

CAPT. ECKERSLEY writes on **L.F. TRANSFORMERS**

Popular Wireless

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INCORPORATING "WIRELESS"

June 18th, 1932.



This week our cover picture shows a typical scene in one of those popular holiday camps where the radio set is always a good entertainment stand-by—wet or fine.

**DESCRIBED
INSIDE:— THE "DECADE" WITH SIMPLIFIED
TUNING**

RADIOGRAM □ **A NEW TYPE** □ **NOTES FROM** □ **A PROGRAMME**
REMINDERS □ **MAINS SET** □ **THE MIDLANDS** □ **EXPERIMENT**

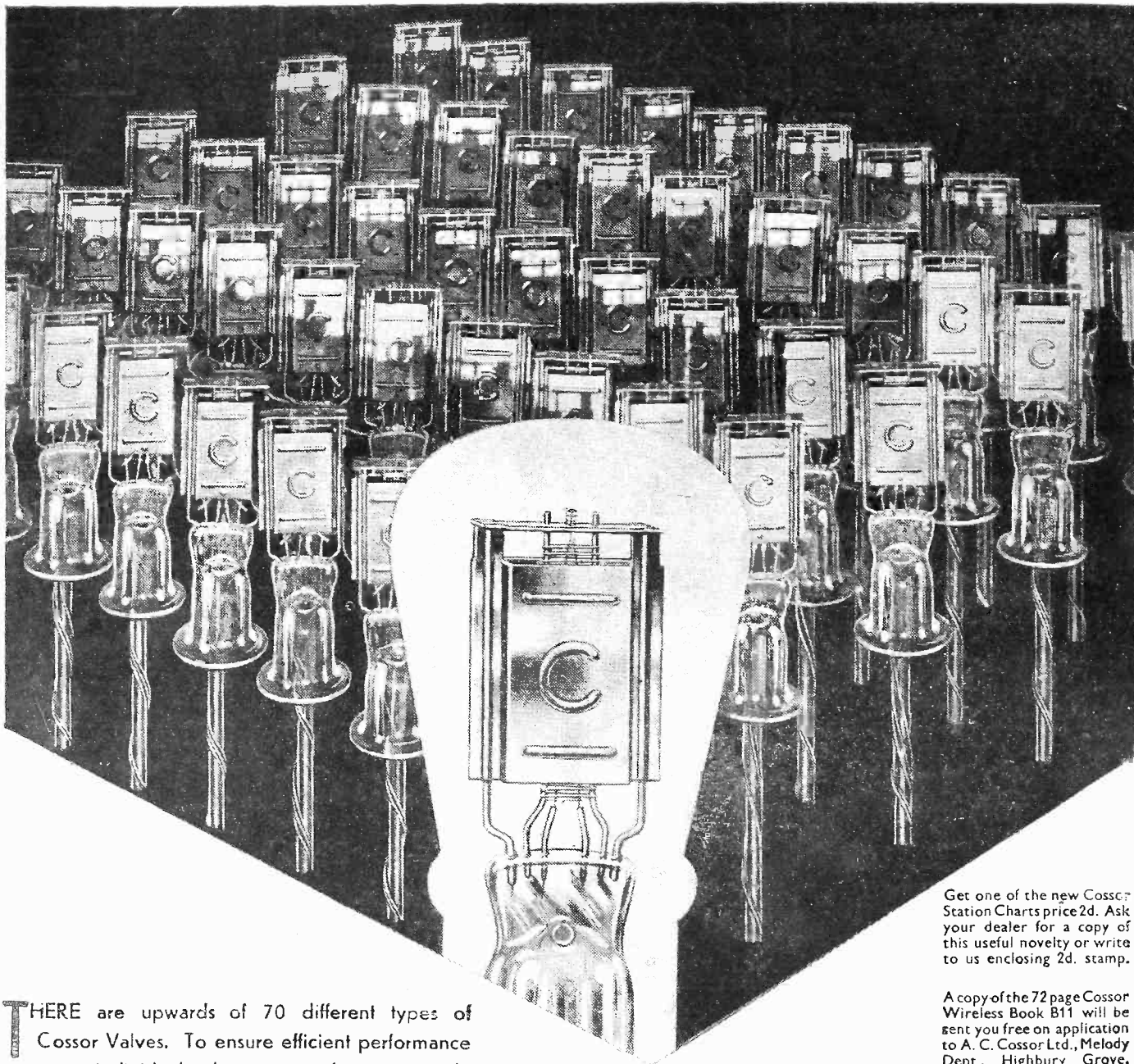
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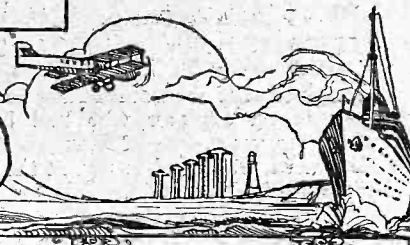
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**A SEA SERPENT!
PUBLIC TASTE
ANTI-PIPS
PUNCTUALITY CRANKS**

RADIO NOTES & NEWS

**PLAIN WORDS
COMPLETELY BANNED
A FINE CHANCE
NO DECEPTION**

Don't Leave Your Licence at Home.

THE portable radio seems to be even more popular with the river lovers than with motorists and campers, though the last-mentioned brand are very keen. A London radio man reports that during the Whitsun vacation about one in four of the pleasure boats on the Thames sported a portable receiver.

And by the way, let us remind ourselves that when the portable travels its licence must go with it, lest there be a P.O. inspector, a summons, and a fine.

The Sea Serpent of Radio.

IT was bound to come, just like the first cuckoo, the largest strawberry, the giant gooseberry, and the sea serpent of the silly summer season. I refer to the "wireless causes rainy weather" letter.

This time a Bristol paper has got it first. Hark!

"Surely the tremendous amount of electricity emanating from hundreds of radio stations is bound to affect the weather. Since the advent of wireless we have hardly had any decent or seasonal weather." Isn't that lovely?—as the sweet young things say. A perfect specimen, true to type; not a spot or blemish of any kind.

A Few Questions.

WHAT is a "tremendous amount" of electricity? Does a "tremendous amount" of it emanate, etc? How does the writer of the letter know what amount of electricity emanates, or even that it is "tremendous"? What is electricity, and does he really believe that it emanates from radio stations?

Why should electricity, even if it emanates copiously from radio stations, make rain? Why should it not make sour milk and dry weather. (Oh yes! I have heard about the condensation of moisture by electrical means. Me and Millikan are like father and son!) Haven't we had any decent weather since the "advent" of radio? When does he think radio "advented"?

Evidently not a reader of "P.W."!

Television.

IN a lecture delivered at University College, under the auspices of the Television Society, and entitled "Seven Years' Experimental Research and Investigation of Television," Mr. R. W. Corkling, F.P.S., A.M.I.R.E. (Fellow), recently stated:

THE POPE AND THE 'PHONES



When Marchese Marconi was demonstrating his new ultra-short-wave transmitter to the Pope in the grounds of the Vatican, His Holiness was greatly interested in every detail, and is shown here as he is being handed the telephones used in the test.

very excellent work that has been achieved during the last few years we must all agree that television has not yet arrived."

He considers that the Baird method has reached its practical limit, with the possible exception of detail improvements.

Not a Bad Idea.

SPEAKING at the Royal Institution last month Sir J. Reith brought up his heavy oratorical artillery in order to prove that the constitution of the B.B.C. is the best in this best of all possible worlds.

The association of elected representatives with the management of public utility services, he thundered, is fundamentally unsound. Government department methods are inapplicable to the conduct of public services.

I smile at the picture of Sir John pretending to pretend to believe that the B.B.C. is not run like a Government department—and pass it over. What I want to know is, would he not be a fine Minister of Broadcasting and Television?

The Public Taste.

HERE is a sentence from his speech which set me thinking. "If any will have it that the B.B.C. has been arbitrary, even drastic if they like, in declining to accept and be guided by a kind of lowest common denominator of public taste, then I reply that the great mass of listeners has approved and encouraged the Corporation."

He is right, I verily do believe, and if only the film-exhibiting industry could be placed under his control England would be a cleaner place; slightly less arresting films would be shown, but the slimy suggestiveness which sickens the soul would be absent. I will say, however, that all the English-made films I have seen were clean.

My Anti-Pip Campaign.

IS there no artist at the B.B.C. to tear his hair and throw the Time Signal Controller down the ash-lift? Did you notice that organisation was carried so far that those petulant "pips" were allowed to wrench us back from the nether world just in the tensest moment of "The Turn of the Screw"?

It was utterly inexcusable! But list! I have a comrade in the fight—no less a (Continued on next page.)

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

person than Hilda Matheson, who was until recently, a B.B.C. "Talks" expert.

Punctuality Cranks.

DESCRIBING her impressions of "The End of Savoy Hill," Miss Matheson imagined that she was listening in the company of an explorer who had been absent for ten years.

"He winced, I am glad to say, at the six barbarous 'pips' superimposed on no matter what programme, even after I had explained that it was for the sake of the punctuality cranks for whom Big Ben was not precise enough."

I do beg of Sir John to see what can be done to remove this blot on some of his choicest items

Plain Words About the B.B.C.

IF the B.B.C. could hear what the fellows in the "9.3 up" say about them they might—but certainly wouldn't—shrivel up. I say but little; my job is to "mark, learn, etc."



When I was tackled by the big man in the corner seat—smokes Burmah cheroots and has a son in the Indian Civil—as to why I never cuss the B.B.C., I replied that although I loathe some of the B.B.C.'s activities I consider that for ten bob they give me and my household about £100 worth of entertainment per annum, and that I regard that as a fairish return—very fairish indeed.

Note for Resurrectionists.

TO "Gentle" (Huddersfield), and any other readers who are serious in their desire to resurrect the "Unidyne" circuit, be it known that Mr. F. W. White, 33, Lewis Flats, Hackney, London, E.8, is willing to help them. Meet Mr. White! And don't forget postage stamps!

Apart from his hankering after "Unidyne," Mr. White is a "Cosmic" user, having replaced his "Reinartz" by it. We think that he is a nice, kind man, with excellent taste in circuits

"The Tryer."

THIS gentleman, of Ashton-under-Lyne, who has conceived the idea of writing his pseudonym from right to left, as it would come out on blotting paper—(made one blink for several minutes)—sends me his log for May 8th to 16th, though he omits to state details of his receiver.



He does, however, make a remark which interested us, for he says that he received a station called "The Colombia Broadcasting System," and adds that it is new to him. What a very recep-

tive receiver he must possess, for that system is a great chain of American stations. A very nice log otherwise; U.S.A., Spain, Russia and Italy on L.S.; 5 SW on phone!

The Complete Canned Concert-Outfit.

I HEAR that at the Amsterdam International Exhibition there appeared a combined all-electric piano, radio receiver and radio-gramophone. Of course, a really complete job would have been made of it if the layout had included a miniature cocktail bar and a musical vacuum cleaner!

However, the basis of the outfit is a Bechstein Baby Grand, and as its keys are struck the music is electrically reproduced through an amplifier and a moving-coil loudspeaker. There is included a microphone for making announcements. Is there enough free money in Europe to buy this?

"SHORT WAVES"

"I bought a three-valve set a week ago, and I am now a rabid wifeless enthusiast."—Provincial Paper.

"His wife has gone back to her home, where she can hear herself speak."—Humorist.

A.: "Will you come and spend the evening with us? We're trying out our new wireless set, and at ten o'clock we shall have supper."

B.: "Thanks, old man. I'll be there sharp at ten."

FATHER'S PART.

The very modern child was looking through his father's book of Great War photographs. "Dad," he said presently, "what were you in the war for?"

Father smiled proudly. "Why, my son, your father was a battery sergeant-major," he replied.

"High or low tension, dad?" asked the boy. "Answers."

Cookery expert (broadcasting for the last time): "And when all these instructions have been carefully followed, go into the tool-shed and bring in a cold chisel, sledge-hammer and pick-axe; or, as a last resource, plug with dynamite!"

CONTROVERSY!

Just take the case of Mr. Jones. Who casts abroad his home-made verses (Of course, you're free to drop the 'phones And miss the hot stuff he rehearses; But that won't stop him mouthing there Into the vast, defenceless void of air).

Take, as I said, the case of Jones. Who thinks (and means us all to know it, Such deep conviction marks his tones) That what he spouts proclaims him poet. This private view of his own patter Surely amounts to controversial matter?

BITTER.

When we're freed from the day's toil and strains, We switch on for some charming refrains; Then we hear that sweet voice Say: "We'll now broadcast the noise Made by lorries and hooters and trains."

A Fine Chance For Britain.

NOW! This All-British Exhibition at Copenhagen; September 24th to October 9th. The largest All-Brit. exhibition ever held across the North Sea, German Ocean and English Channel! What a chance for our radio manufacturers, eh? Denmark holds the world's record as a radio user, with about 134 sets per 1,000 head of population. (By the way, the U.S.A. comes second, with 98; Great Britain third, with 92½.)

When I say that we export to Denmark only 3 per cent of that country's radio imports you will understand why I describe the above-mentioned exhibition as "a fine chance."

There is No Deception.

KNOWING that you are all as alive-oh in the top storey as could possibly be, I am moved to anticipate, and squash, a little idea which may perchance germinate in your roof-gardens—as follows. You know that our P. P. Eckersley has gone to Australia to advise the government there about broadcasting. You may have observed, moreover, that his articles for the *Daily Mail* have temporarily ceased. Right!



Now, let me assure you that every reply to queries, as published in his "Corner," is written by him. Genuine P. P. E.!

If you want confirmation of this—ask our comps! In order to be able to set up his manuscript they have to go through a course of algebra, Braille, sky-writing and Egyptian hieroglyphics. (Comes in useful, too, for dealing with our Mr. Dowding's MSS!)

Tired of Evolution.

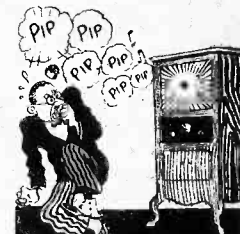
B. M. (near Halifax) writes an interesting letter, but nevertheless that of a fellow who is wearying of "the game." He feels that the "home constructor" is being pushed out of the picture and that he must bow before the "all-metal, all-mains, all-goodness-knows-what, on one dial." I advise him to wait till after his summer (Ha!) holiday and then to think the matter over.

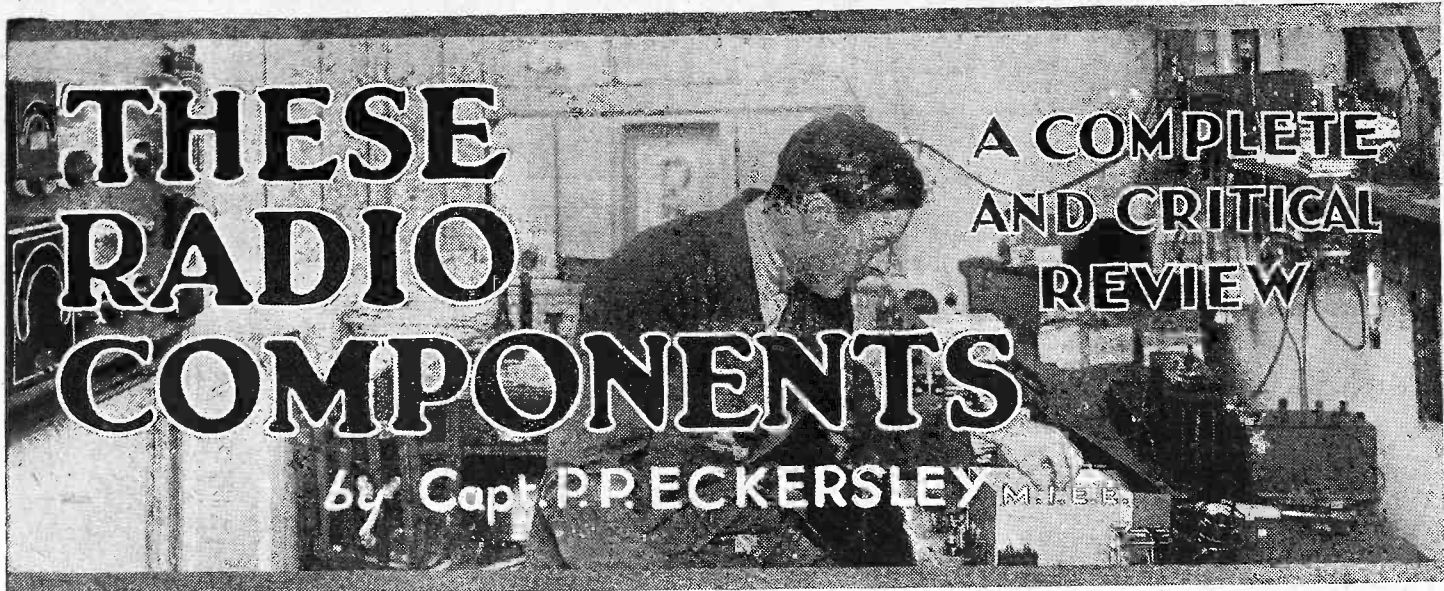
"P.W." has a lively, keen, scientifically-directed technical department, whose efforts are directed solely to the achievement of some progress, some step, in the evolution of radio reception. Let him stagnate and turn into a mere listener if he chooses. But there are always fresh worlds to conquer and, if he be a genuine radio enthusiast, he will follow "P.W." like a bloodhound.

Chris. and the Pips.

MUCH gratified to notice that during Chris. Stone's gramophone recital the other night, which was most vilely disturbed by those absurd Greenwich time "pips," he was moved to remark: "Hum! I thought that would happen!"

In a good-natured fellow, such as Stone must be, that is to be appraised as a caustic remark. Frankly, I think the B.B.C. is an ass to allow scientific chronology to obtrude its obscene hiccoughs while music holds the stage. ARIEL.





A TRANSFORMER is a very pleasant help in trouble. It raises volts without consuming appreciable power. It is an important component and in certain cases its use is imperative.

For all that, I predict that in time to come no one will even use transformers unless absolutely forced to do so.

There are two ways in which to look at wireless—one as a hobby, the other as a means to extend one's powers of hearing. You may use wireless in both of these forms if you will.

Difference in Outlook.

The hobby of wireless is building new sets and circuits and pulling in more and more distant stations. The other side of wireless lies in the possession of a set which gives a truly clear sound picture of an event broadcast.

The hobby side may well take liberties with quality and go for sensitivity, selectivity, and a sufficient economy of material. The extended-hearing side discards anything which may even theoretically affect the "pleasingness" of the result.

Let us first discuss the transformer, then, in terms of its convenience as a means to eliminate perhaps a whole valve stage, as a means to "step down," to "match up impedance," and so on.

We do not use iron in H.F. circuits, and so the first time we meet the L.F. transformer is in the detector stage. Now, a detector of the "power" leaky-grid type requires a full and overflowing measure of H.T. upon its anode, otherwise surely you get distortion.

Saving the Volts.

If you use resistance in the anode of the detector you have to use a very high H.T. voltage, and that is expensive if you use the mains, or almost prohibitive if you use the dry battery. So a transformer is a low D.C. resistance impedance and very useful. But so is a choke a low D.C. resistance impedance. But the transformer can actually step up the volts from (detector) primary to secondary, and so many people like to use it because of this gain.

Inter-valve transformers are excellent in that they economise H.T. and step up the volts between stages.

Output transformers allow either a very high-impedance valve—e.g. a Pentode to

L.F. TRANSFORMERS

Our Chief Radio Consultant continues his striking series this week, by throwing new light on a much misunderstood component, and on its claims when compared with R.C.C.

work into a relatively low-impedance (moving-iron) speaker, or an ordinary valve to work into a low-impedance speaker (moving-coil), etc., etc. In this last case you gain nothing in "binge"; you merely use the transformer as an efficient means to transfer power from one type of circuit to another.

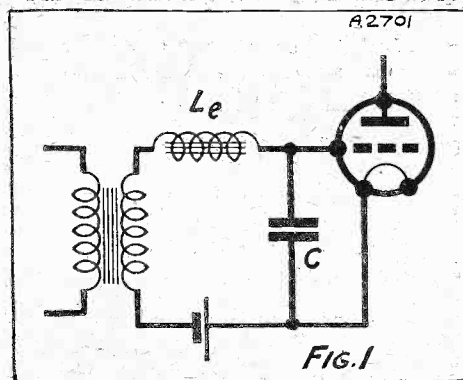
What is there to look for in a transformer?

Firstly, the frequency characteristic must be reasonably good.

Secondly, the expense must not be absurd.

Now you cannot really talk about the frequency characteristic of a transformer without a more concise definition. It's the characteristic of the transformer plus valve and surrounding circuits which matters.

AS IT SHOULD BE SHOWN



What is known as the magnetic leakage of a transformer can be considered as an inductance in series with the secondary winding. Unless properly used, this inductance can completely spoil the response curve of a transformer.

Every transformer has what is called some magnetic leakage. This means that the primary cannot be 100 per cent coupled to the secondary, and a few lines of force escape and do not do a mutual embrace of both windings.

This means that the transformer ought to be drawn, as in Fig. 1, where L_e is an inductance introduced outside the secondary in series with the load. Now, if this load is a valve, then it has in effect a capacity C , as shown. This capacity, in series with an inductance, may have an effect. Thus, when at some frequency resonance occurs, and (relatively) large circulating currents are set up, and the voltage across C may rise above normal.

This effect is often usefully used by those who know how to tame it—it is terribly effective in producing bad humps in frequency characteristics to those who don't!

Plenty of Iron.

My advice to you, when choosing an inter-valve transformer, is to get one which has a decent amount of iron in it, which has a decent reputable name behind it, and I should try and be sure to ask the makers for frequency characteristics, stating the makes of valves with which such characteristics were obtained.

But now for the "quality" merchant. Why do I not like transformers? Now look at it like this. I have taken two loudspeakers—one we will call M.C., and the other M.I. M.C. had a really quite good frequency characteristic, M.I. had a worse frequency characteristic.

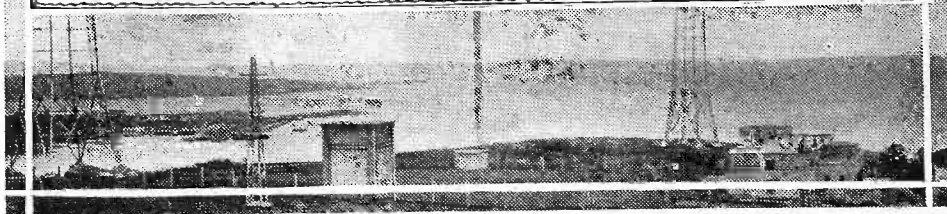
I played those two loudspeakers from a flat characteristic amplifier fed by broadcasting or by direct speech into a high-quality microphone or by first-class gramophone pick-up. And I found that I, and others with ears, and ordinary people with ears, and musicians, preferred M.I. So I said with justification, frequency characteristic is not everything.

Resistance-Capacity Coupling.

I then produced the very finest result I could by using a resistance-capacity push-pull technique throughout my chain, using no iron anywhere except in the speaker M.I. mentioned above. I then began to introduce transformers, having, to all intents and purposes, perfectly straight-frequency characteristics between 50 and 10,000 cycles. You could remark the introduction of transformers; each time the introduction of transformers made the result worse.

(Continued on page 456.)

STATIONS WORTH HEARING



Up-to-the-minute information for the long-distance searcher.

THE crashes and bangs with which atmospherics are still providing us are cramping the long-distance man's style, since only the more powerful of the foreign stations are really worth listening to on evenings when these natural nuisances are in evidence. Luckily the number of powerfully received stations is considerable and except on the very worst of nights the long-distance set can do useful work in bringing in alternative programmes from abroad.

Looking through the records in my log for several weeks past, I am able to give the reader a list of the stations which never seem to falter and whose strength is generally such that there is no need to make more than moderate use of reaction. These are generally receivable with good quality and without undue interference unless atmospherics are exceptionally violent.

A Long List.

