

**THESE RADIO COMPONENTS—** By CAPT. ECKERSLEY (See Page 153)

# Popular Wireless

Every Thursday  
PRICE  
3d.

No. 515. Vol. XXI.

INCORPORATING "WIRELESS"

April 16th, 1932.



## Also This Week:

A TALK WITH A  
YUGO-SLAVIAN LISTENER

□ □ □

HOW TO CONNECT UP  
THE ECKERSLEY A.C. TWO

□ □ □

NOTES FROM THE MIDLANDS

□ □ □

FULL DETAILS OF  
The W.L.S. SHORT-WAVE ONE

□ □ □

PARTS FOR OUR SETS

By G. V. DOWDING, Associate I.E.E.

□ □ □

A FURTHER LIST  
OF OFFICIAL "P.W." EXHIBITORS

□ □ □

MIRROR OF THE B.B.C.  
STATIONS WORTH HEARING  
SHORT-WAVE NOTES  
Etc., Etc., Etc.

Our cover photo shows two of the keepers of the Eddystone Lighthouse with their radio set. Broadcasting has proved an immense boon to the lonely watchers of the seas.

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# Get the MAY number of **THE WIRELESS CONSTRUCTOR**

On Sale  
Everywhere  
This Week

Every home constructor should make a special point of looking out for the May number of "The Wireless Constructor," which will be out this week. It is filled with contributions from distinguished authors, and packed with valuable information on all aspects of radio. Among the constructional articles are full details of two first-class sets:—

## The "Vi-King" Super

This is the first super-heterodyne receiver to be described for home-construction by Victor King, whose receiver designs are always extremely popular. He has some important things to say about super-hets. which will appeal to all readers, whether or not they are interested in building this particular set.

## The "Pentode" Two

With its fine tone, ample volume, simple operation and low cost, this two-valver constitutes an ideal receiver for anyone who does not want or cannot at the moment afford an elaborate outfit. It has two-band tuning, and although it uses only two valves it by no means confines reception to the local or home stations.

**Remember also that—**

# JOHN SCOTT-TAGGART, F.Inst.P.

WRITES EXCLUSIVELY FOR "THE WIRELESS CONSTRUCTOR"

and in this number contributes:—

## FROM MY ARMCHAIR

Among the diverse topics discussed by "S.T." in this informal chat are queries raised by readers about reception, hints on aerials, and notes on choosing a mains unit.

## DECOUPLING SIMPLY EXPLAINED

Many listeners must have wondered why decoupling is so essential in a multi-valve receiver, how it works, and what makes the set start "motor-boating" if decoupling is omitted. In this article Mr. Scott-Taggart tells the whole story in easy-to-understand language.

INCLUDED WITH MANY OTHER FEATURES IN THE MAY NUMBER ARE:—

Shall I Design a Portable ?  
Round the Dials  
The Month on Short Waves  
Queer Queries  
Pick-up Hints and Tips

Making Tuning Readable  
With Pick-up and Speaker  
Wireless Woodwork  
Where to See the S.T.300.  
A Practical Man's Corner

etc., etc.

# THE WIRELESS CONSTRUCTOR

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Set of Specified Valves	1	0	0
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### COSMIC III STAR

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Cabinet—to specification	17	6	

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CYLDON Junilug Double-Drum drive 0005 condenser	1	10	0
Eckersley Tuner	15	6	
R.L. Audirad output choke	8	9	
Set of Specified Valves	1	8	6
Specified Cabinet	17	6	

### SINGLE DIAL SUPER

Utility Triple Gang Condenser with minimum trimmers and split-end vanes	1	7	6
Utility Drum Drive	10	0	
Varley Square Peak Coil (Extensor Type)	15	0	
Coltone Oscillator Coupler	10	6	
3 Lewcos 126 Kc. Intermediate Frequency-Band Filters	1	11	6
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<b>KIT "B"</b> Author's Kit with valves less cabinet.	£4:16:0
CASH or C.O.D.	
or 12 monthly payments of 8/10	
<b>KIT "C"</b> Author's Kit with valves and cabinet.	£5:13:6
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or 12 monthly payments of 10/5	

**FINISHED INSTRUMENT** with valves and cabinet, Royalties paid, £7:5:0, or 21/- down and 11 monthly payments of 12/5.

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CASH or C.O.D.	
or 12 monthly payments of 8/-	
Specified Valves £1:6:0.	Specified Cabinet, 17/6.

<b>KIT "B"</b> Author's Kit, with valves but less cabinet.	£5:13:6
CASH or C.O.D.	
or 12 monthly payments of 10/5	
<b>KIT "C"</b> Author's Kit complete with valves and cabinet.	£6:11:0
CASH or C.O.D.	
or 12 monthly payments of 12/-	

## "W.L.S." SHORT-WAVE ONE

As described this week.

<b>KIT "A"</b> Author's Kit, less valves and cabinet.	44/6
CASH or C.O.D.	
or 12 monthly payments of 4/1	
<b>KIT "B"</b> Author's Kit with valve.	£2:11:6
CASH or C.O.D.	
or 12 monthly payments of 4/9	
Specified Value, 7/-	

### ECKERSLEY A.C. 2

As described in last week's issue.

<b>KIT "A"</b> Author's Kit, less valves and cabinet.	£5:6:0
CASH or C.O.D.	
or 12 monthly payments of 9/9	
Specified Valves, 28/6.	Specified Cabinet, 17/6.

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Complete with multi-ratio input transformer.	5/4
Cash Price £2/17/6	
Balance in 11 monthly payments of 5/4.	only

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Cash Price £3/7/6.	6/2
Balance in 11 monthly payments of 6/2.	only

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<b>W.B. P.M.1 PERMANENT MAGNET MOVING-COIL SPEAKER.</b> Complete with input transformer.	Send
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<b>ULTRA IMPERMANENT MAGNET MOVING-COIL SPEAKER,</b> with input transformer.	Send
Cash Price £2/15/0.	5/-
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<b>★ ATLAS A.C. ELIMINATOR, TYPE A.C. 244.</b> Three tappings, S.G., detector and power. Output, 120 volts at 20 m.a.	Send
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<b>EKCO H.T. UNIT.</b> Type A.C. 25. For multi-valve sets requiring up to 25 m.a. 3 tappings, S.G., detector and 120/150 volts. For A.C. Mains.	Send
Cash Price £3/17/6.	7/1
Balance in 11 monthly payments of 7/1.	only

<b>REGENTONE H.T. ELIMINATOR</b> for D.C. Mains, Type W.I.F. Tapped 60/70, S.G. and 120 v. at 12 m.a.	Send
Cash Price £2/7/6.	4/4
Balance in 11 monthly payments of 4/4.	only

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As described in Feb. 1932 "Wireless Constructor."	
<b>KIT "A"</b> Author's Kit less valves and cabinet.	72/6
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or 12 monthly payments of 6/8	

<b>KIT "B"</b> Author's Kit, with valves but less cabinet.	£5:4:9
CASH or C.O.D.	
or 12 monthly payments of 9/7	

<b>KIT "C"</b> Author's Kit complete with valves and cabinet.	£5:19:9
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P.W.16/4/1932

## The Set the Experts Recommend



"IT IS, INDEED, ONE OF THE  
FINEST 'THREES' I HAVE  
TESTED" says *Popular Wireless*

*And other experts are just as  
enthusiastic - read these tributes*

"The sensitivity of the receiver is very high, and the selectivity of the band-pass circuits is all that is likely to be required by the majority of listeners. . . . The interior of the receiver is a masterpiece of neat, efficient design . . . it combines extreme ease of handling with a sensitivity that is above the normal for a set of so few valves. It is, indeed, one of the finest 'threes' I have tested" says *Popular Wireless*.

"The 'His Master's Voice' 3-valve is one of the most outstanding triumphs of the British Radio Industry. It would be difficult to overdo praise for this excellent table-console set, which has a great many points that distinguish it from the ordinary run of sets . . . The quality of reproduction from the self-contained moving-coil loudspeaker is simply great." *Amateur Wireless*.

"Practically every modern feature likely to enhance the performance of the set and simplify its operation has been incorporated. Sensitivity is well above the average for a receiver of this type. Separate tuning scales are provided for both wavebands . . . We found the calibration quite accurate and very helpful. All scales are illuminated by concealed lamps." *Wireless World*.

### BRIEF SPECIFICATION

3-valve radio receiver and moving-coil loudspeaker in walnut cabinet. Mains operated (A.C. or D.C.). Band-pass tuning. Marconi valves. One tuning knob. One volume control—new "His Master's Voice" frictionless pattern. One operating switch—new continuous action pattern. Unique illuminated control scales, showing only what is in operation—long waves, medium waves, or the playing of gramophone records from a pick-up. Mains aerial (A.C.). Plugs for additional loudspeaker.

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**RADIO—"True to Life"**

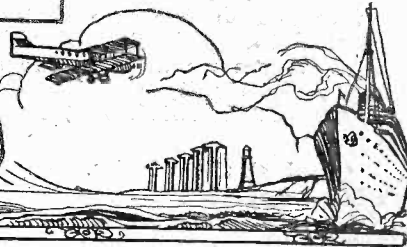


# Popular Wireless

**LARGEST NET SALES**



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**SOCIETY TIT-BIT**  
"NOT SO EASY"  
SLOW MORSE  
GARDEN LUCK

## RADIO NOTES & NEWS

**SHY CHAMOIX**  
**A FAIR COP**  
**RADIO AND HISTORY**  
**THE "COSMIC"**

**Are We? We are Not!**

**N**O, not downhearted a little bit. Sterling is appreciating and the world is putting its money on the big British drum. We, the taxpayers, have no money left, but we do see life, and see it steadily and whole.

Not even the pin-pricking of the Ibero-Hibernian demagogue (no prizes!) of Dublin can put down our tails. Even during 1931 the radio trade increased its turnover by almost 50 per cent, and the Post Office issued 900,000 new licences!

As against the 1,250,000 sets sold last year it is estimated that during this year 1,800,000 new sets will be sold. Mostly "Cosmics," what?

**Life of Morse.**

**T**HE letters and journals of Samuel F. B. Morse, whose name is imperishable from the annals of telegraphy, have been brought together by his son, Mr. E. L. Morse, and published in the U.S.A. in two volumes at ten dollars a set. The books are illustrated with reproductions of Morse's paintings, and with diagrams relating to his designs for the telegraph.

This news will be of world-wide interest to those engaged in the communications business. (I should love to have the books myself, but ten dollars in sterling is not spendable, at one fell swoop, on books during these hard times!)

**More U.S.A. News.**

**OWEN D. YOUNG**, of the famous "Young Plan," and Chairman of the Executive Committee of the Radio Corporation of America, got 27 votes for

President of the U.S.A. at a recent election amongst the students of Princetown University.

Dr. Irving Langmuir, well-known for his work in connection with valves, has received the \$10,000 prize of "Popular Science Monthly" for notable scientific achievement.

During the search for the Lindbergh baby, all the resources of the U.S.A. cable, radio, telegraph and telephone companies were employed; even a part of Lindbergh's

The Society's trustees are the Midland Bank, Ltd. This should create confidence in the minds of the hardheaded Lancashire folk! Good luck to the new society and its researches.

**"Not So Easy, My Dear Watson."**

**S**O W. L. S. has unearthed a sleuth-hound who professes to have discovered that W. L. S. and "Ariel" are one person, and that I (we or he) am (are or is) a Cumberland amateur! Far from this being a clue to "Ariel," it is a joke at W. L. S.'s expense. But he must take it like a sportsman, and give up his Cumberland accent; while I shall have to change the colour of my wig and resign from the H.A.C., using only the longest waves in future.

**Charged While You Wait?**

**I** HAVE here a report that a South Shields man has designed a switch-board with which it is possible to charge or discharge an accumulator within a few minutes. He has also produced a type of cell which is robust enough to take in a full cargo of "juice" almost at a gulp. So, if all this proves to be accurate, we shall not need to trouble

quite so much about "charging rate" in future.

**Slow Morse for Students.**

**T**HE Radio Society of Great Britain has organised programmes of slow Morse transmission for the benefit of students of that code. The transmissions take place on Sundays at 11.0 a.m. on about 160 metres; they are preceded by

(Continued on next page.)

### HENRY'S HAUL—THE NEW B.B.C. DANCE ORCHESTRA



Here is Henry Hall with the members of his B.B.C. Dance Orchestra, which recently took over the job that had been so long and so ably done by Jack Payne and his "boys." Note the smart uniforms—one of Henry's ideas.

estate was invaded to form a telegraph headquarters, and television portraits of the baby were on the air.

**Society Tit-Bit.**

**T**HIS is to announce that the Preston and District Radio Research Society has been formed and is ready to enrol more members. Particulars may be obtained by writing to the Secretary, Mr. J. E. Bradley, 89, Friargate, Preston.



# NEWS—VIEWS—AND INTERVIEWS (Continued)

an announcement and last for ten minutes.

This arrangement will, I hope, be welcomed and utilised by many of those who from time to time have written to me about their difficulties in getting Morse practice. If you use these practice programmes, please write and inform the Society, at 53, Victoria Street, London, S.W.1.

## Luck o' the Garden.

TOOK a Saturday off last week for the express purpose of trimming the trees in my garden and wasting another gallon of paraffin on that ever-cursed dump of sodden leaves which I can't burn up. Having acquired a twelve-foot tree-pruner I sallied out and practised on the "May" tree which is trying to shove the veranda down. Excellent! Most of the bits fell



next door! I then came to the lilac tree which supports my aerial.

Taking special care not to clip the wire—I clipped the wire. The insulator shot away like a bullet and smashed a pane in my pet ground frame, besides startling our new kitten into catalepsy! Yes, life is odd!

## Short-Wave Note.

C. H. B. asks for the name of the station which was sending V's, ABC and OKN on about 50 metres at 20.30 on February 12th. Sorry I cannot trace the call-letters; perhaps some listener on that "band" can do so. In answer to C. H. B.'s further query for a book of call-signs, I would again refer him to the "Radio Amateur Call Book Magazine," a quarterly, at 5s. 6d. a copy, obtainable here from Mr. F. Carter, Flat A, Gleneagle Mansions, Streatham, London, S.W., who compiles the British section. The current issue contains over 190 pages, 11½ in. × 8½ in., of up-to-date information about amateurs in every country which boasts one or more.

## What Makes Chamois Shy.

SWITZERLAND, being a sort of a trilingual country, has had to plan its broadcasting system accordingly. The German-Swiss have Beromunster, and the French-Swiss Sottens. Italian Switzerland is to have a station near Tessin; it is on order by the Administration of Telegraphs and Telephones from Marconi's, and is expected to be ready by the end of the year.



I am informed that it is to be erected on Monte Ceneri and that its power will be 15 k.w. (unmodulated) in the aerial. So far no one has written to say that radio causes avalanches and makes chamois shy. But there's all eternity before us!

## Book Broadcasts.

PUBLISHERS and booksellers are complaining that the B.B.C. is neglecting to devote an appropriate proportion of its "ether time" to books and literature. The *Publisher and Bookseller* has analysed the B.B.C.'s programmes and the amount of time which is given to various subjects and finds that, calling the share of books and literature 1, music is 47.4; news, 7.7; education, 5.3; religion, 4.3;

## "THE COSMIC CIRCUIT."

The Editor, "Popular Wireless."

Sir,—Wishing to give to a friend living in the country a simple wireless set, I consulted my chauffeur, Mr. L. T. Walker, who has made sets for himself, and he drew my attention to an article by Mr. G. V. Dowding about a special 3-valve set on page 1253 of "P.W." for 13th February, 1932. Mr. Walker offered . . . . . to make up and wire a set in accordance with the blue print diagram which accompanied my copy of "P.W."

In the course of a day after the things arrived he had put them together in accordance with the blue print, and on connecting to a small aerial inside a barn here, it worked well, straight away. The switch that changes easily and automatically from long waves to short in the process of tuning is an attractive feature. Daventry 5 X X was very loud; various other and continental stations could be easily got; and the performance was excellent. I listened to the set that night, and next day sent him off to my friend's house to rig up an aerial and install it. By evening the whole thing was done.

Whether it be by reason of the tuning of the aerial, which the connections abundantly arrange for, or for a combination of reasons, I have seldom heard a 3-valve set giving a louder or better results in this neighbourhood. It was seldom necessary to use any reaction. Other amateurs may like to take advantage of the arduous, but successful efforts of Mr. Dowding and his co-workers to evolve the simplicity and efficiency of this remarkable set. The inventors describe their determination to design "a first-class instrument for ordinary broadcast reception," and I am glad to testify that they have succeeded.

Yours truly,

Nr. Salisbury.

Oliver Lodge.

vaudeville, 2.85; science, 1.15, and art, 0.41. A few other types of matter are included in the full analysis.

## Let People Know.

I AM inclined to agree that more time should be used by the B.B.C. on talks about books, though I am taking this analysis as correct for the sake of argument; I should like to know the B.B.C.'s side of the question, however.

To the objection, which I foresee, that people want more amusement and less

education, I would reply that the B.B.C., having revealed to tens of thousands the delights of the world of music (a world of whose magnitude and beauty many were ignorant), it can reveal also, and to far more people, the delights of the world of books, to their everlasting benefit and joy.

## A Fair Cop.

I DID not expect to catch the "Telegraph and Telephone Age" napping, but it seems that even Homer nods sometimes. In a description of an American aeroplane radio set, this periodical says, "Operating on a short wavelength which pierces the roar of motors, it requires only one-twentieth the amount of power used by a woman's curling iron!" Leaving out the "dame" stuff, I would ask the acute, non-effete, editor of the "T. and T. Age," how the length of anything can pierce a noise or roar. "P.W." pauses for a reply, being always ready to learn. (In the meantime our artist suggests his solution!)



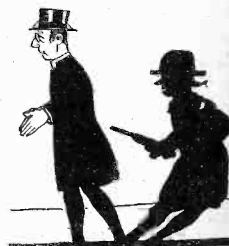
## Wireless and History.

LIEUT. - COMMANDER KEN. WORTHY'S first and fascinating article, "How Wireless Would Have Altered History" (April 2nd), which dealt with the defeat of the Spanish Grand Fleet in 1588 has reminded me that the lack of wireless contributed to that defeat in a positive manner. After the unsuccessful British expedition to the Low Countries the year before, Drake decided to "sing the King of Spain's beard" by sea, as a set-off to the military failure. He got out of Plymouth only just in time to escape orders from Queen Elizabeth that he was not to annoy Spain.

As a result he did enough damage to the Armada lying in the Tagus to put off the threatened invasion of England for over a year. But wireless, had there been such a thing, could have recalled him before he lost sight of Plymouth Hoe.

