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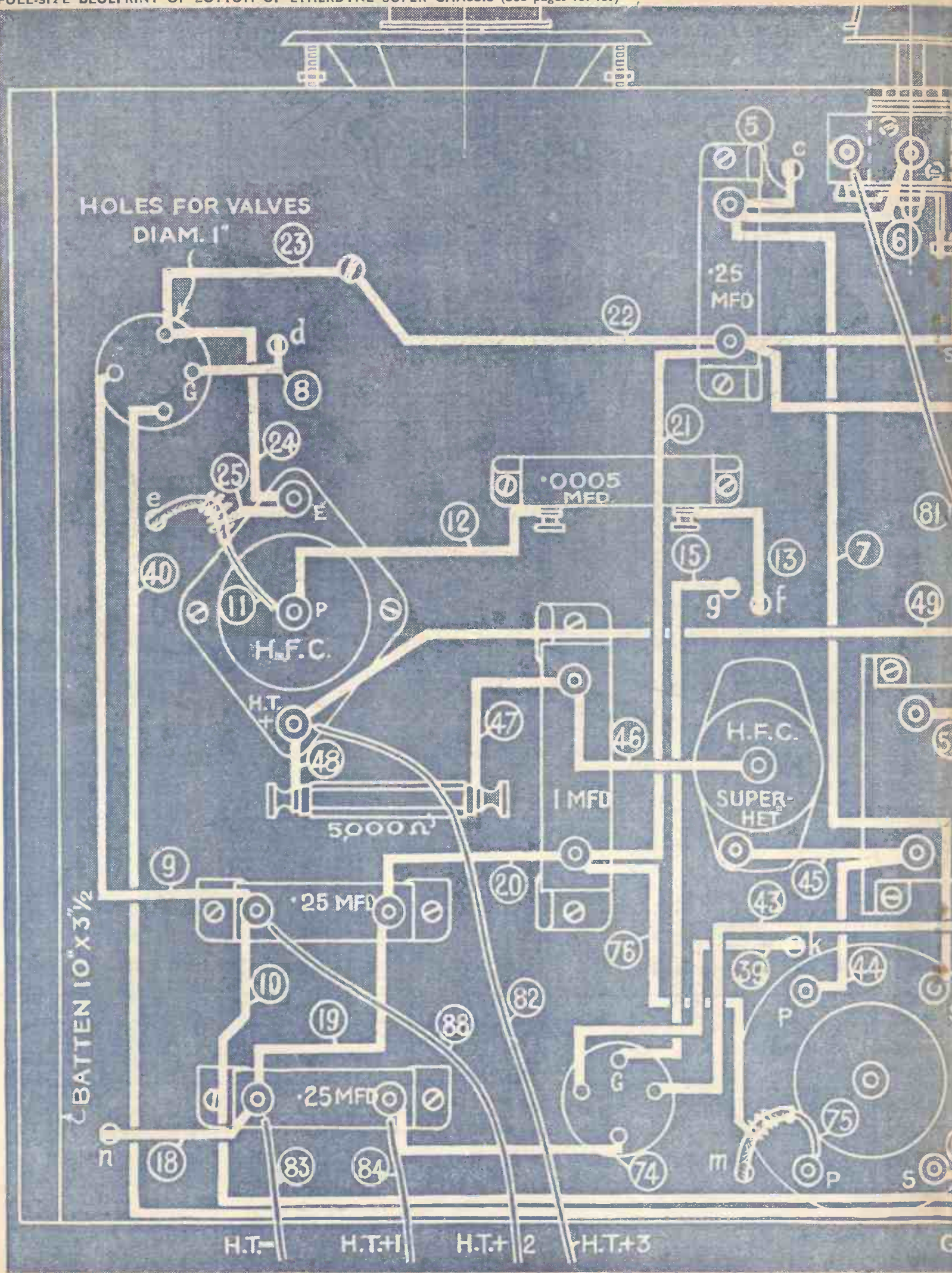
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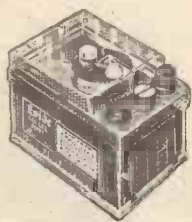
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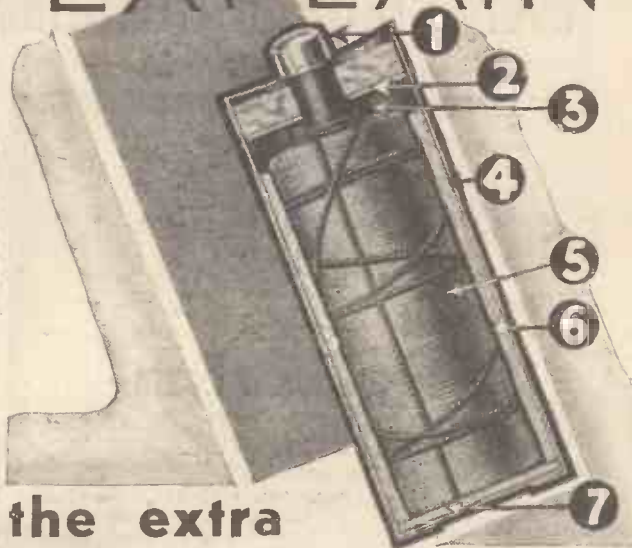
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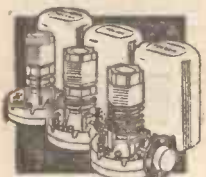


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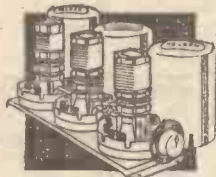
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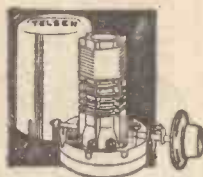
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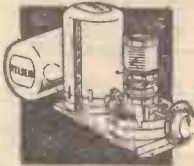
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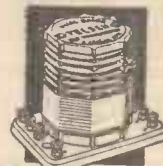
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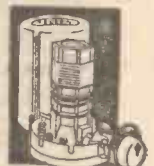
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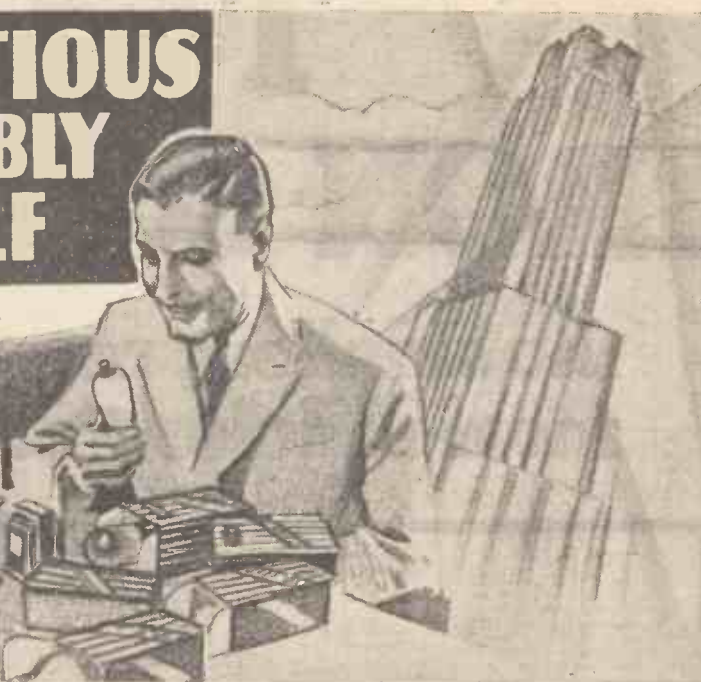
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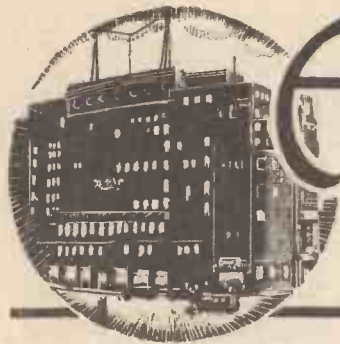
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Radio Gossip of the Week

Chaos in the Ether!

WHISTLES! Muttering background noises! High-pitched ear-splitting and seemingly unending notes accompanying everything you tune in! That is the sort of thing the luckless owner of an old-fashioned set is in for this winter.

Which is why we do so earnestly beg you to think about a new set NOW. Not merely think about it—but *build* it!

Where a Super-het Scores

IN this fight in the ether the super-het beats every other type of set, just because it is more inherently selective than any other type of set.

For the family's use a super-het is probably the only real solution to ether chaos; the only type of wireless installation that can be left in non-technical hands to bring in whichever foreigner is wanted.

Meet the Etherdyne Super!

WHAT more emphatic avowal of our faith in the Etherdyne Super can we possibly make than to give you eleven pages exclusively on this wonderful set this week?

We want you to read all about this set. Because if you just read about it you are bound to catch our infectious enthusiasm for its outstanding qualities. Meet the Etherdyne Super—and welcome it, because it solves the problem of the ether and gets those stations clear!

A Smart Cop!

WE like the story of the police radio car receiving a message that a certain car had been stolen and was travelling in their direction. By a curious coincidence the stolen car happened to be just in front of the police car at that moment.

Ahead went the police car, forcing the thieves to stop. Within two minutes of flashing out the message Scotland Yard got this answer: "Stolen car now recovered; thieves captured."

Economy in Swiss Radio

LOW-POWER stations seem to be doomed in Switzerland. Nor is this really surprising when we remember the mountainous aspect of the country.

Berne and Basle stations, which are both of low power, have recently had their programme times very much curtailed.

The Swiss authorities aim now at increasing the strength of their high-power stations, and

in 1934 we may expect both Beromunster and Sottens to come on the air with as much as 100 kilowatts.

Highest European Transmitter?

WE give you three guesses, but perhaps we had better tell you which is the highest transmitter, because you *never* would guess. It is a little 5-metre telephony station fitted up in the rest hut of the Regina Margherita Observatory in Italy.

The height of the observatory, which is the highest rest hut in Europe, is over 15,000 feet above sea level. In addition to its use for meteorological forecasts the 5-metre transmitter it has proved a great aid to alpine climbers.

New Station for Portugal

TO popularise radio in Oporto a small transmitter is to be erected. Until now the inhabitants have been forced to listen to the Spanish programmes. Two or three years ago a group of amateurs tried out a scheme of local broadcasting but owing to lack of finances it failed.

THIS WEEK'S ETHERDYNE SPECIALS

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Japan's first woman radio engineer. Miss Chiyono Sugita in her private radio station, which seems to be well equipped with up-to-date gear!

Radio Gratitude!

PROOF of the power of the microphone, especially when it is placed in a popular church pulpit, is strikingly demonstrated by the will of Miss Caroline Broughton, of Bradford.

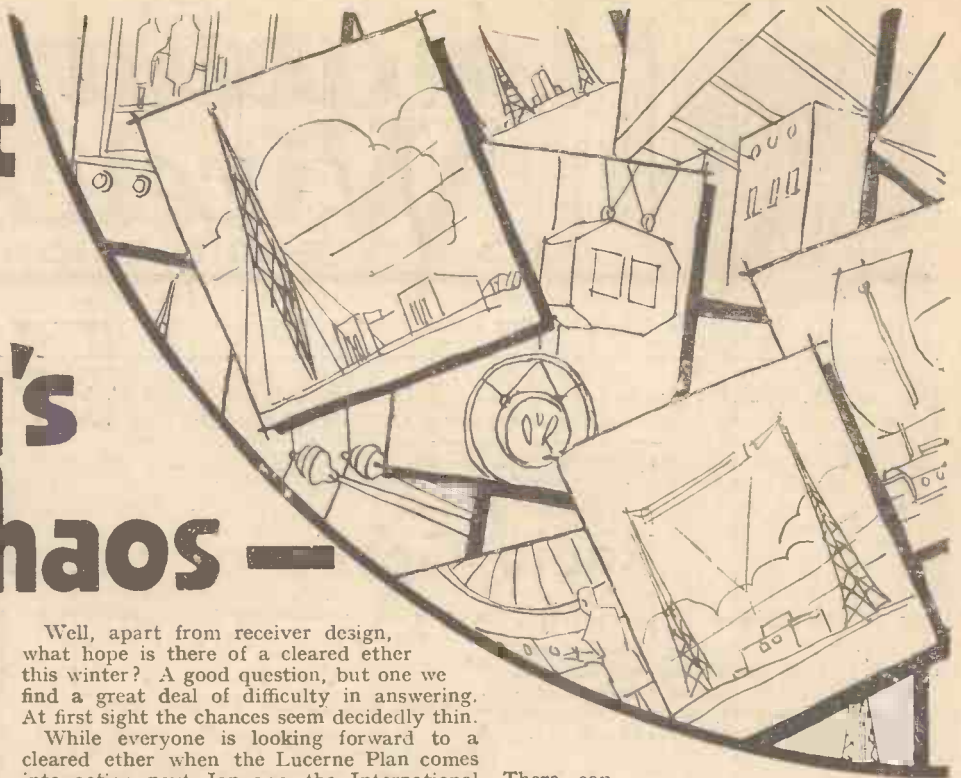
She bequeathed £100 to the Rev. Patrick McCormick, Vicar of St. Martin-in-the-Fields, "in grateful acknowledgment for help received through his broadcast services."

Another £100 was left to the Rev. Hugh Johnson, also of St. Martin-in-the-Fields, and conductor of the daily broadcast service.

Broadcasting House

FOR the bright and breezy comments on what is happening at Broadcasting House—headquarters of B.B.C. "politics"—please turn this week to page 748.

You Must fight To-day's Ether Chaos —



WILL ether chaos come? What a question to ask! And yet thousands of anxious listeners are asking just that. Well, before saying what we think about it, let us see just what we all mean by ether chaos.

We mean, surely, interference between stations that cannot be overcome at the receiving end. Because if we do not mean that the whole thing is just a scare, a panic without real foundation for alarm.

Interference—Always with Us!

There has *always* been potential interference, when you come to think about it. Given a sufficiently unselective set, of course there is interference, even between stations separated by hundreds of kilocycles. Think back to the old crystal days and recall how worried we used to be about separating the two new London stations.

So that merely to talk of interference is nothing new. Ever since man began his onslaught on the ether that ether has been a potential source of bedlam for listeners. You see our point? **Until recently, we mean, such interference has been manageable, because with suitable sets we could always separate the stations.**

Now what has changed in the conditions of reception? The ether is the same, and if anything sets are more selective than they have ever been. Then what is all the fuss about?

Just this: the power of stations has gone up all round Europe, and, as if that were not trouble enough, many more stations have come into existence. There simply isn't room for them all in the ether. And that is, fundamentally, what is all wrong.

On our Mettle!

Well, well, you may say, but isn't that where the set designer is put on his mettle? It most certainly is! But how many designers are on their mettle? Don't let us be invidious, please!

All we say is **look around you**. See what the constructor is being offered to fight this imminent ether chaos. See all the straight "threes" and "fours," presented as real solutions to the problem—to the greatest problem that radio has had to face since it began to grip the popular imagination ten years ago; and ask yourself if those sets are the best solution available to-day.

You owe it to us to ask yourself just that. If you decide that something more might be done with all the resources at our disposal you will be willing to bear us out to the end of this article.

Well, apart from receiver design, what hope is there of a cleared ether this winter? A good question, but one we find a great deal of difficulty in answering. At first sight the chances seem decidedly thin.

While everyone is looking forward to a cleared ether when the Lucerne Plan comes into action next January, the International Broadcasting Union officials are wrestling with eight dissentient countries. These countries are making a firm stand about long waves.

Even if we do get some sort of order on the medium waves we cannot hope for much on the long waves. That is how we read the situation. But look more closely into the new plan and you will find medium waves difficult enough to handle, even supposing everyone agrees to come into line.

There will be many shared channels, for one thing. And for another you will find many high-power stations transmitting side by side in wavelengths. **Not only is the clear reception of the home stations in some danger; the separation of adjacent foreigners looms formidably difficult, too.**

Chaos in the ether does not necessarily mean one long, continuous shriek, remember.

There can be chaos in a very real sense without that. There can be the sort of chaos that includes a background whistle behind every station you tune in. Chaos that means a faintly muttering background with every station not already rendered unbearable by a heterodyne whistle.

Not Trying to Scare!

We are not trying to scare listeners away from foreign-station reception. Far from it! Too many listeners are wedded to their favourite foreigners to give them up without a valiant struggle. High power, though possibly one of the niggers in the woodpile of chaos, has the redeeming feature of providing us with programmes from abroad of real entertainment value.

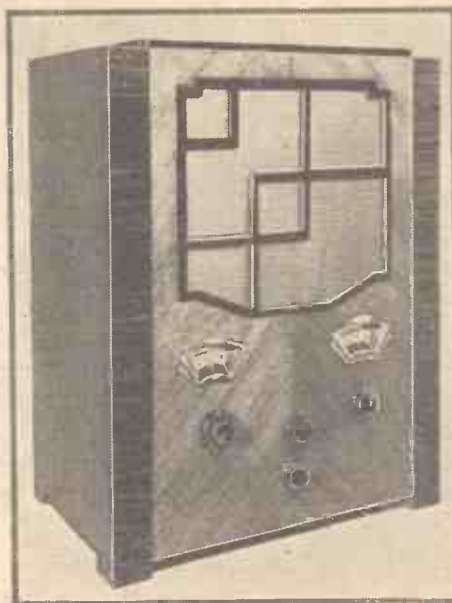
We do not side with those who would reduce the power of stations. We know full well, indeed, that only with high power can we hope for really worth-while signals from abroad, signals of such power that they will provide a really high ratio of speech or music to background noise.

No, high power in itself is a good thing. It is only when it is allied to too many stations that it causes trouble. High power is growing all round. Given cleared channels we shall have dozens of programmes of real entertainment value. Can we hope that the International Broadcasting Union's technical arbitration will succeed? Fraught with such dire consequences, the situation is at this moment being faced by all Europe's broadcasters.

We Must make Sets Selective!

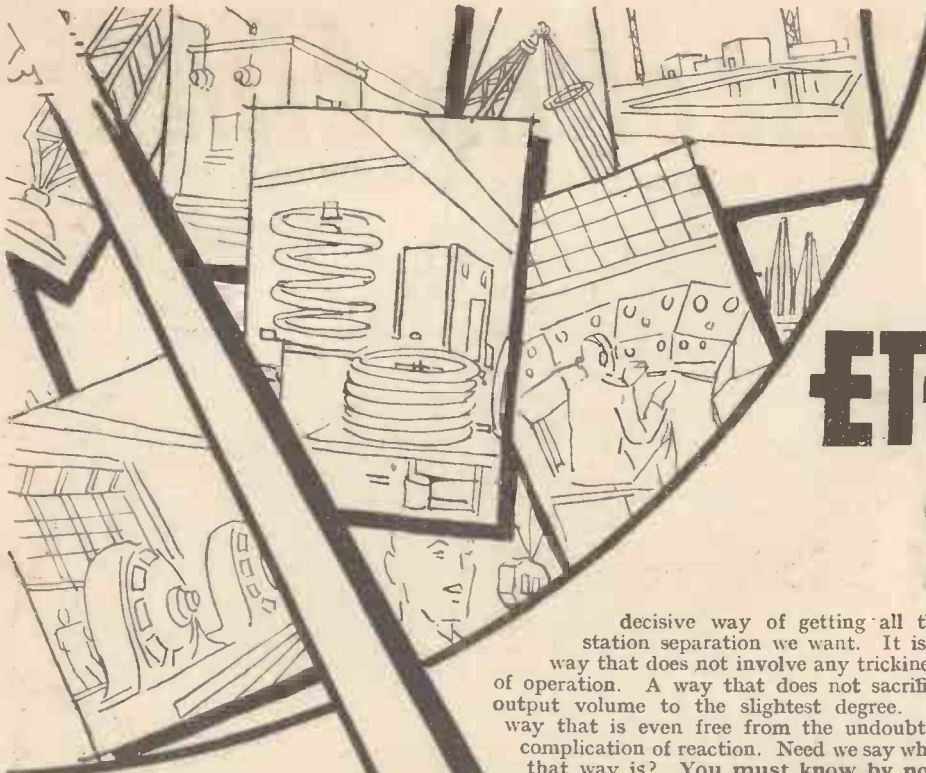
Whatever happens, we cannot rely on such freedom from interference between stations as to justify us relaxing for one moment our grip on the receiving end of the business. While potentates and engineers are squabbling over wavelength share-outs we have our job to do—clear-cut and without doubt. **Our job is to make our receivers just as selective as it is humanly possible to make them.**

Selectivity is a much-hackneyed word. Yet it is still misapplied, still brought in to give weight to essentially fallacious arguments. Let us define selectivity as the measure of



The set that is making the radio world talk!
The new "Amateur Wireless" super-het—the
Etherdyne Super

- with the ETHERDYNE SUPER!



a set's ability to bring in programmes clear of interference.

