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# Amateur Wireless

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Every  
Wednesday

and  
Radiovision

**PENTODE & CLASS B  
FOR THE A.V.C. 4**

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STARS WANT!**

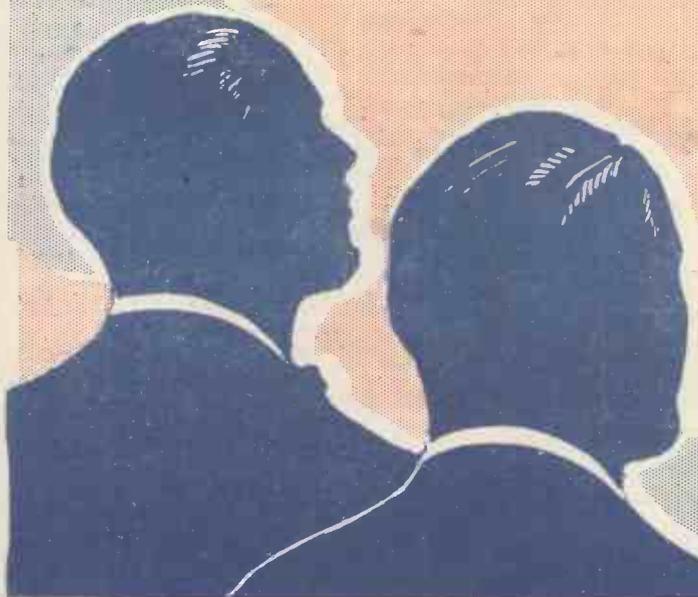
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SET YET**

**THREE SHORT-  
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**BROADCAST  
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and

**RADIO MAP**



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- 2—0.20 volts.
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- 4—0.400 volts.
- 5—0.10 milliamperes.
- 6—0.50 milliamperes.
- 7—0.250 milliamperes.
- 8—Resist/valve test.
- 9—Plug-in test for valves.

### ROTAMETER

- 1—0.8 volts. For low-tension voltage test.
- 2—0.30 volts. For grid-bias voltage test.
- 3—0.250 volts. For high-tension test.
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- 5—0.20 M.A. For individual valve test.
- 6—0.100 M.A. For testing current taken by total valves in set.
- 7—0.250 M.A. For testing current taken by total valves in set.
- 8—FILAMENT AND RESISTANCE TEST (4,000 ohms). For D.C. and rectified A.C.
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# "HIS MASTER'S VOICE"

THE GRAMOPHONE COMPANY, LTD., 98-108 CLERKENWELL ROAD, LONDON, E.C.1

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

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## News and Gossip of the Week

### Another Show Number

ONLY three more days to go! Have you been to the "Show of Shows" yet?

Radiolympia closes its doors on Saturday, August 25, but the doors of the 1935 radio season are only just opening.

Now's the time to tune-in to all the latest ideas in radio. AMATEUR WIRELESS will keep you informed of everything that will help towards better home radio.

### Crusaders Marching On!

SPONTANEOUS support comes from all sides for our Constructor Crusade. Amateurs everywhere recognise that this movement is the most significant development for years.

Readers are enrolling in their hundreds. Everyone appreciates that this great co-operative effort will do much to revive a really healthy interest in home construction.

### Greta and Ever Greater

PROBABLY you will hear Greta Keller on August 30. She is to broadcast again on September 4 and again on the 15.

The B.B.C. tried to get her for June 1 and also for July 4, but something upset her arrangements — and she just didn't.

### Over Fifty Times

SHE has built up her great reputation entirely by broadcasting. Now known all over the Continent. She must have broadcast here more than fifty times.

### Adroit Droitwich

THINGS are getting on at the super-station. The tackle is well under weigh and they hope to have her going in October—when the new long-wave National takes over full service from Daventry.

### Midland Regional

WE remind you this means the Midland Regional will continue at the Daventry site with Empire transmissions until the end of the year.

### Opening Date

OCTOBER 7 is the date set down officially

for the completion of the National Programme Service to Droitwich. There is, however, a more or less unofficial date for its opening.

### Press Visit

THIS is September 6, on the occasion when there is to be a Press visit to the station. Late dance music will be radiated that night and Daventry will close down.

It will sound much more powerful in your loud-speaker, of course. Droitwich is nearly five times the power of Daventry.

### Les for Home

LES ALLEN takes his summer holiday in September. He intends to visit his parents in Toronto. It is expected that during his stay there he will be invited by the Canadian Broadcasting Commission to undertake a few engagements in the Dominion.

Not to be wondered at, considering his immense popularity here.

### We Are Suspicious

THERE is a growing suspicion, not without good foundation, that Les may receive a tempting

offer to remain in the land of his birth.

If so, England's loss will be Canada's gain. On the other hand, he will be well advised to think twice about surrendering the hold he has gained in the affections of his vast audience in this country.

Whatever he eventually decides to do, he can never forget the fact he is an outstanding example of an artist's reputation being entirely made by the B.B.C.

### Which Eight?

ROSALIND WADE and her Radiolympia Girls have already demonstrated their artistry at the Exhibition. Eric Maschwitz has great plans for utilising eight of their number in connection with variety performances in the studio during the coming winter.

Miss Wade, for her part, has equally definite ideas of what is and what is not suitable for broadcast dancing.

Those of you who have seen the R.O.G.'s will agree that a combination such as these dancers would find television a good medium for expression.

### Name the Children!

IN the meantime there is a tendency to get away from the old style of title of the Eight Step Sisters. The question is: what shall the new ones be called?

They might be called the ROGS—Radiolympia Girls.

### Radioctavias?

OR, to give them a classic style, keeping in view there are to be eight of them, why not call them the Radioctavias? Anyhow, they will come without calling, probably.

### "In Town To-night"

THE Variety Director had practically decided not to continue this series. He considered it a good idea, but that we had had enough of it.

Heavy correspondence, however, has swung him round the other way. Apparently these broadcasts have been very popular.

### Different Make-up

THEY will be continued on October 6, the night the Proms end. They may be a little different in make-up.

All grades of society will be invited and many novelties will be introduced.

### Book Talks

DO you read much? If so, you will have probably followed the book reviews of the past season. The new series begins in the autumn.

Mr. A. J. Cronin, the well-known writer, will alternate with Mr. G. K. Chesterton.

An arduous task, reviewing books. Many publishing firms bring out a book every day in the year.

Fortunately, not all are reviewed by wireless.

### Oh, Christopher!

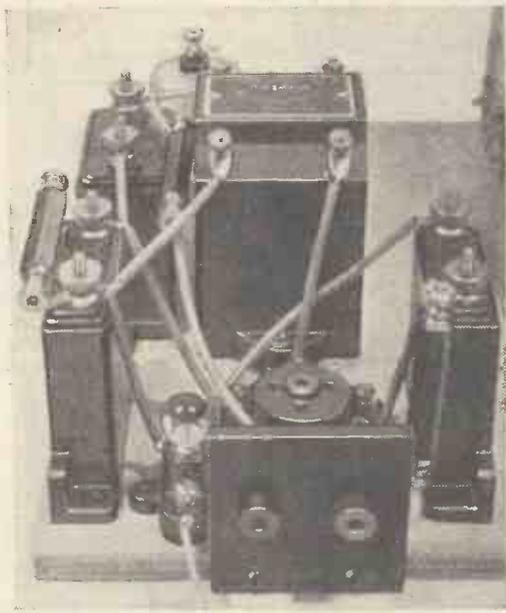
SCREAMS of delight must have gone up in many homes the other evening when ever-popular Christopher Stone announced a record as: "From Smetana's 'Battered Bride'—sorry, I should say 'Bartered Bride'!"



Fiedelholz: photo

Short waves versus gangsters! Washington motor-cycle police are now equipped not only with short-wave receivers but also transmitters. They are thus always in touch with headquarters—and escaping gangsters!

# Pentode and Class-B Outputs for the



Straight pentode output for the Crusaders' A.V.C.4, the "star" set of which full details were published last week

**F**OUR valves doing the work seven used to. That sums up, in a phrase, the fundamental point about the first—but by no means the last!—Crusaders' set design.

Yet, in spite of this four-valve circuit doing the work of seven it is essentially "straight." We use that much over-worked word only because we want to make the point that the new set is not—by any stretch of the baseboard or the imagination—a super-het.

### Look Around You!

In itself that may seem somewhat incredible in this super-het age. But, in the words of one greater than us, look around you.

Having done so—at Radiolympia—you will agree that, ubiquitous though the super-het may be—it is not alone. Plenty of straight sets present themselves unashamedly for your attention.

Rightly, we suggest. Because with modern valves, the straight set—or rather the straight sequence of valves—has attributes enabling it not just to compete with the super-het but in some ways to beat it.

But it would be fatally easy, in trying to make out an adequate case for the Crusaders' A.V.C.4, to condemn the super-het. That is not our object. We are fully aware of the invaluable advantage of the super-het in gaining super selectivity. All we say is that, from many points of view, we thought it advisable to take a line of our own in presenting the first set of the Crusade.

### Snag-free Circuit

We wanted, above all, a snag-free circuit. And we have got it. Make no mistake about that. The original set worked right from the start. There was no doctoring needed to make it give good results.

Four valves doing the work of seven. The first two being high-frequency pentodes arranged in transformer-coupled cascade circuits before the detector.

Then the detector—first of

Continuing our story of the first Crusaders' set—the A.V.C.4—we explain this week the relative merits of three output systems—Q.P.P., class-B, and pentode. Useful hints in operating the completed set are also included in these notes.

the multiple-function stages in the set. A double-diode-triode; a valve with two diodes and one triode. One diode for half-wave distortionless detection of heavy inputs. Associated triode for immediate low-frequency amplification after detection. Second diode for full automatic volume control of the high-frequency amplification.

Then the output. In the original model a pentode push-pull circuit—a Q.P.P. valve consisting of two pentodes in one bulb, giving over 1,000 milliwatts power output.

Thus the circuit as first presented last week. We gave a hint of alternative outputs—now we give actual facts and figures about them.

You must know that the controversy about the best output stage is still raging. We cannot as yet say which system will triumph. Perhaps the truth is all three rival systems will have an honoured place in the amateur's scheme of things.

There is Q.P.P. output, such as we have used for a start. No doubt about its economical output. With a total anode current for the whole set of only 12 milliamperes this valve gives you an undistorted power output of well over 1,000 milliwatts, representing a volume that will amply fill even a large room.

But there you are—Q.P.P. is not everyone's choice, as yet. We can offer you two alternatives. First, there is class-B amplification. It is really much the same as Q.P.P. so far as the set goes.

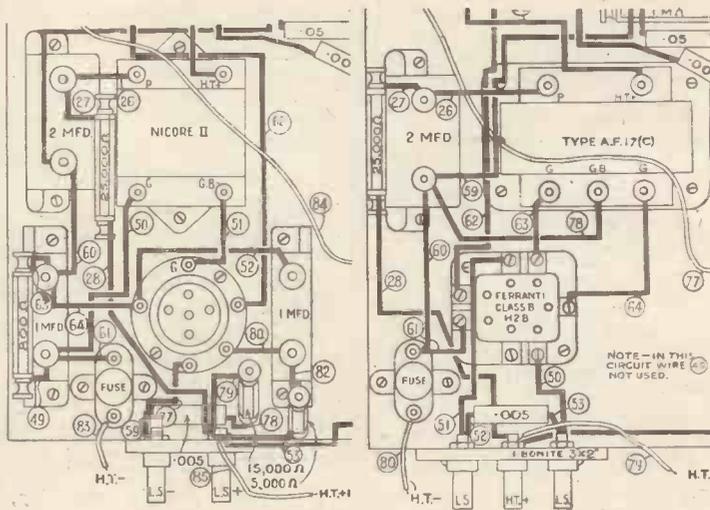
In fact, looking at the alternative blueprint layout, you will see that the only tangible difference is the change from Q.P.P. to class-B transformer. Note carefully the connections if you decide on this system.

Moreover, note right here some important

figures. We find that with the class-B system shown you can get a minimum of 1,400 milliwatts with an anode current around 4 milliamperes average higher than Q.P.P. Perhaps, though, the most important point is that the permissible maximum power output is much higher than with the Q.P.P. system.

If you really do want a lot of volume, you can bump up the undistorted output of the class-B system to as much as 2,000 milliwatts with, of course, a correspondingly higher drain on the high-tension battery.

Now a word or two on the pentode output system: This is the least likely looking system in view of the preceding variations—



Third-scale wiring diagrams showing pentode and Class-B output arrangements for the Crusaders' A.V.C.4. A full-size blueprint of both can be obtained for 6d., post paid; ask for No. AW 445a

but don't turn it down summarily without looking into its special attractions.

If, for example, quality above volume and all else is your aim, we are inclined to suggest this third system very strongly. A straight intervalve transformer is all you need—not a special affair as with class-B and Q.P.P. That in itself may commend the system of straight pentode output to those already possessing a good transformer. With this only two output terminals are provided for the loud-speaker, of course.

In place of the fixed .005-microfarad condenser for cutting the top notes, the pentode uses this condenser in series with a 1,500-ohm fixed resistance for the usual form of tone control—as shown by the appropriate layout.

What is most important to note about this system is the use of a new type pentode—the new Mullard PM22C, which has come into the limelight, we think, as the radio show has progressed.

This valve can give a maximum power output of 1,000 milliwatts. That is what we make it give—but see that automatic grid bias has been engineered into the circuit.



Putting the valves into position in the Crusaders' A.V.C.4 before trying out its station-getting properties. See the test report on page 198

# Crusaders' A.V.C.4

Very simple, this. Just an 800-ohm resistance between the high and low-tension negatives, with a condenser across it. The low-frequency secondary transformer connection usually going to the grid-bias battery now goes, of course, to high-tension negative.

Another practical point of difference is the use of a five-pin in place of a seven-pin valve holder. This again is clear from the blueprint layout.

## Good Quality and Volume

High-tension consumption with this valve is on the high side but is not too bad when you consider the very good quality, coupled with the more than adequate volume. As a matter of fact, we have arranged matters so that the valve is a trifle over-biased, this without loss of volume and with quite a good saving in anode current. The average anode current obtained during tests of this valve, with our amount of biasing, is 15 milliamperes. A treble-capacity high-tension battery is of course essential for economy of working.

Well, now, there are lots of little points you will want further information about. Supposing we make a start with the ganging of the set?

As a rule, you know, ganging a set with self-adjusting volume control is a bit of a nightmare, because you never quite know how far the signal strength is being made up by correct adjustments of the gang condenser trimmers and how much by the control action of the valve.

So in this set, we have arranged the circuit in a way that makes ganging very simple—because we just cut out the S.A.V.C. action altogether when ganging up.

You will note that the second high-frequency pentode has two anode leads—one from the coil and one from the detector. You take off one of these leads—actually the lead marked on the blueprint as No. 40. Forget it for the time being and gang up in the usual way. You will not be troubled with S.A.V.C. action, which is cut out simply by the removal of this No. 40 wire.

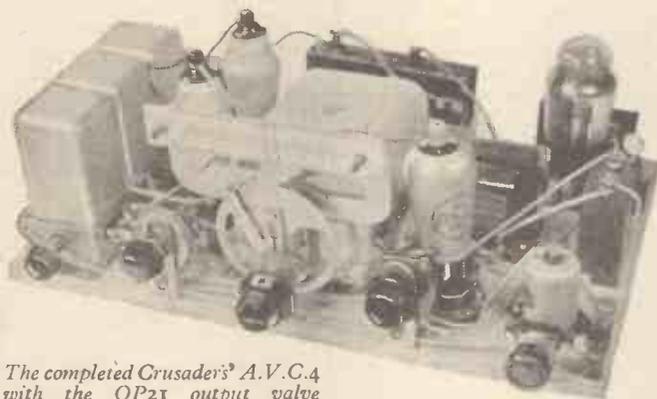
You know how to gang, presumably? Just to refresh your memory, here are a few hints. Start off with a weakish station about the middle of the medium wave-length range.

Adjust the main tuning knob until you think you are obtaining the maximum signal strength.

Then twiddle the back trimmer on the side of the condenser—the one farthest from the front of the set. Adjust this until again you seem to be getting loudest signals. Then leave that and tackle the front trimmer in the same way, again doing your best to tickle up the volume.

That leaves you with the concentric trimmer control on the front of the set to deal with. Leave that until last, and re-adjust frequently over the whole tuning range, particularly when you go quickly from one end of the scale to the other.

By the way, this trimming must be done with an ear not only on volume but with an eye on the accuracy of the wavelength calibrations. It is possible to throw out these



The completed Crusaders' A.V.C.4 with the QP21 output valve

readings by as much as 25 metres if you wrongly adjust the side trimmers and make up on the front one.

Adjust trimmers so that you get maximum signal strength and accurate scale readings with reference to a station whose wavelength is known—one of the regionals for choice. You can make up any final loss of volume



Great interest is being taken in the Crusaders' A.V.C.4, one of the most outstanding battery sets yet presented to the constructor

through this adjustment of the side trimmers by a re-adjustment of the main control trimmer.

Talking of tuning, you might like to fit up the search-light tuning suggested by the two diagrams opposite. A piece of tin is shaped as shown, so that the slit in it comes between the lamp and the wavelength scale. As the bulb moves along with the indicator, its light will shine in a searchlight through the slit—and there you have searchlight tuning, which is very much more accurate, we think, than the somewhat diffused beam of light ordinarily thrown.

## It Is So Stable!

This set is so stable that you can run up to 150 volts high-tension without any fear of spilling over. But, of course, any increase of high tension must be made with a corresponding increase in the grid bias on the output stage.

With either class-B or Q.P.P. you will have to run up to 10½–12 volts grid bias. With the straight pentode increase the bias effect until the anode current is reduced to between 15 and 20 milliamperes—admittedly over-biasing, but then batteries must live, mustn't they?