## Promotion for Pirates.

THE "Indian Wireless Magazine" in a well-meant Open Letter to "pirates" reveals that it cherishes astounding ambitions for the conversion and future status of those gentry, for the concluding sentence runs, "Let us hear that you have turned from 'Pirate' to 'Prelate'." A long jump, that! One other phrase struck me as worthy of comment. "You stand like a Thief in the Docks." Catching the next boat for the nearest non-extradition port, no doubt!



ARIEL.



# THESE RADIO COMPONENTS

# A COMPLETE AND CRITICAL REVIEW

by  
Capt. P. P. Eckersley

M.I.E.E.

THE Editor has suggested to me that I should write a series of articles on components. I have consented.

How slowly things develop. What a series of first approximations! Five years ago—or is it six?—I heard reproduction which satisfied me. Nine-tenths of reproduction I hear to-day is—well, frankly, awful! I return to my detector and my two-note mag. and my moving-iron speaker, I turn it on, I listen, I wonder. My set was expensive when it was bought, more expensive than it need have been, because it did not sell in large quantities. It has no spectacular qualities, it will not reach out far—it simply makes music and natural speech.

The fact that I cannot get “foreigners” is not the set’s fault. I live in a place where there is much shielding and much electrical interference. I do not deny that there is a lot of pleasure in reaching out. But I do think that fundamentally one wants quality. Whatever one rakes in, surely it should be presentable?

## The Basis of Judgment.

This is not irrelevant to my introduction. One must have a basis of judgment. My basis is that the resulting noise shall be pleasant.

I have another introductory paragraph or two. They concern another difficulty. I see that difficulty so clearly that it may take me a whole article to explain it. Read on; fear not.

I feel that the amateur movement requires encouragement. To think, to plan, to create, brings us nearer happiness than any other occupation we have so far discovered. “He is wrapt, he is lost in something,” are words we often hear, and they mean what I have said, that to create is to forget oneself, to forget oneself is to find room to remember happiness.

One may have a passion to build bridges, great, swinging arcs of steel, contemptuous of angry flood and gaping ravine. One may stand staring at the beauty of a locomotive and itch to be the brain to conceive its subtle power.

One may see in the fragile tautness of an aeroplane, swooping and flashing in the

Our Chief Radio Consultant here commences the most important series of articles on the subject of modern radio products that has ever been published, for he is going to “write his mind” without fear or favour. P. P. E. can always write interestingly, and in these exclusive critiques he will use the full force of his virile pen in an endeavour to tear the last veils of mystery and camouflage from the present day products of the wireless industry for the benefit of “P.W.” readers.

sunlight, something intensely personal; one may long to make and design aeroplanes. In every one of these cases one is forced to satisfy only one of those longings by making bridges or engines or aeroplanes one’s career.

It is difficult to choose, and circumstances sometimes come along and rule them all out and one must be something else. Here, it seems to me, is where wireless may fill a whole side of one’s life because one can create and design within the limits on one’s own home, and within the limits of one’s spare time.

The work is delightfully compact, and yet it is a full scale model which develops; a model which, when created, can give one and one’s own real pleasure in its performance. More than this, there is at one’s disposal a mine of stimulating information, books and journals of all kinds.

## “P.W.” Comradeship.

I enjoy writing and working for POPULAR WIRELESS because I always feel it is not just work as such—it is a sharing with you of my knowledge and experience so that you may have as much pleasure in reading as I have in writing.

My difficulty is to sense your mind, to know what you would like me to tell you—if I can. My difficulty in writing these articles on components is to know what standpoint you would like me to take up, which way I should expose the problems for you. You see, a component is only a component in a whole set.

I give you an example of my difficulty in terms of a perfectly fair instance. If you designed a set for a flat, overall characteristic between 30 and 8,500 cycles per second, you might with one loudspeaker and one station get a lovely result; with another loudspeaker and/or another station, a perfectly foul result.

For example, some loudspeakers are bass heavy if you give them equal voltage input over the full gamut 30 to 8,500 cycles. But lots of sets cut off bass because they use a pentode with the output (auto) transformer “tapped up” too much. Now, the balance between a really too bass heavy loudspeaker and a really too high effective impedance output valve may just even up perfectly. But if you were to substitute the pentode by a low impedance valve, that loudspeaker would boom the place down.

## Balanced Design.

Again, some types of interference, as typically that frying noise you get when the signal is a bit weak, have a characteristic frequency around the six thousand mark. Now the “perfect” loudspeaker reproducing full strength at 6,000 cycles and giving all those very clear “s” sounds in “Sister Susie’s sewing shirts for soldiers,” gives a terribly strong frying noise interference too.

A theoretically worse speaker cuts off at 5,000, and the background noise is far less.

Analogously, So-and-So’s plug may be perfect for the X.Y.Z. engine; it may be a failure in the C.B.A. The M. magneto—but I labour the point.

What I must do is to ask you to keep all these points of view in mind when I am discussing components, and to help you I will try and make it clear from what point of view my criticism or praise is directed. Then we shall all understand one another. At least I hope so.

I think it better to take components from end to end. Aerial and high-frequency, detector, note magnification and then loudspeakers. One might then sum up and see how to balance these components with a design, a design to suit the purse and pleasure of the user.

Next week, then: Coils and Tuners.

NEXT WEEK CAPT. ECKERSLEY SURVEYS “COILS AND TUNERS”



## NOTES FROM THE MIDLANDS

By OUR SPECIAL CORRESPONDENT.

With the extension of the B.B.C. headquarters, the use of a temporary outside studio and preparations for the new "Daventry" stations, there is much activity in the Midland Region. Our Correspondent comments on the latest developments of this activity and has much of interest to say concerning programmes.

**P**ROGRESS with the extensions to the Midland Regional headquarters in Broad Street, Birmingham (where a new large studio and other additional accommodation is being provided) is not rapid. There have been hitches, mainly of a legal character.

In the meantime programme activities in the Midlands go on very much as usual, but with certain interesting new ventures. The gramophone recitals introduced by Mr. Robert Tredinnick (one of the Birmingham announcers) have aroused enormous popularity, and are to be continued at quite frequent intervals.

### A One-Man Show!

For some time after the transfer of the other announcer, Mr. Jack Cowper, to London, in February, Mr. Tredinnick carried on alone, but Mr. T. A. G. Lidell has now taken up the position vacated by Mr. Cowper. Mr. Lidell graduated at Oxford in 1930, has studied music, and has been on the stage.

Mr. Charles Brewer continues to produce his bright and breezy shows (for which he often writes many of the lyrics and much of the music, as well as doing the producing). His series of "Nine-thirty Novelties" come to an end, for the time being, on April 11th, and on April 25th, he is offering listeners a programme of rather a new type called "The Bogey Foresome."

Then he is going up to London to produce "Little Miss Make-Believe," which was one of his most successful shows. This will be broadcast on May 3rd and 4th, Regionally and Nationally, with Clapham and Dwyer in the cast. This is the second time Mr. Brewer has been invited by Headquarters to produce a show there.

By the way, with typical fastidiousness, the B.B.C. has sent a note to the newspapers pointing out "as slight mistakes have occurred" that Mr. Brewer's correct title is Principal Assistant and Producer. So now we know.

### The "Nine-thirty Novelty."

The versatile Percy Edgar, Midland Regional Director, will be one of the cast in the "Nine-thirty Novelty" on April 11th. The enunciation has been the weakest point in most of the "Novelties." (This does not refer, of course, to Mr. Edgar, who has one of the clearest and most pleasing of voices, but to the chorus singing).

Mr. Edgar plays another broadcast rôle on April 23rd, when he will be down at Stratford-on-Avon giving a running commentary on the scene preliminary to the opening of the Shakespeare Memorial Theatre by the Prince of Wales, whose speech will also be broadcast. This outside relay is of National importance, but there is also a tendency in Regional programmes to send the microphones out into the towns and country more than formerly.

The Midland Regional programme does not include nearly so much outside broadcasting as the North Regional programme, but it is certainly on the increase. This raises the question of whether there is more good-class outside material (such as orchestras, concert parties, and theatre relays) in the North of England than in the Midlands.

Or is it simply the result of a difference of outlook between the B.B.C. staff in Birmingham and their colleagues in Manchester, the Northerners attaching first importance to reflecting outside activities in the radio programmes, and the Birmingham officials giving greater importance to studio productions?

In its Midland "Towns" series of programmes the Midland Region has, of course, reflected external talent in a way that the North has never attempted. On April 30th, Wolverhampton is the subject of one of these broadcasts.

The B.B.C. has foreseen that when the alterations to the premises at Birmingham

in "P.W." that a film company had approached the B.B.C. with a view to making a "talkie" behind the scenes at the Midland Regional station. The company was British Movietone News, and the B.B.C. agreed to the distribution of such a film in the Midlands only.

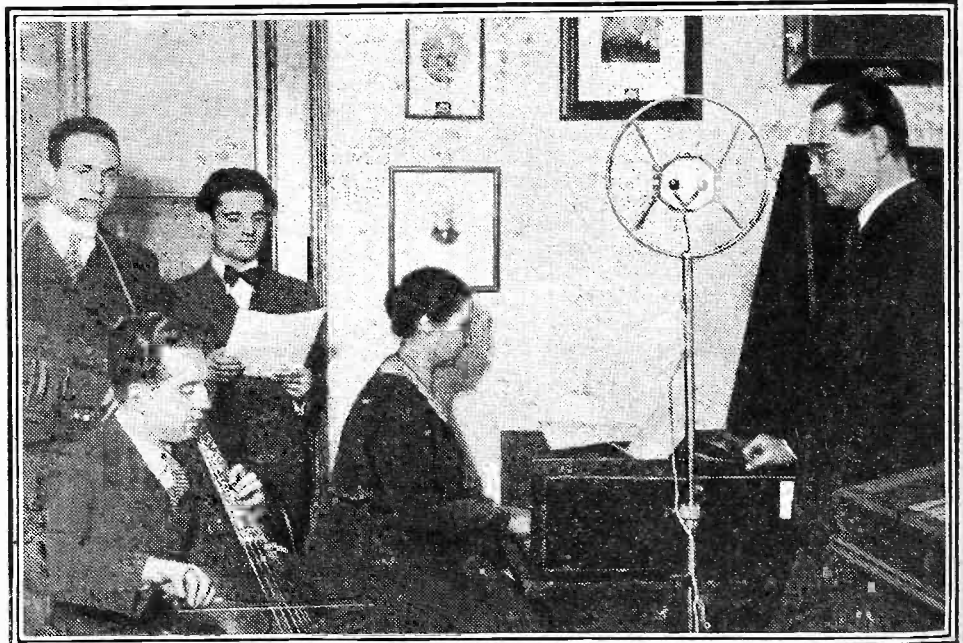
The film company came to the conclusion that it would not be economical to take the film unless it could be shown more widely. The B.B.C. has now suggested that it shall be taken at the London headquarters and have agreed to it being distributed nationally, and at the moment of writing arrangements for the taking of the film are in hand.

### The B.B.C. Film.

It is surprising that this sort of thing has not been done before, but probably the B.B.C. has been waiting until its new premises in London and elsewhere were occupied before it thought of showing itself to any great extent on the screen. There would, for instance, be little point in taking a film (except as an historical record) at Daventry, seeing that such changes are to be made there. When the seventeen aerials of the Empire short-wave station have been erected, the site of the old 5 X X will be strangely transformed.

The B.B.C.'s mobile transmitter has been steadily testing the proposed site for 5 X X and 5 G B at Droitwich, and in the meantime the two short-wave transmitters intended for erection at Daventry are being built by the Standard Telephones and Cables Company in London.

## INSTRUMENTS OF THE PAST IN MODERN BROADCAST



A scene recently in the Vienna studio during a 200th birthday celebration concert of Joseph Haydn, Austria's great composer. Both the piano and string instrument were actually the property of the great musician himself.

get properly under way there might be some dislocation of studio activities, and arrangements have therefore been made for the use temporarily of an outside studio in Birmingham. This studio was offered to the B.B.C. by Messrs. William Bayliss, Ltd., who had recently constructed it for their own purposes. It measures 100 ft. by 21 ft., and 15 ft. high, and will be used for musical programmes.

I mentioned in my last Midland Notes

Both on account of the transfer of 5 X X and 5 G B nearer Birmingham, and on account of the higher power which they are to have, the signal strength of these two stations in the Midlands area will be greater than at present.

But what is more important is that when 5 X X has 100 kilowatts power it will really and truly be a "National" transmitter, capable of giving a service from Land's End to John o' Groat's.





# ON THE OTHER SIDE— A TALK WITH A YUGO-SLAVIAN LISTENER

By A SPECIAL CORRESPONDENT.

Situated on the shores of the sunny Adriatic, with mingled peoples and diverse religions, Yugo-Slavia is a singularly fascinating country. And you will thoroughly enjoy this interview with a Yugo-Slavian lady who is a keen radio listener.

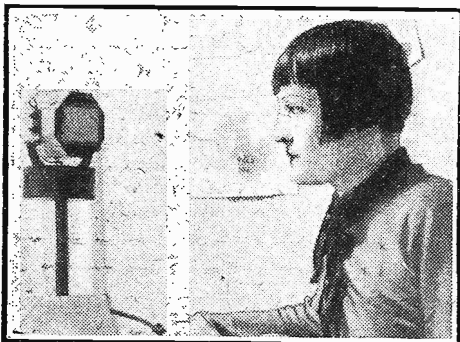
A CHARMING friend of mine, who, apart from being a Serbian with long listening experience in Yugo-Slavia, has the advantage, possessed by few mere listeners, of knowing all about the other side of the Yugo-slav microphones, has very kindly told me all about radio in her beautiful country and has let me have some interesting photographs as well.

## A Unspoilt Country.

"Few Britishers know Yugo-Slavia," she said. "It has not yet become a tourist country for western Europeans, although Germans and Czechs and Hungarians flock to enjoy the Dalmatian sunshine every year.

So does Bernard Shaw from time to time, but the mass of the tourists stay in France or go farther off to Greece: and I am glad this is so, for tourists spoil even the most unspoilt country. I am sorry, too, because

## HAVE YOU HEARD HER?



She is Miss Jelena Bilbija who announces the "Radio-Belgrade" programmes on 430.4 metres.

my country is hospitable and would be glad to welcome inhabitants of that cold and dreary island to sunny Adriatic coasts.

"Our population is made up of Serbs, of orthodox faith; of Croats, mostly Roman Catholic; of Slovenes, all Roman Catholic. In Bosnia the Serbs are mostly Mohammedans—the long Turkish invasion, which lasted until fifty or sixty years ago, is the cause of this.

## Peasants Predominate.

"I am telling you all this, as otherwise you will never be able to understand our broadcasting service. And then there is another important point—we are still considered one of the most important corn countries of Europe; most of our people

live on the produce of the land, they are peasants. In Southern Serbia there are still many people who are unable to read or write; on the other hand, we are a very musical people.

"You will understand now that it is impossible that broadcasting be as important as in other countries. In Slovenia the Roman Catholic organisations own and operate the broadcasting service. A priest is the station director, another priest the musical director.

"Our Roman Catholic priests are first of all Slovenes, and then Yugo-slavs, and then Roman Catholics.

## The First Balkan Broadcaster.

"In Croatia there is another broadcasting station. It was the very first broadcaster in the Balkans. It was opened in 1926.

"Enthusiastic amateurs were responsible for this. In Belgrade, the capital, a French company had a station, then the Post Office took over, and at last the London Marconi Company built a transmitter, and since then Belgrade has had regular broadcasting.

"It is typical of the political situation that a foreigner was chosen managing-director at Belgrade, and most of the capital is foreign, too, as far as I know.

"We listeners only number a little over 30,000 in the whole of the country. And the number only increases by hundreds and not by hundreds of thousands, like in Britain.

"We have to pay 300 dinars a year for our licence, but the postman comes and collects every month, so that we pay on the instalment system, similar to listeners in Germany and the other countries near us.

"You will be unable to grasp that the only people who ever listen-in are the people in the towns; and only a very small percentage of the total number of inhabitants live in our towns.

## Little Time for Listening.

"In Slovenia things are different. The village priest has a receiver, and one or other of the well-to-do peasants may buy a receiver. But in Croatia, by the time the man is back off the fields he either goes to bed or sits out in front of the door and does some gossiping, or goes to the 'pub.'

"People often compare us with Russia. Especially the conditions in Southern Serbia. Apart from the fact that we are not, and I think will never be, Bolsheviks, there is one thing against listening there—absence of the sun. We live outdoors, in the open all day long. And if we want music we play it ourselves.

"In Russia, with the long winter and the general organisation of Bolshevism, it is quite possible to gather the peasants together in halls and make them listen. But we are a free people and our peasant is an upstanding man on his own ground, and not a cultivator of other people's land. So you can't force him to do a thing he does not incline to.

## A Privilege of the Few.

"Broadcasting could greatly help our peasants, could give them an interest in many other things besides the cultivation of the ground, but it will take a long time till they will spend money on a set.

"Then there is another thing which will keep broadcasting in Yugo-Slavia a privilege of the few for a long time yet—our Post Office collects the licence money, the companies get a part (far too little) for their expenses, and that is all.

"The Post officials, and the State as a whole, is not awake to the importance of broadcasting as yet; or, at least, it seems so, for otherwise the government would have helped to build a high-power station so that our peasants would be able to listen-in on a crystal set. In Poland every person can hear Warsaw on a crystal set.

"As long as we have to buy valve sets, except in the towns, I am afraid the number of our listeners will remain limited. But, in spite of all this, we have good programmes. "And we regularly interchange with Vienna and Prague for the big symphony concerts and opera performances. Our own opera-house performances from Belgrade, Zagreb and Ljubljana are regularly relayed. "And now I hope I have given you an idea of our country, its three broadcasting stations, all belonging to separate companies and the small band of enthusiastic listeners."

## PICTURESQUE!



In contrast with the smart young thing seen in the background note the picturesque garments of this Croatian peasant woman.

MIRROR OF THE B.B.C.

By O.H.M.

# THE B.B.C. AND CANADA

PUBLICITY FOR B.B.C. OFFICIALS—"THE RUNGS OF THE LADDER," Etc.

MAJOR GLADSTONE MURRAY, who manages so successfully to obscure his name and activities on this side of the Atlantic, finds himself now in the full glare of American publicity. He has gone to Ottawa to give evidence before the Parliamentary Committee there on the subject of the future organisation of broadcasting in the Dominion.