The list of medium-wave stations is surprisingly large. Starting near the top of the band and working downwards it reads: Brussels No. 1, Florence, Prague, Langenberg, Beromunster, Rome, Toulouse, Strasbourg, Brussels No. 2, the Poste

Parisien, Hilversum, Heilsberg, Turin, Gleiwitz, and Trieste. The list includes no less than fifteen stations, which is not too bad for the summer, when you come to think of it.

There are many others, too, which just

WHO IS IT ?



These listeners certainly seem to have struck something good! Perhaps it is one of those fascinating Continental accordion bands, which are now "all the go."

fail to find a place in the list, since on certain nights they are apt to be a little below par. These stations are always worth going for, since on their good nights they are quite as well received as any of those in the main list.

Several Surprises.

The secondary list of "almost first-raters" includes Vienna, Stockholm, Belgrade, Katowice, Frankfurt, Lwow, Berne, Milan, Breslau, Genoa, Bratislava, Nurnberg, Herby and Leipzig—a total of fourteen. We thus have twenty-nine stations on the medium waveband within the compass of any reasonably good set, and save on a very bad night good reception is to be looked for from about twenty of them.

One of the interesting points about reception just now is that if you make a careful search over the medium waveband you are almost sure to come across some surprises. Lyons Doua, for instance, recently broke a silence extending over several weeks, and on one evening provided loudspeaker reception at full strength.

Another surprise was furnished by Rabat, who was received strongly and perfectly clear of interference. On a few evenings Marseilles was found coming in finely, though for a long time his line in the log had contained hardly an entry.

Higher Up the Scale.

Bratislava is one of those stations which you may not hear for a week, and then suddenly find coming in at fine volume.

On the long waves when the ether is clear of atmospherics very fine reception is possible by day or by night. The star stations there are Huizen, Radio-Paris, Zeesen, Warsaw and Kalundborg. Motala varies a good deal and Oslo is at the moment nothing like so strong as he was recently.

R. W. H.

NEGOTIATIONS have been carried out for broadcasts this summer in the Midland Regional programme from Skegness and other resorts. It is hoped that Fred Clements' Concert Party from the Arcadia, and De Mond's Party from the King's Theatre will be relayed from Skegness.

The land-line from Skegness to Birmingham is rather a long one, the distance between the two places being about 100 miles, but the engineers do not anticipate any difficulties. Land-lines of much greater length are, of course, regularly used by the B.B.C. nowadays.

There are also several inland resorts on which the Midland Regional Director intends to draw. Relays of bands and concert parties have already taken place several times this season from Cheltenham and Leamington.

Out of Bounds !

On the east, the Midland Regional station can draw on Skegness and possibly one or two other resorts, but Yarmouth and seaside towns further south belong technically, I believe, to the London Regional area. Similarly, relaying from coastal towns on the west is out of the question as there is nothing nearer than Welsh resorts, and in many cases these are the preserve of the B.B.C. West Regional administration at Cardiff.

To avoid overlapping of activities, England and Wales were recently divided up

NOTES FROM THE MIDLANDS

News about programme activities in this important area.

roughly between the various regional administrations, and the boundaries decided upon gave the West Regional station the whole of Wales and a large part of the south-west of England.

The four corners of the Midland region according to this division are Shrewsbury, Mahlethorpe, south of Skegness, and Swindon. London administers the rest of the south and south-west of England as far as Lyme Regis. Cornwall comes under the Plymouth station. The Northern Region is bounded by Berwick, Grimsby, Stoke, Chester and Carlisle.

A First Relay.

Outside broadcasts by Midland Regional are averaging over fifty a month. Two rather unusual O.B.'s during June are the first relay ever carried out from Pershore Abbey, Worcestershire (June 29th), and the running commentary on the motor-car hill-climb at Shelsley Walsh (June 25th).

In addition, studio activities continue vigorously, though the absence of a really

good-sized orchestra at Birmingham prevents the production of ambitious musical programmes in the studios, and it is on the dramatic side that the greatest activity is to be found.

A very interesting experiment was made on June 15th when a broadcast version of the Leicester Pageant was produced in the Birmingham studios. Mr. Percy Edgar, the Midland Regional director, and his principal assistant, Mr. Charles Brewer, did not consider that a relay of the Pageant at Leicester would be a satisfactory broadcast. A special adaptation was, therefore, made and the cast came over from Leicester to act in the Birmingham studios.

Talented Officials.

Miss Gladys Ward, who is an official of the Midland Regional station and is the liaison in Birmingham between the B.B.C. and the Press, was the authoress of a play called "Love in Idleness," which was broadcast from Birmingham on June 2nd.

When, as in this case, a B.B.C. official takes a personal part in the programmes, his or her name goes before the public (though, curiously enough, this does not apply to announcers). Mr. Percy Edgar is well known in the Midlands, both as a performer and in his capacity as the B.B.C.'s principal official in these parts. Mr. Brewer's name appears so frequently as author and producer of programmes that it is probably better known than any other.

L. W. A. B.

LETTERS TO A YOUNG "HAM"

by ARIEL

In his second bright epistle, "Uncle Ariel" takes his young nephew seriously to task for preferring model railways to modern radio! As he points out, it is much better to get Sydney on one valve in daylight than to know whether the 6.45 from Lower Puddington runs on Sundays!



My Dear Young Ham,—Since I last addressed you Time has plucked you from the perambulator and deposited you in Miss Sniffer's Juvenile Academy for Grown-up Post-War Products. Your pa and ma tell me how clever you are; that's why uncles leave their money to Dogs' Homes! But I never did like too clever nevvies. You doubtless recall your cousin Edwin. He was so clever that I never missed my cheroots till his ma told me that he had developed a liver. Poor little fellow! He might have been anything—even a member of the A.R.R.L.—had not Mr. Bright and his Disease intervened!

"Puff and Whistle Business."

I observed the other night, when I was visiting your "old man" in a vain attempt to sway his mind in favour of screened-grid valves, that you possess an extraordinarily fine set of rolling-stock. Perhaps it was not necessary—or discreet—for you to have left the entire railway system, to-

gether with your boots and half your school cap, on the floor of the lounge-hall: but, leaving that on one side—I'm sorry that I trod on two leaden porters and most of a tunnel!—tell me, in confidence, do you really feel that this puff and whistle business is the whole cheese—I mean, is it in this that you, Horace Snock-Portle, have found your soul? Because, if so—

"As Man To Man!"

What I am driving at is—*where do you stand in relation to radio?* There! I put the point to you, bluntly, frankly, as man to man! Is the loco. biz. the be-all and end-all for you, or is it merely a blind? You see, I lay the cards on the table! Face up—and no conjuring! Come on, what do you say? Is it to be grades or kilo-cycles? Porters or portables? Bogies or billifarads? I can't say fairer than that.

I do not think that the Snock-Portles would be happy to have a member of their

clan in Rails, especially with Great-Uncle Timothy in Overseas Air Lines. Moreover, Rails have had a depressing effect upon the clan's expectations since Grandpa invested so much in San Matadorian rails—said rails being blown up quarterly by the revolutionary party and the only locomotive having a boiler like a colander! No, Horrie, do not nourish an anachronism in your young bosom. You are of the Radio Age!

It is true, as you point out, that from the railway emerged a Jimmie Thomas. That was lucky for him! He might have been there still! But the question is, if Horace Snock-Portle once submerged himself in railways, *would he ever emerge?* Once got the smell of the tunnel and the greasy overalls into your blood—and who can eradicate them? Not Milton; not Pears!

"A Future Devoid of Radio?"

Can you, without a shudder, contemplate a future devoid of radio? Young rip as you are, even you would blench at the necessity of telling some boon companion (who comes leaping up, artlessly inquiring whether you can "get" South Pole Radio on 0.3 metre) that the slush-lamp and the ticket-clipper are for you the acme of delight, and that they are going to add two coaches to the 4.37 from Bungalow Park to Allotment Junction!

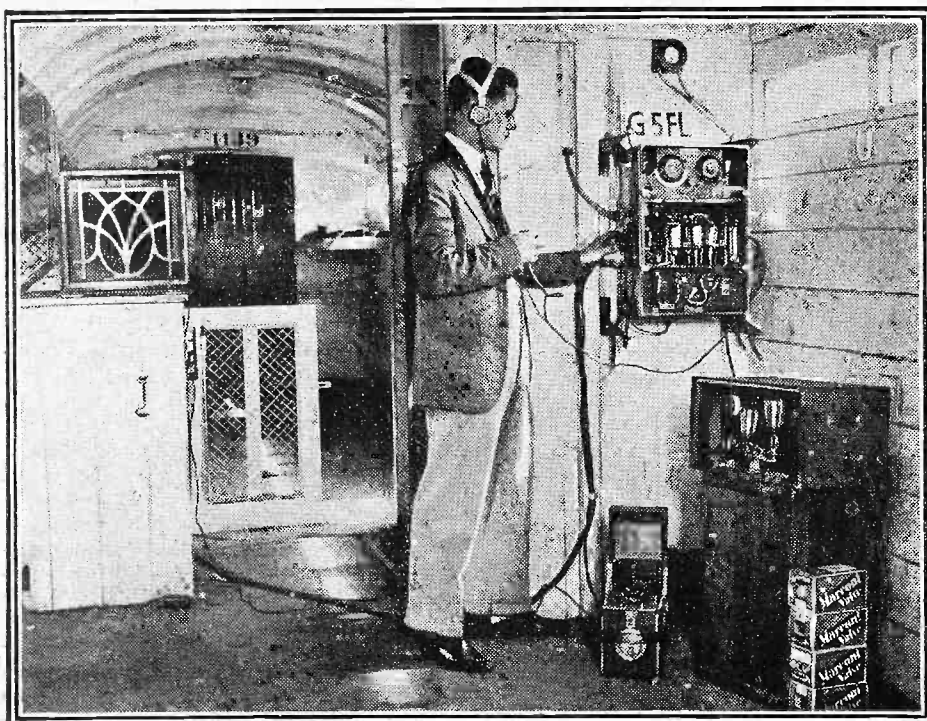
Here's the lining of your cap. You've been cleaning toy engines with it. Nice thing to do to a cap, I must say. Are there no table-napkins in the house? Let me tell you that a really nice radio "fan" knows the resources at his disposal down to the last screw in his pa's tool-chest and the smallest bit of junk in the kitchen dresser: nor does he disdain the assistance of selected portions of ma's sewing-machine, sister's typewriter and brother's ukulele. Get Sydney Radio? Why, a clever "fan" gets all he wants, even if, as a last resort, he has to buy it.

But just think over what I have said, in the light of the fact that I refuse to give you a model of Elephant and Castle station for your birthday. (Do they really make such loathsome things?) I will give you a 2-volt accumulator if your pa gives you a receiver. Failing that, I suppose it must be another trip to the Zoo, *avec tuck*.

Your affectionate

UNCLE ARIEL.

TWO-WAY TALKS 'TWTXT TRAIN AND 'PLANE



For the first time in history a two-sided conversation was carried on recently between the famous "Flying Scotsman" and the air liner "Heracles" while both of them were travelling at full speed. Here is the compact apparatus which was installed on the train for the experiment.

THE MIRROR OF THE B.B.C.

By O.H.M.

A "WAR" IN SCOTLAND!

THE KING AND MILITARY BAND MUSIC— B.B.C. AND CARL ROSA
—FOREIGN OPERA RELAYS, etc.

THE trouble about the Highlands has been overshadowed by the new conflict between Sir Daniel Stephenson, on behalf of the Glasgow Choral and Orchestral Union, and Mr. David Cleghorn Thomson, the B.B.C. Director for Scotland.

Glasgow has never forgiven the B.B.C. for moving its Northern Headquarters to Edinburgh. But the present crisis is concerned with the formation of the new Scottish National Orchestra, which the B.B.C. is sponsoring.

Sir Daniel Stephenson takes the view that the attitude and action of Mr. Cleghorn Thomson make the co-operation of the Glasgow Union difficult, if not impossible. There have been some very angry public exchanges.

The balance of the argument seems to rest with Mr. Thomson, although he, in the opinion of many, might have dealt with some aspects of the situation on rather different lines.

The King and Military Band Music.

Apparently His Majesty is a great enthusiast for Military Band Music, and is an assiduous listener to Mr. Walton O'Donnell's Military Band. Indeed, this liking by the King is so widely known that the absence of Mr. O'Donnell's name from the Birthday Honours List caused some comment.

I believe, however, that more will be heard about this next January.

B.B.C. and Carl Rosa.

The Carl Rosa Opera Company has been suffering from the hard times common to all artistic enterprises except the B.B.C. It is understood that the B.B.C. has actually stepped in to help the Carl Rosa Company round a difficult corner in the last fortnight of its present season.

If this is so, it reflects great credit on the B.B.C., which has come in for some very hard knocks from spokesmen of the Carl Rosa interests. It has always been a cause of complaint that the Opera Subsidy should be administered by the B.B.C. in the interests of only the Covent Garden Syndicate.

The Carl Rosa Company has a warm place in the hearts of thousands of music lovers up and down the country. It has, indeed, contributed far more to spreading the love of Opera than any other organisation.

If the B.B.C. can so contrive matters that the Carl Rosa Company is able to go on permanently without too great a drain on B.B.C. finance, there will be general public approval.

Foreign Opera Relays.

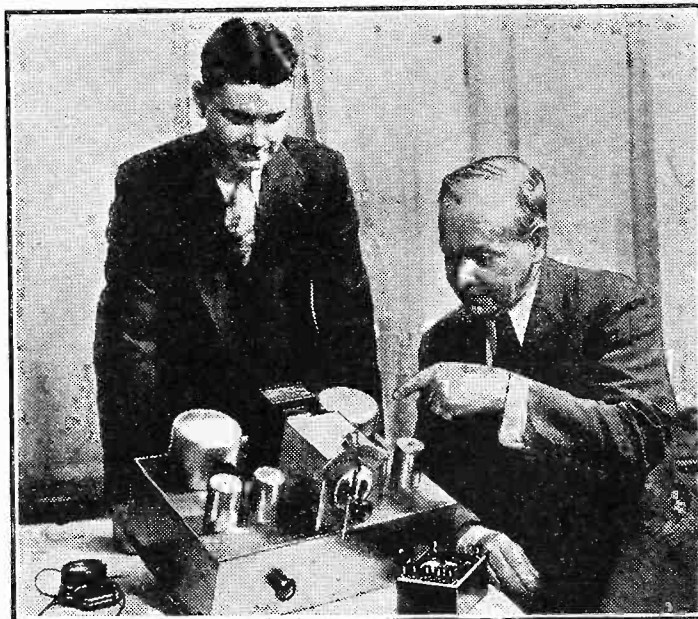
The nations are certainly getting together with sensible plans for programme exchange, and nothing, I think, could be more acceptable to English listeners than some forthcoming opera relays from Germany.

Following so close upon the all-too-short Covent Garden season, will be the relay on

Wednesday, June 22nd, of the second act of "Samson and Delilah" to London listeners from the Berlin State Opera, followed on Friday, July 1st, by the first act of Verdi's opera, "The Sicilian Vespers."

Another relay is arranged for Friday, July 8th, of Weber's "Euryanthe," which has been specially abbreviated for broadcasting; while I understand that negotiations are in progress for a relay, on Wednesday, July 27th, of the first act of Mozart's "Don Giovanni," from the Residents Theatre, Munich, where it will form part of the Munich Festival.

IT CAN'T BE THE VALVE!



It can't be the valve he is indicating, for this is the "revolutionary" set invented by a 21-years-old U.S. electrical genius, and it uses no valves at all. They claim it ropes in the foreigners with amazing ease.

Eighteen Microphones for Five O.B.'s.

No fewer than eighteen microphones will be required for five outside broadcasts which are to be included in the afternoon programme on Saturday, June 25th.

The "O.B.'s" begin at 1.30 p.m., when a break is to be made in the Commodore Grand Orchestra Concert for a brief switch over to Lord's Cricket Ground, where Mr. Howard Marshall will give some up-to-the-second details of the England—All-India Test Match.

Half-an hour later we take a trip to the Midlands to hear the running commentary on the Open Hill Climb for Racing and Sports Cars up the famous Worcestershire hill called Shelsley Walsh, and then come back to London to listen to Colonel Brand and Captain H. B. T. Wakelam describing the Centre Court games at Wimbledon.

By 3 o'clock it will be time to link up with Liverpool to hear the departure of the M.V. "Georgie" on her maiden voyage across the Atlantic, following close

upon which we are to hear an account of the Royal Air Force Display, relayed from Hendon.

Of the eighteen microphones required for these relays, four are wanted at Shelsley Walsh, nine at Liverpool, two each at Hendon and Wimbledon, and one at Lord's Cricket Ground.

Two Peak O.B.'s.

The Prince of Wales' speech at the Annual Dinner in Celebration of Dominion Day (July 1st), relayed from the Savoy Hotel, on Thursday, June 30th; and a running commentary by Captain E. H. Robinson on the Final of the King's Prize, relayed from the 1,000 yards range at Bisley Camp on Saturday, July 16.

THE LISTENER'S NOTEBOOK

A rapid review of some of the recent radio programmes.

MR. ERNEST NEWMAN must have delighted all Wagner enthusiasts with his plea for more tolerance on the part of anti-Wagnerians.

I must confess I thought his argument very sound, and his remark on the popularity of the long opera as shown by the fact that people can and do enjoy five hours of Wagner was really unanswerable.

It is quite true that we must allow the artiste to do his own job in his own particular way. "We must try and cultivate an open mind, endeavouring to understand what is in the artiste's mind," said Mr. Newman.

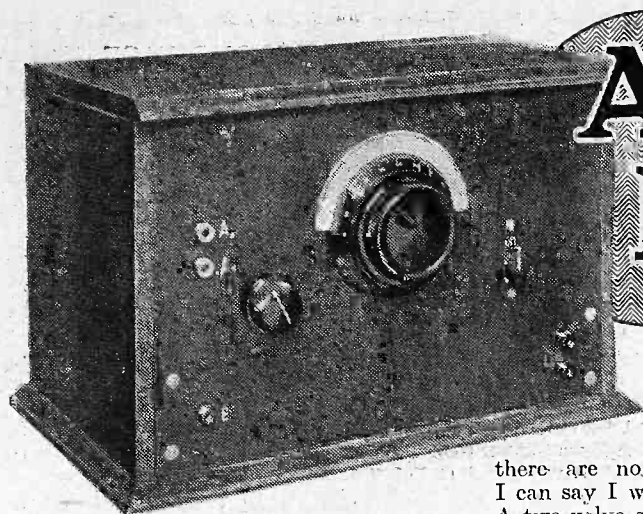
The thought struck me, how much of this reasoning was applicable to the B.B.C. and its critics. A good deal, I think.

Although Mr. Lyle was more restrained this year in his running commentary of the Derby, one could sense that he wasn't entirely free from excitement.

I suppose that the majority of listeners (and it would be a record "house" for this commentary) were anxious to hear but one thing, viz. the result; but I always feel that, on the occasion of the Derby broadcast, there's a good deal of really interesting matter left unsaid.

Don't you think that excellent comedy team, Alexander and Mose, would improve their turn if the more gloomy of the two (I don't know whether it is Alexander or Mose) would cheer up just a little bit,

(Continued on page 456.)



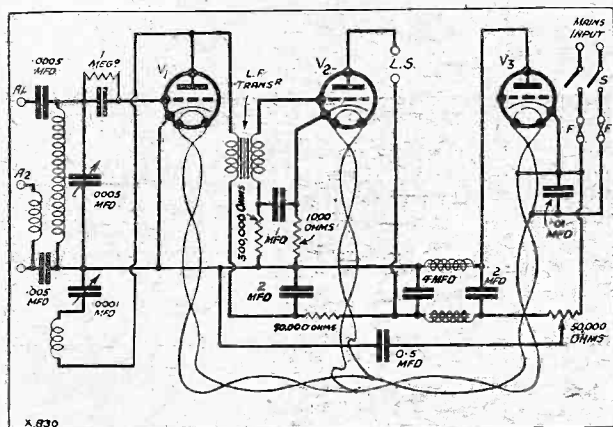
A NEW TYPE MAINS SET

By K. D. ROGERS.

The high-voltage, indirectly-heated-cathode valve is a particularly interesting newcomer to the ranks of the mains valves. Here are some details of its practical application.

THE development of the indirectly-heated-cathode valve has been remarkably rapid. It is only a comparatively short time ago, since the first 1 amp. A.C. valves made their appearance, and since then we have been led rapidly through steadily improving types to the .5, .25, and (shortly to be released) the .1 amp. valves for use with D.C. mains.

SIMPLIFIES THE CIRCUIT



This circuit is complete, and will operate on either D.C. or A.C. Note the absence of the usual mains transformer.

All these valves have been of the comparatively low-voltage heater type, the .1 amp. with their 40 volts, or thereabouts, being the highest. There are rumours, however, that use is to be made, for both D.C. and A.C., of the high-voltage type of heater, and it is said that at least one large British valve concern is interested in the prospect of turning out a British version of the Austrian Oster-Ganz full voltage mains valves.

Agreeably Surprised.

These, it will be remembered, I mentioned in a recent article in "P.W.," and since then I have been carrying out some extensive tests.

The valves are on the market, being sold at prices round about the normal, and I have had under observation some of these valves operating in a set specially designed for them.

As to their "life," I cannot yet say anything. They seem to last all right, but it requires a long series of tests before adequate details as to lasting power are collected.

As regards results, remembering that

there are no S.G. types yet available, I can say I was most agreeably surprised. A two-valve set using these valves is just about as good as one using the lower voltage types we have in this country.

But it is at the same time not only very much easier to build, it is cheaper, and it can be used, without change, on either D.C. or A.C.

This seems absurd, I know, but it must be remembered that as the heaters of the valves take the full mains voltage across them they need neither a breakdown resistance (in the case of D.C.) nor a step-down transformer (where A.C. is concerned).

No Voltage Regulation.

Illustrating this article are photographs of the two-valve Oster-Ganz receiver (the third valve is a rectifier) and the circuit on which it is based.

From this it will be readily seen that the fact that the heaters need no voltage regulation greatly simplifies things. The rectifying valve can, if desired, be used on either D.C. or A.C. In the former case it is a passenger, while in the latter it is

essential to provide smooth anode current for the rest of the set.

Smoothing is carried out by means of a specially round double choke, and apart from this everything in the set is perfectly standard. The choke, I understand from the valve people, is obtainable, or will shortly be obtainable, from Messrs. Igranic Electric, and from Ormond.

D.C. or A.C.

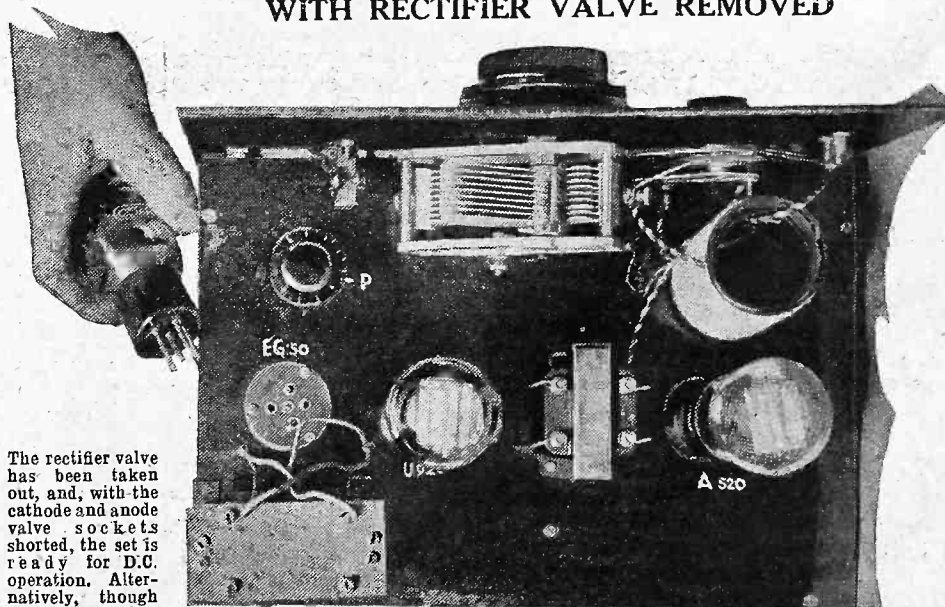
Apart from the choke the set is perfectly normal and resembles the usual D.C. receiver (minus the heater resistance) with which we are familiar. Where it does differ is in its application to A.C., for it is decidedly novel to be able to operate the same set on either D.C. or A.C., and the lack of mains transformer in the latter case is very striking.

