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INCORPORATING "WIRELESS"

April 9th, 1932.



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2. THE SPANISH MAIN—By Lieut.-Commander The Right Hon. J. M. KENWORTHY, R.N.

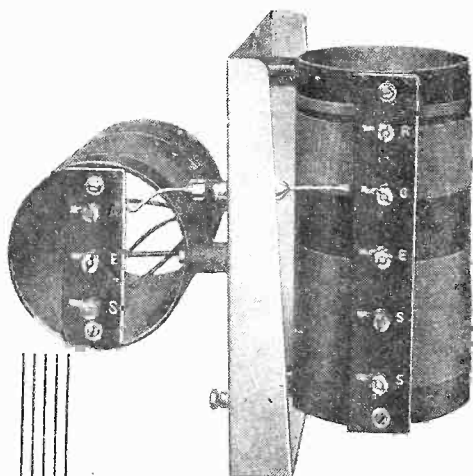
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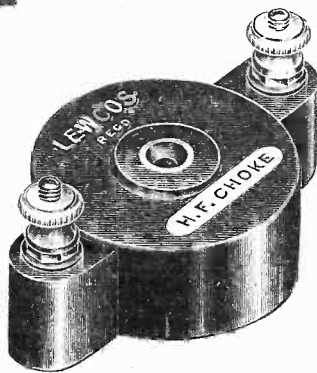
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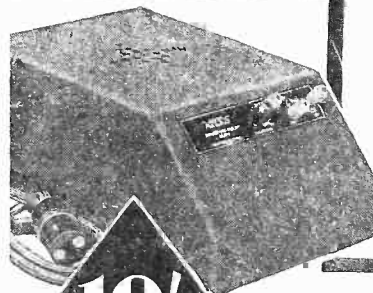
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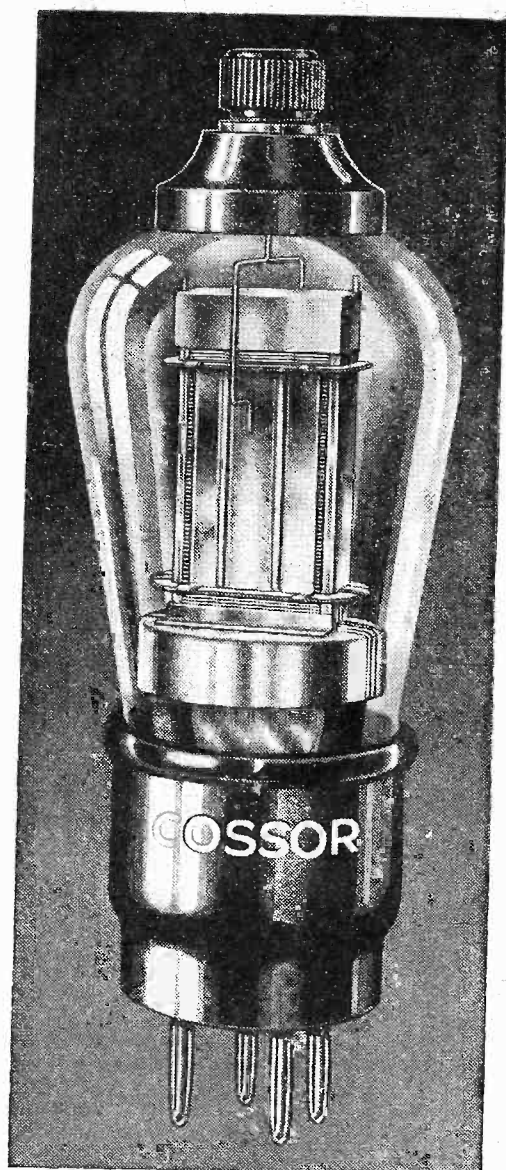
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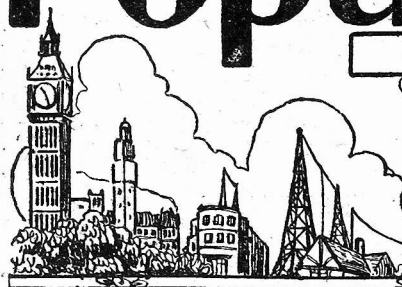
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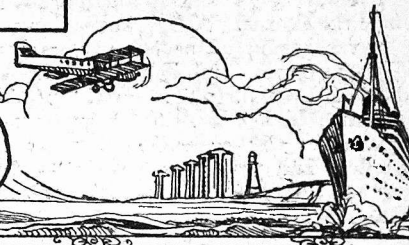
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**SPRING THOUGHTS
RADIO & GRAMMY
NO HARM IN TRYING
THE FRETFUL ETHER**

RADIO NOTES & NEWS

**MY LATEST PLAGUE
S.O.S. CALLS
INTENSIVE PIPS
CANINE STATIC**

Thoughts on Spring.

"SUMMER-TIME" will soon be on all our timepieces, and the call of the wild will drown the call of the wireless, at least till about 8 p.m. Soon the sparrows will scuffle about amongst the budding branches and cracks will appear in wireless poles.

Camp sets, hiking, motor-car and portable sets will be renovated. Conscientious men will lower aerials and scrape wires, besides scrubbing insulators. (When will the "pram" set arrive, by the way?) Loud-speakers will soon creep towards windows and doors, and begin the spring *al fresco* contests. But so long as spring really comes—let 'em all come!

Jack's Post-Bag.

JACK PAYNE certainly has reason to be satisfied with the public's response to his and his "boys'" efforts in the world of radio. I learn, for instance, that between the date when his retirement was announced and that of his final broadcast, he received some 20,000 messages from all parts of Europe.

On the day of his last broadcast under B.B.C. auspices he got about 1900 letters and forty parcels of gifts for himself or his wife. Good luck to him—but I can't help wishing that the "boys" came into the picture a little more prominently. I know that my Theory of Stick-wavers is generally unacceptable—but, after all, the "boys" played the stuff, didn't they?

The British Empire Station.

CONSIDERABLE comment has been caused through the action of the B.B.C. in placing its order for the British Empire station with the Standard Telephone Company, most of whose capital is held by the American firm which is the Empire's greatest competitor in the communications business, the International Telegraph and Telephone Corporation, backed by J. P. Morgan & Co.

Hence I feel that I ought to point out that such action connotes neither disregard

of British interests by the B.B.C. nor inferiority of the British products.

An Explanation of Interest.

FIRST of all, bear in mind that the station will be built by British labour, anyhow. Then, it should be recognised that, following the general routine of British Government Departments, the B.B.C. avoids dealing exclusively with one supplier in order to obviate a virtual monopoly.

Within a few days of placing the order for the Empire station the B.B.C. gave the

to be over, and I understand that the radio people will be able to broadcast as many records as they may require. So I should think! There's nothing like radio for selling records! Good records, of course.

The I.S.W.R.L.

PUBLICATION of this League's "News," which was suspended during Nov.-Jan. (inclusive) was resumed, in February, and all subscriptions have been carried forward proportionately.

No Harm in Trying.

I SEE a report that a group of financiers is investigating the possibility of establishing a broadcasting station on Brecqhou, one of the Channel Islands, near Sark. This is interesting, but rather melancholy news, for I don't think that there is any chance of the Post Office giving them a licence for the purpose.

The B.B.C. has a monopoly of broadcasting which, I have no doubt, extends to the Channel Islands, and I can hardly believe that it would consent to an invasion of its prerogative by financiers.

Long-Distance Men to Note.

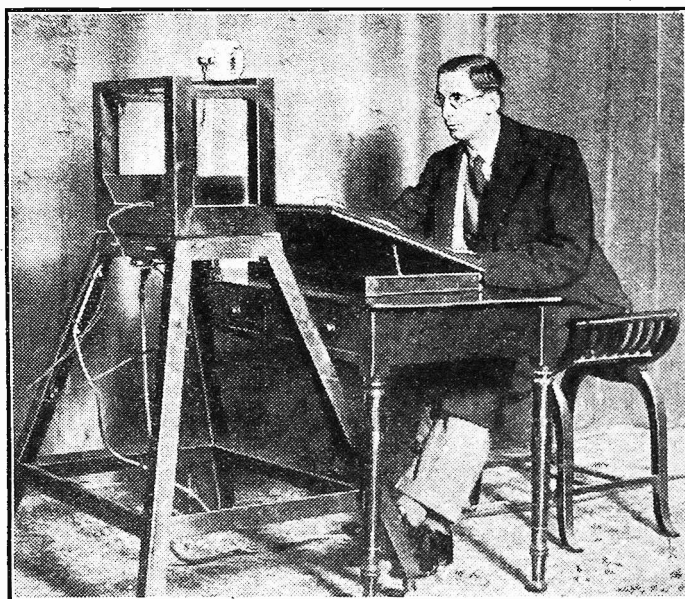
NEXT June, wind, weather, and war permitting, the American Williams-Maris Arctic Expedition will set sail for the Far North, Ellesmere Island, to be precise. Here they hope to set up a radio station and base camp at Fort Conger, from whence they will send daily

weather reports by wireless. The scientific director of the expedition will be Dr. H. B. Maris, of the United States Naval Research Laboratory. Signals to hunt for, boys!

The Fretful U.S. Ether.

IF the ether had feelings it would just hate America, because over and above the enormous number of broadcasting and other kinds of radio stations there, the amateur transmitters number no less than
(Continued on next page.)

DE VALERA AT THE DUBLIN STATION



The new President of the Irish Free State, Eamon De Valera, is here shown broadcasting a message to the Irish people in America, from the studio of the Dublin Broadcasting Station.

Marconi Co. an order for the two Western Regional transmitters: in fact, that Company has had all the B.B.C.'s orders for medium-wave regionals, namely, eight.

Moreover, in such European countries as do not possess big radio companies, Marconi's have built 23 stations out of 37, the odd 14 being divided between other manufacturers.

Radio and Grammy Shake Hands.

THE dispute between the German broadcasting company and the gramophone record industry is now reported

"ARIEL'S" RUNNING COMMENTARY ON RADIO (Continued)

22,739, and they are a busy crowd, too. Last year, nearly 4,000 new amateur stations joined the chorus. Well, it keeps thousands of clever young chaps happily, and usefully, employed, and helps to take their minds off Ireland, India, liquor, "petting," gunmen and dollars. So I suppose it's O.K., especially as while they are key-punching and yelling into their "mikes" they can't listen-in to any of these vaudeville programmes.

My Latest Plague.

BEDSTEDS, bees, and bats having quietened down during the winter, it is my sad lot to have been bombarded with epistles from a "boot-clicker" of Northampton all about the, alleged, effect of radio upon his household chronometers.



Nervously clicking my boots, I would advise him that I attribute his inability to leap from slumber at 6.30 a.m. not so much to the malignant effect of broadcasting upon his clocks, watches, hour-glasses, etc., as to the somnolent effect of "clicking," super-added to the well-known punch of Northants ale. Perhaps he will check me up on this and write again—next year!

General Ferrié.

IT is my melancholy duty to record the passing of the French General Ferrié, the father of French army wireless. His name is perhaps more familiar to those of us who were radio men before and during the Great War, for he it was who organised the Eiffel Tower station and service, and was one of the most well-known personalities in European radio.

He was present at Marconi's experiments in communication between Wimercaux and Dover in 1899, and initiated the French military radio service in 1900. He had many decorations, including the Legion of Honour, and was a D.Sc. (Oxford).

B.B.C. "SOS" Calls.

NO doubt you will be interested to learn that of 833 SOS messages broadcast from London during 1931, 335 were successful; about the same as for 1930.



That works out to about 40 per cent. Provincial SOS calls produced 23 per cent of successes, whilst such illness calls as were broadcast nationally secured about 52 per cent of successes.

The "Daily Express" tells a pretty story about a kid who was found in the street by a policeman, crying bitterly.

"What's the matter, sonny?"

"I'm missing—and haven't been heard of since!"

"Deferred Television."

RATHER an apt phrase, that, for the "talkies," I think. It was manufactured by A. T. (Staines), who has written at some length on the subject of television. The interesting thing about television, when it comes, will be its operation in the home at the very time when the scenes it depicts are being enacted. However, I am afraid that we shall have to wait a long time for a domestic visual supply of the world's events direct from the "roaring loom of Time." Nevertheless, having been through some of the early struggles of wireless telegraphy, I think we ought to have sympathy with the pioneers of television so long as they stick to hard facts.

"SHORT WAVES"

A number of new yodelling songs were broadcast recently. It is feared that many milkmen listened-in intently.—"Punch."

HELPFUL HINTS.

It is extremely doubtful if a short high aerial has any real advantage over a high short one.

Distortion caused by a horn type of loud-speaker can be eliminated by stuffing a certain amount of cotton-wool down the funnel. If this is not entirely successful, it may also be inserted in the aural organs.

To ensure your aerial poles "standing" severe gales without "falling," use stay wire that has been manufactured in Scotland. Such wire will never "give."

A.: "What do you think I shall be allowed on these old valves when I buy new ones?"

B.: "Um—er—I should say you'd be allowed to take them home again."

In America a man has been playing a saxophone solo at the bottom of a coal mine.

On the surface this would appear to be an excellent idea, but unfortunately the thing was broadcast.—"Punch."

RADIO JERKS.

"Let Beethoven build your muscles," writes a correspondent in "The Daily Mail."

"What does it matter if you owe your torso to a rhapsody, and your calves to a cantata? You ought to be proud to go into a gymnasium and demonstrate a good pull-up for 'Carmen.'"

Sweden's Sweet Goodnight!

EVIDENTLY they have been going in for big noise in Sweden—you know! "heard it all over the house"—for there is now a law that no music in a house or flat shall be audible in another after 11 p.m. I don't know whether talks or fat stock prices are tolerated at 11.5 p.m. In order to help on the great silence the Stockholm Broadcasting station now shuts down at the hour mentioned. But could not much the same thing be accomplished merely by reducing power?

Does the B.B.C. Do It Purposely?

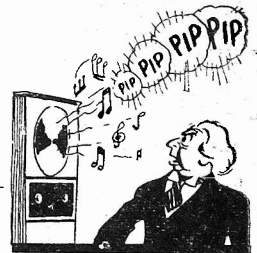
TALKING of reducing power recalls the complaint of C. B. H. (Nuneaton) that as he alleges, the B.B.C. increases its power at times on Sunday in order to try and drown the reception of Radio-Paris's concerts.

I am of the opinion that the B.B.C. wouldn't dream of such tactics, and, any-

way, a receiver which will cut out B.B.C. stations in favour of Radio-Paris is easily designed, though what can be done for listeners very near B.B.C. stations depends on circumstances; but, anyhow, if listeners prefer French broadcasting the B.B.C. loses not a penny of revenue for that reason, so why should it worry?

The Intrusive "Pips."

F. G. A. (Watford) is so obliging as to state that if the Greenwich time "pips" irritate me I ought to be in a hospital or lunatic asylum, because my nervous system must be diseased. My objection is not levelled at the "pips" *qua* "pips," but at the unseasonable moments chosen for them wherein to pip.



There is a time to pip and a time to refrain from pipping, and I say that the B.B.C. perpetrates a sin against artistic propriety in allowing its pipping to cut across a piece of music.

F. G. A.'s letter is so impolite that I can only hope that it was prompted by dyspeptic misery rather than by an ungovernable passion for horology. Why doesn't he get a reliable clock, anyway?

Shakespearean Note.

THE B.B.C.'s broadcast version of "Othello," produced in March, was to me a very satisfying piece of work; it kept me from my Sunday tea and sent me flying to the shelves for the play to read again. More, please! This reminds me that the Prince of Wales is to open the Shakespeare Memorial Theatre at Stratford-on-Avon on April 23rd, when his speech will be relayed to "National" listeners. A historic occasion! Make your youngsters hear it, if possible!

Canine Static!

THE latest truthful story going the rounds of the "trade" is that a man who owns a very sensitive portable owns also a dog; this dog, whenever he scratches, causes a discharge of frictional electricity in its coat strong enough to make noises in the loudspeaker.



Solemnly I accept this statement, not a muscle moving on my famous "poker face," and as solemnly recommend that instantly these noises occur the portable owner should stroke a cat in the opposite direction, thus neutralising the dog's charge! Failing this, he should call up a Post Office van and ask it to detect the tyke very severely.

ARIEL.



A GREAT deal has been written in the past few weeks about the departure of Jack Payne and his "boys," and the arrival of Henry Hall in the capacity of director of the B.B.C. Dance Orchestra. Attempts have been made to forecast the style of the new performers and compare it with the old. After the first broadcast of the new band so much space was given to so-called criticisms that one is forced to the conclusion that rumours of bad business in Fleet Street are not without foundation.

Not Meant For Dancing.

Because I am a close student of the technical side of rhythmic music, I have read every word which has been written, in the hope that I might find at least some indication that this kind of musical performance, designed for listening and not for dancing, is coming to be regarded as deserving of specialised and separate study. I have searched in vain for a kindred soul, and find that, though there is some adroit use of dance band jargon, and a great deal of purely personal opinion, there is very little appreciation of the fundamentals.

The enormous popularity which Jack Payne achieved, quite apart from the merit of his work, was almost entirely due to his immediate appreciation of the fact that he did not go to the B.B.C. to play music for dancing.

Personality Counts.

He created a new form of entertainment, and in doing so certainly became the B.B.C.'s best licence-seller. Whoever the B.B.C. chose as his successor found the greater part of his row hoed for him. If Henry Hall can live up to the popularity of his predecessor, his success is assured, even though his standard of performance should prove consistently low. That popularity is far more a matter of personality than musicianship, and it is here that Henry Hall must look to his laurels.

Say what you like about Dance Music but you must never forget that to many listeners it is the best feature of the B.B.C. programmes. That is why the big change-over from Jack Payne to Henry Hall is so important, and why this frank and outspoken article on the subject makes such good reading.

I visited the Palladium on almost every occasion that Jack Payne figured in the programme. Many of his performances were good and warranted the applause they received, but they were never outstandingly better than similar performances by other well-known bands. His radio personality was entirely responsible for his phenomenal stage success. On one occasion, when either he or his men were tired or out of sorts, he put up a really bad show.

It made no difference whatever; the house rose to him, as it had always done,

and he took his dozen or so curtains, and was called upon to make his usual speech to what is probably the most critical variety audience in the world.

The same can be said of his broadcasts. By whatever standard we assess them, it has to be admitted that they were sometimes definitely bad; yet they invariably headed the list of appreciations in the weekly analysis of correspondence on programmes, and the few letters of criticism could always be associated with the kind of crank who hates anything suggestive of dance music anyway.

It Suits The Palate.

The fact of the matter is that, whatever the B.B.C. may say to the contrary, the public has got right hold of this new form of entertainment. It suits the palate of the day. It is, and I hope always will be, something individual and different from anything else in the programme.

If Henry Hall tries to win Jack Payne's place in the hearts of listeners by playing them music for dancing, he will fail, no matter how well he performs from a musician's point of view. If he allows his performance to become in any way a compromise with other forms of broadcast programmes, he may achieve some popularity within Broadcasting House, but listeners will never forgive him.

A Grave Mistake.

They expect him to progress and improve but not to change the character of their favourite hour. He has already committed one error of inexperience. He allowed himself to be caught by a wily journalist into giving in an interview an account of all the alterations he proposed to introduce when he took Payne's place before the microphone.

How much of this he really said, and how much was garbled, I do not know, but if he said anything at all, he was foolish, because his strength lies in his

(Continued on next page.)

THE SIXTEEN-YEAR-OLD OBOIST!



Henry Hall was certainly not afraid to give youth a chance, for this member of the orchestra is only sixteen! He is Richard Matthews, and the rest of the players look on Richard as their mascot.

THE NEW B.B.C. DANCE ORCHESTRA

(Continued from previous page.)

ability to grasp the fact that the public likes in principle the kind of show it has become accustomed to.

He Stands Alone.

While this ready-made popularity makes Henry Hall's initial problem easier, it may also prove to be his undoing. He can inherit the audience and the popularity of the type of broadcast if he is wise enough to leave well alone, but he must develop his own radio personality.

Here he has got to stand entirely alone, for I warn him that he will get no help

avoid bruising his heel on the stony path he has to travel if he reflects that the choice may have been influenced by the fact that he is, perhaps, more easy-going than his predecessor, and therefore more open to coercion.

I do not wish to add to the difficulties of his new position, but I cannot help feeling that there are quite a lot of people in whose shoes I would sooner stand than Henry Hall's at the present moment. Time alone will show whether he will become the tool of those who are only too anxious to shape his destiny for him; whether he will become another public hero, or whether he will find the via media which will keep his part of the programme safe from the ravages of the uplift experts, and at the same time earn the undivided praise of both the public and his immediate colleagues.

His task is difficult almost beyond

the threat attributed to him in one daily paper to eliminate anything which even remotely approached what Americans call "hot playing."

