmas Party dance to your Battery Set.

**Model A—For Mullard P.M. 2B, B.T.H. PD220, Cossor 220B, Hivac B220, Marconiphone B21, G.E.C. B21, Clarion B22.**  
**Model B—For Cossor 240B, Ferranti HP2, Clarion B24.**

**PRICE**  
(Both Models less Valve)  
**57/-**

### Class B Speakers

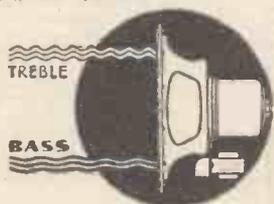
Class B Speakers suited to the characteristics of all Class B valves are included in the Rola range. Write for complete list to-day.

### Extension Speakers

There is a correct Rola Extension Speaker for practically all British radio receivers. Write for Extension Speaker Broadsheet.

**THE BRITISH ROLA CO., LTD.,**  
Minerva Road, PARK ROYAL, N.W.10.  
Phone: Willesden 4322-3-4-5.

**ROLA  
SPEAKERS**  
for better  
Radio Reception



Potted Biographies—13

## Claude Hulbert and Enid Trevor

**D**URING a pleasant hour spent with them in their South Kensington home, I learned a good deal about Claude Hulbert and his wife, Enid Trevor.

Claude and Jack Hulbert are sons of a London doctor. I was interested to find that Claude was at school at Frertherne House, then in Baker Street, some years before I was a classical master there. Both Jack and Claude went to Cambridge eventually.

"What made you go on the stage?"  
"Well, you see, nobody seemed to care what I did. I think they thought I couldn't do anything . . . er . . . didn't they, darling?" In which sentence he spoke exactly as he does on the wireless. "While I was up there," he continued, "I joined the *Footlights*, and then (in 1921) I played in *Fantasia*."



Claude Hulbert

Both he and his wife are keen broadcasters. They told me they believed in it from the first, despite the assurances of some of their professional friends that there would be nothing in it.

"We have been married ten years in February," Enid told me.

I asked if they had any children. "Yes, two," said Claude (exactly as he would say it in the studio) "er . . . one at school and the other in the garden." I could see a pram.

He then reached down a charming photograph of two really lovely children—Jill and Jacqueline. I should like to have taken away that picture with me.

They then told me that they met some years ago when they happened to play in a concert party. Enid thought Claude was an ass, and he thought she was facetious. So they began well!

I then asked what made them think of these domestic scenes which they have made so popular. I mentioned the *School for Husbands*, *Selling the Flat*, *Answers to Correspondents*, and one or two others.

"They are all founded on fact," said Enid. Honestly, I could hardly believe Claude could be so aggravating, but she says he can. "We even have rows about what we are going to broadcast. Then when it's all settled Claude will go and alter half of it at the last moment."

I felt sorry for Enid. And yet there was a twinkle in both their eyes which told me very plainly that these two are very happy in their home with their children and a huge Alsatian named Wolf.

You will be interested to know that Claude is a keen wireless enthusiast. He told me he had stacks of **AMATEUR WIRELESS** in the house.

The next time you listen to them in their next "row," don't you believe all they say to be true. The atmosphere of their home struck me as being exceedingly happy.

W.-W.

## Easy Terms

**Strict Privacy Guaranteed**  
—we deal with you direct

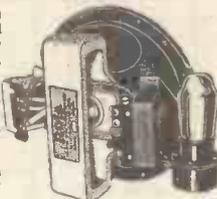
### ROLA CLASS B SPEAKER-AMPLIFIER

**SEND FOR IT ON 7 DAYS' TRIAL**

Complete Class B Amplifying Unit, with Valve and Rola P.M. Moving-coil Speaker. Send only 5/- for 7 days' trial.

**5/-  
DOWN**

If approved, balance in 11 monthly payments of 6/6. Cash or C.O.D. Carriage Paid, £3,11.0.



Rola P.S. Send only 5/-. Balance in 11 monthly payments of 4/6. Cash or C.O.D., Carriage Paid, £2,9.6.

### W.B.P.M. 4 MICROLODE MOVING-COIL SPEAKER

**SEND FOR IT ON 7 DAYS' TRIAL**

With Switch-controlled Multi-ratio input transformer. Send 5/- for 7 days' trial. If approved, balance in 8 monthly payments of 5/3. Cash or C.O.D. Carriage Paid, 42/-.

**5/-  
DOWN**

W.B.P.M. o. Send only 2/6, balance in 8 monthly payments of 4/3. Cash or C.O.D., 32/6. Carriage Paid.