If cabled accounts are accurate, this B.B.C. Canadian has found himself in the centre of a violent controversy in which he has given at least as hard knocks as he has received. A correspondent in Ottawa tells me that Major Murray created a profound impression. One Canadian Cabinet Minister is reported to have said, "this fellow may change the trend of radio thought of the North American Continent."

## Publicity for B.B.C. Officials.

It seems to me that the time has come for the B.B.C. to reconsider its policy about personal publicity for its officials. There is, I understand, a rigid rule against personal publicity for regular members of the staff, the only exceptions at present made being those directly associated with dramatic production.

I feel that restrictions of this kind are not only silly in themselves, but also unfair to other members of the staff. Broadcasting is a monopoly in this country, and most people agree that this is right. But one of the consequences of monopoly is that members of the staff have no alternative employer in the same line of business.

This being so, surely they should have the benefit of restrained and dignified publicity of a personal kind if only to develop for them a little general goodwill.

## "The Rungs of the Ladder."

Famous men, among them Lord Beaverbrook, Lord Ashfield, Mr. C. B. Cochran, Mr. J. H. Thomas, the Poet Laureate, and Mr. W. H. Davies, will describe some of their early adventures and experiences in

a new series of talks which starts at the end of April, under the title of "The Rungs of the Ladder."

The talks will be given on Monday evenings. A new Wednesday feature arranged by the "Talks Department" is a further experiment in broadcast dialogue called "Encounters," which is to follow the lines of the recent "Conversations in the Train."

"A Topical After-dinner Show" is the sub-title of a Rex Evans' programme called

## HI, THERE! GET OFF MY CORN!



Even scarecrows have taken to radio now! This one was fitted with a loudspeaker, to which the farmer connected his set, in the hope that the constant noises would scare the birds. But, as a matter of fact, they seemed positively to like it!

"Merry-go-round," to be produced by C. Dennis Freeman on April 12th. Elsie Randolph, who appeared with Jack Buchanan in the Hippodrome piece "Stand Up and Sing," Jean Melville, and Billy Thorburn are in the cast.

I have already given details of the arrangements to broadcast the speech of the Prince of Wales when he performs the opening ceremony of the new Shakespeare Memorial Theatre at Stratford-on-Avon on Saturday, April 23rd, and also of the running commentary by Mr. Percy Edgar describing the scene for listeners on the Continent and America, as well as the British Isles.

## From Stratford-on-Avon.

On the same day, which is St. George's Day, Shakespeare's "Henry 5th" will be broadcast from National transmitters, as it has been arranged by Peter Cresswell, who will also act as producer. On Sunday, April 24th, National listeners will again be linked with Stratford-on-Avon for the relay of the Matinée Concert which the City of Birmingham Orchestra is giving under the conductorship of Leslie Howard. Frank Mullings, the well-known tenor, is to be the solo artist.

The oldest piece of music ever sent into the ether—"A Hymn to Apollo" which was composed nearly three centuries before the birth of Christ, is to be included in "Caractacus," which, as I have already stated, is to be produced by Peter Cresswell in May.

The hymn is to be used as a theme for the Chorus of Priests in the play. Its existence was unknown for many centuries until 1893, when it was found during excavations at Delphi by a French archaeologist who unearthed a slab of marble such as was used for recording works of art in the days of ancient Greece, and upon which the musical symbols were inscribed.

## Coming Events.

I promised in a recent note to give readers some brief details from time to time of forthcoming programmes for National and Regional listeners. Here are a few for the first weeks of May:

Sunday, May 1st—Violin Recital by Temianka; Orchestral Concert, conducted by Leslie Heward (Regional).

(Continued on page 173.)

## "A SET YOU CAN GET THE WORLD ON."

The Editor, POPULAR WIRELESS.

Dear Sir,—I noticed in "P.W." that you said move the moderator coil about a little. I did, but that was of no use, so I took it off from where it was by the short-wave coil and placed it beside the dual range coil, 1 1/2 inches from it and 1/2 inch up from the baseboard. That did the trick, and now I get any amount of stations, 35 up to now—Lisbon, a German station, Rome, Writtle, Moscow, air-stations, all on loud-speaker on the short wave. Six on the long- and 23 on the medium.

It is now 11.45 p.m. and I have just picked up Danville, New York, playing records. W J V and W G Y on the loud-speaker (which is a Rees-Mace Cone, made for a 7-valve set). It is still coming through O.K., and I am quite excited about it, and so is the wife. It is 158 on the dial.

I am more than proud of the set, for I can say to friends, "There is a set you can get the world on." Again I thank you for such a wonderful set, and the best of luck to "P.W."

I remain,

Yours truly,

E. J. BANON.

7, Canning Place Mews, Kensington.

# THE LISTENER'S NOTEBOOK

A rapid review of some of the recent radio programmes.

ALTHOUGH—as foreshadowed in these notes some weeks ago—it was inevitable that the talks on the theatre should continue, the B.B.C. was clearly taken by surprise when lovers of the stage replied with no uncertain voice that they *did* want such fare over the ether. Now Mr. Agate has to prepare for May, and it is to be hoped that he will have got rid of that troublesome cough by then.

Philip Ridgeway's return with his parade was marked by his usual bewildering bustle, and really, a little more attention should be given to the way the chairman and some of his party rush the patter. Mr. Ridgeway is a live wire in this branch of entertainment,

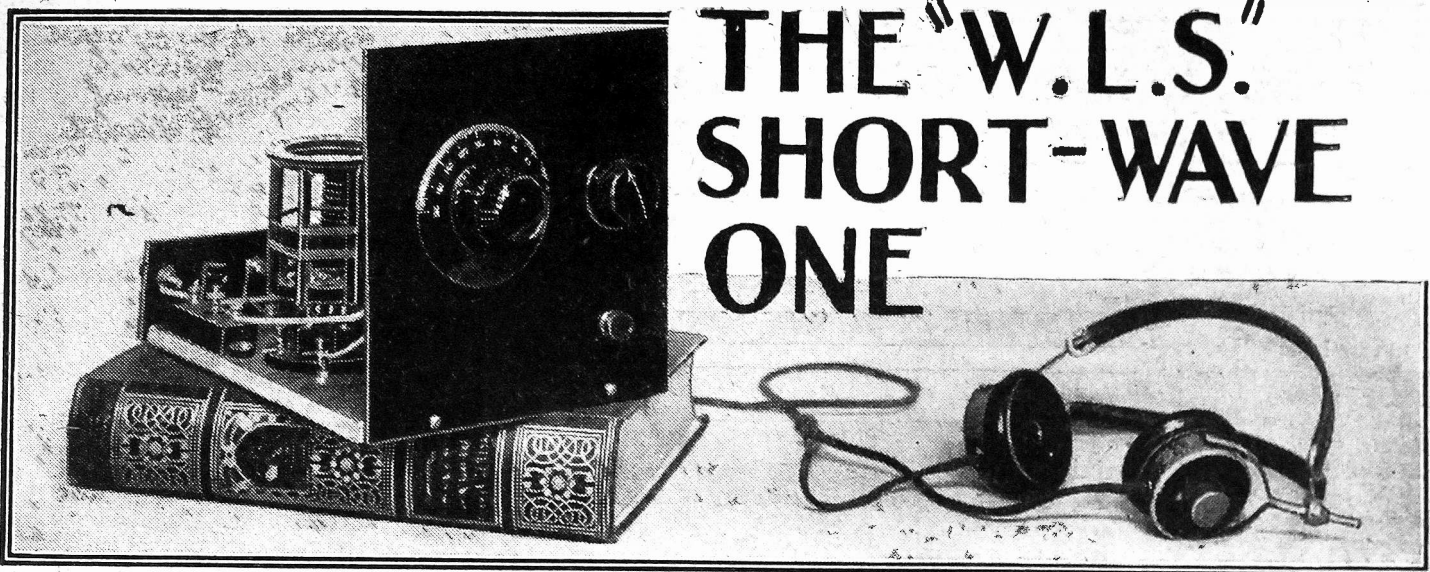
and so one can rest assured the hint will be considered.

Some of the singers may soon be well-known, and one turn that must have been favourably received was the singing of "As in a Looking Glass," accompanied by the human trombone.

I listened the other night to the Children's Hour. It came from the North Regional Station. What curious children they must be in the North! And yet one wonders if they really are pleased with what they get.

It was doubtless intended that "The Gypsy Baron" should be the big musical (Continued on page 172)





READERS who are unable or do not desire to build a modern all-in set such as the "Cosmic" will find this little one-valver plus an ordinary outfit for medium and long waves an attractive alternative.

Through the medium of replies to the queries that I sometimes ask in "Short-Wave Notes," I make the acquaintance of many of "P.W.'s" more enthusiastic short-wave listeners. From the response to any particular query or remark I can judge fairly well the amount of interest that is taken in the particular subject I refer to: and that is the main reason for the existence of this single-valve short-wave set.

It is made not only for the newcomer to short-wave work (for whom it is eminently suitable) but also for the enthusiast that cannot content himself with one set, however well it works, and must always be trying out something new.

#### Good Reasons for a "One."

As I write this I can almost hear the sound of raised eyebrows at the idea of using "a mere one" for any purpose. But don't be misled—there are several very

In response to numerous requests, W. L. S., one of "P.W.'s" short-wave experts, has designed a real "Hot Stuff" one-valver with a world-wide range. And in this and following pages you will find full constructional details for building this remarkably inexpensive and efficient little receiver.

good reasons for using a "mere one" for short-wave work.

#### Three Important "Tests."

Let me enumerate them very briefly before we begin talking real business. First of all, many readers do not feel inclined to play about with their broadcast receiver in such a way as to receive short waves on it. The family is always liable to want a particular item from the local station just as you are listening to the lions roaring in Nairobi. If, therefore, you *must* build a separate set for short-wave work, you will want it to be cheap, simple and efficient.

This little set passes those three tests without any trouble.

Secondly, although the louder short-wave stations can be put on the loudspeaker with a "two" or a "three," it is the weaker ones that are the more interesting, and these necessitate headphones. If you are going to use headphones, you can do it on a "single" and still hear everything that is worth hearing.

#### Avoiding Background Noise.

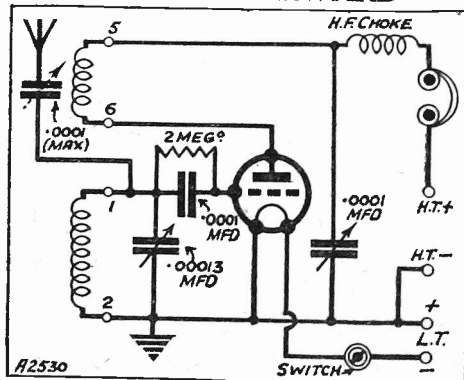
Thirdly, the trouble about the distant short-wavers is not so much that they are *really* weak as that they are weak compared with the background noises. That being the case, you are not going to be any better off if you use lots of amplification.

In fact, the single-valver scores over all others in that particular respect—the background is as low as it can be made. This background can always be clearly heard; so it follows that any signal strong enough to come through the background will also be clearly heard.

If it *isn't* strong enough to cut through it, well—you wouldn't hear it on the most  
(Continued on next page.)

### VERY FEW PARTS ARE REQUIRED FOR THIS WONDER SHORT-WAVER

#### PERFECTLY STRAIGHTFORWARD



- 1 Panel, 7 ins. × 7 ins. (Permeol, Becol, Peto-Scott, Ready Radio).
- 1 Baseboard, 7 ins. × 9 ins., and sheet of copper foil the same size.
- 1 Cabinet to fit (Pickett, Camco, Peto-Scott, Ready Radio, Osborn, Morco, Gilbert).
- 1 Slow-motion condenser, .0001 or .00013 mfd. (Ormond, Polar, J.B., Cyldon).
- 1 Reaction condenser, .0001 mfd. (Ready Radio, Telsen, Lotus, Cyldon, Wavemaster, Graham Farish, Igranice, Polar, J.B., Ormond).
- 1 L.T. push-pull switch (Ready Radio, Telsen, Wearite, Goltone, Bulgin, Colvern, Peto-Scott, Igranice).
- 1 H.F. choke suitable for short waves (Lewcos No. 11, R.I., Wearite, Polar, Ready Radio, Telsen Binocular, Tunwell).
- 1 Valveholder (Telsen, Lotus, Wearite, Bulgin, Clix, Igranice, Graham Farish, W.B., Magnum).

- 1 .0001-mfd. fixed condenser (Dubilier type 610, T.C.C., Ferranti, Formo, Telsen, Goltone, Sovereign, Lissen, Graham Farish, Igranice, Watmel).

- 1 2- or 3-meg. grid leak and holder (Lissen, Dubilier, Telsen, Ready Radio, Ferranti, Sovereign, Graham Farish, Loewe, Watmel).
- 3 Skeleton coil formers and one base (Goltone).
- 1 .0001 max. compression condenser (Formodenser, Goltone, Sovereign, Lewcos, Telsen, Graham Farish).
- 1 Terminal strip, 7 ins. × 2 ins.
- 7 Terminals (Belling Lee, Bulgin, Igranice, Eelex, Clix).

#### ACCESSORIES.

VALVE.—H.L. Type (Mazda, Marconi, Osram, Cossor, Eta, Six-Sixty, Mulard 2DX, Tungram, Dario).

BATTERIES.—H.T. 60-volt ordinary capacity (Lissen, Pertrix, Drydex, Ever-Ready, Magnet).

ACCUMULATOR.—2-volt (Lissen, Exide, Ever-Ready, Pertrix, Ediswan, G.E.C.).

PHONES.—Ericsson, etc.

## THE "W.L.S." SHORT-WAVE ONE

(Continued from previous page.)

expensive set on the market, unless the set were equipped with an automatic gadget that stopped all commercial stations, trolley buses, vacuum cleaners and generators at a touch of the knob!

In case I might be accused of contradicting myself, let me say that a set like the "S.G.4" is intended for receiving the better of the short-wave stations reliably on the speaker; while a "single" like this is more of a set for the DX man, who wants to hear all those funny stations that are so difficult to pick up, but so exciting when you have got them.

### Efficient Detector.

The last reason for the existence of this set is rather more obscure. If you confine yourself to a detector valve only, you have just got to make it reasonably efficient to do much with it. If you pile on the note-mags, you will be getting beautiful signals, but your detector efficiency may become worse and worse without your knowing it. With many two-valve short-wavers, if one were to remove the L.F. side one wouldn't have anything left at all!

As proof of that I may say that several friends and chance acquaintances who have heard my "one" have admitted that I am getting louder signals than they do on two!

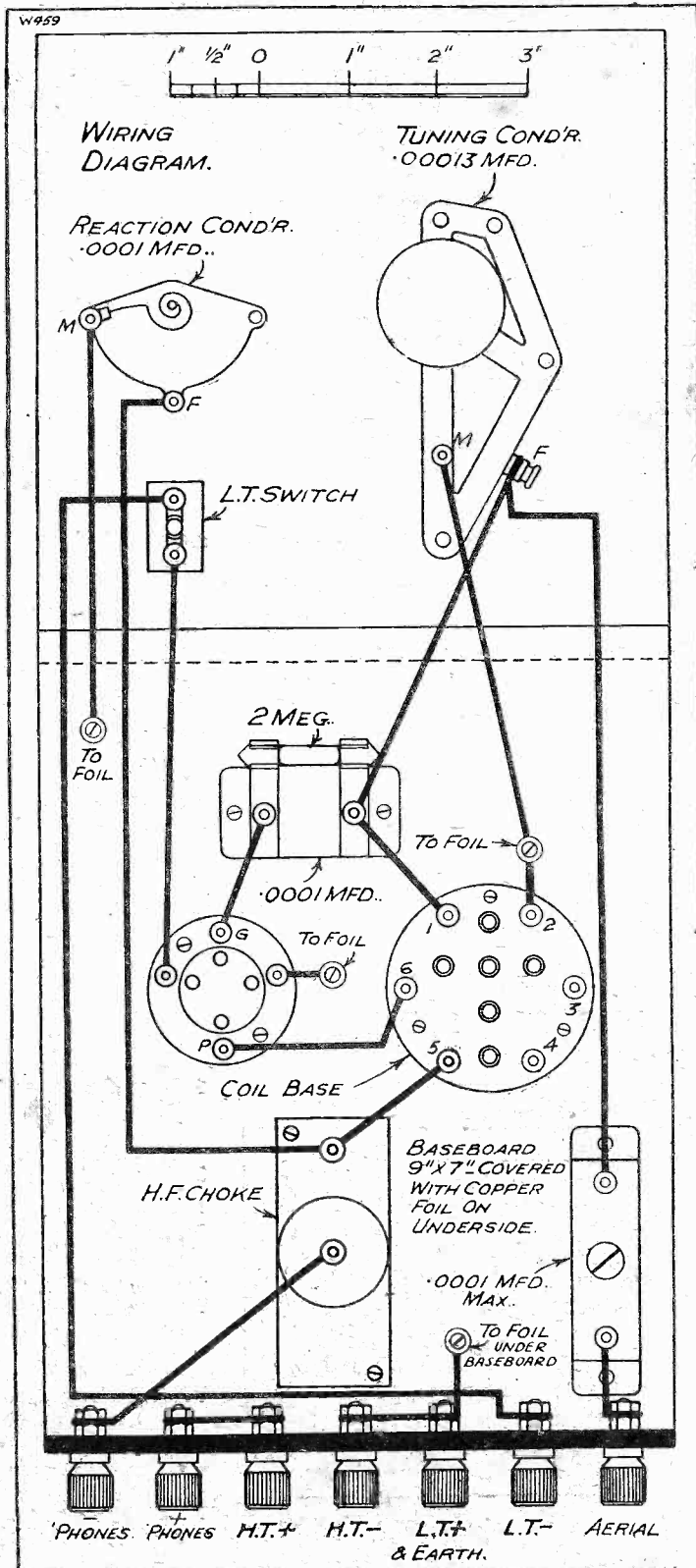
### Specification.

So now we will start! The specification is as follows: Circuit, straight "throttle-controlled" variety; coils, home-made, simple but good; layout, compact but not cramped; general construction, ordin-

ary panel and baseboard, but with copper foil underneath the latter, and all "earth" connections taken straight through to it. Aerial coupling, capacity method, using a "Formodenser." Tuning by .0001 variable, and reaction by the usual small reaction condenser.

A glance at the photographs will show you that the set is not at all unconventional. All the important leads are very short—note the grid leads and those from the coil to

## WIRED IN THIRTY MINUTES



The wiring of The "W.L.S." Short-Wave One offers no difficulties even to the novice. The whole job, right from start to finish, need not occupy more than half-an-hour at the very outside. Follow this diagram carefully, and you will be sure of success.

the condenser that tunes it. I have used a full-size panel in case the set is to be housed in a cabinet, but the two condensers might very well be mounted on small metal brackets, thereby economising yet further and giving the set that real "experimental" appearance.