He has a clarinet player whose rendering of these more exotic passages is quite the best thing I have heard. His first saxophone, if a little too full for the remainder of the section he leads, has such clean style and fine tone as to put him right in the first rank of performers on this instrument.

Some Slight Criticisms.

I cannot say as much for the tenor; he is "reedy" and rather thin of tone, and does not seem to be able to hold his pitch on the low notes. I know that Hall does not approve of too much brass, but I think he is holding it down too much, particularly as he has such a good first trumpet player whose tone and precision is quite delightful. After an era of cultivated "muddiness," which the players of this instrument have allowed the coloured American players to teach them, it is even more pleasant to hear really good playing and absolute certainty of pitch.

I am frankly disappointed with the rhythm section. It is probably to a large extent a question of balance. I will leave it at that, with this remark: that, excellent as their work is in all the other fields of operation, the staff which the B.B.C. maintains for balancing orchestras in the studio have not the smallest idea of how to balance a band for this type of performance.

On the whole, I am very pleasantly surprised by the new band. I find their performance restful after what one has become accustomed to. Adjustment of balance will probably put right a certain lack of fullness, and I strongly recommend Mr. Hall to tackle this problem himself without the help of the experts, just as Jack Payne found it necessary to do.

VAL THE VOCALIST



In the centre is Val Rosing, who sings the songs, and on his right stands the orchestra giant, F. Burton Gillis, who is six-feet-seven in height! Accidentally mirrored to the left is an enormous "ghost," which is probably how the giant looks to little Richard Matthews (right), the oboist.

from the B.B.C. Individual success is only achieved at the B.B.C. at very considerable cost. When Jack Payne left there were very few tears shed among the staff. Admittedly, he was "tetchy" and *difficile*, and by no means easy to work with, but he sacrificed everything to make a success of his job.

An Easy-Going Disposition.

So far as the public is concerned, he was justified, and if hero-worship was his aim, he certainly registered a hit. It is within the power of Henry Hall to be just as big a success, but it remains to be seen whether he can do so and still keep friends with the B.B.C.

If he is incredulous of the good fortune which led to his selection, it will do him no harm, and may possibly help him to

conception, but I believe—from an all too brief acquaintance—that he has got it in him to succeed if he is given a fair chance.

From the purely technical point of view, he seems to be well-equipped. I have heard the new band broadcast twice. They are obviously unaccustomed to the work, and have got to settle down and "find their feet." It is hardly fair to criticise yet, but there are one or two points which stand out.

First of all, the standard of collective and individual musicianship is definitely high. The band shows no tendency to exercise the licence which is erroneously supposed to be the right of dance bands to play out of tune.

The orchestrations are simple enough to be executed without loss of theme, though I am glad that Hall has not fulfilled

TIPS FOR CONSTRUCTORS

Taking Wires through Screens, Terminals on Pentodes, etc.

A wrapping of insulating tape or a short length of Systoflex should always be placed over wires which pass through holes in the screen.

Never use pliers to tighten up the terminal on a pentode or a screened grid valve, as the threads easily strip on these.

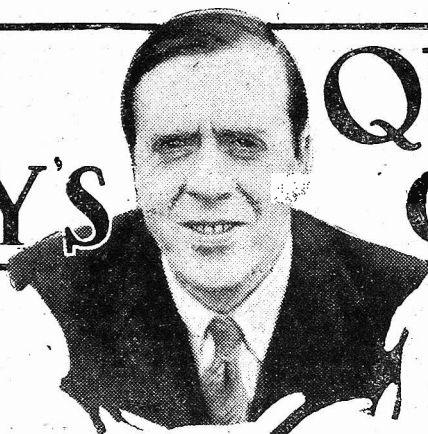
When stripping the top cover from a flexible lead, search for and remove the single thread of cotton that runs in a continuous length along the rubber insulation. When this is removed the outer covering is stripped much more easily.

The ordinary cheap flex, obtainable at a few coppers a yard, is hardly good enough for reliable mains connection, and it pays to ask for best quality flex when such a lead is being installed.

Most electric light companies will undertake to install loudspeaker extension wiring, etc., when wiring up a new house, if requested.

When making connections to a wire-wound resistance be very careful not to tighten the nuts excessively, as if it should turn, this would break the very fine wire which is connected internally to it.

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.

Interference from Trains.

A. B. (Catford).—"Electric trains run past the back of my house, and before a train passes I hear a series of clicks from the loudspeaker. Can you suggest a cure?"

"I believe that the trouble is caused by signalling apparatus."

I fear there is no real cure. You should try and get your aerial as far away from the railway as possible.

The only way to stop the nuisance is for the railway to eliminate the interference at source. This they are not forced to do.

Sometimes tramway and railway companies are very kind, and do their best to eliminate interference. At other times they find the problems too difficult or the solution too costly.

The B.B.C. would help you in this. They know how to get into touch with the authorities, and it is, as I said before, the railway people alone who can really help.

Duplicating Earths.

P. B. (Catford).—"I have been told that using two earths is undesirable."

"For some time past my earth system has consisted of a lead taken to the main pipe and also another lead from the earth terminal to a plate buried in the ground. I was under the impression that this would ensure a good earth at all times."

"Now I am rather doubtful and would like to know whether I would get better results if I did away with one of the earths and only used say the water-pipe?"

Why not try it and see?

In general, one can say that there is no gain in putting one very good earth (water pipe) in parallel with another very good earth (buried plate), and there might conceivably be a slight disadvantage in doing so if one was slightly worse than the other.

The bad thing to do is to put a bad earth in parallel with a good one; that may result in just a bad earth. One good earth is simplest, two good earths in parallel is possibly not so good. But I'll bet you would not notice much difference if you disconnected one of your earths, provided they're both good. Why not try it and see?

Grid-Leak Detection.

J. M. (Gidca Park).—"I find that a milliammeter connected in the plate circuit of the leaky-grid detector of my set reads 5 milliamps. when the set is not tuned to any station. When, however, I tune in either of my local stations the reading falls to between 3 and 4 milliamps."

"Is this in order?"

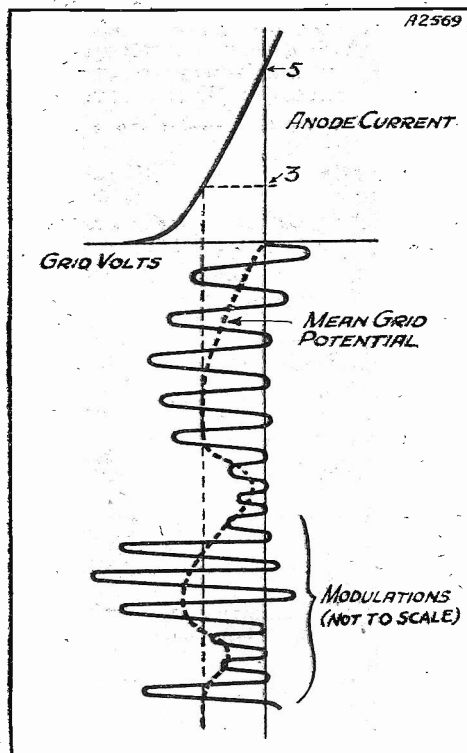
It is "in order" in degree if not in

quantity. A leaky-grid detector works in this way:

1. Before signal the valve passes (say) 5 milliamps., just like a good valve will.

2. A carrier (not modulated) is tuned in. Analyse it very slowly. First there is a positive grid swing, then a negative, then a positive, and so on. At the first positive swing electrons flowing past the grid get attracted to the grid because that grid is

DETECTOR ANODE CURRENT



With the aid of this diagram Capt. Eckersley explains to J.M. why the anode current of a grid detector falls when a station is tuned in.

(+). Quite a lot collect on the grid and tend to flow back to the filament. But the grid circuit is not conductive—it is "leaky" only, and the electrons flow very slowly.

3. The grid goes negative and the negative charge remains in the grid, only slowly leaking away.

4. The grid goes positive again and collects some more electrons. But not so positive as before, because it already carries a lot of electrons.

5. The same as 3.

6. The same as 4.

Look at the diagram. This shows the momentary potential of the grid during several swings of the carrier-wave potential.

Note that after a few swings taking only a few millionths of a second, the whole grid potential has gone negative—steady negative, and so the current reduces from 5 to (say) 3 milliamps.

But if we modulate the intensity of the carrier wave the mean grid potential changes according to the modulations, and we thus get rectification. But if we reduce the mean grid potential too much we get bad quality because we start going round the negative bottom bend of the valve characteristic.

So it is better to let the carrier wave reduce the current by about 10 to 15 per cent, no more in usual practice.

Wireless Warmth?

M. H. L. (Richmond).—"Why is it that a chill seems to descend on to a room when the radio suddenly stops at the end of an evening's programme? I have often noticed this, and some friends, to whom I have mentioned it, also say that they have experienced this weird effect."

"Is it because the sound waves from the speaker actually have been warming the air of the room?"

Sir! Before I will answer this question you will answer some of mine!

(1) Buy a thermometer. Switch off the wireless. Does the thermometer mercury, or spirit, descend in the tube?

(2) If it does, do the same experiment at different times in the evening, carefully observing whether the fire is dying down or burning up.

I suggest you will be unable to correlate wireless, on or off, with temperature unless—

(a) You have a set worked from D.C. mains, and when it is on it is possible to feel a considerable heat arising from it.

(b) You have a poor electric heat supply which is robbed by the wireless set.

I suggest you usually switch the set off fairly late when the fire is dying and the night is getting colder outside, and that your attention, free to wander when the noises have ceased, feels a growing chill.

You are not by any chance leg-pulling?

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"

MORE ABOUT THE MODERATOR

Some further details regarding "P.W.'s" new power-selectivity scheme, together with a description of the construction of the "Moderator" coil.

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

YOU can easily make a Moderator coil yourself, for it involves no complicated windings. In fact, it is a job which anyone can tackle without previous experience of coil-making.

The main item needed is a "P.W." "Coil Quoit"—an article which costs sixpence, and is very easily obtainable.

Then you will require a small quantity of number 30-gauge double silk-covered wire. Thirty feet will be ample, but if you do not happen to have some of this wire in your possession already, you will have to purchase rather more than is necessary, for the shops don't sell wire by the ha'pennyworth!

However, the remainder will no doubt come in useful on some future occasion.

Now for the winding. Fix the end of the wire to one of the holes provided for the purpose in the Quoit, leaving three or four inches for connecting purposes. This represents one of the two terminals on a commercial Moderator coil.

How to Wind It.

Now evenly wind on twenty-one turns in the form of a single layer, and at this point, the twenty-first turn, make a small loop to act as a tapping. A half-inch loop will suffice, and don't forget to remove carefully the insulating material from it.

Now continue with another six turns wound (in the same direction) over the first layer, and make a second loop. The coil is completed by putting on this second layer eight more turns (same direction of winding), at which point you thread the wire through the second hole and cut off, leaving enough to spare for a third loop. Thus you have a coil of thirty-five turns, with tapping loops at 21, 27 and 35 turns.

The second terminal of a Moderator Coil does not directly connect to the winding, but has a short lead fixed to it, this lead terminating in a plug or crocodile clip for making connection to the required tapping point—one of these points being the actual end of the winding.

Fixing the Coil Quoit.

You need not worry about fixing sockets for the tapping points—a small crocodile clip answers the purpose quite well, but do not attempt to "make do" with twisted wire connections, for that practice inevitably results in breaking the wire after a short while.

Some Coil Quoits have small brackets by which the article can be screwed vertically or horizontally to the baseboard. Where brackets do not exist, the Quoit can still quite easily be mounted with the aid of a strip of wood passed through it, or over it (according to its position), each end of the piece of wood being screwed lightly to the baseboard.

I hinted last week that it may happen that in cases it is difficult to apply the Moderator scheme. You see, there are so many different kinds of aerial tuners and

tuning circuits—some of which are, to say the least of it, peculiar to the extreme!

I endeavoured to indicate simple methods of determining the possibility and suitability of "Moderating," but it is certain that there will be people who will find it quite impossible to say definitely whether their sets will respond to "Moderation" treatment until they have actually tried it.

And just as inevitably, there will be a percentage of enthusiasts who will make the experiment, and fail to obtain the results the fortunate majority will enjoy.

Fortunately, there wouldn't be a great financial loss if the uses of the Moderator

Coil unit). Then join the other end of the winding (or the other terminal on a complete unit) to the aerial terminal of the set by means of a short length of wire.

Finally, connect one each of the two condenser terminals to the above two points. As a refinement, the coil and the condenser can be built into a small wooden box, on to a miniature baseboard and panel, or even into the set itself.

But it should be noted that this rejector wave-trap, for such it is, will deal with only the medium-wave stations.

For Long-Wave Selectivity.

You could quite easily make the device serve a useful long-wave purpose by merely removing the tapping-plug or clip when you are on the long waves. (With the home-made coil, disconnect one end of the coil itself, making certain you leave the aerial lead joined to one side of the condenser, and the other terminal of this joined to the aerial terminal of the set.)

The coil is now out of circuit, and the small variable condenser operates as a series selectivity device. And you will find

that in the majority of cases it does this quite well.

In regard to the use of the Moderator system for "Moderating," I find I have so far failed to mention something of vital importance. This is that you cannot couple a Moderator coil with a shielded tuner—one of those tuning units in a metal case.

Canned Coils.

The metal casing, or "can," is provided for the purpose of preventing the coil itself from coupling with anything outside. But in a simple detector-L.F. single-circuit tuning type of set, such screening plays little useful purpose, and you can at least try the experiment of removing the can in order to "Moderate."

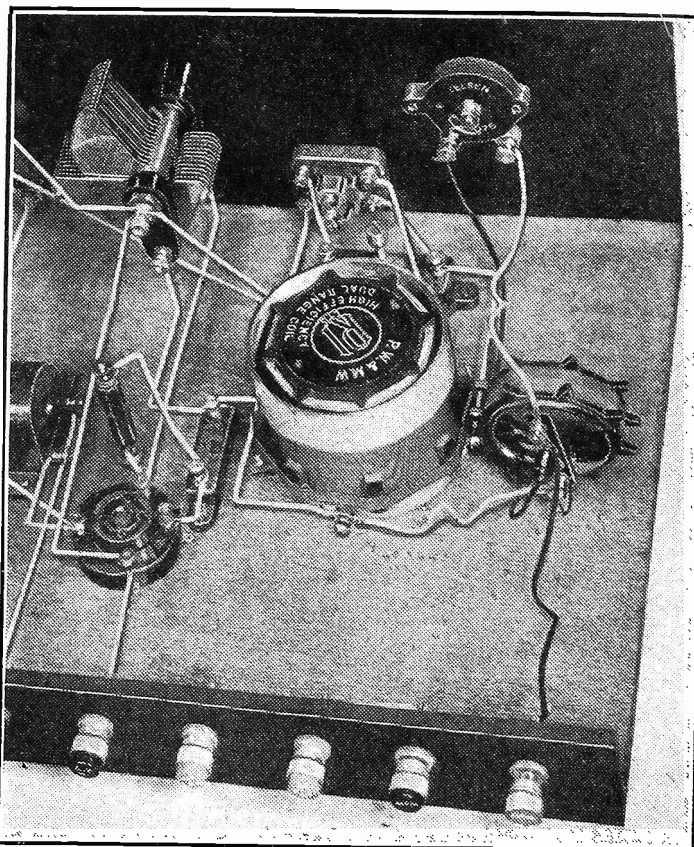
I've tried doing this with various makes of "canned" coils, and in certain instances enormously improved results were obtained, the mere removal of the shield-

ing having quite a bit to do with it!

However, if you too, find this, don't immediately start calling the coil maker names, for shielding in multi-valve sets is an essential feature of design, and that your coil is shielded means that the designer thereof had had H.F. amplifiers in mind.

There is quite a lot more I'd like to say about this Moderating business, but I fear I will have to ask our Query Editor to take up the story in his "Radiotorial" columns in future issues.

WIRED AS A WAVE-TRAP



Even if you are unable to "moderate," the Moderator coil and condenser can be used as an efficient wave-trap and for controlling long-wave selectivity, as is explained in the accompanying article. In such a case, however, the Moderator Coil does not have to be placed near any other coil in the set. As shown above it is rather too close to the dual-range coil.

Coil ceased at "Moderating" in the full sense of the word. But it doesn't. The Moderator Coil and the .00075-mfds. condenser together, comprise the elements of a quite efficient wavetrap.

And in this guise you will find them quite able to suppress a badly interfering local station without robbing the set of station-getting powers.

All you have to do is to remove the aerial lead from the set, and connect it to one end of the Moderator Coil winding (one of the two terminals on the commercial Moderator

HOW WIRELESS WOULD HAVE ALTERED HISTORY

By
Lt Commander
the Hon J.M.
Kenworthy R.N.

No. 2. ON THE SPANISH MAIN

DESPITE the defeat of the great Armada and the thwarting of that attempt to conquer England, Spain was for long the greatest of the sea powers; and, with a monopoly of trade in the New World, conferred on her by Papal Decree, was able to derive great wealth from the exploitation of the Indies, as Central and South America were called in those days.

Her mariners had solved the problem of navigating long distances under sail at sea. Every year great galleons laden with gold, silver, precious stones and other valuables set sail from the Spanish Main bound for their own country. With this wealth the Spanish kings were able to maintain great armies and remain the dominant power in Europe.

Those Buccaneers.

But the first real challenge to Spanish ascendancy in the wealthy West Indies came from a few poor sailors from England and France who, in their turn, wished to trade with these rich territories.

Their first objective was the herds of wild cattle on these islands, which they hunted, preserving the meat by smoking it. In the Caribbean this was known locally as "buccan," and this gave rise to the name of "buccaneers." These seamen commenced as legitimate traders, legitimate, that is, in so far as they refused to recognise the Spanish monopoly.

But they were harassed and persecuted by the Spanish governors, and presently, in their rage, joined together and threw down the gauntlet to the Spanish power.

Later they degenerated into pirates; but they did not begin as pirates, and considered themselves perfectly respectable merchants, forced to take action for the defence of their trade.

Their Island Rendezvous.

Their advantage lay in the fact that they were able to attack the Spanish possessions by surprise, and before news reached the stronger Spanish forces, or before the Spanish could concentrate, they had departed again. Indeed the only factor in their favour, in this apparently unequal contest, was that of surprise.

If radio had existed in the days of the Spanish Main, many of our naval victories might have been impossible. The great Spanish galleons laden with treasure would have had warning of the approach of the British buccaneers and the English ships would not have had such easy prey. This is the subject Commander Kenworthy deals with in this, his second article

If the Spanish governors and Admirals had had wireless they could have quickly gathered their forces and overwhelmed the buccaneers. But they never knew where and when the blow would fall; their ships and troops were scattered, and again and again they were overwhelmed by a sudden descent.

A BOLD BUCCANEER



A born sailor and leader, Sir Henry Morgan was a constant thorn in the flesh of the Spaniards. His surprise tactics were always threatening their overseas possessions, and he raided and plundered them with the utmost skill.

The headquarters of the buccaneers from the year 1630 to 1655 was the small island of Tortuga in the West Indies, which they captured and converted into a stronghold.

From here they set out on their expeditions, and here they returned with the loot and treasure they had seized. Again and again the Spaniards would fit out an expedition, lay siege to Tortuga, capture it, install a garrison and think all was well.

A Born Fighter.

Then once more the buccaneers would gather their forces and fall upon Tortuga, recapturing it. Once again it was the absence of sure means of communication such as wireless would have provided that favoured them. Growing bolder, they actually captured the island of Jamaica in 1655, and with their growing power began to paralyse the Spanish trade.

Their greatest leader was a Welshman, Henry Morgan, who was recognised and knighted by King Charles II of England, and made deputy-governor of Jamaica. A man of tremendous courage, and a born leader, he was a thorn in the flesh of the whole Spanish system in the West Indies.

In 1671 he suddenly appeared on the mainland of the Isthmus of Panama with an overwhelming force. Yet the Spaniards had far greater forces in ships and men, if they could have been summoned.

Shocks for Spain.

But Morgan captured the city of Panama, and took care that no Spaniards escaped to carry tidings of what he was planning. Next he seized the Spanish ships lying in the Bay of Panama, on the other side of the Isthmus, and ravaged down the south Pacific coast of America, taking the rich colonies of Spain completely by surprise.

They had no means of summoning help, for they were isolated from each other. Nor could they be warned of their danger in time to prepare a defence.

Eventually Morgan departed with rich plunder in the captured ships. He sailed South, away from the pursuing Spanish forces hastily gathered together; and

(Continued on next page.)

HOW WIRELESS WOULD HAVE ALTERED HISTORY

(Continued from previous page.)

rounding Cape Horn beat his way northward to the West Indies and his stronghold in Jamaica. The Spaniards knew nothing of his movements till he reappeared in the Caribbean.