### BLUE SPOT 29 P.M. MOVING-COIL SPEAKER

**SEND FOR IT ON  
7 DAYS' TRIAL**

Suitable for Power or Pentode. A very Sensitive Speaker.

**2/6  
DOWN**

Send only 2/6 for 7 days' Trial. If approved, balance payable in 8 monthly instalments of 4/3. (Cash in 7 days, 32/6.) Carriage Paid.



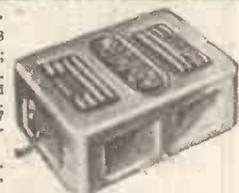
### TELSEN ELIMINATOR

**SENT ON 7 DAYS' TRIAL**

Model W.346, 150 volts at 28 m.A. S.G. and Detector Tappings. Send only 2/6 for 7 days' trial. If approved, send further 2/6. Balance in 17 monthly payments of 6/-.

**2/6  
DOWN**

Cash or C.O.D. Carriage Paid, 14/17/6.

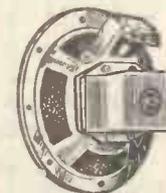


### N.T.S. CLASS B SPEAKER

**SEND FOR IT ON 7 DAYS' TRIAL**  
Gives perfect reproduction. With input transformer for power or pentode. Send 2/6 for 7 days' trial. If approved, pay balance in 6 monthly payments of 4/6. Cash or C.O.D. Carriage Paid, 22/6.

**2/6  
DOWN**

Also model for Power or Pentode. Cash or C.O.D., 18/6. Or send only 2/6. Balance in 5 monthly payments of 4/-.



## New Times Sales Co.

FIRST WITH RADIO ON EASY TERMS.  
ESTABLISHED 1924.

**56 LUDGATE HILL, LONDON, E.C.4.**

Dear Sirs:  
(1) Please send me.....  
(b) I enclose Cash/Deposit.....  
NAME.....  
ADDRESS.....  
A.W. 9/12/33.

Electradix Bargains. NEW XMAS BARGAINS

12-PAGE SALE LIST NOW READY.

We quote a few items:-

MICROPHONES

A New Practical Home Mike for 5/6 Wireless Broadcasting at Home... Microphone Carbon Granules. In glass capsule, enough for four buttons.

FRETS for speaker panel fronts or baffles. Fine 8-in. octagon, in flanged, black, moulded bakelite...

METERS. Panel and Portable Meters. All sizes and ranges from 5/8. Movements only of standard moving coil, 5/-.

THE DIX-MIPANTA VEST-POCKET TESTER. A wonderfully versatile moving-iron multi-range meter for service on A/C jobs.

WIRE. Lead-covered single, 3/028, 15/- 50 yds.; 7/029 ditto 15/- per 50 yds. L.C. Twin, 1/044, 15/- per 50 yds. coil; L.C. Twin, 1/044, 18/- per 50 yds. coil.

PARCELS of experimental odd coils, magnets, wire, chokes, condensers, switches, terminals, etc., post free.

ELECTRADIX RADIOS

218 UPPER THAMES STREET, LONDON, E.C.4

Any Amplion, Blue Spot, Baker, Celestion, Epoch, Ferranti, Grampian, Igranic, Lamplugh, Magnavox, Ormond, R. & A., Rola, Sonochorde, or W.B. Speaker supplied.

and pay balance by monthly instalments. No references, Entirely private and confidential. KITS, PARTS, SETS, ELECTRIC CLOCKS, ON EASY TERMS.

Micromesh THE MODERN VALVE. Literature and prices on request. Standard Telephones and Cables, Ltd., St. Chad's Place, 364 Gray's Inn Road, London, W.C.1. Terminus 6233.

ADD 50/- WEEKLY TO YOUR EARNINGS

by charging accumulators in your spare time. Complete Plant incorporating Wokinghouse Rectifiers, to charge 100 cells weekly. Trade Price £4 : 4 : 0 or 8/- monthly. A.C. Mains only. Send for description booklet. MAINS' POWER RADIO, LTD., ROMFORD, ESSEX

Broadcasting Stations

Wavelengths are brought up to date week by week. For the purpose of better comparison, the power indicated is that of the carrier wave.

Table with columns: Metres cycles, Kilo- (Kw.), Station and Call Sign, Country, Power (Kw.), Metres cycles, Kilo- (Kw.), Station and Call Sign, Country, Power (Kw.). Lists various stations like Daventry (GSG), Schenectady (W2XAD), Zeesen (DJB), Paris (Coloniale), etc.

# Postcard Radio Literature

Here "Observer" reviews the latest booklets and folders issued by well-known manufacturers. If you want copies of any or all of them FREE OF CHARGE, just send a postcard giving the index numbers of the catalogues required (shown at the end of each paragraph) to "Postcard Radio Literature," AMATEUR WIRELESS, 58/61 Fetter Lane, E.C.4. "Observer" will see that you get all the literature you desire. Please write your name and address in block letters.