From a listener's point of view that is the only definition that matters, surely? Removed from the realms of half-understood technicalities, such a definition enables us to see just where we are. To weigh up all the weapons at our disposal for our fight in the ether.

Well, what have we? Among straight sets we have iron-core coils to help us. We have various methods of aerial coupling. Various systems of coupling the high-frequency valve to the detector in order to increase the inter-stage selectivity. That dismisses straight sets rather summarily, perhaps, but let us hasten to add that, when designed by an expert—and operated by an expert—the straight three and four, or any set with one high-frequency stage having two tuned circuits, can be made marvellously selective.

What is not, perhaps, so widely realised is that this sort of set depends for its selectivity on the principle of sacrifice. You have a certain amount of high-frequency amplification to play with and a certain amount of inherent selectivity in the two tuned circuits. The process of getting any wanted station free from interference is then a process of playing off your selectivity against your available high-frequency amplification, which may be partly derived from the valves and partly from reaction.

What is the result? You certainly do get some stations clear of interference, albeit with quite an amount of knob-twiddling—an amount that the absolute lay listener would not be able to summon up, by the way.

An Important Point

But, and this is the point, there are dozens of other stations quite well worth hearing that you can separate completely only by cutting down the high-frequency amplification or the signal input to such an extent that loud-speaker reception is impossible.

We have nothing against the straight set, as much. Indeed, during the coming winter we shall produce straight sets, but we shall take good care to point out just where they come in relation to set design as a whole.

Meanwhile, we have in mind a much more

decisive way of getting all the station separation we want. It is a way that does not involve any trickiness of operation. A way that does not sacrifice output volume to the slightest degree. A way that is even free from the undoubted complication of reaction. Need we say what that way is? **You must know by now that it is the way of the super-het.**

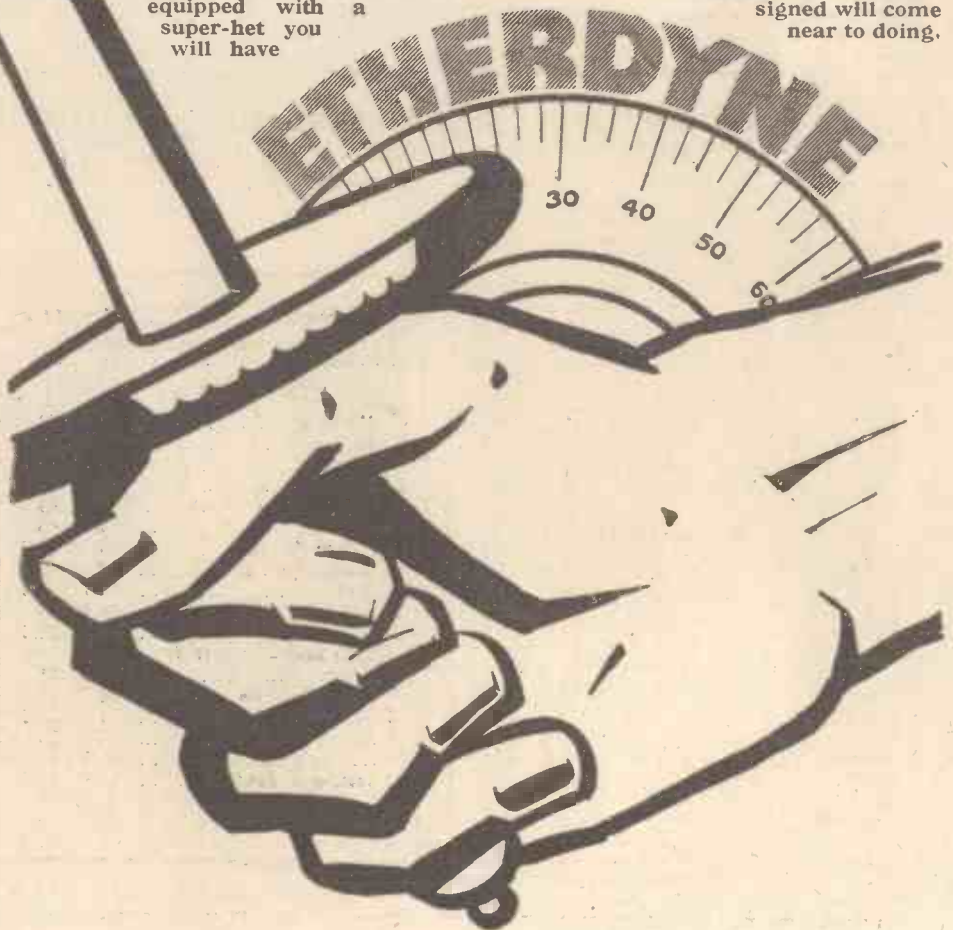
And that brings us to the whole point of this fight against chaos in the ether.

We want to emphasise that the super-het, of all possible combinations of valves, is the one combination that will give you the clearest ether this winter. Come what may of the *Plan de Lucerne*, if you are equipped with a super-het you will have

more worth-while programmes at your disposal than any other listener with an ordinary straight set.

This is so indubitable, so absolutely above criticism, so entirely outside argument, technical or otherwise, that we will not labour the point. But we would ask you to bear it in mind when you are driven to something like a panic by all this talk about chaos in the ether.

Unbiased critics have handled the Etherdyne Super and have had to admit that it does all we claim for it. And our claim is no humble one. For we claim that the Etherdyne Super will clear a way through the ether, will fight ether chaos, present and future, in a way that no other constructor set yet designed will come near to doing.





My Test of the ETHER-

A Special Report on the Set by J. GODCHAUX

THE Etherdyne Super scours the ether; that is the main impression I have formed from the two days' trial I have made of this remarkable receiver. It is the super-het *par excellence*, combining all the qualities of this well-tried circuit without suffering from the weaknesses of designs previously placed before the home constructor.

The superonic-heterodyne circuit is not a new idea; when it was first brought out some years ago—it was originally the conception of a French engineer—it achieved promptly considerable popularity. Later, as other circuits of a less complicated nature were designed which then provided a better quality of reproduction, except for special uses this type of receiver was less favoured by the average listener.

Most Efficient for Present Difficulties

But, during the past three years or so, the ever-increasing number of high-power transmitters brought into operation in Europe and placed in a dangerously limited band of channels, together with the fact that the development of valve technique and that of modern components generally permits a much higher quality of reproduction, the super-heterodyne has come back into its own and is recognised, perhaps, as the most efficient principle for coping with present difficulties arising from wavelength congestion.

Anyone who to-day endeavours to tune-in to individual broadcasts and isolate them from the welter of signals which emanate from the ether will realise the problem set to wireless engineers in regard to selectivity; moreover, this state of affairs, notwithstanding the measures which are being attempted, is not likely to ameliorate in the near future. It is the reception side of this problem which has been so very efficiently tackled, and great credit is due to the conceivers of the Etherdyne Super.

Look at the log on this page, obtained over short periods spread over two days. I may safely say that of all the receivers I have hitherto handled, irrespective of nationality, make, or design I am absolutely unbiased in my judgment—I consider that the Etherdyne has achieved the best results. It is exactly the set required by the listener who desires to hear transmissions from a large number of studios without having to consider either their distance from his receiving station or their power.

My log shows eighty-eight stations; I know that in the course of a few more hours I could have added at least another dozen. You may say that the number of transmissions captured by a receiver does not necessarily convey much to its prospective possessor. This is perfectly true inasmuch as search how you will you may not find as many different programmes but, on the other hand, the fact that your receiver will allow you to hear an entertainment *through more than one channel* is in itself a big advantage.

On some evenings mutual interference

between some stations, one of which may be the one you want, will occur, and if you can tune-in satisfactorily to a relay you will reap the benefit of the selectivity and sensitivity of the set.

It is seldom that in the course of an evening you will find more than thirty or forty broadcasts of programme value; you may hear many more transmissions when twirling the dials, but the programmes may not prove of interest. If you can get at least thirty at good volume with ease—*without interference, whistles or other noises* which are apt to mar both music and speech—the variety of entertainment offered should satisfy even the most fastidious. With the Etherdyne Super you can do so with certainty.

Can be Handled with Facility

At the outset I was struck with the facility with which it could be handled; tuning was as simple a matter as if the set had only possessed one knob, but the extra controls offered in the form of the pre-set aerial condenser, anti-breakthrough unit, condenser trimmer and volume control, added 100 per cent to the efficiency of the receiver.

The circuit, which has been described fully elsewhere, is highly efficient as it combines extreme sensitivity with a remarkable degree of selectivity. I had no trouble whatever in separating neighbouring stations such as Königswusterhausen - Daventry; Warsaw-Eiffel Tower-Motala; and such stations in the medium waveband as Turin-Heilsberg; Poste Parisien-Breslau; Graz-London Regional and so on, usually so difficult to receive clearly.

In the minds of some people the idea of a

J. Godchaux Abrahams' Log of the Etherdyne Super

LONG WAVES				LONG WAVES				LONG WAVES			
Wavelength	Station	Aerial	Osc.	Wavelength	Station	Aerial	Osc.	Wavelength	Station	Aerial	Osc.
833	Heston Airport ...	6	37	1,154.8	Kalundborg ...	28	57	1,411.8	Warsaw ...	51	72
857	Leningrad ...	9	39	1,190.5	Luxembourg ...	33	60	1,445	Eiffel Tower, Paris ...	53	74
900	Croydon ...	10	40	1,200	Reykjavik ...	35	62	1,481	Moscow ...	57	76
937.4	Kharkov ...	13	47	(When Luxembourg was closed down).				1,554.4	Daventry ...	60	80
1,000	Moscow ...	16	50	1,255	Vienna (Experimental) ...	37	64.5	1,635	Zeesen ...	67	83.5
1,035	Kiev ...	17.5	51	1,304	Moscow (T.U.) ...	43	67	1,725	Radio Paris ...	74	87
1,083	Oslo ...	20.5	53	1,354.4	Motala ...	44	69	1,796	Lahti ...	76.5	91
1,126.6	Monte Ceneri ...	24	55.5					1,875	Kootwijk ...	80	93
MEDIUM WAVES											
217	Konigsberg ...	11	14	315	Marseilles P.T.T. ...	40.5	42	403	Katowice ...	66.5	65
224.4	Cork ...	14	16.5	319	Naples ...	41	42.5	413	Athlone ...	66.5	66
225.9	Fecamp (Radio Normandie) ...	18.5	16.75	322	Goteborg ...	42	43	416	Rabat ...	67	67
227.4	German relays ...	18.75	18	325	Breslau ...	43	44	419.5	Berlin ...	68.5	68.5
231	Malmö ...	19	21	329.2	Poste Parisien ...	44	45	424.3	Madrid (EAJ7) ...	70	69
237.2	Bordeaux Sud Ouest (faint) ...	19.5	22	331.5	Milan ...	45	46	(After 11 p.m.)			
239	Nurnberg ...	20	22.5	335	Poznan (faint) ...	46	46.5	436	Stockholm ...	72	70.5
242.3	Belfast ...	20.75	23	338.2	Brussels (No. 2) ...	47	47.5	441	Rome ...	75	72.5
247.7	Trieste ...	22	24	342	Brno ...	48.5	49.5	447.1	Paris P.T.T. ...	76	73.5
257	Hoerby ...	23	26.5	345	Strasbourg P.T.T. ...	49.5	50	459	Beromuenster ...	80	76
259.3	Frankfurt ...	24	27.5	348.8	Barcelona (EAJ1) ...	49.75	50.5	465.8	Lyons P.T.T. ...	81.5	77.5
261.6	London and W. National ...	28	31	(When Strasbourg was closed down)				473	Langenberg ...	83	79
263.8	Moravska-Ostrava ...	28.25	31.25	352.1	Graz ...	50.5	51	480	North Regional ...	85	81
273.7	Turin ...	28.5	31.5	356	London Regional ...	52	52	488.6	Prague ...	86.5	82.5
276.5	Heilsberg ...	29	31.75	360.5	Muhlacker ...	53	53.5	503.8	Florence ...	90	85
279	Bratislava ...	29.5	32	364	Algiers (het.) ...	54	54	509	Brussels (No. 1) ...	92	86.5
288.5	Scottish National ...	30.5	34.5	372	Hamburg ...	56.5	56	518	Vienna ...	94	89
294	Limoges P.T.T. (faint) ...	33	36	376.4	Scottish Regional ...	57.5	57.5	525	Riga ...	94.5	91
296.1	Hilversum ...	34	36.5	381	Lwow ...	58.75	59	533	Munich ...	95	92.5
301.5	North National ...	35	38	385	Radio Toulouse ...	60	60	537.6	Palermo ...	95.5	92.5
304	Bordeaux Lafayette ...	37	39	389.6	Leipzig ...	61	61.5	(When Munich was not working)			
309.9	West Regional ...	39	40	398.9	Midland Regional ...	63	63	545	Sundsvall ...	96.5	93.5
312.8	Genoa ...	40	41	403	Sottens ...	64	64	550.5	Budapest (I) ...	100	95

-DYNE SUPER

ABRAHAM'S, the Broadcasting Authority

"super-het" evokes complicated circuits, with a number of "extra" gadgets which have to be used "just so" if good results are to be attained. Far from it in this case; all you need do is to connect up to aerial and earth, attach the various leads to their respective accumulator, high-tension and grid-bias batteries and jot down in your log the condenser-dial

circuits synchronise and, as you will see from the log, they remain more or less in step throughout the band.

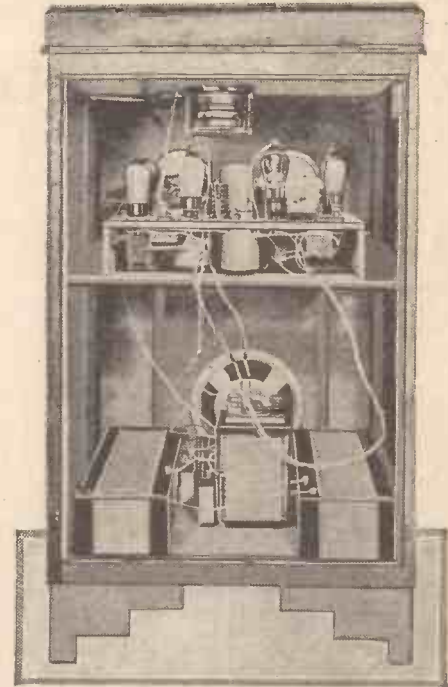
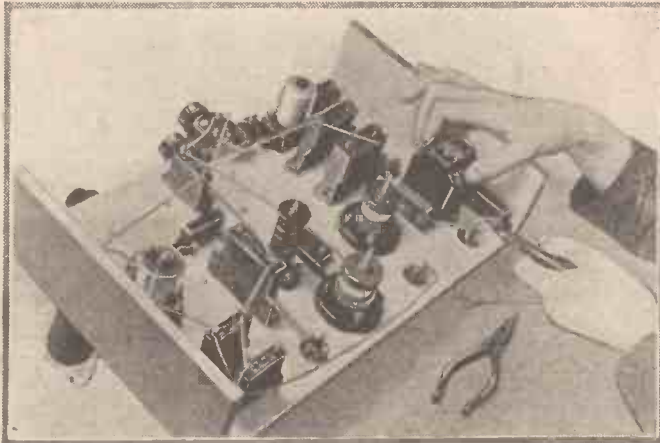
Using the Pre-set Condenser

The pre-set aerial condenser plays an important part as regards clarity of signal; keep it as near the minimum point as possible, as this ensures a loose aerial coup-

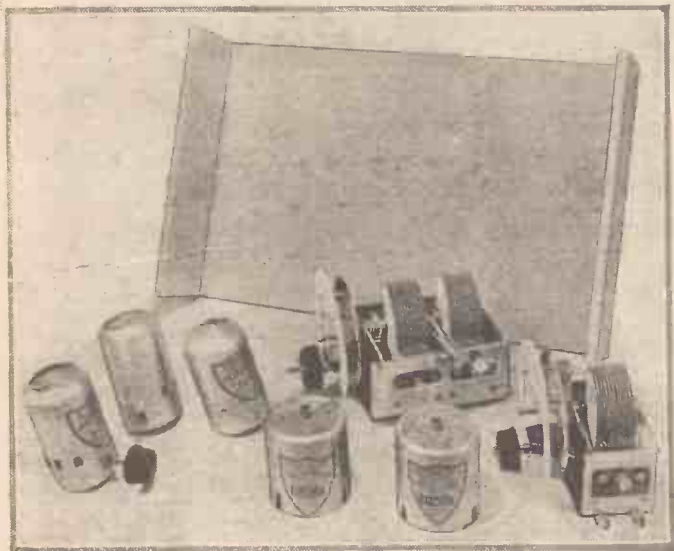
(Right) A view of the bottom of the chassis of the Etherdyne Super, designed by S. Rutherford Wilkins, of the AMATEUR WIRELESS staff

(Below) The metallised-wood chassis, coils, variable condensers, and intermediate-frequency transformers for the Etherdyne Super

(Bottom of page) A photograph of all the parts needed for the construction of the Etherdyne Super



The Etherdyne Super arranged in radio-gramophone form—an attractive proposition for any listener



ling. For local stations you may not need any adjustment at all, but if you come across a weak signal a gradual clockwise screwing in, even when the volume control is all out, will increase the strength to a remarkable degree.

You may, therefore, play with this aerial coupling until there is no background interference. The looser the coupling the clearer, but also weaker, the signal. A little experience will enable you to adjust it so that except in special circumstances it can stay put.

The trimmer on the left is of great assistance in separating neighbouring transmissions; use it

with care. Tuning will be effected without howls, hisses or plops; the transmissions slide in and out without squeals, but you must tune the oscillator condenser to its exact position for the wavelength desired. In most instances where distortion is noticed it will be due to incorrect tuning. The volume control requires no explanation, but it is good to know that you cannot overload the valves.

My first search when trying out the Etherdyne Super was for irritating harmonics, often a failing of super-het circuits. I found none; neither was there any trace of break through on the long waves.

"Mains" Results from Good Batteries

The Etherdyne Super, although easy to construct, is a first-class receiver and it should receive due consideration; it is a battery set, but it requires good batteries. It is useless to try and feed it with cheap and small batteries which cannot possibly give the necessary anode current. If those of the double- or triple-capacity type are used, they will prove an economy in the end, apart from the fact that by adopting them from the start you will ensure not only that the valves work under the best conditions, but also that the volume and quality of reproduction will be equal to that given by most mains-fed sets priced at a much higher figure.

readings of the stations as they roll in.