Morgan had many imitators and successors and the growing boldness of the buccaneers almost broke the power of Spain in the Indies. And as the power of Spain declined and her might as a sea power waned, so the English increased in confidence and strength and gradually supplanted the one-time Mistress of the Seas.

"Jenkins' Ear."

The lesson of this period is that Spanish power was weakened because there was no certain means of quick communication between the different territories, and the attackers could choose their time and place to attack. In other words, wireless is an ally of the Imperialist Power.

But the worst blow, which proved that Spain had passed her zenith, was the war between England and Spain of 1739. It had, apparently, only secondary results in Europe.

But on the other side of the Atlantic the reactions of this war had far-reaching effects. It was known as the War of Jenkins' Ear. Jenkins was a merchant skipper who had been captured by the Spaniards and had one of his ears cut off.

The Spanish officer who inflicted this punishment said he would like to serve the King of England the same way.

Jenkins was liberated, returned to London, told his tale, and soon had the populace in an uproar. He actually appeared before the House of Commons with his head swathed in bandages and related his grim story.

In 1739 war was declared. Admiral Vernon was sent across the Atlantic with an expedition to attack the Spaniards.

An Epic of Adventure.

Porto Bello was taken with a loss of only seven men on our side. Such an exploit would have been impossible if wireless had existed; for the place could hardly have been taken except by surprise.

Indeed, when the news of war had reached the Spaniards, an attempt by Admiral Vernon to repeat his success on Cartagena failed. This was a weaker fortress than Porto Bello, but the element of surprise was lacking, and it held out.

But another expedition to the other side of the South American continent under the famous Admiral Anson was even more successful.

Starting out with six ships, the largest of which was the *Centurion*, Anson made for Cape Horn, with the intention of attacking the colonies on the Pacific side of South America, just as Captain Morgan had done, starting from Panama; but in the reverse direction.

Disease broke out amongst his crews, some of his ships were lost, and eventually the survivors were concentrated on board his flagship *Centurion* and the *Gloucester*.

By this time, out of 961 men who had formed the crews of the original squadron, only 335 were left alive in his two remaining ships!

But he had reached the coast of Peru, and again his arrival was a complete surprise. The Spanish colonists had no news of such an expedition being on its way.

Several rich towns were taken and plundered and much booty collected. But then the *Gloucester* ran into a gale, was dismasted and sank. Anson was left alone in the *Centurion* and she, his last ship, was in a pitiable state. She was leaking badly, her rigging was rotten, her spars sprung and her crew dying fast of scurvy.

Nevertheless, the gallant Admiral continued his voyage up the coast; for he meant to intercept the great Spanish treasure ship, the annual galleon leaving for Spain with the year's harvest of riches.

Eventually on the 20th of June, 1743, Anson sighted the ship, the great prize for

THE GREAT LORD ANSON



Starting as a cabin-boy he became Admiral of the Fleet and a Peer of the Realm, his most magnificent feat being an expedition against the Spanish treasure ships. Although his crews were decimated by scurvy, he nevertheless found his objective, captured it with a fantastically inferior force, and then sailed round the world—a very rare feat in those days—with the spoils! And when—years later—he brought the enormous treasure safely to Portsmouth the Chancellor of the Exchequer nearly fainted with joy!

which so much had been risked and so many perils faced.

In spite of the fact that she carried 550 men to his miserable remnant of 201, and 70 guns against the *Centurion's* 60, she was forced to surrender after a sharp fight. She bore the high-sounding name of *Nuestra Señora de Cobadonga*, and a treasure worthy of such a title.

If the Spaniards had had wireless they would have kept this ship in harbour until Anson was accounted for. In the meantime, no word of the expedition had reached England, and the nation thought that Anson and all his ships had perished.

And, indeed, nothing was heard of him until nearly four years after he had sailed from home. In the meantime he had circumnavigated the globe. Placing a prize crew on board the galleon, he sailed for China and reached the port of Canton, where he sold the Spanish ship, transferring all her wealth on board the *Centurion*, and sailed for home.

But on the very threshold of final success he was almost captured. For by this time war had also broken out with France. A French fleet was in the Channel, and Anson, with all his treasure on board, actually sailed through the enemy vessels in a fog, finally anchoring off Portsmouth on June 15th, 1744.

The great Spanish galleon carried wealth amounting to over £1,250,000 sterling, and the total proceeds of this expedition were worth more than two million pounds, an immense sum in those days. The money arrived at a time when the Exchequer was exhausted and the country hard pressed.

Cabin Boy to Admiral.

It enabled further ships to be fitted out, and the two wars to be brought to a successful conclusion. Anson rose to high rank in a service which he had entered as a cabin-boy and, after other famous victories, died a peer of the Realm and an Admiral of the Fleet, loaded with honours.

Yet, if Marconi had been born before him, he would never have been able to strike these shrewd blows at Spanish power, or to have done so much to lay the foundations of British sea supremacy both in commerce and in war.

A NOVICE MAKES THE "COSMIC"

—and gets 80 stations.

By D. G. LUCY.

A GROWING interest in foreign languages, plenty of spare time, and POPULAR WIRELESS have been instrumental in making me a "wireless fiend." A copy of POPULAR WIRELESS attracted my attention on a bookstall; a train journey resulted in a determination to make the "Cosmic" Three; and this article is the result of the "Cosmic" Three.

Many years ago, in the Dark Ages of wireless, my brother was one of the noble band of heroes who listened in to 2 L O on the 'phones; a three-valve set was one of his many triumphs, and of this curiosity a few parts still remained. Three valve holders, a transformer, a few grid-leak holders, and a condenser were quickly unscrewed, and with the other parts bought from the shop at the corner, made a goodly show when arranged as in the blue print.

On a 20-ft. Aerial.

Two and a half hours later I switched on! A few extremely faint howls reached my delighted ears; in a few moments I was listening to the sugary strains of Reginald Dixon, from the North Regional transmitter.

After a few minor adjustments, I sat down in earnest to "rake the ether," as the advertisements say. On the first night, with a low 20-ft. aerial, I got about 25 stations. The list has gradually grown, until now I can get about 80 stations, all at good entertainment strength on the loudspeaker. The short waves have not yielded many stations, yet, except stations like Zeesen, Radio LL, and Lisbon.

The only fault I have to find with the set is the fact that never again will I be able to have the thrill of listening to Reginald Dixon for the first time!

IMPROVING YOUR RECEPTION

BY W. L. S.



ALTHOUGH most people reading my initials at the head of this page will probably associate the following article with short-wave work, it is intended to apply also to the ordinary broadcast listener. As a matter of fact, it *does* concern the short-wave man rather than the others, but then so do all general articles on improving the efficiency of a receiver!

I have set out to try and answer a question that I am so often asked: "Why is it that two sets made from similar designs can be so totally different; and why do you sometimes find a set that is beautifully easy to handle, while another, and quite similar set, is a perfect brute?"

"Look to the Det."

Yes, readers, it *is* a big question; and you are wondering how I have summoned up the cheek to attempt to deal with it in such a small space. The answer is that I haven't—I am merely passing on a few disconnected hints.

First and foremost, let me say this—if you have a set whose behaviour is of the "untameable" variety, *look to the detector*. The printer would convey my meaning if he put those last words in the biggest capitals he possesses.

Very often in a large multi-valver the H.F. stages give trouble, but far more often the detector is not doing its bit. Furthermore, figures still prove that the vast majority of sets in this country are comparatively simple three-valvers, mostly without H.F., and in these cases there is very little that *can* misbehave itself except the detector.

"Ploppy" Reaction.

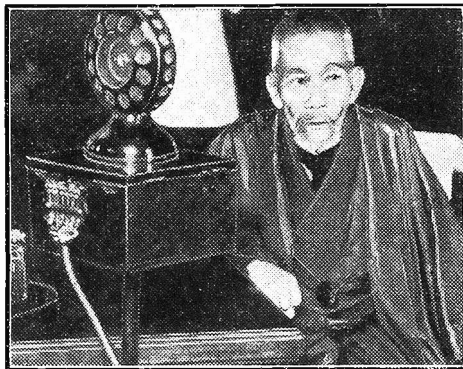
Now to get down to details. The "misbehaviour" may consist of several things. First and foremost I should place "ploppy" reaction. There is no need for me to detail the gruesome symptoms—you all know the sickening thud with which some sets go in and out of oscillation when you move the reaction control, even with the lightest touch. Your set is not oscillating—you hear faint music—up comes the reaction control, the music getting louder, louder and clearer, then—scr-r-reech!—you are oscillating hard and you have to go back and do it all over again. Think of the man next door, too, if he is listening to that particular station!

A practical article in which a popular "P.W." contributor gives readers some useful hints on how to "hot-up" their receivers.

Now to cure it. First, see how much H.T. your detector is getting; seven times out of ten you will find that bad reaction control is caused by excessive H.T. on the detector. If reducing the H.T. doesn't effect a cure, try the opposite—*increase* the L.T. *slightly*. This doesn't mean putting 6 volts on 4-volt valves! It merely means—see that your detector valve is getting all the L.T. volts that you think it is.

Dirty switch contacts, long straggling flex leads to the accumulator, filament

BROADCASTING IN JAPAN



TSUYUOSHI INUKAI, who is a 78 years old member of the present Japanese government, broadcasting his election speech from Tokyo recently.

rheostats in particular (although one seldom sees them in use now), all have a knack of bringing down your voltage just sufficiently to lead you into some kind of trouble.

Lastly, look to your grid-leak. Very often the substitution of a leak of higher resistance than the one in use will cure ploppy reaction without any other adjustments being made.

Another annoying trouble that we all know is "hand-capacity." This is more prevalent on short-wavers than any other receivers, and is generally due to poor layout and unnecessarily long wiring. Of course, you must have the moving

vanes connected to earth; if you do not do this you may be quite certain of trouble. Also, as I have often remarked, one very useful cure for this on short-wave sets is to *remove* the earth.

You may look upon these as two very small difficulties, but the combination of ploppy reaction and hand-capacity effects is often deadly enough to make strong men break down and weep! Not only does the set shriek at you just as you are getting your station nicely, but when you have repeated the performance ad lib., and really found him, he disappears the minute you move one finger away from the dials. And yet there must be thousands of sets like this still in use (although not by readers of "P.W.," of course).

L.F. Instability.

Next to these two detector troubles comes an L.F. trouble, generally some form of instability. It is surprising how many folk think that the L.F. part of their set must be in order if it doesn't happen to howl. The point is that an L.F. stage or stages can howl at a wonderful variety of different frequencies, only a very few of which are audible to the ear.

Very, very often can bad quality be traced to an L.F. valve that is whistling away happily to itself at a frequency of 20,000 cycles or so—well above the audible range. If you find that holding your fingers across the L.F. transformer secondary improves your reproduction tremendously you can be quite sure that something of that sort is happening. The fairly low resistance of the path through your fingers damps down the secondary circuit sufficiently well to make the whole thing stable.

Try a Leak.

If you cannot cure this trouble by reversing the transformer connections or by altering the grid-bias (and defective G.B. batteries are a frequent cause of it), try the effect of a fairly high leak across the secondary; start with 2 megohms and don't go below .5 megohm if you can help it. This applies particularly to short-wavers, but is often of help with other sets as well.

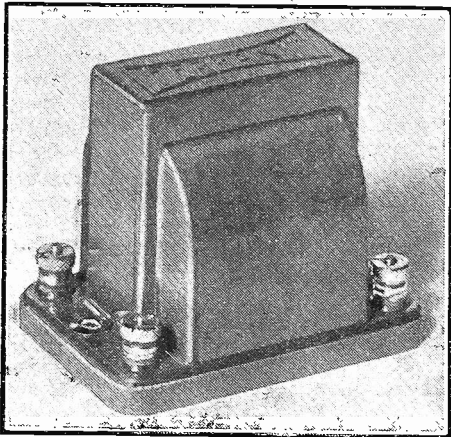
Instability due to lack of de-coupling is another frequent cause of poor reception.

Space prevents me from giving any further details, but in a later article I may be able to deal with some of the more complicated faults and their cures.

FROM THE TECHNICAL EDITOR'S NOTE BOOK.

**FERRANTI'S NEW TRANSFORMER.**

THAT great Hollinwood factory which produces transformers for the Grid Scheme as big as houses (or, at least, cottages!) has turned its attention to the "cheap" L.F. transformer market.

AND NOW THE AF 10!

This is Messrs. Ferranti's A.F. 10 L.F. transformer. The casing is bright red in colour.

For years it has been supplying aristocrats of the class, but obviously at prices above the purses of many constructors.

But with more and more of the cheaper transformers making their appearance, I suppose Hollinwood gradually came to the conclusion that as there was a "cheap" market which had to be catered for, there was no reason why it shouldn't have the advantage of the best that Ferranti could provide at such prices.

If I am right, and I have little doubt but that I am, then all I can say is that Ferranti are to be congratulated upon their decision and the result thereof.

No one has suggested that their new A.F.10 is a perfect transformer—certainly they haven't—and, anyway, there is still the A.F.3 or the A.F.5 for those who

can afford them, but all the same the A.F.10 is a Ferranti, and that means careful design and production and a reliability which will be the envy of the cheap foreign markets.

We have tested A.F.10's and I have no hesitation in saying that we find them markedly superior to some components in the same price class—which, in the circumstances, is not surprising!

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.

RELIABLE RESISTANCES.

Although it is very easy to pile up resistance where you don't want it, and thus cause inefficiency and an undue wastage of energy, it is by no means so simple to create uniform values of resistance when it is desired to turn that factor to good account.

Resistance as such is easily obtainable, it is the uniformity that presents the difficulty. Especially is this the case when the circuit concerned has to pass a fair amount of current.

ACCEPTED WITH ALACRITY

The jolly gathering at the Lewcos Annual Staff Dance. Two members of "P.W.'s" staff received invitations, and "a good time was had by all!"

An example is the anode circuit of an amplifier—the resistance being required for coupling purposes.

It has long since been realised that the ordinary graphite or carbon compound is unable to provide the required stability: not only does it tend to alter in resistance as with different potentials, but it does not easily resist temperature changes and mechanical stresses.

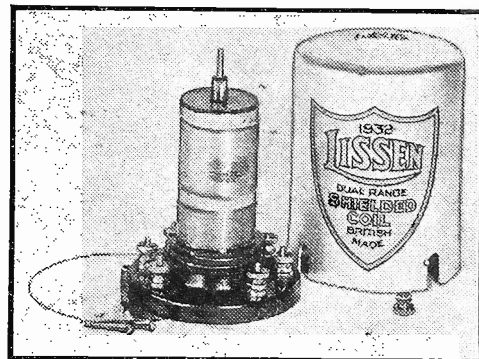
But in recent years special materials have been developed which are perfectly satisfactory. That used in the Graham-Farish "Ohmite" is a very good example.

For instance, there is a 2,000-ohm valve capable of carrying 10 milliamperes of current without the slightest trouble—there is a wide range of values available, but I mention this one as it is a haphazardly selected sample which formed the subject of my recent tests.

And these tests were, strictly speaking, quite unnecessary, for we have used numbers of Graham-Farish "Ohmites" in various of our sets, and they have given us no occasion to regret the choice.

NEW LISSSEN LINE.

Lissens have a very good name for coils. Some of you will no doubt remember their plug-in types, and there will be not a few who are still using them.

A COMPACT COIL

The shield can be removed merely by unscrewing one small, milled nut.

These Lissen plug-ins were veritable highlights in a field of mediocrity and actual duds. In fact, I remember that there was a time, and not so far back in the calendar either, when it was safe to specify only about two or three makes of coils out of some score or more which were on the market. And Lissen's were, of course, included among that two or three.

Then they were first in the field with the once vastly popular "X" type of coil.

And now they have brought their coil activities right up-to-date with a Dual Range Shielded Coil.

It is a complete two-band tuner and comprises medium and long-wave windings and reaction. Being made to close margins of inductances, the Lissen Coil can be ganged either in band-pass or simpler arrangements.

It is small in size, and its shielding enables it to be built into compact multi-valve instruments. Additionally it can, of course, be used with good effect in the more modest types of sets.

On test we have found it right up to the standard set for the best coils of its kind, and in that it costs only 6s. 6d. it will be gathered that it is an item which represents good value for money.



ON THE OTHER SIDE A TALK WITH A CZECH LISTENER

By Our SPECIAL CORRESPONDENT

A REPRESENTATIVE of a Czech labour movement introduced to me by a Czecho-slovakian Legation official who heard that I wanted to know all about their national broadcasting, spent a whole of one afternoon chatting about his pet topic.

Frankly, I didn't know much about the state of affairs. I had never been within three hundred miles of Prague. I know no Czech.

Comparatively Few Listeners.

Our little talk remedied matters!

"My country comes sixth in the list of European broadcasting and there are now 353,052 listeners," he said. "We are lucky in having six stations and since the new huge Prague station opened, using a power of 120-kilowatts, the number of listeners has gone up with a jump. It has made a big difference to owners of small sets in country districts."

"What sort of sets are used?"

"Crystal-set listening is now popular in a circle about 50 miles' radius around the new Prague station. This transmitter is not, of course, right in the main city. It is at Liblice, which is 18 miles out. It is a huge station.

"The big electric works at Kolin, in the Elbe basin, supply all the power. Overhead landlines connect Liblice with the power supply. Liblice takes 450 kilowatts.

A Historical City.

"Did you know," he continued, "that Prague is a historical city, as far as wireless is concerned?"

"The old Prague-Kbely station was once the first station in Europe to be working regularly. Later the Prague-Strasnice station was reckoned to be the most powerful, while the station building was being erected, but by the time the programmes were 'on the air,' one of the German Reichs Rundfunk chain stations capped it in power."

"What about relays?"

"As the Prague authorities are out to help crystal set owners, a number of relay stations are run, all taking the Prague programme. Brno, Bratislava, Kosice and Moravska-Ostrava all take the main programme. Before our new Prague station opened, Bratislava, a relay,

Here is another article of a fascinating series, and this time we introduce the British listener to his contemporary in Czecho-Slovakia.

was more powerful than its main station!"

"Do they relay by wireless link or landline?"

"Our Post Office authorities supply the landlines between the stations and also provide special lines to outside broadcast centres, to the Prague National Theatre, for example.

"The Post Office landline centre in Prague

is connected up with the European landline circuit on which your B.B.C. concerts are heard at international programme times. A few months ago, when Toscanini conducted the New York Philharmonic Orchestra, just before his illness, Prague and its associate stations relayed this via Rocky Point and your Post Office reception station at Wroughton."

Providing the Programmes.

"Who runs the programmes?"

"The ordinary programmes are directed by a number of associations, the Masaryk Adult Education Institute, the People's Academy, the Confederation of Non-Manual Workers and so on. These are all societies of working people who contribute to them very much like your Trade Unions over here. These societies provide 'uplift' talks and a certain amount of education."

"Are they considered good, or too educational?"

"A popular opinion is that so much money is being spent on station development at the moment. Bratislava improvements and the new Prague for example, that programmes are suffering. When the country's relay system is finished this grumble may not be justified."

"What sort of programmes are given?" I pressed.

"They start early in the morning at 6.30 and thereabouts. Gramophone music is given; not talks. Most of the educational talks are given from 5 o'clock in the afternoon onwards till about 7, when the main musical programme starts.

Too Many O.B.'s.

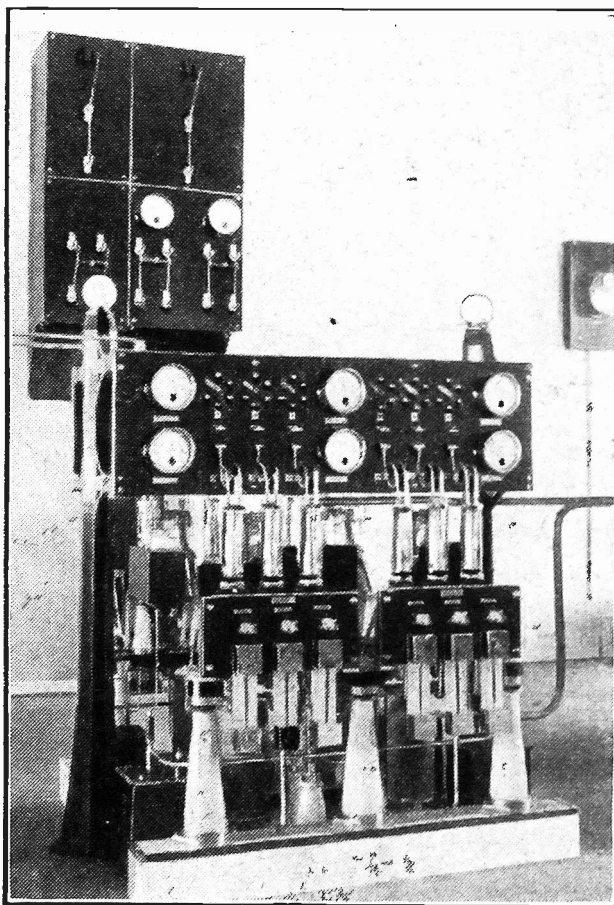
This is because many of the talks are intended for all listeners and not only for housewives. They are fitted in at a time when most people are home from their offices and factories and can hear them before the evening entertainment starts.