## Mullard Valve Guide

THIS booklet contains characteristics and curves for all Mullard valves, a description of how the battery types are made and the construction of A.C. mains types, advice on how to choose an output valve, descriptions of the multi-mu and screened pentodes. Certainly a booklet for every constructor. **107**

## Ferranti Super-hets

The cream of the supers in one catalogue. Ferranti have some astounding and unique cabinets. For instance, the Arcadia Companionette is designed to be used alongside an armchair, the base forming a useful place to park one's books. A very interesting catalogue. **108**

## A New Guide to Class B

Guide is a modest name for it, for the theory of class B is fully explained. You should certainly have a copy of this very useful book by Multitone. Class-B transmission, economy, and requirements from coupling components, are included in the first section. In the second section they deal with good quality and stability, sources of high tension and design. The design section deals with choosing a driver transformer, valve, and loud-speaker; converting existing sets, biasing the driver valve—but you must get the book. **109**

# Notes and Jottings

CAN you write a selling slogan? If you can then here is your chance to win a car. A competition is being organised to find a title and slogan for a radio receiver. Details of the competition can be obtained from Kolster Brandes, Ltd., Cray Works, Sidcup, Kent.

Demands for the G.E.C. home-broadcaster, which was recommended by "The Experimenters" last week, have exceeded all expectations, we learn. From this we suppose that their party ideas are going to be popular this Christmas. The price of this new unit is £1 is., the increase of 2s. 6d. in the list price being due to improvements in manufacture.

Now where is your address book? You have a correction to make. On December 4 the Edison Swan Electric Co., Ltd., transferred their head office to 155 Charing Cross Road, London, W.C.2.

Those who are fitting up an extension loud-speaker for Christmas should remember the new W.B. model known as the Equilode. This is provided with a form of matching that makes it suitable for use with any set.

With two high-frequency pentode and iron-core coils, the new Straight Six receiver put on the market by Higgs (Great Britain), Ltd., is interesting. A high degree of selectivity is claimed.



# HETERODYNE WHISTLE FILTERS

*In a Class alone.*

**N**OWADAYS the reception of many high-powered stations is completely spoiled by the shrill interference known as "heterodyne whistle." It can be quickly and easily rectified by the inclusion of one of these special filters, simply connected between your set output and loud-speaker.

Primarily designed for use with speakers of the moving-iron or balanced-armature type. Cut off, 3,250 cycles.

**TYPE A** **PRICE 10/6 EACH**

For moving-coil speakers of all kinds. Cut off, 4,750 cycles.

**TYPE B** **PRICE 10/6 EACH**

**RECOMMENDED for the "1934 CENTURY SUPER"**

Send for 80 page Catalogue No. 153A.  
Enclose 2d. postage:



TYPE 'A'  
LIST NO  
L.F. 26



TYPE 'B'  
LIST NO  
L.F. 27



TRADE MARK

Telephone: Grangewood 3266/7      Showroom Holborn 2072

**A. F. BULGIN & CO. LTD.,** Abbey Rd., Barking, Essex  
London Showrooms, 9-10-11 Cursitor Street, E.C.4

The New



## 'EQUILODE' EXTENSION SPEAKER



The first and only moving-coil "extension" speaker which works perfectly with any set from 2 valves upwards. Volume is exactly equal to that of your principal speaker, and by a simple switch adjustment, the "Equilode" is PERFECTLY MATCHED to your set.

**ONLY 2/6 DOWN**

**7 DAYS' TRIAL**

Also the only extension speaker with separate VOLUME CONTROL and ON-OFF SWITCH. Send only 2/6 for it on 7 days' trial. If satisfied, balance in 7 monthly payments of 5/-. (Cash in 7 days, 33/6.) Full instructions for matching to any set enclosed.

British-made WATES UNIVERSAL METER. The only popular-priced instrument for testing resistances as well as batteries, valves, circuits and all components. SEND ONLY 1/6 for 7 days' trial. If satisfied, balance by five monthly payments of 2/6. (Cash in 7 days, 12/6.)

**ONLY 1/6 DOWN**



**E. J. HERAUD, Ltd. (Dept. A.W.33)**  
NUMBER ONE, EDMONTON, LONDON, N.18  
Phone: Tottenham 2256.      Estab'd 34 Years.

Branches 78/82 Fore St., Edmonton; 77 West Green Rd., Tottenham; 34 St. James St., Walthamstow; and 139 Herford Rd., Enfield Wash.