The question of aerial need not worry you much; if you possess an outdoor one all the better, but if you cannot find anything more suitable than an insulated wire 10 ft. long, slung across the room, you may still expect to hear at excellent strength broadcasts from most of the B.B.C. transmitters and from a number of high-power Continentals. Such is the sensitivity of the Etherdyne Super that I was able to listen to Rome, Breslau, Beromuenster and other 60-kilowatt stations with an aerial only about 5 ft. long, merely hanging from a picture rail!

The volume was quite loud enough for a small-sized room. Turn the condensers slowly or you will miss a number of broadcasts; within a few minutes you will have found the respective dial readings at which the



The output was found sufficient to feed two moving-coil loudspeakers, and in some instances the volume control had to be brought into operation.

The Etherdyne Super is a well thought out receiver in the circuit of which the most up-to-date ideas have been incorporated. It fulfils the claims of the "A.W." Technical Staff, and the results obtained with it should satisfy the most exacting listener. The log appended definitely proves that it is just the receiver wanted to-day.

What the B.B.C. is Doing

News from Broadcasting House

By Our Special Commissioner

Lucerne Plan to Go On!

A WAY you Jeremiahs who say the Lucerne Plan will never come into action! This Plan to end plans, so to speak, will begin on January 15, 1934, as originally intended.

At Amsterdam the I.B.U. officials have certainly been having a spot of bother, but not so much that the whole plan is in danger. It is on the long waves that all the discussion has centred.



Eric Maschwitz,
Director of Light
Entertainment

Flat Refusal from Holland!

HOLLAND is sticking out for its present long wavelength. I see its point, too. Having pioneered long-wave broadcasting it does not see why it should make way to Rumania, of all countries, which has been allotted the present Dutch long wavelength.

Of course, from a cold technical point of view, Holland ought to give up. Its service area is over flat country, whereas Rumania is very hilly. Holland could make do with a medium wave, but, as they say, they were in the running long before Rumania even thought about broadcasting.

I.B.U. Coming to London

FOR its next meeting in six months' time the International Broadcasting Union has decided to make for London. That will be frightfully jolly for them, won't it?

Droitwich's Power Goes Up

ASK anyone with wireless at his finger tips what the proposed power of Droitwich is to be and he will answer 100 kilowatts. For that is what we have always been told.

Now comes the Chief Engineer himself with the statement that the power will be 150 kilowatts. Which, by the way, is the maximum allowed for long-wave stations under the Lucerne Plan, excepting Russians, which apparently may trifle even with 500 kilowatts—if they like to waste their roubles that way.

Sorry, Mrs. Borrett!

SO the B.B.C. has "frozen out" that charming lady announcer. I call it rather a shame. No one could say I'm a lady-killer, but, really, I liked Mrs. Borrett. Her fresh, clear voice appealed where some of the men's often appalled.

Anyway, how the deuce does the B.B.C. judge public opinion on such a question? By the crank letters it receives? Or how? I don't so much resent the B.B.C. changing its mind, or backing out of an experiment, but I do object to its pretence to know what the public is thinking.

And I'm glad Mrs. Borrett had the courage to deny that she had resigned. Ever genteel, the B.B.C. officials so much prefer one to resign than to get the sack. I think the lady had the last word.

St. George'(s) for England!

A FEW more bars about St. George's Hall! The B.B.C. is going to remove ten rows of stalls to make room for a larger orchestra than the hall was designed to take. That alteration will reduce the seating accommodation to about 350.

What the engineers are raving about are the acoustics, which they are gratified to find are quite "dead." Let's hope the shows won't be.

Crazy Night Coming!

YOU will be able to test the acoustics for yourself on October 28, when the first St. George's Hall broadcast will take the form of a Crazy Hour, featuring Jack Hylton, the Houston Sisters, and Charles Heslop.

The hall will be in a bit of a lash-up state then, but they are putting up some nice new curtains, and during the year for which the hall has been leased by the B.B.C. there's no knowing what young Eric Maschwitz will do.

Anyway, he has what he has always wanted—a hall of his own to play about in. Give us some good shows, Eric!

Paying for the Empire Stations

SLOWLY but surely it is dawning upon the B.B.C. that its Empire transmissions are not getting to our colonial kinsmen in the great wide open spaces of the earth.

As that realisation sinks in, the B.B.C. gloomily reflects that it cannot hope to collect any money from the Empire to pay for the Daventry transmitters.

There are two questions being asked: Can the B.B.C. go on bearing the cost of this Empire service? Or should it do something about improving the Empire stations? No doubt about it—they will have to go on now, and do what they can to make more reliable contact.

Why Not Relay the Programmes?

AS most Empire listeners have sets for medium waves, the sensible thing to do is to encourage the erection of super-receiving stations to pick up our short-wave signals and re-radiate them to local listeners on the normal medium wavelengths.

Malta is already thinking about such an idea. Malaya has got to the agitation stage, too. While Ceylon has actually voted £1,000

towards building a special Empire receiving station.

All of which points to the future of Empire broadcasting. It lies not so much in the individual contact through short waves as through the medium of super short-wave relay points.

Us and the U.S.!

WHILE W. S. Paley, "Czar" of American radio I mentioned last week, was still over here he gave us quite a pleasant shock. He drew attention to the fact that in America it is estimated there are seventeen to eighteen million radio sets for twenty-five to thirty million homes, but he pointed out that in this country we have nothing to be ashamed of.

We have, in fact, something between five and six million sets for about ten million homes. So we are really on a par with the States in radio consciousness.



Vice-Admiral Carpendale,
Director of
Administration

For the Matrimonial Stakes

PRETTY little Jean Melville, the B.B.C. accompanist, is going to be married. At a party she met Mr. Van Denys, who is also a pianist, and they discussed a double-piano act. Which they later broadcast with success.

Now they are going into double harness for life. Good luck!

Night on the Thames

ON the good ship, or rather motor-launch, *Water Lily*, the B.B.C. has been busily installing the short-wave transmitter usually used for the Boat Race commentary.

The idea is to spend a night on the river on October 28, going from Westminster Bridge down to the Pool of London. The signals from the launch bearing the commentators will be picked up by a receiver on the roof of Adelaide House, near London Bridge.

B.B.C. Gets the Power Craze

WHEN the Nationals on the medium waves are scrapped and put up again as regionals in Scotland and Northern England, the power of all the regionals is going up. It is now 50 kilowatts, but I believe it can go up as high as 70 kilowatts.

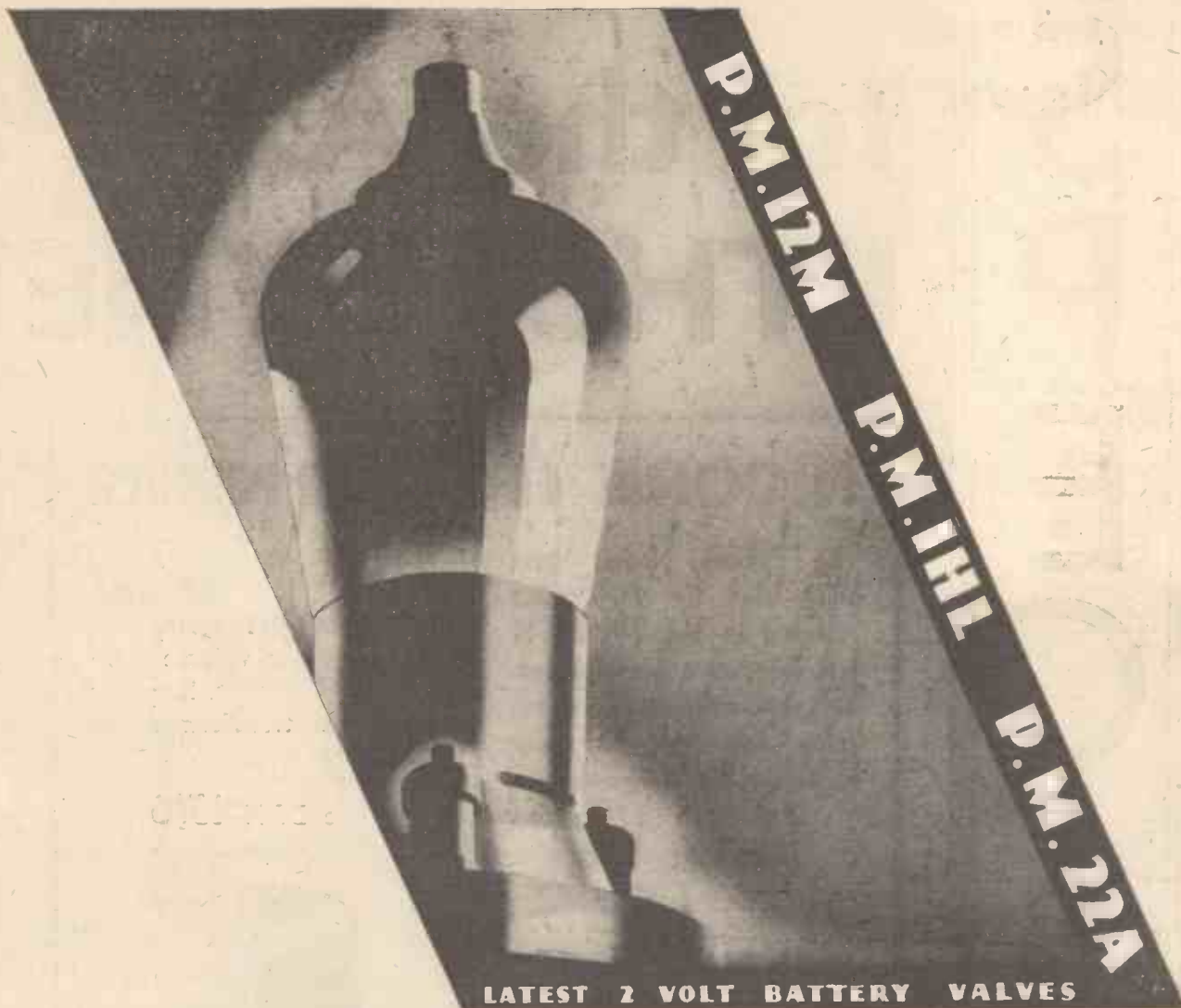
My Error Again!

ONCE more the B.B.C. has trapped me over its flag flying! I was amazed, especially after last week, to see on the masthead this time the Swiss National flag proudly flying in the breeze. Of course, I thought, Vice-Admiral Carpendale is entertaining some of his old pals from the Swiss Navy.

But no, there was a much more important reason. The B.B.C. was doing the honours to M. Baud, head of the Société Suisse de Radiodiffusion, together with other prominent radio people connected with the Swiss broadcasting system



Another radio romance! Jean Melville, the popular B.B.C. piano accompanist, is engaged to Mr. Van Denys, a pianist with whom she broadcast in a recent double piano act



Over three million aerials lead down to Mullard Master Valves. Why? Our answer is because they are good, reliable valves, well tried and tested in home-built and factory sets all over the country. This is the most tangible evidence we can offer in support of our product, and you will agree that any manufacturer who succeeds in dominating a market of millions can only hold that position by virtue of unequalled technical and manufacturing resources. In short, a Mullard radio valve must be the Master valve.

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On Your Wavelength!

By Thermion

Farewell, But Not Good-bye!

AFTER a mass of conflicting rumours the truth has emerged at last: Mrs. Giles Borrett, the B.B.C.'s woman announcer, is to be withdrawn after a three months' trial. Mrs. Borrett, however, though she ceases to be an announcer, will still appear before the "mike" in the rôle of a programme artist.

Before she became an announcer she took many parts in wireless plays under the name of Sheila Stewart. It was the clearness of her enunciation when taking part in plays that led to her selection as an announcer.

Eve or Adam for Announcing?

RECENTLY I have made short trips to both the north and west of England and everywhere I have found a strong preference for the male announcer, though very few of those that I have questioned on the subject were able to tell me why it was so.

We are a queer nation and, whatever the reason may be, women announcers don't seem to go down with us.

Abroad, of course, they are immensely popular, achieving in some cases almost the fame of film stars. I believe that both Rome's signora and Beromunster's mademoiselle receive large "fan mails."

Why Men Sound "Woompy"

THE only drawback I can see to the male announcer is that so many people find that, though they obtain excellent quality when music is coming through, the news bulletins are apt to sound rather "woompy."

If your set has tone control—and if you are wise it has—you will find that the setting for good speech quality is quite different from that required for first-rate musical reproduction.

The reason is, I believe, that most announcers speak in very low tones right into the microphone, so that the sounds which come from our loud-speakers are actually a good deal louder than are their originals in the studio.

Try this Experiment!

HERE is a little experiment that you can try yourself in order to see what happens. Read a few lines aloud first of all in your ordinary voice. Now read on, but more and more quietly, until you are speaking just a little above a whisper.

You will notice that as the volume of your voice is reduced it sounds more and more "chesty," the low pitches assuming greater prominence. Thus, when an announcer speaks close to the microphone there is likely to be an undue preponderance of low-pitched sounds. Amplify the output of the microphone up to ordinary room-level and "woomphiness" is almost bound to result.

Was Sir John Justified?

SIR JOHN REITH, I observe, has been telling the world that the average wireless listener is a person of lamentably low intelligence. I always think that pronouncements of this kind are a little unfair, for the "average wireless listener" has no chance of retaliating and of giving his opinion of the Director General!

I am inclined to think that Sir John has pitched it a little too strongly. I meet the wireless man-in-the-street in fairly large quantities and my correspondence with him is considerable.

One does, of course, come across the "idiot boy" question, but on the whole your average listener, whether you talk with him or correspond with him, is a pretty knowledgeable person. Perhaps I get a better sample than most because "A.W." readers prove their intelligence by the very fact of being "A.W." readers!

London and West National

I HAVE lately had opportunities of seeing how the common-wave working of the London National and the West National pans out in practice. In my own home, which is about fifteen miles from Brookman's Park as the wave waggles, there is no noticeable interference of any kind from Washford Cross. But as you move westwards this interference soon assumes considerable proportions.

When, in fact, you are more than fifty miles west of Brookman's Park music begins to be distorted in a curious way and there is a kind of stuttering effect on speech. The net result is that this common-wave working has decreased the genuine service area of both the London National and the West National to about fifty miles or so. And that, after all, is not too good for 50-kilowatt stations.

What Causes the Distortion?

NO one, so far as I know, has yet suggested what may be a possible cause of the musical distortion and the stuttering of speech which occurs when you are at a place between the London National and the West National.

Electrical impulses do not travel at the speed of light over wires. The formula for their speed is a terrifying one about as long as your arm, but it boils down to the fact that they move much more slowly than they do through the ether.

Now, Brookman's Park is little more than a dozen miles from Broadcasting House, whereas Washford Cross is the best part of two hundred as the telephone line runs. It seems, therefore, that there must be an appreciable time lag between the arrival of an impulse due to a sound in the London studios at Brookman's Park and the arrival of the same impulse at Washford Cross.

Hence the West country transmitter is always a small fraction of a second behind the London. It follows that when you are listening at a place where both transmissions are received the stuttering effect may become

noticeable. It will, of course, be exaggerated if you are much nearer to the London National than you are to the West, for then there will also be a time lag due to the greater distance that the latter's waves have to travel through the ether.

Fécamp's "Hefty" Watts

OFFICIALLY, Fécamp has been working for some little time with an output of a mere 700 watts. This must, of course, be so, since strict orders were issued by the French Government that the station should use no more.

Well, I was running round the dials the other morning in a little village that nestles almost at the foot of Dartmoor. Somewhat to my surprise I found Fécamp coming in so strongly that the volume control had to be turned right back to prevent my ears from being blown in.

Broad daylight? Well, you can't have much broader daylight than at ten o'clock on a sunny morning.

A.V.C. Proves its Worth

IN that same little Devonshire village I had the most convincing demonstration that I have ever had of the value of automatic volume control. When I was there a year ago the set in use had not this refinement and fading was often so bad that hardly a station could be found fit to listen to with real enjoyment.

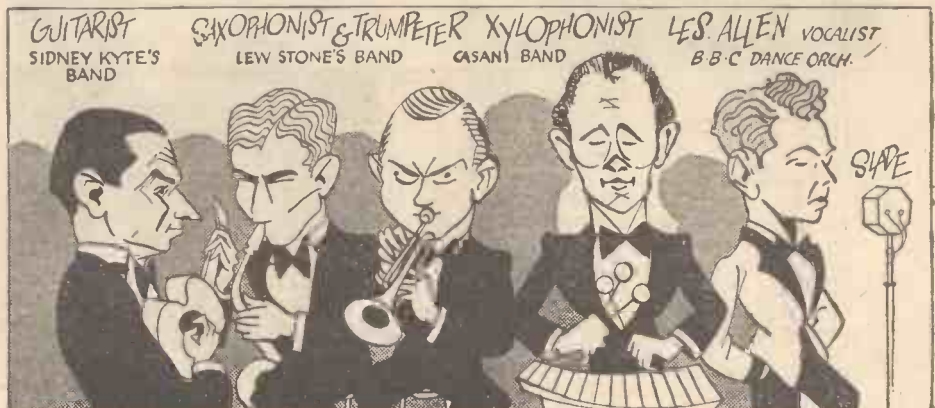
This year an A.V.C. set has been installed and fading has ceased to be a nuisance. The only thing you notice whilst listening to a distant programme is that though the volume remains steady there may be a slight rise and fall in background noises.

Poor Old Daventry!

SINCE the new Droitwich long-waver is likely to start testing in the spring and to come into full operation next summer I suppose that the authorities are not bothering to spend much money on the old Daventry plant. Its quality has certainly fallen off to a marked degree and there is still a considerable shrinkage in the size of its service area.

Many complaints reach me from listeners in different parts of the country. They can console themselves with the thought that only a few months must elapse before the long-wave

Broadcasters You Should Hear By Slade



National blossoms out into beautiful quality and fine volume.

The quality from Droitwich should be infinitely better than that of Daventry ever has been, for the former will use low-power modulation whilst the latter modulates at high power, which makes a certain amount of distortion almost inevitable.

Slowing them Down

TWO members of the French Academy of Sciences, I see, have been engaged in trying to knock spots off the old idea that wireless waves travel at the speed of light—that is, 300,000,000 metres a second.

They find that short-wave transmissions between France and South America show an average speed of 270,000,000 metres a second, whilst in the case of some of the long waves the speed may be as low as 240,000,000 metres. Though at first sight they seem to do so, these figures don't really disprove the old idea. Wireless waves don't move in a straight line from one place to another.

They go up to the Heaviside Layer, then back to the earth, then up again, and so on. This lengthens out their path and reduces their apparent speed from point to point. It is really no fairer to measure the distance that they cover as a straight line than it would be to measure the length of a saw-blade over the ins and outs of the teeth.

Radio Advertising

RADIO advertising must, I suppose, be worth while or people wouldn't indulge in it as they do. I must say, though, that what our American cousins would term my "re-



"Aunt Molly" of the Belfast station has just become engaged. She is seen here at a recent Radio League party. Irish listeners in particular will wish her good luck!

actions" are not at all favourable when at the end of some rather fine musical piece in a foreign programme a chappie suddenly says "If you want to keep dry on wet days buy a 'Slosh' mackintosh."

So annoyed do I become that I instantly resolve that whatever kind of mackintosh I do buy it will not be a "Slosh." Does wireless publicity affect you in the same way or do you find it hard to wait until the shops open next morning?