"A complaint is that too few programmes originate from the studios. There are, some say, too many O.B.'s. Broadcasts are made from the big Smetana Hall in Prague. These are all orchestral concerts. Dance music is provided by an outside band.

"A relay is often made from the Czecho-slovakian Auto Club, where there is a fine dance orchestra.

(Continued on next page.)

THE WORLD'S BIGGEST MEDIUM-WAVER



A close-up of one of Prague's H.F. amplifiers, which carry out their good work on 488.8 metres. Prague is Europe's most powerful medium-wave station—it employs 120 kw., and comes in just above the North Regional.

WIRELESS WOODWORK

Some Hints on Cabinet Construction.

THE cabinet illustrated on this page represents a simple and practical means of obtaining a pleasing effect without much trouble. The ends of the cabinet are cut from material about half an inch in thickness and, after being carefully prepared, the "leg-shape" is cut away at the bottom.

This can be done in a few minutes with a centre bit (see H). The base A is made slightly larger than the baseboard either way, and when cut to length the pieces are "halved" at each end, as shown. Note how the moulding covers the joints and screws holding the sides to the base.

The top of the cabinet, B, is chamfered at its edges as at X, and on its underside are screwed two cleats, D (see sketch and small inset). The top is secured to the ends of cabinet by further screws through the cleats.

The piece E is next placed in position,

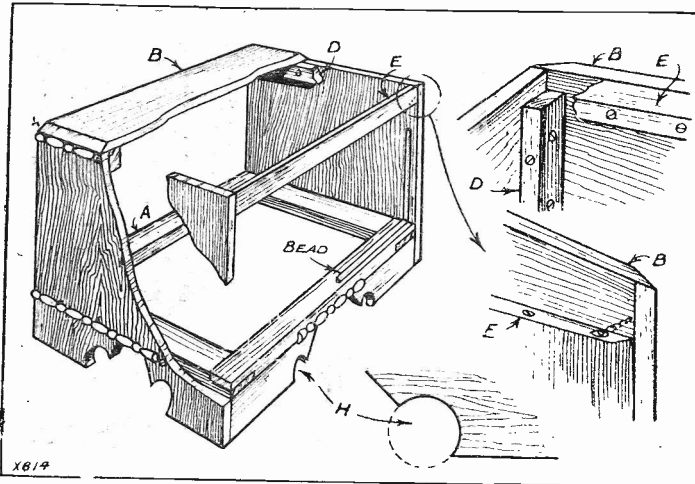
and this time "pocket screwed" as seen in the drawing. Afterwards, screws are driven up through the underside of this piece and into the top of the cabinet.

The moulding is then returned round the top and bottom of the cabinet and, last of all, a small "bead" placed where the front of panel is exposed. The front of the cabinet is provided with a shaped base to match the ends, which can be screwed from the bottom into the base framework.

The turned moulding should only be of a light pattern, and can be fixed with small brads. The set is pushed in from behind, and a ply back used to exclude dust.

R. T.

TRY YOUR HAND AT THIS ONE



You will find a brief description of this easily-constructed cabinet on this page, giving all the necessary details for the handyman.

A TALK WITH A CZECH LISTENER

(Continued from previous page.)

"Mind you, all these outside broadcasts are under the strict control of the station authorities. An official, M. Kares, controls the whole of the non-musical programmes side, whether outside broadcasts or studio items.

"All talks and news bulletins are controlled by a section known as the Radio Journal. This has no connection with the news bulletins, and *journal parlé* given from French stations!

"Our Czech Radio Journal is a section of the broadcasting department having control of all non-entertainment material. The Radio Journal works in cooperation with the leading news agencies.

Very Little News.

"Not a great deal of current news is given. The Journal people arrange for well-known business and sporting folk to come to the microphone and talk about the week's programme."

"We often hear English announcements at Prague. Why is that?"

"If you glance down the programme lists you will see a fair amount of time is devoted to English, French and German lessons on the wireless. This is because the modern trend among young Czechs is to get out of the country, so soon as their education is complete!

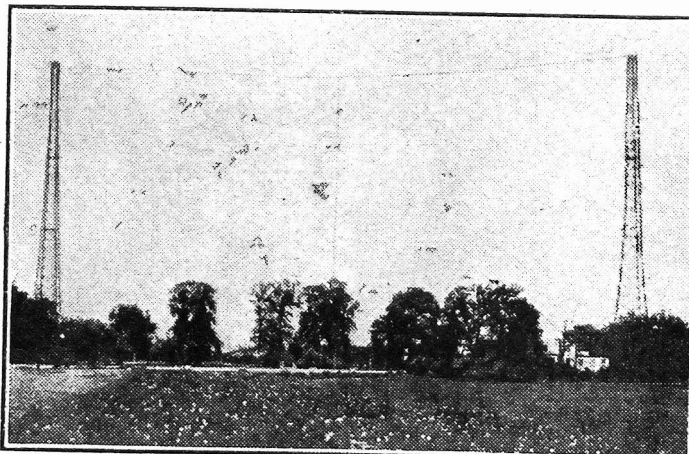
"They realise that the country is mainly

agricultural and that in manufacturing and art the best work is to be found in England, France and, until recently, Germany.

"Young children in Czecho-Slovakian schools are taught English. It is difficult for us to speak your language, as Czech is quite unlike Latin or Teutonic languages, but is more like Russian and Polish. Incidentally, Russian *patois* is understandable to our peasant Czechs, and that is why many radio relays are made of Russian-station programmes.

"The station calls from, say, Prague, are difficult for you British listeners to follow? It is so difficult to give the exact phonetic pronunciation.

THE PRIDE OF BRATISLAVA



This is a general view of the Czecho-Slovakian station at Bratislava, which works on 279 metres.

HINTS & REMINDERS

Short Waves—Hand-capacity—Coil Winding, etc.

On a short-waver, removing the earth lead often removes hand-capacity effects without weakening the strength of distant stations.

Connecting a small variable condenser in series with the earth lead is another good tip for reducing hand-capacity on short-wave sets.

When winding your own coils from printed instructions, be careful to note the direction of winding, as if this is not indicated you may fail to get reaction.

When mounting a valve holder on a metal baseboard do not forget to slip a piece of cardboard or other insulating material under it to prevent accidental shorts, especially if the valve holder has rather long soldering tags.

The ordinary L.T. battery needs recharging about once every two months whether it is being used or not.

If you live in the country, where battery charging presents difficulties, remember that special mass type low-tension batteries are made for the convenience of listeners who cannot arrange for their batteries to be charged at frequent intervals.

As soon as an L.T. battery is run down it should be taken to the service station and recharged.

The specific gravity of the acid in an accumulator when tested by a hydrometer affords just as good a check on maintenance as its voltage.

"Prague is spelled and pronounced *Praha*, and the opening signal is Halo! Radio-Praha vysila!

"After the Radio Journal talk generally given at the end of the evening programme, the quaint old-world closing-down address is 'Radio Journal, Praha, konci vysilani a preje vsem posluchacum doma i za hranicemi prijemnou dobrou noc!'"

Reception Troubles.

"Surely," I asked in conclusion, "the opening of the new Prague station has cured most reception troubles?"

"Well," he explained, "at present some listeners in the Prague district are having troubles like those I heard about when your new B.B.C. stations opened! It is all a fight between owners of small crystal sets who want high power, and valve set owners who want alternative programmes and better quality.

"At the moment the Liblice station works from 2.25 p.m. onwards, the Stranice station only in the mornings.

"The Radio Journal people want to work Liblice on 488.6 metres, and Stranice on 250."

ED. NOTE.—The next talk in this series will be: "A Chat with a Yugo-Slavian Listener."

MARCONI MAINS OUTPUT VALVES ARE DEFINITELY WITHOUT EQUAL

PX.4 (upper inset and curve) is a highly popular A.C. super power type for anode voltages up to 250. It unites the exceptional mutual conductance of 6.0 MA per volt with robust construction, entire freedom from hum and an output more than sufficient for domestic use. 17/6

DPT (lower inset) is an indirectly heated power pentode for D.C. mains, with the standard Marconi 16-volt 0.25 ampère filament. The output is comparable to that of PX.4, the receiver power consumption totalling only about 60 watts. Note the massive mica-bonded electrode system. 20/-

80

70

60

50

40

30

20

10

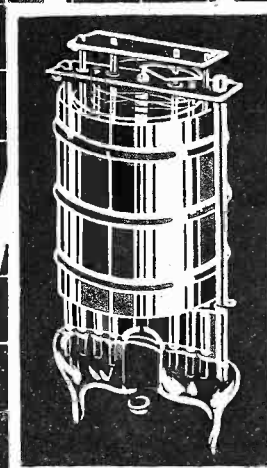
ANODE CURRENT IN MILLIAMPERES



EA=250

EA=200

EA=150



60

50

40

30

20

10

0

GRID VOLTS

AN indication of the excellence of long-distance reception conditions at the present time is to be found in the fact that it is still possible to receive American medium-wave stations on nights that are free from atmospheric.

And, luckily, the nights when atmospherics are about are very much in the minority. I don't remember a year in which the American medium-wavers have been well received so far into the spring as this.

You have, though, to try for them rather later than was the case some weeks ago. The time in the eastern states of America is five hours behind our own, and good results are not to be expected unless you wait until an hour when it will be dark over there. Conditions, as a rule, are at their best about an hour or a little more after darkness has set in in the United States.

Listening to Americans.

This means that you can hardly expect to hear much unless you are prepared to sit up until between one and two o'clock in the morning. If, though, you happen to be up at that time, you may be surprised



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.

to find how many U.S.A. stations are to be heard.

On our own side of the herring-pond long-distance conditions remain little short of marvellous. All of the long-wave stations are coming through with tremendous strength and, provided that it is working, you can tune in almost any one that you want, in daylight or in darkness, with just about the same certainty that you feel when going for your local station.

Interference Troubles.

The number of well-received stations on the medium wave-band shows few, if any, signs of a decrease. There are a certain number of heterodynes, but, luckily, these affect very few of the stations that are really worth hearing.

Almost the only sufferers of note are Bordeaux and Beromunster. The Swiss station is not by any means always

heterodyned or jammed, and when you find him clear he comes in splendidly. Bordeaux Lafayette, on the other hand, has been practically blotted out night after night for quite a while now.

Spark transmissions continue to be annoying between 220 and 270 metres,

and it is really time that an end was put to a form of interference which is quite unjustifiable in the present year of grace. The spark transmitter is almost as much out of date as the penny-farthing bicycle or the hansom cab.

A Score of Good Stations.

The pick of the medium-wave stations are Turin (extraordinarily good), Heilsberg, Bratislava, Hilversum (at all hours), Genoa, Göteborg, Lwow, Toulouse (good in the afternoons as well as in the evenings), Frankfurt, Katowice, Hamburg, Strasbourg (much improved of late), Breslau, Milan, Brno, Stockholm, Rome, Langenberg, Prague and Brussels No. 1. A pretty useful score in both senses of the word.

In addition, there are many other stations which are well worth attention. I do not include them in the star list, because they are apt to vary in volume.

READERS who have never had queer experiences of freak reception due to their particular locality are, I know, inclined to take some of my remarks on that subject "cum grano salis." Even I, myself, can hardly believe some of the freaks that come my way, and I'm told that I am gullible enough! And here is a particularly interesting case.

F.N.B., of Hale, who won the "Amateur" section of our last competition, tells me that he has spent many hours vainly trying to find Sydney, V K 2 M E, but has never yet heard him! And yet he receives Australian amateurs galore whenever they are coming through, even on telephony.

Stations Readers Mention.

He also mentions that the theory that used to be held—that signals "bunched together" at the Antipodes—seems to be discounted by the comparative difficulty in finding New Zealanders at the present time. When they do come over, as he says, they are generally strong, but for long periods it is impossible to find them at all.

There is a whole bundle of correspondence in my basket on the subject of E A Q, Madrid. A summary of it seems to prove that this station is working on 30.5 metres during fairly long periods, not merely between 8.15 and 8.45 p.m., as the "book of words" tells us.

Others mention Poznan, on 31.35 metres, and Bandoeng, on 31.86 metres, as good signals just recently. The "star turn" continues to be Rome, on 25.4: he still appears to work on his 80-metre wave occasionally, but not often.

SHORT-WAVE NOTES



News and views regarding an exciting and fascinating wave-band.

By W. L. S.

I am becoming quite embarrassed by letters arriving with wild speculations about my real identity! Although it does not need a Sherlock Holmes to discover it from "P.W.," very few have really tracked me. The first was a neighbour of our friend C T I A A—D. V. R., of Lisbon.

Has anyone, other than R. C. F. (Woldingham), heard a station announcing himself as "Bagdad" on 49 metres? He was heard from 17.40 to 18.40 giving news, including the Irish Sweep draw, and gramophone records. R. C. F. has also logged Y I D, Basrah.

My "Peculiar Statements."

W. S., of Leeds, takes me to task for my "peculiar statements" about W 2 X A D, particularly my prophecy that he should soon be a good signal as late as 11 p.m. W. S. finds that the station does not transmit at that hour, and quite rightly surmises that, in that case, we shouldn't

hear him! I can't quibble with that, but I have noticed that W 2 X A D is often to be heard at wonderful strengths when, according to his schedule, he had no business on the air at all.

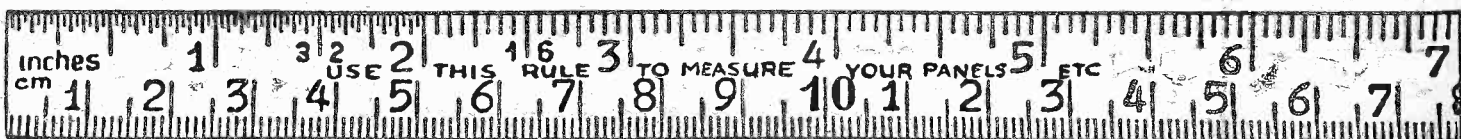
Also—W. S. and others please note—the schedule is frequently changed, and at this time last year he was on the air regularly up to 11 p.m. (G.M.T.). By the time you read this, I shall be surprised if that is not once more the case.

I have had an interesting budget from Mr. Roy Perkin, of Z S 2 L (Port Elizabeth), giving me details of his short-wave receiver, which he backs to beat any that we have ever published over here. It comprises a screened-grid detector, resistance-coupled to the first L.F., which is transformer-coupled to an optional second L.F.

S.G.'s for Short Waves.

I can't see much difference between the first part of the set and my own "two" that appeared in the January issue of "M.W.," but it is run completely from A.C. and therefore makes use of the excellent characteristics of indirectly-heated valves. Thanks very much, R. P.

Several queries from readers about the difficulty of making a screened-grid stage work really well on short waves have impelled me to write a separate article on that subject, my weekly space being too small to allow me to do justice to it. Suffice it to say that two friends—one a member of the "P.W." staff who used to be dead against S.G. for short waves—are now quite converted.



ALL PRINCIPAL CIRCUITS

Including the 'Cosmic' III and the 'Eckersley A.C.2'

Feature COMPONENTS



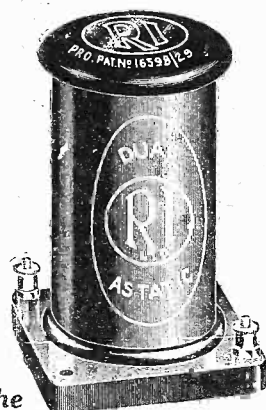
COSMIC COIL UNIT

The R.I. Cosmic Coil Unit is specified for the "Cosmic" III because of the distinctive and exclusive advantages that it possesses. It combines in one complete unit coils for long, medium and short waves, ensuring easiest fixing and most compact set assembly. A fact of paramount importance is the skeleton construction of the short-wave coil former, which reduces dielectric losses to a minimum—a vital point in this circuit. Every individual coil is carefully tested, before release, on the "Cosmic" III circuit, and checked with a wavemeter over the entire range of broadcast and short-wave bands

12/6

List No. BY 31

The problems of selectivity and sensitivity plus modern economical considerations demand a finesse in component design and efficiency which R.I. have long foreseen and provided for in components that are always consistent with, and often ahead of, latest developments in modern radio.



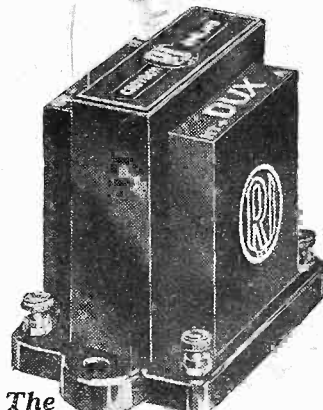
The DUAL ASTATIC CHOKE

Specified for "Cosmic" III

Remarkably efficient on the short waves as well as the medium and long waves this is the only choke that cuts out all blind spots and resonant losses—an important feature for short wave work. Its skeleton form of construction and astatic winding ensure freedom from H.F. interference with adjacent components.

7/6

List No. F.Y.1



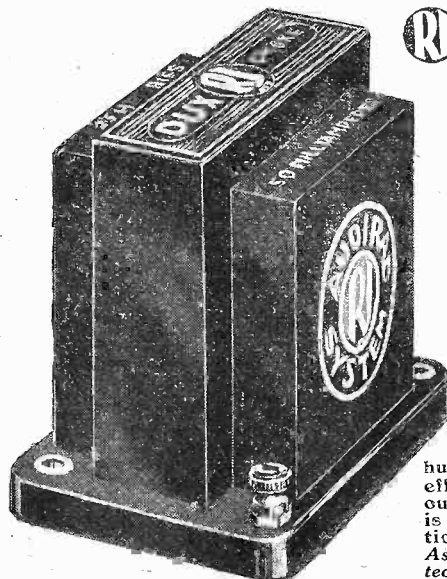
The "DUX" Transformer

Specified for "Cosmic" III

This remarkable Transformer has attained enormous popularity by unequalled performance in hundreds of thousands of sets, and is the designers' first selection for the "Cosmic" III, because it is without doubt the lowest priced transformer that is really efficient and which gives the good L.F. amplification, so vital a feature in the circuit.

6/9

Inductance 30 henries. List No. DY 29.



ECKERSLEY TUNER

For the "Eckersley A.C.2."

R.I. produced the original model of Capt. Eckersley's amazing Tuner in strictest accordance with the inventor's specification and have improved the details of construction to a pitch of accuracy that determines the greatest degree of selectivity with sensitivity. Every individual model is subjected to exacting laboratory tests before release

15/6

"DUX" AUDIRAD CHOKE

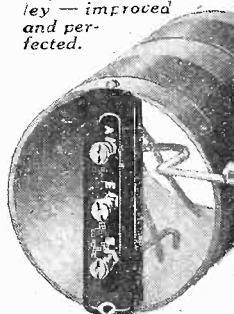
Specified for the "Eckersley A.C.2."

A new form of choke dealing with low frequencies and high frequencies by means of a unique stopping device which bars H.F. currents that would normally be passed by the self capacity of an ordinary L.F. choke, and cause hum and other H.F. interference. Its super-efficiency for smoothing or output filtering in A.C. circuits is the reason for its specification in the "Eckersley A.C.2."

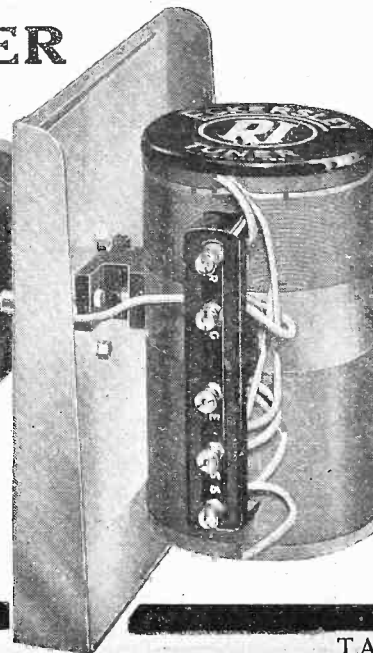
Ask for the Dux Audirad leaflet giving full technical information and diagrams.

8/9

The original model built for Captain Eckersley — improved and perfected.



The R.I. 1932 Catalogue is now ready. Ask for a copy.



MIRROR OF THE B.B.C.

By O.H.M.

THE OPERA MUDDLE

THE CHILDREN'S HOUR—NEW IDEAS IN PRESENTATION, etc.

THAT we are to have even an attenuated opera season in London is due principally to the patience and businesslike qualities of Sir John Reith, who, I understand, was responsible for rescuing the situation when it was despaired of by the Opera Syndicate.