Let me add, before going further, that if you have such a thing as a low-frequency amplifier about the place, you automatically become the possessor of a loudspeaker receiver for the short waves. I often plug this little set into my radio-gramophone and shake the walls to tunes from Schenectady and Pittsburg.

### Some Points that Count.

I can hear readers saying to themselves: "He always preaches about making the detector circuit efficient; but how does one go about it?" A sensible query, too. Well, here are some hints. First, take another look at the leads from the coil to its tuning condenser. Note, not only the shortness, but the *directness*. The condenser really is directly across the coil, and the tuned circuit is a compact affair. It does not include half the wiring in the set and the L.T. switch, like some I have met!

Next, the coil itself. It is wound on a skeleton former, and the actual amount of insulating material in the field of the coil is pretty small. Likewise, there is not much metal about the place, except the end of the tuning condenser, which is far enough away to be harmless.

The grid condenser and leak, too, are taken "en route" from the grid terminal to the top of the coil. And all leads that have to go to earth do so *quickly*, through the medium of a 4 B.A. brass bolt. The copper foil underneath the baseboard is earth, so far as a short-wave set is concerned, and it matters very little whether you connect an external earth or not. Very often you will be better off without it. For this reason no earth terminal has been provided, but L.T.+ may be earthed if desired.

### How the Aerial is Coupled.

The two windings on the coil-former are the grid coil and the reaction coil. The aerial is capacity-coupled in this case because this method usually gives stronger signals, and we want the strongest possible signals this time. In a multi-valver I certainly prefer inductive coupling, and loose at that, because it is not signal strength but quietness that one is after then. Capacity-coupling is a little bit liable to increase the background noise if made too tight, but here we have it variable and can alter it to suit our own location.

I have been carefully thinking over the general arrangement of the set, and I cannot find any possible source of trouble, even to the inexperienced. The charm of a single-valver is that there is nothing to go wrong, or even to cause little bothers. It can't threshold howl—and if you don't know what that means I will not damp your ardour by telling you! Suffice it to say that it is a trouble tied up with the L.F. side of short-wavers. The detector valve is of the "H.L." class.

If you wire the set up just like the original, you will not find any trouble from hand-capacity effects, which were delightfully conspicuous by their absence! Please note that the "earth" foil is connected to L.T.

(Continued on next page.)



## THE "W.L.S." SHORT-WAVE ONE

(Continued from previous page.)

positive, which is also connected to H.T. negative. The switch is in the L.T. — lead.

Now we must talk about the coils for a little. The six-pin formers used are very efficient for the job, and the business of winding is really absurdly simple. Two

are left blank in the case of these particular coils.

All your coils are made in the same manner, with  $\frac{1}{4}$  in. between the insides of the grid and reaction coils every time. "Close coupling and few turns" is the motto with these coils, and it is a very good motto where short waves are concerned.

You will probably want to cover all wavelengths from about 18 metres to 100 metres. Three coils should do this for you. "A" (18-30 metres) has three turns grid winding and three turns reaction.

"B" (29-60 metres) is the one we have just talked about—9 grid and 5 reaction.

"C" should cover roughly 55 to 100 metres, and the best size for that will be 15 turns grid winding and 8 reaction. These figures will apply to 26 D.S.C. wire, but it is not vitally important that you should use that size. In any case there will be small variations in your wiring—perhaps in your variable condenser—and certainly in the coils themselves, that make it impossible for me to give you an accurate calibration for your set.

### Seven Metres.

You will therefore have to find out for yourself where you are in wavelength with the help of the rough guide I have just given you.

You may wind coils of all shapes and sizes, even up on the broadcast waves, for which you will require about 60 turns grid and 25 reaction.

If you want to receive 7-metre broadcasting (when it happens!)  $1\frac{1}{2}$  turns grid and 2 turns reaction will do for you. This particular set works perfectly well there, and I have received signals on it on 7 metres. (Perhaps I had better add here that they emanated from a wave-meter on the other side of the room!)

So you will see that, in the language of the "talkies," it is an "all-purpose, all-pocket, all-people's set."

### Use of Aerial Coupling Condenser.

One tip here may not be amiss. If you find, having made coils to my specification, that your wavelength ranges are wrong, you can alter them quite considerably by resetting your aerial coupling condenser. Generally speaking, this will need to be nearly all out. If you screw it inwards your wavelength will naturally go up.

You can only find your wavelengths by listening to everything you hear until you identify it. Then one of "P.W.'s" or "M.W.'s" many lists of short-wave stations will help you to find where you are in wavelength.

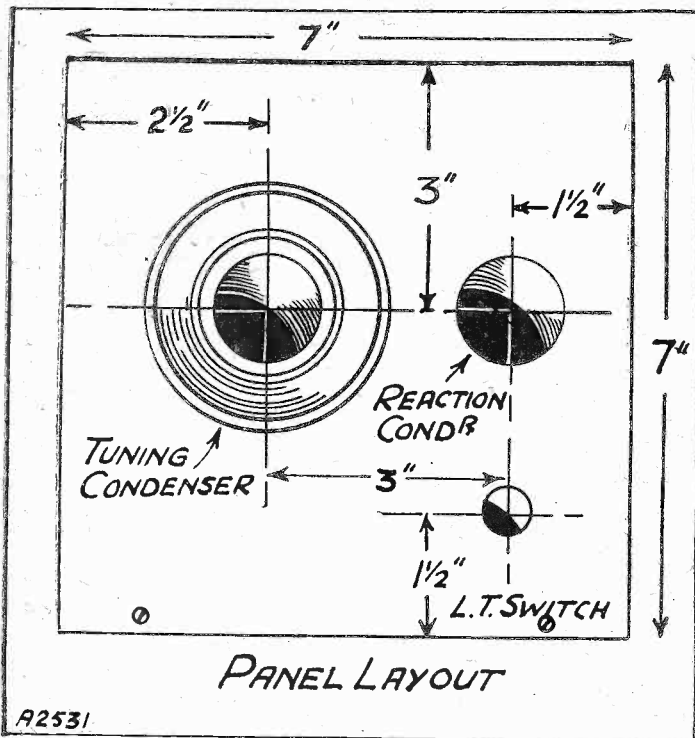
On the 40-metre coil you should receive two groups of stations. One of them occupies the band between 31 and 33 metres, and includes the G.E.C. station W 2 X A F at Schenectady, N.Y., as well as Sydney, Zees, and others.

The other "band" is between 47 and 51 metres, and includes some half-dozen Americans, Nairobi, Moscow, the Vatican City, and Chi-Hoa, Indo-China.

In between these two groups is the 40-42-metre amateur wave-band, occupied by innumerable amateurs of all countries, using both telephony and C.W.

But half of the fun of short waves consists of finding out things for yourself, so I will not spoil your pleasure by telling you everything.

### A SEVEN BY SEVEN PANEL



The panel is quite a small affair, and there are only three controls. Most panel components are arranged nowadays for one-hole fixing, so it should only be necessary to drill the ebonite at the places marked. All the measurements are clearly indicated.

coils are wound on each former. The lower, and the larger of the two, is the grid coil. This begins on Pin No. 1.

Having attached your wire to this pin, you will need to cut a small notch at a point about 1 in. up the nearest "rib" to the pin. This is just to hold the first turn and prevent the whole winding from slipping down the former.

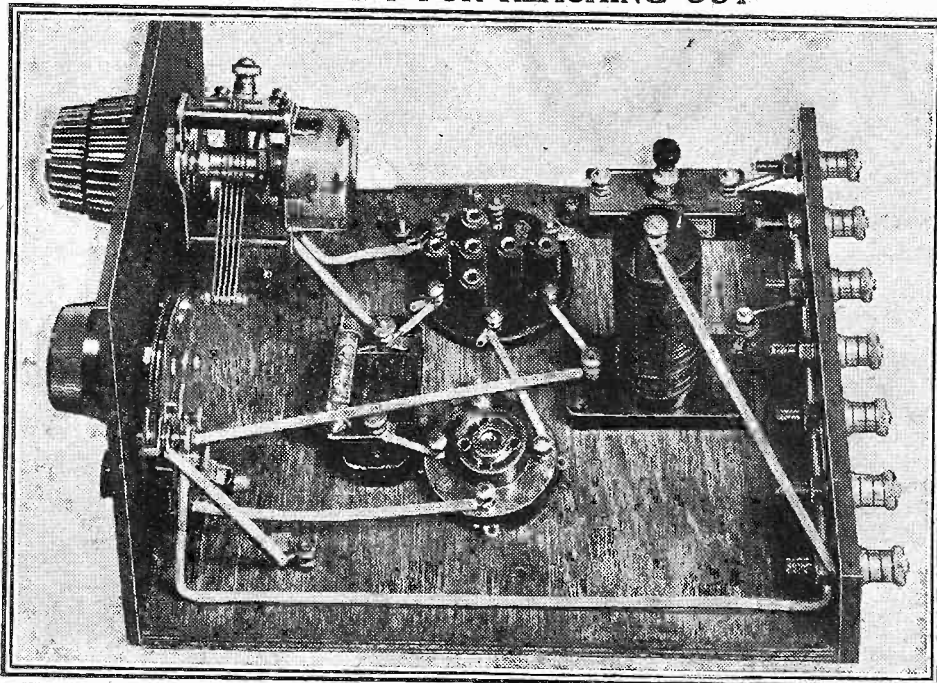
Take your wire up into this notch (which may be just a shallow hack-saw cut) and go off round the former in a clockwise direction, looking down on it from the top. If you are making the 40-metre coil, you will continue for nine turns (wound without spacing), make another notch, and lead the end of your wire down to pin No. 2.

### The "Earthy" Ends of Windings.

This is, of course, the "earthy" end of the grid coil, so that the reaction coil, wound in the same direction, must begin at its "earthy" end as well.

Attach your wire to pin No. 5, crawl up through the nearest hole until you reach a point  $\frac{1}{4}$  in. above the top of the grid winding. Cut your notch there, lead the wire into it, and continue just as before. For the coil we were dealing with you will need five turns, after which you cut your final notch and return the wire to pin No. 6. Pins 3 and

### ALL READY FOR REACHING OUT



When you have finished the set it should closely resemble the original model, which is illustrated above. This photograph will also give you a good idea how the wiring is spaced out, a most important point in a short-wave receiver.

## FROM THE TECHNICAL EDITOR'S NOTE BOOK.

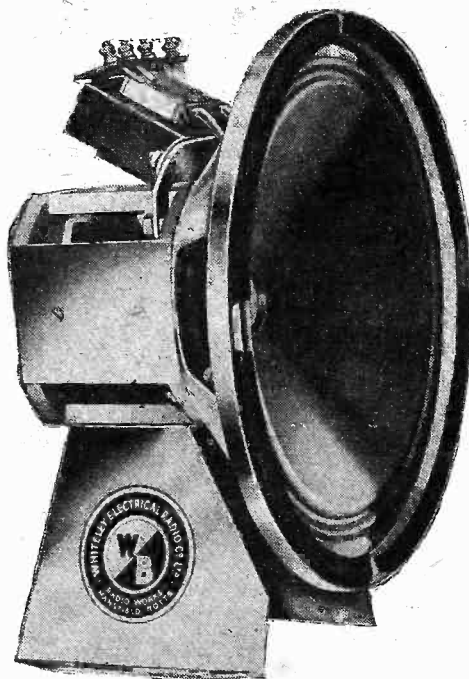
# Tested and Found-?



## AN INEXPENSIVE "M.C."

I SHOULD think we have arrived at the very rock-bottom of values in loud-speakers as a result of a coincidence in abnormal low price levels of raw materials and improvements in manufacturing technique. Anyway, I cannot visualise any further price reductions, without sacrificing quality, for a very long while to come.

## THE NEW W.B.



This is the P.M.4 W.B. Permanent-Magnet Moving-Coil Loudspeaker.

A good example of modern loudspeaker value is seen in the new W.B. Permanent-Magnet Moving-Coil Loudspeaker, which sells, in chassis form and complete with an output transformer, for 42s. One used to pay that for a pair of headphones not so very long ago!

But, you may well ask, are those low-priced speakers really moving-coil speakers, or do they carry such a description merely by courtesy?

Well, they really are moving-coil loudspeakers, but you must not get the idea that "moving-coil" implies a standardised performance. It doesn't. There are as many "quality" differences in moving-coil speakers as in any other type—more so if anything.

And none of these inexpensive m/c's. (under £3, say) is equal to the bigger and more expensive ones. But they are good—very good indeed, and definitely are worth buying.

To revert to the W.B. P.M.4, this is an honest proposition and does give good results, results which will, I anticipate, cause it considerable popularity. It is sensitive and can be used with advantage on almost any kind of set. But endeavour to hear it yourself in comparison with other speakers in the same price class.

## PLEASE NOTE

Manufacturers and traders are invited to submit radio apparatus of any kind for review purposes. All examinations and tests are carried out in the "P.W." Technical Department with the strictest of impartiality, under the personal supervision of the Technical Editor.

We should like to point out that we prefer to receive production samples picked from stock and that we cannot, in any circumstances, undertake to return them, as it is our practice thoroughly to dissect much of the gear in the course of our investigations!

And readers should note that the subsequent reports appearing on this page are intended as guides to buyers and are, therefore, framed up in a readily readable manner, free from technicalities unnecessary for that immediate purpose.

## A SUPER ADAPTOR.

The "Ealex" Short-wave Adaptor operates on the super-heterodyne principle and is one of the simplest devices of this kind that is available in commercial form.

It is designed to cover a 16-60 metre wave-range and to "super" at a wavelength of 1,100 metres. There is only the one tuning dial and the reaction adjustment remains practically constant over the whole band.

There are no complications in applying the unit to practically any set, for the existing batteries can be used. And I should mention that only recently the unit has been considerably improved.

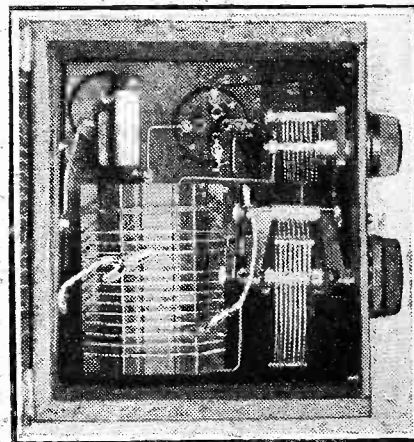
It costs £3 for the battery model, and £3 5s. for the A.C. model. On test we found it to handle very pleasingly. The controls are flexible and searching is

simpler than with the average adaptor of ordinary design.

## COILS FOR THE "COSMIC."

The two coils which were especially designed for our now-famous "Cosmic" set, have proved so satisfactory that they are to be adopted as standard "P.W." components. Thus they will be used

## FOR SHORT WAVES



The Ealex Short-Wave Adaptor.

separately or together in various future sets as well as in "Cosmic" constructions.

The dual-wave coil, which covers medium and long-wave stations can, of course, be employed in any ordinary receiver, while the short-wave "Cosmic" coil is also "universal" in its application.

So traders should note that both coils will no doubt remain current well into the next "season." They may even run into 1933, for we are not contemplating any new coil designs. (The same applies to the "Moderator" Coil.)

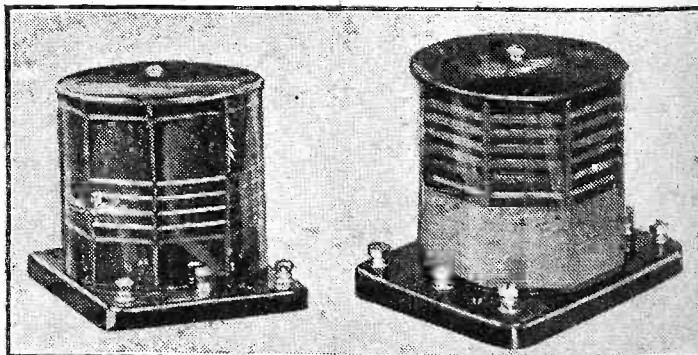
That the industry has already recognised the merits of these "P.W." "Cosmic" coils is obvious from the number of reputable manufacturers who are making them.

Among the first to go into production were Messrs. Ready Radio, Ltd., and their coils form the subject of the illustration on this page.

They are made in exact accordance with the official "P.W." specification, and are robustly and cleanly finished. Readers can embody them in their sets with every confidence that they will get full "Cosmic" results so long as all the other gear and connections, etc., are of an equal standard.

The price of the Dual Range type is 6/6 while the short-wave lists at 4/6; only 11s. for complete three-band tuning.

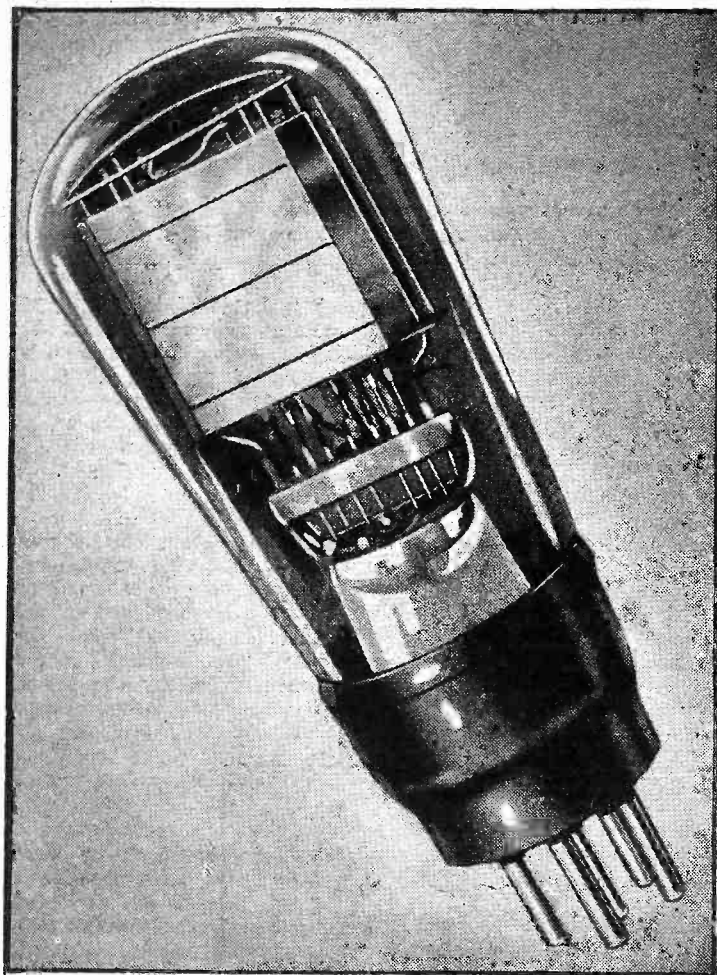
## ALL THE WORLD ON ONE DIAL!