Tale of a Crystal Set

I HEARD the amusing story the other day of an experience of a friend of mine who has to travel a great deal. For company's sake he usually carries around with him a small radio set, consisting of a very simple crystal circuit and a pair of telephones, this being sufficient to give him all the results he requires.

One evening, having retired to his room in the hotel he rigged up the aerial, which was just a piece of wire hung round the room, and proceeded to tickle the whisker. Imagine his horror when large blue sparks leapt from the crystal to whisker whenever they were separated.

Having very hastily removed the headphones, he inspected the aerial, supposing that this had accidentally come into contact with the electric-light wires, but everything appeared perfectly normal.

On removing the aerial the sparks no longer appeared, proving that the trouble was in some manner or other due to the aerial. He made further investigations with absolutely no result, and as it was somewhat late he decided to leave the matter for investigation until the next morning.

Next morning, on glancing from his window, he saw almost on the other side of the road the masts of an umpteen kilowatt transmitter—hence the sparks!

Sounds are Easily Reflected

I INSPECTED a sound-proof chamber the other day at the laboratories of the G.E.C. at Wembley. The interesting part was the extraordinary deadness of the sound in the room.

Clapping one's hands produced no reverberation at all, sounding merely like a somewhat loud click. Speaking, of course, sounded strangely unnatural, but my guide held up a short piece of wood about 6 in. long and 2 in. wide (actually a token to which a key was attached) about 2 ft. from his mouth and the quality immediately became more brilliant and sparkling.

When I commented on this fact I was told



Echo of the Manchester Radio Show! Mr. Arthur Clarke, Northern Sales Manager of the well-known Atlas firm, is seen here presenting a chassis of the Atlas moving-coil loud-speaker to Mr. Johnson Clark, the famous ventriloquist

that it was due to reflection from the small piece of wood which was very noticeable owing to the total absence of any appreciable reflection from the walls. In fact, I was told that when the room was first erected a small notice was placed on the far wall labelled "no smoking" and that the reflection from this piece of cardboard was sufficient to upset the results and it had to be removed!

"Double" Transmissions

I SEE that experiments are being carried out in Holland with a new system of broadcast transmission in which two different programmes are both radiated on the same wavelength. A special form of receiver is then used to separate one from the other without overlap.

Details of the system are not given, but I believe it is possible to do something of the sort—at least, on short waves—by using a horizontally polarised wave for one programme and a vertically polarised wave for the other.

Whatever the method may be, I hope the experiment turns out to be a success, because the ether is already close to saturation point and any development that promises to provide a little more elbow-room will be heartily welcome.

Experiment with Common Waves

THE present scheme of using a common wavelength for radiating the same programme from two different stations (for instance, the 261.6-meter wave now shared by the London National and West Regional) has not turned out to be a great success, particularly for listeners who happen to live in districts where the two transmissions overlap.

There are times when the two waves seem to get out of phase with each other and set up a pronounced beat effect which definitely spoils reception so long as it lasts.

The Binaural Effect

WHILE on this topic, there is another type of transmission on which high hopes were based a few years ago—when there was more free space in the ether than there is now. I refer to the so-called "binaural" transmission, which was designed to give a more realistic effect to loud-speaker reproduction. Just as there is no real "depth" in anything that is viewed with only one eye, so there is a definite lack of depth or direction in a sound heard only by one ear.

Of course, the microphone takes the place of the ear in wireless transmission, but it is not sufficient merely to use two microphones unless both are connected to different carrier-waves.

Only then does one really get the true binaural reproduction, similar to the stereoscopic effect in sight. But as it means using two different wavelengths to transmit the same programme, I am afraid the idea is quite impracticable so long as other conditions remain as they are.

Those Copyright Fees

THE Court of Appeal has recently decided that broadcast music can only be reproduced in hotels, restaurants and other "public" places subject to the payment of certain copyright fees. The same point apparently arises in the case of gramophone records, and I hear that a special test case will shortly be brought before the High Court to settle the matter.

The Gramophone Company takes the view that it is one thing to sell a record to a private individual in order that he may play it at home, and quite another for the owner of a restaurant or hotel to play the same record for the entertainment of his customers.

In the second case, it is claimed that an extra copyright fee should be paid as a special tribute from the owner of the premises.



Step-by-step Assembly of the Etherdyne Super

Easy Stages in the Construction of the Set

CHASSIS construction! That is the keynote of the assembly of the Etherdyne. A chassis as neat as any metal set, but as easy to build as the simplest of panel and baseboard jobs. It is a wooden chassis, and the wood is the new Metaplex, becoming so popular with constructors.

You can make up this chassis for yourself, with a flat piece of wood for the base and two side supports to raise the board 3/4 in. Or you can buy the baseboard already drilled to take the specified parts.

Step 1. Get together all the parts. Take care to tighten up all their nuts and bolts. See that you have everything as specified.

Step 2. Drill the chassis if not bought already done. You can get the details from the blueprints on the inside covers last week and this. Fix the side supports after the drilling.

Step 3. Compare your components and chassis with the picture of the upper and lower sides of the chassis shown by our free photo-chart—given last week. Make sure you can identify all the components shown there.

Step 4. Looking at the chart, imagine your set is complete and that you are in front of the set. Then the two-gang condenser is on the left, the single-tuning condenser on the right, and the three tuning coils between them, roughly at the centre.

The valve-holders are fitted as follows: High-frequency valve to the left of the gang condenser, and then from left to right we have the oscillator-detector, the intermediate-frequency valve, and the second detector. Just behind the single condenser is the pentode.

We advise you to study the chart and blue-

prints very carefully before actually fixing anything.

Step 5. Now you can start work. Fix the under-chassis parts first, so that you have a flat, solid base beneath you. No particular order in fixing the parts here, but perhaps the smaller ones had better be done first. Note that the resistances are not fixed, but are held up by the wiring, which is done later.

Step 6. Fixing the volume-control bracket. Mount the bracket first without the control. Two screws make a firm fixing. Take care when fitting the control to put on insulating bushes each side of the spindle—the control must *not* be earthed.

Step 7. Other component pointers. See your low-frequency transformer and intermediate coils are fixed the right way round. With the screened high-frequency choke, make sure the upper terminal is the one with the metal strip connected to the screen. The other terminal goes to high tension and must not be mixed up.

Step 8. Fitting the components above the chassis. Fix the five valve-holders in the order already mentioned. Make sure grid and anode pins are the right way round, and that the holes for the pins clear the pins properly.

Step 9. The coil assembly. The two outer coils should be screwed in positions first, leaving the middle coil of the three to be centred by the spindle running through the bases of all three coils. This little tip will save you the risk of fouling the spindle.

Step 10. Fitting the anti-breakthrough unit. This is a choke with two copper wipers

arranged to be shorted in one position of the wavechange switch. First fit an ebonite bush to the end of the coil spindle, so that when the coil knob is turned to the right, for medium waves, the metal piece on the bush comes in contact with the wipers and thus shorts out the choke.

Step 11. Mounting the variable condensers. The two-gang job is fitted with three bolts screwed from the underside. Remove the trimmer from the frame—it is not wanted. Four bolts screwed from the top fix the single tuning condenser. These condenser fixing bolts serve another purpose. They connect the top and bottom surfaces of the metallised baseboard together, as the impregnation is not, of course, solid.

Step 12. Mounting the terminal strips for the aerial and earth, loud-speaker, and pick-up. These with the aerial pre-set complete the component fixing.

On pages 757 to 759 we give full details of the next step-wiring.

In the wiring instructions we show how to connect up the battery leads to the various components. You might anchor the cords as they leave the chassis to go out to the batteries by means of a small staple driven into the baseboard at some convenient point.

This week we have necessarily skimmed over the construction, but we think the seasoned constructor will have enough information to proceed with the assembly. For novices we are preparing a more comprehensive step-by-step assembly guide, and this will be given in our next week's issue, when all doubtful points will be very fully explained.

COMPONENTS YOU NEED FOR BUILDING THE ETHERDYNE SUPER

CHASSIS

- 1—Peto-Scott Metaplex metallised wood to specification

CHOKES, HIGH-FREQUENCY

- 1—British Radiogram, type Super-het (or Bulgin).
- 1—Telsen, type W341 (or Graham Farish, Bulgin HF9).

COILS

- 2—Lissen iron-cored screened aerial.
- 1—Lissen iron-cored screened 126-kilocycle oscillator.

CONDENSERS, FIXED

- 1—Graham Farish .0005-microfarad mica (or Lissen, Telsen).
- 2—Graham Farish .0001-microfarad mica (or Lissen, Telsen).
- 1—Graham Farish .0005-microfarad mica (or Lissen, Telsen).
- 1—Graham Farish .002-microfarad mica (or Lissen, Telsen).
- 1—Graham Farish .01-microfarad mica (or Lissen, Telsen).
- 3—Telsen .25-microfarad, type W229 (or Graham Farish, Lissen).
- 2—Telsen 1-microfarad, type W227 (or Graham Farish, Lissen).
- 1—Telsen 2-microfarad, type W226 (or Graham Farish, Lissen).

CONDENSERS, VARIABLE

- 1—Telsen twin-gang .0005-microfarad, type W306 (or Graham Farish, J.B.).
- 1—Telsen single .0005-microfarad, type W339 (or Graham Farish, J.B.).
- 1—Sovereign .0003-microfarad pre-set (or Lissen, Telsen).

HOLDERS, VALVE

- 4—Clix four-pin chassis-mounting.
- 1—Clix five-pin chassis-mounting.

MISCELLANEOUS

- 1—British Radiogram anti-break-through filter.
- 1—Varley battery economiser, type DP44, Power Puncher.

PLUGS, TERMINALS, ETC.

- 10—Belling-Lee wander plugs, marked: H.T.+, H.T.+1, H.T.+2, H.T.+3, H.T.—, G.B.—1, G.B.—2, G.B.—3, G.B.+ (two) (or Clix, Ealex).
- 2—Belling-Lee spade terminals, marked: L.T.+, L.T.— (or Clix, Ealex).
- 3—Lissen terminal blocks (or Telsen).
- 1—Belling-Lee wander fuse, marked: H.T.— (or Bulgin S5 fuse holder).

RESISTANCES, FIXED

- 1—Graham Farish 500-ohm (or Telsen, Lissen).
- 1—Graham Farish 5,000-ohm (or Telsen, Lissen).
- 1—Graham Farish 40,000-ohm (or Telsen, Lissen).
- 1—Graham Farish 1-megohm (or Telsen, Lissen).

RESISTANCES, VARIABLE

- 1—Sovereign 50,000-ohm, with combined three-point switch (or Bulgin VS50).

SUNDRIES

- 1—British Radiogram 2-in. metal mounting bracket for potentiometer.
- Connecting wire and sleeving (Lewcos or Goltone).
- 2—Bulgin two-way battery cords.
- 1—Bulgin three-way battery cord.
- 1—Bulgin four-way battery cord.
- 2 yd. thin flex (Lewcos or Goltone).
- 2 ft. shielded sleeving (Lewcos or Goltone).

SUITABLE VALVES

Make	1st H.F. Met.	S.G. Inter. Met.	Det. Osc.	2nd Det.	Power
Cossor	220VS*	220VS*	—	210Det	220PT
Marconi	VS24	VS24	S22*	HL2	PT240
Mullard	PM12M	PM12M	—	PM2DX*	PM22*
Mazda	S215V	S215V	—	HL2	Pen220A
Hivac	—	—	—	L210	Z220
Lissen	—	—	—	HL210	PT240
Osram	VS24	VS24	S22	HL2	PT240
Six Sixty	—	—	—	210D	230PP

*Valves used during "A.W." tests.

TRANSFORMERS, INTERMEDIATE-FREQUENCY

- 1—Lissen 126-kilocycle with reaction.
- 1—Lissen 126-kilocycle without reaction.

TRANSFORMER, LOW-FREQUENCY

- 1—Varley Nicorell (or Lissen Hypermik, R.I.Hypermu).

TABLE-MODEL ACCESSORIES

BATTERIES

- 2—Lissen 60-volt high-tension, type Super Power (or Ever Ready, Pertrix).
- 1—Lissen 16-volt grid bias (or Ever Ready, Drydex, Pertrix).
- 1—Lissen 9-volt grid-bias (or Ever Ready, Drydex, Pertrix).
- 1—Lissen 2-volt 40-ampere-hour accumulator, type LN2005 (or Exide, Ever Ready).

CABINET

- 1—Peto-Scott, type Etherdyne consolette.

LOUD-SPEAKER

- 1—Igranic permanent-magnet, type D9 (or W.B., Amphion, R. & A., Blue Spot 45 PM.).

MAINS UNIT (in place of batteries)

- 1—Atlas, type T25, for A.C. (or Ekco AC 20/3, Regentone CB/20, or 1—Atlas, type DC 15/25 B, for D.C. or (Ekco DC 15/25/3, Regentone CB/DC).

RADIO-GRAMPHONE ACCESSORIES

CABINET

- 1—Peto-Scott, type Adaptagram A, with plain front.

GRAMPHONE MOTOR

- 1—Garrard, type 11B.

LOUD-SPEAKER

- 1—W.B. permanent-magnet, type PM4A (or Igranic, R. & A.).

NEEDLE CUP. 1—Bulgin duplex, type NC1.

PICK-UP. 1—British Radiophons, type 645.

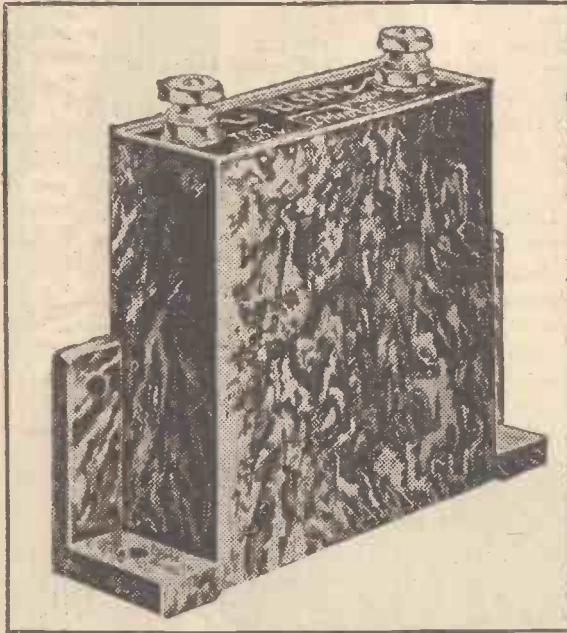
SWITCH

- 1—Bulgin Single-pole rotary, type, S91LB.

TELSEN PAPER CONDENSERS

Specified for the A.W.

“Etherdyne Super”



THE designer's choice of six Telsens Paper Condensers for use in the Etherdyne Super is an eloquent tribute to their lasting efficiency. Built to Post Office and Admiralty standards, they are rigorously tested at every stage of manufacture. Self-sealing, absolutely non-inductive and hermetically sealed.

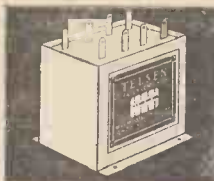
The illustration below shows the position occupied by Telsens Paper Condensers in the built-up Etherdyne Super.



TELSEN PAPER CONDENSERS.

500 Volt Test.	1000 Volt Test.
Cap. .01 ... 1/3	1/9
„ .04 ... 1/3	1/9
„ .1 ... 1/6	2/-
„ .25 ... 1/6	2/-
„ .5 ... 1/6	2/-
„ 1. ... 1/9	2/6
„ 2. ... 2/6	3/6

TELSEN COVER EVERY CONDENSER REQUIREMENT



TELSEN PAPER BLOCK CONDENSERS from 4s



TELSEN GRID LEAKS 6d.



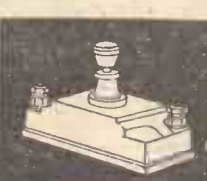
TELSEN LOW VOLTAGE ELECTROLYTIC CONDENSERS from 2s6



TELSEN FIXED MICA CONDENSERS from 6d.



TELSEN TAG CONDENSERS from 4½d.



TELSEN PRESET CONDENSERS 1/3

TELSEN FOR EVERYTHING IN RADIO

ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON, BIRMINGHAM

Don't Forget to Say That You Saw it in "A.W."



**design, construction,
performance, price**

Design is of paramount importance; the foundation on which depends the ultimate performance of a reproducer.

For this reason the R. & A. research department is constantly studying the problems of sound reproduction, and the result is to be found in the uniform high quality of performance inherent in every R. & A. Reproducer.

Ask your dealer to demonstrate any R. & A. model. Compare its performance with that of any similarly priced instrument, and you will appreciate a superiority which is acknowledged by the leading Set manufacturers who are fitting them as standard in their 1934 models.

The complete range comprises :

- TYPE '60' Differential Armature ... 21/-
- "BANTAM" P.M. Moving Coil
(Two models) ... 27/6
- "CHALLENGER" P.M. Moving Coil
(Five models) ... 35/-
- "ALPHA" P.M. Moving Coil (Two models) 52/6
- "VICTOR" P.M. Moving Coil ... 70/-

Each model (except Type 60) is fitted with Transformer specially designed to match the impedance of the valve with which it is to be operated.

REPRODUCERS & AMPLIFIERS LTD., WOLVERHAMPTON.



JUST ANOTHER WAY OF SAYING -

Whatever the circuit, the experienced constructor will always choose "J.B." For tuning iron-cored coils, in particular, the accurate matching found in J.B. Gangs becomes imperative; and the mechanical rigidity of "J.B." ensures the permanence of this matching.

Illustrated is the "J.B." Straight Line Dial, the whole scale of which is always on view and illuminated by a lampholder which travels with the cursor. Dial only, type S.L.1., as illustrated, 6/6; type S.L.2, with switch for lamp, 7/6; J.B. Nugang with cover and dial, as illustrated, 2-gang, 21/6; 3-gang, 26/6; 4-gang, 35/-.



**THE "J.B."
STRAIGHT
LINE DIAL**

Shown fitted to a "J.B."
Nugang Condenser

PRECISION INSTRUMENTS

Advertisement of Jackson Bros. (London) Ltd., 72, St. Thomas Street, London, S.E.1
Telephone: Hop 1837.

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

Your Wire-by-wire Guide to the Etherdyne



Making Full Use of Last Week's Photo-chart and Blueprint

COME along, constructors! Building the Etherdyne Super is not only a wonderful pastime to start the winter evenings; remember also that its assembly has been simplified to the greatest possible extent. It is a chassis set, and that means there is wiring to do above and below deck. But don't worry over that—the blueprint on the inside covers last week and this week, together with the photo-chart, will solve all the snags—there aren't many, anyway!

Two Sections of Wiring

Let us assume we are all looking at the photo-chart together. What is the first thing that strikes us? Surely the fact that there are two distinct sections of wiring, one above the baseboard and the other below.

For each section there are certain wires that are restricted to the section as you see them. But there are other wires, and this is very important to note, connected partly above and partly below the baseboard.

We have numbered all the wires used in the set from No. 1 to No. 89. If you make each connection in numerical order, and cross off each wire on the chart as you actually make it in your own set, you will be quite sure that

Have you noticed how your friends are talking about our amazing new set—the Etherdyne Super? You must read all about it to keep pace with them!

no wire has been left out, and what is equally important, that no extra wire has been put in.

As we are dealing with wires in two sections, that is above and below the baseboard, we have arranged a simple and foolproof aid to indicate the continuity of wires that in their connection from one component to another have to pass through holes in the baseboard. We have numbered the wires and so as to make the chart quite easy to follow we have lettered the holes through which some of the wires have to pass.