## Screened Leads

A word or so on the screened leads in this receiver. Not all of them, by any means, are earthed. Wires shown as Nos. 19, 31, 32, 33, 34 and 35 are *not* earthed on the outside at all. Don't flatten down these wires so that by any

Continued on page 224

## PARTS NEEDED FOR THE CRUSADERS' A.V.C.4

### BASEBOARD

1—Peto Scott Metaplex, 16 in. by 10 in.

### CHOKE, HIGH-FREQUENCY

1—Varley screened, type B P26 (or Telsen, Lissen).

### COILS

1—Telsen triple unit, type W477.

### CONDENSERS, FIXED

7—T.C.C. tubular type, values: .0001- (2), .005-.01- (3), .05-microfarad (or Dubilier, T.M.C.).  
3—Graham Farish 1- (2), 2-microfarad (or T.M.C. Lissen).

### CONDENSERS, VARIABLE

1—J.B. three-gang .0005-microfarad with slow-motion drive, type Linatune.  
1—Bulgin, .0003-microfarad differential.

### HOLDER, FUSE

1—Bulgin, type F5, with fuse bulb.

### HOLDERS, VALVE

\* 4—Graham Farish, 4-pin (2), 5-pin, and 7-pin (or W.B., Telsen).

### PLUGS, ETC.

5—Clix plugs and sockets: marked aerial, Earth, H.T., L.S. (2)  
6—Clix wander plugs: marked H.T.+, H.T.-1, H.T.-, G.B.+, G.B.-1, G.B.-2.  
2—Clix spade terminals, marked L.T.+, L.T.-.

### RESISTANCES, FIXED

7—Graham Farish 1½-watt, values: 10,000- (2) 25,000-ohm (2), 1-megohm (3) (or Telsen, Dubilier).

### RESISTANCE, VARIABLE

1—Ferranti 1-megohm with on-off switch.

### SUNDRIES

2—Ebonite strips, 3 in. by 2 in. and 2 in. by 2 in. Connecting wire and sleeving.  
3 yards of thin flex for battery leads.  
1—Bulgin 2.5-volt dial lamp.  
3—Peto Scott metal-mounting brackets, 2½ in. (2) and 1 in.  
6 ft. screened sleeving.  
1—Telsen pick-up terminal block.  
1—Bulgin S92 switch.

### TRANSFORMER, LOW-FREQUENCY

\* 1—Lissen Hypernik, type QPP (or Ferranti, Wearite).

## ACCESSORIES

### BATTERIES

2—Lissen 60-volt high-tension, type LN233.  
1—Lissen 9-volt grid-bias, type LN180.  
1—Exide 2-volt accumulator.

### CABINETS

1—Peto Scott table type for set  
1—Peto Scott for loud-speaker.

### LOUD-SPEAKER

1—W.B. Stentorian Senior.

### VALVES

2—Cossor 210VPT.

1—Ferranti H2D.

\* 1—Marconi QP21.

### \* PARTS FOR ALTERNATIVE OUTPUT STAGES

### PENTODE VERSION

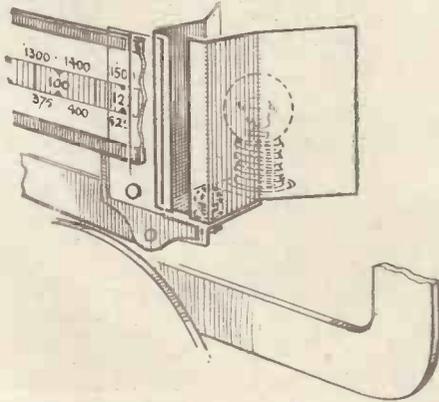
2—Graham Farish 1-microfarad condensers.  
4—Graham Farish valveholders, 4-pin (2) and 5-pin (2).  
3—Graham Farish 1½ watt resistances, 800, 5,000, and 15,000 ohms.  
1—Varley Nicore 1 low-frequency transformer,  
1—Mullard PM22C pentode.

### CLASS-B VERSION

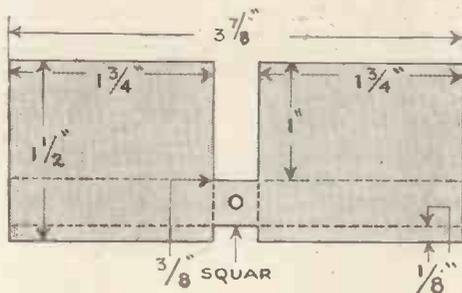
4—Graham Farish valveholders, 4-pin (2), 5-pin, and 7-pin.  
1—Ferranti class-B transformer.  
1—Ferranti HP2 valve.

(Complete kit of parts for this set can be obtained from the Peto-Scott Co., Ltd.)

# Putting the Crusaders' A.V.C.4 Through Its Paces



How the home-made reflector can be fitted to the condenser for searchlight tuning



Dimensions of the piece of tin needed to make the reflector for searchlight tuning

HOWEVER hardened one may be to radio, testing a new circuit or complete receiver usually holds a fascination which is capable of providing that "first-set" thrill all over again.

I welcomed the opportunity of laying my hands on the Crusaders' A.V.C.4. The testing of this particular set offered even more interest than usual. It gave me the chance of obtaining first-hand information on that vexed question: Straight circuit or super-heterodyne?

I must confess that before I sat down to put the new set through its paces the odds were on the super-het—but more about that anon. Well, the evening duly arrived when the latest creation of the "A.W." Technical Staff's was in front of me—all connected up and simply asking for someone to "turn up the wick."

I might mention here that the test was carried out in South-east London under very ordinary conditions. Taking a good look at the set one is immediately impressed by the modern, compact and well-finished cabinet.

As I was really more interested in the chassis and the results to be obtained, I soon had the five knobs and the escutcheon plate off and the set out in full view. The wiring and layout is certainly very neat and simple, and should present no difficulties even to a beginner—let alone a Crusader!

I noted that the high-tension leads were connected to the following values: H.T.+1 to 70 volts and H.T.+ to 120 volts. The grid-bias plugs were in 3 and 6 volts, G.B.—2 being, of course, the higher.

All connections being complete, I gave the volume control a fraction of a turn and switched on the juice. I set the vertical line on the tuning scale to 342 metres as I wished to try out the automatic volume control and the output capabilities.

Turning the volume control up to the maximum, the output was amazing and the claim for quality of reproduction was substantiated in every way. The QP21 is certainly a wonderful valve and it is very evident that its output of 1,100 milliwatts is more than ample for ordinary domestic purposes.

While on this station I decided to see how selective the set was. I tuned in Strasbourg, receiving her at the same strength and quite free from the local. This seemed very satisfactory so I dropped back to Radio Toulouse, which likewise came in with volume equal to the previous stations.

I was now getting really interested so I settled down to see what was on the air and what the A.V.C.4 would rope in. After a few moments the odds on the super-het fell with a bang as my leg continued to grow and the absence of heterodynes and background noise became most evident.

From Fécamp to Moscow the medium band was explored with such ease and satisfaction that it was hard to believe that I was not handling a set using many more than four valves. When the upper end of this band was reached a slight touch of the reaction control was needed and it was then that the beauty of the system used was appreciated.

The volume control has to be at its maximum before the reaction operates or, in other words

no reaction is employed until absolutely necessary. Rather a hot idea, I think!

It was quite a treat to be able to tune-in a powerful station after some of the distant ones without having one's eardrums shattered by a terrific increase in output. The automatic volume control is a valuable asset, especially when it works as efficiently as it does in this set. By a turn of the wave-change switch the long waveband was explored and even this comparatively uninteresting section soon

## List of Stations Received

### MEDIUM WAVES

Fécamp  
Dublin  
Milan Vigentino  
Juan-es-Plns  
Gleiwitz  
Trieste  
Frank-am-Main  
Copenhagen  
London National  
Turin  
Bordeaux  
Scottish National  
Hellsberg  
North National  
Huizen  
West Regional  
Poste Parisien  
Breslau  
Brussels  
Hamburg  
London Regional  
Strasbourg  
Berlin  
Moscow  
Milan  
Scottish Regional  
Leipzig  
Katowice

Munich

Madrid  
Rome  
Stockholm  
Paris PTT  
Sottens  
North Regional  
Langenburg  
Lyons PTT  
Prague  
Brussels (I)  
Florence  
Vienna  
Muhlacker  
Athlone  
Budapest  
Vijipuri  
Moscow

### LONG WAVES

Oslo  
Moscow  
Kalundborg  
Luxembourg  
Motala  
Warsaw  
Eiffel Tower  
Daventry  
Paris (National)  
Kootwijk

revealed that there was quite a variety of stations to choose from.

Here again, the selectivity was thoroughly tested out and passed all trials with every satisfaction. On the lower end I picked up Croydon putting out the usual instructions, while at the top of the scale I got that big Dutch station Kootwijk on 1,875 metres. Ten stations were actually received on the long waveband, all being at ample volume.

These, together with the forty-seven received on the medium band, form a pretty good bag for one who was just trotting along the dial.

Speaking of the dial, I must mention that the full-vision tuning scale with its illuminating light behind eliminates all eyestrain and fiddling about, as one is able to see at a glance the wavelength of the station tuned-in. Taking the results obtained and bearing in mind that no effort was made to break records, I can say that the first design for the Crusaders is going to set a very high standard.

From all points of view—quality, selectivity, sensitivity and ease of control—this Crusader set is bound to appeal to a wide circle of amateurs.

I can honestly say, without any axe to grind, that this is one of the best straight fours I have ever tested. Compared with what a four-valver of even a year ago would do, the results are quite staggering. Those high-frequency pentodes are wonderful! L. O. S.



Connecting up one of the high-capacity Lissen high-tension batteries to the Crusaders' A.V.C.4, a set that gives its best results only with the right type of power supply

# Sets the Stars Want!



Versatile Eve Becke, who is equally well known on radio and gramophone records

Eve Becke

## THE ONE I'VE GOT

MY favourite set is the one I've got now—a Twin Super-het, which means you can get any station you want. I listen-in to foreign stations an enormous amount, and with my set you can find any station direct.

You can have a high tone tune-in, or a low tone, if you prefer it that way, as I do.

As to appearance, my favourite set is absolutely modern, made of square unpolished walnut rather than the colour of pitch-pine. Instead of the usual round grill, there is a cut-out square of cane in front of the two loud-speakers. Above this there are just four tuning knobs, and a small dial.

It looks, in fact, like a very well-made cabinet—not at all like a wireless set. As my flat is ultra-modern, it is exactly the set I want.



Jeanne ("Mrs. Feather") de Casalis, one of the most amusing of our radio comedienne now on the air

Mrs. Feather

## MY FAVOURITE SET: I DON'T WANT TO SEE IT

WHAT do I think a radio set ought to look like? Well, what I like is a set you can't see at all—I mean the sort that is let into the wall with a panel of silk or gauze for the loud-speaker. Most wireless sets are not beautiful, are they?

We all have our pet ideas as to the ideal wireless set, haven't we? Here some of the best-known radio stars give their views in characteristic fashion. Eve Becke is satisfied, "Mrs. Feather" doesn't want to see it, Eileen Joyce says it must match her piano, Leonard Henry's is long overdue, and Mabel Constanduros wants it very portable!

Actually, I own a portable, because when I am in the country I have no electricity. But, of course, the ideal set is not a portable, because they are so variable. Conditions are always changing, and you can't always get the same results.

The best set I ever had—and I have it still—is a very cheap one that I once very nearly gave away to the gardener. It has a very good tone—very faint, you understand, but very clear and distinct, like listening to something behind a half-closed door.

That's the sort of set I like—no blowing you out of the room with noise.



Collins photo  
Eileen Joyce, whose wonderful piano work is much appreciated by all music-loving broadcast listeners

Eileen Joyce

## IT MUST MATCH MY PIANO

THE most important thing about the ideal radio set for me is—that it must match my piano. (Do they make sets in ebony, I wonder?)

The cabinet work would have to be very handsome—and ultra-modern, too. Another important thing is clock-face tuning. I like a good, plain, homely face . . . and large figures, easily read.

Other things I should want are ease of control, no overlapping stations, and a set where "fading" is unknown.

Those miniature portables that you see now—about five inches long—I think they are lovely.

But, whatever my ideal set is like, it must match my piano.



Fox photo  
Mabel Constanduros "at home" in her Sussex retreat, near Arundel. Her son Michael looks on!



Fox photo  
Leonard Henry, a leading Junny man over the air, does a bit of gardening—raking up new broadcasts?

Leonard Henry

## MY FAVOURITE WIRELESS SET IS LONG OVERDUE

IT will be a super-super-het, of course, and so sensitive that you daren't even tell it the one you told the vicar. It will never fail to come to you when called—just a murmured "Hetty, Hetty," and in it will dash, "Hetty, Hetty," and in it will dash, waving its short earth, and crouch at your feet, with a deep, far-away look in its valves.

Should it suffer from any internal troubles, there will be no difficulty in diagnosis. Just as you reach for the screwdriver, it will fling false modesty to the winds and say, plaintively: "Excuse me, it's my pentode."

Again, should it be battery operated, it will never let you down. When the current drops to a certain level the set will quietly remark: "Oy—Juice!"

Strangely enough, I still prefer the ordinary clock on the dashboard, as it were. I once experimented with a cuckoo of that ilk, but it was hardly a success. The B.B.C. chose to broadcast the nightingale, and my bird blew up in sheer mortification.

Oh, but I haven't told you the half of it—

[Oh, yes you have.—Ed.]

Mabel Constanduros

## A TRUE-TO-LIFE PORTABLE

WHAT I want is a portable that really is one; something that I can lift. That's all I want. I've got a "portable" now that goes down to Sussex with me at week-ends, and it's all I can do, with the help of my chauffeur, to hike it in and out of the car.

What else? It would have to be very selective—that is, for the benefit of my son, who insists on listening-in to the foreign programmes. And soft-toned definitely, because in a flat no music is allowed after eleven, and we like getting the late dance music.

A leather-covered set would be a splendid idea, as its corners wouldn't get knocked about in the car. But it doesn't really matter what it looks like. The only thing that matters is—it must be carriable.

# On Your Wave-length

## "A.W." and Radiolympia

IT is interesting to note how many of the "novel" features of the wireless sets at Olympia were suggested originally in the columns of "A.W."

Take variable selectivity, which is an excellent adjunct to several up-to-date receivers. Unless my memory deceives me, "The Experimenters" devoted considerable attention to this many moons since and a simple design embodying it duly appeared.

"A.W." can justly claim to have led the way in popularising the super-het, for it published the first really efficient home-constructor designs, and there must be hundreds of Century Supers and Super Sixties still giving good service.

Tuning by milliammeter was described in "A.W." ages before visual indicators came along.

These are just three matters in which "A.W." has led the way. You will find heaps of others as you walk round the stands. Good old "A.W."!

## Home-constructors' Year?

ONE thing that cannot fail to impress you as you wander round Radiolympia is the magnificent opportunities offered this year to the home constructor. Components are good; they are cheap; they lend themselves to neat, efficient designs and easy set-building.

Will there be a revival of home construction? There are many reasons why it seems likely, and not the least of these is the offer by makers of "stripped" components, which are very much cheaper than the same things stuck into elaborate cases with rows of terminals.

Last year you couldn't buy them, and the result was that it cost almost as much to build a set as to buy it ready made. Now that a real saving can be effected, take my tip and think about building your own.

## Sets for All Pockets

WHAT is the cheapest set on offer at Olympia I don't quite know, though there are several at prices which seem almost incredible to the old hand, who remembers the time when a crystal set cost a fiver and a single-valver the best part of £20.

Anyhow, there are plenty of small straight sets this year at £3 or £4 apiece, and there is a perfect spate of mains and super-hets ranging from £10 to £12.

Myself, I'd prefer—in the unlikely event of my ever purchasing a ready-made set—to scratch up an extra pound or two and to go in

## By THERMION

for something in the £15 to £20 class, for the extra refinements are jolly well worth while.

If you are a millionaire, there are monster radiograms, whose prices run up to £150, waiting for you.

Whatever your tastes and the length of your purse, you will find something to suit at Radiolympia.

## Real Service Guarantee

PHILCO'S secret is out at last. They are offering those who purchase their sets the most comprehensive and the most water-tight of guarantees yet drawn up.

Here's what it comes to. They guarantee their valves for three months and their sets for twelve. Any component which goes wrong within the guaranteed period will be replaced free and the labour charge, no matter how much work may be involved, will be just five bob.

In other words, you know where you are. There won't be any of the nonsense about which I have had quite a bit to say in the past of replacing a transformer or a condenser "free" and charging anything from fifteen to thirty shillings for labour. Even if the whole set has to be pulled to bits, five shillings is all that you will have to plank down for the job.

That's the right spirit, and I very much hope that other manufacturers will give us service guarantees that are equally unambiguous. They can afford to do so if their sets are as reliable as they should be.

## Bees in His—er—Loud-speaker

LIKE the White Knight in "Alice," who carried a mousetrap attached to his saddle, in case there should be any mice, it is as well to provide for anything in these days. Therefore, if a swarm of bees does happen to make its way into your loud-speaker—I am not, of course, saying that it will; still, it might—bear in mind the experience of an Australian wireless fan, Mr. George McNaught, of Liverpool, New South Wales.

All was peace and quietness in his home till through the open window there entered a swarm of bees. As one bee, they made their way through the frets of the loud-speaker baffle, and in a matter of moments the whole thing was one solid mass of little creatures.

Mr. McNaught tried all kinds of things, from Fluxite to Flit; but, unlike him, the bees remained unmoved.

Then, inspiration! He switched on the set, tuning in the local station as loudly as possible.

With a close approach to the speed of light, the swarm departed through the window and all was well.

Believe me, or believe me not, there is nothing like a topical talk on the mother-love of the earthworm for ridding the loud-speaker of any unwanted inhabitants, such as bees, mice, or bats.

## B.B.C. Radiolympics

WHEN you go to Olympia you will, of course, visit the B.B.C.'s theatre to see in the flesh many of the stars that have so often entertained you by way of your loud-speaker. And a jolly good show you will find it; at any rate, I did.

You will also have the opportunity of seeing as well as hearing, some of the crooners at work. And this you will not find so jolly; at any rate, I didn't.