Sir Thomas Beecham conducting four weeks of Wagner is a proposition certain to pay, so there is no question of more subsidies or disproportionate payments from broadcasting funds. So far so good, but it seems to me that the whole affair should be cleaned up for good.

First of all, the wretched word "subsidy" should be dropped, and the B.B.C. could hasten its obsequies by coming out boldly and accepting responsibility for opera within reasonable limits, just as it has accepted complete responsibility for Empire broadcasting.

If this course is followed there would be removed at once a constant source of Parliamentary irritation. There is pretty general confidence in the use which the B.B.C. makes of its financial resources. Sir John would soon put opera on a sound basis of organisation and finance.

The Children's Hour.

I was the first to advocate publicly the appointment of Mr. John Kettelwell to the

vacant post of head of the Children's Hour at headquarters, hence I take unusual pleasure in the fulfilment of this aspiration. New blood was badly wanted in the B.B.C., and just this kind of new blood—versatile, original, cultivated, and idealistic.

I look to Mr. Kettelwell to make a really fine thing of the Children's Hour. He is fortunate, of course, in having as his "right hand" Captain Derek McCulloch, the far-famed "Uncle Mac," who, by the way, has just become a proud father. Good luck to the new partnership in all their enterprises.

FURTHER OUTLOOK—MUD!



This Air Ministry wireless operator is receiving radio reports from abroad, and from the data so collected at headquarters in Kingsway, London, the Weather Report will be prepared. Let's all hope he gets some good ones this year!

SEVENTY STATIONS ON THE "COSMIC"!

The Editor, POPULAR WIRELESS.

Dear Sir,—Although I have built many sets of the straight-3 type, I must say that I have not yet built one to equal the "Cosmic Three," it leaves them miles behind.

I built my "Cosmic" Three about a fortnight ago. The selectivity is remarkable. For instance, I can receive London Regional, Stuttgart and Algiers without any background (thanks to the moderator), Toulouse on 385 m., with HARDLY ANY background of Midland Regional, also Radio Paris (with HARDLY ANY background of 5 X X (background is only noticeable during intervals). Hoping this report will be of interest to you.

Yours faithfully,

H. B. BURTON.

"Ivanhoe," Ansty Road, Wyken, Coventry.

P.S.—I have built a second "Cosmic." This one for an uncle, who wishes me to thank you for such a fine set. I also add my thanks.—H. B. B.

SHORT-WAVE STATIONS. (Received to date.)

W 2 X A D (twice on L.S.), 19.56 m.
PARIS (Colonial) on 19.68 and 25.2 m. (L.S. both).

ROME, 25.4 (L.S.).
CHELMSFORD (G 5 S W), 25.53 (Ph.).

V K 2 M E, Sydney, 31.28 m. received this afternoon. I heard the "Kukka-burra" call very clear.

ZEESN, 31.38, full (L.S.) strength.
HILVERSUM (L.S.) on 31 m. approx. (relaying football match between Holland and Belgium).

C T 1 A A, Lisbon, testing Tuesday night.

W 2 X A F, 31.48 m. (Ph.).

C T 1 A A, 42.9 m. (L.S.) Friday (Heard Capt. Eekersley and Mr. Kelsey on records).

W 3 X A L, Boundbrook (Ph.).

MOSCOW, 50 m. (L.S.).

VATICAN, 50.26 (Ph. and L.S.).

Also various 'Phone stations.
MEDIUM WAVES. I have made a log of 41 identified and 3 unidentified stations (by help of World Radio).

LONG WAVES. 12 identified stations.

New Ideas in Presentation.

Mr. Lance Sieveking's new musical fantasy, which he calls "Arrest in Africa," is to be produced in the National and Regional programmes on Friday and Saturday, April 15th and 16th, and from what I hear the piece is already exciting considerable interest at Savoy Hill.

Mr. Sieveking has been responsible for some unusual programmes in the past, as is only to be expected from a man whose ability has brought him the special privilege of devising and trying out new ideas in the presentation and development of radio drama.

But in "Arrest in Africa" Mr. Sieveking has gone much further than hitherto; he has written the music for ten songs, his first effort in composition. We must expect, therefore, that this fantasy, the story of which is about a village policeman who is sent to the African jungle to "get his man," as told in a series of scenes mixed with songs and sound effects, will be rather original.

There is, however, much more behind Mr. Sieveking's work than meets the ear of the average listener—and after all, big things can only come from experiments.

The Productions Department at B.B.C. headquarters is also busy in other directions, both inside and outside Savoy Hill. I say outside, because Val Gielgud, the Director of Productions, has written "Red Triangle," a drama to be produced in London in the near future.

The play is based upon the story

(Continued on page 147.)

THE LISTENER'S NOTEBOOK

A rapid review of some of the recent radio programmes.

LET me put in a good word for "Oranges and Lemons." It was well acted, and the human touch was prominent throughout. The dialogue, too, was good, and a moderate use of effects was very telling.

I am sure there must have been plenty of argument at the family fireside over the closing stage, when the long-suffering daughter of Mrs. James Miller shut the door in the face of her step-father, who had combs, studs, and some oranges to sell. What would you have done?

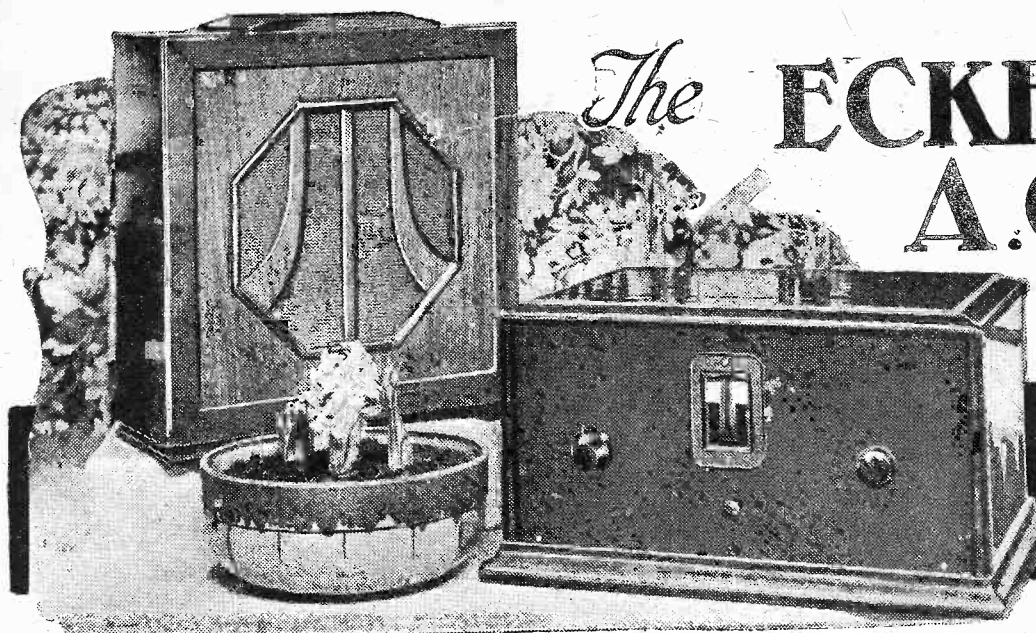
Without a doubt "Fun Racketeers" is the proper title of those two clever comedians Haver and Lee. Their humour, always fresh and pungent, seems to bubble from them in some mysterious way that the ether appears only too happy to handle it. Their turn is one that must give rival couples cause to think furiously.

If Ann Penn could only start with a more impressive introduction to her impersonations she would be flawless. The way she takes off some of the big stars is really first-class.

The Sisters Waters are adding to their reputation. They are two hard-working young artistes, and it was significant that the applause from the studio went on even while the announcer was giving out the next turn. This may be against the etiquette of the studio, but it is sometimes, nevertheless, excusable.

As one who has listened to solo singing by many choir boys, and who thought the Temple choir boy Lough almost perfect, I do not hesitate to place the Welsh boy singer, Iwan Davies, above them all.

(Continued on page 146.)



An amazingly simple set without a single complication for running from electric mains. It incorporates that most modern of dual-range coils—the Eckersley Tuner—thus ensuring ample station separating powers.

Designed and Described by the "P.W." RESEARCH DEPT.

"WHAT an engine!" Have you ever heard this exclamation applied to an A.C. mains receiver? It's certainly a quaint way of putting things, but, you will agree, very apt where some such sets are concerned.

In fact, so complicated are many mains receivers, especially commercial ones, that they simply seem to shout, "For experts only!" But is it necessary? Must one have such an "engine" if the many advantages of an all-from-the-mains outfit are to be enjoyed?

By way of answer to our own question

we will ask you to take a look at the photos and diagrams of the set illustrated on these pages. It's just as simple as a two-valve battery set, and yet does not use a single dry-cell.

A Dual-Purpose Receiver.

As a matter of fact, by altering a few connections it can be used as an ordinary battery receiver. We'll tell you what the alterations are later on, so that you can use your present batteries and valves for the time being, if you like.

Quite a lot of people with mains use an

ordinary battery set and derive the high-tension from a mains unit. If you are one of these and want to go completely over to mains, but at the same time do not want to spend too much in the process, then you want to tackle this "two," for you can use your present mains unit and most likely quite a number of the present components.

The reason is that it is designed for a separate mains unit. But don't think you will be losing any efficiency because of this.

From an all-round efficiency point of view it would be exceedingly difficult to

(Continued on next page.)

EVERY COMPONENT USED IN THIS ALL-MAINS SET IS LISTED HERE

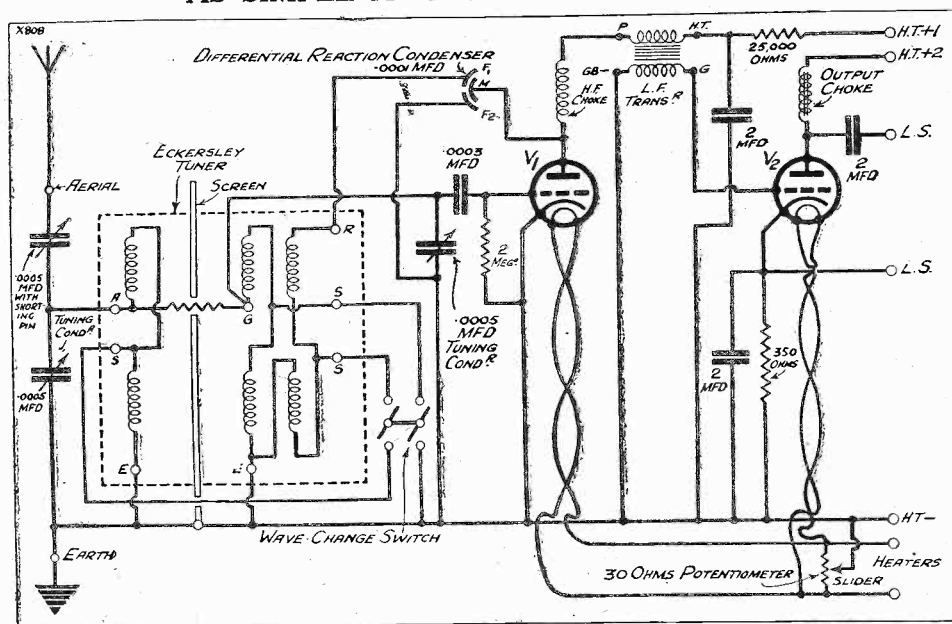
- 1 Panel 14in. × 7 in. (Permcot, Becol, Ready Radio, Peto-Scott, Wearite, Goltone).
- 1 Cabinet to fit above, with 10-in. baseboard ("Morco," Pickett, Camco, Gilbert, Osborn, Ready Radio, Peto-Scott).
- 1 Double drum .0005-mfd. variable condenser (Cyldon "Junilog," Polar, J.B.).
- 1 .0005-mfd. solid dielectric condenser, with self-shorting pin (Ready Radio).
- 1 .0001-mfd. differential reaction condenser (Telsen, Ready Radio, Polar, J.B., Cyldon, Lotus, Graham Farish, Wave-master, Dubilier, Ormond, Lissen, Magnum, Formo).
- 1 .0003-mfd. fixed condenser (T.C.C., Dubilier, Formo, Ferranti, Ready Radio, Sovereign, Goltone, Graham Farish, Lissen, Telsen).
- 3 2-mfd. fixed condensers (Telsen and Dubilier, T.C.C., Formo, Ferranti, Sovereign, Hydra, Helsby, Igranice, Lissen).
- 1 Eckersley Tuner (any good make).
- 1 H.F. choke (Lewcos type M.C., Telsen, Ready Radio,

- Peto-Scott, Sovereign, Dubilier, Watmel, Atlas, Tunewell, Formo, Graham Farish, Varley, Lissen, R.I., Wearite).
- 1 Output choke (R.I. Audirad, Ferranti, Varley, Telsen, Igranice, Graham Farish, Wearite, Magnum, Lotus).
 - 1 2-meg. grid leak (Graham Farish Ohmite, Loewe, Igranice, or the following with

- holder, Telsen, Ready Radio, Sovereign, Ferranti, Lissen, Varley, Watmel).
- 1 30-ohm. potentiometer (Claude Lyons "Humdinger").
 - 1 25,000-ohm Spaghetti resistance (Varley, Bulgin, Telsen, Lissen, Sovereign, Lewcos, Graham Farish, Tunewell).
 - 1 350-ohm Spaghetti resistance (see text) (Bulgin, etc.).

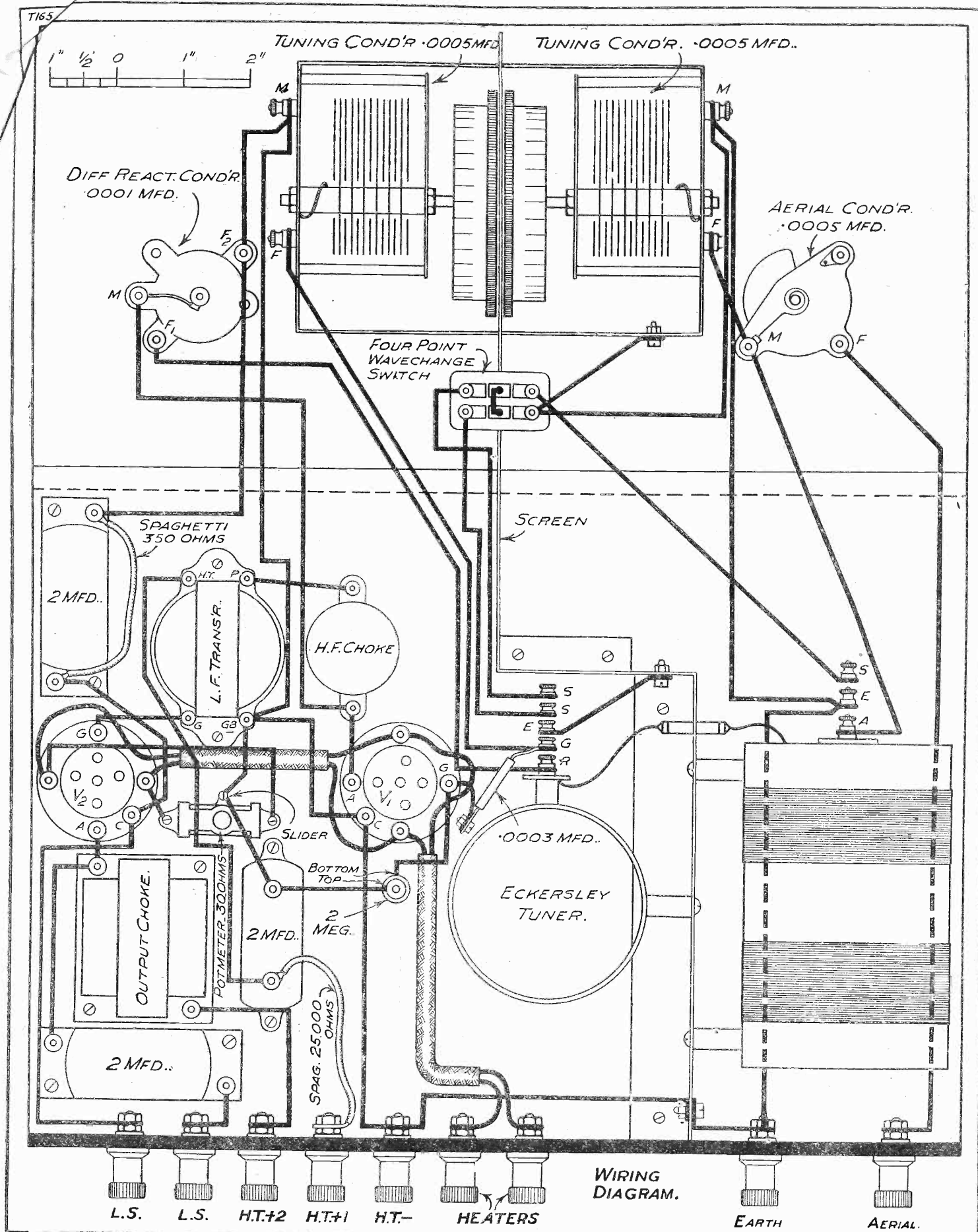
- 1 L.F. medium ratio transformer, (Igranice Midget, Telsen, R.I., Ferranti, Climax, Lewcos, Lotus, Graham Farish, Lissen, Varley, Sovereign, Formo).
- 2 5-pin valveholders (W.B. small type, Graham Farish, Telsen, Bulgin, Igranice, Lotus, Clix).
- 1 4-point wave-change switch (Telsen).
- 1 Terminal strip, 14 in. × 2 in.
- 9 Indicating terminals (Igranice, Belling-Lee, Eelex, Clix).
- Glazite, Lacoline, Jiffilix, Quickwyte.
- 18-in. metal-covered twin flex (Lewcos).
- Wire, screws, flex, etc.

AS SIMPLE AS A BATTERY RECEIVER



The simple nature of this all-from-the-mains receiver is largely due to the use of a separate unit for the power supply instead of incorporating all the "mains" components in the receiver proper.

A PERFECTLY SAFE RECEIVER FOR YOUR A.C. MAINS



Once you have assembled and wired the Eckersley Two there is nothing to worry about. There are no accumulators to charge, no high-tension to run down, not even a grid-bias battery to bear in mind. It is always ready at the turn of a switch to provide you with programmes in plenty.

FOUR FINE SETS

Here are four fine sets for you to choose from, each the leader in its class. Any set built with a Ready Radio Kit can be depended upon to give the results the designer claims for it.

COSMIC STAR

The Cosmic Star covers all wavelengths—short, medium and long. It will bring you programmes from America, Australia, Africa and Asia with the same ease with which you tune in a Continental Station.

KIT "A" 89/6
Complete Kit of Components together with panel (ready cut and drilled), baseboard, Jiffilinx for easy non-soldering wiring and free blue print.

OR BY EASY PAYMENTS 10/3 down and 9 monthly payments of 10/3

KIT "B" £5:12:3 Complete Kit of Components with valves and free blue print.
KIT "C" £6:13:3 Complete Kit of Components with valves, beautiful Table Cabinet and free blue print.

OR BY EASY PAYMENTS
10/6 down and 11 monthly payments of 10/6
12/3 down and 11 monthly payments of 12/3

S.T. 300

The S.T. 300 is the finest screened-grid three ever designed. Its wonderful selectivity, sensitivity and power make station-finding the simplest of matters to the least experienced operator.

KIT "A" £3:18:6
less valves and cabinet

OR BY EASY PAYMENTS
7/3 down and 11 monthly payments of 7/3

KIT "B" £5:10:9 With valves less cabinet.
KIT "C" £6:9:3 With valves and cabinet.

OR BY EASY PAYMENTS
10/3 down and 11 monthly payments of 10/3
12/- down and 11 monthly payments of 12/-

TO INLAND CUSTOMERS.—Your goods are dispatched post free or carriage paid.

TO OVERSEAS CUSTOMERS.—Everything Radio can be supplied against cash. In case of doubt regarding the value of your order, a deposit of one-third of the approximate value will be accepted and the balance collected by our Agent upon delivery of the goods. All goods are very carefully packed for export and insured, all charges forward.

"Popular Wireless"
Official Exhibitors
sell Ready Radio
Kits. Look for the
sign in the window.

SINGLE DIAL SUPER

KIT "A" less valves and cabinet £8:18:3
OR BY EASY PAYMENTS
16/6 down and 11 monthly payments of 16/6

KIT "B" with valves less cabinet £12:7:0
OR BY EASY PAYMENTS
22/9 down and 11 monthly payments of 22/9

A.C. ECKERSLEY TWO
If you are interested in the A.C. Eckersley Two, write to Ready Radio for details and prices.

Head Offices: EASTNOR HOUSE,
BLACKHEATH, S.E.3. Phone:
Lee Green 5678. Grams: Readirad,
Blackvil.