The object of this is to make quite sure you do not go astray when passing a lead from one side of the board to the other.

Take just an example; look at wire No. 8 on the top part. You will see that it is connected from a terminal on the two-gang condenser through hole D to the underside, where, by locating the corresponding letter D you can easily see that the No. 8 wire goes finally to a terminal on a valve holder. So with all the others.

Please note that in our references to the actual positions of the components on the top and bottom sections of the baseboard, we shall assume you are studying the photo-chart as it appears when

unfolded, with the words "Constructor's Photo-chart" at the top.

The descriptions "above," "below," "left" and "right" therefore refers to the photographic positions, and not, of course, to the actual positions or relative positions of the components in the set.

Now let us go right through the wiring of the set, explaining the path of each connection as simply as we can.

No. 1 starts at the aerial terminal and goes to the left-hand terminal of the aerial pre-set condenser.

No. 2 starts at right-hand terminal of the pre-set and goes to top terminal of the anti-breakthrough choke.

No. 3 starts at bottom terminal of the anti-breakthrough choke and goes to terminal marked "4" on the aerial coil, which is the coil of the three-coil unit that is nearest the control knobs.

No. 4 starts from terminal marked "1" on the same coil and goes to the right-hand terminal of the two-gang condenser nearest the front of the set.

No. 5 starts from terminal marked "2" on the same aerial coil and goes through the hole marked C in the baseboard to the top terminal of the fixed condenser just to the left of the volume control.

No. 6 starts from the same condenser terminal and goes to the centre terminal of the volume control.

No. 7 starts from the same condenser terminal and goes to the top terminal marked "S" on the base of the intermediate-frequency transformer mounted almost in line with the volume control right at the back of the baseboard.

No. 8 starts from the left-hand terminal of the two-gang condenser nearest the front of the set, and goes through the hole D in the baseboard to the grid terminal of the valve

holder seen at the top left-hand side of the underside view.

No. 9 starts from the anode terminal of the same valve holder and goes to the left-hand terminal of the fixed condenser immediately below the screened high-frequency choke.

No. 10 starts from the same condenser terminal and goes right along the back of the baseboard to anode terminal of the valve holder immediately below the intermediate-frequency transformer base.

Did you get a copy of the two-colour photo-chart of the Etherdyne Super given with last week's AMATEUR WIRELESS? It will prove invaluable to every constructor

No. 11 starts from the centre terminal, that is the one that is actually on the top, of the screened high-frequency choke, and goes through hole E to the anode terminal of a screen-grid valve, when that valve is eventually inserted. This wire should be of the shielded flexible type.

No. 12 starts at the same terminal of the screened choke we have already mentioned—centre—and goes to the left-hand terminal of the small fixed condenser just to the right of the choke.

Wire No. 13!

No. 13 starts from the right-hand terminal of this small fixed condenser and goes through the hole F in the baseboard to the terminal marked "4" on the centre coil of the three-coil unit.

No. 14 starts from terminal marked "1" on the same coil to the right-hand terminal of the gang condenser farthest from the front of the set.

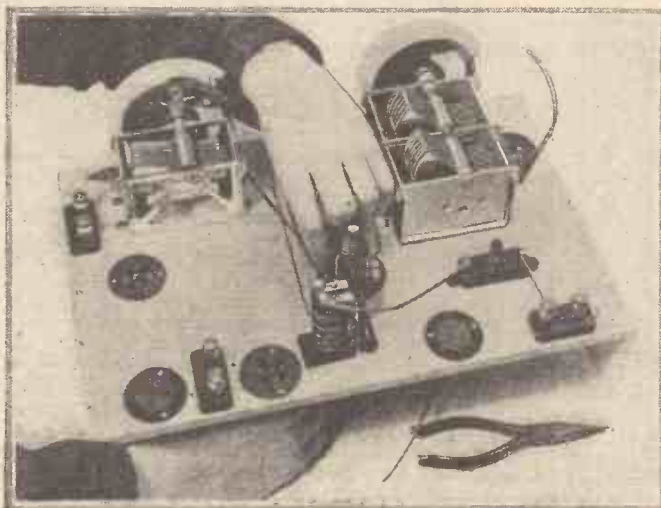
No. 15 starts from the same condenser terminal and goes through hole G in the baseboard to the grid terminal of the valve holder just to the left of the intermediate-frequency transformer base that is nearest the bottom of the baseboard.

No. 16 starts from the earth terminal on the frame of the two-gang condenser and goes to the terminal marked "2" on the centre coil.

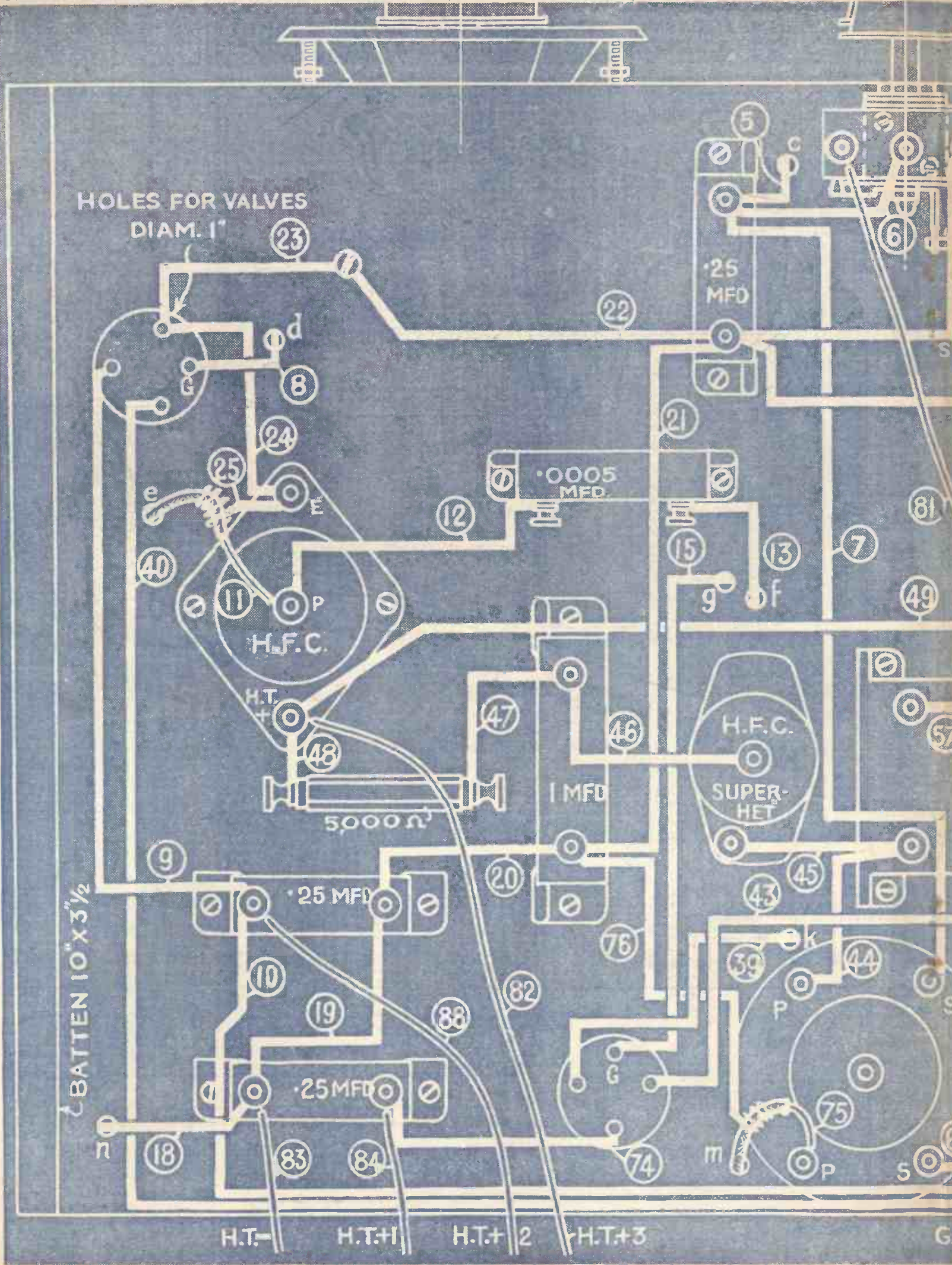
No. 17 starts from the same coil terminal and goes to terminal marked "2" of the coil nearest the anti-breakthrough choke.

No. 18 starts from the earth terminal of the terminal block in the top left-hand corner and goes through hole N in the baseboard to the left-hand terminal of the fixed condenser in the bottom left-hand corner.

No. 19 starts from the same condenser terminal and goes to the right-hand terminal of the fixed condenser just above.



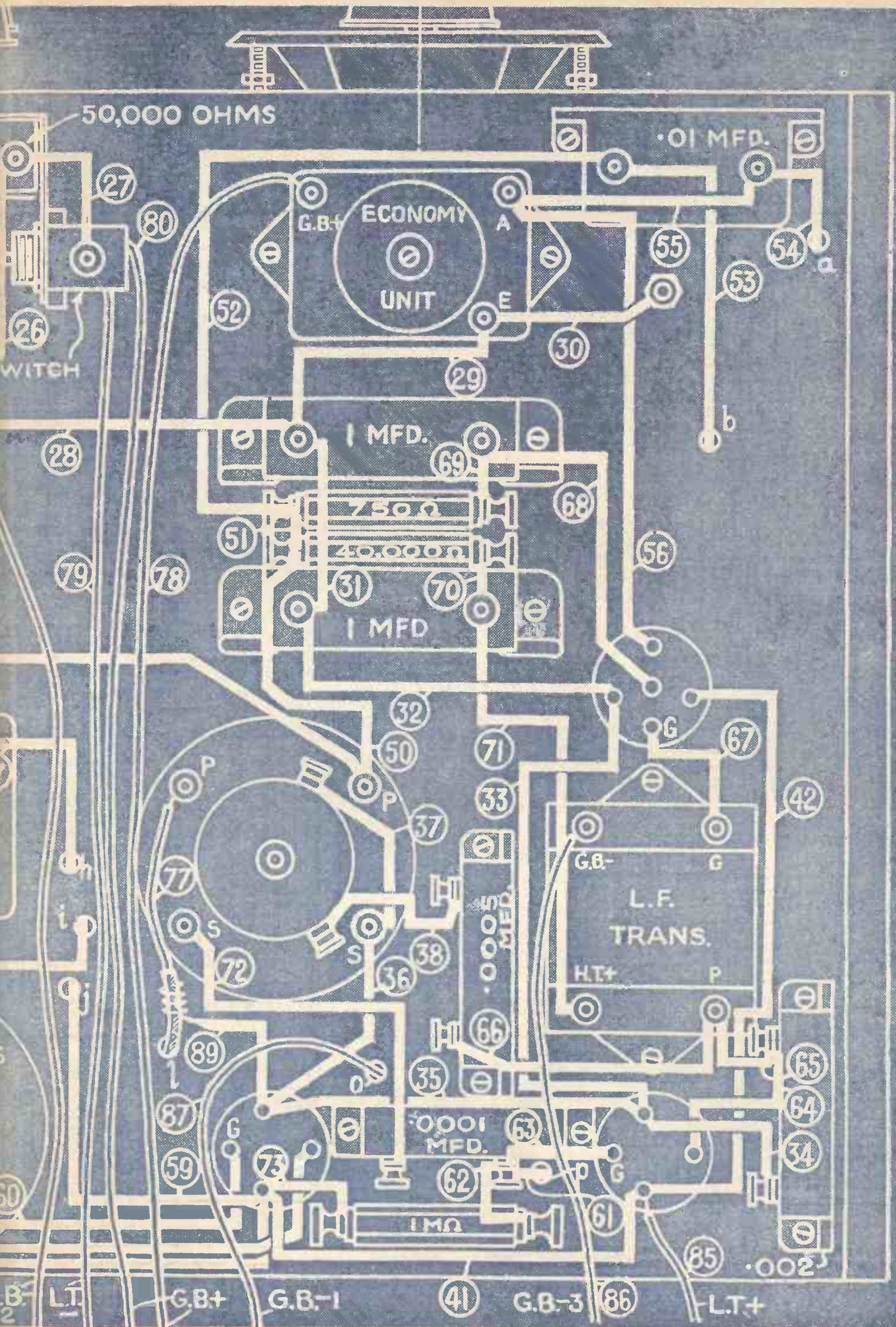
Making a start with the wiring of the upper part of the Etherdyne Super chassis. Last week's photo-chart will prove invaluable!



HOLES FOR VALVES
DIAM. 1"

BATTEN 10" x 3 1/2"

H.T.- H.T.+1 H.T.+2 H.T.+3



50,000 OHMS

.01 MFD.

ECONOMY
UNIT

G.B.+

A

E

SWITCH

1 MFD.

750Ω

250,000Ω

1 MFD.

G.B.-

L.F.
TRANS.

HT+

.0001
MFD.

1MΩ

.002

G.B.+

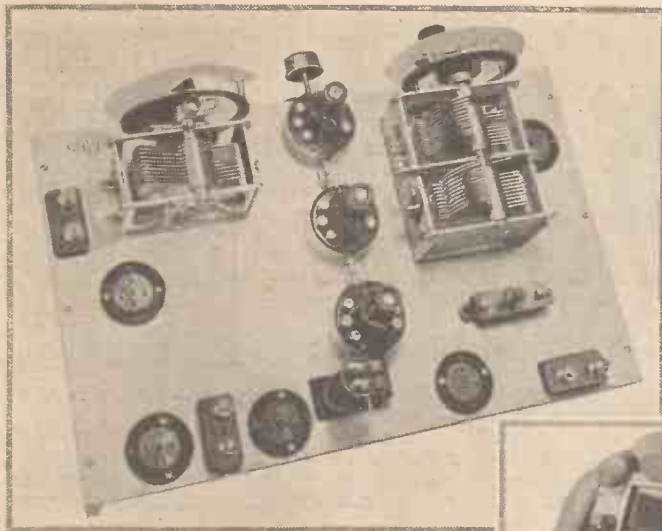
G.B.-1

(41)

G.B.-3

(86)

LT+



Here you see the top part of the Etherdyne chassis before wiring is started. There will be no trouble about it if this article is carefully followed

No. 20 starts from the same terminal just mentioned and goes to the lower terminal of the larger fixed condenser just to the left of the unscreened high-frequency choke.

No. 21 starts from the same terminal just mentioned and goes to the lower terminal of the fixed condenser to the left and just below the volume control.

No. 22 starts from the terminal just mentioned and goes to the two-gang condenser fixing bolt that is shown near the top left-hand corner just to the right of the valve holder.

No. 23 is really a continuation of the No. 22 wire, a loop being made under the bolt and the wire continued to the top filament terminal of the valve holder in the top left-hand corner.

No. 24 continues from that same valve holder terminal and goes to the top terminal of the screened high-frequency choke. Here "top" refers to the photo-chart and not to the top terminal of the choke itself, which for clearness is being called the *centre* terminal.

No. 25 starts from the terminal just mentioned and is bound round the metal shielding on the anode lead marked No. 11 already made.

No. 26 starts from the lower terminal of the condenser to the left of the volume control and goes to the right-hand terminal of the volume control.

Last week a full-size blueprint of the top of the Etherdyne Super chassis was given on the inside of the cover. Have you kept your copy?

No. 27 starts from the terminal just mentioned and goes to the terminal you can see on the switch part of the volume control.

No. 28 starts from the lower terminal of the fixed condenser to the left of the volume control and goes to the left-hand terminal of the large fixed condenser just below the battery economiser unit.

No. 29 starts from the terminal just mentioned and goes to the bottom right-hand terminal of the economiser unit.

No. 30 starts from the terminal just mentioned and goes to the single tuning condenser's fixing bolt just to the right of the economiser.

No. 31 starts from the left-hand terminal of the fixed condenser just below the economiser unit and goes to the left-hand terminal of the large fixed condenser just below the condenser you started from.

No. 32 starts from this left-hand terminal of the large fixed condenser and goes to the left-hand filament terminal of the valve holder just above the low-frequency transformer.

No. 33 starts from the terminal just mentioned and goes to the top filament terminal of the valve holder in the bottom right-hand corner.

No. 34 starts from the bottom terminal of the small fixed condenser at the bottom right-hand corner and goes to the top

valve holder in the bottom right-hand corner.

No. 42 starts from the terminal just mentioned and goes to the right-hand filament terminal of the valve holder just above the low-frequency transformer.

No. 43 starts from the right-hand filament terminal of the valve holder to the left of the intermediate-frequency transformer near the bottom of the baseboard, goes through the hole 1 in the baseboard to the terminal marked "6" on the coil nearest the anti-breakthrough filter unit.

No. 44 starts from the uppermost p terminal on the intermediate-frequency transformer nearest the bottom of the baseboard and goes to the lower terminal of the small fixed condenser on the right of the unscreened high-frequency choke.

No. 45 starts from the terminal just mentioned and goes to the lower terminal of the unscreened high-frequency choke.

No. 46 starts from the upper terminal of the unscreened high-frequency choke and goes to the top terminal of the large fixed condenser just to the left of the unscreened choke.

No. 47 starts from the terminal just mentioned and goes to one side of a resistance held in position by its wiring and placed just to the left of the large fixed condenser that is itself to the left of the unscreened choke.

No. 48 starts from the other side of this resistance and goes to the lower terminal of the screened high-frequency choke.

No. 49 starts from the terminal last mentioned and goes to the right-hand p terminal on the intermediate-frequency transformer to the left of the low-frequency transformer.

No. 50 starts from the terminal last mentioned and goes to the left-hand terminal of the lower resistance of the two resistances fixed between the two large fixed condensers that come below the economiser unit.

More Resistance Connections

No. 51 starts from the resistance terminal just mentioned and goes to a similar terminal on the resistance just above it.

No. 52 starts from the resistance terminal just mentioned and goes to the left-hand terminal of the fixed condenser just to the right of the economiser unit.

No. 53 starts from the terminal just mentioned and goes through a hole B in the baseboard to the top terminal of the terminal block of the loud-speaker on the right-hand side of the baseboard.

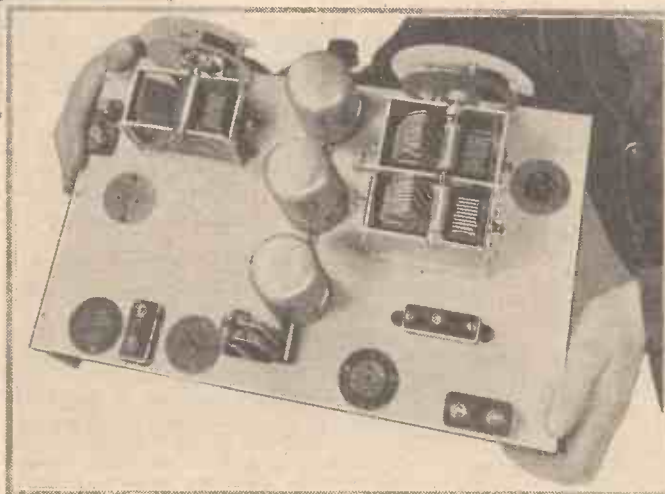
To the Economiser Unit!

No. 54 starts from the other terminal of the loud-speaker block and goes through a hole A in the baseboard to the right-hand terminal of a small fixed condenser on the right-hand side of the economiser unit.

No. 55 goes from the terminal last mentioned to the top right-hand terminal of the economiser unit.

No. 56 starts from the terminal last mentioned and goes to the top terminal of the valve holder just above the low-frequency transformer.