Naturally one is limited in the available H.T. to the voltage of the mains, and any step-up that could have been arranged by the transformer has to be foregone. But this is important only in cases of low-voltage mains, such as the 105-volt supply at Hampstead and other places, and where it is desired to use very big power.

For all ordinary cases the 200-240-volt supply is ample, and users of the Oster-Ganz circuit would be as well off from the voltage point of view as they would with the standard set.

(Continued on next page.)

WITH RECTIFIER VALVE REMOVED



The rectifier valve has been taken out, and, with the cathode and anode valve sockets shorted, the set is ready for D.C. operation. Alternatively, though wasting a valve, the set can be used on D.C. with the rectifier in situ.

The letters (with the exception of P., the potentiometer) refer to the types of valves used in the set. Note the copper "fishing net" over the bulb of the detector.

THE NEW TYPE MAINS SET

(Continued from previous page.)

Naturally the lack of the transformer provides very much easier construction, more compactness, and a great saving in cost. The rectifier is simply in series with the mains, with its heater across the mains, and that is all there is to it.

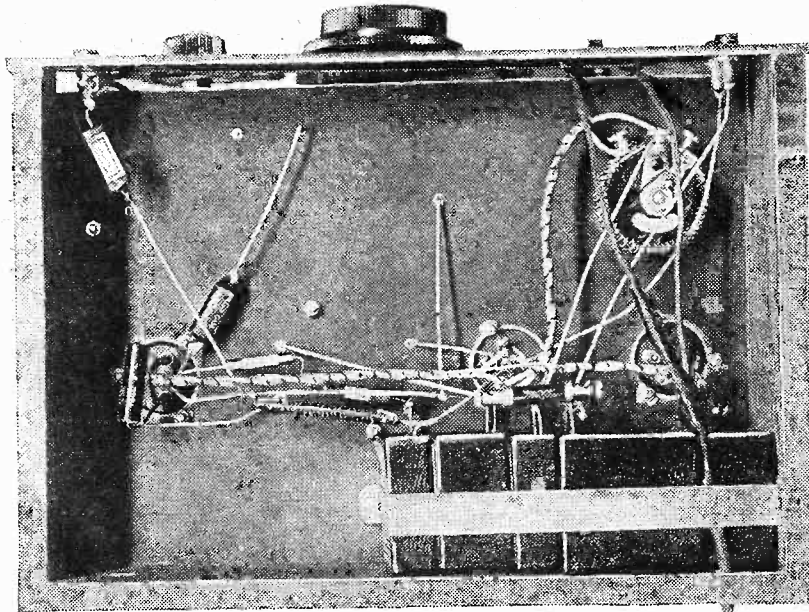
In constructing a D.C. set the rectifier would usually be left out, its cathode and anode connections being joined together. The potentiometer, which is essential on A.C. for balancing out hum, would also be omitted in the case of D.C. Otherwise there is no difference between the two circuits.

Metallised heater wiring is advisable, though the ordinary twisted flex is suitable in many cases.

Wire Mesh Screen.

The characteristics of the various valves so far available are very good, and no doubt these will be improved as time goes on. The screened-grid valve has already passed its experimental stages, and I am daily expecting to hear that it is released for "general consumption."

HARDLY ANYTHING IN IT!



The simplicity of the set is remarkably striking when you compare it with the average D.C. or A.C. receiver of standard type. This is all the wiring—underneath the baseboard.

An interesting feature in the case of the detector is the wire mesh that is fixed over the bulb of the valve to act as a screen. This is in lieu of the zinc metal coating which we give our valves, it being "earthed" to the cathode in just the same way.

No Mains Hum.

During the tests with the set illustrated here, it was noticeable how free from either D.C. or A.C. hum was the reproduction, while the set could be handled in exactly the same manner as the normal two-valver of British design.

Most of the wiring, as you can see, is carried out under the baseboard, and the

lack of the usually necessary mains components makes the set almost ridiculously light and compact.

The circuit shown in the theoretical diagram is quite complete. Should enthusiastic readers wish to hook up a set of this description, the choke has the usual inductance, but must be properly balanced, and will be obtainable as mentioned, while the other values are marked on the diagram.

Only a very simple tuning circuit is shown, and naturally this is not as selective as it should be for use close to broadcast stations, but obviously any type of tuning system can be employed, and the one chosen was used because of its extreme simplicity, as the tests the set was subject to did not include selectivity or anything to do with the tuning system.

Order Your Voltage.

Should you want to get hold of these valves (they will probably be generally available before long), they can be obtained from the agent, Eugen Forbat, Farnham, Surrey.

A number of voltages are available, for it must not be forgotten that these valves, unlike the types we have been accustomed to, are sold like electric lamps, for the particular voltage of the mains on which they will be used. Thus you can get them in practically any voltage from about 150 to 250 volts, and when ordering you must specify the voltage you require.

The usual detector and various L.F. and power types of valves are available, and details will be readily sent upon application.

Naturally, whether or not this type of valve becomes popular in this country will depend upon the attitude of our valve manufacturers. A "full voltage" valve seems to me to be a much needed aid to radio, for although we can get

down to .1 amp. on D.C. sets, there is still a great waste of voltage in breakdown resistances for the heater circuit.

The Ostar-Ganz valves have a current consumption of something like .03 to .05 amp., giving them a wattage on 200 volts of round about 6 to 10 watts, so that the drain on the mains is practically negligible until a very large multi-valve set is considered.

With 200 volts and .1 amp. valves the wattage is, of course, 20 watts up to the maximum number of valves available, while for the .5 amp. type it is 100 watts. I shall await the future of the new valves with the greatest interest.

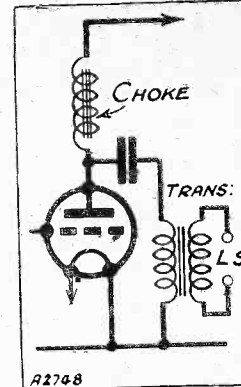
CORRESPONDENCE

UNTAPPED CHOKES—AN EXCELLENT RECORD—DELIGHTED L.S. BUILDER.

DECOUPLING FOR YOUR SET.

The Editor, POPULAR WIRELESS.

Dear Sir,—With reference to my article, "Decoupling for Your Set," in the issue of May 21st of "P.W.," I should like to point out, in order to correct a possible wrong impression, that although a transformer or a tapped choke is as effective for an output filter as a simple untapped choke, the latter is far and away better when viewed purely as a "decoupler."



Note how choke and transformer both play their part in this Speaker coupling recommended by Mr. Rampton.

Where a tapped choke or a transformer is necessary to ensure adequate matching of valve and speaker, in order to obtain the best results from them, there is a solution to the difficulty in that adopted with some moving-coil speakers (see diagram).

In this case the speaker is both choke and transformer coupled, and the transformer will be quite cheap as no D.C. has to pass through its primary. Readers who have a tapped choke or output transformer in their possession should try decoupling earlier valves, when they may find that these can still be used without ill-effects. If trouble is experienced the above scheme should be tried.

2, Bromley Grove,
Shortlands, Kent.

Yours faithfully,
H. A. RAMPTON.

LONG DISTANCE RESULTS IN AUSTRALIA.

The Editor, POPULAR WIRELESS.

Dear Sir,—For some years I have intended writing you, re the excellence of your paper. I mostly use a One-Valve "Magic," and have enclosed a ticked off list of stations receivable almost nightly.

6 F W. Perth, can be raised as soon as 2 F C closes down. J O A K (Winter) after 2 B L closes down. New Zealand depends more on one's skill in tuning.

As a railway night officer my hours of duty are somewhat erratic, also my hours of listening-in, but last Oxford and Cambridge Boat Race night I arrived home about 11.45 p.m. and proceeded to tune 6 W F. I found other stations on the air, and found all four of the N.Z. stations on for a special broadcast of the Boat Race, via 5 S W.

It came back to me very well. We were in time to hear the announcer board the launch. After the race was finished the station gave a detailed description as received by them.

I have not tried the short waves to any extent, but last winter made up a couple of coils and received a number of N.Z. and Australian amateurs. One night I tuned in a station giving records. The announcer gave his call sign "California." I have mislaid the code letters, but some weeks later in W.L.S.'s Notes he mentioned this station.

Also, almost any night about 8.30 p.m. it was possible to raise a Russian (?) station at fair phone strength on about 80 metres, with a man and woman announcing alternately in different languages.

I must say that the air in Australia is getting somewhat crowded, and with more stations to come one can only wonder how we will manage. I suppose we will all have to fit up Captain Eckersley's Tuners.

By the way, I noticed in yesterday's paper that he is going to give us a visit (to learn things?) I will try to see what he looks like, anyhow!

I think this is about all. Wishing your paper every success.

I remain,
Yours faithfully,

N.S.W., Australia.

A. VENEN.

* Ed. NOTE.—The ticked-off list is too long to reproduce, but it shows well over fifty stations—and some as far away as Japan! Excellent work for a one-valver.

AN INEXPENSIVE LOUDSPEAKER.

The Editor, POPULAR WIRELESS.

Dear Sir,—I am writing just to thank you for giving me the opportunity of constructing an inexpensive loudspeaker.

It was published in No. 489 of POPULAR WIRELESS, October 17th last, and I decided then to make it at the first opportunity apart from Sets.

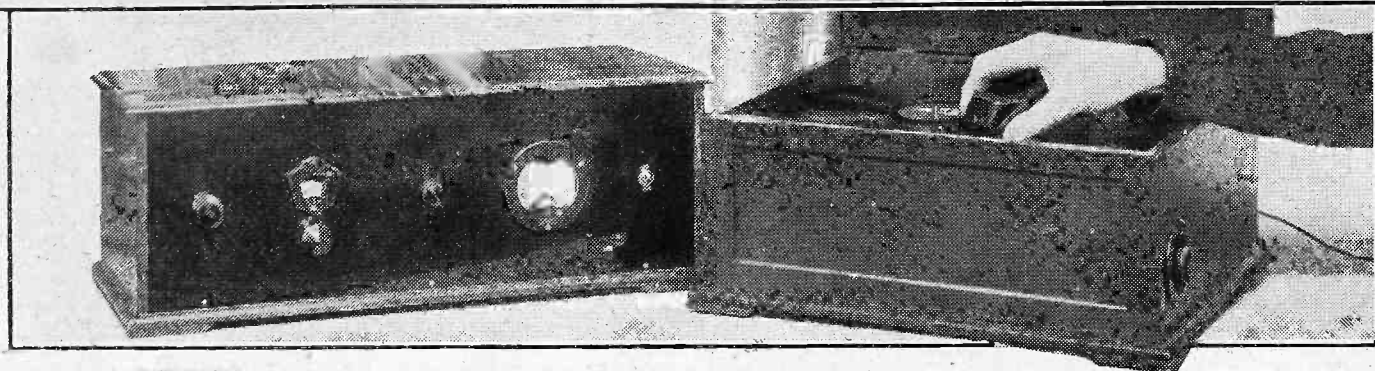
I have now completed it, and am delighted with the result. It is really better than my £2. 2s. 0d. speaker. I could not keep strictly to your instructions. The plywood was 3/4 in. instead of 1/2 in. I could not get Kraft paper and made the Cone with Six-Sixty.

It is quite O.K., and I am proud to show it to my friends. Again thanking you.

Whitstable, Kent.

Yours faithfully,
R. J. KEASDALE.

RADIOGRAM REMINDERS



THE question of operating a radio-gramophone from batteries is always cropping up, and last time in these notes I mentioned that there were two ways out of the output voltage problem—to use either push-pull or one of the new pentodes.

In either case the consumption of current from the anode power source will be high, but the need for high voltage is obviated. How much power you are going to dissipate in your radio-gramophone depends upon several factors. These include whether or not you have a mains unit for the H.T., what loudspeaker you desire to use, and most important of all, how loud you require the reproduction to be.

Select a Sensitive Speaker.

This latter is the deciding factor in every case, for upon the answer to that question depends the size of the output valve or valves, the type of loudspeaker, and therefore the power consumption of the set.

The degree of loudness will depend upon the sensitivity of the loudspeaker (given a definite output wattage), and it is best, when designing a radiogram that is to have limited power, to pick a really sensitive speaker. There are several on the market, and recently there have been brought out some remarkably cheap, efficient and pleasing moving-coil speaker units that are well worth considering.

But even with a sensitive speaker you will be surprised at the amount of power

The question of the battery-driven radiogram will always be a vexed one, owing to the difficulty of getting adequate power without prohibitive cost due to battery energy expenditure.

that is required to give anything like a good punch to gramophone reproduction, for the use of a very sensitive pick-up will probably not help you.

This does not mean that a sensitive pick-up should not be used, but if one of exceptional sensitivity is employed, the detector (or first L.F. valve when used as a gramophone amplifier) will probably be badly overloaded on loud passages, unless the sensitivity of the pick-up is offset by means of a volume control.

Thus, you can start with a big input from the pick-up and hope to get a big output that way. The size of the output valve is the main consideration, and it is upon this that the success or failure of the receiver rests.

Something Up Your Sleeve.

Obviously, if your room is very small, you will not need so big an output to "fill it" comfortably as when the room is large.

The average room requires, with a sensitive speaker, at least 500 milliwatts to give the slightest safety margin on overloading, in my opinion. Actually, I would rather see 1,000 milliwatts' output available, in order to have something up my sleeve as a safety factor. The easiest way to obtain this is to use one of the new pentode valves but it cannot be obtained without the consumption of a considerable amount of current. You cannot get something for nothing, and if you want a largish output, you must be prepared to give an adequate input.

With the Mazda Pen. 220A the total consumption of a three-valve radio-gramophone would be in the order of 20 to 25 milliamps at 150 volts H.T. Thus, for a dissipation of 3,000 milliwatts you will get about 1,000 milliwatts of useful A.C. "speech" energy. Not bad going, that! But your speaker

and the valve must be matched, if you are to get anything like the maximum undistorted power output of the valve.

There are speakers on the market now that are designed to work on 500 milliwatts or so. They are admirable for the small battery radiogram, for they ensure that the most will be made of the energy passed on to the speaker.

A Cheap Battery Model.

Where a set is to be used only occasionally as a full-blooded gramophone, and will normally be employed as a radio receiver at moderate volume, it is worth considering

HAVE YOU HEARD THESE?

RECORDS FOR YOUR RADIOGRAM.

"Home" GRACIE FIELDS - H.M.V.

"What Would You Do?" - H.M.V.

MAURICE CHEVALIER.

"Oi!" FLANNAGAN AND ALLEN - Col.

"Turkish Delight" - H.M.V.

RAY NOBLE AND HIS NEW MAYFAIR ORCHESTRA.

"Where'er You Walk" - H.M.V.

MASTER DEREK MIDDLETON.

"Auf Wiedersehen" (my dear) H.M.V.

AMBROSE AND HIS ORCHESTRA.

"Rain on the Roof" - H.M.V.

SAVOY HOTEL ORPHEANS.

"Snuggled on Your Shoulder" H.M.V.

SYLVIA FROOS.

NO MORE PRICKED FINGERS



Here is the latest automatic needle-holder which obviates the need for fiddling about in a box of needles, with the usual physical discomfort from the sharp points. By pressing down the cylinder a needle is brought up on a horizontal "lift," while used needles are deposited in the large container surrounding the central cylinder.

the substitution of the Pen 220A type of valve by the Pen. 220, which is a much "smaller" valve, though it is capable of giving an output of 500 milliwatts. But it takes very much less than the 220A from the H.T. battery.

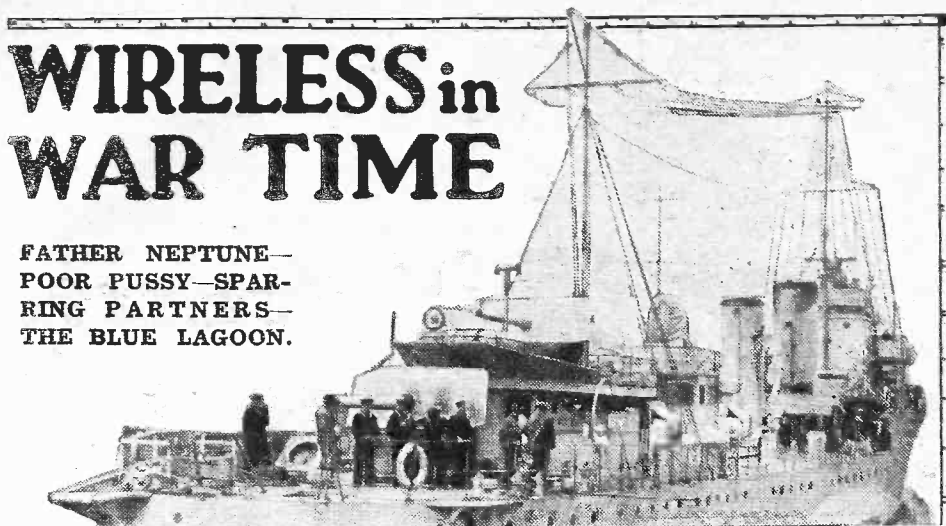
This valve is sufficient in some cases for the gramophone side of the set, where only small volume is required; but, as I said before, it leaves very little for safety.

For those who are interested in battery radio-gramophones, a simple, cheap home-constructor's design will appear in the July issue of "Modern Wireless." Here the larger pentode output valve is used, and one of the sensitive loudspeakers I have mentioned.

K. D. R.

WIRELESS in WAR TIME

**FATHER NEPTUNE—
POOR PUSSY—SPAR-
RING PARTNERS—
THE BLUE LAGOON.**



Extracts from the diary of a wireless operator at sea, 1916-1918.

JULY 7TH.—The actual ceremony of "Crossing the Line" seems more amusing to look back upon than it did when I was figuring as one of the "victims."

A procession was formed, headed by Father Neptune wearing a cloak, a string beard and a crown, and carrying a large wooden sword with jagged edges. Next came the barber with a wooden razor about two feet long, and the barber's assistant, the soap boy, carrying a pail of muck which could be smelt from one end of the ship to the other.

The rear was brought up by four policemen and the rest of the ship's company, including the captain, who on such occasions has to take a back seat and put up with quite a lot of nonsense from the crew.

Arrived on the lower deck, where there was a large canvas tank full of dirty water, Father Neptune ordered me to be shaved. While this was being done he began a long speech

Beer All Round!

One has to be sensible on these occasions, and if one wants to be let off lightly it's best not to struggle or make a fuss, but I must admit that it was difficult not to resist the barber's boy slapping me all over with a whitewash brush well supplied with such filthy muck.

After a short respite, I was eventually thrown into the canvas tank and ducked several times. What was left of the soap and other stuff in the pail was then slapped over my head, and I received Father Neptune's blessing. At last the ceremony was over. Neptune stood beer all round, and everything became normal again.

Nine Lives?

JULY 11TH.—There is not much doing in the ether just now. In fact, there's not much doing anywhere; and life on board is inclined to be monotonous. There was one little incident yesterday, however, which disturbed our daily routine. The ship's cat got in the propeller tunnel and, having regaled itself on bilge water, promptly went mad. An expedition armed with revolvers explored the tunnel with the idea of putting it out of its misery, but at the moment of writing the cat is still at large, despite the expenditure of some twenty rounds of ammunition.

Last night I had little sleep because I had to send a message to Durban and had

a terrible job to get a reply. I can understand why.

This ship, being a captured German, has a Telefunken quenched gap transmitter. The note in the 'phones is very distinctive, and as there is a raid reported in these waters, the Durban operator seems to be very loath to reply to my call!

However, I sent out an explanation in code and eventually got an answer. I am

A DEEP SECRET!



This picture shows the scene when listening for submarines with a "hydrophone"—the ingenious electrical ear which picks up the regular thump of the engines, and thus discloses the presence of an under-sea enemy.

going to fix up a "stand-by" "spark" set, to avoid trouble in the future.

JULY 14TH.—Durban. We anchored in the harbour of Durban yesterday alongside The City of Lahore. After dinner I went ashore with V—. Durban strikes me as a splendid city, miles ahead of Bombay. The streets are beautifully clean and broad, and the whole place is laid out in an ideal way. I took a car ride down to the beach and found a fine parade and hundreds of people about. Although it is rather late in the season, the weather is good, and people from all parts of South Africa are here for their holidays.

JULY 24TH.—We caught sight of Table Mountain on the 22nd, but we did not call

at Cape Town. Atmospheric conditions are good to-night. I have heard Durban quite loudly, although the station is about 1,000 miles away, and the normal range is 300 miles.

JULY 25TH.—Each day at lunch and dinner the captain, the chief officer and the chief engineer get up some discussion. In the morning the talk is usually about the press messages I pick up.

Doubtful Darwinism!

At dinner to-night we had an exposition on the Darwinian theory from the captain—at least, he thought it was about the Darwinian theory, but I have my doubts.

JULY 26TH.—More remarks about the Russians at lunch to-day, and many bitter allusions to the air raids, of which I receive lurid accounts in the press messages. The subject of drink also cropped up as a topic for discussion, and the chief officer spoke of its influence on matrimonial bliss, which naturally was followed up by a short dissertation on marriage itself.

We understand that liquor once played a leading part in his life, but a recent marriage saw the spell broken, and now he ostentatiously refuses brandy sauce and port wine pudding at meals. Later on the discussion veered round to windjammers. This made an interesting discussion, for here they were all on their own ground and knew what they were talking about.

JULY 27TH.—The breakfast topic this morning was boxing and boxers. This was well worth listening to. The chief officer appears to have been a bit of a boxer in his day and, in the course of his travels, sparred with Sam Langford and Bob Fitzsimmons. Once when slightly mellow he rashly challenged Langford, but Sam took it in good part, and patting him on the cheek, said: "That's all right, old man. You go home and iron your shirt."

JULY 30TH.—They were talking to-day about their early days at sea, and all agreed that in those times food was poor and meagre. The captain related with considerable humour how one day a stoker came up to him with a pot of tea in his hand. "Look here, sir," he said. "This tea is so — weak that it won't run aht the spaht."

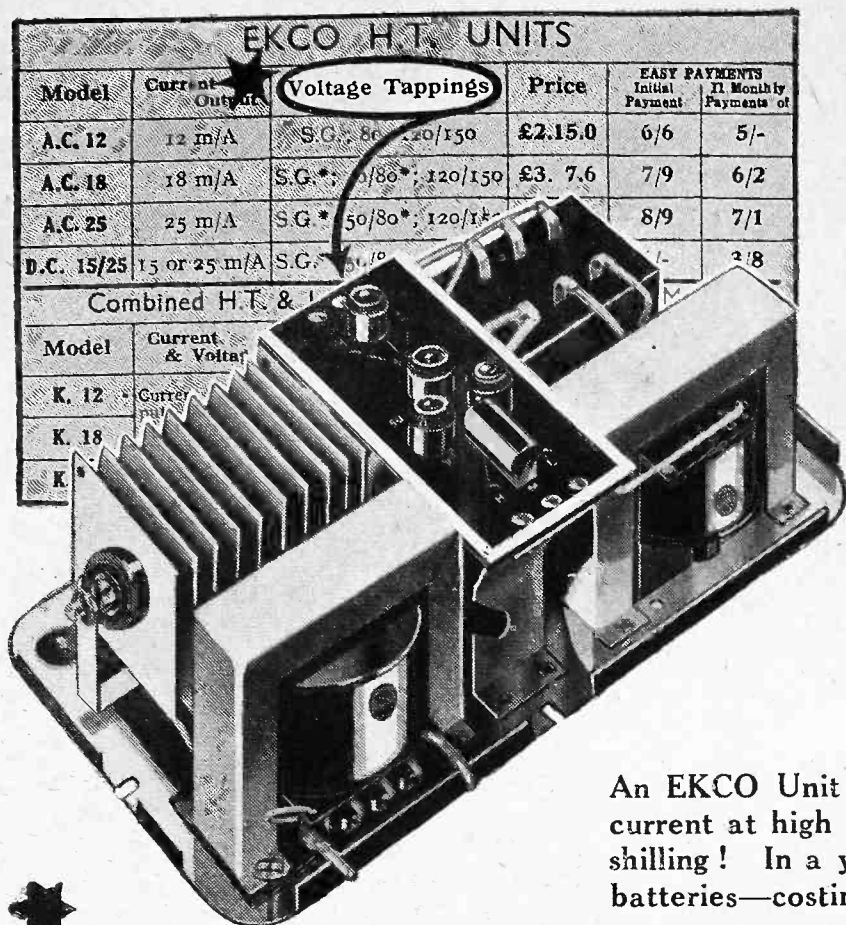
Masses of Monkeys.