To me, I must confess, the popularity of crooning has long been one of the world's great mysteries.

Who likes crooners? Being of an inquiring turn of mind and ever in search of knowledge, I put the question "Do you like crooners?" to scores and scores of people of all tastes and in every walk of life. So far, I cannot remember ever having come across one who did.

Yet the Johnnies who run dance bands say that there is a demand for it, and you simply can't buy a croonless jazz record.

Who, then, are these lovers of crooning? Why does one never come across them? Is theirs a secret vice, like drug-taking or drinking one's bath water?

Will the pro-crooners come out into the open in the correspondence columns of "A.W."? Will you write and tell me whether you like crooning or hate it like poison? And if you do like it, will you let me know if even you could stick the woman crooner that we had not long ago?

## Back to the Old Clock

AT twenty-four hours on Saturday night (or, possibly, it should be 00 hours on Sunday morning) the B.B.C.'s 24-hour clock folded its hands and departed from the programme announcements.

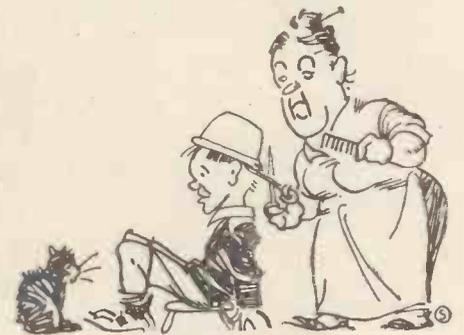
This will be good news to the many readers who had to do sums on their fingers when an announcer talked about 19 hours 50, and were still more perplexed when, as was occasionally the case, he really meant 17 hours 50.

Myself, I don't share in the indignation against twenty-four-hour time. It's a jolly

Continued on page 203

## RADIO TERMS ILLUSTRATED . . . . .

## By OUR CRAZY ARTIST





KINGS OF THE AIR

# WIDEN YOUR CHOICE OF PROGRAMMES

No matter what type of Receiver you use—Battery or All-Electric (A.C. or D.C.)—there is a Cossor Screened Grid Valve to suit it. By fitting one of these highly efficient valves you can considerably widen your choice of programmes.

Because Cossor S.G. Valves have negligible inter-electrode capacity they permit exceptionally high effective amplification, and this means increased range. To fit a Cossor Screened Grid Valve, therefore, is a simple way of improving performance.

## COSSOR SCREENED GRID VALVES



SEE THE COMPLETE RANGE OF COSSOR PRODUCTS ON STAND 73 RADIOLYMPIA

### Cossor 2-volt Screened Grid Valves

Type	Fila-ment Amps.	Anode Volts	Imped.	Amp. Factor	Mutual Conduc-tance m.a./v.	Price
*215 S.G.	-15	120-150	300,000	330	1-10	12/6
*220 S.G.	-2	120-150	200,000	320	1-60	12/6
*220 V.S.G.	-2	120-150	110,000	—	1-60	12/6
*220 V.S.	-2	120-150	400,000	—	1-60	12/6

### Cossor A.C. Mains Screened Grid Valves

Type	Purpose	Imped.	Amp. Factor	Mutual Conduc-tance in.a./v.	Price
**MSG-HA	Super H.F. Amp'n.	500,000	1,000	2.0	17/6
*†MSG	Super H.F. Amp'n.	400,000	1,000	2.5	17/6
**MSG-LA	Super H.F. Amp'n.	200,000	750	3.75	17/6
*†MVSG	Variable-Mu S.G.	200,000	—	2.5	17/6

The above Valves have Indirectly Heated Cathode, 4 Volts, 1 Amp

### Cossor D.C. Mains Screened Grid Valve

*†DVSG	Variable-Mu S.G.	—	—	2.5	17/6
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The above Valves have Indirectly Heated Cathode, 16 Volts, 0.25 Amp.

\*These Valves available with or without Metallised Bulbs.

† Characteristics measured at -1.5 grid volts

\*\* Stocked with Metallised Bulb only

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**On Your Wavelength**  
Continued from page 200

good thing in its proper place, and that place is railway time-tables. Had it been adopted there first of all, the transition to the broadcast programmes would have been simple and natural.

**Another Wireless Exhibition**

CONGRATERS to the Brixton *Bon Marché* on its enterprise in running a little wireless exhibition of its own in a railway coach at various South London stations! This kind of thing will be very much appreciated by the man and the woman who cannot manage to come to Radiolympia, but still want to see what manufacturers have to offer this year in return for their money.

The *Bon Marché* people are showing all kinds of sets from big radiograms down to tiny portables. I would like to see the idea of travelling wireless exhibitions on a small scale very much extended.

Radio trains and radio coaches at stations are fine; but there are heaps of country places where there is no room for either—even if there is a station at all.

Why don't some of our more enterprising firms rig up exhibition motor-vans and send them out for tours round the country? If they worked in conjunction with local wireless dealers, I am sure they would find that it paid them hands down.



Keystone photo

*Burns and Allen arrive—in a typically funny way. The famous American pair at Victoria Station recently. Did you hear them later when they broadcast from London?*



H.M.V. photo

**BETTER BALANCED RECORDS**

Better balance and hitherto unobtainable effects have resulted from an experiment carried out by Ray Noble during a recording recently at the H.M.V. studios. The well-known dance composer-conductor was situated in a sound-proof box, from which point he was able to hear through a loud-speaker the playing of the orchestra, which was, of course, taking its cue from him through the glass partition. In this way Ray Noble was able to hear the effect of the orchestra as it would be heard through the record—a very good idea.

facturer would design and advertise a set capable of really fine reproduction at small volume he would do pretty good business.

Anyhow, I am jolly thankful that I don't live next door, or even within a hundred yards, of a fellow who owns a set with a 20-watt output. That kind of apparatus must be more than a little trying to one's neighbours.

I am quite sure that if this craze for big power output were stopped, there would be far less of this loud-speaker nuisance we hear so much about.

**Unmasked Reception**

WHAT exactly does unmasked reception mean? You may have noticed, when you are listening on a landline telephone and your correspondent speaks rather loudly, that his voice becomes all woompy. This is because as the volume goes up you lose the high frequencies.

Similarly, you know how frightfully hard it is sometimes to put proper names over the telephone line—loss of high frequencies again.

These things are due to what is known as masked hearing, and you can observe similar results from your wireless loud-speaker. Put up the volume and you get a lot of bass, but often music loses its brilliance; lower the volume and the bass largely disappears. Masked hearing again.

The new Multitone invention—which seems to me one of the most important to come along for some time—definitely claims to take the half-swallowed potato out of the announcer's mouth and enable you to hear music as you have never before heard it reproduced.

**Micro-wave Telephony**

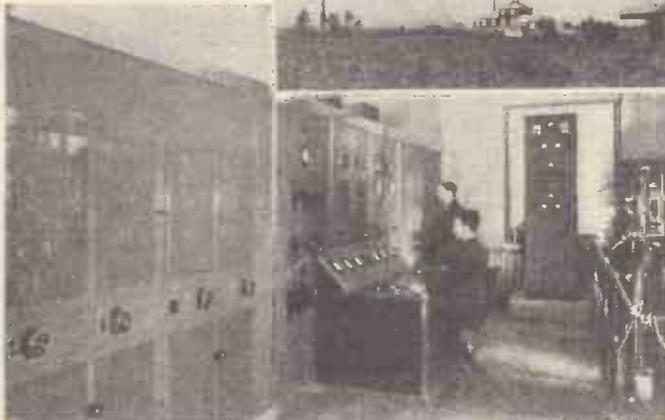
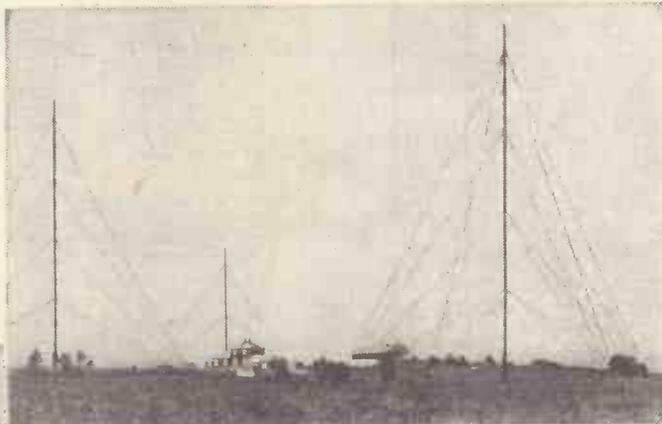
THE use of micro-waves for short-range telephony is rapidly spreading, particularly where it saves the laying of an expensive cable.

The latest proposal is to set up a radiophone link of this kind between the Channel Islands and the mainland. One station is to be erected on the Dorset Downs at a height of 250 ft. above sea level, whilst the corresponding station will be located on the island of Guernsey.

It is expected that the new service will be in full operation before next Christmas.

**NEW 20-KW. STATION FOR NORWAY**

Another increase in power is registered by the starting up of the new Trondelag station, Norway. This is a 20-kilowatt Marconi plant of the very latest type, employing the system known as series



Marconi photos

modulation, which provides excellent quality of transmission. According to reports, the new Norwegian has already started test transmissions. Have you heard them yet? It will be a good test for that new set you have just installed!

**High-power Loud-speakers**

THIS year, again, I notice that many manufacturers of receiving sets and radiograms are making a fetish of the gigantic output of which the said apparatus is capable. This ranges from 2 1/2 to 20 watts.

Now, I wonder just how many ordinary householders like myself want 2 1/2 watts—much less 20? What I need is a set whose volume will comfortably fill any of my living-rooms as and when required, but which can be toned down, without undue loss of quality, to a sound level which forms just a pleasant musical background for conversation.

Generally speaking, I find that something round about one watt is amply sufficient for any need, and that in the ordinary way just a fraction of a watt is all that one requires.

I cannot help thinking that if some manu-

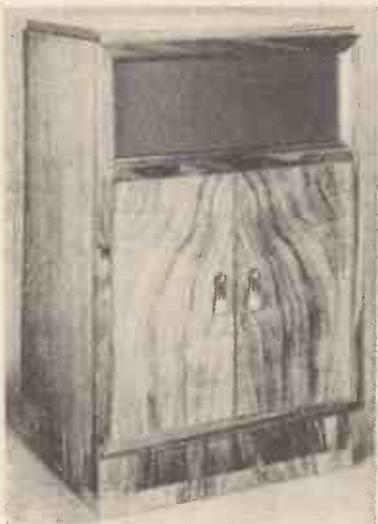


She shall have music—and speech, too, if need be—wherever she goes, especially if she always remembers to take her Portabout set on her hikes!

notes as they occur to us during a tour.

The cheapest radio-gramophone? We are not going to commit ourselves, but is there anything to beat the **Cossor** four-valver at 16 guineas? Judging by the number of people round the stand (No. 73) it seems a big attraction.

Although very few of the sightseers can have realised what it all meant, the variable-selectivity idea, as shown on the **Kolster-Brandes** super-het



ery handsome, isn't it? The **All-wave** super-het, tuning from 15 to 58 metres and over the usual medium and long waves. For A.C. or D.C. mains

only 7 kilocycles, you have no alternative if you want clear reception but to increase the selectivity—and, incidentally, to reduce the quality by cutting down top-note response to a maximum of 3,500 cycles.

There is no doubt that variable selectivity will become widespread as its advantages become better known. Indeed, this development in super-hets seems to us to be one of the most fundamental advances in receiver technique.

For the first time now, there is no need to be in the slightest doubt as to the foreigners you tune-in. Look on the **Telsen** stand (No. 75 and 101) for example, where the sets embody a new patented dial.

# Radio's Show of Shows

## Some Outstanding Products Reviewed

ONLY three more days to go! Have you been to Radio-lympia yet? The show of shows—for amateurs and set-buyers alike—closes on Saturday, August 25. It offers a unique chance for everyone interested in radio to see the whole industry in correct perspective.

We have been roaming around the stands, picking out some of the high-lights that seem to us to represent real advances. The object of this little article is simply to review a few of these outstanding exhibits, in the hope that you may be further guided during your own visit.

We shall make no attempt to place these impressions in any particular order, but just to jot down



Dubilier dry electrolytic condenser—constructors, please note!

sets, is bound to set a fashion during the coming season. (Stand No. 84.)

The idea behind variable selectivity is the ability to vary the coupling of the primary and secondary intermediate-frequency coils.

### To Suit Conditions

In practice this means that you arrange your selectivity to suit conditions. When listening to, say, the local or other station not suffering from the close proximity of adjacent stations, you don't need as much selectivity as under severe conditions. Consequently, you do not have to sharpen up tuning so much, and so you retain high-note definition with better quality.

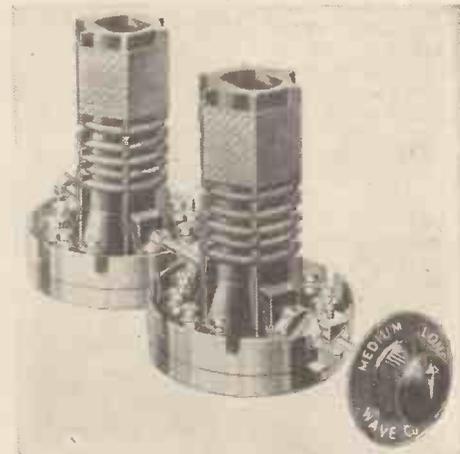
For bad conditions, where the separation is perhaps

A diagonal line travels across a scale marked in lists of foreign stations. In front of each station name is a small square, which the line passes through when the set is tuned to it.

In this way the receiver is very accurately tuned-in to all stations within range, without the slightest doubt as to the identity of the programmes.

**Philips** sets (stand No. 62) have always been good value for money, but this year they have surpassed themselves with a five-valve straight set for A.C.-mains operation. This set has two high-frequency stages, detector and pentode, with self-adjusting volume control. It includes a very fine micrometer dial and is, as a matter of fact, one of the few straight sets to give 9-kilo-cycle selectivity.

High fidelity is only one of the big



Telsen dual-range air-cored coils, which are being continued this season for use with standard-type valves



Something like a loud-speaker! **Celestion Auditorium** model for public-address work

features of the **R.G.D.** range this year. Paraphase push-pull amplification, using resistance coupling throughout, accounts for part of the excellent quality of the output.

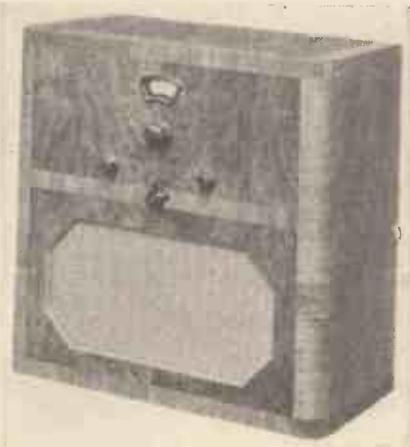
The designers have also embodied a special horn-type of moving-coil loud-speaker, claimed to give a level response from 70 to 10,000 cycles.

On the gramophone side the quality is maintained by the use of a piezo electric type pick-up, as far as we know the only instrument at the show using it.

Of course, one of the biggest selling features

of the large **R.G.D.** radio-gramophone is the variable selectivity, again working on the principle of varying the coupling between the primary and secondary windings of the intermediate-frequency transformers.

One of the sets using two loud-speakers in the same cabinet to great effect is the **Burndepth Ethodyne** five-valver at 18 guineas. (Stand No. 81). This set, which is for A.C. mains, has one loud-speaker to deal with bass and middle frequencies, the other dealing only with the higher frequencies. The overall



One of the **McMichael** new-range sets with twin moving-coil loud-speakers—a good-looker

balance is very good—and the particular angle of the mounting of the loud-speaker chassis seems to spread out the sound so that there are no "shadows."

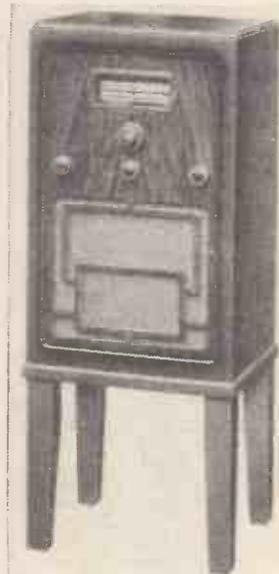
One of the surprises of the Show is the Mullard completed set—it is not a kit, we mean. This set, called the MB3, at 8 guineas is a very nice job. There is no reaction—only two knobs, one for combined volume and on/off, the other for wave changing and tuning.

A high-frequency pentode, with variable-mu characteristics, is used for the high-frequency stage, a straight pentode for the detector, and pentode output—a three-pentode circuit that operates more like a super-het, so sensitive is it to the foreigners.

One of the most useful accessories to the modern set is a record player, complete, of course, with pick-up and volume control.

We are impressed with the very handsome appearance of the C.A.C. record player, which has been introduced to exploit the Collaro letter-box automatic record changer (Stand No. 89.)

You take your record from the filing cabinet beneath, "post" it in the slot at the top of the cabinet, and this starts the motor, draws in the record,



Cossor's, as usual, have a fine range of sets. This is the model 3455 three-valve battery console

puts it on the turntable, places the pick-up on the record, plays the record, and reverses the whole procedure so that you eventually get back your record through the slot.

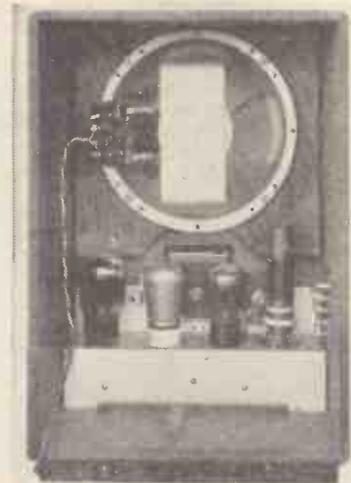
Another good accessory in the C.A.C. range is their short-wave adaptor at £10. This is a two-stage adaptor, tuning between 12 and 96 metres. It is for use with A.C. mains sets—a very good point.