READY RADIO

Showrooms: 159, Borough High Street,
London Bridge, S.E.3. Phone: Hop 3000.

CASH or C.O.D. ORDER FORM

To: READY RADIO, LTD.,
Eastnor House,
Blackheath, S.E.3.

Please dispatch to me at once the following goods.....

for which (a) I enclose (cross out line)
(b) I will pay on delivery (not applicable) £.....

Name.....

Address.....

P.W. 9/4/32.

To: READY RADIO, LTD.,
Eastnor House,
Blackheath, S.E.3.

Please dispatch to me the following goods.....

for which I enclose first deposit of £.....

Name.....

Address.....

P.W. 9/4/32.

EASY PAYMENT ORDER FORM

THE ECKERSLEY A.C. TWO

(Continued from page 132.)

design a more desirable set. Take selectivity for a start.

This is taken care of by an Eckersley Tuner, which at the same time ensures that there will be no shortage of distant programmes. Nor will quality be poor.

The detector valve is coupled to the output valve by a transformer, and there is an output filter, differential reaction, automatic grid-bias and potentiometer control among its many refinements. The potentiometer ensures that the H.T.— shall be connected to the heater transformer in an "accurate" manner, so that hum is avoided.

Special Wave-Change Switch.

The wave-change switch is a little out of the ordinary, so a few words of explanation will be useful. It is in effect two plunger type on-off switches, so connected that one knob controls them both.

The two plungers are wired together, and it is important that this connection is not omitted. When the knob is pushed in the four contacts of the switch are all separated and the set works on long waves, when they are all connected (switch pulled out) the receiver is adjusted for medium waves.

Instead of this particular switch a three-spring wave-change switch could be employed, the fourth contact being obtained by connecting a flex wire to the plunger. Another component point concerns the .0005-mfd. solid dielectric condenser in the aerial lead.

See that this is one with a shorting position when the moving vanes are all in or all out. If this condenser is not set

shorted by this means for long-wave reception, results on this band will be rather poor.

Now a word about the 250-ohm spaghetti resistance that is used to provide the automatic bias for the last valve. This value is suitable for the valve we used in the original set, and mentioned first in the list of accessories, assuming an H.T. voltage around 150.

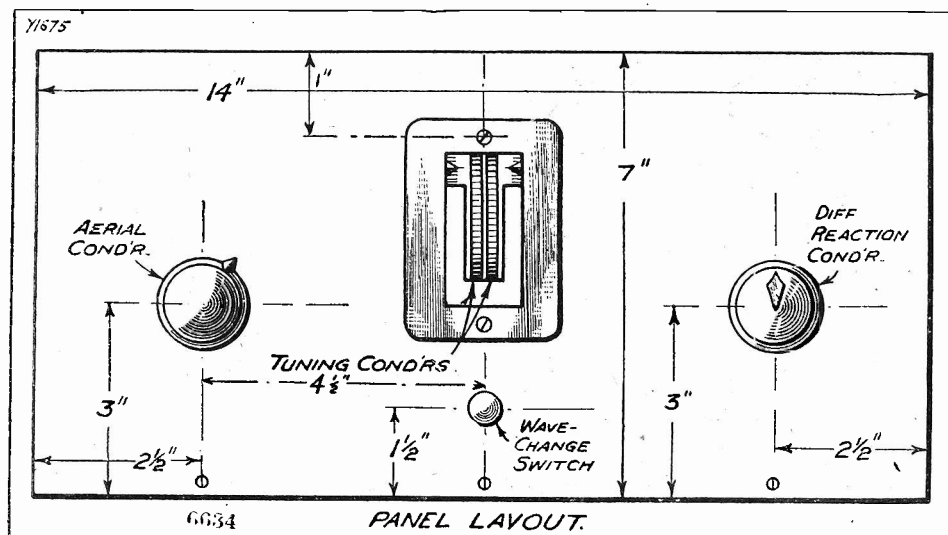
With some of the other valves mentioned as alternatives a different value of resistance is necessary, but the right value is

and pick out the curve taken at this voltage, or the nearest voltage if 150 is not given. Run a pencil along the bottom line till you come to the right G.B. voltage and then work up this line until you reach the point where it crosses the 150-volt curve.

Not Very Difficult.

Here you must work to the left of the chart and read off the current given in milliamps. To find the required value, divide this current in milliamps into the desired G.B. voltage multiplied by 1,000.

DETAILS FOR YOUR RULE AND SCRIBER



There are only four panel components to mount, and easy dimensions make the marking out of the positions for the holes a simple matter. Note that there is no on-off switch, all the "on-offing" being done from the unit.

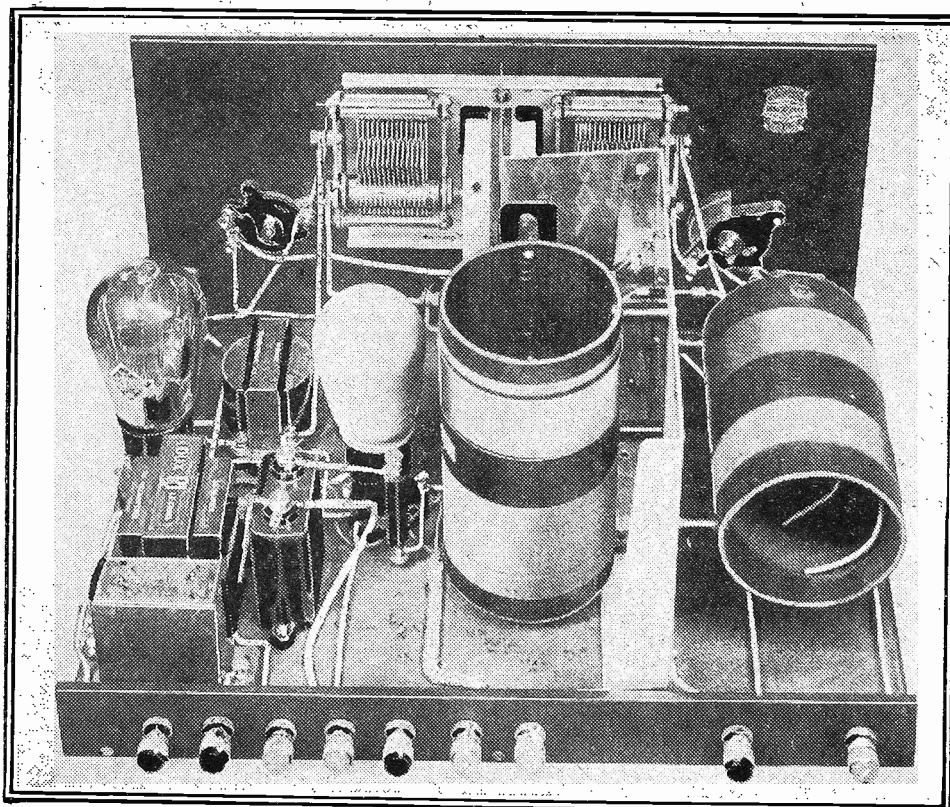
easily worked out in the following manner. First of all get out the maker's curves from the box in which the valve is supplied (it is usual thus to enclose them).

Note the bias required for 150-volts H.T.

The main screening is provided by the Eckersley Tuner, but this has to be joined up to the metal plate of the extensers by a small screen bent at right angles. Note also that a small piece is cut out of it to make room for the wave-change switch.

The wire used to connect up the heater terminals of the valve holders to the terminals marked A.C. L.T. is of the type covered with metal braiding. It is usual

FINE RESULTS FROM FOREIGNERS AND LOCALS



Although there are only two valves, this set does not tie you to locals and near-by stations. It will bring in distant transmissions, on the speaker, of course, at good strength, good quality, and free from interference.

ACCESSORIES TO CHOOSE FROM.

Loudspeaker (Epoch, Marconiphone, Celestion, Graham Farish, W.B., Blue Spot, H.M.V., B.T.-H., R & A).

Valves—1 Det. (Cossor 41M.H.L., Mazda A.C./H.L., Mullard 354V., Marconi M.H.4, Osram M.H.4, Six-Sixty 4D.X.A.C., Eta D.W.4023, Tungram A.R.495).

1 Output valve (Cossor 41M.P., Mazda A.C.P., Marconi and Osram M.L.4, Six-Sixty 4P.A.C., Mullard 104V., Tungram A.P.495), Eta D.W.1003).

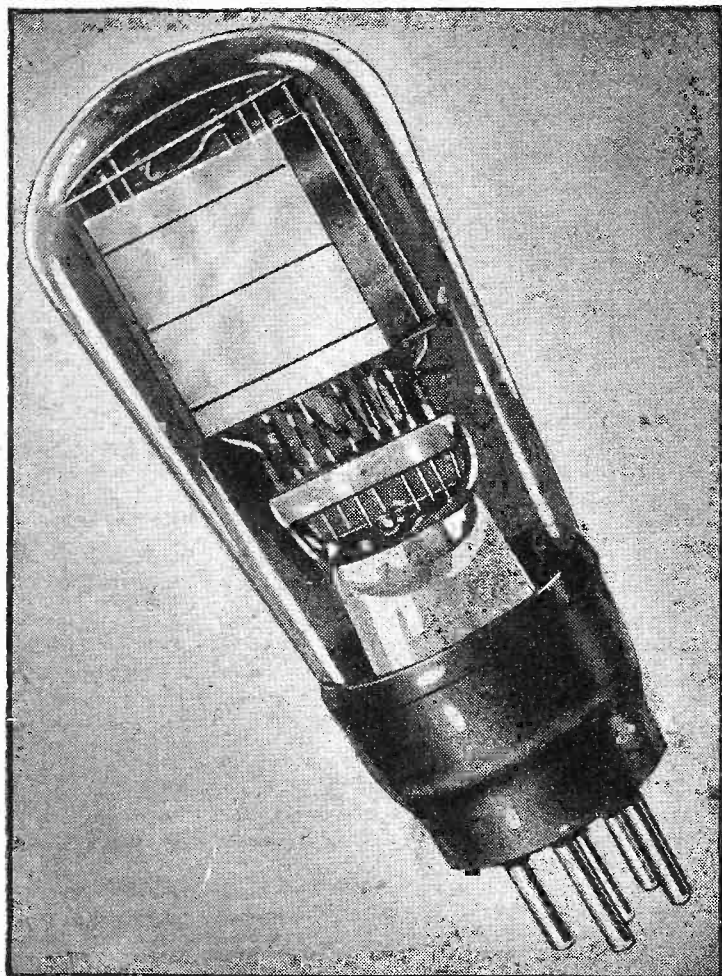
Mains Unit.—To supply 150-200 volts at 30 milliamps, and 2 amps at 4 volts for heaters. It should not have an earthed centre-tap on the heater transformer (Heyberd M.W.1).

practice to connect such covering to earth, but we did not find it necessary to do this.

But you might with your mains. So it is as well to use similar wire and earth it if you have any bother from humming or instability.

Next week we will tell you how to connect up to the mains unit, etc., and also give details for using it on batteries.]

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

The Edison Swan Electric Co. Ltd.

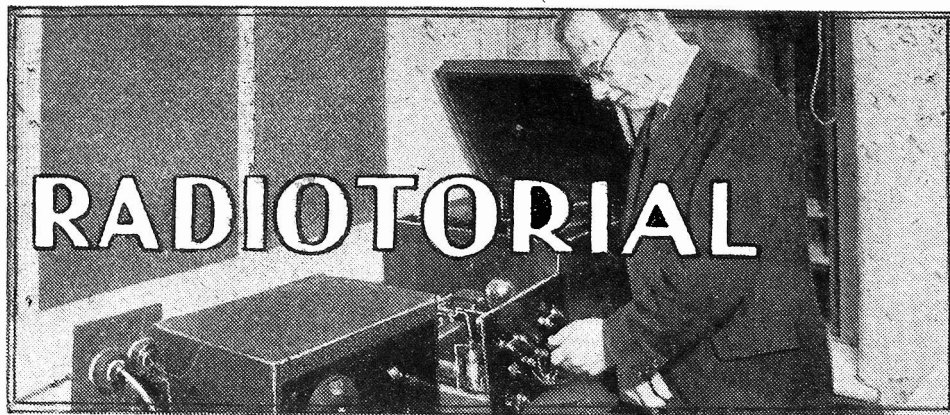


155 Charing Cross Rd., London, W.C.2

V.147

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

MAZDA THE BRITISH VALVES



RADIOTORIAL

All 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. Lile, 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

AN AMPLIFIER FOR GRAMOPHONE WORK.

F. B. (Mountain Ash).—"Is it possible to use a single-valve amplifier for gramophone pick-up work without altering the wiring of the main set? In case that is not clear, I mean can an amplifier be used to boost up the pick-up before this is connected to the set?"

"I find the pick-up I have tried is not quite strong enough to bring out the full

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.

tone on dance records, but I do not want to run the extra valve for radio in the ordinary way.

"If you have ever put out an amplifier of this kind, will you please give publication date. Or failing that, can you supply a description of connections?"

It is quite possible to do as you wish, but you might not find it easy to work out a satisfactory layout, etc., from a brief description. So we think your best plan is to get details of the very similar and suitable arrangement recently described in "The Wireless Constructor."

This was called the "Uni-Amp," and takes the form of a compact unit, with flexible leads like an "Antipodes Adaptor." It embodies volume control, and is just the thing for your purpose, and it can also be used as a straight amplifier for a valve set. (Full details appear in the April number of "The Wireless Constructor," now on sale, price 6d.)

OSCILLATOR WINDINGS FOR "SINGLE-DIAL SUPER."

The gauge of wire for winding the oscillator unit of the "P.W." "Single-Dial Super" is No. 30 D.S.C. throughout. Diagrams of this unit were given on page 76 of the March 26th issue, and the numbers of turns are as follows:

Long-Wave Anode Winding	74 turns	At top of
" " Grid	40 turns	former
Medium-Wave Anode Winding	34 turns	
" " Grid	15 turns	

Both rotors have 20 turns in all, 10 to each slot. (Note: The direction of winding is marked on the diagrams mentioned.) *

HUM ON SHORT-WAVES.

F. A. (Reading).—"While talking over with some friends the best circuit arrangement for a new set I was thinking of, I learned to my astonishment that the general opinion appeared to be that whereas with my mains set which gives no hum whatever on ordinary wavelengths (that is the 250 to 600 band, and on the long-waves, 1,000 to 2,000 metres) I was likely to find trouble when I went to very short-waves.

"None of them could explain why that should be so, but they all seemed very emphatic about it. I should like to know if it is a matter of common experience and, if so, how it can be accounted for?"

"It seems to me that on short-wave work with the very high frequencies involved one would be much farther away from the sort of frequencies that would be troublesome when introduced by the mains, so I should be glad of an impartial opinion and if possible, some explanation."

Your friends were quite right, and it is commonly found that mains apparatus which is perfectly satisfactory on both ordinary wavebands, can and does introduce very objectionable hum when used for short-wave sets. That is the reason why you so seldom see a set using mains valves employed on short-waves, and why so many short-wave enthusiasts, who run their ordinary broadcast reception sets from the mains, keep an accumulator and H.T. battery especially for short-wave work.

Although the frequencies introduced by mains apparatus are comparatively low, and those used in short-wave working are enormously high, it must be remembered that a short-wave set is usually worked in its most sensitive condition right on the edge of oscillation. And also that the signals coming into a short-wave set are often very weak when compared with those normally dealt with on ordinary broadcast wavebands. As a result of both these factors hum is far more troublesome on the mains set than on the ordinary set when using short-waves.

It is a matter of common experience, when listening to ordinary broadcasting, to find that a slight hum, which is hardly audible when no programme is being received, is quite unnoticeable when the set is tuned in to the local station. In other words, the

programme-level is very high compared with the interference level, and under normal working conditions the latter is unnoticeable.

If the set were used for very weak signals, however, at a strength level equal to or even less than the hum level, the hum would become correspondingly troublesome.

H.T. BATTERY RUNNING DOWN TOO QUICKLY.

W. M. (Welshpool).—"Although the time varied within a few weeks, I used to find that a double-capacity battery lasted the set just about four months, and it was nearly always necessary to treat myself to a third one before Christmas! In fact, I had got accustomed to thinking of the expense of a battery once every four months as the proper thing."

"But at the beginning of last December I found that the one I was using seemed very low and I got another one. (Beginning of December.) Instead of that lasting until about now, as I had hoped, I found I needed another one three or four weeks after Christmas."

"I was a bit sore at having to buy one so quickly, but I thought I had been unlucky and got a dud, and must not grumble too much, so I got another kind, British make. And behold, exactly the same trouble has arisen, and now at the end of another two months I am down again!"

"Nothing in the set has been touched at all, and when the batteries are new it sounds perfect. Do you think it can be the 18-months-old valves causing the trouble, or what is likely to be upsetting it in this way?"

"I have got the new battery in, and it sounds perfect, but all the time I am afraid it is running down like the other two. Would it be an advantage to pull out the H.T. negative plug when the set is switched off?"

It certainly looks as though the insulation somewhere in the set has broken down and is wastefully emptying the battery even when the set is supposed to be off. And as the best rough-and-ready method of preventing this waste of H.T. is to remove the H.T. negative plug from the battery when the set is not working, we certainly recommend that you should do this. Even more important, and to counteract the leak during the time that the set is on, is to find it and replace the dud part, as this may get worse and is certainly doing no good when the set is switched on, whatever may be the case when the plug is removed after the programme has closed.

The best way to trace such a fault is by means of a milliammeter, which should be connected in the H.T. negative lead. It should, of course, be of such a type that it will read the total current of the set.

(Continued on page 138.)

TECHNICAL TWISTERS

No. 108—THE BAFFLE-BOARD. CAN YOU FILL IN THE MISSING LETTERS?

The effect of a baffle-board is to increase the effectiveness of the cone in regard to . . . response.

* * *

Unless such a precaution is taken the displacements of . . . by one surface of the diaphragm tend to interfere with or cancel the effect of the displacements caused by the other surface, and the resulting sound wave is not a true copy of the original.

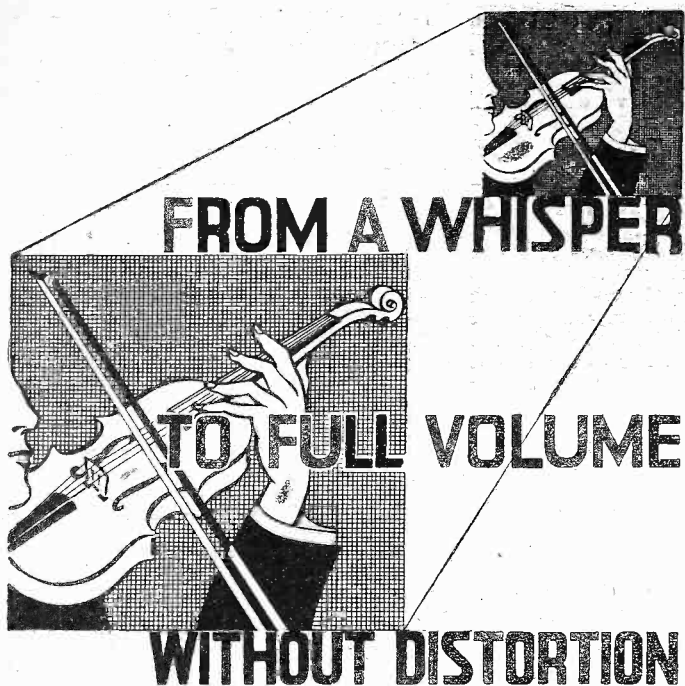
* * *

The chief practical effect of providing a suitable baffle-board is an improvement in the . . . notes.

* * *

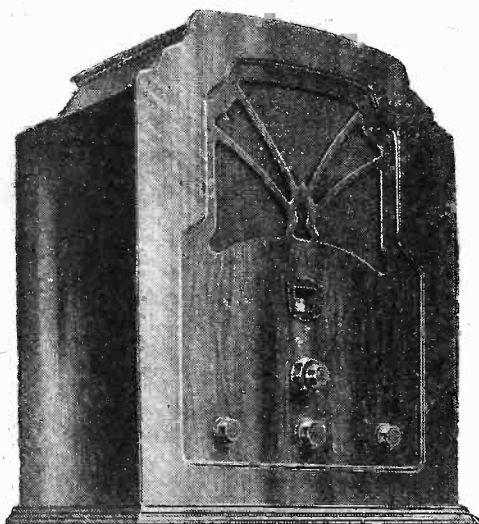
It is important to use a . . . board.

Last week's missing words (in order) were: Emission. Grid Bias. Current.



The magnificent new Regentone 3-valve All-Electric Receiver. A specially designed, engineer-built modern circuit, built in to a distinctive dual-tone walnut cabinet, operating entirely from the electric supply.