AUGUST 4TH.—Sierra Leone, West Coast of Africa. We arrived here just in time to cross the boom before sunset. As we steamed slowly up to our anchorage, V—and I, standing on the boat deck, noticed a small promontory. As we passed by, we both exclaimed in one voice, "The Blue Lagoon!"

Certainly the effect was indescribably lovely, for the promontory was covered with masses of palm trees, and as we passed by we could see that they were alive with parrots and monkeys. The water of the bay was perfectly calm and, to complete the beauty of the scene, the beach was of a deep orange colour, fringed with palm trees and great masses of flowering shrubbery.

Particularly noticeable was the brilliant yellow of the mimosa. We eventually anchored off this little town, which nestles at the foot of a range of tall, luxuriantly covered hills, the tops of which are often hidden by clouds. Dotted over the face of the hills are dozens of little villas, and from the sea they look just like dolls' houses.

(To be continued.)

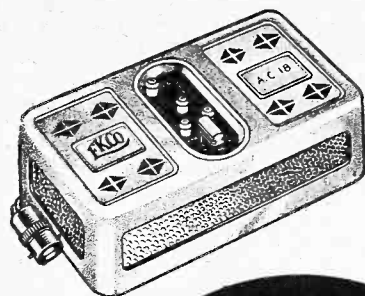


The Unit Control Panel, showing :—

Top : The S.G. Plug, with its three alternative voltage tappings ; 80-90 ; 70-80 ; 50-70 ; up to 3 m/a.

Centre : Negative Plug.

Bottom : The 50/80 v. Plug, adjustable in three positions, High, Medium and Low, up to 3 m/a ; and the 120/150 v. Plug—120 volts at approximately 21 m/a up to 150 v. at approximately 11 m/a.



All models are similar in external appearance.
Size, 9×5×3½.

EKCO

POWER UNITS

Woburn

EKCO H.T. UNITS

Model	Current Output	Voltage Tappings	Price	EASY PAYMENTS Initial Payment 11 Monthly Payments of	
A.C. 12	12 m/A	S.G. ; 80 ; 120/150	£2.15.0	6/6	5/-
A.C. 18	18 m/A	S.G.* ; 50/80* ; 120/150	£3. 7.6	7/9	6/2
A.C. 25	25 m/A	S.G.* ; 50/80* ; 120/150		8/9	7/1
D.C. 15/25	15 or 25 m/A	S.G.* ; 50/80* ; 120/150			2/8

Combined H.T. & L.T. Charger Units (for A.C. Mains)

Model	Current & Voltage	L.T. Output (for charging accumulators)	Price	EASY PAYMENTS Initial Payment 11 Monthly Payments of	
K. 12	Current Output and Voltage Tappings same as Models A.C. 12, A.C. 18 and A.C. 25.	1 amp. at 2.4 or 6 volts	£3.19.6	9/-	7/3
K. 18		1 amp. at 2.4 or 6 volts	£4.12.6	10/3	8/5
K. 25		1 amp. at 2.4 or 6 volts	£5. 7.6	11/9	9/10

50/- worth of H.T. for one shilling!

An EKCO Unit will give you ample, silent, unvarying current at high voltage for one year at a cost of one shilling ! In a year you would buy at least four H.T. batteries—costing at least 50/- !

There is an EKCO Unit for every type and size of set. Just connect the appropriate model in place of your usual battery—then switch on—that's all !

Choose the Unit suitable for your set from the Table below or post coupon for full details.

All Ekco Units are obtainable on Easy Payments.

EKCO H.T. UNITS					
Model	Current Output	Voltage Tappings	Price	EASY PAYMENTS Initial Payment 11 Monthly Payments of	
A.C. 12	12 m/A	S.G. ; 80 ; 120/150	£2.15.0	6/6	5/-
A.C. 18	18 m/A	S.G.* ; 50/80* ; 120/150	£3. 7.6	7/9	6/2
A.C. 25	25 m/A	S.G.* ; 50/80* ; 120/150	£3.17.6	8/9	7/1
D.C.15/25	15 or 25 m/A	S.G.* ; 50/80* ; 120/150	£1.19.6	6/-	3/8
Combined H.T. & L.T. Charger Units (for A.C. Mains)					
Model	Current & Voltage	L.T. Output (for charging accumulators)	Price	EASY PAYMENTS Initial Payment 11 Monthly Payments of	
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K. 18		1 amp. at 2.4 or 6 volts	£4.12.6	10/3	8/5
K. 25		1 amp. at 2.4 or 6 volts	£5. 7.6	11/9	9/10

Tappings marked * are adjustable.

To E. K. Cole, Ltd. Dept. A.12, Ekco Works, Southend-on-Sea.
Please send me full details of Ekco Power Units

Name.....

Address.....



Can the microphone give us an adequate presentation of a full-scale drama from history, such as the Battle of Waterloo? That is the bold experiment which is to be tried by the B.B.C. and judged by listeners at the end of this week.

TO attempt a literary reconstruction of any historical incident or period is always a risky proceeding. To attempt such a reconstruction in a medium as comparatively experimental as broadcasting still remains, and of an episode so generally well-known as the Campaign of Waterloo, may seem almost unjustifiably audacious.

But to those who maintain both interest and belief in the possibilities of radio as a medium, the idea of making use of it as a means of historical reconstruction has been present for a considerable time.

A few weeks ago, the author of an article in the "Radio Times" made an eloquent plea for such reconstructions, and an actual example of a programme of this kind has already been broadcast in "Crisis in Spain," which was composed last year by Mr. E. A. Harding. It may be objected that, as far as the Battle of Waterloo is concerned, the last word must already have been said.

"The Battle of Waterloo."

In the eyes of a good many people items in radio programmes approximate far more nearly to contemporary and journalistic activities than to historical treatises, to novels, or to plays. And while "Crisis in Spain" can be justified rather on the lines of a Radio Topical Budget—an illustration in sound of contemporary happenings—a reconstruction by wireless of the Battle of Waterloo immediately puts itself into competition with such well-established competitors that its hopes of success appear slight indeed.

It is, of course, true that few of the decisive battles of the world have so much literature to their credit as Waterloo. It has been treated in almost every conceivable way; by purely popular writers such as Fitchett and Sir Edward Creasey; by military experts of every nationality such as Sir John Fortescue or Captain Becke; in the most sonorous prose of fiction by Victor Hugo, and the equally sonorous verse of Thomas Hardy, Lord Byron and Sir Walter Scott.

In addition, almost all of the stupendous literature devoted to the career of Napoleon deals with it in greater or lesser detail. What then remains?

It is the modest hope of the authors of the programme that is to be broadcast on

June 18th this year, that by means of the particular medium in which they are interested a reconstruction of certain aspects of Waterloo can be achieved, which shall be more vivid than any stage representation can be, as their medium is not subject to the stage limitations of space and time. And possibly more satisfactory than even any film can be.

In the strictest sense of the word, this

DIRECTOR OF PRODUCTIONS



This is Mr. Val Gielgud, the author of the accompanying article and part-author of "The Battle of Waterloo," a radio drama to be broadcast on Saturday, June 18th.

programme is no contribution to the literature of the Drama. It cannot be called a play in the true sense of that word.

In the first instance a draft was made, composed of a certain number of scenes during the Hundred Days, written in dialogue form, but based almost entirely upon facts and conversations for which a reasonable degree of documentary historical authority exists.

The main problem was how to make all these comparatively disconnected episodes a coherent whole, and to solve this problem the authors fell back upon the method which was first used in broadcasting by those who first brought adapted versions of novels to the microphone. Once the prologue is over, the scenes of the panorama are held together by a double thread of narrative briefly and concisely written.

The double thread of narrative was chosen because it has been proved by experience that the effect of a single narrator is apt to become boring; while by means of two voices a certain effect of balancing rhythms can be achieved, which is very helpful to the flow and rhythm of the programme as a whole.

At Least Five Studios.

For this type of programme, the Dramatic Control Panel and its attendant multiple-studio system is, of course, vital, and for "Waterloo" at least five studios will be employed. Each of these studios has its own acoustic properties, and by dividing the cast between them for the various scenes making up the panorama it should be perfectly easy immediately to establish the considerable changes of place that are the vital element in a programme which begins in Vienna and ends on St. Helena.

When dealing with so extraordinary a personality as that of Napoleon, there is an almost irresistible temptation to indulge in the picturesque, to call upon the Effects Department for every shot in their lockers, every cannon in their armoury and every coconut shell in their cupboards!

Every attempt has been made to envisage this temptation clearly, and to avoid it in proportion, for to reproduce the sound of a heavy cavalry charge—if such a thing were even remotely possible—would be a very poor substitute for reading Hugo's description of the battle. And the sound of Mercer's, or, alternatively, General Gourgaud's, cannon would be very much the same as the sound of the cannon in any other engagement of that twenty years' war.

Establishing a Precedent.

So, for the most part, the characters will speak for themselves. And the listener who agrees with the prevailing view that war has become permanently unfashionable and out of date, need not be deterred by any fear that in the course of this programme he will be brought too close to the grisly realities of the battle-field. The battle itself is handled strictly from the points of view of the two staffs concerned, and, as the Duke of Wellington remarked on the morning of that famous Sunday, "Generals have better things to do than to shoot at each other"; thereby establishing a precedent most satisfactory for staffs in later and less romantic campaigns.

In sum, the programme is an experiment, and its main interest probably lies in whether it gives any clue to the possibilities of the reproduction in sound of the equivalent of an historical document. For if any degree of success, however small, can be found in the broadcasting of "Waterloo," an immediate and almost illimitable prospect of similar programmes, expertly contrived and skilfully written, will be available, on the one hand, for the listener to hear, on the other for the radio dramatic author to exploit.

Making the most of a Milliammeter

Here you will find some very helpful information on choosing a suitable instrument, as well as hints on using it in the most effective manner in order to check overloading, to test circuits, and to discover leaky insulation.

By H. A. RAMPTON.

MANY amateurs do not feel the need for a meter as they would for a dual-range coil or an anti-motorboating unit. Yet a meter does help to get better quality, it helps to ensure that the valves are working efficiently and are not overrun.

There need be no fear that a meter will lead you into a mass of highly technical figures. When using it as an indication of the power-handling capacity of the output valve, one simply ignores the scale readings and just sees how much the needle "kicks."

But I will deal with its uses at the end of this article. Let us consider the best instrument to choose for ordinary home use—the milliammeter.

Read the Current.

If a valve passes 5 milliamps at 100 volts it will probably pass 7 or more at 120 volts. If, therefore, a current-measuring instrument is inserted in the anode current, it will be possible to tell from the *current reading* whether the valve is receiving its correct *H.T. supply*.

A good milliammeter may cost anything from twenty-five shillings upwards. As a rule one of this class will be all right, though if you pay more the results will, of course, be somewhat more accurate.

As the output valve takes considerably more current than any of the other valves in a set, the scale reading of the meter should be slightly greater than this figure. In this way readings are easier as the whole scale is in use.

Locating a Leak.

In general, you will find that for battery-operated sets an instrument with a range of 0-20 milliamps will be suitable. For mains-driven receivers 0-30 or 0-50 milliamps, according to the type of valve used, will be necessary.

The idea in getting an instrument that registers slightly more than the current taken by the output valve is so that it will serve to measure the total current taken by all the valves.

The easiest way to do this is to put it in the H.T. *negative* lead before this reaches the connection to L.T. *negative*. (This point is important. If the L.T. current is allowed to pass through the meter, it will probably be irretrievably damaged.)

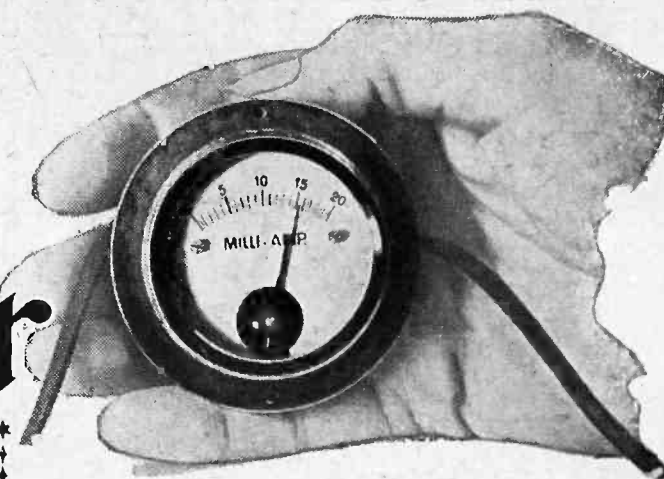
If you leave the meter in this position it will be possible to check up whether the current increases at any time. Another point is that the efficiency of the by-pass condensers can be checked by assuring yourself that no H.T. flows when the set is switched off.

If there is an indication of current it is an easy matter to connect the meter in the

ANOTHER BRANCH OF SCIENCE !



The instrument in the tree is certainly not a milliammeter, but it is very closely allied, for it is an outside broadcast microphone, and it picks up a bit too much energy the milliammeter needles will "dance merrily" unless the control engineer is very slick with the volume control.



anode lead of each valve in turn in order to trace the culprit.

By connecting a milliammeter in the lead to the anode of the output valve it is possible to check whether it is being overloaded. In normal practice the needle should remain almost steady. If it swings about when loud passages are received, the volume should be reduced, otherwise there is bound to be distortion of the received signals.

Try This !

Or you can get over the trouble by increasing the H.T. voltage, and, of course, the grid bias to correspond.

If the grid bias is not correct the needle will not kick evenly both ways. If it kicks upwards, the G.B. is too high; if downwards it is too low.

Don't forget to disconnect the H.T. plug before altering the grid bias. If you have an old partly worn-out valve you do not want, plug it in the last valve holder in place of the usual one and try altering the G.B. with the H.T. connected up.

Watch the milliammeter as you do so. Note the tremendous increase in current while you are altering the bias (that is, while the plug is out), and you won't try it with your best valve!

With the correct value of bias the current registered should agree fairly accurately with the figures given by the makers.

Fix a Fuse.

In tracing troubles in a receiver that refuses to work, the meter may again be connected in the anode lead of each valve in turn. If the normal current is registered, you will have proved (a) that the valve is getting its correct L.T., H.T., and G.B., and (b) that there is no break in the anode circuit, such as a burnt-out transformer, or in the circuit that passes the grid bias to the valve. (In a detector circuit this means the grid leak connections and not the tuned circuit.)

But by proving that there is no break, it does not prove that the circuit is completely O.K. There may be a short-circuit somewhere. This is not unlikely in these days of all-metal receivers, fixing screws and screening cans being frequent offenders.

A final hint. It is best to use a low-resistance fuse in series with an expensive meter. It should be rated to blow at a current slightly greater than the maximum reading of the instrument.

SHORT-WAVE NOTES

By W. L. S.

Who has many interesting tit-bits for readers, including preliminary details of the newly-discovered potentialities of the waveband around five metres.

THE little private "competition" arranged between M.S., of Harlow, and F.N.B., of Hale, Cheshire, has fizzled out rather tamely, since M.S. has failed to send me any details at all! F.N.B., on the other hand, turned in a wonderful log of 120 amateurs on telephony, during the one period of twenty-four hours.

A Formidable List.

The list of stations includes "hams" from Spain, Portugal, Belgium, Germany, Denmark, France, Holland, French Morocco, Czecho-Slovakia, and U.S.A. The only reader to challenge him at all was V.H.C. (Northfleet), who sent in a good list of British amateurs, but was not nearly so successful with the foreigners. This being the case, F.N.B. scores a walk-over!

Next time we organise a listening competition, I really shall have to enter myself. The only trouble is that, being a journalist, I should have great difficulty in persuading people that I was telling the truth.

The week's news is fairly scarce, conditions remaining dull in spite of greatly improved weather. P. R., of Sheffield, remarks that they suddenly bucked up during the competition week-end; F.N.B., however, in spite of his tremendous list of stations, definitely says that things were not good. That, I suppose, is purely a local difference between Sheffield and Hale.

Concerning Bandoeng.

The only Americans that readers mention specifically as being at all good are W2XAF and W2XAD. What we should do at this time of year without the latter station to cheer us up I really don't know.

F.D.T. (Redhill) passes on the following information, received direct from Bandoeng on their QSL card. Five transmitters are active—PMB (14.60 metres), PLE (15.93 metres), PMC (16.56 metres), PLV (31.86 metres), and PMY (58.3 metres). The regular Tuesday afternoon broadcast (14.40-16.40 B.S.T.) is taken always by PLE and PLV, and sometimes by PMY.

Incidentally, another good Tuesday programme is that broadcast by Poznan (Poland) on 31.35 metres from 18.45-21.45 B.S.T. E.H. (Bristol), among others, reports this as a good RS on one valve. Yes, E.H., the high-power C.W. signal on 50.26 metres is the Vatican, H V J.

That Mystery Station!

I find that the station just above the 20-metre amateur band that I mentioned last week was not W A J, but our old friend W I Y, who is usually to be heard all day on C.W. How long his irregular musical broadcasts will continue I cannot say.

We hear the term "epoch-making" applied to lots of things these days, but I do not think Q.S.T. is far wrong when it describes the recent developments in 5-metre work by that term. The tale of the amateur transmitters' steady "downward

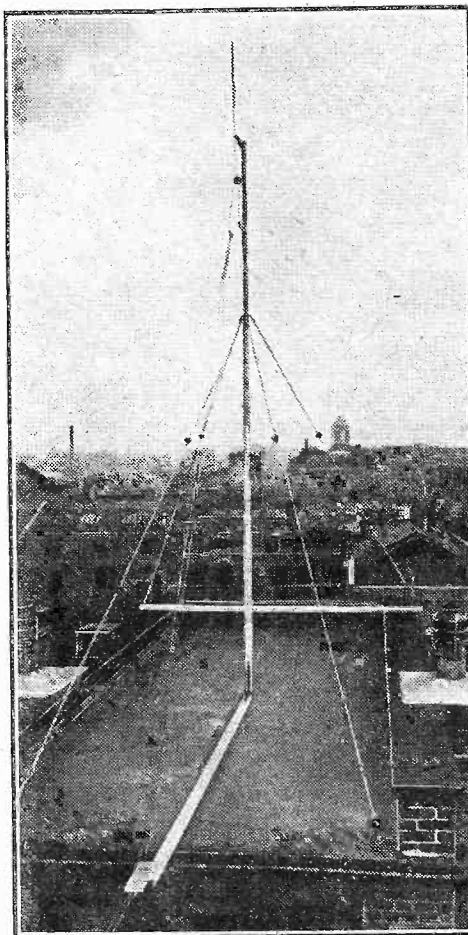
trek" from 440 metres to 20 metres, and even 10 metres, is ancient history; but everyone did think that 20 metres would be about the shortest wave that was of any practical use to them.

Now, however, thousands of American hams are working on the unexplored territory of 5 metres, and are obtaining all the thrills once more. In this country, too, we are not by any means asleep. There are probably at least fifty active stations on 5 metres in London alone, and the chief craze appears to be "duplex" telephony. The band is of such an enormous width that broadly-tuned, frequency-modulated telephony can be tolerated until the transmitters are improved.

Great Strides in the States.

Only short-distance work has been possible as yet over here, but in the States they have erected transmitters on the top of skyscrapers, fire-towers, and even in aeroplanes, with the result that communication

A FIVE-METRE AERIAL



Recently Mr. Baird has been very active in the region of 5 metres with his television experiments, and it seems highly probable that there will be some interesting developments in the near future. This photograph shows the ultra-short-wave aerial on the top of the Baird premises in Long Acre, London.

up to 150 miles has been established with "vest-pocket" transmitters and minute inputs.

Busy Times Ahead.

I predict some great developments in this work, and hope to be "first with the news" when they occur, as I shall be well in the swim by the time you read this.

One thing seems certain—that the super-regenerative receiver has all the others beaten for 5-metre work. It is so simple to make and operate that it looks to me as if it will be the ideal gear for the 7-metre broadcast when that starts. One rather surprising feature of the circuit is that the tuning strikes one as being quite broad. Imagine a 5-metre receiver with a .0001 condenser and a direct-drive dial!

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"W.L.S." IN

MODERN WIRELESS

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1st of the Month. Price ONE SHILLING.

In response to the many readers who are not content with the "tame" one-valver that I recently described, and who insist on a description of my own "hot" set, I have said all that I can think of about this "hotting-up" process in a separate article, now in the hands of the Editor.

Much Useful Data.

My recent article on "Location" has brought forth some interesting experiences from readers. One man receives the whole world with the exception of Nairobi; another in the same town finds Nairobi his star station. Another complains that W2XAD is always weak, although W2XBJ, W A J and W I Y (none of them far off in wavelength) are always good when they are on.

A Wolverhampton reader mentions one of the most peculiar effects that I have met—that of receiving practically everything that is going, but at the *wrong time*. He gets Sydney, for instance, when others find that he is on the point of fading out. He gets W2XAD when I find him weak, and when he should really be coming up well this man finds him going off! This short-wave business certainly is a big freak!

An Interesting Band.

Soon after this I hope to have my own station going again with telephony on 42.25 metres, the usual times being Sunday mornings, and sometimes Saturday afternoons.

The worst of 20-metre work is that the DX work down there tempts one to forget all about one's friends in the same country, who can only be heard on "40."

Judging from last Sunday, all the old friends are still there—and very much there! Unfortunately, the B.B.C.'s longer Sunday programme will probably have the effect of cutting down the "phone" time for the amateurs.

They are quite within their rights, of course, to work there at any time of day, but most of them become martyrs to the cause of broadcasting.

"ATLAS" POWER COSTS LESS & GIVES MORE!

... There's no cheaper source of H.T. Power than an "ATLAS" Mains Unit. First cost is low, outputs are higher and fully up to rating, and running costs are less than one penny a week. A model incorporating a L.T. Trickle Charger makes any battery receiver all-mains operated without alterations to set or valves.