No. 57 starts from the top terminal of the small fixed condenser to the right of the unscreened high-frequency choke, through a hole H in the baseboard, to a terminal marked "1" on the coil nearest the anti-breakthrough unit.



Another view of the top of the Etherdyne chassis. Remember that a full-size blueprint of the top was given last week; and of the bottom this week

filament terminal of the valve holder just to the left of it.

No. 35 starts from the terminal just mentioned to the top filament terminal of the valve holder just below the high-frequency transformer placed to the left of the low-frequency transformer.

No. 36 starts from the terminal just mentioned and goes to the terminal marked s on the right-hand side of the intermediate-frequency transformer placed to the left of the low-frequency transformer.

No. 37 starts from the terminal just mentioned and goes to one of the side terminals of the intermediate-frequency transformer to the left of the low-frequency transformer. This terminal is not on the base of the intermediate-frequency transformer, but sticks out from the side. From the photograph point of view the terminal in question is the one shown uppermost—there is another shown below it.

No. 38 starts from the top terminal of the small fixed condenser to the left of the low-frequency transformer and goes to that other side terminal of the intermediate-frequency transformer just mentioned.

No. 39 starts from the left-hand filament terminal of the valve holder to the left of the intermediate-frequency transformer placed at the bottom centre of the baseboard and goes through a hole k in the baseboard to the terminal marked "4" on the coil nearest the anti-breakthrough filter.

No. 40 starts from the lower filament terminal of the top left-hand valve holder and goes right along the bottom of the baseboard to the lower filament terminal of valve holder below the intermediate-frequency transformer to the left of the low-frequency transformer.

No. 41 starts from the terminal just mentioned and goes to the lower filament terminal of the

No. 58 starts from the terminal just mentioned and goes to the terminal on the left-hand side of the single tuning condenser.

No. 59 starts from terminal marked "5" on the coil nearest the anti-breakthrough unit, through a hole j in the baseboard, to the lower filament terminal of the valve holder below the intermediate-frequency transformer to the left of the low-frequency transformer.

No. 60 starts from the lower terminal s on the intermediate-frequency transformer nearest the bottom of the baseboard, goes to the left-hand terminal of the valve holder just to the right of it.

No. 61 starts from the right-hand terminal of the small fixed condenser that in the actual

This week a full-size blueprint of the top of the Etherdyne Super chassis is given on the inside of the cover. Make use of it when building your set!

set is found just below the fixed resistance shown by the photo-chart between the two valve holders at the bottom-right-hand corner of the baseboard, and goes through a hole p in the baseboard to the top terminal of the pick-up terminal block at the top of the baseboard.

No. 62, again, starts from the right-hand terminal of the fixed condenser already mentioned and goes to one side of a fixed resistance just above it.

No. 63 starts again from the fixed condenser terminal already wired with the starts of Nos. 61 and 62, and goes to the left-hand terminal of the valve holder in the bottom right-hand corner.

No. 64 starts from the right-hand terminal of the valve holder just mentioned and goes to the top terminal of the small fixed condenser just to the right of this valve holder.

Well on the Way Now!

No. 65 starts from the terminal last mentioned and goes to the p terminal of the low-frequency transformer.

No. 66 starts from the p terminal and goes to the lower terminal of the small fixed condenser just to the left of the low-frequency transformer.

No. 67 starts from the g terminal of the low-frequency transformer and goes to the lower terminal of the valve holder just above the low-frequency transformer.

No. 68 starts from the centre terminal of the valve holder just above the low-frequency transformer and goes to the right-hand

terminal of the fixed condenser just below the economiser unit.

No. 69 starts from the terminal last mentioned and goes to the right-hand terminal of the upper of the two fixed resistances held in position between the two large fixed condensers already referred to.

No. 70 starts from the right-hand terminal of the lower of these two resistances and goes to the right-hand terminal of the large fixed condenser just above the intermediate-frequency transformer.

No. 71 starts from the terminal last mentioned and goes to the terminal on the low-frequency transformer marked "H.T.+."

No. 72 starts from the left-hand terminal marked "S" on the intermediate-frequency transformer to the left of the low-frequency transformer; and goes to the left-hand terminal of the small fixed condenser just below the resistance suspended between the two valve holders already referred to.

No. 73 starts from the lower filament terminal of the valve holder below the intermediate-frequency transformer, and goes to the left-hand terminal of the resistance located above the hidden fixed condenser.

No. 74 starts from the lower terminal of the valve holder to the left of the intermediate-frequency transformer, and goes to the right-hand terminal of the fixed condenser in the bottom left-hand corner.

No. 75 starts from the lower terminal marked p on the intermediate-frequency transformer nearest the baseboard, and goes through hole m in the baseboard to the anode of the screen-grid valve—the valve near the pre-set aerial condenser. This connection should be a shielded flexible type of wire.

No. 76 starts by being twisted round the shielding of No. 75, and goes to the lower terminal of the fixed condenser immediately to the left of the unscreened high-frequency choke.

No. 77 starts from the top terminal marked p on the left-hand side of the base of the intermediate-frequency transformer near the low-frequency transformer, and goes through a hole l in the baseboard to the top of the valve just to the right of the anti-breakthrough choke. This wire should also be of the shielded flexible type.

Now we come to the flexible battery connections, which are also numbered on the chart. The battery cord we have used for neatness and general convenience consists of four separate groups of flexible wires, each one a distinct colour or combination of colours so that you know where you are.

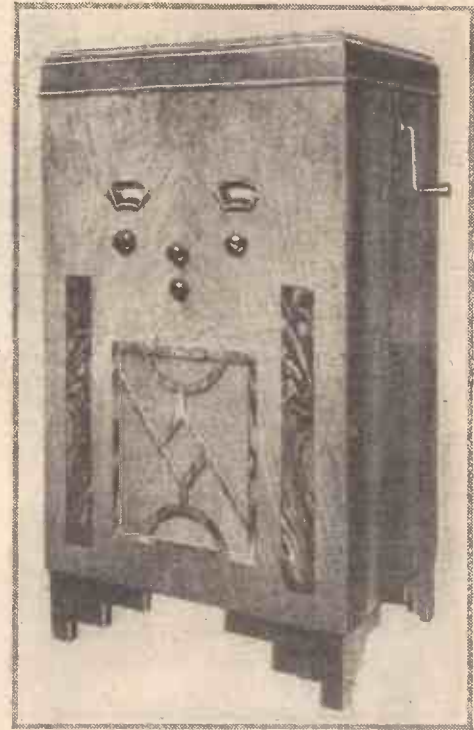
First of all let us give you the four groups. There are two *two-way*, one *three-way* and one *four-way*, respectively for low-tension, pentode bias, variable- μ bias, and high-tension.

Now as we give you the numbers in the numerical order they are connected in the chart, we will also give you, in brackets, the colours by which you can identify the wires.

No. 78 starts from the G.B.+ terminal on the economiser unit and goes to a wander plug marked G.B.+ (red and yellow in one of the two-way cords).

No. 79 starts from one of the underneath terminals on the switch part of the volume control and goes to a spade terminal marked L.T.— (yellow and black in the other two-way cord).

No. 80 starts from the other or remaining under-side terminal of the vol-



The radio-gramophone version of the Etherdyne Super completed and housed in its attractive Peto-Scott cabinet. Don't forget that the Etherdyne Super can be made as either a table-cabinet or a radio-gramophone

ume control switch and goes to a wander plug marked G.B.+ (red in the three-way cord).

No. 81 starts from the left-hand terminal of the volume control and goes to G.B.—2 (black in the three-way cord).

Careful with the H.T.'s!

No. 82 starts from the lower terminal on the screened high-frequency choke to a wander plug marked H.T.+3 (yellow and red in the four-way cord).

No. 83 starts from the left-hand terminal of the fixed condenser in the bottom left-hand corner and goes to a wander plug marked H.T.— (yellow and black in the four-way cord).

No. 84 starts from the right-hand terminal of the fixed condenser in the bottom left-hand corner to a wander plug marked H.T.+1 (yellow and white in the four-way cord).

No. 85 starts from the lower filament terminal of the valve holder just below the low-frequency transformer and goes to a spade terminal marked L.T.+ (red and yellow in the two-way cord already in use for wire No. 79).

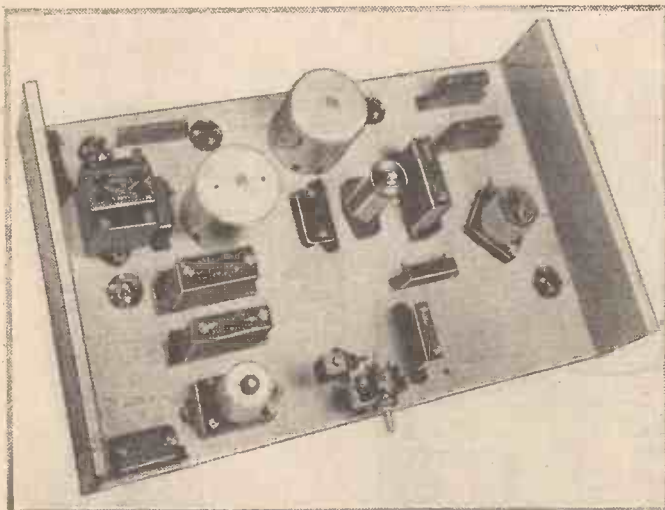
No. 86 starts from G.B.— terminal on the low-frequency transformer and goes to a wander plug marked G.B.—3 (yellow and black in the cord already used for wire No. 78).

No. 87 starts from the lower terminal of the pick-up terminal block and goes to a wander plug marked G.B.—1 (yellow in the three-way cord already used for wires No. 81 and 80).

Flexible Anode Connection

No. 88 starts from the left-hand terminal of the fixed condenser just below the screened high-frequency choke and goes to a wander plug marked H.T.+2 (yellow in the four-way cord).

No. 89 is in the nature of an afterthought, consisting of a short piece of wire bound round the shielding of the anode connection marked No. 77 to the upper filament terminal of the valve holder just below the intermediate-frequency transformer to the left of the low-frequency transformer.



A view of the underneath of the Etherdyne Super chassis before wiring is started. See also the photographs and full-size blueprint on other pages of this issue

WHY I CHAMPION *the* SUPER-HET

A Special Article by W. JAMES

A SUPER-HETERODYNE receiver is a most interesting type. Some say that it cannot be beaten for selectivity and sensitivity. As both these properties are so essential to-day, then it looks as though the super-het set is the best that you can have.

Now, I am not going to state that this type of receiver is necessarily the most selective and the most sensitive, for you can build straight sets which are satisfactory in both these respects. I must confess to a great liking for super-heterodyne receivers, however, and I know that extraordinarily good results can be obtained, probably more easily than with a straight set.

My First Super—Ten Years Ago!

The only thing I have heard said against a super-heterodyne set is that the quality may not be too good. There is nothing in this nowadays. My first super-het, built nearly ten years ago, might have been a bit squeaky, but it used to get the American stations all right. It had nine valves.

If we made a set to-day with nine valves, something ought to happen. Normally, you can get all the stations you want, say up to one hundred, with five valves. Now the interesting thing about such a five-valve set is that each valve would have a totally different job to do.

In a straight set you have a high-frequency stage to magnify the weak signals, a detector to rectify them, and then probably a power valve. A super-heterodyne receiver must have an intermediate-frequency stage and an oscillator (which is sometimes combined with the first detector or a separate valve may be used).

Briefly, a super-het consists of two units. One unit has a high-frequency amplifier, a detector, and a power valve. The other unit has the means for picking up the station desired and for creating a new signal, having the same frequency as that of the high-frequency amplifier in the first unit.

If this amplifier is designed to work on a frequency of 126,000 cycles (126 kilocycles), then the circuits in the other unit must pick up the station desired and turn the signal into another having this frequency of 126 kilocycles. It will then be magnified, rectified in the usual way, and passed to the power valve.

To pick up the station desired an ordinary tuned circuit is needed. This may be connected to a single high-frequency stage or not; it depends upon various factors, which will be explained later. We must now inject into the circuit, or into a valve, oscillations having a definite frequency relative to that received.

For this purpose an oscillator is used. The oscillator is merely a valve having enough reaction to make it oscillate, and a tuning condenser is used with it in order that the frequency may be adjusted.

The next element required in the circuit is a rectifier, and we can now make the new signal.

By tuning, the frequency of the new signal can be adjusted to that of the amplifier.

These three items are separately extremely simple and when working together they account for a large amount of the selectivity of the set. The circuit is so arranged that the signals from the station desired are applied to the detector (called the *first* detector). We also apply to this valve the locally generated oscillations.

The detector, therefore, has to deal with the two sets of oscillations and we find in the output a new signal. This signal has the same low frequency as the original one in the aerial, but the high frequency is different.

Thus, if the frequency of the station to which we are tuned is A and we tune the oscillator to a lower frequency B, the new high frequency is A-B. The new frequency is actually equal to the difference between the frequency of the signal and that of the oscillator.

Now the job is always to make the new frequency equal to that of the amplifier. If this is, say, 126 kilocycles, a very usual figure, then it will be clear that we can create a signal of this frequency by making the oscillator 126 kilocycles above, or below, the frequency of the signal picked up in the aerial.

For example, if the aerial is tuned to 1,000 kilocycles, then the oscillator can be tuned to 1,126 kilocycles or to 874 kilocycles. The result is the same, whether the oscillator is tuned to the lower or the higher frequency, because the difference is the same.

This opens up an interesting possibility. For, if the oscillator is tuned to, say, 750 kilocycles, this is just right for two stations, one working on a frequency 126 kilocycles higher and the other the same amount lower.

In this example, the two stations would be working on 624 and 876 kilocycles. If, therefore, both stations were picked up by the aerial, both would be heard, and there would be bad interference.

In practice one station might have the exact frequency of, say, 624 kilocycles and the other, perhaps, 870. In this case a bad whistle would be heard. The problem is to avoid this, and

let me add that some sets do allow this form of interference.

To avoid it completely is merely a matter of tuning. This might seem quite easy. You must have between the aerial and the first detector a tuned circuit which will let one station through and not the others. The frequency difference looks large enough; twice the frequency of the long-wavelength amplifier or 252 kilocycles when the amplifier is tuned to 126 kilocycles.

With a two-circuit tuner, however, such as a band-pass connected between the aerial and the first detector, the results are normally very good, except for one case; that is, when you are tuned to a distant station and your local powerful station happens to have a frequency of about 252 kilocycles away from the distant station.

Hearing a Whistle

Thus, if you live in London and you have the aerial circuit tuned to North Regional and an intermediate frequency of 110 kilocycles, a whistle may be heard. The aerial circuit is tuned to 625 kilocycles (North Regional). London is working on 843. The oscillator is set to 735 kilocycles and is therefore 110 kilocycles above North Regional and beats with this signal to produce the long-wavelength signal for the amplifier.

But the powerful local station may force oscillations in the aerial circuit, and if they also reach the first detector a squeal or high-pitched whistle will be heard, because London, 843 kilocycles, is 108 kilocycles higher than the oscillator.

Something can be done to avoid the interference by altering the intermediate frequency. Usual values, however, are 126 and 110 kilocycles.

The trouble is met, as described, when tuning to a distant station and a powerful one, such as the local, gets into the set. The cure is to provide better tuning and shielding. Shielding will stop the wires and coils from picking up the local station, but good tuning must be provided to cut it out entirely.

Sometimes a wave-trap is employed, but is not really necessary. Three tuned circuits will provide adequate tuning to stop the trouble and often a high-frequency stage, between the aerial and the first detector, if carefully designed, will avoid it.

The high-frequency stage is also useful for two other reasons. First, it magnifies the incoming signal, which adds to the sensitivity of the set; and, secondly, it will stop oscillations from the oscillator reaching the aerial.

In some sets, where adequate precautions are not taken, oscillations from the local oscillator do flow back to the aerial and are radiated. They may then be picked up by others and spoil their reception. One of the chief points in the design of a super-het is, therefore,

Continued on page 789



S. Rutherford Wilkins, the designer, watching another member of the "A.W." Staff try out the Etherdyne Super

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(Sgd.) E. W. Edwards.
(Original can be seen.)

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I am very pleased I took up your proposition and in my humble opinion there isn't a better product on the market. I have had all the other kinds through my hands and have dissected them all, and I know they are all inferior.

Yours faithfully,
(Sgd.) Allan L. Litt-Wilson.
(Original can be seen.)



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(Original can be seen.)

STRAIGHTFORWARD

Dear Sir,
I thank you for your straightforward and easy process. I think it is one of the best hobbies that anyone could take up.



(Signed)
F. J. Herbert.
(Original can be seen.)

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"Amateur Wireless," 28/10/33.

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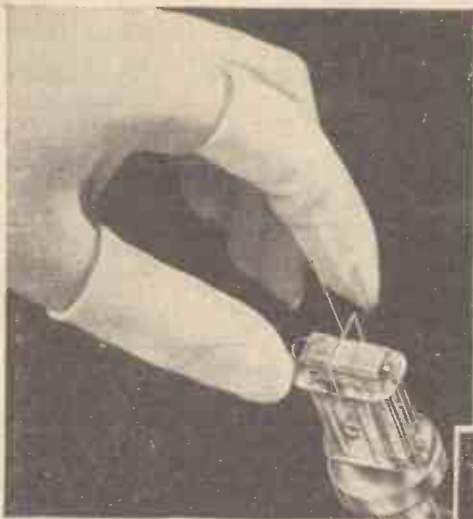
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In the Cossor factory, you would find the most rigorous inspections—the most elaborate precautions—the universal use of finger-stalls is but one of them. Sometimes, perhaps, our engineers may be just a little *too* particular—but, after all, they are the men who are really responsible for safeguarding Cossor quality.



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There must be No More War Plays! :: Thrill of the Week :: Cochran's Hour :: Straight Tip to Haver and Lee :: Best Vaudeville Vocal Effort :: Making us See the Buggins

RARELY have I admired a play from the constructional point of view as much as I admired *The White Château*. Mr. Berkeley's dialogue all through was convincing—much too convincing in the trench scenes. It might have all happened as he portrayed it. Higher still, in my estimation, was the English of the exquisite verses so beautifully spoken by the Chronicler, Henry Oscar; neither can I forget the nobility of conception in the final scene.

As there were more than twenty speaking parts I cannot spare space to review the excellence of each player, but I should like to mention the playing of *Diane* by Jessica Tandy. Also that of *Philip Luttrell* by Charles Mason, in whom, I imagine, there is a potential juvenile lead for many a play to come. He has a charming voice and, above all, sympathy.

Condemning a Masterpiece

Mr. Howard Rose must forgive me if I say I found in his producing a reason for the strongest condemnation of all such plays for what they must mean to far too many people. In very admiration of his presentation of what I consider a masterpiece, I have no hesitation in condemning the whole thing out of hand.

By sheer technical skill and good judgment Mr. Rose made those scenes so vividly perfect that I do not think I am letting my imagination run away with me when I say I am certain hundreds of listeners switched off (long before the uplifting *finale*) because memories of fathers, sons, and brothers were too painful. Broadcasting exists primarily to entertain, not to sadden. A human play in the ordinary sense is one thing; so vivid a portrayal of the supreme sacrifice in the Great War is quite another.

Even if I have to do the obvious thing and quote the B.B.C.'s own motto *Nation shall speak peace unto nation*, I say, without fear or favour, that THERE MUST BE NO MORE WAR PLAYS—at least, if they are as real as *The White Château*.