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16
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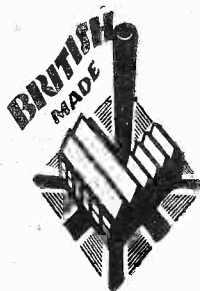
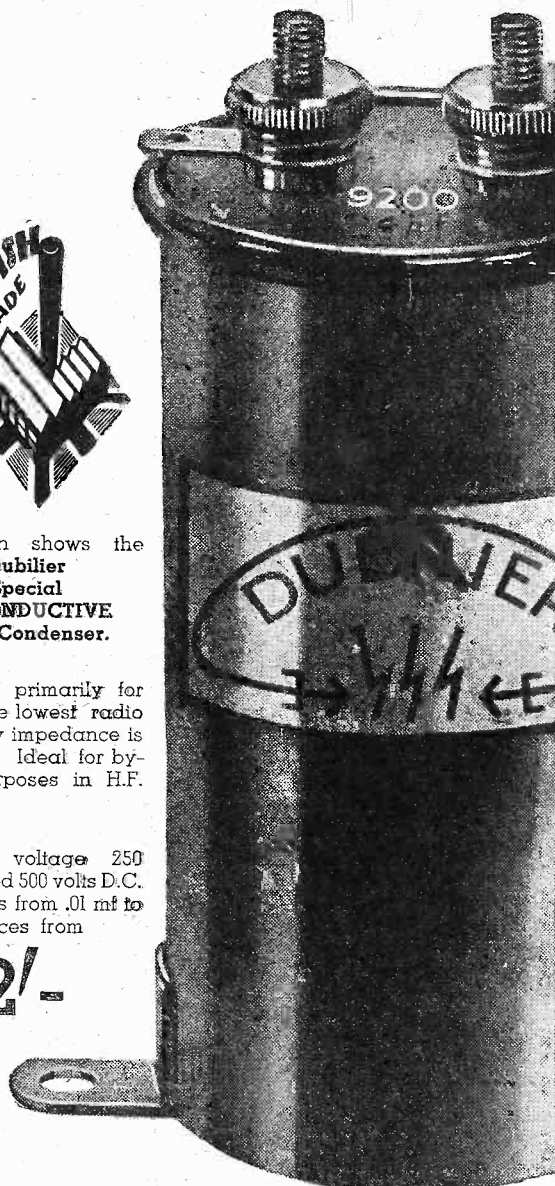


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2/-



B3

DUBILIER CONDENSER CO. (1925) LTD.
Ducon Works, Victoria Road, North Acton, W.3

RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 136.)

Possibly you can borrow some such instrument from a knowledgeable acquaintance who will connect it up for you, the usual method of testing being as follows:

With the filament switch off and with the milliammeter in the negative lead of the battery, there should be no current flow at all even when the battery plugs are at maximum. If a small steady current is observed this is a certain indication that the set has sprung a leak and you must immediately find it.

You can soon tell whereabouts the fault lies by removing, one at a time, the valves from their holders, the coils from their sockets, etc. and, of course, when one such change results in the milliammeter needle dropping back to zero, you know that you have interrupted the circuit where the leak is.

If there is still a leak when everything that is ordinarily removable from the set has been removed, you will have to try disconnecting the fixed condensers, especially those used for bypassing, which are the most likely cause of such a trouble. Undo one terminal of each condenser until you get on the track of the leak.

It requires a little patience, and really the job should be done by someone who knows his way about the inside of a circuit such as you are using, because it is very easy for anyone inexperienced to cross the wires during this operation, which might result in an expensive burn-out.

If care is taken, however, the probability is that the first few tests will disclose whereabouts the fault lies, and you will immediately be able to localise this still further, so that only two or three changes are involved before you have discovered where the leakage lies.

Once you have seen how handy a milliammeter can be in this way the probability is that you will not rest until you have got one for yourself, and, as your own experience shows, it is not altogether a luxury, for it may easily save its own cost in upkeep efficiency.

Naturally we assumed you have recently bought a new G.B. battery.

FINDING THE POLARITY.

T. D. (Leyton).—"Could you tell me of any very simple and safe method of telling which is the positive main, and which is the negative in a house wired for D.C.? I have been told that a piece of raw potato will enable this to be done, but my informant was in the dark as to the method except that he was sure the ends of the wire were stuck into the raw potato.

"If this is so, I should like to know what happens to indicate positive, and of any similar methods that may be used without expensive apparatus?"

The raw potato method is quite a good one, but like all methods for finding polarity it must be tackled carefully and by someone who understands the peculiarities and dangers of electric light mains. The electric light companies have the strongest objection to unqualified persons interfering with the wiring.

With all such testing methods, it is usual to insert a lamp of the type used for lighting in series with one of the leads, so that even should a short occur the current is strictly limited.

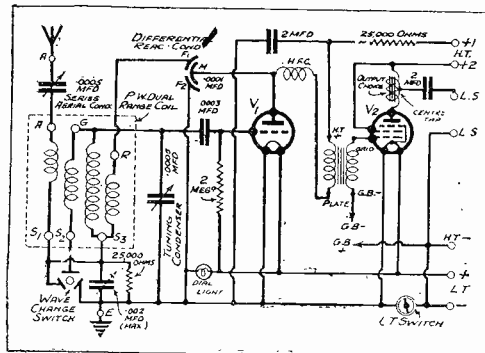
The method of using the raw potato is to slice it so as to show a clean surface, push one bared wire down into this, and hold it fast, and then place the other bared wire quite near on the surface, or embed it in the clean surface of the potato.

If the wire used is ordinary copper wire a green tint will appear at one of the wires, and this is the

one that is connected to the positive poles of the mains. An additional indication is afforded by the fact that a froth or a series of bubbles tends to collect at the negative pole.

Alternatively pole-finding paper may be employed for the test, the colour of this being altered at one pole when the two wires are placed on the paper. As different pole-finding papers are available, giving

MISSING LINKS, No. 31 DETECTOR AND PENTODE



This is the simple circuit given last week, with the three "missing" components inserted. It will be seen that these were all condensers—a 2-mfd. for decoupling, a '0003-mfd. grid condenser, and a 2-mfd. for the output circuit.

different reactions, it is necessary to find out exactly what change will occur when procuring the paper in question.

Another very common and easily-applied test is to dip the bare ends of the wires into a tumbler containing a little water to which a teaspoonful of salt or vinegar has been added. In this case, it will be found that one of the wires bubbles very freely indeed, which is an indication that this wire is connected to the negative of the supply.

There are other simple tests commonly and satisfactorily employed, but the foregoing are so readily used that to give more details would be confusing and unnecessary.

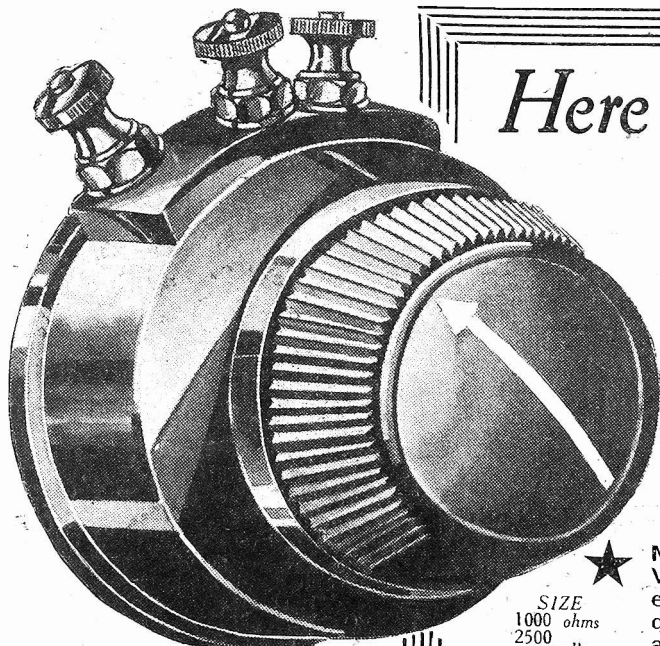
"P.W." PANEL, No. 66.

ABOUT MAINS UNITS.

The chief advantage of an H.T. mains unit is its constancy—it never "runs down." It also has the advantage of very low running cost, though initially it is more expensive than a battery.

Unlike the battery, it has a high internal resistance and consequently its voltage drops appreciably when large currents are delivered.

Owing to its high internal resistance a mains unit is less likely to burn out valves through a short, than an H.T. battery.



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CARRYING
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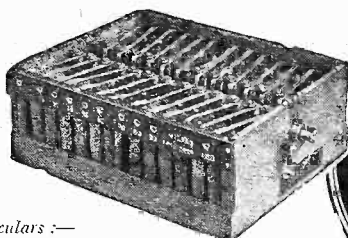


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27th February 1932

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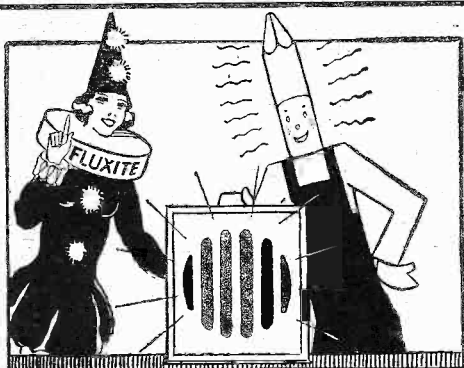
As you know, we have been stocking these units for the last fifteen months, and during this period have sold a good many to customers all over the County. We know that a number of these units are given really hard work, but we can honestly say that we have never had a complaint of even the most trivial nature. It is our opinion that, for either reliability, good workmanship, and consistent service, it would be impossible to better your products.

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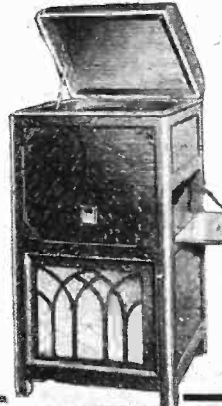
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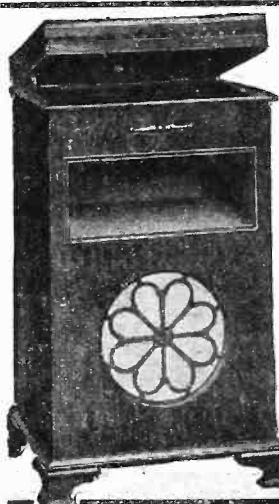


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WERE YOU BORED BY THAT VAUDEVILLE CRITIC?

A review of the B.B.C.'s recent Saturday night experiment in which a well-known critic was invited to discuss the variety programmes of the week.

"YOU'VE always been a fairly warm supporter of the B.B.C.," said my friend. "But what did you make of this vaudeville critic of theirs? I'm hanged if I can see what use he was to anybody." There must be many a listener who has asked himself a similar question.

What exactly is the function and value of the vaudeville critic?

To ask this question is to ask what is the value of any criticism of any public entertainment. The answer seems fairly obvious.

What We Expect.

There are three things which the public legitimately expects from a critic. We want our attention drawn in advance to anything which is particularly good of its kind, so that we are not in danger of missing it. We want to know what is really bad so as to be able to avoid it. And we like to think that the critic is doing what he can to encourage new talent where he finds it, so that new stars will be forthcoming as the old ones drop out.

Now let us consider a vaudeville critic in the light of these expectations, and we

shall find that by the very nature of his task he is precluded from performing any of these functions of criticism properly. This explains why my friend, and thousands more like him, were impatient about a vaudeville critic, who must of necessity fail, however hard he tries, to be of assistance to the great body of listeners.

I said that we expect a critic to draw our attention in advance to anything which may be particularly good of its kind. This is what the dramatic critic of a daily newspaper does for us in his reviews of current plays.

But a poor vaudeville critic is handicapped from the start. As a basis for deciding whether or not we will listen to a given programme his views are useless, for the very good reason that his criticism is given after one or two performances which are rarely repeated!

A Parallel Case.

As a guide to the listener, his views are about as useful as an out-of-date time-table to a man who wants to choose the best train from London to Liverpool! To appreciate how entirely futile his recom-

mendations are, we have only to imagine a newspaper which instructed its critics not to say anything about a stage play until the end of its run.

So it amounts to this. If you have not listened to the week's vaudeville, you find the remarks of the vaudeville critic merely a great bore. And if you do happen to have listened to the week's programmes, the only "kick" you are likely to get from his remarks is the mild satisfaction of seeing how far his opinion of the various artistes coincides with your own!

Nor is the fact that the critic is employed by the B.B.C. altogether a satisfactory arrangement. This reminds me of the second function of criticism—pointing out what is really bad, so that we shall be able to avoid it in the future.

Independent Opinion Preferred.

If you were a vaudeville critic, employed by the B.B.C. to talk about artistes who had already been approved by that august body, would you feel able unmercifully to slate anyone in whom your employers had already shown a certain confidence? Would you not be tempted to praise where you could, and preserve a discreet silence in the case of really bad turns?

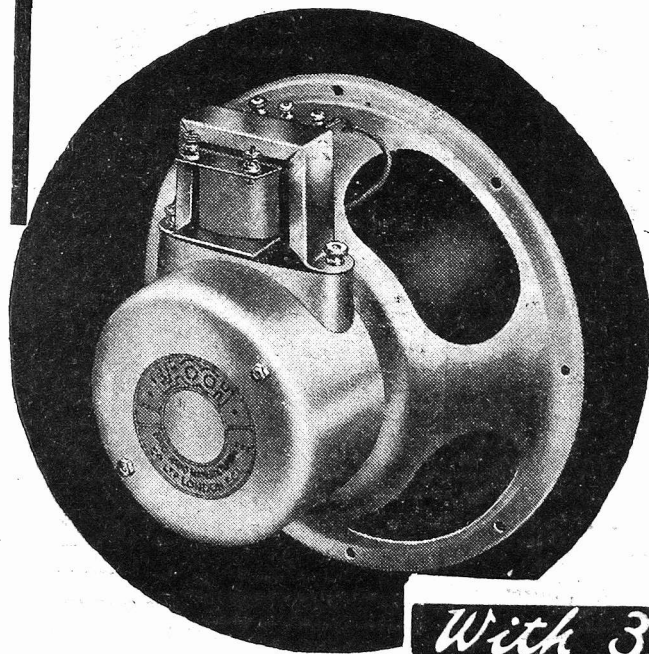
A vaudeville critic may honestly try to slate what he thinks bad, but he will never entirely get over this. Instinctively we prefer to rely on definitely independent opinion—newspaper critics, for example, who clearly have no axe to grind.

Nor is a vaudeville critic very helpful in the matter of discovering new talent, for

(Continued on page 142.)

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60 VOLTS 5/6 100 VOLTS 9/- 120 VOLTS 11/-

WERE YOU BORED BY THAT VAUDEVILLE CRITIC?

(Continued from page 140.)

the B.B.C. does this effectively, first sifting the sheep from the goats, and then letting the public decide for itself.

The emergence of so many radio stars—Leonard Henry, Christopher Stone, Tommy Handley, Stainless Stephen, A. J. Alan, and many others—without the assistance of official critics indicates that the public is quite capable of making its own radio stars.

Perhaps the whole trouble is that radio criticism in general is unnecessary because radio entertainment is itself so cheap.

After all, the real *raison d'être* of the dramatic critic is that most people cannot afford to discover what plays they like by a process of trial and error, and depend on the critic to show how best they may lay out whatever money they have to spend on the theatre.

Dramatic Critics.

Playgoers, through the high costs of seats, cannot afford to visit six likely shows in the hopes of finding two about which they can rave—much as they would like to. But this consideration of cost is one that does not arise in broadcasting. The cost is the same, no matter how often you listen!

So that it is easy for the listener to become his own critic. A visit to the theatre is an important occasion and the show we shall honour with our patronage a matter for long and earnest debate,

simply because the theatre is expensive. Listening, on the other hand, is cheap, and if we do happen to start listening to the wrong thing, it is so easy to switch off! No inconvenience; no waste of time or money.

Plenty of Reasons.

On the whole, therefore, there seems an abundance of reasons to account for the failure of radio criticism as we know it at present. I refer particularly to the vaudeville criticism, of course, as this is what interests the bulk of listeners. Obviously,

RADIO WRINKLES.

Some Aids to Better Reception.

If you have a milliammeter it is a good plan to connect it occasionally in the H.T. lead, and note whether you get a reading when the set is switched off. If this occurs, one of your condensers or similar component has its insulation broken down and needs replacing.

NEXT WEEK

A TALK WITH A YUGO-SLAVIAN LISTENER THESE RADIO COMPONENTS— THE COMMENCEMENT OF AN IMPORTANT NEW SERIES OF ARTICLES BY CAPT. P. P. ECKERSLEY

the advance talks on forthcoming symphony concerts and so on have their uses, but these appeal to a very limited section of listeners.

My friend who criticised the vaudeville critic so unmercifully admitted later that the various men who undertook the job were amusing in themselves. But this is surely small compensation for their inevitable failure as critics.

Large condensers of the metal enclosed type need not always be thrown away even when faulty, as if they are opened up it may be found they consist of several 1-mfd. units, only one of which is faulty.

It is not a good plan to solder a grid leak direct to the wiring of a short-wave set, with the idea of shortening the leads, as the heat applied to the end of a leak will often seriously upset its working.

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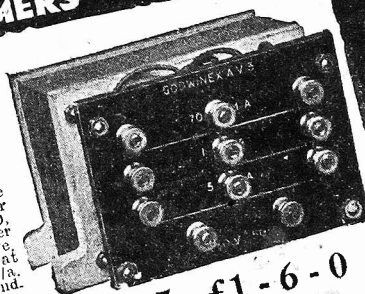
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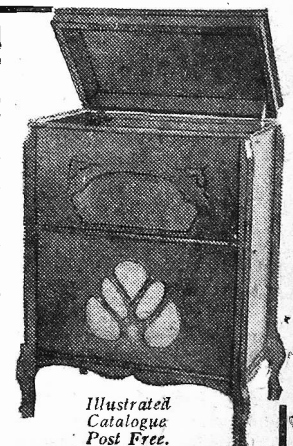
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TECHNICAL NOTES

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

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

G.'s and Grid Current.

THERE is a good deal of difference between different screened-grid H.F. amplifying valves as regards the amount of grid current passed. Often enough these stages are used without any grid bias, and so it becomes an important question how much grid current the valve will pass with zero grid bias.

As I say, some valves pass a good deal more current than others in these circumstances and naturally it would seem better, other things being equal, to choose a valve in which the grid current at zero grid bias was relatively small. You can investigate this roughly by trying two or three different valves alternately in the same position, when you will probably find that their characteristics are noticeably different.

In such a case it is quite possible that the grid current characteristic mentioned above is mainly responsible for the differences. For one thing, if you are using a valve which passes a relatively heavy grid current at zero bias, this will have a broadening effect upon the tuning and the circuit generally will not be so lively.

Small Bias.

If, on the other hand, a small amount of grid bias is used, the natural or inherent differences in the valve will not appear so marked. In fact, you will sometimes find that of two valves, curiously enough, the one which passes the greater grid current at zero bias will actually give the better results when the proper amount of grid bias is applied. It is not only a question of the strength of the signals, but also of the actual quality and performance.

Trimming Precautions.

With ganged condensers, a trimming condenser is generally provided across one or more of the circuits so that they may be brought into tune. This method is fairly convenient in many ways, but sometimes the capacity of the aerial will completely upset the whole of the tuning, and as aerial capacities vary very greatly, it is important to have some means of avoiding interference with the tuning in this way.

One arrangement which is often used is to introduce a condenser of small capacity in series with the aerial, and before the point at which the aerial lead is connected to the top of the tuning coil. The capacity of this condenser may be as small as 35, or even 25 micro-microfarads. With this arrangement the aerial tuning will alter only a very slight amount with different aerials, so that the upset in the trimming department is relatively small.

Effect of Aerial Capacity.

Another arrangement which is sometimes used, is to connect the aerial to a tapping on the tuning coil, preferably a

(Continued on next page.)

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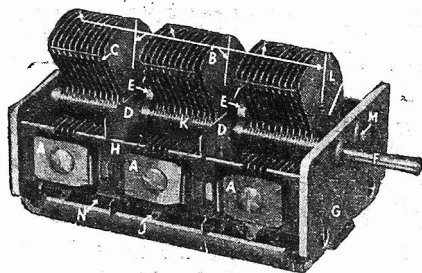
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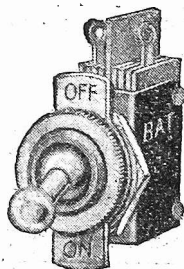
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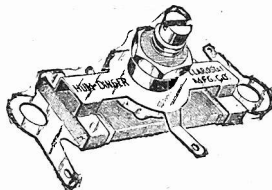
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TECHNICAL NOTES

(Continued from previous page.)

tapping fairly near the earthed end of the coil so that the effect of the aerial capacity is greatly diminished. Of course, this may at the same time reduce the signal strength, and it is a question for you to decide whether the signal strength will stand reducing.