The ReadRad Short-Wave and Dual-Range "Cosmic" coils.



# THE NEW LOW CONSUMPTION HIGH EFFICIENCY PENTODES



## ★ FOR THE MAN WHO USES BATTERIES PEN 220

Here is the solution to the output stage problem in battery operated receivers. The Mazda Pen 220 gives an astonishingly high undistorted output for an anode current of only 5 m/a. It is the ideal output valve for portables.

**PRICE 17/6**

## ★ FOR THE MAN WHO HAS AN ELIMINATOR PEN 220A

A valve which delivers a huge undistorted power output for an anode current of not more than 18 m/a, the Pen 220A needs only 150 volts on the anode and can be made to give excellent results with 120 volts and a current of only 12 m/a. It is undoubtedly the valve for the man who wants really magnificent volume for the operation of large moving coil speakers.

**PRICE 17/6**

## EDISWAN RADIO

155 Charing Cross Rd., London, W.C.2

V.147

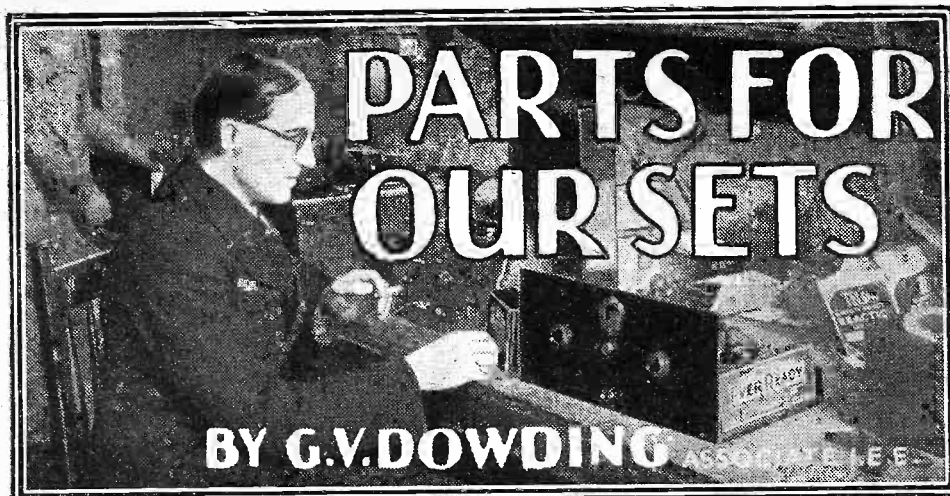
Mazda Valves are 100% British made and designed by British engineers.

The amazing

# MAZDA THE BRITISH VALVES

The Edison Swan Electric Co. Ltd.





An explanation of the policies which guide the compilers of "P.W." component lists.

"WHY do you always list about six makes of every component in your components list?" asked one of my correspondents recently. And he went on to suggest, what is perfectly true, that there is a "best" in everything, and added that he thought we could serve constructors better if we listed only one make of each part—the make we considered superior to all the others.

From some points of view it would be very nice if we could do this. For example, it would make it possible to provide lay-out dimensions.

But there are serious objections. In the first place it must be remembered that "P.W." has an enormous circulation, the largest of its kind in the world. And as was revealed by those letters from advertisers which were published in "P.W." a few weeks ago, "P.W." also, and not surprisingly, has the greatest home constructor following.

Now what does this imply? Obviously that a "P.W." set design will inevitably be copied by tens of thousands of enthusiasts and that the components figuring in it will meet with a very considerable demand.

So we always endeavour to design our receivers with as few specialised parts as possible in order that the risk of shortages of supply are reduced to a minimum.

Of course, it does happen now and then that a manufacturer produces something which so excellently fits in with some scheme we are developing that we should be doing our readers a serious disservice if we too rigidly adhered to a policy of "alternatives at any cost."

#### The "Sold Out" Bogey.

In such a case we approach the manufacturer concerned beforehand in order to obtain his assurances that he would be able to cope with really big business in his new line.

Should he not be able to guarantee quick deliveries on a large scale, then we regretfully have to turn our attention to something else.

I well remember that some two years ago a firm placed a gadget on the market which identically coincided with one of our current requirements. It was in the nature of a missing link in a receiver design that would have been impossible without it.

We invited the Managing Director of this concern to a conference at which he asserted he could meet any demand. And

I must say that the details which he supplied regarding his factory resources were most impressive.

#### Keeping Down the Cost.

But it so eventuated that the particular "P.W." set in question was a rather bigger success than usual, and although the firm manufacturing the component for which there was no alternative make then available actually exceeded the output guaranteed, the demand easily beat his supply. New machines were installed, but even then it was only with difficulty that the firm was able to cope with the business, and complaints from constructors to the effect that they were unable to purchase the article continued to reach us from all over the country for quite a long time.

That taught us a lesson we haven't forgotten, and ever since we have tried to

increase rather than restrict our "alternatives" in component lists.

Quite apart from the question of "easy-availability," there is another aspect to the subject, and that is the vitally important one of costs.

Many constructors have numbers of components in their possession, and the more of these which can be used for a new set the cheaper that new set is going to be.

Again, prices of components vary widely, and it is our opinion that "P.W." constructors have sufficient discrimination to be able to cut their radio cloth to suit their purses.

There are, for instance, L.F. transformers which catalogue at round about one pound, whilst others list at only half (or less) that figure. If we were always to specify the "best," our sets would always be fairly expensive instruments. Nevertheless many of the less costly components are excellent value for money, and as regular readers will know, we frequently give advice as to those items which they should spend the most money on if they want the greatest all-round value as judged on a cost-results basis.

I must make it plain, too, that our components lists are not haphazard selections from catalogues or mere complements to our advertising pages. A particular make must reach an adequate standard of efficiency and must be technically suitable for the set for which it is specified before it can be included in such a list.

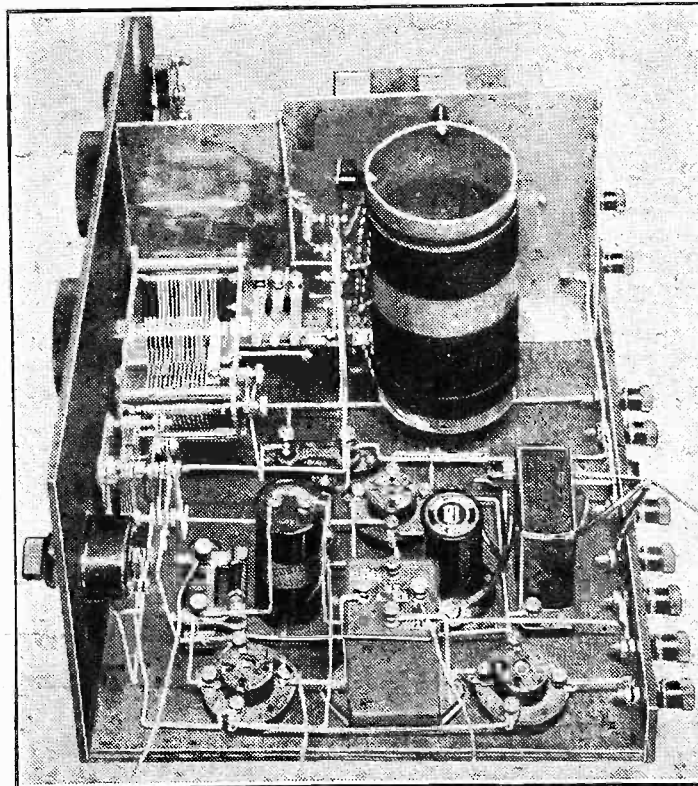
#### Development and Production.

Further, it is not our practice to build around prominently advertised articles. Our invariable procedure is as follows. A circuit is carefully developed in the Research Department, and when it has reached the "production" stage, and not until then, we survey the market for suitable components.

It should also be noted that we do not turn out sets in accordance with a predetermined schedule: when we have something really worth the attention of constructors the appropriate constructional article appears—not before. It never has been the policy of "P.W." to issue practical versions of text-book circuits at dated intervals.

Looking back a month or two from the time of writing, I see we have given you details of only the "P.W." Eckersley sets, the "Cosmic" and the "P.W." "Single Dial Super," and you must agree that all these have original features of worth-while characters. As for the future, all I can say about that is "wait and see," for prophecy in radio is particularly dangerous!

#### NOT A DIFFICULT TASK!



It is not a difficult matter to arrange the design of a set so that there is latitude for components of different shapes and sizes. As a matter of fact, to do so results in the incidental advantage that there is less tendency towards an inefficient crowding—a fault encountered in many commercial designs.



# CAPT. ECKERSLEY'S QUERY CORNER



Under the above title, week by week, our Chief Radio Consultant comments upon radio queries submitted by "P.W." readers.

Don't address your letters direct to Capt. Eckersley; a selection of those received by the Query Department in the ordinary way will be answered by him.

## Do Condensers Condense?

B. P. (Tring).—"I do not understand why a condenser should be so named. What does it condense?"

If you hang up a flat plate of conducting metal and fill that plate with electrons, you are said to make that plate negatively charged.

Fig. A shows the plate. Now I have taken away a lot of electrons from a second insulated plate, which is said to be then positively charged. I bring the two plates near to one another, Fig. B.

Now (+) attracts (-) so all the electrons in the first-mentioned negatively-charged plate concentrate upon the surface of the plate, attracted towards the positive plate. So the bringing of the two plates near to

it will pay me to buy the covered wire in preference to ordinary bare copper."

Enamel? Does enamel conduct? If enamel *does* conduct, then the high-frequency currents will be set up in the enamel and not the wire—all H.F. currents flow on the skin of a wire.

If enamel does *not* conduct, then the enamel will not shield the wire—only conducting materials shield electric forces. If it's half and half, you get a beastly high-resistance aerial.

In fact, enamel (*good* enamel, that is, not that lampblack stuff) does *not* conduct, and therefore does *not* shield. It, of course, is useful in protecting the wire from chemical action due to the dirt- (and salt-) laden air.

\* \* \*

## Earthing the Pick-up.

J. M. D. (Belfast).—"I have recently constructed a three-stage amplifier which was very unstable. When, however, I joined L.T. neg. to earth, it was reasonably stable. Complete stability was, however, only achieved when one side of the pick-up was earthed, but this shorts the bias to the first valve. Can you make any suggestions? Would an input transformer solve my problem?"

I cannot expand my answer much, but all I wanted to write was "yes." May I leave it at that? Or surely a condenser would help, as indicated in the sketch.

\* \* \*

## The Height of An Aerial.

R. D. (Dundee).—"My aerial is 25 ft. high. If I increase the height to 50 ft., will I get double the volume?"

This all depends upon a number of factors not given. For instance, if an aerial and inductance coil had no wasteful resistance, an aerial an inch high would be as effective as one 1,000 ft. high. It is radiation efficiency, which counts.

By doubling the height of a typical broadcasting aerial the radiation efficiency might be increased 20 per cent, and you might notice an increase of volume thereby, particularly with crystal sets. With

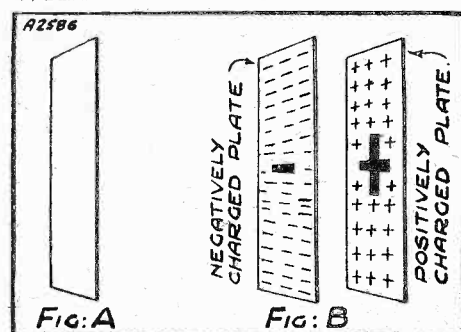
valve sets the same change might not be noticed.

## A Serious Snag When Receiving Loud Music.

N. M. L. (Southend).—"In a receiver incorporating two highly efficient small power valves in push-pull in the last stage I have struck a serious snag. When receiving loud sustained passages the set, apparently, goes into oscillation, and after an interval of a few minutes the anodes of the power valves appear to be getting almost red hot.

"If, when the apparent oscillation occurs one of the power valves is removed the receiver stops oscillating, and results are quite good in every way. I should be pleased to know the cause of the trouble and the best way of trying to cure this?"

## WHAT HAPPENS INSIDE IT?



This pictorial diagram illustrates the action of a condenser when the plates are charged.

one another—one negative the other positive—has condensed the charge upon the surface of the plates.

The term condenser was invented in the early days of electricity long before wireless came. It has remained with us.

A condenser exists in a wireless set as a component of an oscillating circuit designed to allow that circuit to oscillate at a frequency determined by the value of the condenser, that is by the strain of the charges pulling towards one another in the surfaces of adjacent plates.

The strain value is varied according to the area of the plates which are actively facing one another.

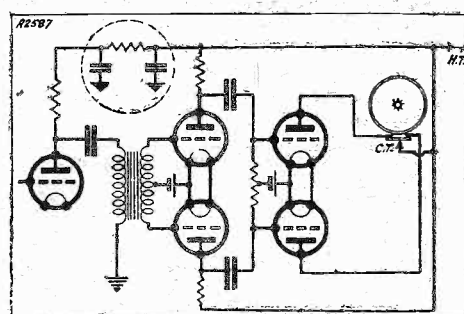
\* \* \*

## Enamelled Wire for Aerials.

N. K. (Chatham).—"Why is it that enamelled-covered wire is sometimes used for aerials? Doesn't the covering of enamel stop the wireless waves from being received?"

"I ask this question because I am putting up a new aerial, and I have been told that

## PUSH-PULL FOR STABILITY



Here is the circuit which Capt. Eckersley drew to illustrate his reply to N. M. L., a Southend reader of "P.W." It shows a detector transformer—coupled to two L.F. valves in push-pull, with these in turn resistance-coupled to push-pull output valves.

This is very difficult without a circuit diagram or description. What are the two preceding valves, what the power supply, what the method—transformers or resistance capacity, etc., etc?

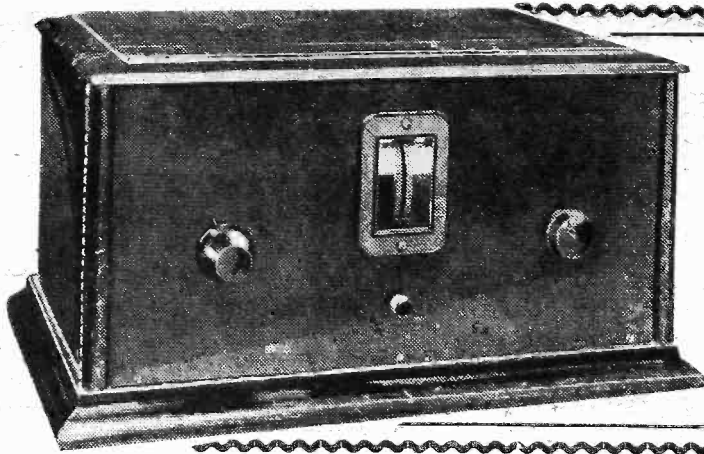
In general, I say decouple, although really push-pull should eliminate this necessity.

But say, in general, the circuit is as shown, then in the detector circuit insert the decoupler as I have shown it. If there is no penultimate stage, then do the same, or if there is one try the decoupler in that stage.

If using an eliminator be sure it is powerful enough, or if a battery, be sure it is of low internal resistance. You might try reversing a transformer before you try decoupling.

Certainly, a push-pull system should not require decoupling, but the detector is, of course, not push-pull.

ONLY IN "P.W."  
can you read Capt. Eckersley's  
replies to listeners' own problems.  
AND REMEMBER—  
Captain Eckersley's technical articles  
appear only in  
"POPULAR WIRELESS"  
and "MODERN WIRELESS."



## HOW TO CONNECT UP THE ECKERSLEY A.C. TWO.

By the "P.W." Research Department.

Last week constructional details were given of this all-from-the-mains receiver, and below you will find instructions for connecting it up to the power supply, and also how to use it on batteries if desired.

**T**HERE are nine terminals on the terminal strip, the connections for four of which are obvious, namely, the aerial, earth and loudspeaker. So we have five others to consider.

First of all, let's assume you have an H.T. mains unit that has no L.T. A.C. output. The connections to H.T.— and the two positives are easy. Put the maximum, about 150 volts or so, on plus 2 and take plus 1 to a variable tap or to about 80 to 100 volts.

### Suitable Mains Units.

So long as the unit will give at least about 25 milliamps at the above voltages it is O.K. For the filaments you must buy a transformer, with a voltage output of 4.

An amperage output of 2 is required for this set, but as one costing only a little more can be obtained which will give 3 or 4 amps. you may be tempted to buy one. Certainly you never know when you may want to go in for more valves on the mains, but such a transformer is only suitable if it is a very good one with excellent regulation.

Otherwise the voltage across it may rise too much when only taking 2 amperes.

Two flexible wires should be wired in parallel to those that go into the mains unit adaptor plug, and the two secondary ones go to the L.T. terminals on the receiver. Neglect the centre tap if there is one.

### Cutting Out Hum.

When you come to use the receiver, set the slider on the 30-ohm potentiometer about half-way and if you are troubled with hum try moving it one way or the other. You may do this while the set is working if you are very careful and employ a wooden handled screw-driver.

If your mains unit has A.C. L.T. output terminals, use these instead of a special, extra transformer, connecting up in just the same way. But

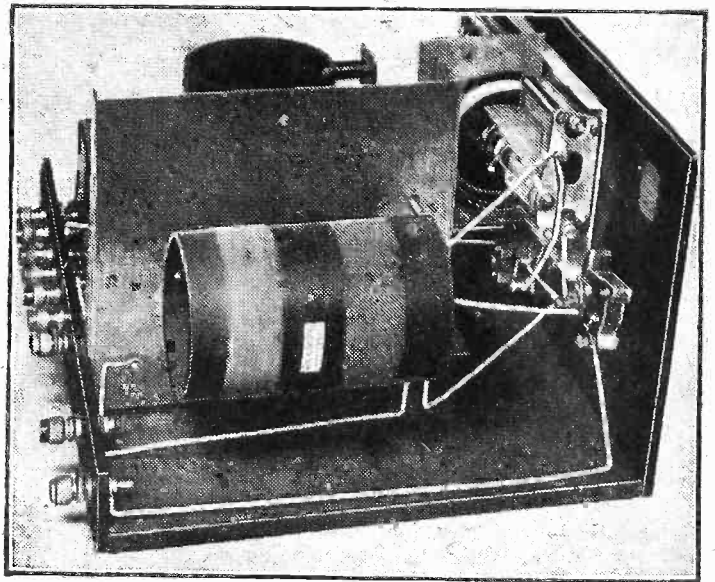
and use a separate transformer in the manner already described.