HULLO!  
SOLD YOUR RADIO?



NO! GETTING BETTER RECEPTION WITH AN AIRCLIPSE

Instantly you get astonishing new clarity of reception by connecting up the AIRCLIPSE in place of your present aerial. Selectivity is amazingly improved. The Airclipse is not another gadget—not a condenser. It is an auto-inductive aerial that filters incoming signals. It eliminates lightning danger; disposes of untidy wires; fits inside or outside the set.

*A delighted user writes:—"Sensitivity was far above what I expected from it. My friends are also much impressed."*

A "GREAT" LITTLE GIFT

# AIRCLIPSE

AUTO-INDUCTIVE AERIAL

FOR A.C. MAINS AND BATTERY SETS

**5/-**

Of all Dealers or direct from:—

**AIRCLIPSE LTD., 182, VAUXHALL BRIDGE ROAD, LONDON, S.W.1**  
Phone: Victoria 5022.

PREPAID ADVERTISEMENTS

Advertisements under this head are charged THREEPENCE PER WORD, minimum charge THREE SHILLINGS. DEPOSIT SYSTEM. As the publishers cannot accept responsibility for the bona fides of advertisers in this publication, they have introduced a system of deposit which it is recommended should be adopted by readers when dealing with persons with whom they are unacquainted. It is here explained. The amount of the Deposit and Fee must be remitted by Postal Order or Registered Letter (Cheques cannot be accepted), addressed to "Amateur Wireless," Advertisement Department, 58/61 Fetter Lane, London, E.C.4.

REPAIRS to Loud-speakers, Transformers, and Head-phones, 4/- each; Blue Spots, 5/-. Moving Coils a speciality. Cones fitted, Eliminators and Sets quoted for. Satisfaction guaranteed. Prompt service. Inquiries invited. Terms to trade.—Loud-speaker Repair Service, 5 Balham Grove, London, S.W.12. Battersea 1321.

CHARGING WITHOUT MAINS!—Thousands are charging their own accumulators, why don't you? "Tonic" trickle-charger kits keep 2-volt accumulators fully charged. Ideal for remote districts. From 7/-, postage 9d. Full particulars, stamp.—Williams, Netherend, Cradley, Nr. Birmingham.

GRAMOPHONES, Radiograms, Motors, Arms, Pick-ups, Loud-speakers, Horns, Springs, Needles, Repairs, cheapest.—Catalogue, Kezenteum, 120 Old Street, London, E.C.1.

INSTRUMENT AND RESISTANCE WIRES. Transformer and Choke Stampings. Insulation. Lists free.—Lumen Electric Co., Scarisbrick Avenue, Litherland, Liverpool, 21.

MAINS TRANSFORMERS REWOUND.—Prompt service, satisfaction guaranteed. Prices on request.—The Sturdy Electric Co., Wesley Terrace, Dipton, Newcastle-on-Tyne.

ANY RADIO SET, Kit, or Gramophone Part at bottom price or H.P. Catalogues free.—A. W. Burt, 185 High Street, Deptford, S.E.8.

TELEVISION APPARATUS.—We specialise in all components, Diacs, Neons, Lenses, Motors, etc. Illustrated List Free.—Sanders, 4 Grays Inn Road, London, W.C.1.

REVOLUTION IN H.T. BATTERY CONSTRUCTION.—The Nonfade Sectional H.T. Battery (prov. patent), the home-constructor's dry battery, has arrived. No scrapping for small defects. Each cell can be tested with cell tester supplied free with battery. When battery runs out, send for Nonfade Cells and rebuild at home: result, new battery at two-thirds cost. Price: 66 volts, 5/6; 108 volts, 7/6; 126 volts, 9/6; Pye portable, 11/6. Refills when required, 3/8, 6/-, 6/8, 9/6. Nonfade Chemical Earth, 1/- All post free.—Nonfade Works, Haselbury, Crewkerne.

"UNIVERSAL" RADIO BARGAINS.—Iron-cored dual coils, 3/3. Ready Radio 303 kits, 17/6; with cabinet and M.C. speaker, 35/-. Silver Ghost M.C. speakers—get our price. Sinclair M.C. speakers, 15/11. Blue Spot 100 U's, 14/11. D.X. screened coils, 2/11. S.T.500 kits, in sealed cartons, 69/6. Class-B drivers and chokes, 5/11. H.M.V. screened chokes, 10d. Dario super transformers, 3/6. Lotus transformers, 2/11. Six-pin coil formers and caps, 1/-. Record valves, 3/3. Variable condensers, 1/11. Fixed and leak, 5d. Full range Lissen components, kits, and sets at right prices. Thousands of other astounding bargains. Stamp for our huge bargain lists and prints.—"Universal," 20 Victoria Road, Peckham, S.E.15. New Cross 4933. Stockists Milnes H.T. units and spares.