Things have been so arranged that self-adjusting volume control actually works on the adaptor valves—and so helps to reduce fading during short-wave reception.

Typical of the all-wave tendency is the seven-valve super-het introduced by Allwave International Radio and Television, Ltd. (Stand No. 113). Besides tuning from 15 to 58 metres it also covers the normal broadcast bands. It works



Goltone, though not at the show, have many interesting components. Here is their striped iron-core tuning coil

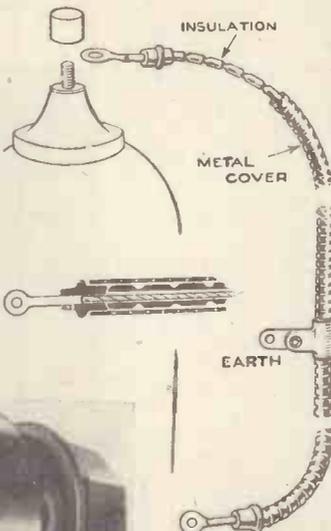


Welcome back the K.B. Pup! Back view of the model KB362—a three-valver for battery operation

on A.C. mains, and there is also a model for D.C. Special models can be obtained for 100- and 125-volt supplies.

A super model, with 12-in. moving-coil loud-speaker, and automatic record changer, is housed in a most ambitious-looking cabinet, and priced at 50 guineas. Various doors open at the

New Marconiophone model 25 pick-up, as used in all the Marconiophone gramophones—price £1 2s. 6d.



This flexible connector for the tops of screen-grid valves has a novel bead arrangement between the centre copper wire and the outer screening—new Peto Scott product



This Ohmite potentiometer volume control is sure to be popular this season—it is a new Graham Farish product

—enough to fill a dance hall easily.

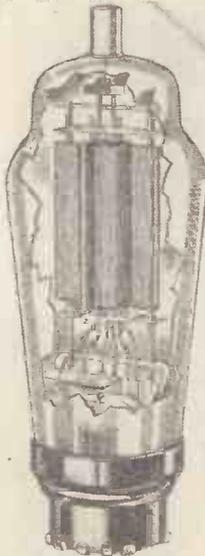
Very good value for money is exemplified in the Beethoven six-valve super-het, with twin loud-speakers and eight stages of operation. (Stand No. 57.) In walnut cabinet, fitted with chromium pieces, the price is only 13 guineas. Of course—it is for mains operation, A.C. only.

Searchlight tuning is the feature of the Alba model 68, a six-valve super-het in a low-boy type of cabinet—not a table model, that is. The price is only 14 1/2 guineas for A.C. mains, and 15 1/2 guineas for the universal model. (Stand No. 32.)

**Spectrum Tuning**

Spectrum tuning—another great aid to easy station finding, will be found in the Atlas A.C. super-het. This is a five-valver. The big feature is the tuning dial, which is quite different from anything else at the show. (Stand No. 85.)

When the set is switched off you cannot see any of the station calibrations



Mullard Pen26, a new universal mains valve with the new pinless base

on the dial. As soon as you switch on, through the positions of thirty-six medium-wave stations are immediately thrown up in green. When on long waves, the green station marks fade out and the



front, the feature being that all the controls are behind the doors and not under the top.

Going to the other end of the scale, you might take a look at the Aerodyne three-valve battery model—called the Raven. (Stand No. 68). The price is only 5 guineas, including a 12-in. moving-iron loud-speaker, a chromium plated clock and all the controls in chromium on an ebonised bakelite cabinet.

**It Plays 30 Records!**

Perhaps the most intriguing radio-gramophone mechanism at the show is included in the Autotrope, an instrument that enables no fewer than thirty records to be played on both sides—giving three to five hours continuous playing, according to whether you use 10- or 12-in. records.

The complete instrument is definitely in the de-luxe class, and sells at £150. This enables you to get as much as 10 watts output



This Amplion Lion super chassis is sure to be talked about—look at all the impedance matching connections at the back!



Nice-looking Lissen set in a wide range—this being the three-valve battery model 8098

and long-wavers come out in red.

Another very interesting point about this tuning device is that it is arranged to tilt bodily, so that everyone can suit their own eye level without bending down.

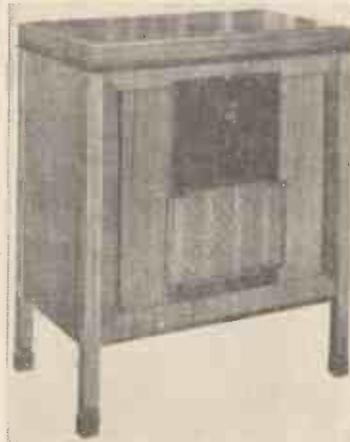
If you want a good example of low-price radio of high efficiency you might take a look at the Marconiphone stand (No. 76), where there are two sets of outstanding interest from this point of view.

The model 262 is the Lucerne special reduced from its original price of 12 guineas to the amazingly low new

four-gang permeability tuner. (Stand No. 103.) With this you can assemble a two-high-frequency straight set, or even a super-het, without coil changing or variation of efficiency over the whole of the wavebands. Owing to the system whereby a dust iron core moves in and out of the windings for tuning variation, the selectivity remains constant irrespective of wavelength—an advantage over the more orthodox tuning systems in use to-day.

**Front Trimmer For New Gang Condenser**

One of the most useful condensers for tuning is the new Jackson Linatune, which can be obtained in either two- or three-gang models.



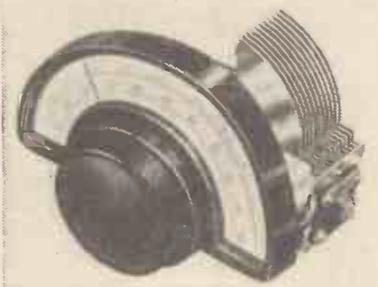
Marconiphone model 289 is a super-het auto-radio-gramophone. Has visual tuning and other refinements yet costs only 33 guineas!



Senior permanent-magnet moving-coil loud-speaker in good walnut cabinet—accessory of the G.E.C.'s new range

price of 11 guineas. For A.C. mains there are five valves—the cheapest super-het in the whole Marconiphone range.

Another outstanding value-for-money job in the Marconiphone range is the 292 radio-gramophone, which sells at 48 guineas. There are nine valves, automatic record changing, quiet and delayed self-adjusting volume control, variable selectivity and multi-directional loud-speaker—many special refinements, you see.



Many constructors will fall for this new Formo tuning scale—it is so open and easy to read

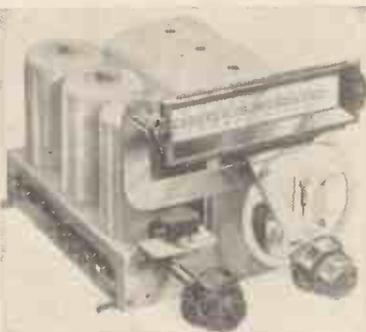
(Stand No. 114.) A front trimmer is provided, so that although tuning is virtually one knob, you can always ensure accurate tuning by a final twiddle on the trimmer, which is concentric with the main control.

**New Dial That Is Easy To Fix**

In the Formo condensers the new tuning dial is very striking. (Stand No. 59.) The dial is fitted to the front of the panel and at first glance gives the impression of having been attached through the back—whereas actually no hole has to be drilled in the ebonite panel. A condenser the constructor will appreciate for its easy fitting and good appearance.

**Clock-face Tuning**

Perhaps one of the most striking features of the Ultra range of sets is the clock-face neon tuning dial—another potent aid to easy tuning-in. The model 44 at 15 guineas is a typical Ultra product, a four-valve super-het with over-size moving-coil loud-speaker. (Stand No. 67.)



Jacksons give the home set maker a very good start with this J.B. Linacore tuning assembly

Those who still use low-voltage energised moving-coil loud-speakers ought to see the 12-volt 1,000-microfarad dry electrolytic condensers on the electrolytic T.C.C. stand. (No. 37.) You use these condensers across the moving-coil to remove any final trace of mains hum.

Dubilier are showing, for the benefit of D.C. mains users,



One of the Lampex range of sets, which includes battery A.C. and universal types. Note the open tuning neat scale and loud-speaker fret

No one should miss the Pye Cambridge sets—for their cabinet work is really outstandingly fine. To many fastidious listeners who object to destroying the *tout ensemble* of their furnishing schemes the Pye sets are doubly attractive—simply because they do not in any way resemble radio instruments.

**Concealed Loud-speakers**

Cunningly concealed at the bottom of the cabinet are two loud-speakers, one reflecting the sound on to the floor and the other, of the horn type, sending the sound upwards through a small and almost unseen grille opening. (Stand No. 69.)

Turning now to just a few of the components, we must not forget to mention the Telsen ultra-short-wave coils, which go from 18 metres upwards. There is no coil changing, internal switching being carried out without detracting from the general rules of low-loss construction.

Another very interesting coil is the Varley



Nine stages in this Ecco model 95 super-het transformer—and it works on either A.C. or D.C. mains at will

4- and 8-microfarad dry and reversible electrolytic condensers. (Stand No. 96.) These condensers are suitable for voltages up to 275 volts. Should this voltage be exceeded the condensers re-seal themselves—and if the mains are accidentally applied the wrong way round the condensers are not affected.

If you want to add class-B amplification

Continued on page 224

# Constructor Crusaders' Corner

## CRUSADERS ARE BEGINNING TO AIR THEIR VIEWS

"WHY the dagger?" a Crusader has been asked by a friend. He suggests the answer: "It symbolises the probing and dissecting necessary in order to bring reception to perfection."

Well, that is one explanation. Another is that it represents the weapon of attack by all who are fighting for better home radio.

### Tell us Your Aims!

But the pen is mightier than the sword, so get down to those heart-to-heart letters telling us all about your real aims in this home-construction business.

In asking for answers to five leading questions about set design recently we hardly bargained for such a welter of replies. And how

**DO** you realise what you are missing by not enrolling as a Constructor Crusader? You are missing FREE blueprints! Already the scheme is operating in favour of members—they have received full-size blueprints, worth 1s. 6d. each, to build the A.V.C. 4 receiver, the first Constructor Crusader set. Three more "boom" sets are contemplated, and for each of these Crusaders will have a free blueprint, too. It costs only 1s. to join, as explained in the enrolment form on the inside back cover. If you would like to wear the badge that too costs only 1s., post paid. Join the Crusaders and get more out of home-construction!

conflicting they are! It is not going to be easy, at first, to see the wood for the trees.

Until enough of you write in with views we shall have to suspend judgment on these points. Take for example the vexed question of layout. Shall we have panel-and-baseboard layouts, or chassis constructions? At the moment it is fifty-fifty among those Crusaders who have written in.

Typical of the baseboard brigade is the point of view extolled by CC1187. "I prefer baseboard and panel mounting, as when trying out new ideas all the components are to view and easily get-at-able." There speaks the experimenter who knows he is going to alter the set not long after it has been first built.

The other side is well represented, too. "I favour the chassis," says J. Dick, "because it gives a neater finish to a set. I think we all agree the commercial set is a 'good-looker.' The chassis makes possible the neatest arrangement of the controls. There can be no comparison with baseboard sets, with their string of scattered controls, which, no matter how good the design, make the set look amateurish."

### Pride!

There speaks, you see, the would-be professional set-builder—the very well-defined class building to last—and wanting to be proud of appearance. It is again a very understandable point of view.

As this amateur, who is of course a good Crusader, goes on to say, "all-metal chassis are not necessary now that

metallised wood can be obtained." He sees one objection to metal-chassis construction—the extra tools needed to work it.

These are but typical of many letters received on both sides. The first category want baseboard sets for accessibility and quick changes of circuit. The second category want chassis construction in order—as far as we can see—to vie with commercial practice.

Several Crusaders have written asking for sets to be designed to incorporate special types of coil. This is always difficult, because to make a set merely to exploit a coil is not sufficient justification for the design.

Our number of designs is strictly limited—and that is one big reason why we want to be very certain that these designs do cater for majority demands.

The question of gang condensers as against single condensers for tuning was raised a week or so ago. Some surprisingly vehement demands have been made, following this, for separate condensers. By no means a majority are as yet "sold" on the gang-condenser idea.

In fact, the only really serious demand for the gang-type of tuning comes from a Portsmouth Crusader, who says he favours it because "other people have to manipulate the set, especially the older ones."

We will return to this question of operation in a moment. Many letters come in favour of single condensers, of which T. M. Dowds' is typical.

He says: "By all means separate condensers for tuning. This system, although giving sometimes three separate tuning dials as well as a knob for reaction is, in my opinion, best suited to allow a novice to get satisfying results—and a definite knowledge in handling the high-frequency side of his set." Our italics.

Yet another advocate of separate tuning condensers says: "I prefer the separate tuning condensers because I think that just a touch on one or the other has so much influence on the tone. Then again, one does not want to keep pulling the set out to trim the gang condensers. Separate condensers, again, can be replaced more easily."



The young idea! A new recruit to our Crusade starts in making up a new set with a three-gang condenser and a three-coil unit—can it be our A.V.C.4?

Well, these are real views from working constructors, and as such they must be taken into serious consideration.

Still another bone of contention being handled at the moment by the Corner refers to the use of a separate set for the constructor—or one set for all purposes, including the family.

### Saving Family Heartburning

Quite a lot of readers now seem keen on the idea of a separate fixed set for the family, so that they, the constructors, can carry out alterations to their heart's delight. We agree that this is a very good idea—and saves any amount of family heartburning.

Opinion hardens towards this point of view, more especially with the short-wave set. The reason is clear. Short-wave listening is now something the keen fan wants to be able to enjoy in at all hours—and not just when the family has done with the set late at night.

That is why the all-wave set does not seem to be catching on among genuine constructors, but there is no knowing how the pendulum will swing during the season.

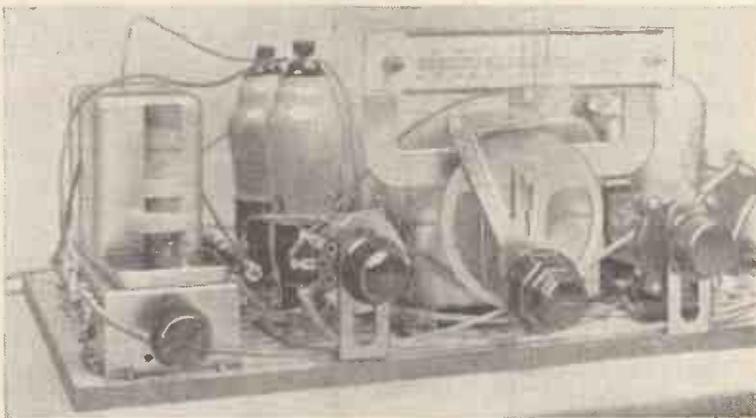
Just another striking example of how the amateur flies right in the face of popular, or shall we say non-technical, demand—on the question, this time, of internal or external loud-speakers.

Not one correspondent has so far anything to say in favour of built-in loud-speakers—for speakers as an integral part of the set. All plump in no uncertain terms for the separate cabinet loud-speaker.

It looks as though the console set for constructors is in for a rapid decline—now that we know which way the wind is blowing.

By the way, we specially want your views on the design of the Crusaders' A.V.C.4. This set represents the very latest technique in straight fours for battery operation.

Do you approve of it? What of the alternative outputs? Which is it to be—Q.P.P., Class-B or ordinary pentode output? Settle this problem, some of you Crusaders!



All the controls of the Crusaders' A.V.C.4 can be seen in this picture of the completed set. The main tuning-control knob, by the way, has a super-imposed trimmer for final tuning adjustments

# The Constructor Crusaders' Br

Specially Prepared for "A.W." by J. GODCHAUX ABRAHAMS

- 203.5 metres, BOURNEMOUTH, and PLYMOUTH (England). H1
- 206 metres, FÉCAMP (France). Call : *Rah-dee-owe Normandie.* F1
- 209.9 metres, NEWCASTLE (England). A1
- 215.4 metres, RADIO LYONS (France). Call : *Eeci Rah-dee-owe Lee-yon.* F2
- 222.6 metres, DUBLIN (I.F.S.). See Athlone K1
- 224 metres, LODZ (Poland). Call : *Har-low Raadjo polskie woodsh.* D3
- 233.5 metres, ABERDEEN (Scotland). B2
- 236.8 metres, NURNBERG (Germany). Call : *See Munich.* E2
- 238.5 metres, SAN SEBASTIAN (Spain). Call : *Ay-ah-hota-ochoo-oon-ay-own rah-dee-owe san say-bast-ee-yahn.* G2
- 240.2 metres, NICE—JUAN-LES-PINS (France). Call : *Eeci poste de Niece, Can ay Jew-an lay pan; Ay-miss-you de la coat d'az-ewer.* F2
- 241.9 metres, CORK (I.F.S.). Relays Dublin and Athlone. K1
- 243.7 metres, GLEIWITZ (Germany). Relays Breslau (q.v.). D3
- 245.5 metres, TRIESTE (Italy). Call : *Eh-yah Rah-dee-owe Tree-ess-tay.* E2
- 247.3 metres, LILLE (P.T.T.) (France). Call : *Ee-ci Lille Pay Tay Tay.* E1
- 251 metres, FRANKFURT-ON-MAIN (Germany). Call : *Ach-toong! Here Rych-zender Frankfoort.* E2
- 255.1 metres, COPENHAGEN (Denmark). See Kalundborg. C2
- 257.1 metres, MONTE CENERI (Switzerland). Call : *Rah-dee-owe Svits-ay-ra Ee-tal-ee-ana Montay Chen-airy.* E2
- 261.1 metres, LONDON NATIONAL and WEST NATIONAL (Great Britain). J1
- 263.2 metres, TURIN (Italy). Call : *Eh-yah Rah-dee-owe Torino.* F2
- 265.3 metres, HORBY (Sweden). Relays Stockholm (q.v.). C2
- 267.4 metres, BELFAST (N. Ireland). A1
- 269.5 metres, MORAVSKA-OSTRAVA (Czecho-Slovakia). Relays Prague (q.v.). D3
- 271.7 metres, NAPLES (Italy). Call : *Eh-yah-rah-dee-owe Nar-polly (Roma ay Bar-ee).* E3
- 274 metres, MADRID (EAJ7) (Spain). Call : *Ay-ah-nota-see-ettay oo-nee-own Rah-dee-owe mah-dreed.* G3
- 278.6 metres, BORDEAUX - LAFAYETTE (France). Call : *Allo! Allo! Ee-ci Bordo Pay Tay Tay.* G2
- 283.3 metres, BARI (Italy). Call : *Eh-yah Rah-dee-owe Bar-ee.* E3
- 285.7 metres, SCOTTISH NATIONAL (Great Britain). A1
- 288.5 metres, RENNES (P.T.T.) (France). Call : *Ee-ci Ren Pay-Tay-Tay.* G1
- 291 metres, KONIGSBERG (Germany). Call : *Acht-toong! Here Rych-zender Keunigs-burg* D3
- 296.2 metres, NORTH NATIONAL (Great Britain). A1
- 298.8 metres, BRATISLAVA (Czecho-Slovakia). Relays Prague (q.v.). E3
- 301.5 metres, HILVERSUM (Holland). Call : *Here Hilversoom.* D1
- 304.3 metres, GENOA (Italy). Call : *Eh-yah Rah-dee-owe Jen-owe-va.* F2
- 307.1 metres, WEST REGIONAL (Great Britain). J1
- 312.8 metres, POSTE PARISIEN, PARIS (France). Call : *Allo! Ee-ci poste par-ee-zee-yen.* F1
- 315.8 metres, BRESLAU (Germany). Call : *Ach-toong! Here Rych-zender Brayz-low.* D2
- 318.8 metres, ALGIERS (N. Africa). Call : *Ee-ci Rah-dee-owe Pay-Tay-Tay Alzhay.*
- 318.8 metres, GOTEBOG (Sweden). Relays Stockholm (q.v.). C2
- 321.9 metres, BRUSSELS II (Belgium). Call : *Here Brew-ssel.* E1
- 325.4 metres, BRNO (Czecho-Slovakia). Call : *Rah-dee-owe Broo-know.* D2

Place-names on this map are those of broadcasting stations that can be heard on the majority of sets in the British Isles. Any simple set can be expected to bring in the stations printed in BOLD CAPITALS.