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METALLISED
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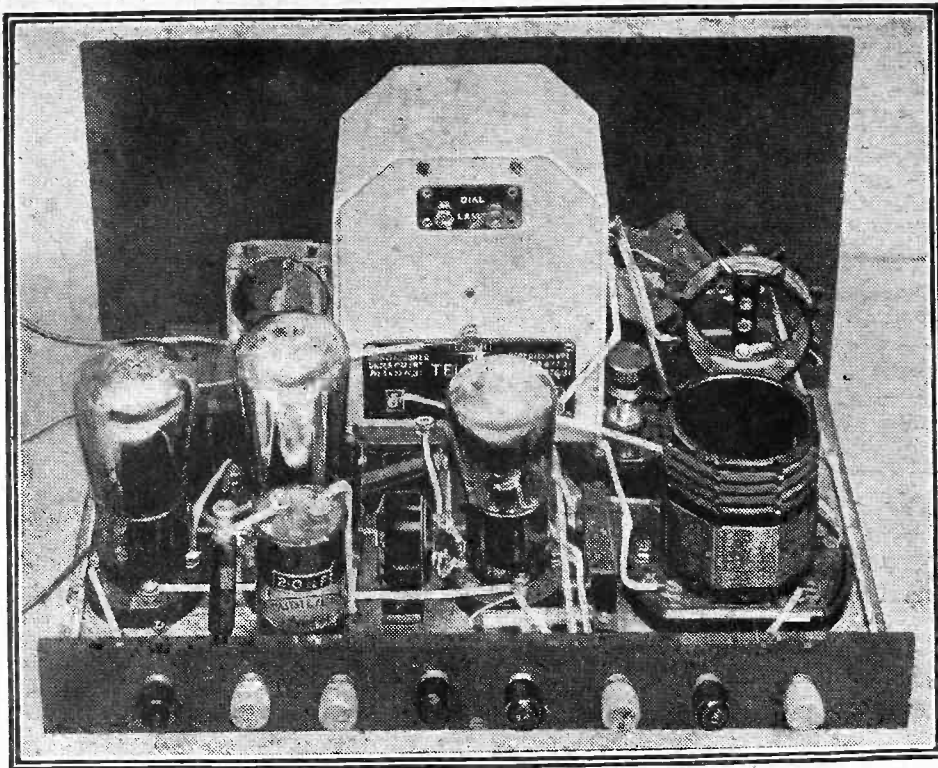
will give you much higher amplification without instability. Lissen research has succeeded in reducing the inter-electrode capacity of this Screen-Grid Valve to the minute figure of .001 micro-microfarads. (Inter-electrode capacity causes instability and howling.) The magnification figure of this valve has been increased to 1,000. To get immensely increased range, ask for Lissen S.G.215. Price **12/6**

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POWER
PENTODE**

The Lissen Power Pentode Valve—P.T.225—converts any set with one stage of L.F. amplification into a fine, full-volume "Pentode-output" receiver. This valve puts new power into your loud-speaker, and new brilliance of tone, too. Use it instead of a power valve and at once you get an amazing step-up in volume. Where before you got a whisper, now you get a torrent of pure sound, and it takes no more current than the power valve it replaces—its H.T. consumption is only 7 m/A. Ask for Lissen P.T.225. Price **12/6**

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LISSEN LIMITED, WORPLE ROAD, ISLEWORTH, MIDDLESEX



HIGH QUALITY OUTPUT

You do not have to push the reaction in order to obtain great volume with the "Decade," and this, together with a carefully stabilised L.F. section, ensures a perfect quality output.

HAVING closely examined the "Decade"—at least, by means of the published specification—readers may wonder how this set could possibly be simplified without sacrificing some of its outstanding qualities.

But it can; and the simplification isn't theoretical, or even insignificant.

It is achieved by the introduction of an Extenser. Most of the Extensers cost a few shillings more than ordinary condensers; but against this can be credited the fact that, instead of the rather elaborate control switch, we now need nothing more than a simple push-pull on-off type.

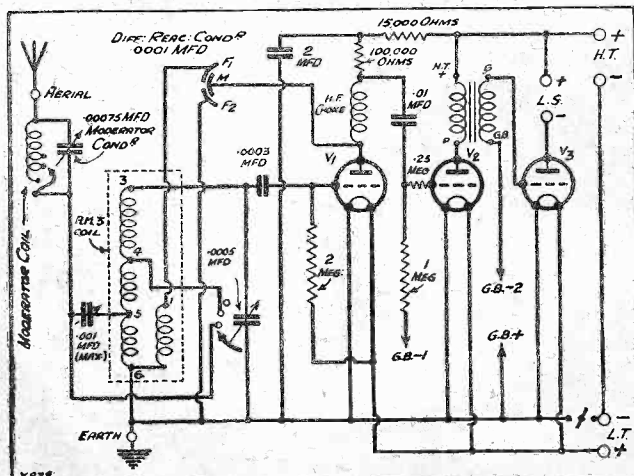
Automatic Circuit Control.

So in this new model of the "Decade" the single switch has only one job to do, and that is to switch the set on and off. The Extenser automatically does the

wave-changing. Its dial is numbered from 0-100 and 0-200, and rotates through 360 degrees instead of the normal 180. And, as you twist it from 0-100, so you tune in the medium-wave stations. From 0 to 200 the long-wave stations come in, the change-over from the one band to the other being absolutely automatic.

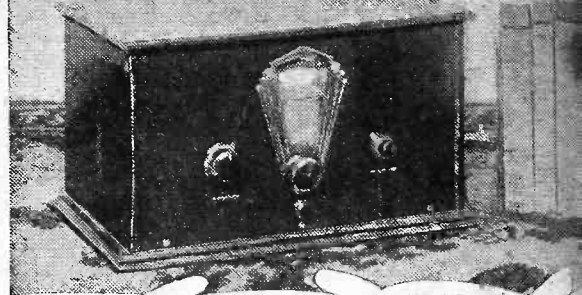
Also, the Extenser automatically carries out the necessary Moderator circuit rearrangement which was, in the first model, accomplished by the rather complicated control switch. From the household's

AERIAL LOSSES AVOIDED



The Moderator coil and condenser bring the aerial circuit into resonance at "medium-wave" frequencies, and thus enable the maximum of power to be developed.

The "DE" WITH SIMPLIFIED



By G. V. DOWD

Who describes a "P.W." set which represents no doubt read about the first model of "P.W." all the features found in

point of view the Extenser is pure gold, for the Daventry's, Radio Paris, London Regional, Northern Regional, and so on are all, in effect, welded into the one tuning band.

And it must be admitted by all that it is no small advantage to have the one switch which figures on the panel doing the one "stop-start" job.

The Extenser not only simplifies, but it also tends to increase a set's operating efficiency because it reduces and simplifies the wiring.

These facts will, of course, be well known

YOUR SHOPPING LIST FOR THIS

- 1 Panel 12 in. x 7 in. (Peto-Scott, Permcol, Ready Radio, Wearite, Lissen).
- 1 Baseboard, 12 in. x 7 in. x 1 in.
- 1 Cabinet to fit above (Peto-Scott).
- 1 0005-mfd. Extenser with disc drive (Telsen Telexor, Cydon, Wavemaster, Formo).
- 1 0001-mfd. differential reaction condenser (Lotus, Ready Radio, Telsen, Cydon, J.B., Polar, Wavemaster, Magnum).
- 1 00075-mfd. solid dielectric condenser (Magnum, Polar, Telsen, Ready Radio).
- 1 Push-pull on-off switch (Bulgin, Lissen, Telsen, Ready Radio).
- 3 4-pin valve holders (Lotus, Lissen, Telsen, Graham Farish, W.B., Tunewell, Igranic, Clix, Benjamin, Bulgin).
- 1 Dual-range coil (Colvern R.M.3).
- 1 Moderator coil (Ready Radio, Peto-Scott, Sovereign).
- 1 001-mfd. max. compression condenser (Lewcos, Sovereign, Goltone, Graham Farish, Formo, Polar).
- 1 01-mfd. mica condenser (T.C.C., Dubilier, Telsen, Lissen, Graham Farish).
- 1 2-mfd. condenser (Dubilier type 9,200, Telsen, Lissen, T.C.C., etc.).
- 1 0003-mfd. fixed condenser (Lissen, etc.).
- 1 H.F. choke (Lissen, Lewcos, Telsen, Atlas, Tunewell, Graham Farish, Ready Radio, Varley, R.I., Peto-Scott, Sovereign).
- 1 2-meg. leak, with holder if required (Igranic, Lissen, Telsen, Graham Farish, Ready Radio, Loewe, Dubilier).
- 1 15,000-ohm resistance (Graham Farish Ohmite, etc.).
- 1 100,000-ohm resistance (Graham Farish, etc.).
- 1 1-meg. resistance (Graham Farish, etc.).
- 1 L.F. transformer (Lissen Torex, R.I., Graham

Farish, Telsen, Varley, Lot Ferranti).

1 Terminal strip 12 in. x 1 in.

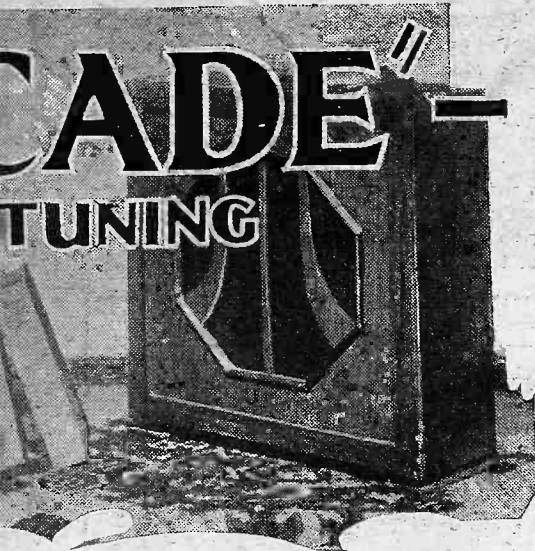
1 Block of wood for mounting

NO WAVE-CHAN



The Telexor covers both medium and long-wave stations in the one complete rotation of its dial.

A SET WHICH UNIF



Associate I.E.E.

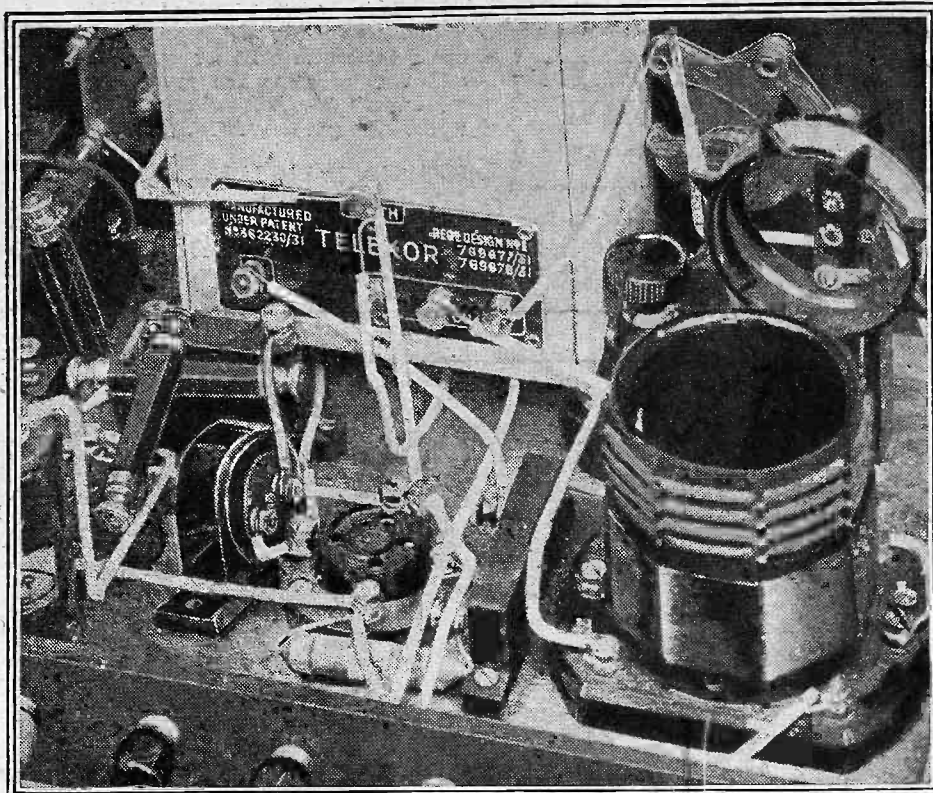
ultimate in simplified effectiveness. You have a universal receiver—well, this model embodies plus Extenser tuning!

to regular readers of "P.W.," and we have summarised them for the benefit of an ever-increasing circle of new readers.

A further advantage which accrues from the use of an Extenser in this particular receiver is that a very attractive panel appearance is obtained.

This is particularly the case with the Telsen "Telexor," for that component has a handsome escutcheon, and there is also a panel light for illuminating the dial, although the use of this is quite optional.

The "Telexor" retails at 12s. 6d., and at this figure it is an excellent investment.



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lings these days, but while all of these may not be hopeless "duds," the fact remains that many are.

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Using Existing Parts.

Care should also be taken that the selected components are not "outsizes," and cannot be built into the set without materially altering the layout—a fatal variation from the specification.

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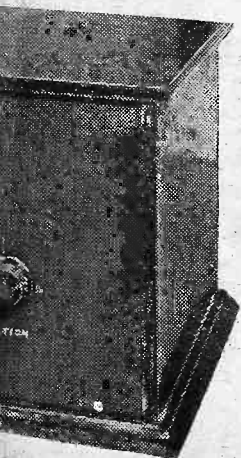
(Continued on next page.)

R-ATTRACTIVE RECEIVER

c, Tunewell, Slektun, (Scott, etc.).
ator coil, 1½ in. high.

- 8 Indicating terminals (Bulgin, Belling Lee, Eelex, Igranice, Clix).
- 18-gauge tinned copper wire and sleeving (Wearite or Quickwyre, Jiffilinx, Lacoline).
- Flex, screws, etc.
- Battery Plugs (Belling Lee, Eelex, Clix, Bulgin, Igranice).

SWITCHING



ACCESSORIES.

LOUDSPEAKER.—Blue Spot, Celestion, H.M.V., Marconiphone, B.T.H., Epoch, R. & A., Cossor, Graham Farish, W.B.

VALVES.—For use with battery H.T.—Detector: Marconi H.L.2, Mazda H.L.2, Mullard P.M.1H.L., Cossor 210H.L., Osram H.L.2, Tungram H.210, Eta B.Y.2020, Lissen H.L.2, Six-Sixty 210 H.L., Triotron H.D.2, Dario H.F.

1st L.F.: Cossor 210 Det. or 210L.F., Mullard P.M.1L.F., Marconi L.2/B, Osram, L.210, Mazda L.210, Tungram L.210, Eta B.Y.1210, Lissen L.210, Six-Sixty 210L.F.

Power: Mullard P.M.2A., Mazda P.220, Marconi P.215, Osram P.215, Cossor 220P., Eta B.W.604, Tungram P.220, Lissen P.220, Dario S.P.

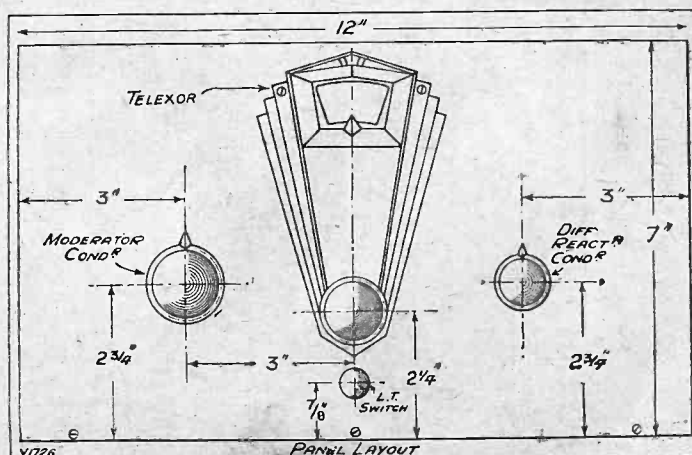
For Use With Mains Unit: As above with following additions, Mullard P.M.202, Mazda P.220A., Marconi and Osram P.2, Cossor 220P.A., Eta B.W.602, Six-Sixty 220S.P., Lissen P.220A., Dario H.P., Triotron U.D.2.

BATTERIES.—H.T., 120 to 150 volts (Lissen, Pertrix, Ever Ready, Drydex, Siemens, Cossor). Super capacity should be used.

G.B., to suit output valve (Ever Ready, etc.).
ACCUMULATOR.—2-volt (Exide, Pertrix, Lissen, Ever Ready, G.E.C., Ediswan).

MAINS UNIT.—To give 30 milliamps, at 120 volts (Atlas, Heayberd, R.I., Tunewell, Tannoy, Regentone, Formo, Lotus).

FULL MODERATOR ADAPTABILITY



The flexibility and adaptability of the three panel controls will amaze those unacquainted with the potentialities of "moderated" sets.

THE WAVEBANDS

★ "has indeed solved my H.T. worries"

Pinewood Avenue,
Crowthorne,
Berks.
April 30th, 1932.

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I have only one regret, and that is that I did not know about the Milnes H.T. Unit earlier and been able to have saved some of the money I wasted on Dry H.T. batteries.

I am,

Yours truly,

F. L. THOMPSON.

THE Milnes H.T. Unit gives better reception than any other type of H.T. supply, and is cheaper than mains operation. You can't damage the robust nickel-iron cells by careless maintenance—there is no buckling of plates—no sulphation—no mains hum, and practically no attention is needed. The Milnes unit will give 40 milliamps at a definite voltage against a dead silent background, and is charged automatically from your L.T. accumulator.

MILNES H.T. SUPPLY UNIT

PRICES IN U.K.

£ s. d.

90-volt 2.18.0

120-volt 3.16.0

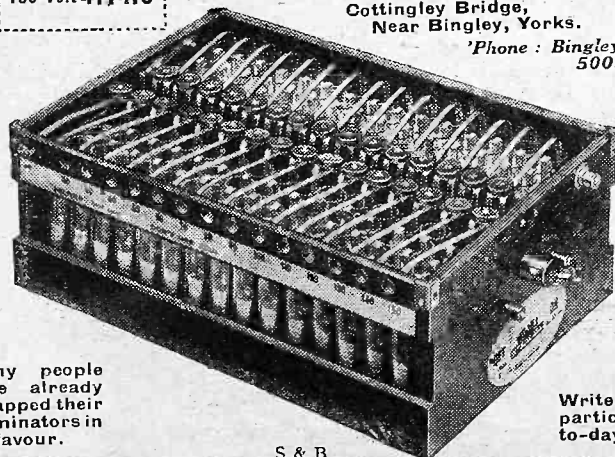
150-volt 4.14.0

SUPPLIES H.T. CURRENT
FROM L.T. ACCUMULATOR

MILNES RADIO CO.,

Cottingley Bridge,
Near Bingley, Yorks.

'Phone : Bingley
500.

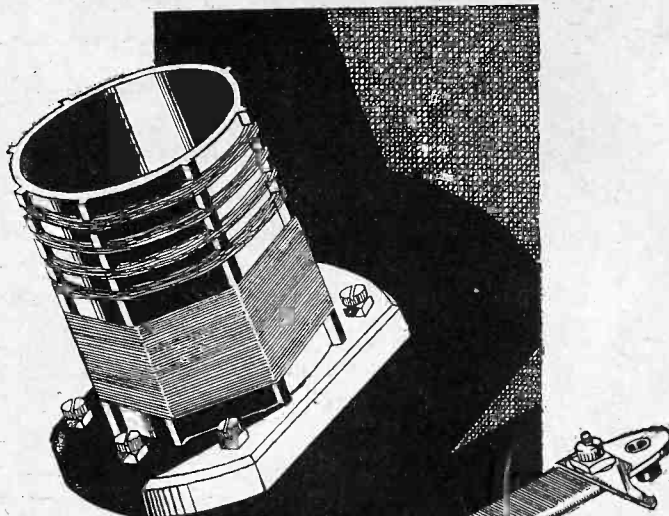


Many people have already scrapped their Eliminators in its favour.

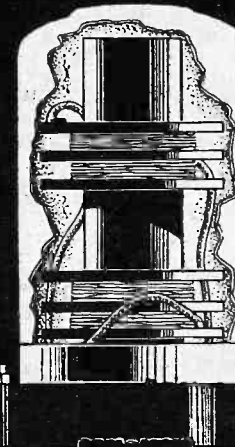
S & B

Write for particulars to-day.

Colvern components for every receiver



For
"The Decade"
Colvern RM3
Dual Range Coil
with reaction.
8/6

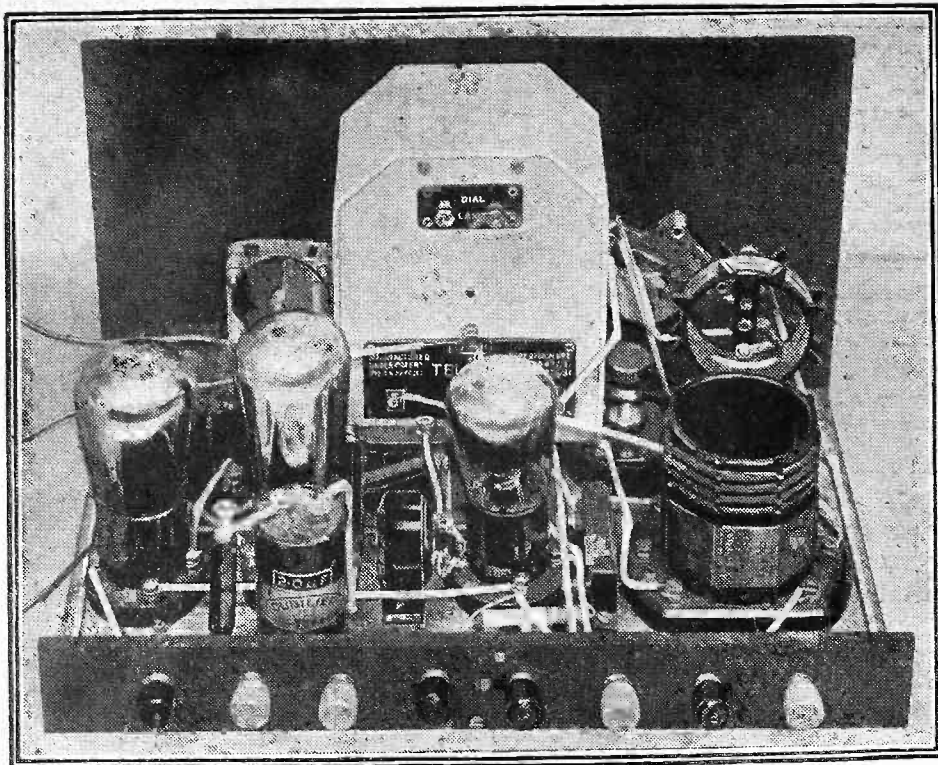


For Mains Units and Decoupling. Fit Colvern Strip Resistances. Rating 5 watts—wire-wound.
10-25,000 ohms 1/9 each
26,000 - 50,000 ohms 2/3 each

For your Super-Het. Colverdine intermediates with variable coupling and limited range adjustment to compensate for circuit capacity
12/6

Colvern coils are available for every type of modern receiver. The leading designers specify Colvern components and the confidence they place in them is a sure guarantee of their excellence and reliability. Wherever the best is needed, the choice always falls on Colvern.

COLVERN LIMITED
MAWNEYS ROAD, ROMFORD, ESSEX.



HIGH QUALITY OUTPUT

You do not have to push the reaction in order to obtain great volume with the "Decade," and this, together with a carefully stabilised L.F. section, ensures a perfect quality output.

HAVING closely examined the "Decade"—at least, by means of the published specification—readers may wonder how this set could possibly be simplified without sacrificing some of its outstanding qualities.

But it can; and the simplification isn't theoretical, or even insignificant.

It is achieved by the introduction of an Extenser. Most of the Extensers cost a few shillings more than ordinary condensers; but against this can be credited the fact that, instead of the rather elaborate control switch, we now need nothing more than a simple push-pull on-off type.

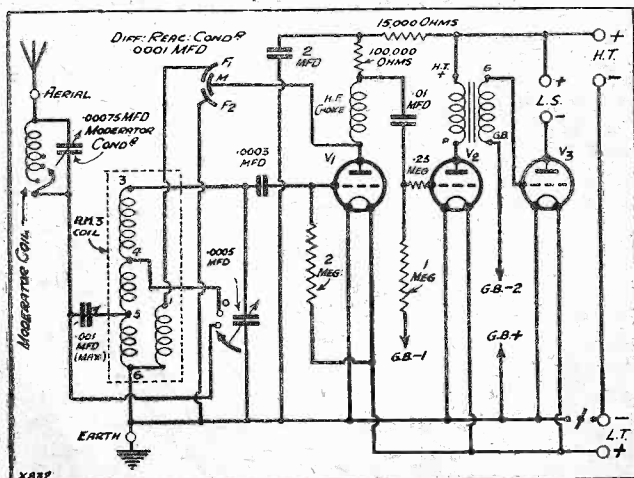
Automatic Circuit Control.