5-GUINEA S.G.3 KIT with Valves; Kompact Consolette Speaker Cabinet, Batteries, etc., £4/4/0; Class-B Four Kits, £2/10/0; S.T.500 Author's Kits, £3/10/6; Etherdyne Super Kits, £6/5/0. Keenest prices quoted for Radio Requirements. Old Sets taken in part exchange for 1934 models.—Serwell Wireless Supplies, 64 Prestbury Road, London, E.7.

CHARGE YOUR BATTERIES WITH SERADIX BATTERY CHARGERS. Illustrated catalogue for stamp. Models from £2/15/0.

SERADIX RESISTORS, as specified by leading designers. Fitted wire ends. Grid leaks, 5d.; 2-watt type, 6d.; 1-watt type, 8d. Full range of lists for stamp.

CATALOGUES OF SERADIX MAINS EQUIPMENT, Television Accessories, etc., for stamp.—575 Moseley Road, Birmingham.

INFORMATION BUREAU

Will every querist please observe the following revised rules.

Please write concisely, giving essential particulars. A fee of one shilling postal order (not stamps), a stamped, addressed envelope and the coupon on the last page must accompany all queries. Not more than two questions should be sent at any time.

Slight modifications of a straightforward nature only can be made to blueprints. For more serious alterations the minimum charge is 2/6.

Blueprints supplied by us will be charged for in addition, but of course, readers may send their own blueprints for alteration.

Modifications to proprietary receivers and designs published by contemporary journals cannot be undertaken. Readers' sets and components cannot be tested by us. Queries cannot be answered by telephone or personally. Readers ordering blueprints and requiring technical information in addition should address a separate letter to the Query Department.

We do not answer queries in cases where the fee is omitted. Queries should be addressed to the Query Department, "Amateur Wireless," 58/61, Fetter Lane, London, E.C.4.

A.C. NEW CENTURY SUPER.—All specified parts, including Valves, 50 per cent. under list.—208 Parchmore Road, Thornton Heath.

OAK CABINETS, good finish, hinged lid. All sizes to clear from 7/6 C.P. Radio Catalogue, 1/-.—Gibson, 99 Burnley Road, Ainsdale, Lancs.

HUNDREDS REAL UP-TO-DATE BARGAINS.—Clear cheap. List.—Simmons, 9 Ilfracombe Avenue, Southend-on-Sea.

MEASUREMENTS MADE FOR AMATEURS.—Instruments and technical books loaned. Inquiries: BM/ZLME, W.C.1.

SUPER "DIRECTOTONE" KIT BARGAINS.—Remarkable offers to home constructors. All parts guaranteed. Every component carefully tested. Straight 2-valve kit, 14/6. Straight 3, 17/6. S.G.3, employing 2 H.F. stages, 24/6. Also the new S.T.500, 66/6. All carriage paid, cash or C.O.D. Large quantities of radio parts at revolutionary prices! 2d. stamp brings lists of these with particulars of our Special December Snp!—The Direct Trading Company, 65-66 York Terrace, Baker Street, N.W.1.

"THE WIZARD AERIAL ELIMINATOR."—Replaces outside and inside aerials; no wires; operates any set, 2/6.—Dale, 32 Hyde Park Terrace, Leeds.

FEED YOUR WIRELESS with Fullers H.T. Accumulators 120 volts, 6,500 milliamperes. Delivered free on first payment of 7/6. Lists free.—Leslie's Radio, Catford, London.

180 ACCUMULATOR CHARGERS, 1/2 amp., 2-6 volts, in ventilated metal case with mains flex (Westinghouse rectifiers) 7 days' trial, 13/11, postage 6d. 1 1/2 amp., 21/-—W. Arden Agency, Wollaston, Wellingborough.

BANKRUPT BARGAINS.—List free with 3-v. diagram. S.T.500 kit, 52/8; S.T.400, 45/-; S.T.300, 35/-; 3-v., 17/6. Screened Dual Coils, 2/6. Transformers, 2/3. Wavemeter .0005 S.M., 3/6. Diacs, and .0005 for S.T., 1/8. Class-B Chokes and Transformers, 5/6. Triotron Midget P.M. M.C., 12/6. D.C. Eliminators, 12/6; A.C., 28/6. Triotron Valves, Det., L.F., and H.F., 3/6; Power, 4/6; Class B, 9/-; S.G., 9/-; Triotron Class-B Speakers with amplifier and valve, 40/-; Small fixed Condensers and Leaks, 5d. New 1934 Lumophon A.C. Mains Sets, £8/8/-. 4-v. Class-B Lumophon Sets, complete batteries, M.C., £6. Clarion 5-v. Super-het Midget Universal, mains, £7. Part exchange. Let me know what you have and what you require. All goods above new. To clear, secondhand, Phillips A.C. Mains Set, type 2514, no valves, 17/6. Phillips A.C. Eliminator, with valve, 17/6. Ekco Trickle Charger, 16/6. Pair Ferranti Q.P.P. Transformers, 15/-. Browne Battery Superseder, 17/6. Century Super set with Lewcos Frame, with valves, £4.—Butlin, 143B Preston Road, Brighton. Preston: 4030.