To find the location of a identification details are pick out the sector by le For instance, Bordeaux



# Broadcast Guide and Radio Map

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any particular station for which are given alongside the map, letter and the radius by number. bears the reference "G2."

Look along the outside edge of the map for "G" and then look up towards London until the radius "2" is reached. All sectors and radial lines originate from London. The circles are drawn at 400-mile intervals.



- 328.6 metres, RADIO TOULOUSE (France). Call : *Allo! Rah-dee-owe Too-looze.* G2
- 331.9 metres, HAMBURG (Germany). Call : *Ach-toong! Here Rych-zender Ham-boorg.* D2
- 335.2 metres, LIMOGES (P.T.T.) (France). Call : *Allo! Allo! Eeci Lee-moge Pay-Tay-Tay.* F2
- 342.1 metres, LONDON REGIONAL (Great Britain).
- 345.6 metres, POZNAN (Poland). Call : *Har-low Radjo poznanskee.* D2
- 349.2 metres, STRASBOURG (P.T.T.) (France). Call : *Allo! Rah-dee-owe Strazs-boor Pay-Tay-Tay.* E2
- 352.9 metres, BERGEN (Norway). Call : *Bair-gen hair.* B2
- 352.9 metres, VALENCIA (Spain). Call : *Oon-ee-own rah-dee-owe Val-enn-cee-ya.* G3
- 356.7 metres, BERLIN (Germany). Call : *Achtoong! Here Rych-zender Bair-leen.* D2
- 360.6 metres, MOSCOW IV (U.S.S.R.). D4
- 364.5 metres, BUCAREST (Roumania). Call : *Ah-ee-tchee rah-dee-owe Book-oo-recht.* E4
- 368.6 metres, MILAN (Italy). Call : *Eh-yah rah-dee-owe mee-lah-no.* E2
- 373.1 metres, SCOTTISH REGIONAL (Great Britain). A1
- 377.4 metres, BARCELONA EAJ1 (Spain). Call : *Ah-kee estar-cee-ownay-ah-nota-oono Ov-nee-own rah-dee-owe Barcel-owe-na.* F2
- 377.4 metres, LWOW (Poland). Call : *Har-low Radjo polskee Lwoof.* D3
- 382.2 metres, LEIPZIG (Germany). Call : *Achtoong! Here Rych-zender Ly-ptish.* D2
- 386.6 metres, TOULOUSE (P.T.T.) (France). Call : *Eeci Rah-dee-owe Too-looze Pay-Tay-Tay.* G2
- 391.1 metres, MIDLAND REGIONAL (Great Britain). A1
- 395.8 metres, KATOWICE (Poland). Call : *Har-low! Polskee rah-dee-owe Kat-owe-vee-tsay* D3
- 400.5 metres, MARSEILLES (P.T.T.) (France). Call : *Eeci Mar-say Pay-Tay-Tay.* F2
- 405.4 metres, MUNICH (Germany). Call : *Achtoong! Here Rych-zender Mewn-chen.* E2
- 410.4 metres, MADRID (Radio España) (Spain). Call : *Ah-key estar-cee-own Rah-dee-owe Es-pa-nee-ya.* G3
- 420.8 metres, ROME (Italy). Call : *Eh-yah Rah-dee-owe Row-ma.* E3
- 426.1 metres, STOCKHOLM (Sweden). See Motala. C3
- 431.7 metres, PARIS (P.T.T.) (France). Call : *Eeci Paree Pay-Tay-Tay.* F1
- 437.3 metres, BELGRADE (Yugo-Slavia). Call : *Ovday Rah-dee-owe Bay-owe-grad.* E3
- 443.1 metres, SOTTENS (Switzerland). F2
- 449.1 metres, NORTH REGIONAL (Great Britain). A1
- 455.9 metres, COLOGNE (Germany). Call : *Ach-toong! Here rych-zender Keuln.* D1
- 463 metres, LYONS (P.T.T.) (France). Call : *Eeci Lee-yon Pay-Tay-Tay.* F2
- 470.2 metres, PRAGUE I (Czecho-Slovakia). Call : *Allo! Prar-ha.* D2
- 476.9 metres, LISBON (Portugal). Call : *Rah-dee-owe Lis-bow-a.* H3
- 476.9 metres, TRONDHEIM (Norway). See Oslo. B3
- 483.9 metres, BRUSSELS I (Belgium). Call : *Eeci Brew-ssel Ee-enn-air.* E1
- 492.6 metres, FLORENCE (Italy). Call : *Eh-yah rah-dee-owe Fee-ren-zay.* E2
- 499.2 metres, SUNDSVALL (Sweden). See Motala. C3
- 499.2 metres, RABAT (Morocco). Call : *Eeci rah-dee-owe Mar-rock.*
- 506.8 metres, VIENNA (Austria). Call : *Hallo Rah-dee-owe Veen.* E2
- 514.6 metres, RIGA (Latvia). Call : *Hallo Ree-ga.* C3
- 522.6 metres, STUTTGART (Germany). Call : *Ach-toong Here Rych-zender Shtoot-gart.* E2

- 531 metres, **ATHLONE** (I.F.S.). Call: *See seo Radio Ath Luain, Artha-Cliath (Dublin), Agus Corcaighe (Cork)*. K1
- 539.6 metres, **BEROMUENSTER** (Switzerland). Call: *Here schwytz-zerischer landes-sender, followed by Bairn, Bar-zel or Tsou-reech*. E2
- 549.5 metres, **BUDAPEST** (Hungary). Call: *Hallo Rah-dee-owe Booda-peschit*. E3
- 559.7 metres, **WILNO** (Poland). See Warsaw. D3
- 1,107 metres, **MOSCOW II** (U.S.S.R.). D4
- 1,145 metres, **MADONA** (Latvia). See Riga. D3
- 1,154 metres, **OSLO** (Norway). Call: *Hallo Ov-zlo haar*. C2
- 1,224 metres, **LENINGRAD** (U.S.S.R.). C4
- 1,261 metres, **KALUNDBORG** (Denmark). Call: *Kee-yob-en-harven Kal-oond-borg og Danmarks Kort-bolge-sender*. C2
- 1,304 metres, **LUXEMBOURG** (Grand Duchy). Call: *Ee-ci Radio Lux-am-boor (also in German and English)*. E1
- 1,339 metres, **WARSAW** (Poland). Call: *Hallo Polskee radio var-schavva*. D3
- 1,389 metres, **MOTALA** (Sweden). Call: *Stockholm-mott-allah*. C2
- 1,395 metres, **EIFFEL TOWER, PARIS** (France). Call: *Ee-ci poste de la Two-er Ay-fell*. F1
- 1,500 metres, **DAVENTRY** (Great Britain). A1
- 1,571 metres, **ZEESEN**, near Berlin (Germany). Call: *Achtoong! Here Doyt-Schland-sender*. D2
- 1,621 metres, **ISTANBUL** (Turkey). Call: *Allo! Allo! Bovcari Ee-stan-bool-telsiz tell-ay-fonoo*. E4
- 1,648 metres, **RADIO PARIS** (France). Call: *Ee-ci Poste Natio-nal Rah-dee-owe Pavee*. F1
- 1,724 metres, **MOSCOW I** (U.S.S.R.). D4
- 1,807 metres, **LAHTI** (Finland). Call: *Huomio! Taala Suomen Helsinki, Lahti, Vuupuri*. C4
- 1,875 metres, **KOOTWIJK** (Holland). D1
- 1,935 metres, **KAUNAS** (Lithuania). Call: *Leet-oo-voss Rah-dee-owe Kownass*. D3

## Leaves from My Short-wave Log

By J. Godchaux Abrahams

A MIXED log, last week, only obtained by searches over most sections of the short waveband. Fortunately, however, time devoted to its capture was not wasted as information was secured which facilitates searches on another occasion.

Times of transmissions made by VK2ME, Sydney, have been slightly altered; for August they are as follows: Sundays, G.M.T. 0500-0700, 0930-1330, and from 1530-1730. EAQ, Madrid, which at present is one of the loudest signals received, is working daily from G.M.T. 2215-midnight and on Tuesdays, Thursdays and Saturdays until 0015, with a special broadcast in English mainly destined to British listeners; on Sundays a transmission is given for North and South America.

"B" Altered to "R"

There has always been some little doubt as regards Venezuelan calls, but you may take it that the B in the combination (e.g., YV1BC) in every instance has been altered to R. So YV1BC, 3BC, 5BMO and 4BSG have made these alterations in their call signs, and instead of hearing a verbal "Bay," you now hear "Air." By the way, YV1RC, Caracas, is now definitely working on two wavelengths, namely 49.08 metres and 25.65 metres.

Another discovery made is DJM, apparently Zeesen, carrying out tests on 49.35 metres. Some time ago it was rumoured that further channels were to be used for the daily broadcasts and possibly this transmission may be one of them.

It is a curious fact that although atmospheric conditions have not been favourable for the reception of broadcasts from the U.S.A. short-wavers, transmissions from South Americans, namely La Paz (Bolivia), Caracas (Venezuela) and Bogota (Colombia) have been regularly picked up. HJ3ABD, of Bogota, on 40.55 metres, has been heard as early as G.M.T. 0500 on Saturdays and Sundays. HJ1ABB, Barranquilla, still on 46.51 metres, has slightly altered his timetable; he now works from G.M.T. 1645-1745 and from midnight to 0230 daily, and from 1900-2300 on Sundays.

### Egyptian Programmes?

Although so far on the medium waves I have seen few reports of reception of the Cairo station, it would appear that we may expect to add Egyptian broadcasts to our log in a not too distant future.

The authorities are planning the installation of a 500-watt relay of the Cairo programmes to be transmitted on 49.92 metres (6,010 kilocycles).

In the calls given out by the B.B.C. Empire transmitters, no indication is now given regarding the Dominions or Colonies to which they are destined, but the broadcasts may be recognised by a number. They are as follows: (1) Australia, New Zealand, Hongkong, North Borneo, and islands in the Pacific; (2) India, Burma, Ceylon, Malay Peninsula; (3) Malta, Cyprus, Palestine, Sudan, East and South Africa, isles in the Indian Ocean, and British Somaliland; (4) West Africa, Gibraltar, St. Helena, Falkland Islands, etc.; and (5) Canada, Newfoundland, Bermudas, British West Indies, British Guiana, British Honduras, and Pacific Islands.

# Radio's Biggest Yet!

THE season's most ambitious set was demonstrated by His Master's Voice on the eve of the opening of the Radio Exhibition to a gathering of the Press at Olympia. Known as the Model 800, the High-fidelity Fifteen-valve Autoradiogram is a masterpiece of radio technique and has been produced by the Hayes designers after many months of intensive research.

### For the Connoisseur

This is definitely a set for the connoisseur—and, incidentally, for those with deep purses. The price is 110 guineas, but there is no doubt that, compared with other receivers in the same price group, this new H.M.V. model more than holds its own. We have heard the instrument working and have no hesitation in saying that it does set a new standard for commercial high-quality receivers.

Owing to the difficulties of radio reception amidst the ironwork of Olympia, the new radio gramophone was demonstrated on records; the result was the best reproduction we have heard outside a research laboratory. If you can afford it, this outfit will give you radio reproduction of a quality that you have never before heard. In this respect, at any rate, British designers can hold their own with any in the world.

This Model 800 so bristles with interesting features that it is difficult to know in which order to tackle them. But here are a few of the more outstanding:

### Special Loud-speakers

The output is 10 watts (50 watts anode dissipation); twin duo loud-speakers (that is, each has two diaphragms) cover the entire frequency range, which is claimed to be from 40 to 8,000 cycles; graduated tone balance is provided; there is a four-range selectivity device, giving 8-kilocycle, 7-kilocycle, 5-kilocycle and 3-kilocycle selectivity; volume control operates both on radio and gramophone; one-knob tuning with fluid-light indicator; the receiver is silent until a station has been correctly tuned-in; eight 10-in. or eight 12-in. records can be played automatically; and there is a scratch filter control.

That is surely enough to satisfy

even the most exacting listener, but there are still many points of interest left. For instance, the set tunes over the whole gamut of broadcast wavelengths; from 13 to 80 metres in three steps, from 200 to 550 metres, and from 1,000 to 2,000 metres.

There are no fewer than 6,381 component parts in the set and these undergo 5,463 mechanical and 1,570 electrical tests before production is completed. On test over a period 350 stations have been received. Two control knobs actuate forty-eight different switches with ninety-six contacts and five separate wavelength-calibrated scales are incorporated in the tuning control.

Great importance is attached to the specially developed Q.A.V.C. circuit; this ensures that no station is heard at all until it has been tuned-in dead on the spot. This new High-fidelity radiogram is certainly radio's most ambitious project yet!



Radio's most ambitious set yet—the H.M.V. High-fidelity 15-valve Autoradiogram. The price is 110 guineas



# Chassis Making Is So Easy!

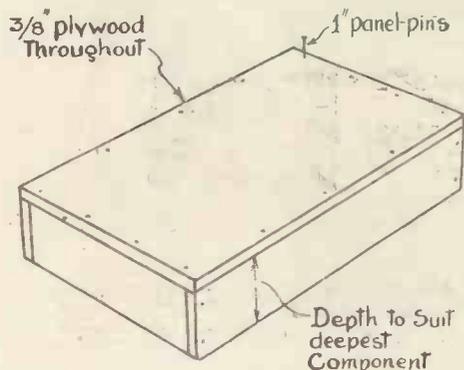


Fig. 1.—Simple wooden chassis. You can use metallised wood for good screening

TO earn the coveted title of Advanced Constructor, you certainly must do something about set-chassis making. It all depends on how you go about the work. You can with advantage start off with a really simple wooden chassis, gaining confidence for more ambitious metal affairs as you knock up various shapes and sizes.

Shall we take a look at Fig. 1, for a start? Here is the most straightforward complete chassis we can imagine. It is made up entirely of wood—preferably treated wood of the Metaplex variety. Unless you use some such material you will probably have to go in for laborious lining of the top and sides with tinfoil.

For, of course, the big object of a chassis, apart from the neatness of the top portion, is to screen high-frequency components from those connected to the low-frequency end of the set. The stability of many sets with a deal of high-frequency amplification is largely due to the careful screening made so easily possible with the metal type of chassis, or with metallised-wood chassis.

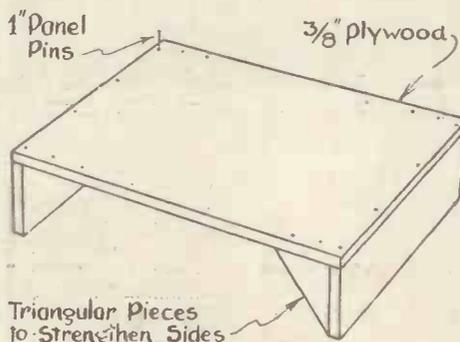


Fig. 2.—More open type of chassis. Accessible and all that, triangular pieces at each end will do quite well for support

the front of the cabinet. Your chassis will be of such a depth that when the condenser and other control are mounted on it their control spindles will come at the desired height up the cabinet.

You can use  $\frac{3}{8}$  in. wood for this Fig. 1 chassis, tacking together the top, sides and ends with 1 in. panel pins. Be generous with these pins, and then you will have a stout chassis that will stand any amount of knocking about.

If you know that the sub-chassis wiring is going to be rather complicated, or if there are going to be a lot of components—some being therefore inaccessible—you might try the Fig. 2 chassis, which

is a more skeletonised version.