So in this new model of the "Decade" the single switch has only one job to do, and that is to switch the set on and off. The Extenser automatically does the

wave-changing. Its dial is numbered from 0-100 and 0-200, and rotates through 360 degrees instead of the normal 180. And, as you twist it from 0-100, so you tune in the medium-wave stations. From 0 to 200 the long-wave stations come in, the change-over from the one band to the other being absolutely automatic.

Also, the Extenser automatically carries out the necessary Moderator circuit rearrangement which was, in the first model, accomplished by the rather complicated control switch. From the household's

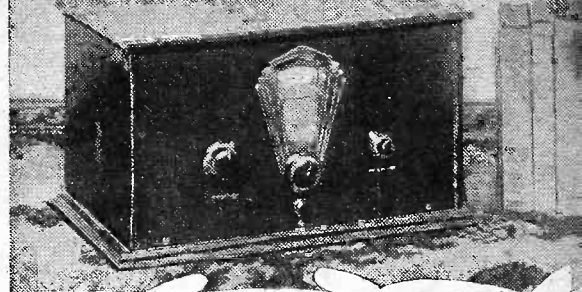
AERIAL LOSSES AVOIDED



The Moderator coil and condenser bring the aerial circuit into resonance at "medium-wave" frequencies, and thus enable the maximum of power to be developed.

The "DECADE"

WITH SIMPLIFIED



By G. V. DOWD

Who describes a "P.W." set which represents no doubt read about the first model of "P.W." all the features found in

point of view the Extenser is pure gold, for the Daventry's, Radio Paris, London Regional, Northern Regional, and so on are all, in effect, welded into the one tuning band.

And it must be admitted by all that it is no small advantage to have the one switch which figures on the panel doing the one "stop-start" job.

The Extenser not only simplifies, but it also tends to increase a set's operating efficiency because it reduces and simplifies the wiring.

These facts will, of course, be well known

YOUR SHOPPING LIST FOR THIS

- 1 Panel 12 in. x 7 in. (Peto-Scott, Permcol, Ready Radio, Wearite, Lissen).
- 1 Baseboard, 12 in. x 7 in. x 1 in.
- 1 Cabinet to fit above (Peto-Scott).
- 1 .0005-mfd. Extenser with disc drive (Telsen Telexor, Cyldon, Wavemaster, Formo).
- 1 .0001-mfd. differential reaction condenser (Lotus, Ready Radio, Telsen, Cyldon, J.E., Polar, Wavemaster, Magnum).
- 1 .00075-mfd. solid dielectric condenser (Magnum, Polar, Telsen, Ready Radio).
- 1 Push-pull on-off switch (Bulgin, Lissen, Telsen, Ready Radio).
- 4-pin valve holders (Lotus, Lissen, Telsen, Graham Farish, W.B., Tunewell, Igranic, Clix, Benjamin, Bulgin).
- 1 Dual-range coil (Colvern R.M.3).
- 1 Moderator coil (Ready Radio, Peto-Scott, Sovereign).
- 1 .001-mfd. max. compression condenser (Lewcos, Sovereign, Goltone, Graham Farish, Formo, Polar).
- 1 .01-mfd. mica condenser (T.C.C., Dubilier, Telsen, Lissen, Graham Farish).
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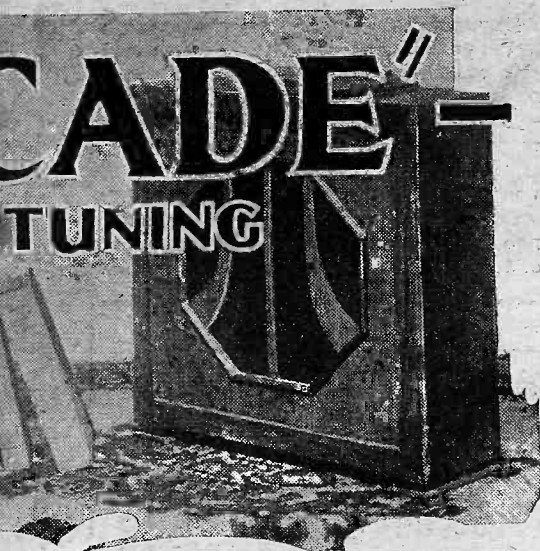
1 Block of wood for mounting

NO WAVE-CHANGING



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A SET WHICH UNIFIES



Associate I.E.E.

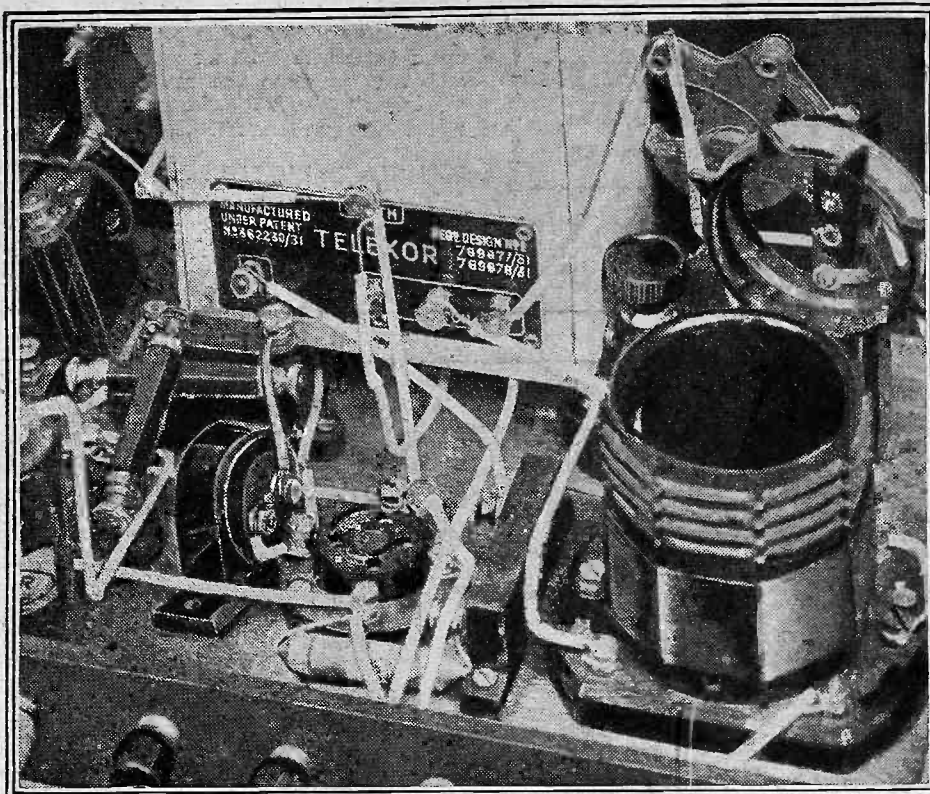
ultimate in simplified effectiveness. You have a universal receiver—well, this model embodies plus Extenser tuning!

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(Continued on next page.)

ER-ATTRACTIVE RECEIVER

ic, Tunewell, Slektun, -Scott, etc.). ator coil, 1 1/2 in. high.

SWITCHING



- 8 Indicating terminals (Bulgin, Belling Lee, Eelex, Igranio, Clix).
- 18-gauge tinned copper wire and sleeving (Wearite or Quickwyre, Jiffilinx, Lacoline).
- Flex, screws, etc.
- Battery Plugs (Belling Lee, Eelex, Clix, Bulgin, Igranio).

ACCESSORIES.

LOUDSPEAKER.—Blue Spot, Celestion, H.M.V., Marconiphone, B.T.H., Epoch, R. & A., Cossor, Graham Farish, W.B.

VALVES.—For use with battery H.T.—Detector: Marconi H.L.2, Mazda H.L.2, Mullard P.M.1H.L., Cossor 210H.L., Osram H.L.2, Tungsram H.210, Eta B.Y.2020, Lissen H.L.2, Six-Sixty 210 H.L., Triotron H.D.2, Dario H.F.

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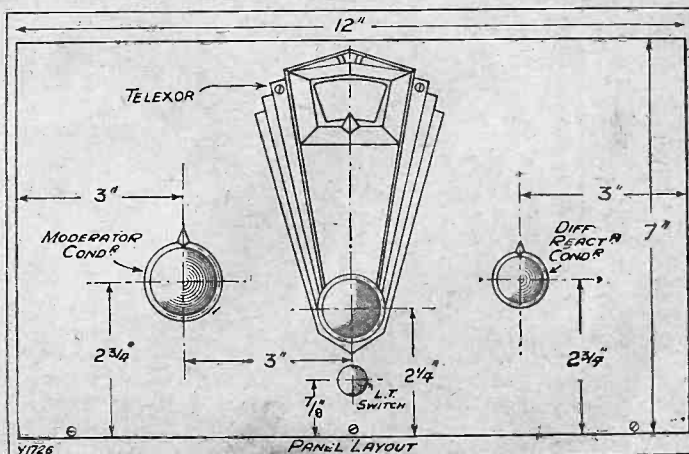
BATTERIES.—H.T., 120 to 150 volts (Lissen, Pertrix, Ever Ready, Drydex, Siemens, Cossor). Super capacity should be used.

G.B., to suit output valve (Ever Ready, etc.).

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

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THE WAVEBANDS

THE "DECADE" WITH SIMPLIFIED TUNING.

(Continued from previous page.)

gather from the rather unusually large number of component alternatives given in the accompanying list.

In the assembly of the set there is only one point which calls for special mention, and that concerns the mounting of the "Telexor." The L.T. switch must be wired up before the "Telexor" is finally in position.

Wiring for the Dial Light.

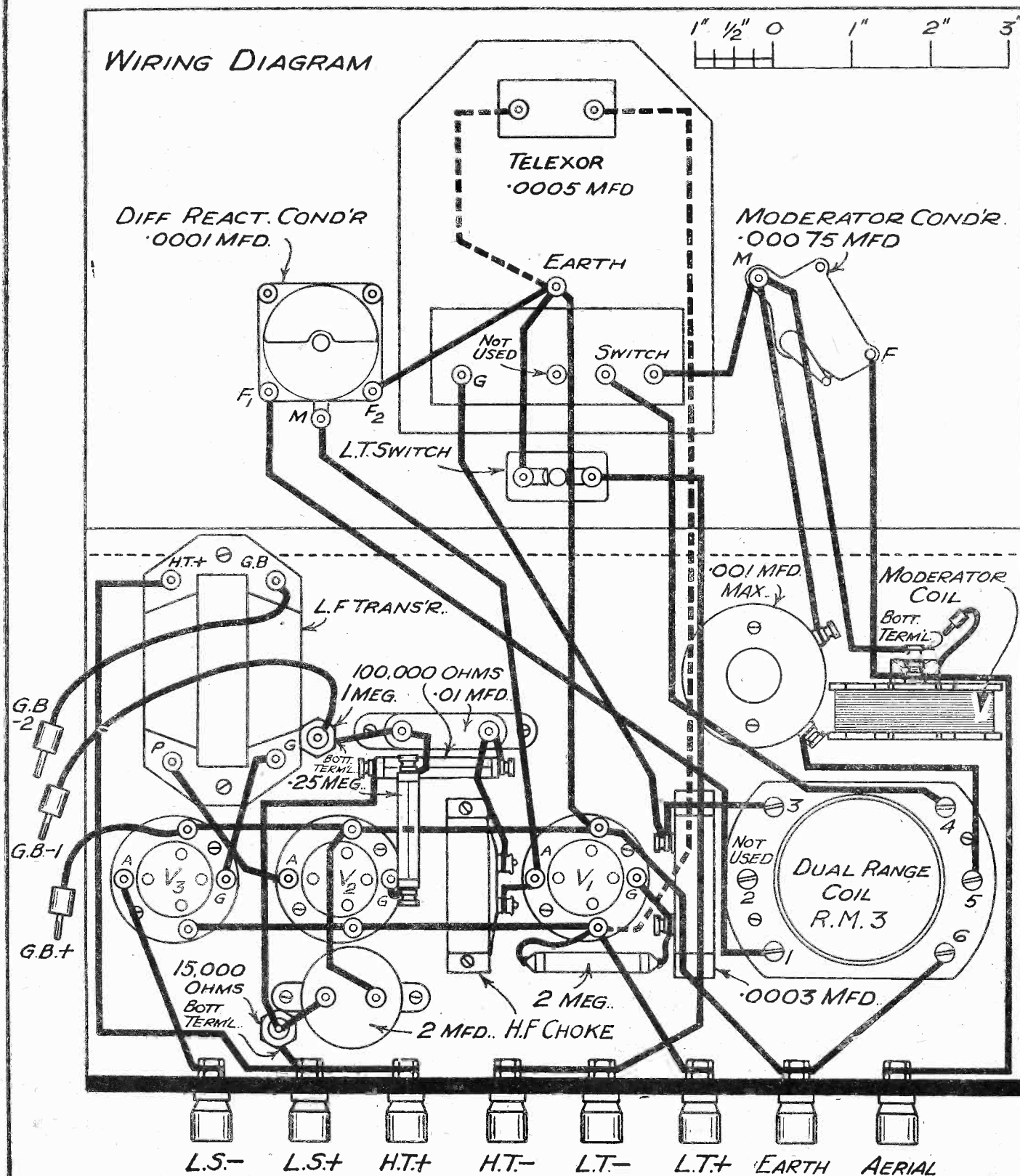
You will notice that the wiring diagram shows dotted lines running to the top two "Telexor" terminals. These indicate the dial-light leads.

Obviously, a dial light is not essential to the operation of the set, but it is a valuable refinement and one which we recommend constructors to take full advantage of.

This light is wired across the low tension supply in such a way that the on off switch of the receiver controls it as well as the valves.

Next week we will give you some further notes on the construction and installation of this outstanding receiver.

T/70



The dotted lines indicate the dial-light leads. Constructors should note that the L.T. switch must be fixed and wired before mounting the "Telexor."

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my H.T. worries"

Pinewood Avenue,
Crowthorne,
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April 30th, 1932.

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MILNES H.T. SUPPLY UNIT

PRICES IN U.K.

£ s. d.

90-volt 2.18.0

120-volt 3.16.0

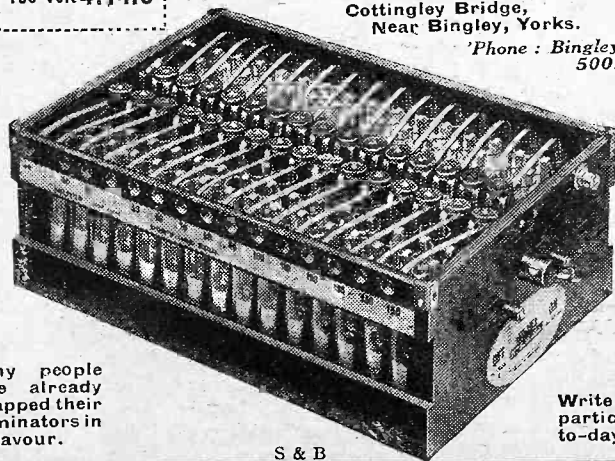
150-volt 4.14.0

SUPPLIES H.T. CURRENT
FROM L.T. ACCUMULATOR

MILNES RADIO CO.,

Cottingley Bridge,
Near Bingley, Yorks.

Phone: Bingley
500.

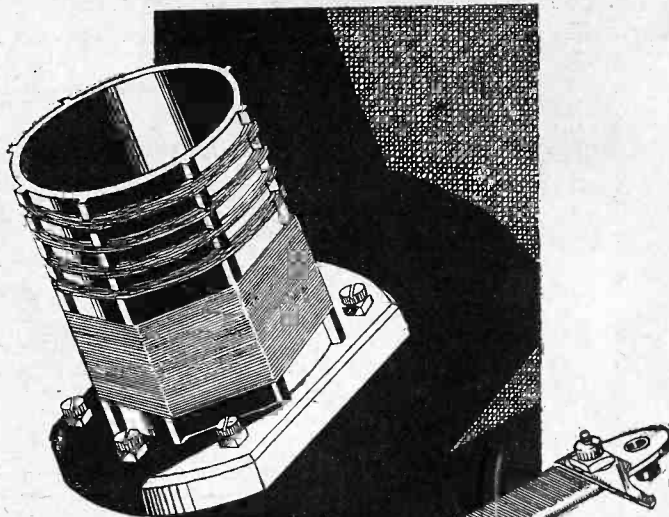


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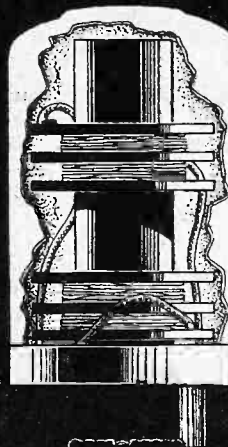
S & B

Write for
particulars
to-day.

Colvern components for every receiver



For
"The Decade"
Colvern RM3
Dual Range Coil
with reaction.
8/6



For Mains Units
and Decoupling.
Fit Colvern Strip
Resistances.
Rating 5 watts—
wire-wound.
10-25,000 ohms
1/9 each
26,000 - 50,000
ohms
2/3 each

For your Super-
Het. Colverdine
intermediates
with variable
coupling and
limited range
adjustment to
compensate for
circuit capacity
12/6

Colvern coils are available for every type of modern receiver. The leading designers specify Colvern components and the confidence they place in them is a sure guarantee of their excellence and reliability. Wherever the best is needed, the choice always falls on Colvern.

COLVERN LIMITED
MAWNEYS ROAD, ROMFORD, ESSEX.

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.

OUTSIDE INTERFERENCE—EFFECT OF CONE ON TONE—RUNNING A LONG LEAD-IN—CONCERNING CONDENSERS.

Curing Crackle.

B. B. (Hastings).—"I am unfortunate in being situated near an electric motor which causes crackling noises in my loud-speaker. A friend has advised me to put my set in a metal box. Do you think that this would help matters?"

Take off the aerial, being sure this does not allow the set to oscillate.

To be sure of this, touch the aerial terminal with your finger. The loudspeaker must not go boomp, boomp, or make any loud sound as you put your finger on and off.

You have now got a set with the aerial disconnected and yet not oscillating. Does the crackle continue?

If moving the aerial does not stop the noise, and if you have electric mains, and if you work the set from the electric mains, you may find a cure by inserting air-cored chokes of low D.C. resistance in the mains and shunting with a small (if A.C. mains) or large (if D.C. mains) condenser, as shown in my diagram.

This may stop crackles.

These may then come in again when you replace the aerial. Now go to the owner of the motor and ask him if you may get someone to connect anti-interference devices to it. Write to the B.B.C. about this.

I think screening the set is the least useful remedy.

* * *

Moving-Coil Diaphragms.

N. K. L. (Southampton).—"In the case of a moving-coil loudspeaker, what bearing does the diameter and rigidity of the cone diaphragm have on reproduction?"

"Does stiffness improve the high notes, and any increase in cone diameter the low notes?"

Phew! No, sir! This problem involves about ten independent values, as, e.g. position of coil drive relative to cone dimensions, cone dimensions, cone edge mounting stiffness, cone stiffness, cone homogeneity, cone mass, eddy currents in pole-pieces, and so on and so forth.

I, for one, am not such a fool as to think I could tackle the problem, while I am wise enough to suspect the theoretical results of those who have been brave enough, at any rate, to tackle them.

In general, one may say that at low notes it is probable that the cone moves in and out like a piston as a whole.

At higher notes, the cone tends to break up, when parts of the cone are stationary and parts move.

This breaking up contrives to be more pronounced and complex as the note is higher. You can damp the edge of an

M.C. speaker without affecting most high-note reproduction.

* * *

A Rattling Baffle.

W. W. (Stony Stratford).—"I have been using for some time a thin baffle-board approximately 4 ft. by 4 ft. Would there be any advantage in increasing the thickness of this to, say, $\frac{1}{2}$ in., or would even 1 in. be better?"

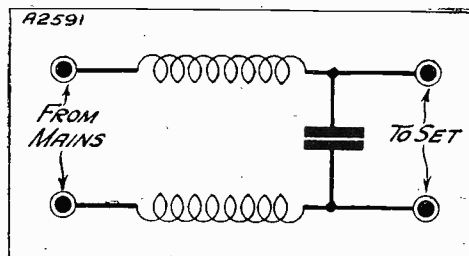
"My trouble, which I am unable to cure, is an annoying rattle on certain notes."

Question.—Does the baffle rattle, or is the rattle due to something other than the baffle?

Answer.—Remove the speaker from the baffle and see if you can hear the rattle. If you cannot hear the rattle it was the baffle, but if you still hear the rattle you cannot blame the baffle.

Advice.—If it is the baffle which makes the rattle, shake the baffle till you locate the rattle, and then use your common sense to

A MAINS SILENCER



You should try this scheme if you are troubled by H.F. interference coming "down" your mains.

cure the rattle in the baffle. Make it thicker, stiffen it with battens, use a 5-ply backing—anything to stop the rattle in the baffle.

But if it is not the baffle that makes the rattle, I am baffled to know what the rattle is. It may be the speaker, or an overloaded valve, or—it may be a host of things. You will, I hope, find the rattle in the baffle and cure it.

* * *

Wall Losses.

A. N. (Mottingham).—"I have just had a puzzling experience. Owing to the fact

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."



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.

that I had to move my set into another room, I took my lead-in along the picture railing and secured it in position with the aid of insulated staples.

"I now find that I lose considerably in volume unless I remove the staples so that the lead-in is clear of the wall of the room. When this is done volume returns to normal. Why is this?"

Certain walls are very "lossy." The high-frequency currents in the aerial set up electric and magnetic fields near the aerial.

If these rapidly changing electric fields have to be created and destroyed and then recreated near a material substance, then the process absorbs more energy than if the aerial is isolated from anything but air.

Walls give what is called "dielectric loss"—that is, a loss due to setting up electric fields, whereas iron and steel near aerials give rise to "eddy current" or magnetic field loss. The absorption of energy is from the aerial into the wall, and hence there is less energy available for the set.

* * *

Non-Inductive Condensers.

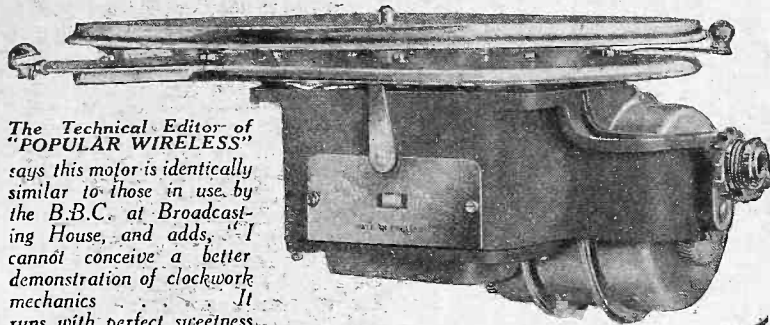
E. J. R. (Dovercourt).—"Recently a number of manufacturers have produced non-inductive coupling condensers. Would there be any advantage in using this type of condenser for coupling purposes in the R.C. stage of my set—as against my present mica?"

I think the non-inductive type of condenser was produced largely for high-frequency decoupling, wasn't it?

In any case, if you've got a mica condenser for R.C. coupling you cannot do better. Lucky man!

So many people use these other paper condensers, and while they are perfectly good for fairly low-voltage work, I always like a high voltage and a good mica condenser.

*A Special Offer
you must not
Miss*



The Technical Editor of "POPULAR WIRELESS" says this motor is identically similar to those in use by the B.B.C. at Broadcasting House, and adds, "I cannot conceive a better demonstration of clockwork mechanics. It runs with perfect sweetness and dead silence. . . . it will be an exceptionally good (and probably extremely expensive!) electric motor which will displace this bargain-price triple-spring motor."

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May 28th, 1932.