N.P. BATTERY CHARGERS for A.C. Mains; trade lists free.

N.P. MAKE CHARGERS to suit requirements; send for prices; we are the lowest in the trade.

N.P. ADVISE on all matters of Battery Charging with diagrams and instructions.

N.P. have a few slightly soiled travellers' models, bargains for cash; trial 7 days; satisfaction or cash refunded.

N.P. send trade lists and photographs of battery chargers, from 62/6 to £17 10s., suitable for large stations.—Nash Products, Ltd. (Dept. A.W.), Stechford, Birmingham 9.

NEW AND USED RADIO COMPONENTS.—Cheap for cash.—Arlin, 44 Ranelagh Road, Westminster, S.W.1.

Special Valve for Portable Sets

AS the main problem in a portable receiver is high-tension economy, the General Electric and Marconi Companies have developed a battery-operated screen-grid valve to give maximum amplification with an absolutely minimum anode current. The new Marconi-Osram S23 screen-grid valve has an anode current of nearly half that of some of the earlier screen-grid valves, with a correspondingly low screen current. The impedance has been raised so as to give a high degree of selectivity, while the amplification factor has been increased to give maximum volume without causing instability.

Readers will be pleased to know that yet another manufacturer has realised the difficulty of matching a loud-speaker to output valve. Reproducers & Amplifiers, Ltd., have marketed a loud-speaker with a universal output transformer. Thus, if your set has triode, pentode, class-B, Q.P.P. or push-pull output this loud-speaker is suitable. It is named the Muxet and is obtainable in chassis form at £1 10s., and in walnut-finished cabinet at £2 5s.

2/9 VALVES 4/-

Each BRITISH MADE—POST FREE Each 2/9 Def. The range of B.H. two-valve valves 2/20 S.G. and 2/10 L.F. remains unchanged in value the 230 Super 2/10 H.F. Ted in your set—we will supply the correct Va. Power at 3/6 2/20 P. MONEY RETURNED IF NOT SATISFIED. Send to-day to: THE B.H. VALVE CO., 8 Station Road, London, N.4. Trade Enquiries Invited.

FULL-SIZE BLUEPRINTS

When ordering, please send Postal Order, NOT STAMPS. Quote the blueprint number shown below; not the number of this issue.

CRYSTAL SET (6d.)

1931 Crystal Set .. .. . AW308

ONE-VALVE SETS (1s. each)

B.B.C. One-valver .. .. . AW387  
Portable Short-wave One .. .. . AW354

TWO-VALVE SETS (1s. each)

Clarion-voice 2 (SG Det, Pen) .. .. . AW371  
Home Station A.C. 2 (D, Pen) .. .. . AW374  
B.B.C. National Two (D, Trans) .. .. . AW377  
Melody Ranger Two (D, Trans) .. .. . AW388  
Full-volume 2 (SG Det, Pen) .. .. . AW392  
"A.W." Iron-core Two (D, Trans) .. .. . AW395  
"A.W." Iron-core Two with Q.P.P. .. .. . AW396  
Consolectric Two (D, Pen) .. .. . AW403  
Screen-grid Two (SG Det, Trans) .. .. . WM289  
A Two for 7 Metres (D, Trans) .. .. . WM1295  
New-style Radiogram (D, Trans) .. .. . WM1299  
A.C. Quality Gem (D, Trans) .. .. . WM1312

THREE-VALVE SETS (1s. each)