If you do not already possess a mains unit, then you simply buy one of the type mentioned in the list of accessories. This is entirely suitable for the receiver, and has the L.T. terminals on it.

It is a unit well worth purchasing as it has an output around 50 milliamps and will serve for much larger sets than this one, and you do not know what you may require in the future.

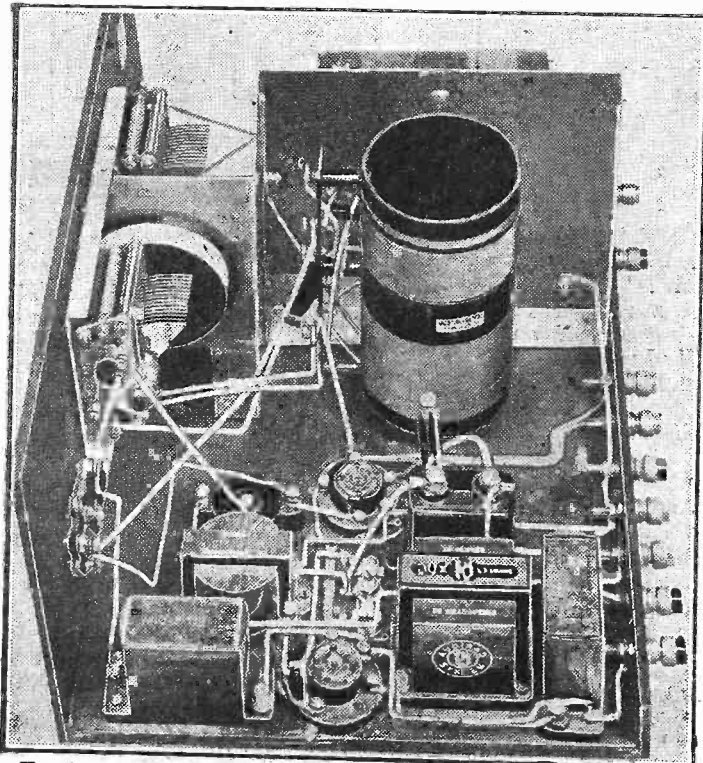
And now about using the set as a battery

### WHERE THE SIFTING IS DONE!



The aerial circuit is tuned by the first coil and condenser, the currents being passed on to the second coil and condenser by the resistance incorporated in the coil unit.

### ON THE OTHER SIDE OF THE SCREEN



Here is the compact L.F. end. On the right of the second valve is the output choke and condenser, and to the left of it the L.F. transformer and a by-pass condenser.

should you find on adjusting the potentiometer you cannot improve matters (always supposing there is a hum to get rid of) it means that the centre tap of the secondary of the filament winding is already joined to H.T.— in the unit.

In such a case you are unlucky, and must either put up with the hum, get the makers of the unit to alter it so that the centre tap is unconnected, or else ignore the terminals

receiver. These are the alterations that have to be made.

### Modifying for Batteries.

Disconnect the two leads that go to the ends of the potentiometer, and join the L.T. battery across the two L.T. terminals. Join H.T. negative to L.T. negative and also the positive of a grid-bias battery. Now disconnect the bottom of the two meg. grid leak from the 2-mfd. fixed condenser and take it instead to the positive filament terminals of the VI valve holder.

Also disconnect the three leads that go to G.B.— of the transformer from that terminal, but leave them joined together, and take the terminal instead to a suitable negative tap on the grid-bias battery. That's all.





# The Secret of the RUMBA RHYTHM

**Piano Accordion — Guitar —  
Drummer's Rattles — *you need them all!***

There is Southern glamour in the Rumba Rhythm of a tango tune. The melody is built up with piano, accordion, guitars, rattles, and drummer's effects. You will hear all the detail of the music if you use an Improved Lissen H.T. Battery in your receiver.

The noticeable truth of reproduction is due to the extraordinary power output of a Lissen Battery—power so pure that everybody ought to use it; power so sustained that over prolonged periods of time it remains steady, noiseless, and abundant always.

## THE SECRET OF THE TEST TUBES

There is a process used in the Lissen Battery which not only produces power of remarkable purity, but which gives the Battery very long life. So much so, that a **PRINTED LIFE GUARANTEE** is given with every Improved Lissen H.T. Battery sold. See this guarantee on the side of the Battery when you buy—it means extra useful battery life in your set.



**LISSEN LIMITED - WORPLE ROAD - ISLEWORTH - MIDDLESEX**

**C**HANGEABLE weather nearly always brings a crop of atmospherics in its train whether or not thunderstorms actually occur. At such times the atmosphere is in a disturbed state, accompanied often by large and quite sudden changes in the pressure of the air. Elec-

trical discharges, some large, some small, are continually taking place in such circumstances and these provide the crackles and bangs which issue from our loudspeakers.

We must expect periods of varying length during the spring and summer when atmospherics are somewhat troublesome, but expert long-distance men know a variety of ways of dodging their effects. You will generally find that interference, when atmospherics are about, is at its worst on the long waves; and reception of the long-wave stations may not be worth while.

#### Dodging Atmospherics.

Again, you may find that crackles are louder and more frequent at the bottom of the medium wave-band than in its middle and upper parts. This happens because with your tuning condensers at very low settings there is only a small amount of parallel capacity in use. The damping is therefore quite low, and undamped wave trains, such as those produced by atmospherics, are at the top of their form when introduced into tuned circuits of low damping. In atmosphericky weather, then, the happiest hunting-ground will usually be the wave-lengths between 300 and 550 metres.

**W**HEN conditions are dull—as they have been of late—I can generally find something exciting among my correspondence. But this week the more fiery of my readers have let me down, and I can find nothing but polite letters asking for information.

"L. V. M." mentions reception on about 21 metres of "W X 2 C J." I presume he means W 2 X C J, which is one of the latest of the Rocky Point stations. The station is testing irregularly at present, but is generally very strong.

#### On 31-35 Metres.

"M. S." (not of Harlow this time, but from Warwickshire!) writes about his adventures on short waves with the "Magic" Two. He is afraid I shall scoff at him for using a set that is so "out-of-date."

Not at all, "M. S." The best set for you to use is one that you like, whatever the claims to fame of more recent receivers may be.

Judging by at least half a dozen letters on the subject, W I X A Z (31-35 metres) has either increased power or taken a new lease of life by some other means. He appears to be coming over better than W 2 X A F at present. E A Q also figures prominently in the list of consistent



Some practical distant-programme notes compiled by a special contributor who nightly searches the ether in order to obtain really up-to-the-minute information for "P.W." readers.

There are other ways of dodging atmospherics. One of these is to change over from outdoor to indoor suspended aerial; another is to make use of a frame. The frame is not particularly susceptible to this kind of interference and, since atmospherics generally come from one well-defined direction, it is often possible, by making use of the frame's directional properties, to receive numbers of stations free from interference.

One of the soundest methods of atmospheric dodging is to bear in mind that the crackles will not be a nuisance so long as the strength of the wanted transmission is considerably in excess of this kind of unwanted natural broadcasting. Go, therefore, for the most powerful stations, and do not bother about their weaker brethren.

#### Bordeaux and Hilversum.

An outstanding station just now on the medium waves is Bordeaux. He is now quite free from interference, and his strength is remarkable. There are in fact two stations, one on either side of the North National, which are providing wonderful reception, Bordeaux and Hilversum. If you live near the North

National, try for them at times when your local station is silent.

Heterodynes have been rather prominent below 275 metres, but Bratislava, Heilsberg and Turin are generally free. Gleiwitz, Trieste and Nuremberg are always worth attention, and

there has been of late a good deal less interference from Morse spark signals. Lodz has been coming in very well on several nights. His wave-length is 235 metres, but his transmission times do not yet seem to be fixed and definite. Try for him rather late in the evening.

#### Some Useful Alternatives.

Vienna, who until recently had been rather uncertain, has shown a remarkable return to form, good reception being possible night after night. Budapest has been very much better than of late, and Munich has given good loudspeaker results on several occasions. Brussels No. 1 I nearly always find good, and the same applies to both Prague and Langenberg. Stockholm is suffering from temporary weakness, but Berlin Witzleben is very much stronger than he has been for some time.

Belgrade, too, is often to be heard at fine strength. Just below Belgrade, Moscow Stalin is coming in so powerfully that he completely drowns any interference that there might be from Spanish stations sharing the same wave-length of 424 metres. Unfortunately, Moscow's ideas of entertainment run mainly to propaganda talks!

## SHORT-WAVE NOTES



News and views regarding an exciting and fascinating waveband.

too bashful to give me his name and address I cannot enter him on the official roll, however.

I am glad to see that the S.G. 4 has found its way as far afield as Peshawar, where Capt. P. J. Fletcher appears to be making good use of it. In spite of trouble with atmospherics, India appears to be a good location for short-wave sets, and, of course, it is well served by stations that are not so far distant as they are from us. Chi-Hoa, Bandoeng, Sydney, Nairobi, and the Russians are all within reliable distance!

#### A Fine Log from Essex.

"H. M." (Essex) writes me his first letter, having been "C. B." as the result of a chill. During the period he has compiled a fine log that indicates that there is not much wrong with conditions at present. He also mentions a scheme for an atmospheric-eliminator at the L.F. end of the set, which I believe is a sound plan, although the theorists won't have it.

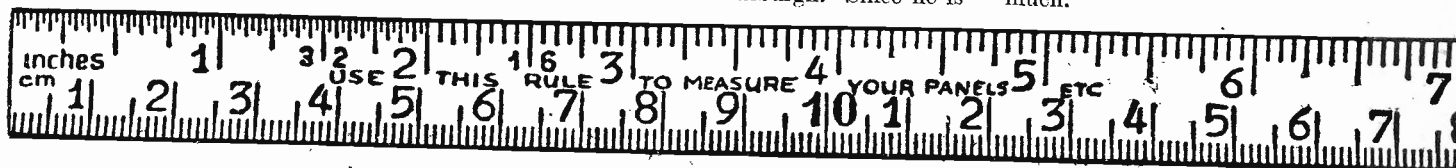
In conclusion, he asks for "pages and pages" of short-wave notes instead of the present amount. Yes, "H. M." but don't forget that we short-wavers are still very much in the minority. All the others would feel hurt if we trespassed on their space too much.

stations, while Radio Maroc seems to be heard by everyone with a receiver that works!

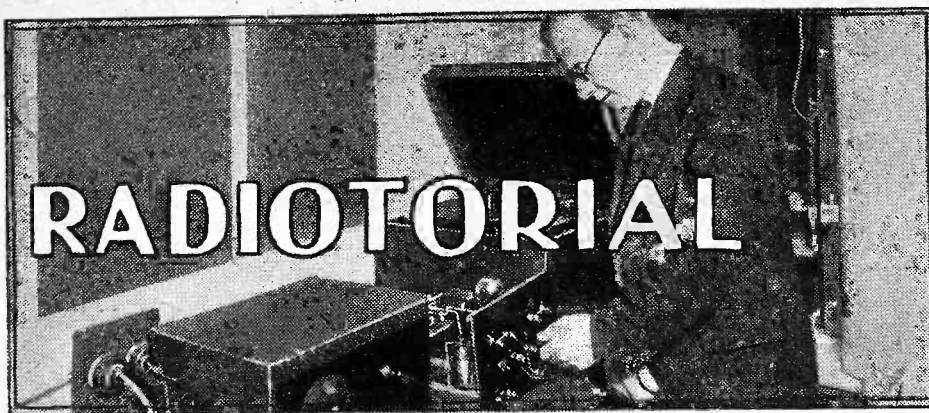
#### The S.G. Four in India.

"D. E. R." (Luton) uses a "Magic" Four de Luxe on short waves, but finds that he gets on better without the H.F. stage below 100 metres. There's certainly something wrong there, "D. E. R." although you mustn't expect too much from it in the way of amplification. It is more in other directions that the H.F. stage usually helps.

The latest recruit to the "H. A. C."—somewhat delayed, I am afraid—is our friend J. R. B. of Edinburgh. Since he is







Alt-Editorial communications should be addressed to the Editor, POPULAR WIRELESS, Tallis House, Tallis Street, London, E.C.4.

The Editor will be pleased to consider articles and photographs dealing with all subjects appertaining to wireless work. The Editor cannot accept responsibility for manuscripts or photos. Every care will be taken to return MSS. not accepted for publication. A stamped and addressed envelope must be sent with every article. All inquiries concerning advertising rates, etc., to be addressed to the Sole Agents, Messrs. John H. Lilc, Ltd., 4, Ludgate Circus, London, E.C.4.

The constructional articles which appear from time to time in this journal are the outcome of research and experimental work carried out with a view to improving the technique of wireless reception. As much of the information given in the columns of this paper concerns the most recent developments in the radio world, some of the arrangements and specialties described may be the subjects of Letters Patent, and the amateur and the trader would be well advised to obtain permission of the patentees to use the patents before doing so.

## QUESTIONS AND ANSWERS

### TESTING FOR A BREAK.

Mrs. G. (Wimbledon).—"Although I made the set myself I felt quite helpless when it went wrong, and it was rather humiliating to find after doing without wireless for a week that the only trouble was a faulty H.F. choke connection. The boy who came to attend to it found this out at once with a pair of telephones, and although he explained how it was done, I am still not quite clear how to do a test of this kind, and should be glad of some information on this point."

Defects arising from faulty components, may often be detected by a pair of 'phones and a dry cell. One tag of the 'phone should be connected to one terminal of the dry cell and two flex leads should be connected, one to the remaining 'phone tag and the other to the remaining terminal of the dry cell (a flash-lamp battery is quite satisfactory).

These two flex leads, if touched momentarily together, will produce a strong double click in the 'phones—one click when they make contact with

On the other hand, if one of the flex leads is connected to the socket of the coil holder and the other to the plug, if a double click is heard, there is a short-circuit across the holder.

Similar tests may be made with valve holders, both for testing for a connection between each terminal and its socket, and for testing for short-circuits between the sockets.

Variable condensers may also be tested by this method, a short-circuit between the plates giving rise to the usual double click, which should not be present in the usual way.

It is, of course, essential to see that all leads are removed from the components under test, and that no coils are in position in coil sockets when these are tested.

Complete circuits may be tested in a similar manner.

### WHO WAS KICKING THAT GONG AROUND 1400 METRES?

R. A. L. (Birkenhead).—"As the set is only a 'two' I had not bothered about long-wave reception before, except to try occasionally for Daventry, Paris, and also one foreigner just underneath Paris, which a friend identified for me as Warsaw. Thinking I might bag this one again, I tried on Sunday night, and to my surprise picked up a station a bit lower down on the dial.

"It was ringing a gong, very fast, and afterwards, I heard a man and a woman announcer, but could not get the name of the station. Unfortunately it closed down just after ten. Could you tell me what station this could have been?"

Probably it was Motala, the long-wave Swedish station which relays Stockholm. The wavelength in this case is 1348 metres, which would bring it a degree or so below Warsaw on the dial.

By the way, we think you are doing wrong in neglecting the long waves, for probably there are several other stations you could pick up, for instance Kalundborg, which is a little lower down than Motala, and which is very often picked up in this country on a two-valve receiver.

### THE COUPLING CONDENSER.

H. T. (West Worthing).—"For the band-pass filter coil which I am using, the makers recommend a .04-mfd. condenser of the non-inductive type. I have been working this for some time, but recently, when investigating a crackle, I thought that the condenser had been causing the trouble, and finally replaced it with a .02-mfd. condenser which I had on hand.

"It did not cure the crackle (which subsequently proved to be a spaghetti resistance), but what it did was to improve signal strength on practically all stations enormously. It is so much better than the .04 that I have left it in position, and I have been wondering why there should be such a great improvement?"

The degree of coupling between the two halves of the band-pass arrangement depends upon the capacity

of the condenser in question, and by reducing that capacity you have greatly increased the coupling. The value used by the makers is generally chosen very carefully to give the correct degree of coupling combined with selectivity to produce the flat-topped band-pass response over the unit as a whole.

You have thrown this careful-matching effect out completely by using a different value, and apparently your local conditions are such that the accompanying loss in selectivity is not troubling you. For a listener living "close under a local station" such a change would probably be noticeably for the worse, and we expect that even in your situation you will be able to verify the fact that the tuning is now double humped because of the lower coupling capacity used.

If you place a milliammeter in the plate lead of the detector, and then slowly tune the aerial band-pass through the carrier-wave of a reliable station, you will probably notice that the meter shows two distinct tuning points, close together, which represents the double hump; and if the .04-mfd. condenser were to replace the .02 condenser now used, these two humps would vanish into the more or less flat-topped response which is the idea of the band-pass circuit.

It is not so easy to detect the humps by ear as it is by a milliammeter in the detector plate circuit, as the ear is not at all sensitive to changes in volume and cannot detect quite large variations.

### TIPS FOR TESTING.

Here is an interesting letter on the above subject, from W. J. A. G. (Purley):—

"As a regular reader of POPULAR WIRELESS, I think one of the most interesting of odds-and-ends is the occasional corner devoted to such things as 'Tips for Testing,' 'Hints for Tuning,' etc.

"In the issue of March 5th I read those on page 1485, and when I read the last I determined to write to you, as I have found that even when a set fails on radio reception, the mere switching to gramophone is not an infallible test.

## TECHNICAL TWISTERS

### No. 109—THE OUTPUT CIRCUIT CAN YOU FILL IN THE MISSING LETTERS?

The loudspeaker is generally best connected direct in the last valve's plate circuit, as a separate output circuit for it offers several important

Among these are the possibility of correctly . . . . . the loudspeaker and valve impedances, and the shortening of the circuit through which the . . . . . current flows.

The . . . . . may be done by means of a tapped . . . . . or by a . . . . . of suitable . . . . .

An advantage of an output filter is that it tends to . . . . . the decoupling arrangements.

Last week's missing words (in order) were: Bass. Air. Low. Thick.

"I have built your set—the 'Three Pound' Three—and have inserted a gramophone pick-up in the detector circuit, in the lead between the grid condenser and the grid of the detector valve. One day, on switching on to radio, there was no result. During the previous day or so we had heard several crackling noises, but put that down to atmospherics.

"On switching on to gramophone, however, results were good, but not up to strength. After several tests the fault proved to be in the spaghetti resistance. This was replaced, and results as usual.