On the other hand, as I mentioned before in these Notes, the connecting of the aerial to a point on the tuning coil near the earthed end will, as a rule, have the effect of sharpening up the selectivity. Of these two arrangements, the small condenser in series with the aerial will often give a greater signal strength than the other.

In many manufactured receivers one or other of the two arrangements mentioned above is used in lieu of the trimming condenser.

"Pre-sets" for Trimmers.

By the way, talking about trimmers for ganged condensers, many of you probably use pre-set condensers for this purpose, and the question arises as to how long these pre-set condensers really remain set. It depends, of course, upon the particular construction of a pre-set condenser, but in some cases I have known these to vary quite considerably within a short period of being adjusted.

If, therefore, you are using ganged condensers and the ganging does not seem to be quite perfect, it is a good plan to try adjusting the pre-set condenser again, as in all probability you will find that this has changed slightly.

Another reason why difficulty may sometimes be experienced in ganging up circuits, is because the coils are not properly matched.

This does not necessarily mean to say that the coils are not in themselves matched, but it may be that when they are in their working positions, circumstances alter their effective inductive values.

Matching Coils.

For instance, suppose one of the coils is near to a tuning condenser, or any other metal part for that matter, this will have the effect of reducing its inductance and, of course, throwing out the matching of the coils as a whole.

So you see that it is not only a question of getting the coils matched in the first instance, but also it is equally important to have them matched in their operating conditions.

This alteration of the inductive value of the coil due to the presence of the metal plate, is the basis of a system of tuning known as "spade" tuning, which was quite popular a few years back.

In case spade tuning may not be familiar to the present day generation of radio amateurs, perhaps I should mention that a metal plate was adapted in relation to the coil, in scissor fashion, so that the effect upon the tuning of the coil could be readily adjusted.

Anyway, all this shows you how important the effect of neighbouring metal parts may be upon the tuning of the coils, and before going to any elaborate trouble with your ganging you should first of all make sure that the coils are properly matched in their operating positions.

Power-Grid Detection.

A good deal has been said lately about power-grid detection, and you may remember an article of mine on this in "P.W." some little time back. Without going in for full-blooded power-grid detection, however, you can often obtain a distinct advantage by trying, so to speak a measure of it. For instance, you may try using a smaller value of grid leak, tuned to perhaps half a megohm instead of the conventional two megohms.

If this produces an improvement in some ways, it may at the same time upset the reaction, and that will have to be corrected. A simple way of counteracting the interference with the reaction is to use a potentiometer across the low tension, and connect the grid leak to the slider of the potentiometer instead of to L.T. positive.

At the same time, it is often a good plan to use a higher value of H.T. on the detector than is commonly used. This naturally depends upon the type of valve employed as detector, and with some types the value of H.T. must be comparatively low, but with certain high-impedance valves which are often used as detectors, as much as 100 volts, or even more, may be necessary for the best results.

Aim at Efficiency.

The detector is really the most vital and sensitive spot in the whole circuit, and it is well worth while to spend a fair amount of time upon getting the detector working under the best conditions. This is far more

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important than either the H.F. or L.F. amplifiers. I have often examined sets in which a good deal of care and attention has been given to the amplifiers, particularly the H.F., but in which the detector was operating under sadly poor conditions.

Varying the Tone.

I said something in "P.W." a little time back about various forms of tone control, the simplest being an arrangement of choke or condenser in series with a fairly high resistance. The object of the resistance (a variable resistance, by the way) is simply to control the amount of by-passing which is brought about by the choke or condenser. The condenser, of course, by-passes the higher notes and the choke lets through the lower ones.

Without going to the length of making a regular tone control, however, you can often obtain much improved results from your loudspeaker by connecting simply a fixed condenser across the output circuit or across the loudspeaker itself. This has the effect of reducing the strength of the upper audio frequencies to an amount which increases with the capacity of the condenser.

(Continued on next page.)

TECHNICAL NOTES

(Continued from previous page.)

A large condenser will weaken them considerably, a small condenser will only weaken them slightly. Listeners have their own particular tastes and fancies as regards the modifying of the tone for different items, dance bands, instrumental music, songs, and so on.

A Set of Condensers.

In some cases quite a useful arrangement can be made by using a number of fixed condensers of different capacities so that any one of them, or any combination, can be connected across the loudspeaker. The most useful values of condenser for trying in this way are about .001, .002 and somewhat larger values.

It is not generally much good using just one condenser without any means of varying the effect. Either you must have, as I say, a set of condensers of different values on hand or else you must have some form of control such as the variable high resistance in series with the condenser.

Controlling H.F. Amplification.

There are various methods for regulating the amount of high-frequency amplification obtainable in a set, although they all have their particular drawbacks. One method which is very commonly used is a potentiometer in the screen circuit of the screened-grid valves. The potentiometer may be adjusted so as to reduce the voltage applied to the screen below the normal value and this will have the effect, of course, of reducing the H.F. amplification.

It is important to note, however, that the reduction in amplification is brought about according to this method by changing the characteristics of the valves, since the impedance of the valves is increased and the slope is reduced. Now this may be all very well over a certain range, and in practice, in certain conditions, the method is reasonably satisfactory. It depends very largely upon the strength of the incoming signals.

Bearing in mind that you have reduced the working part of the characteristic curve of the valves, you will see that if the incoming signals are exceptionally strong, such as the signals, for instance, from the local station, you may run into distortion. So if you are thinking of using this method, you have to decide beforehand whether the signals you intend to receive will be strong enough to cause distortion owing to the limitation of the working part of the curves.

Components and Tone.

Referring to the question of the tone of the reproduction at the loudspeaker, this depends upon the characteristics of various components used in the circuit and sometimes, altogether apart from any actual tone-control device at the output, you can do a good deal to give the tone any

(Continued on next page.)

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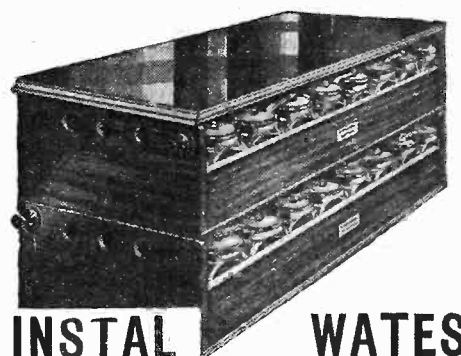
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TECHNICAL NOTES

(Continued from previous page.)

particular desired quality by choosing one or more of the components in the proper way.

For instance, a low-frequency transformer may have a rising characteristic, that is to say, a rise in its characteristic curve at the higher audio-frequency end. A transformer of this kind will tend to bring out the higher notes with greater strength and so is useful in cases where the loudspeaker, for instance, only reproduces the higher notes poorly. In some cases the tuned circuits in a set may have the effect of reducing the loudness of the higher notes, and a transformer of this type will go a long way towards remedying the defect.

Present-day Layouts.

It is not more than two or three years ago that we used to aim at laying out a set with plenty of spacing between the various components so as to avoid any interaction. Now, however, are the days of compact arrangements, and in view of the great advances which have been made in shielded components, and in the use of shields between components, layouts have become very much smaller and space greatly economised.

There is, however, all the difference in the world between a compact layout properly shielded and a layout in which the parts are merely crowded together. Some of the present-day portable sets on the market are really beautiful examples of carefully-designed layout and will accommodate a receiver the equivalent of which, on the old-fashioned arrangement, would have occupied half a dozen times the space.

Compactness and Shielding.

In arranging components close together, it is essential to avoid stray couplings which will render the set entirely unstable. This is one of the reasons why, when you are setting to work to make a receiver from a published design or blue print, you should be so very careful to keep to the designer's instructions.

Always bear in mind that before a design is published, in "P.W." for instance, every detail of the arrangement is carefully thought out by experts and tested, and there is really no need for you to depart from it in any way. If you are expert yourself and you wish, for some particular reason, to modify the design, you may be quite well able to do it, but for the majority of amateurs it is, as I say, a very wise plan not to risk introducing modifications, especially in regard to screening, which may only run you into trouble. Stick faithfully to the designer's layout, and you should get the full results of which the set is capable.

THE LISTENER'S NOTEBOOK

(Continued from page 130.)

Of course, Davies is old for a boy singer, but, even so, one cannot help being struck by his purity of tone and the confidence with which he sings. There is never a tremor. The B.B.C. should see we hear more of Iwan Davies.

If there is one place where the word psychology stands out in bold relief, it is at the B.B.C. And yet one wonders if the science is studied from all angles. Surely

it should be clear that listeners, sitting themselves down for an hour's vaudeville, are at once made fidgety when the programme opens with "Good-night, Vienna," which has been played at least three times before during the day.

I should say that "Songs from the Shows" is running Vaudeville very closely for popularity just now. Though it must be a strenuous hour for the two solo artistes concerned, neither of them showed signs of fatigue. I can't say which I like better with George Baker, Olive Groves or Winifred Fisher.

I don't think Margaret Elwes could have been the only contributor asked to sing less secular songs on Good Friday. Almost every musical turn seemed black-edged. Gladys Ripley, for instance, was particularly depressing.

I was very glad, however, to tune in to the talk on "Holy Week in Seville." It was extremely interesting. The introduction of gramophone records into a talk was something which added to the interest, although this particular talk needed no such support. The story, full of local colour, was beautifully told.

There had been plenty of preliminary talk over the recent vaudeville presented on the music-hall pattern, but, candidly, the show did not set the Thames on fire. It contained nothing original and was only saved from being somewhat of a flop by Gus Elen, who came on last.

What an example he would have been for some of the artistes had he been placed earlier in the programme! Here was a man of seventy, singing with a verve and vigour which convinced one he was in love with his job, while every word, both when he was singing and addressing us, came over as clear as a bell.

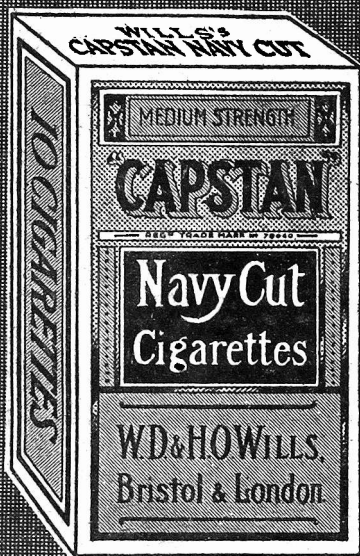
The intermission music might have been all old music-hall airs, I thought. Finally, I would never allow a present-day vaudeville to include (a) Londonderry Air, (b) One More Chance, and (c) Three lots of comedian "twins."

Those folk—and their name must be legion—who have so missed A. J. Alan were, doubtless, all of a glow when Hugh E. Wright came on the scene with his "Taxi" story. It was splendidly delivered, nothing marring it whatever. Mr. Wright has a voice that at once catches the ear, and if we don't hear more of him then the judgment of the B.B.C. will be sadly at fault.

The patrons of the Argyle Theatre, Birkenhead, have certainly not lost any of their old-time vitality, if riotous applause is indicative of vitality. Cosgrove and Westwood seemed to carry them by storm, but frankly, they were just noise to me. Give me Gus Elen every time. Anybody may have the Melody Boys for me!

With the B.B.C. orchestra split up into so many sections, we are likely to find listeners also forming themselves into different camps. For myself, I am enlisting under the banner of Section E, conducted by Mr. Edward Clark, with Marie Wilson as leader. What a glorious 45 minutes they gave us that night the Music-Hall Show grated on the nerves of so many!

*They suit
everyone*



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MIRROR OF THE B.B.C.

(Continued from page 130.)

of "Special Providence," by Mary Agnes Hamilton, who was for several years B.B.C. critic of novels. Thursday, April 14th, marks the first vaudeville appearance of Sir Nigel Playfair, who is giving a recitation of the prologue to A. P. Herbert's operetta "Derby Day."

In the same programme will be an abbreviated version of Mr. Herbert's operetta "Plain Jane," which will be sung by Vivienne Chatterton, Esther Coleman, George Baker, and Warde Morgan, under the conductorship of Richard Austen, who composed the music.

I have already mentioned that George Gee, the well-known comedian in "White Horse Inn," will broadcast for the first time in this vaudeville entertainment; and another newcomer to the microphone that night is "Frédérique," who sings French and Italian songs. With them in the studio will be Ross and Sargent and Colin Wyatt, the Cambridge ski-ace and yodeller.

"Little Miss Make-Believe."

Many admirers of the work of Mr. Charles Brewer, the author, composer, and producer of more than a hundred light shows at the Birmingham station, will be delighted to learn that one of his most successful shows, "Little Miss Make-Believe," is to be repeated for National and Regional listeners on Tuesday and Wednesday, May 3rd and 4th respectively.

"Personally, I am rather surprised this was not done long ago, because in "Little Miss Make-Believe" Mr. Brewer has a radio-musical comedy as good as anything done before or since it was first broadcast for Midland Regional listeners as far back as December 6th, 1930.

An Exciting New Series.

I hear that Admiral E. R. G. R. Evans, C.B., D.S.O., and Admiral Gordon Campbell, V.C., D.S.O., have both agreed to describe some of their adventures in the series of talks to be given on Saturday evenings under the title of "Hazards."

Admiral Evans is a New Zealander, and only last year relinquished the command of the Royal Australian Navy. Most people will remember how, with H.M.S. Broke under his command, and H.M.S. Swift of the Dover Patrol, he engaged and defeated six German destroyers, one of which was rammed by the Broke.

But it is not of the war that Admiral Evans will talk, but of his adventures with the Antarctic Expedition of 1910-11, on which he accompanied Captain R. F. Scott as second-in-command. Scott and other members of the main party all perished, and Lieutenant E. R. G. R. Evans, as he then was, had charge of the subsidiary party which reached its base after narrowly escaping death.

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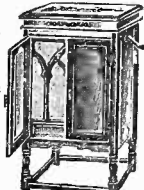
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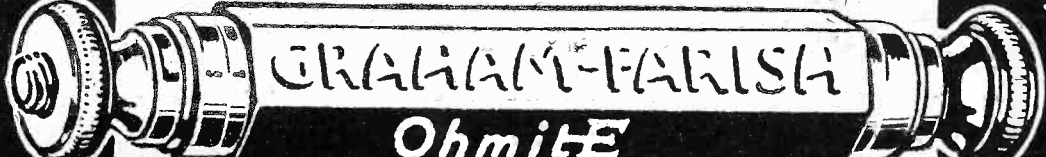
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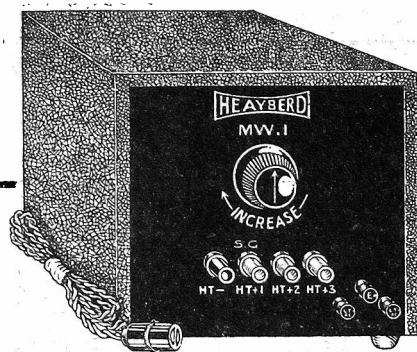
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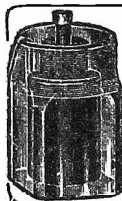
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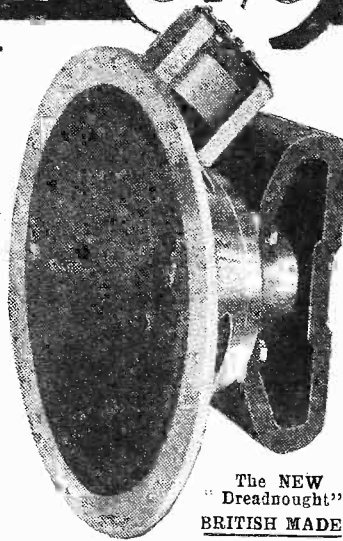
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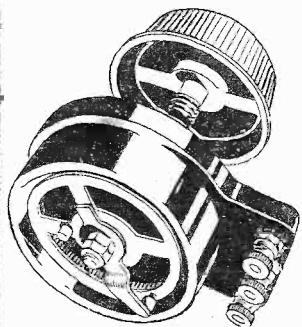
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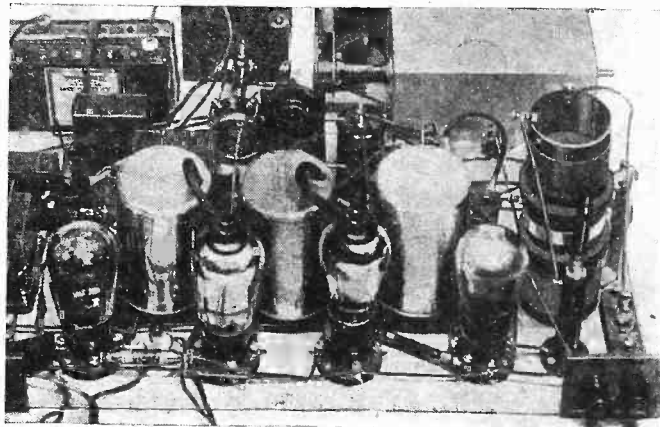
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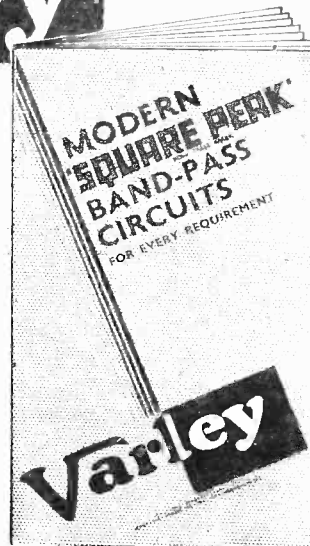
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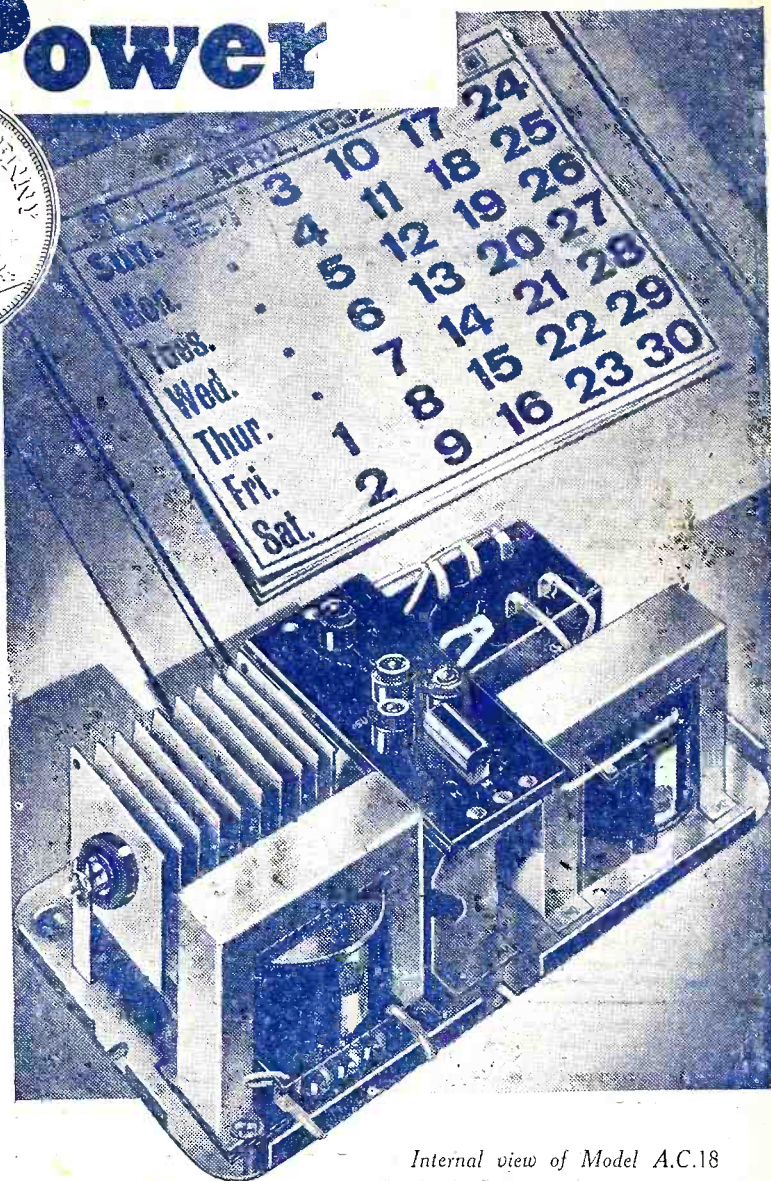
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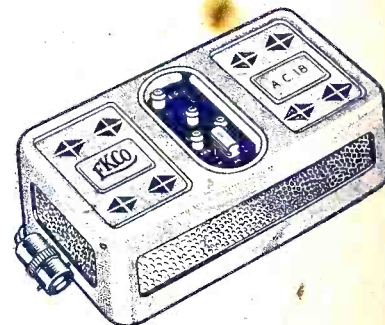
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