James Push-push Three (SG, D, Q.P.P.) (1/6) AW373  
Everybody's Home Radiogram (SG, D, Trans) AW381  
Home-lover's New All-electric 3 for A.C. mains (SG, D, Trans) .. .. . AW383  
Our Up-to-the-minute Three (SG, Westector, L.F. Trans) .. .. . AW384  
Class-B Three (D, Trans, Class B) .. .. . AW386  
S.S.3 (A.C.) (SG, SG Det, Pen) .. .. . AW390  
"Up-to-the-minute Three" with Class B, 1/6. AW384B  
New Britain's Favourite Three (D, L.F., Class B) AW394  
A.C. Triodyne (SG, D, Pen) .. .. . AW399  
Home-built Coil Three (SG, D, Trans) .. .. . AW404  
Fan and Family Three (D, 2LF) .. .. . AW410  
£5. 5s. S.G.3 (SG, D, Trans) .. .. . AW412  
1933 Economy S.G. Three (SG, D, Trans) .. .. . WM306  
Harris Ethergram (SG, D, Pen) .. .. . WM308  
A.C. Calibrator (SG, D, Pen) .. .. . WM309  
Narrow-pass Three (SG, SG Det, Pen) .. .. . WM311  
£6 6s. Radiogram (D, RC, Trans) .. .. . WM318  
Simple-tune Three (SG, SG Det, Pen) .. .. . WM327  
Tyers Iron-core Three (SG, SG Det, Pen) .. .. . WM330  
I.C.B. Three (D, L.F., Class B) .. .. . WM333  
Economy Pentode Three (S.G., D, Pen) .. .. . WM337  
Three-range Three (SG, D, Pen) .. .. . WM336  
Simplicity A.C. Radiogram (SG, D, Pen) .. .. . WM338  
Duo-tune Three (SG, D, Pen) .. .. . WM341

FOUR-VALVE SETS (1s. 6d. each)

Melody Ranger (SG, D, RC, Trans) with copy of "A.W." 4d. postage .. .. . AW375  
"A.C. Melody Ranger" (SG, D, RC, Trans) .. .. . AW380  
Signpost Four (SG, D, L.F., Class B) .. .. . AW398  
"A.W." Ideal Four (2SG, D, Pen) .. .. . AW402  
Table Quad (SG, D, RC, Trans) .. .. . WM303  
"Words and Music" Radiogram (2SG, D, Trans) WM307  
Home Short-wave (SG, D, RC, Trans) .. .. . WM311  
"Words and Music" Radiogram de Luxe (SG, D, RC, Q.P.P.) .. .. . WM307s  
Empire Short-wave (SG, D, RC, Trans) .. .. . WM313  
Merrymaker Super (A.C. Super-het) .. .. . WM345

FIVE-VALVE SETS (1s. 6d. each)

James Short-wave Super (Super-het) .. .. . AW328  
Simple Super (Super-het) .. .. . AW340  
The Etherdyne (Super-het) .. .. . AW406  
Class-B Quadradyle (2SG, D, Class-B) .. .. . WM344

SIX-VALVE SETS (1s. 6d. each)

New Century Super (Super-het) with copy of "A.W." 4d., post-free .. .. . AW363  
New A.C. Century Super (A.C. Super-het) .. .. . AW365  
James Super-straight Six (2SG, D, L.F., Push-pull) .. .. . WM339

SEVEN-VALVE SETS (1s. 6d. each)

Super Senior (Super-het) .. .. . WM256  
Seventy-seven Super (A.C. Super-het) .. .. . WM305  
Q.P.P. Super 60 (Super-het) .. .. . WM319

PORTABLES (1s. 6d. each)

General-purpose Portable (SG, D, RC, Trans) AW351  
Midget Class-B Portable (SG, D, L.F., Class B) AW389  
Holiday Portable (SG, D, L.F., Class B) .. .. . AW393

AMPLIFIERS (1s. each)

Universal Push-pull Amplifier .. .. . AW300  
"A.W." Record Player (L.F., Push-pull) .. .. . AW319  
Battery-operated Amplifier .. .. . AW362  
A.W.'s Push-push Amplifier .. .. . AW376  
Class-B Gramophone Amplifier .. .. . AW391  
Universal A.C. Amplifier (3-valve) .. .. . AW411  
Five Q.P.P. Output Circuits .. .. . WM315

MISCELLANEOUS (1s. each)

"A.W." Trickle Charger .. .. . AW352  
Add-on Band-pass Unit .. .. . AW359  
Short-wave Adaptor for New Century Super .. .. . AW367  
Plug-in Short-wave Adaptor .. .. . AW382  
Three Class-B Units .. .. . AW400  
"A.W." Television Receiver, .. .. . AW401

Copies of the "Wireless Magazine" and of "Amateur Wireless" containing descriptions of most of these sets can be obtained at 1s. 3d. and 4d. respectively, post free. Index letters "A.W." refer to "Amateur Wireless" sets and "W.M." to "Wireless Magazine." Address letters:

Amateur Wireless Blueprints Dept., 58-61 Fetter Lane, London, E.C.4



INFORMATION BUREAU COUPON

Available until Saturday, DECEMBER 16, 1933

Printed for the Proprietors and Publishers, BERNARD JONES PUBLICATIONS, LTD., 58-61 Fetter Lane, London, E.C.4, by The Sun Engraving Co., Ltd., London and Watford. Sole Agents for South Africa: CENTRAL NEWS AGENCY, LIMITED (London Agents for Central News Agency, Ltd., GORDON & GOTCH, LIMITED. Sole Agents for Australasia: GORDON & GOTCH, LIMITED. Saturday, Dec. 9, 1933)

# FREE with the CHRISTMAS issue of WIRELESS MAGAZINE

**T**HE free supplement book, "Choosing Your New Radio," contains 48 pages in which are listed, in order of price, from £3 to £100, just over 150 sets. You will find just the information you need about the principal sets on the market, and if you cannot find in this book something to suit you, you will indeed be hard to please!

This Christmas Number, more varied in its appeal than ever, is as useful as the experience of a skilled staff can make it.

**SOME of the CONTENTS of this SPLENDID XMAS issue**

**GENERAL ARTICLES**

- GUIDE TO THE WORLD'S BROADCASTERS  
By Jay Coote
- WAVELENGTHS OF THE WORLD'S BROADCASTERS  
ON THE CREST OF THE WAVES  
By Jay Coote.
- CHRISTMAS RADIO GHOSTS
- CHRISTMAS BELLS. By Bob Major
- YULETIDE MEDLEY
- CONTRABAND. By Kenneth Ulyett
- WHAT BROADCASTING CAN LEARN FROM THE FILM STUDIOS. By Anthony West
- THE "LOW-DOWN" ON THE B.B.C. I  
By Fred Smith
- STUFF AND NONSENSE. By "Fishglue"
- RADIO AND THE POLICE  
By L. A. Chapman
- RADIO MEDLEY. By BM/PRESS
- BROADCAST MUSIC OF THE MONTH
- THE SHORT-WAVE SEASON IN FULL SWING
- DEPTH-SOUNDING BY RADIO
- ARE AMERICAN IDEAS BETTER—OR OURS?  
RADIO AT CAPE TOWN

**FOR THE CONSTRUCTOR**

- 'THE MERRYMAKER'S SUPER
- 'THE CLASS-B QUADRADYNE
- "ON THE AIR" WITH THE QUADRADYNE

**TECHNICAL FEATURES**

- USING TONE AND VOLUME CONTROLS  
By Percy W. Hartis, M.Inst.Rad.E.
- MECHANICAL CIRCUIT DIAGRAMS  
By P. Wilson, M.A.
- ALL ABOUT THE SCREENED PENTODE  
By J. H. Reyner, B.Sc., A.M.I.E.E.
- MEASURING NOISE
- MORE ABOUT REAL QUALITY  
By Noel Bonavia-Hunt, M.A.
- LINING UP THE GANG  
By Marcus G. Scroggie
- WIRED WIRELESS. By L. S. Kaysie
- A CATHODE RAY TELEVISION RECEIVER  
By J. H. Reyner, B.Sc. A.M.I.E.E.
- TELEVISION RECEPTION WITH THE MIRROR-DRUM RECEIVER  
By H. Corbishley
- ADDING AUTOMATIC VOLUME CONTROL TO THE SEVENTY-SEVEN SUPER
- MORE ABOUT THE SUPER STRAIGHT SIX  
By W. James
- Etc., Etc.

**ON SALE TO-DAY GET YOUR COPY WITHOUT DELAY**



**This ENLARGED CHRISTMAS issue OF 130 PAGES is now on Sale at all Newsagents and Bookstalls USUAL PRICE 1/-**

The  
 Christmas Box  
 FOR A  
**MERRY CHRISTMAS**



You can be certain of a Merry Christmas if your Wireless is alright. But is it?

Better make sure. Give your Set a Cossor Valve or—better still—replace all the valves with Cossor. You'll be surprised at the improvement they'll make—tone, volume, range—all will be better—ready to give you full measure of the feast of good programmes that will be "on the air."

Your Dealer will gladly tell you the correct types for your Set.

**COSSOR**  
**VALVES**

**FREE!**  
**72 PAGE WIRELESS BOOK**

From cover to cover this new Cossor 72-page Wireless Book is packed full of useful and interesting information—lat st circuits—explanations of technical terms—list of broadcasting stations, etc. Send at once for free copy. Please use the coupon.

To A. C. COSSOR LTD.,  
 Melody Dept.,  
 Highbury Grove, London, N.5.

Please send me, free of charge,  
 a copy of the new 72-page  
 Cossor Wireless Book B.V.33.

**B.V.33**

Name .....

Address .....

A. No. 9/12/33

4125