Tack the top portion to two ends, strengthening up the structure with four triangular pieces

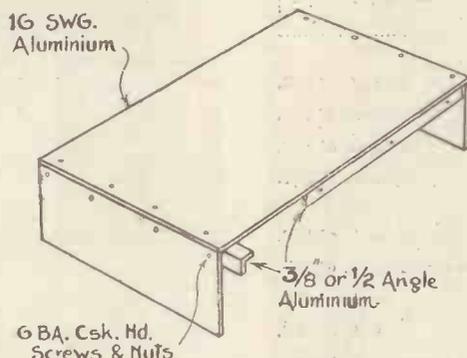


Fig. 3.—Simple metal chassis. Built up without any bending. Three straight pieces for top and sides with angle pieces for all the joints. You can buy angle aluminium—or brass if you like, more expensive

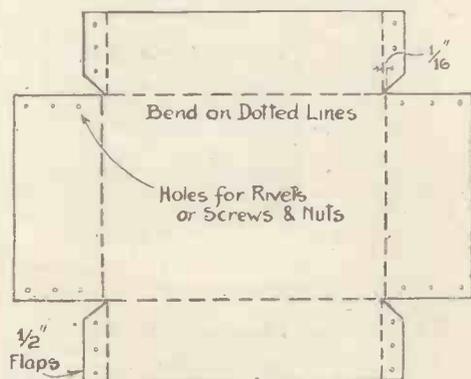


Fig. 4.—Layout of an ordinary metal chassis. Before bending. Where dotted it will be bent. Cut out flaps as shown

So that Fig. 1, built up of Metaplex, is a really sound chassis. Its size depends, of course, on your own needs. The governing considerations will be the depth—determined by your deepest sub-chassis mounted component.

Another point that will help decide this dimension will be the layout of the controls on

of wood. Use the same wood as before, and the same pins. With a shallow chassis this method is very satisfactory.

So much for simple wood chassis, which are becoming more popular as amateurs realise the easy way they can be made up—and as it dawns on amateurs that a good metallised

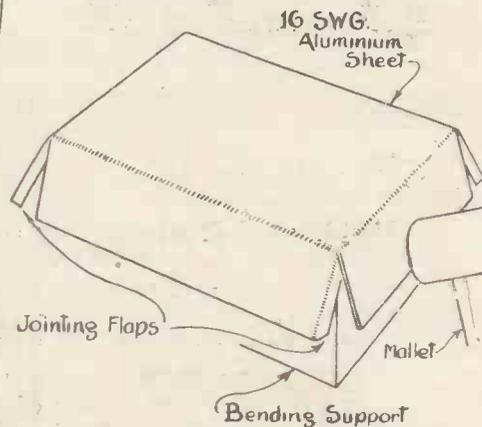


Fig. 5.—How to bend the metal. Place on wooden block and very carefully hit the sides with a wooden mallet

wood chassis can do all that a more ornate all metal job can do.

There are times, though, when a really nice metal chassis is wanted—and then, assuming you are inexperienced—the Fig. 3 construction is admirable. Our idea in recommending this arrangement is simple. There is no metal bending.

### Flat Pieces of Aluminium

All you need are three perfectly flat pieces of No. 16 gauge aluminium, one for the top and two for the ends. These are then held together by angle brackets, which you can buy at the ironmongers quite cheaply—especially in brass. But they are also available in aluminium if you look long enough.

You will find that  $\frac{3}{8}$  in. or  $\frac{1}{2}$  in. angle brackets will be quite strong enough for most chassis constructions.

Now we come to the more complicated sort of chassis—a real all-metal affair. You can see how it is dimensioned from Fig. 4.

Marking out is done with a metal scriber, the top section being very easy to determine. The ends and sides need more careful treatment. You must arrange those little flaps so that the cuts come  $\frac{1}{8}$  in. inwards—otherwise the thickness of the metal will prevent you making a neat fold under.

About the bending. This is really quite an art—but an easily acquired one if you go the right way about it. The first need is a hardwood block to work upon. It should have true corners—to make sharp bends in the metal when it is hit.

Hit with a wooden mallet, too. If an ordinary hammer is used it will badly mark the metal. You can see how this job is done from Fig. 5.

For the final fixing of the flaps you can use either rivets or nuts and bolts—much easier.

At Fig. 6 is just a little idea for chassis experiments. Make up a stand, with two slots in the ends, so that the chassis can be swivelled around—then you can examine components and get at tricky bits of wiring.

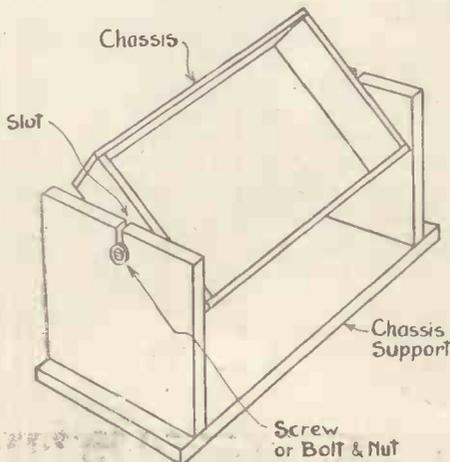
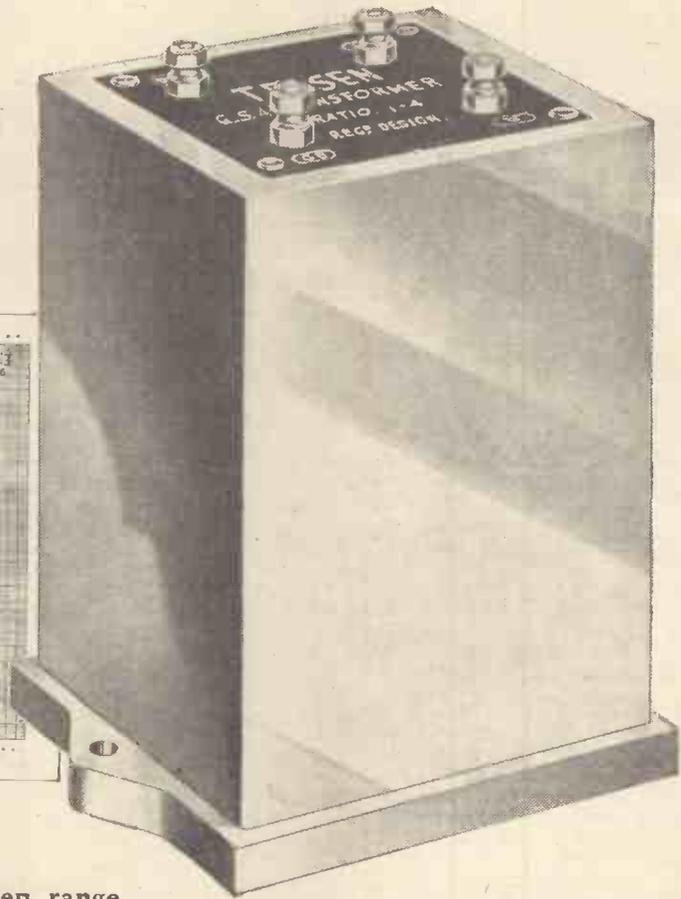
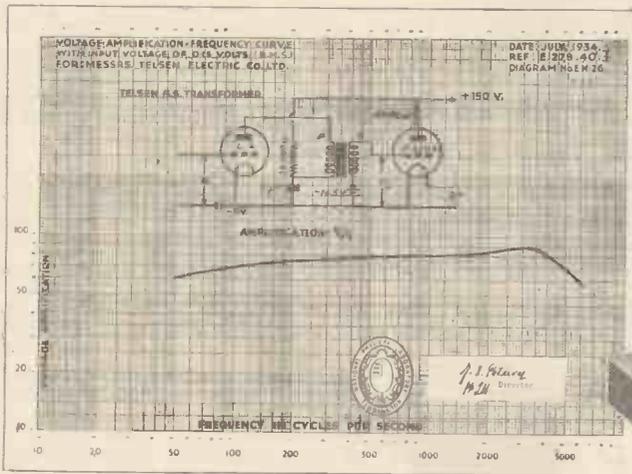


Fig. 6.—Stand for holding the chassis in any position while the set is being built or altered. Can be turned around and clamped where you like with the side-screws

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# Getting That Short-wave Converter to Work!

By F. D. CAWLEY (G5FC)



I HAD a summons the other day. No, not from the police, but from my young friend Frank, whom I had not seen for some considerable time.

"Well!" I exclaimed, after we had exchanged the customary greetings. "What is the trouble this time?"

Frank grinned. "Last night I suddenly had the great idea that I would like the folk to hear 2XAD," he replied. "So I built up a single-valve super-het converter to use with their broadcast set."

"And the result was no sound?"

"Exactly!"

So we arranged that I should pay him a call that very evening. Fortunately, his mother and father had gone out visiting some friends, so we had the place to ourselves, which was all to the good.

### Have You Tested?

"Have you tested anything?" I asked, having a look at the little contraption. It was a neat job in the simple panel-and-baseboard style, with a high-ratio slow-motion dial on the tuning condenser, and valve-base coils.

"No, I haven't done anything," Frank confessed. "As a matter of fact, I didn't get it finished last night until nearly eleven, and after I had twiddled the knobs for a bit I was so disgusted that I packed up."

I nodded, and made a closer inspection of the offending oscillator.

"Is the broadcast receiver tuned to long waves?" I asked, a moment later.

"Yes, I got it ready before you came," was the reply.

"Good!"

I connected up the converter, in the usual way—the broadcast aerial was attached to the converter input, and the converter earth connected to the earth terminal on the broadcast set. The lead from the output of the converter was then connected to the broadcast-set aerial terminal.

### Not Reaching the Loud-speaker

I plugged into about 60 volts high tension and switched on. Just as Frank had experienced the previous night, there was no response. A click when the wander plug was inserted into the socket on the battery seemed to indicate that something was getting through, but it was definitely not reaching the loud-speaker.

I wetted my finger and tapped the aerial connection. It clicked all right.

"Have you got a milliammeter?" I asked. Frank smiled, rather ruefully.

"Afraid not," he replied. "Funds don't run to one. Will a voltmeter do?"

"Oh, yes," I went on. "It will do just as well."

I determined to see how much of the 60 volts was getting through to the anode of the valve. Fixing the voltmeter prongs on to the most convenient terminals, I was not

converter hanging loose, and all the external wires disconnected. And still there was no reading on the voltmeter.

Then my hand happened to brush against the resistance. It was quite warm. At once I realised the nature of the trouble.

"There's only one thing for it," I remarked to my friend, who was standing beside me, "it's a direct short-circuit. What a pity we did not leave that resistance wired up all the time."

"Why?" Frank wanted to know.

"It would not have done so much harm to the battery. You see, the resistance would actually have been a form of load, giving the battery some work to do overcoming it, instead of having a direct short between positive and negative."

"Oh, I see," nodded Frank.

### Appearance of a Fat Spark

I pulled out the wander plug and was not surprised to see a fat spark appear as I did so. The spark was there every time the plug touched the socket on the battery.

"Must be in the coil," I murmured, pulling it out to examine it. It was a commercial job, wound on a former with a four-pin base, the prongs of which were so spaced that it could be plugged into an ordinary valve holder.

One end of the grid winding was taken to the grid pin and the other to one of the filament pins; the reaction winding was connected to the anode pin and the other filament pin.

"Here you are!" I exclaimed, after a few glances at the coil and the wiring of the holder. Frank jumped forward. "You've got the filament connections wrong—they should be the other way round!"

It was quite right. It must be the simplest thing in the world to reverse the wires to the left and right filament sockets.

When I had made the necessary alterations and replaced all the other connections, we heard a faint rushing sound in the loud-speaker.

"Are you sure the broadcast set is properly tuned in?" I asked.

Frank made a few adjustments on the dials and the rushing noise increased considerably in strength. The converter now seemed to be working all right, but we could still not get any signals.

Then I happened to notice the size of the condenser Frank was using to couple the aerial to the converter.

"What value is that?" I demanded.

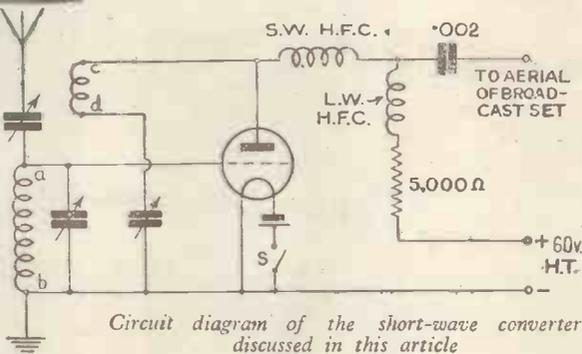
"Three oh's one!" said Frank.

"Oh, that's much too big! Here, let's take it out—no, just disconnect it, and leave the aerial off altogether."

We were able to pick up a few morse stations without any aerial at all. Frank was delighted to hear something at last.

"What you must do," I went on, "is to

Continued on page 216



Circuit diagram of the short-wave converter discussed in this article

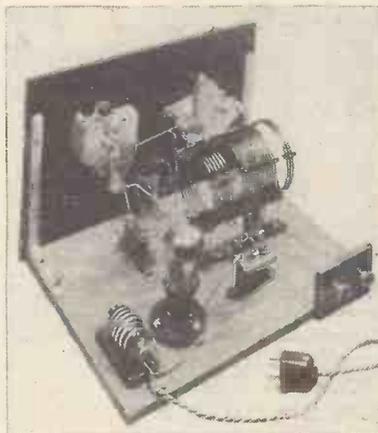
really surprised to discover that no current was getting there at all.

Frank was astounded. "Good heavens!" he exclaimed. "Where is it all going to?"

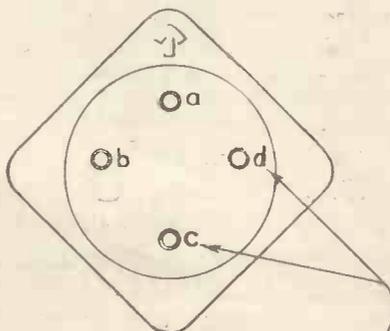
"That is what we have to find out!" I smiled, and I tested the high-tension positive supply through the two chokes and the resistance to try to find which component was faulty. Not until I reached the battery end of the resistance did the voltmeter show a reading.

Rather non-plussed, I disconnected the wire from the battery to the resistance, and coupled it straight on to the long-wave choke, cutting the resistance completely out of circuit. There was still no reading on the meter. Next I followed the same procedure with the choke, and still there was no reading.

As I tested the short-wave choke, I began to wonder what the trouble could be. Eventually I had half the wiring of the



Typical short-wave adaptor



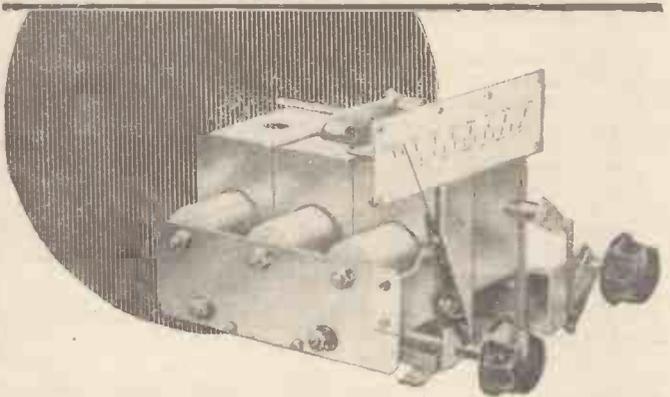
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# Telsen 3435 Mains Super-het



Front of the Telsen mains super-het—a good-looking cabinet is an outstanding feature

ALL the receivers in the Telsen range for this season embody many points of outstanding interest. The Telsen 3435 Super-het tested uses six valves, of which five are receiving valves.

In front of the first detector is a highly efficient amplifying stage using one of the new Mazda pentodes which makes a remarkable difference to the daylight range and the general sensitivity of the receiver. In addition to this, the selectivity is better than usual, while second-channel interference and oscillation is, owing to the good pre-selection, almost entirely absent.

## Nine-pin Base

The first detector and oscillator circuits are coupled into a triode pentode valve which has a nine-pin base. The circuit used by the Telsen people has been so arranged that the sensitivity and oscillation of this circuit remain almost constant over both wave-bands. Another high-frequency pentode is used in the intermediate-frequency stage which is coupled to a simple diode



Back of the Telsen mains super-het, showing the very neat chassis layout of the six valves

used as a second detector. Following the diode is a triode valve as a low-frequency amplifier feeding an output power pentode which gives  $3\frac{1}{2}$  watts.

One of the main features of the Telsen sets this year is the exceptionally simple tuning dial. This dial is calibrated with the names of all of the more important Continental transmitters. In front of each name is a small square. Travelling across the screen is a transparent cursor upon which is an oblique straight edge. When a station is tuned-in all you have to do is to see where the straight edge cuts through one of the numerous squares to find out the name of the station you are receiving.

Along the bottom of the scale are also calibrated the wavelengths of the stations marked on the dial. A visual tuner of the meter type is on the right-hand side, so that the majority of the stations can be tuned in without a sound being heard from the loud-speaker.

At the back of the cabinet will be found a little panel for the aerial and earth connections as well as two sockets marked on-off. The flexible connection which comes through this panel is the mains-aerial connector, and when it is plugged into the socket marked "on" it enables the user to tune in a large number of stations by simply using the mains as an aerial.

The gramophone pick-up is plugged into the two sockets marked for that purpose, making sure that the earthed lead of the pick-up is connected to the uppermost socket. The radio volume control also works when the pick-up is switched into circuit and this switching is effected when the wavechange switch is rotated to the position marked "Gram." An extra loud-speaker can be connected up and should be of

the high-resistance type. If it is intended to use a moving-coil loud-speaker then a suitable stepdown output transformer must be used.

We feel convinced that anybody who is fortunate enough to own one of these new Telsen sets will be very pleased indeed with the results obtained. Although during our tests we only used a small 25 ft. aerial, the number of foreign stations that we were able to pick up at good loud-speaker strength was phenomenal.

During the early evening all the stations marked on the dial, with the exception of an odd Russian or so, were tuned-in. Where the

## IN A NUTSHELL

Makers : Telsen Electric Company, Ltd.

Model : 3435/mv.

Price : £14 14s.