There was another war play during the week, *The Pride of the Regiment*. It was an unlikely tale—a very unlikely tale—of the Crimean War, but even if it had been of the Great War, there could have been no objection to it.

It left me thinking how unreal it all was, and how real the other. Also, before I forget it, how excellent was Wynne Ajello!

The thrill of the week, to me, was Vernon Bartlett's magnificent and courageous speech on the German situation and the way we ought to regard it.

Never do I remember hearing nobler words uttered in the cause of peace. My final thought was to wish heartily that Mr. Bartlett might take a hand in affairs. We need level-headed men like him.

I also heard him on the conditions on various European frontiers earlier in the week.

Although I have always been sea-sick whenever I have been on anything but calm water, Mr. Bartlett made me truly thankful that England's frontiers are marked by pleasant shores and majestic cliffs rather than by so many miles of barbed wire.

I was quite sorry it was not really Mr. C. B. Cochran's birthday after all. The programme said he was sixty the day of his broadcast; he said he was sixty-one last September. He ought to know; I suppose.

I enjoyed every minute of his talks and appreciated the obvious affection that exists between him and those who work under him. The whole atmosphere of the studio was extremely pleasant, and I thought Henry Hall's final words in the best taste.

I thought the tunes not worth hearing. I am sorry to say this, because Mr. Cochran evidently thought well of them. From the musical standpoint there was not one that could pass a test of construction, to my way of thinking.

But for the personal charm of *Professor Herr Cochran, C.B.*, or *Cocky* (as he was variously called by his friends) the hour would have passed slowly for me.

I hope Haver and Lee will not think I am definitely out to disparage them every time I hear their turn, but I do wish they would change it and try another style.

This time they were meditating escape from prison. Surely when they do that they ought to be making us go goosey with excitement? Instead of which they used most of the time up with dialogue that only had a tinge of humour about it.

I dislike applying the word *dull* to them, but I am bound to say I thought they came

very near to deserving it. I have no doubt about their ability as comedians. Neither do I doubt that they *began* well enough with this particular medium. All I say now is that the medium has become tedium, which is bad for it. Now, gentlemen, let us have a change of style. You yourselves will be the first to feel the benefit.

I liked Veronica Brady's comedy song *If the Managers only thought the same as Mother*, but I think it could do with re-writing. It could be made smarter. Miss Brady knows how to deliver a comedy song, which is a good reason for her delivering the best obtainable.

I do not think she is so good in a monologue. The one she gave *might* be re-written, but I think it would be better scrapped.

The Seven Singing Sisters (who are not of the same family as the Eight Step Sisters, I imagine) gave the best vocal show I have ever heard in a variety programme.

Rosamunde Ballet Music

I like their German better than their English and much appreciated their arrangement of Schubert's *Rosamunde* ballet music. They were so good that I think I must ask Mr. Maschwitz to invite them to give a recital. Any chance of it, Eric?

Yes? Thanks awfully.

Grandma Buggins has the happy knack of making her observation just when you think she is going to. She never surprises you by chipping in, however much she may surprise you by what she says. I think she is a fine old girl—beg pardon—er, lady.

Father sweeping the chimney was a good effort. I enjoyed the last line: "That lump of soot in the corner is *Baby*."

Mabel Constanduros is a good broadcaster because she never forgets we cannot see her shows. She is a better broadcaster because she *makes* us see.

Arthur Askey is a comedian of whom we ought to hear more. His comedy songs are excellent. So is his patter. One of his rhymes, by inference, made me raise an eyebrow—but to the pure all is pure, of course.

Othello was a success. I am afraid I thought it might not be, despite so strong a cast, but Peter Creswell's presentation of it impressed me tremendously.

Also I found myself deeply interested in Leslie Woodgate's delightful music. Our Leslie is developing into a composer these days.

There is to be a Sarony Hour on November 3 and 4. If Leslie doesn't lift up his finger and say *tweet-tweet* I shall be very cross with him.



Mabel Constanduros and Michael Hogan—the Buggins family to you!—getting together ideas for another one of their inimitable broadcasts



Mastering the Ether with the Etherdyne

HOW TO OPERATE THE FOUR CONTROLS OF "A.W.'s" AND

FROM the listener's point of view one of the most attractive things about the Etherdyne Super is the wonderfully simple nature of the controls.

No hyper-critical setting of reaction to be done; no juggling with presets or coupling condensers to get the stations clear of interference; in fact, none of the trickiness inherently associated with the simpler type of straight set.

For as we have taken pains to explain elsewhere, in this issue and last week, the Etherdyne Super has so much latent power, and such widely ranging faculties for logging the distant stations, that anyone who can turn a knob at all can get dozens of stations at full loud-speaker strength on this new super.

Only Four Knobs!

Altogether, there are four knobs on the Etherdyne. Two of them are tuning knobs, on the left a knob actuating the two-gang tuning condenser, with a super-imposed trimmer, and a scale marked from 0 to 100 degrees; and on the right a knob for the oscillator tuning condenser, also having a scale marked from 0 to 100 degrees.

Between these two main controls are the two subsidiary controls, the top one being the wave-change switch, to give you medium or long waves at will, and the lower one for working a combine volume control and on-off switch.

circuit and one of the grid-bias circuits.

Now we have to consider the main controls. So long as you do the right thing you will find them delightfully simple. The great secret is to keep the tuning knob on the left in step with the oscillator knob on the right.

There is one correct relation between the settings of the two dials. Once this is found—and it is very easy to find if you glance at our compendium list of stations—you can go

First, adjust the left-hand dial to about its half-way position; then turn up the volume control to nearly or quite maximum; and finally, adjust the oscillator dial until a signal is heard; that will denote all tuning circuits are in tune.

You can then tune in station



Here is the Etherdyne Super—the super-het you have been waiting for! In this article we go into all the details of the set's operation and show you how very simply the Etherdyne can master the ether—no matter how chaotic it may be!

Just a word on these smaller controls before going into details of the tuning operation. The wavechange switch is moved to the left for the long waves and to the right for the medium waves.

The combined volume control and on-off switch is easy to work. Turned anti-clockwise, that is from right to left, the knob will reduce the volume. Moved to its maximum anti-clockwise position, this knob will switch off the set altogether, by breaking the filament

right through the whole gamut of medium- and long-wave stations without the slightest hesitation.

Supposing you want to get the hang of the controls without reference to our log, you can do so.



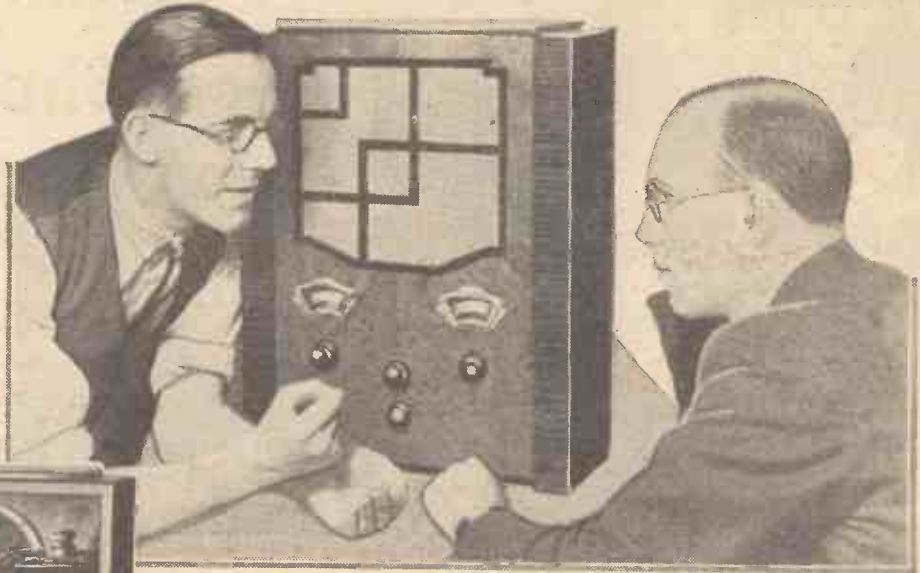
Getting ready the Etherdyne Super for its first tests, which you may be sure it passes with flying colours! Remember this is a set with a history—its pedigree goes back to a set first "hooked up" last Spring!

Etherdyne

AMAZING NEW SET

In its table cabinet the chassis of the Etherdyne Super fits very snugly, with batteries and loud-speaker above

To get the best from your Etherdyne make full use of the Station Identifier given with this issue!



As one constructor to another—a forceful argument in favour of building the Etherdyne Super!

losses, by using two separate condensers, rather than try to do the whole thing under one control.

Actually in practice, you will find the handling of the two controls provides you with a flexibility of operation that will enable you to master the most tangled bit of the ether you encounter.

You should work the Etherdyne with the aerial preset—inside the set near the aerial terminal block—as much out as possible, that is to say, with the *minimum* aerial coupling capacity. This will materially reduce the risk of whistles on foreign stations. The whole secret of stopping whistles in the super-het is to provide a really high degree of pre-selection before the super-het mixer stage is reached by the signal.

We have provided this as far as possible in our aerial circuit and pre-high-frequency stage of amplification, but the last ounce of pre-selection is done on the preset. Once this is adjusted to give you the desired overall sensitivity, which should be the minimum setting consistent with volume requirements, you can forget the inside control and work entirely on the front knobs.

Now for the volume control. It provides you with a wide range of audibility, coping with the strong locals near its minimum setting and with the weak foreigners at its maximum.

When the volume control is just on, that is, just above the "off" position, you will get the locals at reasonable strength, but not much else.

With the control half-way round you should get all the best stations of Europe without trouble—just by turning the two large control knobs.

If you turn the control right up to its maximum you should be able to get a station for nearly every degree on the dials—the ether will teem with stations! The locals

will be unbearably strong, but that is to be expected, as you are then using the set with the high-frequency valves working "all out."

Well, that in brief is the story of how the Etherdyne Super is operated; of how, by a very simple process, you can master the ether.

Free from Whistles!

Second-channel whistles will appear *only if you are using too much preset condenser capacity*. Remember that, particularly. We know this is a whistle-free set when properly worked. Moreover, the elimination of those whistles, which often abound in less well-engineered super-hets, has been achieved in the Etherdyne Super by sound technical design.

By the provision, we mean, of really good pre-selection before the mixer stage. To make up for the inevitable loss of signal strength entailed by this preliminary selectivity we have a first stage of high-frequency amplification. Which means, our selectivity is *not* obtained at the expense of volume. So you need not fear losing volume by cutting down on the preset—there is heaps of amplification after that.

after station by moving the two knobs together, or slowly one after another. Remember to adjust the trimmer knob on the left-hand tuning knob every now and then. You won't have to do this for every station you tune in, but it is a good thing to trim up say three or four times round the dial, so as to be sure of being accurately in tune and thus getting the maximum station clearance and volume.

For a given setting of the left-hand tuning knob it is possible to get a station at more than one point on the oscillator knob on the right. Remember this and make sure that you are on the right oscillator setting, which you can check up by our log. If you get on the second channel you will find your readings widely different from ours. Get back to the correct readings as soon as you can!

As a general rule you ought to get Fécamp at about 14 on the oscillator knob, London National at 22 and London Regional at 46. If you get these three key points right you will be right all round the dials.

Correct Oscillator Readings

Just remember that you can get on the wrong track by a random setting of the oscillator knob. Our oscillator readings are the correct ones, as tests and checks of all kinds have proved.

This peculiarity of the super-het circuit need not worry you, though. We feel it is much better to gain the last ounce of sensitivity and selectivity, and to avoid other



Programme Items You Should Hear!



Solomon, the famous concert pianist, is giving a recital in the Concert Hall at Broadcasting House on November 3. He will be heard in company with Lionel Tertis

Wednesday, October 25

STRAUSS'S vivacious work, *Till Eulenspiegel*, is included in to-night's Symphony Concert from Queen's Hall. Adrian Boult is conducting.

Vaudeville, with Clarice Mayne, Johnson Clarke, Charles Hayes and Gretyl Vernon, is a good alternative.

E. Godfrey Brown is conducting the weekly orchestral concert in Belfast this afternoon. Two good items are down for performance—Tchaikovsky's *Nutcracker Suite* and a symphony by Kalinnikov, a young Russian composer who died many years before reaching his prime.

Thursday, October 26

Emmerich Kalman's operetta, *The Circus Princess*, is being given its first broadcast performance in this country to-night. The operetta is being performed in the Concert Hall at Broadcasting House.

North Regional's star item to-day is a concert by Foden's Motor Works Band, the winners of the recent Crystal Palace Championship.

The Duke of Abercorn, Governor of Northern Ireland, is opening the new Channel and Dock at Belfast Harbour. This channel and dock has been under construction for three years and is one of the biggest engineering enterprises undertaken in the country.

The broadcast starts at noon and includes a descriptive commentary by Captain R. L. Henderson. The new works will be named by Princess Alice, Countess of Athlone.

Mr. J. H. Thomas will be the third speaker in the talk series, "The Debate Continues," to be broadcast nationally to-night.

Friday, October 27

Something for everybody to-day! West Regional is featuring a band concert by the Royal Marines Chatham Band; London Regional a concert of European dances by the Military

Band; North Regional a relay from the Argyle at Birkenhead, and the Nationals are broadcasting Lance Sieveking's *Kaleidoscope*, one of the plays in the Radio Drama season.

European dances will be the theme of a concert to be given by the Wireless Military Band. Norwegian, Russian, Irish, and Italian dance tunes will feature in the programme, which will be conducted by B. Walton O'Donnell.

Albert Sammons, the famous British violinist, is playing the Elgar violin concerto at a concert by the City of Birmingham Orchestra on October 26. The concert will be relayed from the Town Hall. During the interval, the Lord Mayor of Birmingham is giving a talk in the series "Midland Roads and Their Traffic."

Victor Hely Hutchinson is the soloist in a concert to be relayed from the Wellington Hall, Belfast, for North Ireland listeners this evening. He is playing Schumann's *Piano Concerto in A Flat*. It will be remembered that Victor Hely Hutchinson has recently been appointed Musical Director of the Midland Regional programmes.

Saturday, October 28

Jack Hylton and his boys are on the air to-night in the "Music Hall" show. Don't miss them!



Gordon Harker, the famous film star, was one of the leading lights in a film "This is the Life," produced by Albert de Courville



Walton O'Donnell, leader of the Wireless Military Band, which will give a concert of Continental dance tunes on October 27

Sir Walford Davies and Joseph Lewis are performers at a concert given by 375 unemployed Welsh miners at the Central Hall, Tonypandy.

North Regional is taking a relay of the first act of *Lohengrin* from the Theatre Royal, Newcastle-upon-Tyne. The conductor is Robert Ainsworth and the opera

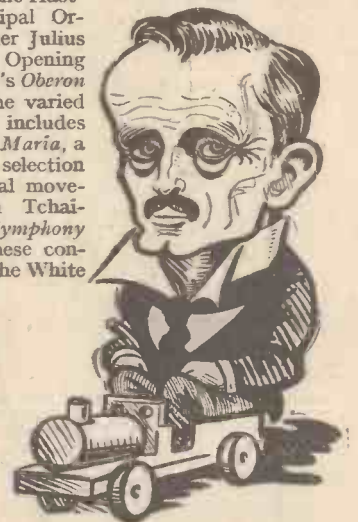
will be given by the Metropolitan Opera Company.

To-day Edinburgh University commemorates its 350th anniversary. The main feature of the day's celebrations will be a talk by Sir James Barrie given during the Commemoration Service, which will be relayed in the National programmes.

Sunday, October 29

Two interesting items are worth making a note of for to-day's listening. O. H. Peasgood is giving a recital of English organ music on the B.B.C. organ in the late afternoon.

During the evening a really pleasant light classical programme has been chosen for the concert by the Hastings Municipal Orchestra under Julius Harrison. Opening with Weber's *Oberon* overture, the varied assortment includes Bach's *Ave Maria*, a *Rigoletto* selection and the final movement from Tchaikovsky's *Symphony No. 5*. These concerts from the White



Sir James Barrie is speaking at the service commemorating the 350th anniversary of Edinburgh University

Rock Pavilion are always worth hearing.

Monday, October 30

Vaudeville again to-night with a particularly strong bill. Four doubles are in the bill—Clapham and Dwyer, Max and Harry Nesbitt with their ukulele, Mr. Flotsam and Mr. Jetsam, and Bill and Elsa Newell. Joseph Wagstaffe is giving some syncopated songs and the show will be supported by the Theatre Orchestra in their usual bright manner.

During the recent reorganisation craze at Broadcasting House it was decided that the Theatre Orchestra needed "hotting up." They increased the personnel from twenty-four to twenty-eight performers and by the doubling system—one musician playing two or more instruments—it is now possible to have four saxophones, a guitar, banjo and all the other things that go to make a good dance band.

Tuesday, October 31

Carnival, a famous microphone play adapted by Compton Mackenzie and Holt Marvell from the novel by Compton Mackenzie, is being

Continued on page 768

"..... a definite advance in Superhet technique"

says

"A.W."



AND IT'S THE LISSEN COILS THAT MAKE IT POSSIBLE!

"Amateur Wire'ess" designers claim for the "Etherdyne" that it is "the set of the year," and a "definite advance in super-het technique." And, once again, you will see that it is built around Lissen Coils! In a big super-het like this "Etherdyne" it is the coils that count—and the "Etherdyne" scores heavily by having the exact matching, the high efficiency, the supreme selectivity of Lissen Iron-cored Coils throughout. These Lissen Iron-cored Coils have lower losses than any previously produced coils. They are particularly efficient in triple-gang, as in this set, being matched to dead accuracy. Shielding is complete, with metal can and metal base supplied; even the terminals are within the screens. The complete set for the "Etherdyne" consists of two Lissen Iron-cored Dual-range Aerial Coils and one Lissen Iron-cored Combined Detector and Oscillator Coil.

Triple Gang of Lissen Iron-cored Coils, as specified for the "Etherdyne" 12/6 EACH COIL

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Broadcasting Stations

Wavelengths are brought up to date week by week. For the purpose of better-comparison, the power indicated is that of the carrier wave.