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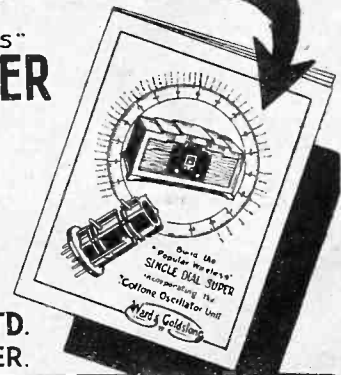
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FROM THE TECHNICAL EDITOR'S NOTE BOOK.

Tested and Found—?



A FIXED POTENTIOMETER.

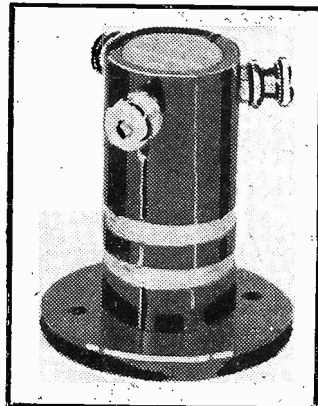
THERE are many sets which would undoubtedly benefit by the introduction of the Bulgin fixed centre-tapped potentiometer. This component is electrically identical to an ordinary 400-ohm potentiometer, but instead of a moving contact, it has a centre tap, thus enabling the grid leak return of a detector valve permanently to be joined to a point midway between L.T. positive and L.T. negative.

But there is, in addition, a .001-mfd. fixed condenser incorporated in this Bulgin

component which has the important duty of by-passing stray L.F. currents.

Nevertheless, the price of the compact little article is only 3s.; so, in addition to its simplifying qualities as compared with a separate potentiometer and

A USEFUL DEVICE



The Bulgin centre-tapped, fixed potentiometer.

condenser, it scores in point of cost.

The advantage accruing from the use of the device in a detector circuit is an almost invariably smoother reaction control. But it has other uses, such as the formation of a centre tap in the filament winding of a power transformer in a mains set.

I have used the Bulgin centre-tapped fixed potentiometer for both the above-mentioned purposes, and find it perfectly satisfactory.

MARCONIPHONE DRY BATTERIES.

A new range of these has just made its appearance. It comprises grid bias and H.T. types of popular sizes, selling at highly competitive prices.

LUXURY SOLDERING.

Once you have used an electric soldering iron you never want to go back to the flame heated kinds. For one thing, an electric iron maintains an even heat and enables long jobs to be tackled without the

necessity of frequent stops while the iron is "cooking up."

Again, there is no soot or rapid oxidation to combat and so it is much easier to make clean, efficient joints.

Browning's Electric Co., of East Ham, manufacture an excellent electric iron for radio work. It is light and only weighs

7 oz. and its consumption, 45 watts, is less than that of one ordinary electric-light bulb.

Its price complete with adaptor and flex is 10/-, and the article carries a six months' guarantee. What I particularly like about it is the fact that its element is very easily replaceable and that new elements are readily obtainable at only 2/9 each.

VERY USEFUL.

I have just met "Celfix" for the first time, and henceforth I am always going to have a 6d. reel of it by me, for it is a most useful material.

It is a fine cord or a thick thread (whichever you like), treated in the same way as that sticky tape—not the black but the medical variety.

And if you want to bind up the end of a radio set lead or bind the handle of a cricket bat or golf club or tennis racket, or cover the handle of a kettle, or do any one of a hundred other such jobs, you merely wind some Celfix on and it fixes itself into place.

It doesn't soil the hands, either, and is water- and heat-proof. Also, it is tough.

Radio enthusiasts, electricians and sportsmen alike should all welcome this new material with open arms.

THOSE SIBILANTS.

During a practical test of the M1 Ferranti moving-coil chassis, I compared the reproduction of this speaker with an earlier type of different make. The result was interesting, even amazing.

And the most marked difference between the two instruments was the difference between their rendering of sibilants. Indeed, to all intents and purposes, these were absent in the one case, and speech came over like this: "Here i' the fir' new'."

But with the Ferranti M1 the "s's" were crystal clear, and

there was not the faintest suggestion of muzziness.

The M1 is a fine speaker, wonderfully sensitive and bell-like in its clean over-all response. Many constructors might think it high-pitched simply because it does do the high notes justice and has none of that woofy boominess so commonly met with in the earlier moving-coil speakers.

But, thank goodness, the "mellow" phase of radio reproduction has practically ended. Do you remember the time when the popular idea of loudspeaker "perfection"

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.

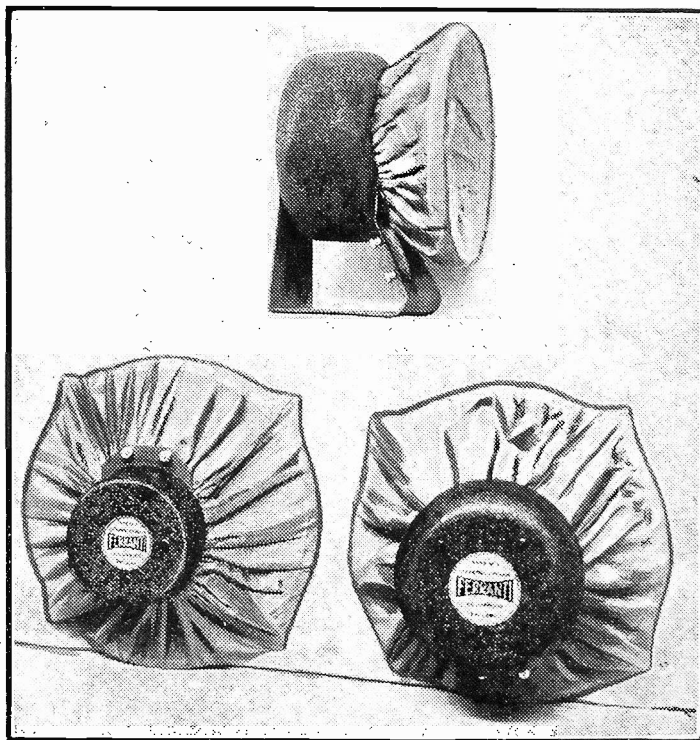
We should like to point out that we prefer to receive production samples picked from stock, and that we cannot in any circumstances undertake to return them, as it is our practice thoroughly to dissect much of the gear in the course of our investigations!

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.

was a more or less complete absence of high notes? I expect most of you very clearly do. Of course, there was a reason for this... there was so much distortion in the average set that a "faithful" response would have been intolerable; a Ferranti M1 would have been far too good to prove successful!

The M1 costs £7 10s. as a chassis, but it is well worth it; and if you cannot possibly run to that figure, then there are the M2 and M3!

HIGH-GRADE MOVING-COIL SPEAKERS



The Ferranti M1, M2 and M3 permanent-magnet moving-coil speakers.

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B.I. Enamelled wires are unequalled for the field windings of small motors, measuring instruments, radio transformers, and other pieces of electrical apparatus where space is all-important. They are produced throughout in our own works, from the raw material to the finished wire, and every phase of manufacture is under the strictest control as regards quality of material and accuracy of gauge. B.I. Enamelled Wire is unexcelled for its high insulation, dielectric strength, flexibility of enamel, and general dependability. We regularly manufacture Enamelled wire as fine as .002" dia.



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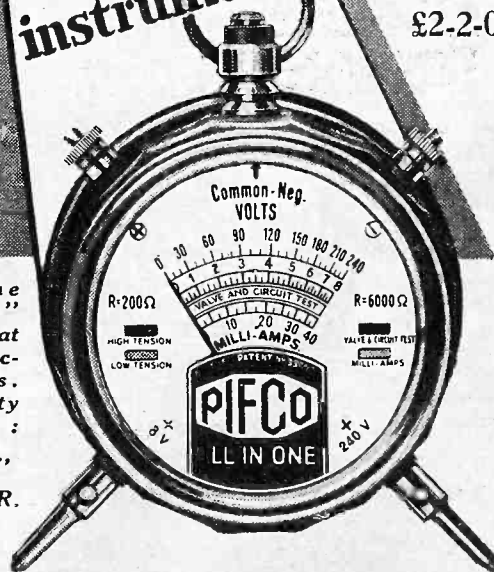
Standard Model for Battery Sets only,

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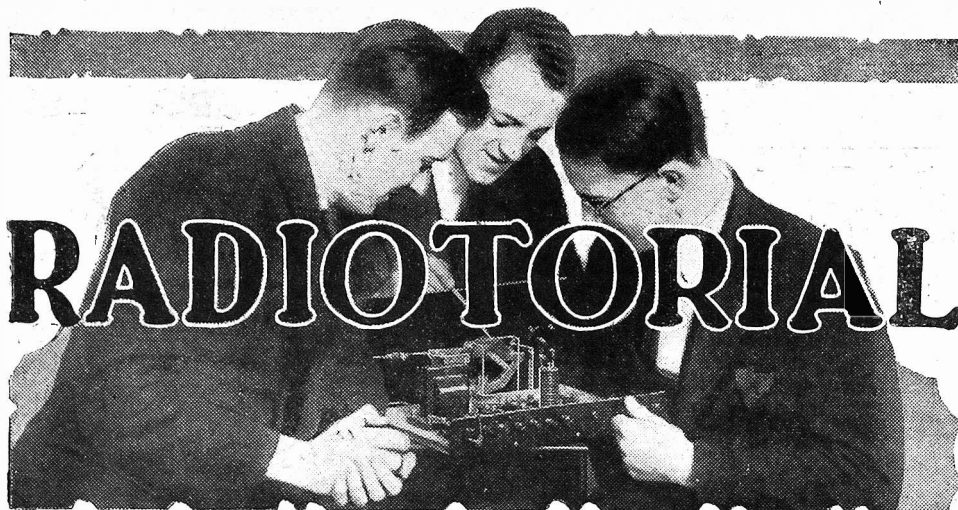
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RADIOTORIAL

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

SUPER CAPACITY NEEDED.

"LONGSIGHT" (Manchester).—"With the old set I always paid a little over ten bob for the H.T. Battery, and with one much-cussed exception it always lasted satisfactorily. (Never much less than three months, and often quite a bit more.)

"According to the milliammeter tests made at different times, 9 milliamps was the normal for that set, though it varied a little on either

HOW ARE YOUR RESULTS NOW?

Perhaps your 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 its unrivalled service.

Full details, including scales 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.

side of that figure according to the actual valves in.

"The new set takes 13½ or 14 milliamps. And the dealer says that is why my old standard type of batteries will not be suitable for the set, and why I should not attempt to run it from one of them.

"He wants to sell me one running up to the £1 mark (but only the same voltage!), and he says it will be the most economical way to go to work. Is that correct?

"I asked because he said, if I liked, I could write to you and he knew you would say he was right."

Yes, he is quite right. If the set is used under normal conditions an output of 14 milliamps or

thereabouts is too much to expect from standard size batteries, and you need one of the super sizes.

A "COSMIC" DISAPPOINTMENT—AND THE CAUSE OF IT.

L.G. (Nr. Gillingham).—"Imagine my disappointment when I switched on the 'Cosmic' and heard nothing. Nothing at all.

"I turned the tuning and I turned the reaction, but not even a whistle rewarded me. It was sickening.

"Perhaps you can guess what was wrong, but I can tell you I had no means of knowing where to look for a fault, and I just kept turning the dials and looking back at the blue print, only to find everything appeared all right, though nothing in the way of a sound was forthcoming.

"But one thing I did notice. When I put the H.T. + 2 plug in the H.T. battery, I got a good click in the loudspeaker. But H.T. + 1 could be moved to any voltage, and there was no click.

"In the end, I put the set away and went to bed, heavy hearted. But I mentioned this 'click' business of the one plug and not of the other to my friend when he came over the day after. And he said it looked as though the 100,000 resistance was a dud.

"He had a 50,000 spaghetti on him so we thought we would try this, but the results were no different. Finally, he said 'perhaps it is the H.F. choke' so we took that out and put the 50,000 in instead, and away she went! Glorious!

"Evidently there was a break inside the choke—it was all right as far as you could tell by looking—but what is puzzling me now is, whether I ought to get another choke, or leave it out and use the spaghetti instead. Is there any objection to this, as I certainly do not want anything better than the results I get now?"

No. There is no objection to the use of the resistance instead of the H.F. choke if reaction is O.K.

The idea of the choke instead of the resistance is, that with some detector valves and H.T. conditions it gives better reaction results. But in your case the spaghetti is perfectly O.K. apparently, so we should continue to use it.

WAS IT THE BATTERY?

The question above which was raised by a Watford reader in "P.W." No. 519 (dated May 14th) seems to have attracted such wide attention that the trouble experienced—unexpected running-down of a new H.T.

battery in about three weeks—must be much more common than is generally supposed.

Most of the readers who wrote, mentioning the experience of "Worried" admit that in their own cases they found the cause to be one of those named; but some interesting

DO YOU KNOW—

the Answers to the following Questions?

There is no "catch" in them; they are just interesting points that crop up in discussions on radio topics. If you like to try and answer them, you can compare your own solutions with those that appear on a following page of this number of "P.W."

- (1) How many broadcasting stations Paris has?
- (2) What are the names of all the Paris stations?
- (3) Who invented tuning?
- (4) Who first noted that radio reception was usually at least twice as good by night as by day?
- (5) What is a watt?

ANSWERS to the above questions will be found on page 454.

exceptions occurred in which the cause of the trouble was in no way connected with a run-down battery.

For instance, a North London reader—A. S. of Highbury—recounts an unusual experience in the following letter:

"I was in the same position as 'Worried,' (Watford) but I am using a 12 m.a. Eliminator, with 60 volts on the Det. (H. L. 2). I have tried a 20-henry choke and condenser, but only to find that it sets up distortion.

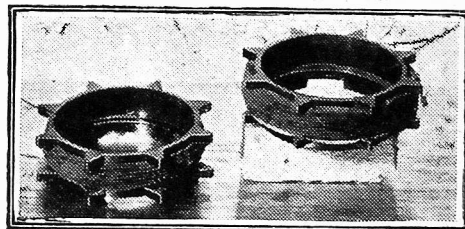
"I removed these and purchased a P.M.2.DX, but it still whistled. I tried all the hints that I have read in 'P.W.' but to no avail.

"At last I tied some thin rubber round the H.L.2 and the whistling stopped. I have since tried a very cheap det. valve, and that does not whistle, but it does not give such good results.

With regard to the 'Cosmic Star,' I have nothing but praise. Up to the present I have received 30 stations including America, but the medium-wave stations are received in queer places on the dial, e.g. Midland Regional, dial 33; Tapping 2, or any other

(Continued on page 454.)

WHAT'S WRONG?



COIL MOUNTING

One of the most important things to watch when mounting coils is that they are well spaced from other coils, and also from metal screens, etc.

In the illustration the Coil Quoit on the left would give very poor results, because it is lying on the metal baseboard. Lift the coil by an insulator, such as a wooden block (right), and the fault would disappear.

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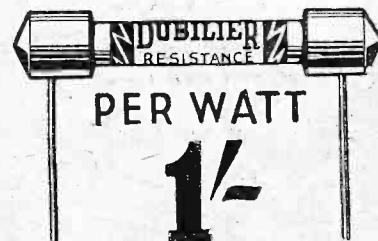
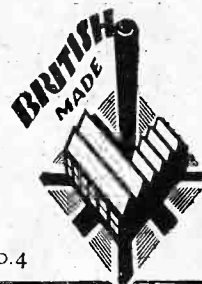
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Their performance in every way matches their phenomenal strength. Dubilier Metallized Resistances are made under a patent process and their range embraces a Resistance for every need.

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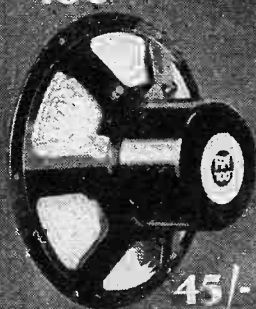
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RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 452.)

tapping. London Regional, dial 50; Tapping 2, or any other tapping. London National, dial 72; Tapping 2, or any other tapping.

"Yours faithfully,

"A. S."

This apparently-wrong position of the stations mentioned in the latter part of A.S.'s letter is due to the particular dial used—or rather to the scale which is marked in the reverse direction, and thus shows the longer wavelength stations such as Midland Regional on a lower dial reading than the shorter wavelength stations, like London National.

If this fact is borne in mind, there is no need for confusing readings, the only difference being that the normal "top" stations come in reversed, at the lower end of the dial; and of course, the "bottom-of-the-dial" stations such as Cork, Trieste, Belfast, Radio Normandie and London National are arranged

"The unit was made up from a 'P.W.' circuit, and in addition to the H.T.—terminal there is a 2-mfd. condenser beside it. There is another 2-mfd condenser and a 4-mfd. condenser, and also a smoothing choke and 10,000-ohm resistance variable.

"Could you tell me how these are connected together, and to the plug for the mains?"

The usual connections for a simple unit of this type are as follows: Earth terminal to one side of the 2-mfd. condenser. The remaining side of this condenser goes to H.T.—, to one end of the potential divider, to the 4-mfd. condenser, to the other 2-mfd. condenser, and to the negative lead of the plug for mains. The positive lead of the mains plug goes to one side of the variable resistance, the other side of which goes to a 2-mfd. condenser and to a smoothing choke.

The other side of the smoothing choke goes to the remaining terminal on the 4-mfd. condenser, to the end of the potential divider and to the maximum H.T. terminal (H.T.+2). Finally, the slider on the potential divider is taken to the H.T.+1 terminal and this completes the connections.

CHOKE OR RESISTANCE?

"CHOKEY" (Leicester).—"Acting on your advice I successfully replaced an H.F. choke with a spaghetti resistance, and thus improved

"P.W." PANEL No. 76. ABOUT THE VALVE.—MUTUAL CONDUCTANCE

The mutual conductance of the valve is the factor relating anode current change (under working conditions) to grid voltage change. It is, in a sense, a measure of the valve's efficiency to do the work for which it was designed.

If the "impedance" and amplification factor of the valve are known, its mutual conductance can be found by dividing the impedance into the amplification factor multiplied by 1,000.

Thus a valve with $\mu = 180$ and Impedance = 100,000 has a mutual conductance of $\frac{180 \times 1000}{100,000} = 1.8$.

at the top of the dial, instead of at the bottom, with the lowest wavelength corresponding to the highest dial reading.

Another unusual experience arising from run-down-battery symptoms is that reported by a Dorsetshire reader.

Writing from Puddletrenthide he says:

"Perhaps it would interest you to know I have experienced the same trouble as 'Worried' (Watford):

"In my own case I purchased a new H.T. battery and everything appeared O.K. for about two or three weeks, after which the same trouble occurred again. Having given up all hope, or nearly so, I decided to change over the leads to primary winding of the L.F. transformer.

"This completely cured the whistle, and the H.T. battery gives its normal life and the set has since logged over 50 stations.

"Thanking you for some very fine sets, my latest being the 'SQ Star'.

"As a regular reader since March, 1930, I wish 'P.W.' every success.

"I am, yours very truly,

"F. L. B."

The queer part of this case is that, provided only the primary terminals were changed over, as described, there could not possibly have been a removal of the current drain from the H.T. battery! But probably some other condition existed, and was not spotted by F. L. B., but was accidentally (and unnoticed by him) put right when he was making the alterations to the primary.

From the batch of letters received, we are tempted to quote yet another—from an Ipswich reader. But the circumstances and effects in this case are so completely topsy-turvy that we must finish our instances of interesting replies with the above examples.

MAINS UNIT CONNECTIONS.

R. A. S. (Birmingham).—"I have been asked to look over a D.C. mains unit of the type with one variable and one fixed H.T. voltage, the former being a slider on a 20,000-ohm potential divider.

results from my detector valve, which for the past twelve months has been perfectly satisfactory.

"I am now making another set which incorporates an S.G. stage, and the owner of this is wondering whether he can do vice-versa, i.e. use an H.F. choke in place of the 600-ohms resistance which is recommended for the screen of the valve.

"The resistance is the only component to be wired in this lead apart from the bypass condenser, which is connected at the screen end of it, and we have been wondering whether his H.F. choke would act all right as the resistance.

"We do not want to put it in and try it out because space is rather scarce and there is a bit of screen to be cut away, etc. But if you think the H.F. choke will be just as good as the resistance, we could do this while the construction is still in the early stages.

"Would it work the same?"

H.F. chokes are not always interchangeable with resistances in this way, but apparently the purpose of the resistance in the case you mention is just to act as an H.F. choke, in which case a proper H.F. choke would quite likely be satisfactory in its place.

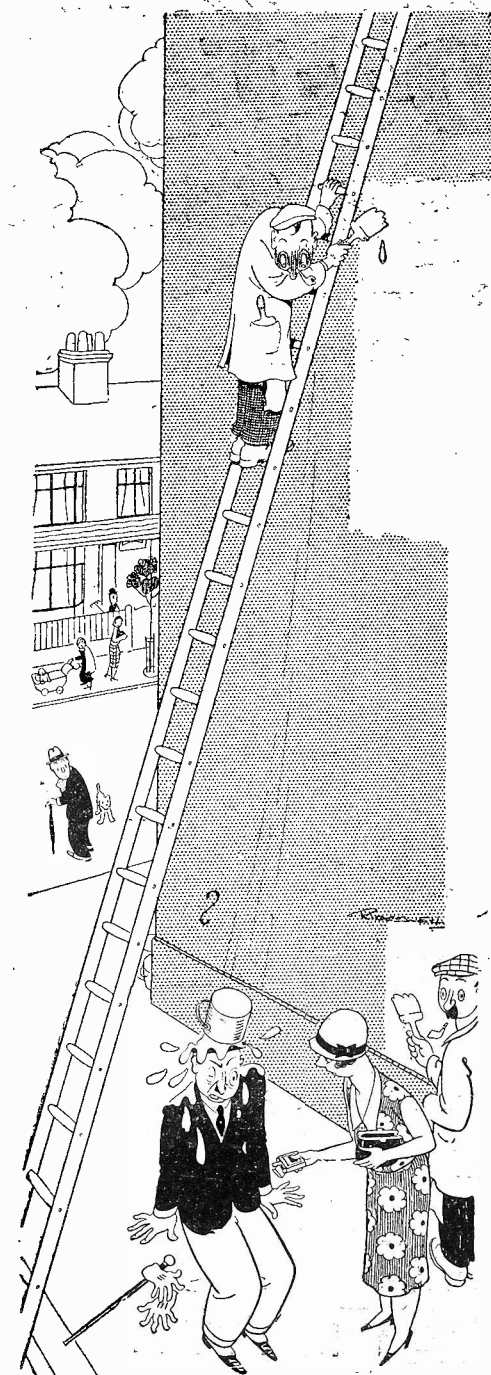
In many cases this would not be satisfactory because the resistance is arranged to drop the voltage simultaneously, and an H.F. choke in place of it would not have the same effect. But where, as in your case, a separate H.T. terminal allows the correct adjustment to be made it will probably be quite satisfactory to use an H.F. choke instead of a resistance.

THE ANSWERS

TO THE QUESTIONS ASKED ON
PAGE 452 ARE GIVEN BELOW:

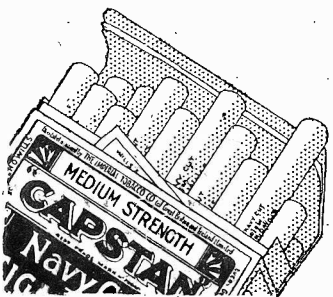
- (1) Six.
- (2) Paris Ecole Supérieure, Eiffel Tower, Poste Parisien, Radio L.L., Radio Paris and Radio Vitis.
- (3) Sir Oliver Lodge, F.R.S. (now "P.W.'s" Scientific Adviser).
- (4) Marconi.
- (5) The electrical unit of power. (It is the power represented by 1 ampere at 1 volt.)

DID YOU KNOW THEM ALL?