Valve Specification : Pre-first detector high-frequency stage (Mazda AC/VP1), combined detector-oscillator (Mazda AC/VP), which is bandpass coupled to the single intermediate-frequency stage (Mazda AC/VP1). Detection is by means of a diode (Mazda V914), a super-power output pentode (Mazda AC2/Pen), completes the receiving valves. There is also a full-wave rectifying valve (Micromesh R3).

Power Supply : A.C. mains 200-250 volts, 40-100 cycles.

Type : Self-contained table cabinet.

stations were not sharing a wavelength there was no sign of interference and in the majority of cases there was a marked absence of fading and background noise.

The automatic volume control worked very satisfactorily, and very often we noticed the visual tuning indicator fluctuating in an alarming manner, while the output remained perfectly steady.

We have not yet mentioned one very important point—that is quality. This receiver uses a new type of Celestion loud-speaker, which has been carefully coupled to the output pentode. Even with the maximum output of over  $3\frac{1}{2}$  watts there is not the slightest trace of distortion.

## Getting That Short-wave Converter to Work! Continued from page 214

build a little aerial condenser yourself. Get two brass plates, one of them 1 in. square, and the other 1 in. by 2 in. Drill a  $\frac{1}{8}$  in. hole  $\frac{1}{2}$  in. from one end of the 2 in. strip, and bend the brass in the middle, making a square-angle bracket.

## Fix the Bracket Firmly

"Fix a terminal to a small piece of ebonite and, after screwing a spare spacing nut onto the shank, fix the bracket in position. This will be the fixed plate of the aerial condenser."

"Wait a minute," Frank interrupted. "Won't the bracket come loose every time you connect a wire to the terminal?"

"It would," I agreed, "if you did not fix it firmly in position with an extra nut before screwing on the knurled knob."

"I see. But what about the moving plate?"

"The moving plate is, of course, made of the other brass plate. A piece of No. 16 gauge tinned copper wire about 4 in. long is bent into a narrow U-shaped formation, and the flat end of it soldered directly onto the plate close to one edge, so that looked at from the side, the wire and the plate form a letter L.

"The idea is, you see, to slide this plate, by means of the U shaped wire, under the head

of a second terminal, also mounted on the piece of ebonite, but a couple of inches away from the first. When the required coupling space has been obtained, the terminal is tightened up, and there is your condenser."

Frank looked rather doubtful.

"But surely every time you adjust the condenser you have to unscrew one of the terminals?"

"That is so. But you must remember that, having found the right degree of coupling, it rarely has to be altered. The chances are that, with a normal aerial, the condenser would only have to be re-adjusted if you wanted to go either above about 60 metres or below about 12 metres."

"I'll try that," Frank nodded.

"You can use that arrangement on your short-wave receiver, too, you know," I added.

"Yes, I see."

"The only other thing I can suggest is that you connect a small variable condenser, of about 15 micromicrofarads, across what is now your main tuning condenser. Make that your main tuning condenser, and fix your slow motion dial onto it. The other condenser can then be used for rough tuning, and an ordinary knob is quite good enough."

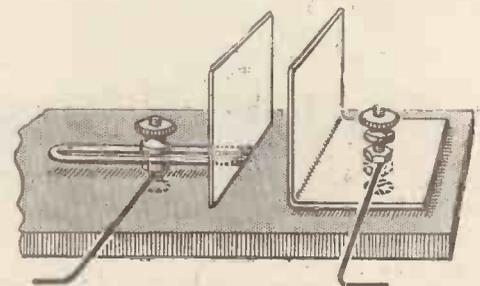
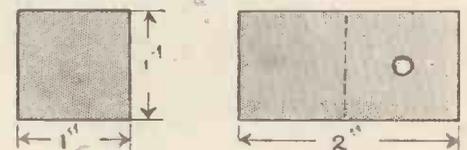
A few days later I met Frank again.

"How is the converter going?" I asked.

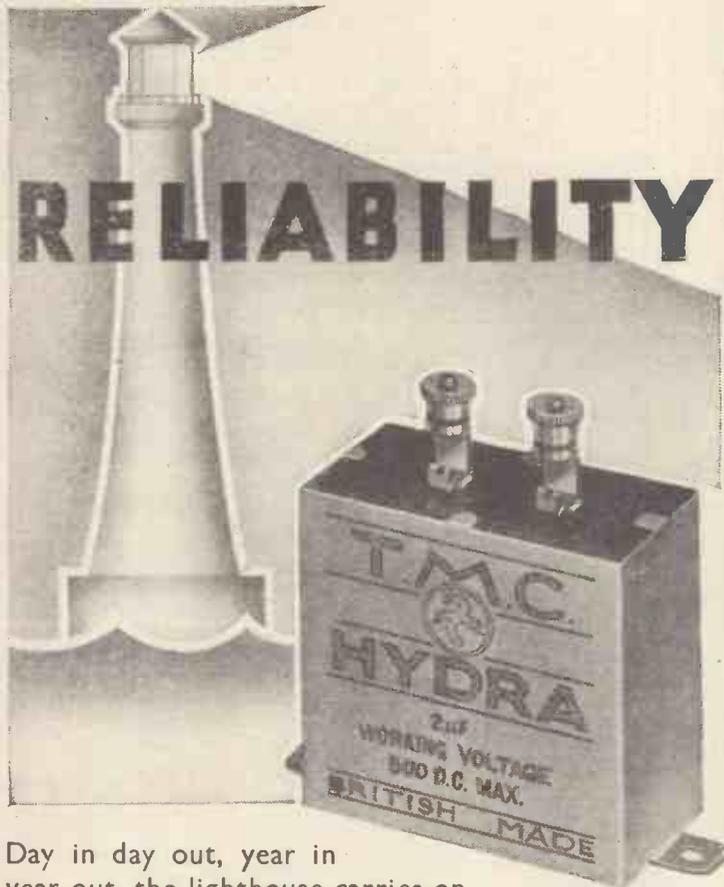
"Fine!" he replied, enthusiastically. "I did everything that you suggested, and got W8 XK at full strength on the first night!"

"That's splendid."

"Oh, and you should see Dad listening to the Yanks! He's quite thrilled with it!"



This is the simple home-made short-wave condenser discussed in accompanying article



Day in day out, year in year out, the lighthouse carries on with unfaltering reliability . . . guiding and safeguarding the ships that pass. And though their jobs are so vastly different, a condenser has perhaps one thing in common with a lighthouse . . . the need for absolute reliability. That is why so many set-builders are turning to T.M.C.-HYDRA condensers. By doing so they know not only that the condensers will be accurate to start with, but also that they will stay accurate in use. Equip your next set with T.M.C.-HYDRA condensers.

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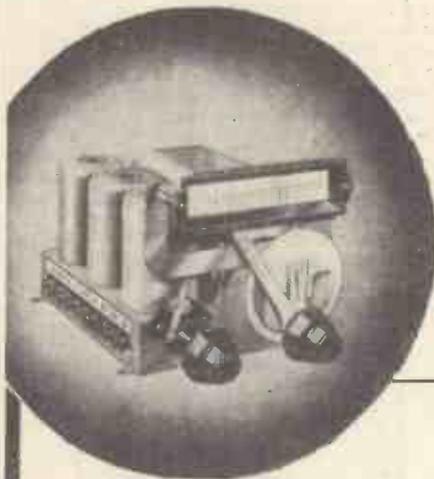


Strict scientific control of every manufacturing process ensures the accurate rating of every T.M.C.-HYDRA condenser, while a special method of sealing prevents the penetration of moisture, so maintaining the high electrical properties of the condenser. T.M.C.-HYDRA condensers are sold by your radio dealer, but if you have any difficulty in obtaining supplies, write to the Sole Distributors:

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Made by TELEPHONE MANUFACTURING Co., Ltd.

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This new J.B. Universal "Linacore" Tuner is suitable for use with either Battery or Mains valves. It has been designed to make possible the construction of really efficient receivers with the minimum possible complication and the maximum certainty of success. It simplifies set building considerably—and is far more efficient and compact than if home assembled. Complete with volume and reaction controls and all switching. Use this new Universal "Linacore" and get performance like a super-het!

J.B. "LINACORE" UNIVERSAL TUNER  
(FOR USE WITH BATTERY OR MAINS VALVES) Model B.P.U. (Cat. No. 2129), 65/-

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To Jackson Brothers (London) Ltd., 72 St. Thomas St., S.E.1

Please send me "Vivid Radio." I enclose 4d. in stamps to cover postage, etc.

NAME .....

ADDRESS .....

**FILL IN THE COUPON  
AND POST IT TO-DAY**

# With the Short-wavers

By KENNETH JOWERS

NOW is the time to fix up schedules for the coming winter months. You should make arrangements now with DX stations and you will be able to show a very satisfactory log later in the year.

VK2ZK, an Australian station which is heard fairly well in this country, wants to hook up with English amateurs or B.R.S. listeners. This station uses some 50 watts on C.W. and 'phone, and would like to hear from any European amateur who can keep to a regular week-end schedule for the next few months. So call up VK2ZK or write to him at Clareville Avenue, Sandringham, New South Wales.

### Worst Period

The past week has proved to be, as far as I am concerned, the worst period for short-wave listening that I have experienced for some months. Almost every evening is spoilt by exceptional static and on the few occasions that conditions might have been bearable interference from motor-car ignition wiped out most of the stations below 30 metres. In the end I was forced to use a simple two-valver with headphones with which I pulled in a fair number of DX stations.



*Sport and General Photo*  
Wireless operators busy during the extensive exercises of the Aldershot Command—receiving messages in an open field

VE1GH, VE2EE, VE2BT and VE3WA were also logged.

Don't forget to send your report to the amateur station which has been specially rigged up at the Chicago State Fair. This station uses the call sign W9USA and will acknowledge all reports from DX listeners. The International Reply Coupon must be sent with your letter.

The Scottish listeners seem to have had a very good fortnight, ending up to August 16.

T. G. S. Fotheringham, of Edinburgh, has logged some hundred stations, all genuine DX and not including the simple W stations. Amongst those logged were LUATN, CX1VV, LUATR, VP4AA, VE2DR, PY1AW, NY1AV, PY2BX, LU1CA, CX2AM, and numerous others. Mr. Fotheringham mentions that W2GQX has a regular schedule with CP1GB, and both stations were heard at good strength.

Our record listener, W. A. Clemenson, of Hampstead, points out that although W2DEW is no doubt receiving reports from listeners in this country, no QSL

card will be sent for some months yet as this station and several others are at the moment cut off from civilisation.

Although W2DEW is only using 50 watts, signal strength over this side is usually R8, as compared with R5, some of the 1-kilowatt American stations. Other transmitters who have accompanied W2DEW on his trip to the wilds are W2EJB, W2CVM, W2DEU, all of which have been heard in this country. A real DX station heard by Mr. Clemenson is the Japanese J5CE, who at the time was only using 20 watts—some going!

### American Sets and Valves

If anybody over this side has an American set or wants to know anything about the valves in it, drop a line to W5ATF, who has got all the dope you will want and will be glad to send it to you. And here again, don't forget the reply coupon.

Bill Ingersoll's portable station, using the call W9DXJ, is being heard well in Europe. W. A. Clemenson has logged him, working W10XDA. Many other readers report this reception. I should like to have all the details of the logs so that I can combine them in one letter which I am sending over to W9DXJ.

A query has been raised as to what has happened to the Italian stations. Only two have been heard so far, so please let me have any dope you can.

Readers of AMATEUR WIRELESS who are interested in short-wave reception should get one of the "Q" lock cards issued by the International Short-wave Club (London). The card is designed for hanging and measures 8½ in. by 10½ in.; it can be obtained free, but a stamp must be included for postage. Communications should be addressed to Arthur E. Bear, of 10 St. Mary's Place, Rotherhithe, London, S.E.16.

F. A. Beane, of Halstead, Essex, has done very well in spite of the conditions. Some of the DX stations he has logged include HJ1AB, the Japanese station on 46.5 metres, a Brazilian on 31.58 metres at R8 which could not be identified. Any information on this station would be appreciated. YV5RMO on 49.39 and YV3RC on 48.78 metres, and LSX, Buenos Ayres, working on the 28.98-metre channel were all heard very consistently. LS6, by the way, is regularly on the air, testing with WEP and WQSO in preparation for relaying the Byrd transmissions from the South Pole.

Many readers mention the colossal signal strength of K4SA, Porto Rico, JPH of Nasaki, Japan, and XEBT of Mexico City, using the 49.83 channel.

### Good Old Century Super!

Readers will join me in congratulating Mr. F. A. Beane, who was placed fifteenth in the Denton Trophy Contest for short-wave listeners, which is open to contestants from all over the world. Mr. Beane was placed first in Great Britain. The receiver in use was the 1931 Century Super, which is still going strong.

A Birkenhead reader, N. C. Hobbs, comments on the fact that the stations he hears rarely receive mention in AMATEUR WIRELESS. He cannot make his log compare with those of other readers. However, he has got nothing to complain about, for on the 40-metre band he has heard K4CV, K4RA, VP5SR, VE5TA and numerous American and Austrian stations. On the 20-metre band some of the best stations were W1AVC, W1WV, W1HUD, W2ZY, W2FQ and W9KE. The Canadians

# Television from Records

WHILE we are so busy trying to find ways and means of bringing a television service into operation, few of us have time to stop to think out some of its entertainment implications.

What I mean is simply this: we just can't begin to visualise what sort of entertainment service television is expected to provide. *There is no precedent.*

To talk of comparing television in the home with the home ciné is not very much to the point. Because whereas the home ciné is essentially a recorded visual sequence, television—*real* television—assumes the vitality of *actual* happening.

Televising actual happenings of a topical nature is not going to be very manageable. Quite apart from any technical difficulties, there is the obvious objection that when these events are taking place the vast majority of potential lookers are at work—as when the Derby is run or a thrilling episode occurs in a Test Match.

So far as sporting events are concerned and the run of ceremonies, such as the launching of big ships, or opening of docks, parliaments and playing fields, most of us are likely to be right out of the picture—literally!—if only actuality television is contemplated.

Obviously, when television does

come—in whatever form—there will be some provision for "bottling" the scenes of excitement. We shall have to put up with second-hand sights, just as now, sometimes, the news bulletins are interrupted to let us hear blattnerphoned running commentaries—actuality broadcasts of earlier in the day.

If we reconcile ourselves to the idea of a certain amount of secondhand, bottled, recorded—call it what you will—television, we



*Sport and General Photo*  
Manfred von Ardenne, well-known television pioneer, with his new receiver producing sharp and clear pictures sized 18 in. by 24 in.

begin to ask ourselves if the process could not be carried farther. Whether, in fact, we might not dare to consider the prospect of looking-in to recordings of, say, plays or variety.

Recordings on film are, of course, already practicable. Only the other day I saw and was entertained with some admirable film shots by the Loewe system, when it was being demonstrated over here. I could not help thinking then that television, thus "bottled" on film, would be very much better than no television at all.

**On Gramophone Records**

Lately another phase of the recorded-television idea has become apparent. The Plew Television Co., Ltd., with premises at Waddon, near Croydon, Surrey, has carried out experiments with ordinary gramophone records containing the essential ingredients of television signals.

It is intended, as a matter of fact, to put a series of these records on the market very shortly, in order that the firm's new simple television machines may be able to provide pictures independently of the rather meagre fare now available from London National.

This development may seem a little surprising—as indeed it is. We have always imagined that the wide gamut of frequencies needed for a good television picture could not possibly be accommodated on a gramophone-record groove.

**Fair Measure of Success**

Nevertheless, the Plew company has, by demonstration, proved that a fair measure of success can be attained with such a method. According to a *Television* witness, the reproduction of a recording of a B.B.C. television transmission was about 75 per cent. as good as the original.

Incidentally, the Plew people seem to have some very go-ahead ideas about simple television sets. They have already developed a mass-production type disc receiver for 30-line reception, with a suitable three-valve wireless set.

Three classes of this machine are now available. The first, the motor and disc alone in a cabinet for operation from an existing wireless set; the second as above but with the addition of a three-valve set; and the third a machine with a five-valve combination—two high-frequency stages.

Intended only for A.C. mains, the television set is synchronised from the mains supply by an ingenious toothed-wheel arrangement revolving between two magnets. No use need therefore be made of the B.B.C.'s synchronising signal.

A frictional drive for the scanning disc is utilised, giving a very accurate control of the motor speed—a lever on the front of the set providing a manual control micrometer in adjustment and silent in action.—A. H.

**B.B.C.'s Misleading Kilowatts**

THE power of British stations as quoted by the B.B.C. in the official lists is misleading in some cases.

West National, for instance, is rated at 50 kilowatts, but actually the power is nearer 30 kilowatts. This is because West National is synchronised with London National on 261 metres wavelength. It was found that with the Watchet transmitter on its full 50 kilowatts there was excessive interference with Brookman's Park. So West National works well below the advertised figure.

Another discrepancy is at Moorside Edge. Both North Regional and North National are officially rated at 50 kilowatts, but the National is below that figure and the Regional probably a little above it.—L. B.

**"A DEFINITE ADVANCE"**

Says Mr. A. K. JOWERS (of Amateur Wireless)



"Without question the introduction of the new magnetic alloy in the construction of the W.B. "Stentorian" range of loudspeakers represents a definite advance in design. I feel that these units are considerably better than the average loudspeaker of their type and price."

Such an opinion from a responsible designer is not lightly given.

To a technician, a list of interesting features alone is not sufficient—he requires results to prove the value of revised design or new discovery. In the W.B. "Stentorian" Mr. Jowers found them.

A W.B. "Stentorian" will bring an unbelievable improvement to your set.

You will hear a considerable increase in volume, due to the exclusive "Nital" magnet which at the same cost provides an enormous strength never before obtainable with a "commercial" material. Due to a new method of speech-coil assembly you will find in your reproduction crisper "attack," and fuller natural bass, and a new "realism" which will astonish you.

SEE IT  
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98



Model P.M.S. I

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- Stentorian Standard (PMS2) - - - 32/6
- Stentorian Baby (PMS6) - - - 22/6

Write for the new W.B. Stentorian leaflet.