(Continued on next page.)

### HOW ARE YOUR RESULTS NOW?

Perhaps the switching doesn't work properly? Or some mysterious noise has appeared and is spoiling your radio reception? Or one of the batteries seems to run down much faster than formerly?

Whatever your radio problem may be, remember that the Technical Query Department is thoroughly equipped to assist our readers, and offers an unrivalled service.

Full details, including scale of charges, can be obtained direct from the Technical Query Dept., POPULAR WIRELESS, The Fleetway House, Farringdon Street, London, E.C.4.

A postcard will do. On receipt of this an Application Form will be sent to you post free immediately. This application will place you under no obligation whatever, but, having the form, you will know exactly what information we require to have before us in order to solve your problems.

LONDON READERS, PLEASE NOTE: Inquiries should NOT be made by 'phone or in person at Fleetway House, or Tallis House.

each other, and another when they are separated again. They may thus be used for testing for continuity in leads, etc., since the loud double click is ample evidence that everything is satisfactory.

A fault on the coil holder, for instance, such as a break between the terminal and the plug or socket to which it is connected, may now easily be detected, since if one flex lead is connected to the terminal and the other to the side of the holder to which the terminal should make connection, absence of the double click is positive evidence that the component is faulty.

## RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from previous page.)

"Switching over to gramophone proved a waste of time, as I was put off the scent thinking that the dual coil must be at fault, or the aerial. Apparently, when radio refused to come through, the spaghetti was not completely broken, but in moving it during tests it got completely broken because in the end there were no results at all, even on gramophone. Some people might not have moved the flexible resistance, and thus they would have searched a long while in vain!

"I leave you to make any use you can of my little hint about not absolutely relying on the gramophone test."

In the Tips for Testing, given on page 1485, it is stated: "Radiogram users should remember that when a set fails on radio reception, the mere switching over to the gramophone will show whether or not the fault is on the low-frequency side."

Within the limits of a brief statement this is substantially true, and W. J. A. G.'s letter raises an interesting point about such rough-and-ready tests.

He says that on switching to gramophone, however, results were good but not up to strength. This latter

with Nos. 1, 2, 3, 4, 5, 6, 7, 8. Could you tell me how these points are connected, by numbers, in which case I think I can wire it up O.K.?"

The lead from the aerial goes on to 1 or 2, as required, for selectivity. No. 3 goes to one side of the wave-change switch, No. 4 goes to another side of the wave-change switch.

The remaining side of the three-point wave-change switch goes to earth, to one side of the differential reaction condenser and the terminals 6 and 7 on the coil unit. No. 5 on the coil unit goes to the remaining fixed plates on the differential reaction condenser. No. 8 goes to the tuning and grid condensers.

### YOUR BIT TOWARDS ECONOMY

Have you ever thought how difficult it is for a newsagent to order just the right number of copies of any particular paper each week?

You can make his task much easier if you place a regular order with him. You will not only help him to order correctly and avoid waste, but you will make sure of getting your copy regularly each week.

### BACK NUMBERS OF "P.W."

D. L. T. (Buxton).—"Where can I get the back number of 'P.W.' describing the 'Full Range' Two?"

Any back numbers of "P.W." which are still in print can be obtained through a local newsagent; or direct from The Amalgamated Press, Ltd., The Fleetway House, Farringdon Street, London, E.C.4, price 4d. per copy post free.

### VARIABLE MU FOR VOLUME CONTROL.

D. N. A. (Nr. Salisbury).—"I have been looking up circuits with the idea of getting a three-valve long-distance loudspeaker arrangement for use with a big outdoor aerial, and I have become very interested in what I read of the variable mu.

"The references I have seen, however, have been very vague, so could you tell me what is the main principle of this type of S.G. valve, and if you have published a set incorporating one of these?"

In current radio practice the word "mu" is understood to mean valve amplification factor, so that a variable mu valve is one in which the amplification can be controlled during operation.

In all but these newest types of valves the amplification factor is quite invariable and depends upon the actual physical construction of the grid, its distance from plate, and the filament, etc. But in the variable mu class of valve a special form of grid enables the amplification factor to be controlled by alterations in the grid bias applied.

When a small grid bias is applied the valve gives the high amplification of low-grid voltages which is expected with the S.G. type of valve; but when a high grid-bias voltage is applied, quite a large input voltage can be dealt with without distortion or overloading, and the effect is as though a much lower amplification valve were being employed for the local station.

As the valves have only just been introduced there are very few circuits employing them, and the best we know of is that in the April issue of "Modern Wireless," in which full constructional details are given for making an S.G. Det. L.F. receiver, called the "Varmu" Three.

### THE MODERATOR.

Our recent articles on "Moderating Your Set" aroused enormous interest, and so we are endeavouring to cover as many of the queries as possible arising from it in next week's "P.W." We will not be able to give indi-

vidual replies in all cases, those selected will be representative ones, likely to be of immediate benefit to the majority of applicants.

In the meantime, here are a few general hints on the subject which will, we trust, solve the problems of many of our querists. It will be appreciated that the fields of application in regard to Moderators are so vast that we could not deal in detail with their every aspect in our articles, though we had hoped that these were pretty comprehensive. For instance, the following points which we enumerate for the benefit of many querists were definitely covered!

1. When the tuning coil is shielded, the metal "can" must be removed or the Moderator coil cannot be coupled.

2. With "Magic" sets, you remove the aerial coil entirely and then place the Moderator coil near the grid coil in the set. For short waves revert to the original connections.

3. "Titan" tuners can advantageously be moderated.

Next week we shall be able to give detailed wiring alterations of some representative arrangements.

### "SHORT WAVES"

A Shropshire farmer says that he gets depressed by the Children's Hour on the wireless. Youngsters, of course, can get their own back by deliberately ignoring the Fat Stock Prices.

"Punch."

### A HOWLING SUCCESS.

The Husband: "I wish I could cut out these weird noises."

The Wife: "Why? They're half the entertainment."

"The Sketch."

Arthur: "Hello, John! Did you listen in to the fight on the wireless last night?"

John: "I should say not! My wife knows too much about fighting already."

Speaking of broadcasting, the "Radio Times" says: "Here is, in process of development, an education of the best kind: by not abusing its privilege of supplying the public with unprejudiced facts from which to gauge the truth for itself, broadcasting cannot help but build a better informed society."

We wish the people upstairs were a little better informed as to how to regulate their loudspeaker.

### BACK TO SIMPLICITY

I tell the joy of simple things.

The green young grass and the crocus:

The song that the nesting blackbird sings;

The radiant arch that the rainbow flings,

The rosy glow that a March wind brings

And the pattering drops that soak us.

I know of simpler joys than these

(If 'tis simple joys you're after).

There is for instance, the ancient wheeze

Dug up by a star of the B.B.C.'s;

It's as funny as foot-and-mouth disease,

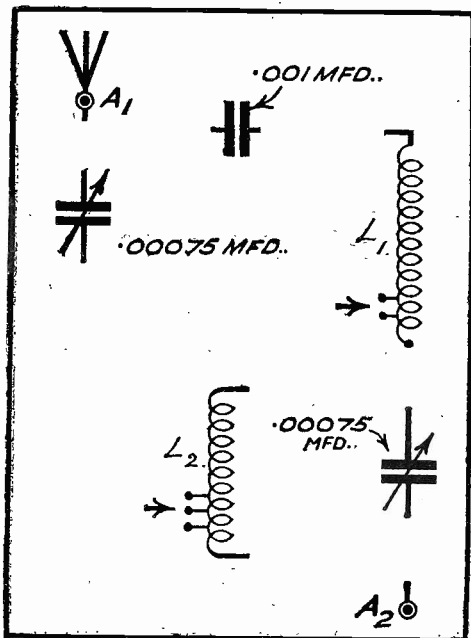
So the studio rocks with laughter.

"Sunday Pictorial."

### VALVE PRICES.

The Electrical Trading Association have issued an attractive folder showing the whole range of Eta valves, with curves and characteristics, at the new reduced prices. Applications for the folder should be addressed to the firm at Aldwych House, London, W.C.2.

### MISSING LINKS, No. 32 BROOKMANS REJECTOR.



This week we have an unusual "missing link"—all the parts are shown, and the test is whether you can fill in the missing "wiring" to join up a Brookmans Rejector.

LOOK OUT FOR THE ANSWERING DIAGRAM NEXT WEEK.

was an important fact, and it clearly proved that the fault was not switched out of circuit on the gramophone side; in other words, there was some sort of trouble on the L.F. side to account for the fact that results were not up to strength.

The input from the gramophone pick-up is usually greater than that received from an aerial, and as the weaker testing voltages are the more severe the test becomes, it is to be expected that any fault common to both circuits would not show up so badly on the gramophone as on radio reception.

We are glad that W. J. A. G. raised this point, because in all comparative tests it is important to notice any deviation from the normal in order to get on the track of the trouble quickly. And in this case the original crackling noises, followed by a failure on radio altogether, followed by unusually weak signals on radiogram, showed that the fault was on the low rather than the high-frequency side of the set.

### THE COIL UNIT CONNECTIONS.

F. S. (Birmingham).—"My set is the good old 'Magic' Four, and I wish to try a Telsen dual-range coil unit in this, which is marked

### "P.W." PANEL, No. 67. SIMPLIFIED WAVE-CHANGING.

Not long ago it was necessary, when changing wave-bands, to change a whole set of plug-in coils.

A much more convenient method, consisting of a dual-range coil unit, then became popular, the wave-change being effected by a switch on the panel.

Later the introduction of the Extensar made a panel switch unnecessary, the rotation of the tuning dial automatically covering both wave-bands.

The final step in wave-change simplification is the Cosmic circuit, in which three wave-bands—long, medium, and short—are covered without coil changing.



## Ideal for Short-Wave work—

—chosen  
for use  
with the  
W.L.S.

SHORT-WAVE ONE

## ERICSSON TELEPHONES

had to be good to be chosen for use with the W.L.S. SHORT-WAVE ONE. Found on every DX fan's bench. Clear, pure and sensitive. Extremely comfortable in wear during long spells at the dials.

All good dealers stock them, or direct from

**ERICSSON TELEPHONES, LTD.**  
67/73, Kingsway, London, W.C.2.

120, 2,000  
and  
4,000 ohms.

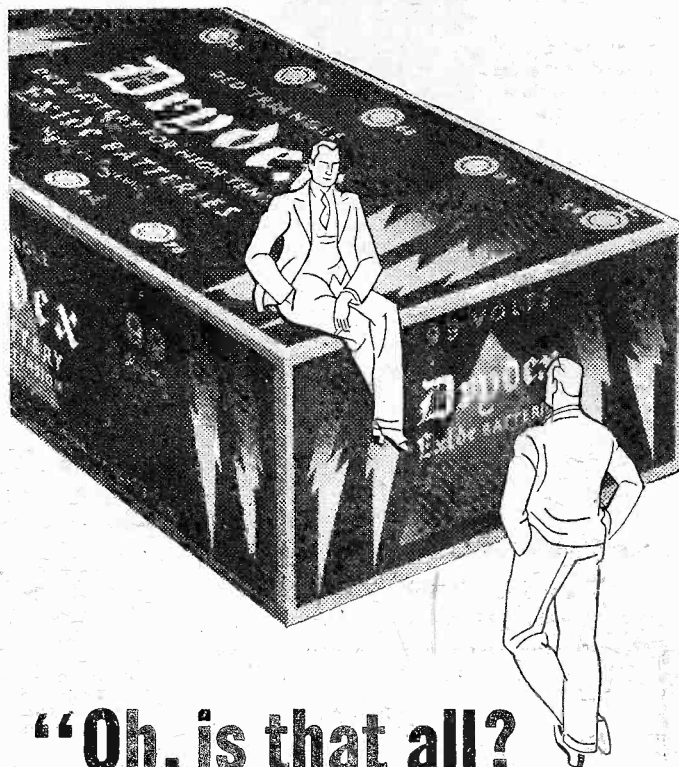
**12'6 Ericsson**  
BRITISH  
SUPERSENSITIVE  
TELEPHONES

All who prefer  
Quality in  
Cigarettes

Say  
**Player's  
please**



N.C.C.86.



“Oh, is that all?

Mine's lasted twice  
as long as that!

Mine's a

# Drydex

● THE Exide DRY BATTERY

Made entirely in England, employing British labour and British capital.

Obtainable everywhere from all good dealers in sizes and types to suit every wireless set. Also for torches, cycle lamps and bells. For wireless low tension use Exide 'C' or 'D' Type Batteries.

Exide Batteries, Exide Works, Clifton Junction, nr. Manchester.  
Branches at London, Manchester, Birmingham, Bristol, Glasgow,  
Dublin and Belfast.

Dx65

# WHERE YOU CAN SEE "COSMICS" AND "S.T. 300."

A further List of Retailers who  
have Registered as Official "P.W."  
Exhibitors.

## LONDON.

M. Kams & Co., 9, High Street, PUTNEY, S.W.15.  
Messrs. Elephant Electrical Co., Radio & Electrical  
Engineers, 29, New Kent Road., ELEPHANT &  
CASTLE, S.E.1.  
J. H. Brookman, 8, Farley Road, SOUTH NOR-  
WOOD, S.E.25.  
L. A. Gardiner & Co., 58, Church Lane, S.E.7.  
Griffin, 187, Broadway, Uxbridge Road,  
SOUTHALL.  
Harper's Radio, 430, High Street, LEWISHAM,  
S.E.13.  
Northcote Motor Co., 145, Northcote Road,  
CLAPHAM JUNCTION, S.W.11.  
A. Orstin, 154, Green Street, BETHNAL GREEN,  
E.2.  
G. H. Pearce, 129, Sydenham Road, S.E.26.  
Plaistow Radio Service, 178, Plaistow Road, E.15.  
Wilkesden Radio, 267, High Road, WILKESDEN  
GREEN, N.W.

## ABERDEEN.

The Aberdeen Radio Co., Ltd., 9, Hadden Street.  
J. P. Christie, 29, Victoria Road.  
Miller Bros., 249-251, George Street.  
Smith Sim, 39, Bridge Street.

## ARBROATH.

W. McKay, 243, High Street.

## ASHFORD.

A. Edenden, 150, Bridge Street, WYE.

## AYLESBURY.

C. R. Steggall, 52, Cambridge Street.

## BEESTON, NOTTS.

C. Hall & Sons, 68, High Road.

## BELFAST.

Belfast Radio & Electric Co., Ltd., 17-19, Queen Street.

## BIDEFORD, N. DEVON.

Messrs. F. H. Darch & Son, 13, Chingswell Street.

## BIRMINGHAM.

G. F. Collins, 511, Slade Road, ERDINGTON.  
J. Elvins, 112, Stoney Lane, SPARKBROOK.  
Hopkins Bros., 216, Hawthorne Road, KING-  
STADING.

Lees Radio Stores, 209, Lichfield Road, ASTON.  
Malcom & Stewart, 491, Alum Rock Road, ALUM  
ROCK.

E. Matty, 69, Lichfield Road, ASTON.

## BLACKPOOL.

A. Morfitt, 306, Lytham Road.  
The Radio Stores, 10, Cedar Street.  
J. Taylor (Messrs. R. H. O. Hills, Ltd.).

## BOLTON.

J. S. McLeod & Co., 34, Gt. Moor Street.

## BRADFORD.

A. Adams, 105, High Street, WIBSEY.  
A. Adams, 50, Oak Lane, MANNINGHAM.  
A. Ridgway & Co., 23, HALL INGS.  
J. Scurrah & Sons, 6-12, Rooley Lane, BANKFOOT.

## BROMLEY.

Chapman & Son, 418, Downham Way.

## BROMSGROVE.

C. Wynne, 19, Worcester Street.

## BURSLEM.

Bancroft Bros., 207, Newcastle Street.

## BURY.

Bennett & Co., 36, Union Street.  
Manchester District Wireless Co., 21, Agur Street.

## CAMPBELTOWN.

A. P. Macgrory, Esq., 16-18, Main Street.

## CANTERBURY.

W. A. Goodhew, 22, Sun Street.

## COLWYN BAY.

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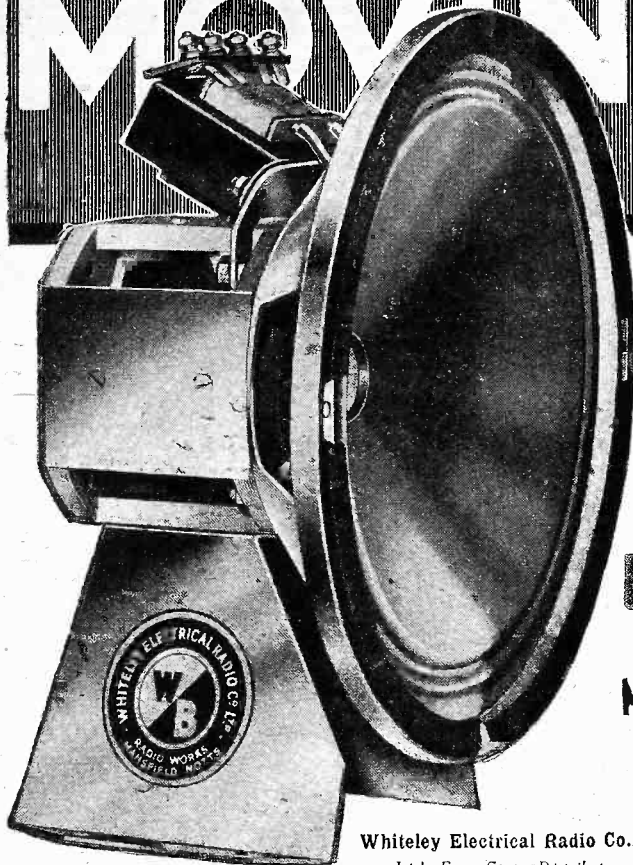
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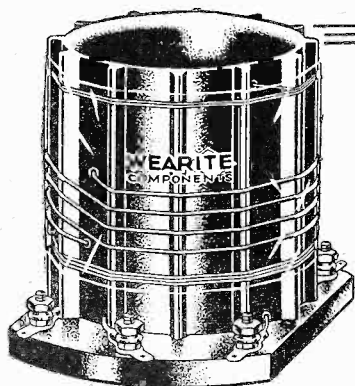
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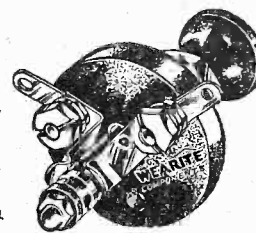


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## THE LISTENER'S NOTEBOOK

(Continued from page 156.)

show of the week. And so it might have been with such a galaxy of musical talent in the cast, with such beautiful stuff to sing, if listeners had known what it was all about. Never have I listened to a show in which so many singers failed completely to get their words over. I agreed with the compère (Frederick Lloyd), who confessed not to have followed the course of events. I hadn't, either. Surely the question of enunciation in singing is one singers have got to deal with. An operetta like "The Gypsy Baron," in which there is very little libretto, is ill-suited as a broadcast item, if its songs sound no more than tuneful vocal exercises.