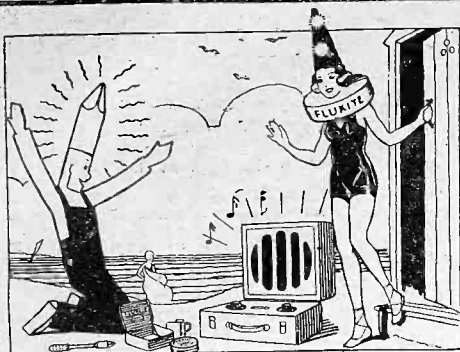
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"We're Fluxite and Solder, the reliable pair, Famous for Soldering—known everywhere! See that we're with you—when out on that trip. Avoid disappointment—have that musical 'dip'!"

See that Fluxite and Solder are always by you—in the house, garage, workshop—anywhere where simple, speedy soldering is needed. They cost so little, but will make scores of everyday articles last years longer! For Pots, Pans, Silver, and Brassware; RADIO; odd jobs in the garage—there's always something useful for Fluxite and Solder to do.

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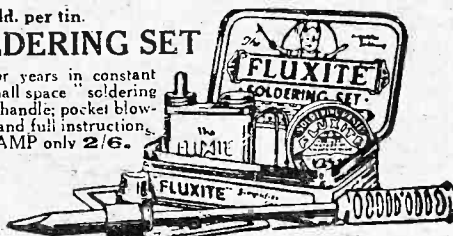
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Extract from the June issue of "Modern Wireless"

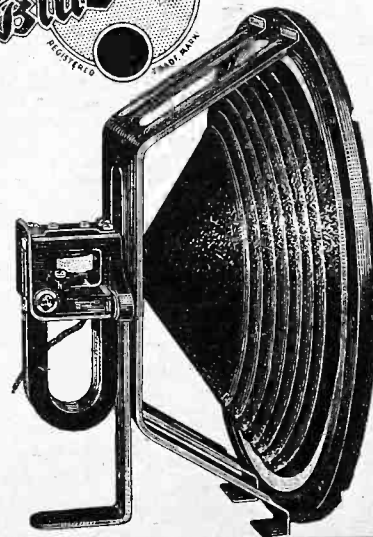
"A new condition is upon us. At one time the superiority of the moving-coil loudspeaker over all other types was freely acknowledged, but the price difference was great.

Nowadays, however, this price gulf is closing up—indeed, it can be said to have closed up so that the moving-coil faces the electro-magnetic principle on equal price terms.

A direct comparison can now be fairly made between the two. And when this is done, the moving-coil does not, in general, stand out as vastly superior as might have been expected.

For one thing, the other types have been greatly improved, and, for another in price—paring the moving-coil some makes have lost greatly in quality.

BLUE SPOT 100U gives a performance equal to a good Moving-coil speaker. Its remarkable sensitivity ensures perfect reproduction for the full musical range and the difficult bass notes especially are made as clear and full and rich as can be desired. This perfection in the lower register is not obtained at the expense of the treble which is clear and liquid in tone with every note given its true value.



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THE LISTENER'S NOTEBOOK

(Continued from page 434.)

so as to make himself easily heard? As it is, one has to listen rather hard to get everything.

And don't you think that Imito's imitations of the trilling birds are absolutely perfect? With the animals, on the other hand, he isn't nearly so clever.

And why does he include the cuckoo in his repertoire? I should have thought this imitation too insignificant an accomplishment for a man of Imito's ability.

I should think Anne Thursfield has supplied amateur sopranos in quest of attractive numbers with songs till Doomsday.

What a prolific song-writer Schumann was, and how tuneful (and short) all his songs are! I think I like the Children's songs best.

Those of you who saw and enjoyed Conrad Veidt's acting of Metternich in that remarkable film, "Congress Dances," must have been mildly thrilled to hear him say, over the ether, how dependent he and all film stars were on the public.

It is, I suppose, something of a thrill to know that we do have so much to do with the ordering of such people's lives.

What fun the Effects Department must have had with Filson Young going West! It was difficult at times to realise that Mr. Young's car was capable of doing the speed he claimed to be doing. To say the least of it, if I were in a car doing sixty, and it made the row his did, I should feel rather uneasy.

Outside Salisbury Cathedral, with the engine still running, it did, I confess, sound something like a car.

As regards the talk itself, although there is much to be said for the style of it, I can't say that I agree with the melodramatic form of delivery. Such a talk doesn't require that.

It did so suggest that the traveller was going to his doom (and the car seemed to confirm that impression, too!).

What have Okehampton and Launceston folk done to our Mr. Young to deserve the testimonial he gave them? I doubt whether they appreciated such advertisement.

It is easy to see why Miss Margaret Bondfield has made such a success of her life. It is not because opportunities just came her way, but rather that she went in search of them and, finding them, made the most of them.

It is extraordinary how certain people and things can always rub one up the wrong way.

"Squirrels' Cage" certainly got my goat. Its ultra-satirical dialogue irritated me to such an extent that I gave it up after persevering with it for half an hour. This satire, however, wasn't entirely devoid of merit, but perhaps it was that on this particular evening I wasn't in the mood for such.

THESE RADIO COMPONENTS

(Continued from page 431.)

In doing all this I was following in the footsteps of other and distinguished investigators and originators. Probably, R. E. H. Carpenter, the father of fine-quality technique, H. L. Kirke who did elaborate experiments for the B.B.C. on the same lines and proved the necessity for resistance-capacity technique and push-pull, and Mr. Denman who actually made practical use of his confirmation of those results and used Mr. Carpenter's circuits in the Science Museum Receiver. It has always seemed strange to me that the B.B.C. did not use Mr. Carpenter's circuits, but doubtless there is some explanation.

B.B.C. Practice

Thus, I cannot think that transformers are good in high-quality practice, and the curious thing is that their use is still to be questioned (and may still produce a noticeably worse result) even after the B.B.C. have considerably spoiled things by using—doubtless for some good reason—five or six of them in cascade before the result reaches us.

In all this I am speaking of *real* quality, quality very few people ever hear or dream it is possible to hear. In fact, so good is the kind of quality I talk about that some people saturated with the usual stuff say they do not like it—it doesn't sound like a loud-speaker any more! This kind of quality is affected by the non-linearity and the transient-distorting qualities of iron.

BATTERIES OR ALL MAINS?

The Editor, POPULAR WIRELESS.

Dear Sir,—I have read with great interest the article by Capt. P. P. Eekersley, M.I.E.E., in your issue of the 21st May on the subject of Dry Batteries.

The object of this letter is not in any way to enter into an argument with your distinguished contributor on a subject so controversial as the battery-driven set versus the all-mains set, but, being in the dry battery business myself, I do feel that Capt. Eekersley has not been quite fair to us, as I maintain that reception from a set driven by really good batteries is at least equal to the reception which can be obtained from any all-mains set or a set working through an H.T. eliminator.

Doubtless you will consider that these remarks are somewhat bigoted in view of my position, but the trouble which a battery manufacturer experiences is largely due to the absence of knowledge on the part of the battery user as to how this very important accessory should be used, and owing to its misuse, batteries have been branded as bad by a good many people.

In order to educate the public in the use of their dry battery, my company has recently issued a booklet in which we have tried to explain in very simple language the functions and uses of the high-tension side of their set.

A copy of this booklet is enclosed for your perusal, and I would like to take this opportunity of saying that if any of your readers who are battery users would be interested to receive a copy of this booklet free of all charge to themselves, I shall be only too happy to see that this is forwarded if they will be good enough to send a postcard direct to the Edison Swan Electric Co., Ltd., Dry Battery Dept., Ponders End, Middlesex.

Naturally, this booklet has not been issued without the hope that it will bring to this company a certain measure of business, but, on the other hand, if the distribution of this booklet will help towards the correct usage of this much-abused accessory as a whole, then I shall feel that its issue has been amply repaid.

I am, dear sir,
Yours faithfully,
For The Edison Swan Electric Co., Ltd.,
R. C. GOMINGE,
Manager, Dry Battery Department.

TECHNICAL NOTES

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

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

Amplification Without Valves.

A GOOD deal of success is being attained in regard to the amplification of the sound from gramophone records by means of a pick-up comprising a carbon microphone instead of the usual magnetic pick-up amplified by valves. The idea of a carbon microphone attached to the stylus of an ordinary gramophone soundbox is a very old one, and dates back long before the war. But in those days small microphones were not nearly so efficient as they are now and, although good amplification could be obtained quite easily, the quality was apt to be rather poor.

But in these days very efficient small microphones can readily be obtained, and the quality which you can get by this sort of arrangement is very much better.

A Microphone Dodge.

The scheme is simply to attach the microphone either to a special stylus bar or more simply to the centre of the sound-box diaphragm and, using a pair of very fine flexible leads, to place it in series with a battery of, say 4 or 6 volts, and in series also with the primary of a suitable step-up transformer. The amplified output is obtained from the secondary of the transformer and may be reproduced through a loudspeaker.

There are various elaborations of this scheme, but the above-mentioned is the basic arrangement. It has the obvious advantage that no valves or other apparatus are necessary, and if you do not want a particularly large amount of amplification you will find the arrangement very interesting to experiment with.

Radio in Cars.

This summer will also see a great increase in the use of radio sets out of doors. The popularity of wireless sets installed in cars has now increased so much in the United States that practically all the car manufacturers there are equipping cars with built-in aeriols. It seems likely that the same kind of thing will happen in this country, and, indeed, several manufacturers are now prepared to install an aerial in the roof of a car and fit in the necessary receiving gear as alternative standard equipment.

Pentode Output.

A pentode valve is particularly designed to provide a large output from a relatively

(Continued on next page.)



Patent

The whole flex gripped—copper, rubber and braiding. No sharp cutting edge; no loose, straggling ends.

No jagged saw-cuts or cross holes to strip the thread inside the cap.

No cutting of flex..No stripping of thread

Grips every battery socket and stays put even in portables under vibration—the resilient hard-drawn spring wireprongs (not soft brass) ensure exceptional self-adjustment and strength of contact. Side entry, with patent loading device—no tools required. 12 permanent indications.

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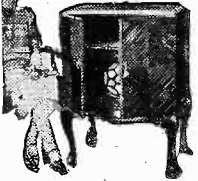
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Polished Oak, Piano Tone Cabinet (42 in. high, 24 in. wide). ON APPROVAL at Makers' Prices! You may return at our expense if you wish to part with it. 3,000 clients B.B.C. Radio Press. All Models from 35/- to £15.



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JARS (waxed), 2 1/2" x 1 1/2" sq. 1/3 doz. ZINCS, new type 10d. doz. Sacs 1/2 doz. Sample doz. (18 volts), complete with bands and electrolyte, 4/1 post 9d. Sample unit, 6d. illus. booklet free.

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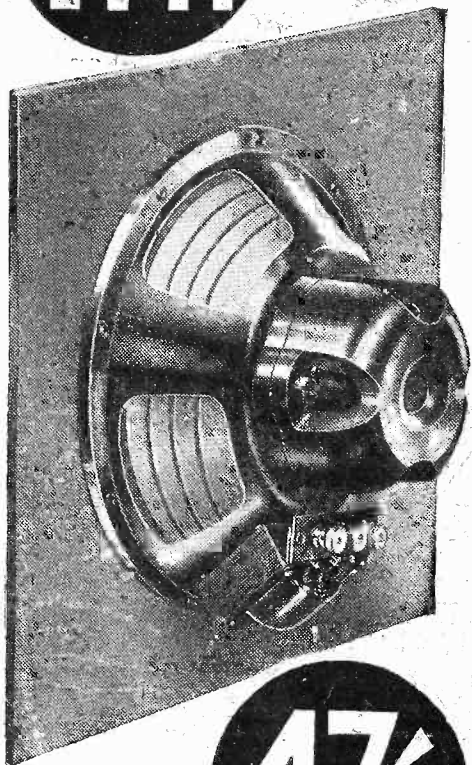
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MAGNET
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London Showroom: 106, Victoria St., S.W.1.

TECHNICAL NOTES

(Continued from previous page.)

small input. Quite a small pentode will give as much as 400 milliwatts when fully loaded using, say, 150 volts high tension and a grid-bias voltage of about $7\frac{1}{2}$ volts negative. It is true that the same output can be obtained from an ordinary power valve; but for that purpose not only must 150 volts high tension be used, but also a negative grid bias of 24 volts, or even more is necessary.

Overloading Troubles.

Whilst a pentode can be used in any part of a low-frequency circuit, nevertheless care must be taken that it is not preceded by too much L.F. amplification, otherwise the input into the pentode will be too large and the valve will be seriously overloaded. This is what often happens when pentodes are used, particularly by amateurs, who tend to kill the goose that lays the golden eggs, as it were.

Knowing that the pentode gives a relatively large amplification, they seek to overdo this by putting in a larger input and expecting a correspondingly larger output. As I have said before, the benefit of the large amplification of the pentode can only be obtained when the whole power dealt with is kept within the proper limits. The way to look at the matter is not so much that the pentode gives a very great amplification, but rather that for a reasonable output it requires only a very much smaller input than ordinary valves. This overloading of pentode valves produces large voltages between the electrodes, and is a frequent cause of the breakdown of these valves.

Pentode Voltages.

With small pentodes the anode voltage may generally be about 150 and the auxiliary grid voltage about 120. If you are using batteries it is a simple matter to adjust these voltages fairly accurately, but with a mains unit quite a good deal of care must be taken.

Not only is the voltage from any tapping on the mains unit liable to be very different from the rated value, but it will jump about according to the load which is placed on the unit, and any alteration of the load on different parts will necessitate a check-up of the voltage delivered by any tapping. This is specially important with pentodes and screen-grid valves, both of which depend so very much for their efficient working upon correct voltages being applied to the different electrodes.

Filter-Feed.

With a pentode it is generally desirable to feed the auxiliary grid by means of a filter circuit consisting of a resistance and condenser, the grid being connected to the mid-point of the two.

Where the voltage of the grid is to be kept below a certain definite value any extra voltage from the high-tension supply can very conveniently be "dropped" in this resistance. A flexible wire-wound resistance forms a convenient unit for this purpose, by the way.

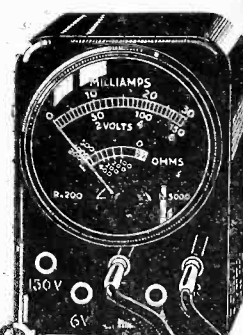
With an ordinary valve one is accustomed to assume that little or no current passes in the grid—which, of course, is the control

(Continued on next page.)

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YOUR
SET**

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BRITISH METERS**



WATES UNIVERSAL METER will tell the condition of batteries and locate any and every fault. No skill required to test voltages, milliamp consumption, valves, transformers, coils, condensers, short circuits, resistance values, distortion, connections. Four readings on one dial: (1) 0-150 volts for H.T.; (2) 0-6 volts for L.T.; (3) 0-30 milliamps for current consumption; (4) Resistance test 0-2,000 ohms. Of all [dealers] or direct, including special 4-page instruction leaflet - **12/6**

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ANSWERS

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TECHNICAL NOTES

(Continued from previous page.)

grid—but with a pentode, remember that the auxiliary grid may carry quite an appreciable current, as much as three or four milliamperes.

Importance of Auxiliary Grid Voltage.

The output from a pentode depends very much upon the voltage applied to the auxiliary grid, which consequently should be as high as possible if we wish to get the maximum output. As the voltage on this grid is reduced the anode current falls accordingly, and therefore also the power which the valve gives.

A curious and important feature of a pentode valve is that the load does not greatly affect the current flowing in the anode circuit as a result of the signal applied to the grid. This is owing to the relatively high impedance of the valve. From this it follows that the higher audio-frequencies are apt to be stronger in the anode circuit with a pentode valve than when an ordinary three-electrode valve is used.

H.F. Stoppers.

Fixed resistances are often introduced into the grid-leads of L.F. valves in order to prevent or minimise trouble owing to H.F. currents getting into the L.F. circuits, and so on to the loudspeaker. The effect of the resistance is to bring down the voltage of the H.F. currents applied across the grid-and-filament path of the valve. You will notice that we have here a capacity; that is, the working capacity of the valve across grid-filament, and in series with this is the resistance just mentioned.

The question of how much voltage is developed across the ends of the resistance depends upon how the impedance of the resistance compares with the impedance due to the capacity. Obviously, if the impedance due to the resistance is large compared with the rest, most of the voltage will be set up across the resistance.

Weakening The Upper Frequencies.

The low-frequency voltages in the circuit, however, must reach the grid through the resistance and, therefore, if this resistance is made too high, there will be a weakening of the upper audio-frequencies. The same thing will happen if the capacity is too large.

Although for other reasons it may be useful to increase the value of the resistance it is, for the above-mentioned reason, necessary not to increase it unduly, and the value of the resistance should only be large enough to achieve the desired object.

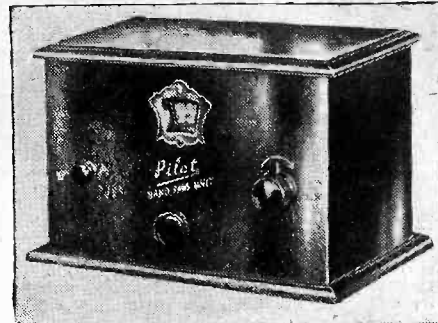
Generally you will find that for a single stage a resistance of perhaps 100,000 ohms will be necessary, but for two or more stages 50,000 ohms is generally quite sufficient.

That Response Curve.

It is very difficult to know with any sort of certainty just how uniformly our receiving sets respond to different frequencies throughout the entire audio range. We talk glibly about uniform response curves, but I wonder how many of us have ever made any really careful tests on this important point. And, in any case, however much we might wish to check over the response of the set, what really reliable means have we at hand for making the test?

(Continued on next page.)

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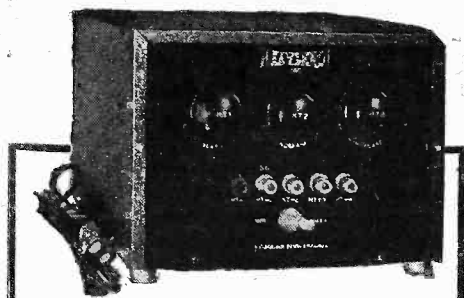
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TECHNICAL NOTES

(Continued from previous page.)

Broadcast, so far as we are concerned, can only be interpreted in terms of the response which our receivers give us, and it is no use blaming the broadcast transmissions for any defects unless we are certain that the defects do not arise in the course of reception and reproduction. In other words, it is hardly fair to blame the transmission for what may very probably be faults of the receiver by which these transmissions are reproduced.

A Useful Check.

It has often been suggested that pure notes covering the whole of the audio range from, say, 50 cycles up to 10,000 cycles, should be broadcast from time to time by the B.B.C. so as to give listeners a really scientific means of checking up on their receivers. Something of this kind has often been done by broadcasting musical notes covering the most important part of the audio range.

This is very useful so far as it goes, but it does not cover the extreme frequencies, particularly the higher ones, which play an important part in the quality of the

NEXT WEEK

HINTS FOR "DECADE" BUILDERS

reproduction, nor is the apparent loudness of the transmitted musical tones kept strictly to a level. Furthermore, the musical tones transmitted for this rough-and-ready test are by no means pure tones. Tests of this kind are sufficient to tell you if there are any pronounced resonance points in your receiver or loudspeaker, but beyond that—which you probably know, anyway—it is doubtful whether they are of very great value.

Some Useful Records.

Gramophone records have been made, giving a series of relatively pure tones ranging in frequency from about 30 cycles to as many, I think, as 7,000 cycles per second, and these are very useful for testing a receiver. But there, again, you can only make the test yourself by means of an electrical pick-up.

The scheme has shortcomings in that, in the first place, the record has to be interpreted through the pick-up, which itself introduces faults, and secondly, however uniform the apparent volume may have been in the recording, there is no guarantee that it will be similarly reproduced from the record.

Frequency and Quality.

It seems to me that the transmission by broadcasting stations of pure tones of uniform loudness over the whole of the range from perhaps 50 cycles to 15,000 cycles, will form a much better means than any other for estimating the "factor of merit," as it were, of a receiving set. By tones of uniform loudness, which is perhaps

rather a vague phrase in itself, I mean obviously tones which the "perfect" receiver would reproduce in the form of musical notes which would sound to the ear of the same loudness irrespective of the pitch.

Owing to the limitations of most ordinary loudspeakers, we are apt to fall into the habit of assuming that the audio frequencies above about 4,000 cycles are not worth talking about, but in point of fact it has been very definitely shown that frequencies up to at least 10,000 play an important part in determining the quality of the reproduced sound. In the best types of talking-picture reproducing apparatus the makers strive very hard to preserve these higher frequencies.

What is Wrong with Home Recording?

I do not seem to hear very much about home-recording these days. Perhaps this is due to the approach of the summer season. Of course, home recording makes its appeal most particularly in the winter months, when listeners are more likely to be indoors.

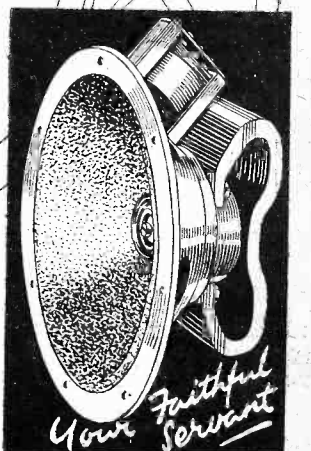
At the same time, I have often wondered whether the types of home recorder which we have so far had, have made the appeal which was expected. I think many people have found that they are not quite so simple to operate as they seemed, or perhaps I should say that good results are not so easy to obtain.

In one sense, that makes the thing all the more interesting to the experimenter, but on the other hand, there are many people who are not quite so bent on experimenting and who prefer something which gives good results without very much trouble or practice.

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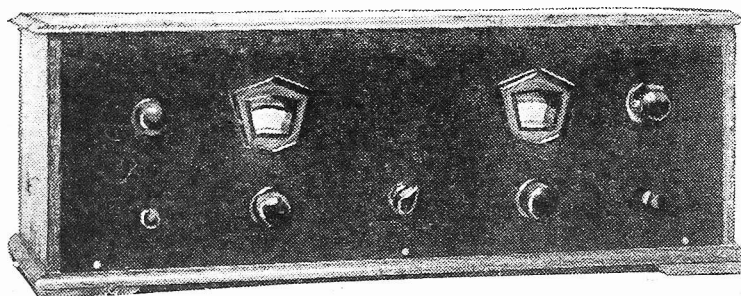
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The Month on Short Waves

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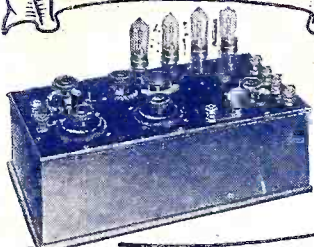
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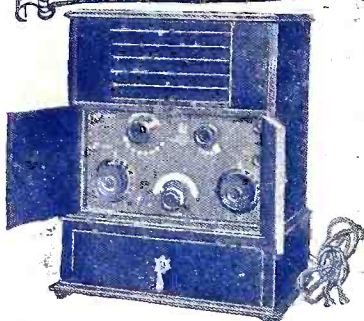
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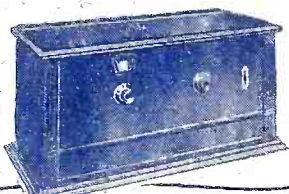
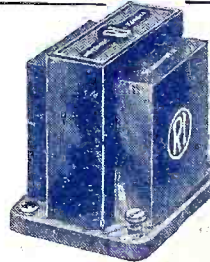


The R.I. RETROACTIVE TUNER 1925

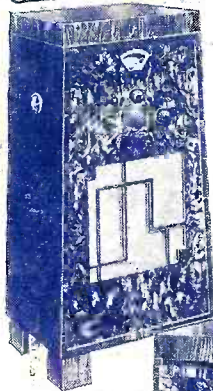
The first tuner with an efficient variable reaction. An outstanding development of early radio.

The R.I. HYPER-CORE CHOKE 1930

The first commercial choke employing nickel iron alloy core.



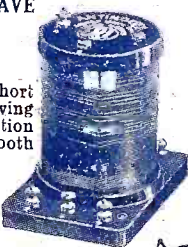
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The MADRIGAL 1931 The first all electric trans-portable receiver to operate without aerial, frame aerial or earth.

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