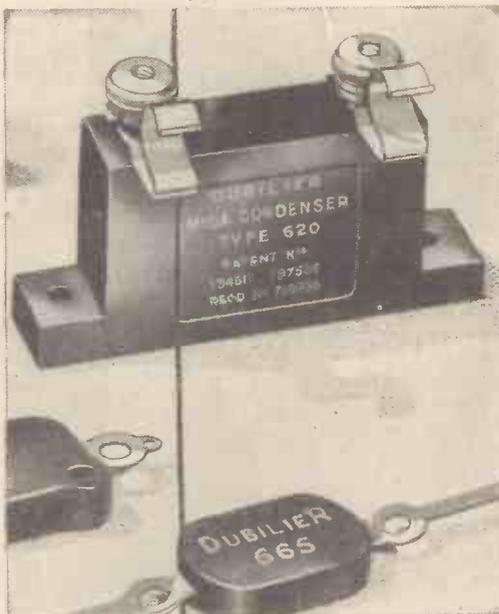


**STENTORIAN**

Whiteley Electrical Radio Co., Ltd., Dept. A, Radio Works, Mansfield, Notts.  
Sole Agents in Scotland: Radiovision Ltd., 233, St. Vincent Street, Glasgow, C2.  
Sole Agents in I.F.S.: Kelly & Shiel, Ltd., 47 Fleet Street, Dublin

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- THROUGHOUT THE WORLD FAMOUS FOR RELIABILITY
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## DUBILIER MICA CONDENSERS

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## Conditions are Improving

Says JAY COOTE

UNDOUBTEDLY, conditions are improving rapidly, and the last few days have brought us a sample of the kind of reception we may expect when the days get appreciably shorter.

Broadcasts, even from the more distant and also weaker stations, have simply rolled in, and my log has been again increased by the addition of lesser-heard transmitters such as Belgrade, Madrid EAJ7, Barcelona, EAJ1, Poznan, Riga and so on.

Towards the week-end one of the loudest broadcasts picked up was a recital of dance records given by Moscow No. 4 (RW39) on 360.6 metres.

### Most Unreliable German

Notwithstanding the alleged closing down of Radio Parede, the transmissions of Heilsberg (Reichsender Koenigsberg) are still subject to interference, and it is one of the most unreliable of the Germans to tune-in.

In the same way, Radio Lisboa (Barcarena), although clear in spasms, is frequently badly mixed up with the new 20-kilowatt Trondelag (Trondheim) transmitter, and it is only when the Norwegian has signed off that decent reception of the Portuguese can be secured. Its neighbour, Brussels No. 1, is a four-star performer; very little fading is to be noticed and the volume of its signals is remarkable.

By the way, contrary to information recently published, arrangements have now been concluded for the relay of concerts from both the Knocke Casino and Ostend Kursaal. As both make a point of engaging during August and September some of the best-known Continental vocalists and instrumentalists, it is well worth turning to this station now and again.

Although only working at low power (1.5 kw.), P.T.T. Toulouse, sandwiched between Midland Regional and Leipzig, can be heard fairly clearly on some evenings. If you do tune it in you might care to listen for a new interval signal which the studio has lately introduced; it is an old French melody, *La Tyrolienne des Pyrenees*, a fairly long excerpt played on a musical box.

Toulouse is one of the favoured French provincial cities, as in 1935 its present plant is to be exchanged for a 120-kilowatt transmitter. Rather silly, don't you think, when the city already has at its disposal a new 80-kilowatt station?

Recently at Geneva in literary circles the question of the best European broadcasting language was discussed. In general it was contended that French was not very suitable, that Spanish, Italian, and English were better, but were surpassed, in their turn, by Russian and German. It was decided that the most sonorous, tuneful and clearest was Welsh, but with the proviso that it was understood.

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As used by the leading set manufacturers this year.

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## New Loud-speaker Saves High Tension

WITH their new Stentorian range of loud-speakers, W.B. have made a marked advance in loud-speaker design. This season they are concentrating on three models, all of which will interest the home constructor.

During the past season they have been experimenting with a new highly efficient magnetic alloy which has been embodied in this new range of loud-speakers. At first glance one might perhaps be forgiven for thinking that the new magnetic iron is not of primary importance, but after the matter is given due consideration it will be realised that, due to the use of the new iron, the loud-speakers can be improved in many ways.

For example, they have been able to increase the size of the gap.

### Nearly Double Volume

Where the home constructor should be interested is that these loud-speakers give almost double the volume for a given input as compared with the more conventional type of unit. This means that the output valves in battery sets need not be so large, quality will be almost as good with a considerably lower high-tension voltage, and the anode current will be reduced or high-tension batteries will last very much longer.

Contrary to general expectations, these new sensitive units do not overload and will handle very high inputs. During our tests we were surprised to find that the Senior model could handle 5 watts without signs of distress.

The special quick and semi-automatic method of matching the loud-speaker to the output valve is still being retained. This feature is highly important when it comes to getting the best quality from a receiver. In future no one need worry about obtaining the correct ratio for the output transformer, as this can be accurately determined simply by moving a rotary switch to alter the transformer ratio.

### Overcomes Matching Troubles

Many readers have in the past experienced difficulty in matching up the loud-speaker with one already embodied in a receiver. The new W.B. units will, in future, overcome this difficulty, for they can be connected up and adjusted until the best quality and maximum volume are obtained.

To give some idea of the remarkable results to be obtained with loud-speakers using this new W.B. metal alloy, it has been decided by the manufacturers that it is quite unnecessary to make more than three models. These will cost £1 2s. 6d., £1 12s. 6d., and £2 2s., and will meet all requirements while results cannot be improved unless these figures are very considerably exceeded.

## NEXT WEEK!

- How to use an ordinary portable for car radio is the subject of a special article by Percy W. Harris, who has had great experience in this branch of radio.
- "A Stenode for the Home Constructor" is the title of an article that will tell you how this famous circuit has been developed so that the amateur can take advantage of it.
- There will also be a special feature explaining all the interesting things Constructor Crusaders could learn from the Radio Show.

## Easy Terms

Why wait weeks for that new Radio accessory? You'll get it quicker from N.T.S. Any items advertised in this journal on Easy Terms, Strict Privacy Guaranteed. Cash or C.O.D. if preferred. Orders over 10/- Carriage and C.O.D. Charges paid. SEND FOR QUOTATION FOR ANYTHING YOU ARE NEEDING.

### W.B. STENTORIAN BABY P.M. MOVING-COIL SPEAKER

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For Power or Pentode. Send only 2/6 for 7 days' trial. If approved, balance in 5 monthly payments of 5/6. Cash or C.O.D. Carriage, Paid, £1/7/6.



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Complete Kit of parts for building, less Valves and Cabinet. Send only 5/-. Balance in 11 monthly payments of 6/3. Cash or C.O.D. Carriage Paid, £3/7/6.



If Valves and Cabinet required, add £2/16/6 to Cash Price, or complete for 10/- deposit and 11 monthly payments of 11/6.

### N.T.S. DE LUXE P.M. M.C. SPEAKER

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A Superb Permanent-magnet Moving-coil Speaker giving Exquisite Tone.

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- 2.—Every member will also be entitled to free technical advice in connection with any or all of the four special Crusader sets mentioned above (each query must be accompanied by a stamped and addressed envelope for the reply). In the case of queries regarding any other "Amateur Wireless" sets the usual rules of the Information Bureau must be observed.
- 3.—All Constructor Crusaders are invited to contribute ideas and suggestions to the Constructor Crusaders' Corner. Constructive suggestions will be specially helpful and will be interpreted by the "Amateur Wireless" Technical Staff as far as possible to the advantage of all set builders.
- 4.—Immediately his application for membership has been approved every Constructor Crusader will receive a certificate of membership. Note that the membership number must be quoted in all future correspondence.
- 5.—Constructor Crusaders will be authorised to wear the badge of membership. Badges for buttonhole wear can be obtained for 1s. extra each, post paid.

To Constructor Crusaders, "Amateur Wireless,"  
 58-61 Fetter Lane, London, E.C.4.  
 (Enclose in envelope bearing 1½d. stamp.)

Please enrol me as a member of the Constructor Crusaders. I enclose postal order for 1s. to cover postage on four free blueprints and office expenses (and also an extra 1s. for buttonhole badge).\* It is understood that I shall be entitled to free technical advice on any matters concerning the four free blueprint sets. My name and address are:

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**CONSTRUCTORS OF Coils, Transformers, and Chokes.** Lists now ready.—Lumen Electric Co., 9 Scarisbrick Avenue, Litherland, Liverpool 21.

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**LIQUIDATORS CLEARANCE SPECIALISTS, 16/6 MOTOR PERMANENT-MAGNET MOVING COILS.** Huge Darwin maguet (list 49/6), 16/6

**R. & A. MOVING-COIL, ENERGISED, 7,500 ohms, 10,000 ohms, 10/-**

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**2-, 3- or 4-gang .0005 condensers, 6/-**

**MAINS TRANSFORMERS. Ekco, 200-250 input, 325-0-325, 4 v 2 amp, 4 v 4 amp, 10/-**

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**McMICHAEL D.C.-MAINS RECEIVERS, new, cartoned (list, £21), £6/0/0.**

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**LIGHT-SENSITIVE CELLS suitable for burglar alarms and television, 10/- each.**

**C.A.V. UNSPILLABLE CELLULOID ACCUMULATORS, 2 v. 40 amp., 7/- each**

**FERRANTI MULTI-RANGE TEST SET, 2 meters, £4/10/0.** Hundreds of cabinets and coils, past and present kinds. American valves stocked. Cheapest house in trade. Write us for quotation for anything radio.

**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 this page must accompany all queries.

Not more than two questions should be sent at any time.

The designing of apparatus or receivers cannot be undertaken.

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 Information Bureau and should see that their remittance covers the price of the Blueprint and the amount of the query fee.

We do not answer queries in cases where the fee is omitted.

Queries should be addressed to the Query Dept., "Amateur Wireless," 58/61 Fetter Lane, London, E.C.4.

**Pentode and Class-B Outputs for the Crusaders' A.V.C. 4**

Continued from page 197

chance they can touch the metallised baseboard—or that will earth them, too. If this happens you may have a lot of trouble with the ganging—as the capacity effects will shoot up.

Anode leads of the screened type shown as Nos. 41 and 42 must be earthed, otherwise the set will really go up the loop. Note that the second high-frequency pentode has two anode leads—but you must not earth the No. 40 screened wire.

Talking of leads, be sure you allow enough wire on the dial-light connections. The bulb has to move along the scale, remember.

**Direct Earthing**

Wire No. 55 earths the outer screen of the high-frequency choke—the only component that is directly earthed to the metallising of the baseboard, by the way. A soldering tag is fixed underneath one of the fixing screws for this lead.

We find the self-adjusting volume control works very nicely in keeping many of the foreigners at good volume without any trace of fading.

Just to end these notes, a few hints on the operation. The knob on the extreme left of the chassis is for wave-changing. Left for medium waves, right for long. Next to this is the volume control, which at minimum also switches off the battery supply.

**Use Reaction Sparingly**

Centre comes the tuning, of course, with super-imposed trimmer. To its right the differential reaction control, which peeps up those distant stations, but is not much needed for the majority of worth-while programmes. On the extreme right, the gramo-radio switch knob; when you use a pick-up to use fully screened knotted leads.

Separate cabinets are provided in the list of parts for set and loud-speaker.

We want your comments on this set. Let us have them, please. The more the merrier!

**Radio's Show of Shows**

Continued from page 206

without too greatly upsetting your present layout, the new Hivac class-B and driver valve combined is worth a look up. Actually it is three complete valves in one—triode-driver and two further triodes in class-B push-pull. (Stand No. 27.)

Then there is the Mullard PM22C, a pentode for those looking for a really high-class battery super-power output stage. Primarily this valve is intended for use with battery-economiser circuits, as it will take up to 20 milliamperes. The output is over 1,100 milliwatts—worth having if the power supply can be made adequate. (Stand No. 65.)

For that super-het you are making, the Mazda AC/TP, a triode and pentode in the same bulb, acts as combined first detector and oscillator. It overcomes all the little snags associated with super-hets. (Stand 18 and 58.)

Something like standardisation has been achieved with universal mains valves—the Marconi Osram group has introduced 13-volt 3-ampere universal valves in which every valve is fitted to a seven-pin base, with all grid connections at the top of the bulb.

**BANKRUPT BARGAINS.**—New list free. Any type set or kit supplied. Part exchange. A.C./D.C. mains sets from £4 complete with M.C. speaker. Regentone 30 m.a. WTA 32/6. W5A with charger 40/-. D.C. eliminators 9/6. Transformers from 1/6. Igranite midget 2/9. Resistance Fed 3/-. Dual coils from 1/6. British valves 1/0. Power, 2/-. Full range Tritron stocked. All goods brand new. Butlin, 143B Preston Road, Brighton Preston 4030.

**1,000 RADIO BARGAINS!**

Complete August lists now available. Enclose 3d. stamps for "THE RADIO GOLD-MINE" to-day.

- 27/6 CLASS B A.C. ELIMINATOR KITS, with full assembly instructions.
- 22/6 C.L.B. III SEALED KITS. An unprecedented bargain.
- 18/6 S.G. III KITS. Complete in sealed cartons. Full diagrams.
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- 12/6 SHORT WAVE III VALVE KITS. Will tune in the world.
- 10/6 CLASS B CONVERSION KITS. Complete in sealed carton.
- 10/6 STRAIGHT III KITS. In sealed carton, with full instructions.
- 10/- SAMPLE BARGAIN COMPONENTS PARCEL. Guaranteed value 30/- to 40/-.
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- 6/10 BLUE SPOT 66K SPEAKER UNITS. List 15/-
- 6/6 D.C. ELIMINATOR KITS, with full instructions and sundries. Sealed.
- 6/6 WESTERN ELECTRIC PENDANT MIKES (list 15/6), a real quality microphone.
- 5/11 BALDWIN UNITS for horns, public address, etc. (list 21/-).
- 5/11 ORMOND TWIN-GANG CONDENSERS with S.M. drives (list 12/6).
- 5/- SAMPLE BARGAIN SUNDRIES PARCEL. Guaranteed value, 15/- to 20/-.
- 4/11 A.V.C. UNITS (list 10/-), with full instructions for any battery receiver.
- 4/11 WESTINGHOUSE H.T.5, H.T.6, H.T.7 RECTIFIERS.
- 4/11 H.T.8, H.T.9 MAINS TRANSFORMERS, boxed.
- 3/11 LISSEN OUTPUT TRANSFORMERS, 1:1, 3:1, 8:1, 23:1 (list 17/6).
- 3/11 WESTINGHOUSE L.T. RECTIFIERS, 1 amp., 4 volt, 6 volt.
- 3/3 IGRANIC IRON CORE COILS (list 10/6).
- 3/3 FAST AND SLOW-MOTION air-spaced Variable Condensers.
- 2/11 DR. NESPER 4-pole balanced armature units (list 10/6).

**THE "GOLD-MINE" CHAIN STORES**  
Branch No. 1 now open.  
For the use of all personal callers, open Mondays-Fridays, 8.30 a.m.—6 p.m.; Saturdays, 1 p.m. (2 minutes from London G.P.O.).  
**THE "GOLD-MINE" STORES**  
24 Aldersgate, London, E.C.1  
Phone: NAtional 7473 (private branch exchange).

- 2/11 BRITISH 2-v. BATTERY VALVES, fully guaranteed. Det., H.F., L.F., Power, S.G., 5/-; C.L.B., 7/10.
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- 2/11 BRITISH RADIOPHONE FULL vision straight line, dial and knob.
- 2/11 COLUMBIA L.F. TRANSFORMER, 3:1, 5:1 (list 10/6).
- 2/6 IRON CORED DUAL-RANGE COILS, with diagrams.
- 2/3 VARLEY SQUARE PEAK DUAL RANGE COILS (list 15/-), boxed with full diagrams.
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- 1/11 SCREENED DUAL-RANGE COILS with 6-term base.
- 1/11 MICROPHONE TRANSFORMERS, 100:1. Worth treble.
- 1/2 READY RADIO SHORT WAVE COILS. 6 terminal base (list 6/6).
- 1/2 ASTRA DIFFERENTIALS, .0001, .00015, .0003, 20 hen. (Chokes (list 8/6), 1/11).
- 1/- POLAR MICA DIELECTRIC Variable Condensers, .0003, .0005.
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- 7d. MICROPHONE BUTTONS, very sensitive, worth 3/-. V. holders, 4.5 pin 3d.; 7 pin, 6d.
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- 3d. Each Fixed condensers, .0005, .005, .0001, .0004, .001-.006, 1, 2 6d.
- 3d. ONLY, POST FREE. Enclose 3d. stamps to-day for your August number of THE "RADIO GOLD-MINE." By far the most comprehensive lists of up-to-date surplus goods (Kits, Components and Accessories) yet produced, with a general price level lower than ever before. Avoid delay. Send (enclosing 3d. stamps) to-day.

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**NEVER BEFORE**  
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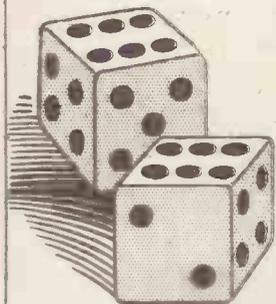
Most wireless receiving Sets to-day are so highly sensitive that only very short aerials are generally necessary, but this sacrifices stability. When the Aerial is a short one, your Set will be more selective, but it may be unbalanced, on the verge of oscillation, and hard to control. The new ELECTRON GLOBE AERIAL remedies this and restores balance to the set, corrects fading and stops 'blasting,' as the set is so easily controlled and maintains selectivity at a higher efficiency. The ELECTRON GLOBE AERIAL gives brilliance and sparkle to the duldest transmission, greatly improving the tone and volume. It has special insulated clamps so that it can be easily fixed to any type or size of steel or wooden mast. Is splendid on water pipes near the window for accessibility, or can be screwed to any wall or flat surface, roof, etc. A handsome ornament to the gable, or as a most efficient Indoor aerial.

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