I shall be sorry if the Commadore Grand Orchestra continue to include items of the "Motor Ride" type in their programmes. I've always liked this orchestra because it could be relied on for something tuneful and spirited, without noise or eccentricity, and always executed in the best workmanship. Frankly, these descriptive pieces, intended for bawling songsters, aren't good enough for the Commadore.

And this reminds me. Isn't Henry Hall overworking his soloist? And isn't the soloist overdoing his crooning? It's dreadfully irritating to have to listen to an hour of him (for he seems to be going all the time).

Personally, I would like to hear the band a little oftener. If we are to have a soloist, why not one who sings naturally? He would be unique.

"To Any Husband" didn't offer anything like enough opportunities to such a brilliant actor as Harold Warrender or, for that matter, to any one of the small cast of promising people. The play was, I thought, a poor affair, and it disappointed me perhaps because I had expected something of the excellence of "Anni and Harold," which was provided earlier in the month. On the other hand, the journey to sunny Italy and back gave the effects department another chance to bring out its marvellous train again.

That Musical Comedy programme which consisted of excerpts from less popular musical comedies owed its success to the fact that these comedies are not so familiar to the public. It seems that not one of them has found favour with the many operatic societies up and down the country, though they all appear to offer attractive chorus work. Fay Carroll and Brian Gaye dealt very adequately with the several songs, I thought.

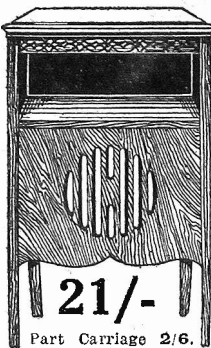
The Victor Olof Sextet, coming on late, seemed to have picked a programme of music more in tune with the hour of their performance than anything else. Their playing was certainly soporific. What happened after Elgar's Elegy I don't know, for I fell asleep.

I often feel that the B.B.C. might pay more attention to the arrangement of its programmes. All too frequently do we find the best wine left till last, and a very late last at that.

Enclose your set in this

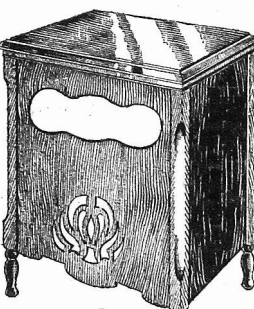
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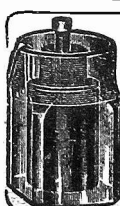
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## MIRROR OF THE B.B.C.

(Continued from page 156.)

Monday, May 2nd—Programme by the Wisbech Male Voice Choir; play, "Dr. Abernethy"; Percy Pitt conducting the B.B.C. Orchestra (National).

Tuesday, May 3rd—Charles Brewer's musical comedy, "Little Miss Make-Believe"; Chamber Music Concert by the Griller Quartet (National); play, "Dr. Abernethy" (Regional).

Wednesday, May 4th—Symphony Concert conducted by Adrian Boult, relayed from Queen's Hall; Isobel Baillie, Muriel Brunskill, Walter Widdop, Horace Stevens, and the National Chorus (National). "Little Miss Make-Believe" (Regional).

### The Yorkshire Mummers.

Thursday, May 5th—"Miscellany," a feature programme arranged by Denis Freeman; Recital for two violins by Jean Pougnet and Winifred Small; the Yorkshire Mummers Concert Party; Joseph Lewis conducting B.B.C. Orchestra (Regional).

Friday, May 6th—Recital by Egon Petri (pianoforte) and Glenna Danieli (soprano) (National); play, "Caractacus," produced by Peter Cresswell (Regional).

Saturday, May 7th—Cinema Organ Recital relayed from the Filmophone Studio; Vaudeville entertainment; first talk in the new series entitled "Hazard" (National). Orchestral Concert, including Vaughan Williams' Cantata, by the B.B.C. Orchestra, conducted by Stanford Robinson (Regional).

Sunday, May 8th—Sousa programme by Grenadier Guards Band; Recital by Pouishnoff; St. Martin-in-the-Fields' Service (National); Symphony Concert conducted by Sir Henry Wood (Regional).

### A Winning Play.

Monday, May 9th—Operatic programme, conducted by Joseph Lewis; winning play of the British Drama League Festival (National). Concerts by Theatre Orchestra, Wireless Military Band and Chamber Music programme (Regional).

Tuesday, May 10th—Sir Landon Ronald conducting a Light Symphony Concert (National). Vaudeville entertainment (Regional).

Wednesday, May 11th—Recital by Peter Dawson and David Wise (violin); play, "Triumph of Youth" (National) Percy Pitt conducting Orchestral Concert (Regional).

Thursday, May 12th—Chamber Music Concert; "Freak Programme."

Friday, May 13th—Songs from the Shows (National). Pini Tango Orchestra; Sir Henry Wood conducting Concert of Contemporary Music, preceded by a talk on the concert (Regional).

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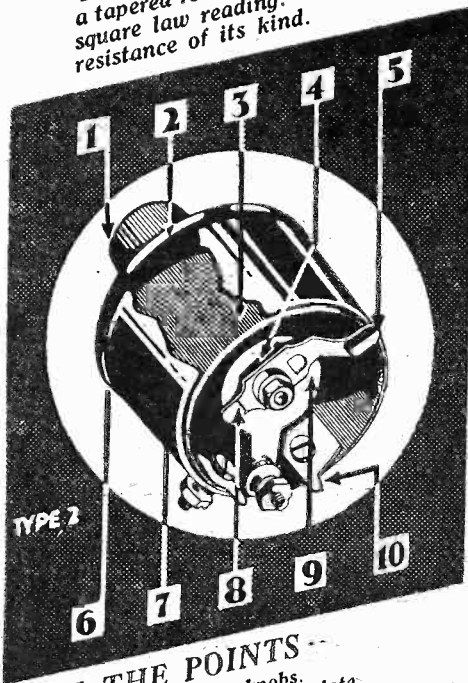
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Some diverse and informative jottings about interesting aspects of radio reception.

By Dr. J. H. T. ROBERTS, F. Inst. P.

### Interchanging Valves.

THERE is often a good deal of misunderstanding about amplification factors of valves, and many amateurs think that all you have to do is to pull out a valve and put in another with a higher magnification factor and you will be bound to get greater signal strength. Now this is not at all necessarily true, and you may find that the signal strength is not changed or you may even find that it has become less!

The point is that you have to consider not only the magnification factor of the valve, but also its *impedance*. It is fairly safe to say that if you have two valves with different magnification factors, but with the same impedance, then substituting the one with the higher magnification factor for the other one will result in an increase of strength of distant stations since the overall amplification will be greater with the better valve.

### Look out for Instability.

It is not even quite so simple as this, however, because if the overall amplification is pushed up too much you may get instability, and any advantages will be counteracted. For instance, suppose the valves in question are S.G. valves, it is quite possible that if the set is working satisfactorily and you substitute another S.G. valve with a higher amplification factor, the whole receiver may become unstable.

What I have said applies more particularly to high-frequency amplifying valves. The position with the H.F. valves is not quite so simple as with the L.F. valves, since with the H.F.'s we have also characteristics of coils to consider as well as certain other factors.

In addition to this, there is always the question of shielding to be considered, and in general we are not dealing with simple magnification. So that you want to exercise a good deal more care with regard to the replacement of high-frequency amplifiers, particularly of the S.G. type.

So far as low-frequency amplifiers are concerned, it is much simpler to say beforehand what the result will be if you substitute a valve of certain known characteristics for another one.

### Spaghetti Resistances.

How long is it since we have been using spaghetti resistances? At any rate, however long it is, they seem to be increasing in popularity and have certainly established themselves as a permanent and very useful little component.

It was quite a good idea on somebody's part to think of making wire-wound resistances in flexible and handy form, and the spaghetti resistance is often very useful in cases where it would be inconvenient if not impossible to fit in a wire-wound resistance of the ordinary type.

There are several points to bear in mind, however. The different resistances have

definite current-carrying capacities or ratings, and you should be careful to make a note of these so as not to over-run a resistance.

### Beware of Bad Contacts.

Another practical point is that the metal end-pieces sometimes come loose, or are not properly fastened on in the first place, and you may get a bad contact which will cause clicks and other irritating noises in the loudspeaker. As a rule, this can be got over by the very careful use of a pair of pliers in pinching the end into position so as to get a good firm grip of the resistance element.

### Detector Improvements.

A condenser added to the anode circuit of a detector often effects a decided improvement. It may bring about an increase in volume or, on the other hand, it may have the effect of making the reaction circuit easier and more satisfactory to operate.

In any case, it is very easily tried, especially if you happen to have a couple of spare fixed condensers. The condenser should be connected between the anode of the detector valve and the filament and different values should be tried until you see which gives you the best results.

This little dodge does not apply to all sets, but in cases where it does apply it sometimes brings appreciably improved results and has the advantage of being very easy to try.

### About Valve Pins.

It is curious to note how design has changed during the past few years in regard to the small but very important matter of valve pins. First of all, we had the rather crude and clumsy split-pin of the ordinary kind, and this was later followed by the much better "banana" type, in which the loose leaves extended backwards from the tip.

The banana type of pin has, in my opinion, a good deal to recommend it for a nice, soft, smooth fit, but it is not quite so easy to make and the leaves are apt to get broken off.

The foregoing types, together with the later side-slotted pin, all rely upon the springiness of the pin itself to get a firm electrical contact, the valve holder being rigid.

### Types of Holder

With the latest type of "solid hollow" pin (or, more correctly, a rigid tube) there is a very small amount of "give" and this is preferably provided by springy members in the valve holder. A very good example of such a valve holder is the Telsen holder, which has metal spring contacts at the sides of the sockets so that, even if there were no "spring" at all in the valve pins, firm electrical contact would still be made.

These holders are designed to provide an efficient contact with the valve legs, whether split or non-split. They have a further advantage that they are of low capacity and are self-locating.

When using a valve with solid pins and in an ordinary rigid valve holder, if there is any "out-of-truth" about the only thing you can do is to bend the pins, but this should be done very slowly and with great care, otherwise you will overdo it or actually crack the material of the valve base.

(Continued on next page.)



## TECHNICAL NOTES

(Continued from previous page.)

### Inductor Speakers.

Judging from inquiries received, a great many readers seem to be interested in the inductor, or so-called inductor-dynamic type of speaker. This is, in a sense, not exactly a cross between an ordinary reed-driven speaker and a moving-coil, but somewhere between the two, and probably his accounts for its popularity, together with the fact that a permanent magnet field is used, so that no field-exciting current is required as with an ordinary moving-coil speaker.

One of the great advantages of the moving-coil is that it is capable of movement through very large amplitudes, and this is particularly important in the lower frequencies where, as you know, a correspondingly larger amplitude is necessary in order to give the same aural impression of loudness. At very low frequencies some of the moving-coils will actually vibrate through a distance of about one-tenth of an inch, which is quite out of the question with an ordinary reed-driven type of speaker.

### Greater Freedom of Motion.

The inductor speaker is a comparative newcomer to radio, and employs a moving-iron system, but with much more freedom of motion than that of the reed-driven type. Of course, you must bear in mind that the permissible amplitude is nothing like so great as that of the moving-coil speaker.

With an inductor speaker it is a good plan to introduce a transformer or choke, so as to isolate the speaker from the set. Perhaps I should have said that this is a good plan with *all* speakers, and that the inductor is no exception to the rule.

With many speakers, of course, you have to use a transformer for matching up inductances, altogether apart from the question of isolating the speaker from the line current of the set. For instance, with a moving-coil speaker, generally you have to use a very high step-down ratio in view of the very low inductance of the moving coil itself.

### Inductor Quality.

I have experimented a good deal with the inductor type of speaker, and as regards quality I do not consider that it is quite in the same class as the moving-coil; but, nevertheless, it is quite an improvement upon older types, and seems to me to fill a need, particularly in view of the fact that it can be worked direct from the set without any field current.

The amplitude of movement of the cone obtainable with an inductor speaker is sufficient to warrant, if not indeed to require, the use of a baffle board, just as with a moving-coil. If you are using an ordinary reed-driven speaker, and you have leanings in the direction of a moving-coil, but do not want to go to the trouble of providing a separate field current, it may well be worth while to consider an inductor speaker. The best types give excellent results for all-round purposes, and are undoubtedly a very good proposition.

### Aerial Condenser Effects.

I said something about the use of a pre-set condenser in the aerial some little

(Continued on next page.)

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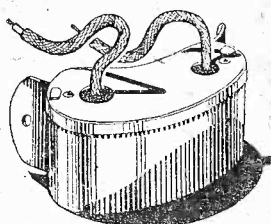
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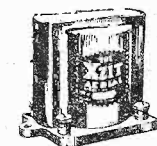
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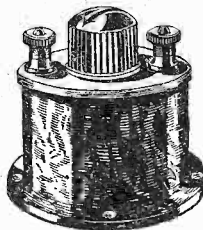
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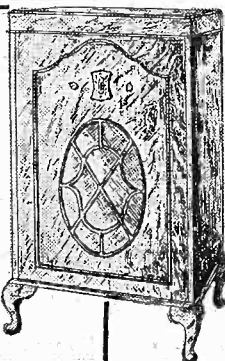
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## TECHNICAL NOTES

(Continued from previous page.)

time back, and several readers have raised various points with regard to this, particularly on the question of the wave-length range.

Everybody knows that introducing a small condenser in series with the aerial generally has the effect of sharpening up the selectivity, although, at the same time, it may reduce the signal strength below normal. This is more particularly the case if the capacity of the condenser is too small.

On putting in a condenser, in fact you may sometimes find that the signal strength is actually improved at first, but as the capacity of the condenser is still further reduced, the signal strength will fall off. Not only is the selectivity actually improved by the use of a series condenser in this way, but if the signal strength is reduced there is a still further apparent sharpening of the selectivity, due to this very reduction of the signal strength fed into the first valve.

### Effect on Tuning Range.

Now as regards the tuning range, so long as the capacity of the condenser is kept within proper limits, the tuning can generally be brought down to include lower wave-lengths without really sacrificing anything appreciable at the upper end.

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### The Earth Question.

Probably you may have noticed recently that various water-supply companies have been inquiring into the question as to whether they should allow water-pipes to be used as earths for radio sets. The trouble appears to be that in some cases the minute currents running to earth cause disintegration or corrosion of the metal pipes owing to electrolytic action. Incidentally, water-pipes have been used as earth connections for ordinary house telephone installations long before broadcasting began.

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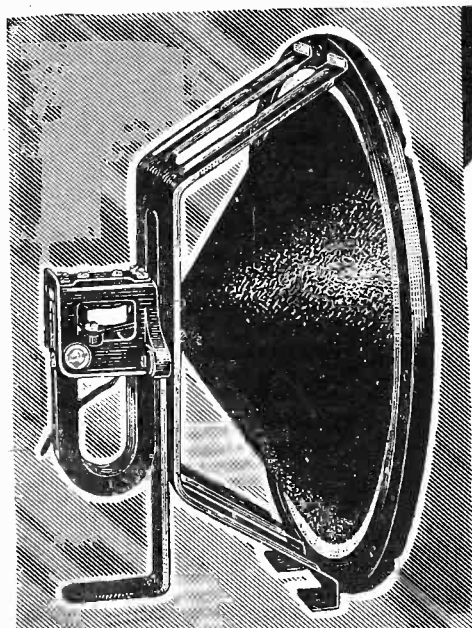
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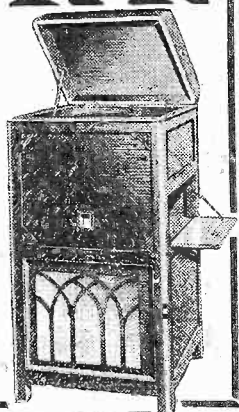
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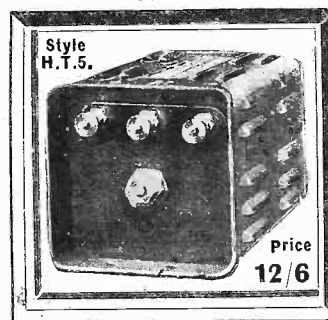
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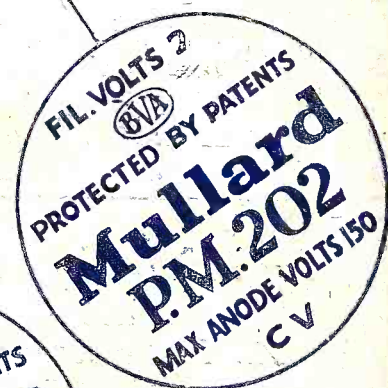
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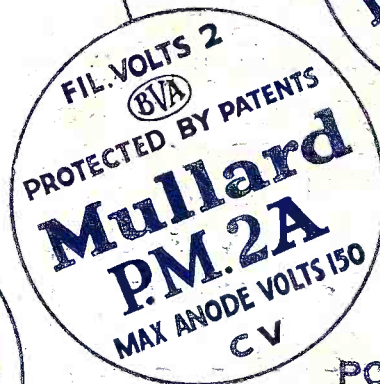


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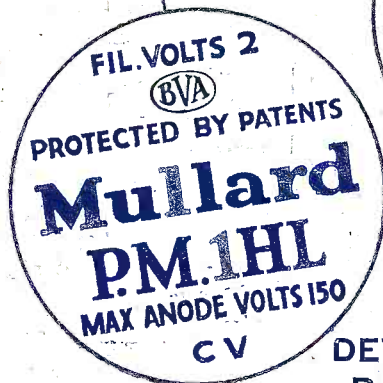
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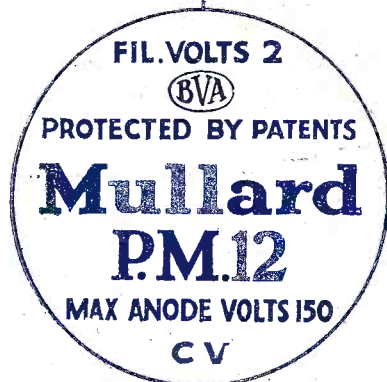
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