Kilo-Metres cycles	Station and Call Sign	Country	Power (Kw.)	Kilo-Metres cycles	Station and Call Sign	Country	Power (Kw.)
16.86 17.790	Daventry (GSG) ...	Great Britain	20.0	309.9	968 West Regional	Great Britain	50.0
16.88 17.775	Eindhoven (PHI) ...	Holland	20.0	312.5	960 Genoa	Italy	10.0
19.56 15.330	Schenectady (W2XAD)	United States	20.0	312.8	959 Cracow	Poland	2.0
19.73 15.200	Zeeseen (DJB) ...	Germany	8.0	315	952.5 Marseilles	France	1.6
25.25 11.880	Paris (Coloniale) ...	France	15.0	318.8	941 Sofia (Rodno Radio)	Bulgaria	5
25.28 11.865	Daventry (GSE) ...	Great Britain	20.0	318.8	941 Dresden	Germany	25
25.4 11.810	Rome (ZRO) ...	Italy	15.0	320	939 Naples	Italy	1.5
25.51 11.760	Zeeseen (DJD) ...	Germany	8.0	321.9	932 Goteborg	Sweden	10.0
25.53 11.750	Daventry (GSD) ...	Great Britain	20.0	325	923 Breslau	Germany	60.0
25.63 11.705	Paris (Coloniale) ...	France	15.0	328.2	914 Poste Parisien	France	60.0
30.0 10.000	Madrid (EAO) ...	Spain	20.0	331.5	905 Milan (Siziano)	Italy	50.0
31.25 9.598	Lisbon (CTIAA) ...	Portugal	2.0	335	896 Poznan	Poland	2.0
31.3 9.585	Daventry (GSC) ...	Great Britain	20.0	338.2	887 Brussels (No. 2)	Belgium	15.0
31.38 9.560	Zeeseen (DJA) ...	Germany	8.0	342.1	877 Brunn (Brno)	Czechoslovakia	32.0
31.55 9.510	Daventry (GSB) ...	Great Britain	20.0	345.2	869 Strasbourg (PTT)	France	11.5
31.6 9.490	Poznan (SRI) ...	Poland	1.0	350	857 Barcelona (EAJI)	Spain	8.0
37.33 8.036	Rabat (CNR) ...	Morocco	6.0	352.1	852 Graz	Austria	7.0
38.47 7.799	Radio Nations (HBP)	Switzerland	20.0	355.9	843 London Regional	Great Britain	50.0
42.92 6.990	Oslo (LCL) ...	Norway	0.5	360.6	832 Muhlacker	Germany	60.0
45.38 6.610	Moscow	U.S.S.R.	10.0	363.6	825 Augsburg (PTT)	North Africa	13.0
46.69 6.425	Boundbrook (W3XL)	United States	1.0	364.1	824 Bergen	Norway	1.0
48.86 6.140	Pittsburgh (W8XK)	United States	40.0	368.1	815 Bolzano	Italy	1.0
48.94 6.130	Mexico (XETE)	Mexico	2.0	368.1	815 Helsinki	Finland	13.2
49.02 6.120	Wayne (W2XE) ...	United States	1.0	368.1	815 Seville (EAJ5)	Spain	1.5
49.18 6.110	Chicago (W9XF) ...	United States	5.0	369.5	812 Radio LL (Paris)	France	2
49.34 6.080	Chicago (W9XAA) ...	United States	5	372.2	806 Hamburg	Germany	1.5
49.4 6.073	Skamlebaek (OXY)	Denmark	5	376.4	797 Scottish Regional	Great Britain	50.0
49.5 6.060	Nairobi (VO7LO) ...	Kenya Colony	5	380.7	788 Lwow	Poland	16.0
49.55 6.055	Vienna (XORZ)	Austria	5	385.1	779 Radio Toulouse	France	8.0
49.59 6.050	Daventry (GSA) ...	Great Britain	20.0	389.6	770 Leipzig	Romania	150.0
49.83 6.020	Zeeseen (DJC) ...	Germany	10.0	394.2	761 Bucharest	Roumania	12.0
50.0 6.000	Moscow (RNE)	U.S.S.R.	20.0	398.9	752 Midland Regional	Great Britain	25.0
50.26 5.969	Vatican (HVJ) ...	Italy	10.0	403	743 Sottens	Switzerland	25.0
202.2 1.483	Tarragona (EAJ33)	Spain	25	408.7	734 Katowice	Poland	12.0
202.5 1.481	Kristinehamn	Sweden	25	413	725 Athlone	Irish Free State	80.0
203	1.477 Bilbao	Spain	25	416	721.1 Rabat	Morocco	6.0
209.8 1.429	Miskolcz	Hungary	1.25	419.9	716 Berlin	Germany	1.5
209.8 1.429	Magyarovar	Hungary	1.25	424.3	707 Madrid (EAJ7)	Spain	3.0
209.8 1.429	Pecs	Hungary	1.2	424.3	707 Moscow (ROZ)	U.S.S.R.	100.0
211.3 1.420	Antwerp	Belgium	4	429.8	698 Belgrade	Yugoslavia	2.8
211.3 1.420	Newcastle	Great Britain	1.0	441.2	680 Rome (Roma)	Italy	60.0
214.3 1.400	Aberdeen	Great Britain	1.0	447.1	671 Paris (PTT)	France	7.0
215	1.395 Liege (Reg)	Belgium	0.3	447.1	671 Danzig	Danzig	5
215.6 1.391	Chatelaineau (EL)	Belgium	25	452	664 Agen	France	2
217.1 1.382	Konigsberg	Germany	5	452	664 Madona	Latvia	15.0
217.1 1.382	Dublin	Irish Free State	1.2	452.8	663 Milan (Vigentino)	Italy	4.8
218.5 1.373	Salzburg	Austria	1.5	453.2	662 Odessa (RDH)	U.S.S.R.	15.0
218.5 1.373	Plymouth	Great Britain	2	453.2	662 Klagenfurt	Austria	5
219.9 1.364	Beziere	France	1.0	456.6	657 San Sebastian	Spain	5.0
220.3 1.362	Binche	Belgium	2	459.4	653 Beromuenster	Switzerland	60.0
222.3 1.354	Liege-Pointe	Belgium	0.15	465.8	644 Lyons (PTT)	France	15.0
224.4 1.337	Cork (6CK)	Irish Free State	1.2	472.4	635 Langenberg	Germany	60.0
225.9 1.327	Fecamp	France	10.0	476.9	629 Lisbon (tests)	Portugal	20.0
227.4 1.319	Bremen	Germany	1.5	480	625 North Regional	Great Britain	50.0
227.4 1.319	Flensburg	Germany	5	488.6	614 Prague	Czechoslovakia	120.0
227.4 1.319	Hanover	Germany	1.5	495.8	605 Trondheim	Norway	1.0
231	1.301 Malmo	Sweden	1.25	500.8	599 Florence	Italy	20.0
231.7 1.294	Kiel	Germany	25	509.3	589 Brussels (No. 1)	Belgium	15.0
233	1.287 Wallonia	Belgium	3	518.1	571 Vienna	Austria	100.0
235	1.283 Lodz	Poland	2.2	525.4	571 Riga	Latvia	15.0
235.5 1.274	Kristianssand	Norway	5	532.9	563 Munich	Germany	60.0
236	1.271 Bordeaux (S.O.)	France	3.0	539.8	555.7 Palermo	Italy	3.5
238	1.260.6 Nimes	France	1.0	550.5	545 Budapest (I)	Hungary	18.5
238.9 1.256	Nurnberg	Germany	2.0	559.7	536 Tampere	Finland	1.0
240.6 1.247	Stavanger	Norway	5	559.7	536 Kaiserslautern	Germany	1.5
242.3 1.238	Belfast	North Ireland	1.0	559.7	536 Augsburg	Germany	25
242.7 1.236	Liege	Belgium	1.0	563	533 Frelburg	Germany	25
245.9 1.220	Dornbirn	Austria	5	565	531 Wiino	Poland	22.0
245.9 1.220	Linz	Austria	5	569.5	526.8 Grenoble (PTT)	France	15.0
245.9 1.220	Schaerbeck	Belgium	15	577.5	519.4 Ljubljana	Jugoslavia	7.5
247.7 1.211	Trieste	Italy	10.0	582	515.4 Tartu	Estonia	5
249.7 1.201	Juan-les-Pins	France	1.0	590	434.7 Oulu	Finland	1.2
250.9 1.196	Barcelona (EAJ15)	Spain	6.0	620	416.7 Moscow (RMO)	U.S.S.R.	20.0
253	1.185 Gielwitz	Germany	5.0	743	404 Ostersond	Norway	0.6
254.6 1.178	Toulouse (PTT)	France	7	760	395 Geneva	Switzerland	1.25
257.3 1.166	Horbj	Sweden	10.0	733	360.1 Heston Airport	Great Britain	5.0
259.3 1.157	Treves (Trier)	Germany	2.3	840	357 Budapest (2)	Hungary	3.0
259.3 1.157	Frankfurt-A-M	Germany	17.0	848.7	353.3 Rostov (RAO)	U.S.S.R.	4.0
259.3 1.157	Cassel	Germany	0.5	857.1	350 Leningrad (RHP)	U.S.S.R.	100.0
261.6 1.147	London National	Great Britain	50.0	837.5	320 Kharkov (RMD)	U.S.S.R.	20.0
261.6 1.147	West National	Great Britain	50.0	9,000	300 Moscow (ROZ)	U.S.S.R.	100.0
263.8 1.137	Moravska-Ostrava	Czechoslovakia	11.0	1,034.5	290 Kiev (RER)	U.S.S.R.	100.0
265.4 1.130	Lille (PTT)	France	1.3	1,071.4	280 Tifis (RDK)	U.S.S.R.	35.0
267.6 1.121	Nyiregyhaza	Hungary	6.3	1,083	277 Oslo	Norway	60.0
267.6 1.121	Valencia	Spain	3.0	1,105	271.5 Minsk (RPMG)	U.S.S.R.	35.0
269.8 1.112	Barl	Italy	20.0	1,126.6	265.75 Monte Ceneri	U.S.S.R.	25.0
271.3 1.105	Rennes (PTT)	France	1.5	1,153.8	260 Kalundborg	Denmark	30.0
273.7 1.096	Turin (Torino)	Italy	7.0	1,170	256.4 Tashkend (RAU)	U.S.S.R.	35.0
276.5 1.085	Heilsberg	Germany	75.0	1,190.5	252 Luxembourg	Gd. Duchy of Lux.	200.0
279.5 1.072	Bratislava	Czechoslovakia	14.0	1,200	250 Istanbul	Turkey	5.0
281.2 1.067	Copenhagen	Denmark	75	1,229.5	244 Reykjavik	Iceland	21.0
282.2 1.063	Lisbon (CTIAA)	Portugal	2.0	1,239.7	242 Boden	Sweden	6
283.6 1.058	Innsbruck	Austria	5	1,255	239 Kiev (RAG)	U.S.S.R.	10.0
283.6 1.058	Berlin (E)	Germany	5	1,255	239 Vienna (Exp.)	Austria	3.0
283.6 1.058	Magdeburg	Germany	5	1,327	222.6 Moscow (RCY)	U.S.S.R.	100.0
283.6 1.058	Sectin	Germany	5	1,355	221.5 Mostala	Sweden	30.0
284.9 1.053	Radio Lyons	France	1.0	1,411.8	212.5 Warsaw	Poland	120.0
286	1.049 Montpelier	France	9	1,445.8	207.5 Eiffel Tower	France	13.5
288.5 1.040	Bournemouth	Great Britain	1.0	1,481	202.6 Moscow (RTC)	U.S.S.R.	500.0
288.5 1.040	Scottish National	Great Britain	50.0	1,538	195 Ankara	Turkey	7.0
291	1.031 Vilpuri	Finland	13.2	1,554.4	193 Daventry (KVA)	Great Britain	30.0
293	1.022 Kosice	Czechoslovakia	2.5	1,620	185 Norddeich (KVA)	Germany	10.0
294.2 1.019	Limoges (PTT)	France	7	1,634.9	183.5 Zeeseen	Germany	60.0
296.1 1.013	Hilversum	Holland	20.0	1,725	174 Radio Paris	France	75.0
298.8 1.004	Tallinn	Estonia	11.0	1,760	170.45 Moscow (RAX)	U.S.S.R.	30.0
301.5 995	North National	Great Britain	50.0	1,796	167 Lahti	Finland	50.0
304.3 986	Bordeaux (PTT)	France	13.0	1,875	160 Kootwijk	Holland	50.0
307	977 Falun	Sweden	5	1,875	160 Moscow (RCZ)	U.S.S.R.	100.0
307.1 977	Zagreb	Jugoslavia	0.8	1,910.8	157 Sverdlovsk (RHX)	U.S.S.R.	40.0
307.4 975.1	Vitus (Paris)	France	1.0	1,935	155 Kaunas	Lithuania	7.0

Programme Items You Should Hear

Continued from page 766

revived to-night and again on Thursday. It tells the story of London before the Great War. Val-Gielgud is producing the play and Lilian Harrison, Charles Mason, Baliol Holloway and Betty Bolton are in the cast.

When the great new harbour at Haifa, in Palestine, is opened to-day by the High Commissioner, Sir Arthur Wauchope, an exchange of messages between the Secretary of State for the Colonies, Sir Philip Cunliffe-Lister, speaking from England, and Sir Arthur Wauchope, speaking from Haifa, will be heard in the National programmes.

Wednesday, November 1

Adrian Boult is conducting the second of the season's symphony concerts from Queen's Hall; the high spot in the programme is Mendelssohn's *Scottish Symphony*.

North Regional listeners are booked for some jolly variety from the Palace Theatre at Huddersfield.

Roy Fox will be on the air as usual; his dance music is always good stuff. By the way, Roy Fox and his boys are busy down at Beaconsfield making a film called *On the Air*, in which they play a prominent part. Several other well-known radio stars are in the cast, including Betty Astell, Davy Burnaby, Reginald Purdell, Mario de Pietro, Hugh E. Wright, Jane Carr and Eve Beck.

Herbert Smith, who is directing *On the Air*, was assistant to Albert de Courville, who directed the British Lion film, *This is the Life*, which featured Binnie Hale and Gordon Harker.

Thursday, November 2

Leslie Sarony has an hour to himself on the radio to-night. What he will do with it is still a mystery, but seeing that Leslie has got a good reputation for writing his own songs and words, the reason is pretty obvious. His songs are of the snappy kind.

North Regional is relaying a notable Hallé Concert from the Free Trade Hall. Robert Heger, the famous German composer, is conducting for the first time before a Manchester audience. Brahms's *Symphony No. 4* is the chief work of the evening.

Friday, November 3

Lionel Tertis, viola, and Solomon, piano, are the artistes in the B.B.C.'s Chamber Music Concert, which is being given in the Concert Hall at Broadcasting House. Works by Mozart, Bliss, Delius and Chopin are included in the programme. This is the ideal type of programme if you want a restful evening's listening.

Members of the Ballets Russes de Monte Carlo are making their first appearance in a television programme at 11 p.m.

Saturday, November 4

An eye-witness account of the first Welsh Rugby trial match at Newport will be given by Rowe Harding in the West Regional programme this afternoon. This is the first of three trials to be given by the Welsh Rugby selectors for choosing the team to meet England at Cardiff in January.

A play by Ian Priestly-Mitchell called *Yorkshire Relish* is in the North Regional programme. This show is described as a comedy and is concerned with strange happenings in the dungeons of an ancient castle.



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In modern Transient Load circuits—which have made possible the claim “Mains Power from Battery Sets”—the amount of high-tension current used depends upon the “noise-value” of the programme. Thus, as the music gets louder and louder, the drain upon your battery gets heavier and heavier. And if beneath this drain the voltage of the battery drops, you get distorted reproduction and lose all the benefits of your modern Class-B or Q.P.P. output.

The cells of a Lissen Battery stand up notably to these sudden drains; they give the required current without volt drop. The big oxygen content of the Lissen cells reduces internal resistance so that the battery can respond *instantly* to any demand. All the time the current flow is smooth and silent, giving distortionless reproduction which really justifies the claim “Mains power from battery sets.”

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

We Test for You

TESTING THE HIGH-FREQUENCY CHOKE

THE high-frequency choke is a very important component in a radio receiver and is largely responsible for the satisfactory behaviour, or otherwise, of the whole assembly. It is a difficult matter to devise a really satisfactory test for these components, and many different suggestions have been put forward at one time or another.

One method, which gives reliable results, depends upon the fact that a high-frequency choke is effectively a small capacity over the major portion of the normal wave range of from 200 to 2,000 metres. In practice the choke is used to act as an impedance to high-frequency currents, and if it is a good sample the impedance will be high over the whole range. It is also usually by-passed by a small condenser of about .0001 microfarad.

This being so, a measure of the effectiveness of the choke is obtained if its impedance is compared to that of a small condenser, a procedure which is justified up to the resonance point, and even beyond to a certain extent, although the choke is then effectively inductive.

The performance factor as quoted in the test reports is the percentage of the current which would be by-passed through a .0001-microfarad condenser. With a perfect choke all the current would be by-passed, giving a factor of 100 per cent. If an absorption occurs in the working range this shows up as a drop in the impedance of the choke, thus giving a lower performance factor.

MAGNAVOX PERMANENT-MAGNET MOVING-COIL LOUD-SPEAKER

MAGNAVOX'S new moving-coil reproducer, type 252, has a somewhat larger diaphragm than is in normal use at the present time, the diameter being approximately 9 in. This is suspended from the outer edge of a pressed-metal chassis of rigid construction which is bolted to the magnet system.

The magnet is of the E-shaped type with a cast centre polepiece bolted to it. The moving coil is located in the gap by means of a web-type centring device behind the diaphragm.

A tapped input transformer is provided and is fitted to the main chassis by means of a small metal bracket. This transformer enables the loud-speaker to be used with all types of output stage including class B. The matching transformer is rated for a maximum current of 50 milliamperes if used with a single valve or 65 milliamperes for each valve in a push-pull circuit.

Test Results

The performance of the loud-speaker on all types of signal was excellent and the power-handling capacity ample for all normal purposes, even including small public-address equipment. Four different impedances are provided by the output transformer and these, measured at 1,000 cycles, were approximately as follows: 3,900, 6,200, 8,500 and 15,500 ohms. In the last two cases a centre tap is provided to enable push-pull circuits to be used. This is a particularly good loud-speaker.

Price: £3 3s.



A new super permanent-magnet moving-coil loud-speaker by Magnavox is particularly efficient

TELSEN STANDARD SCREENED HIGH-FREQUENCY CHOKE

THIS Telsen choke is a small totally-screened component. The windings are accommodated in three slots on a built-up former, which is supported from a moulded bakelite base by means of an iron bolt passing through the centre of the former. The bolt, which also acts as an iron core, projects through the top of the can and forms one connection to the coil. The terminals are mounted on the base, one being the second connection to the coil and the other an earthing terminal for the tag. Holes are formed in the base to facilitate fixing.

Test Results

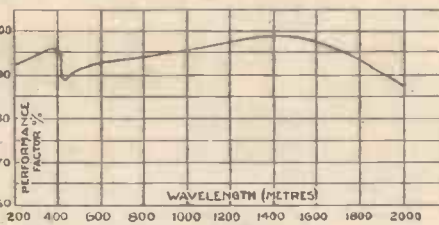
The choke was tested over the normal wave range from 200 to 2,000 metres, and the performance can be seen from the accompany-



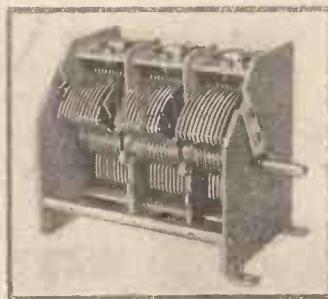
Telsen's new screened high-frequency choke gave a satisfactory performance during test

ing curve. A small absorption occurs at about 400 metres, but this is not serious and generally the performance is satisfactory. The inductance of the windings is approximately 80,000 microhenries.

Makers: Telsen Electric Co., Ltd.
Price: 2s. 6d.



The performance of the Telsen high-frequency choke during our tests can be seen from this curve



The new British Radiophone three-gang condenser is suitable for constructors' midget receivers and motor-car sets as well

GRAHAM FARISH FIXED CONDENSER

THIS condenser is one member of a range of Graham Farish Mansbridge type condensers with values ranging from .1 to 2 microfarads. They are housed in moulded bakelite cases some 2 3/4 in. high and 2 3/4 in. wide, the thickness depending on the capacity. The cases have lugs formed to facilitate mounting in both horizontal or vertical



A 1-microfarad fixed condenser from the Graham Farish range

position, a facility which is very useful. Two large size terminals are mounted at the top of the casing for the connections.

Test Results

The rated capacity of the sample submitted for test was 1 microfarad, the actual measured value being .9 microfarad, which is in reasonable agreement with the rating claimed. The insulation resistance was satisfactory, no sign of leakage being obtained when tested on a 500-volt supply.

The rated working voltage is 250 volts D.C., and although this should not be exceeded in practice, the condenser was found to operate indefinitely on 250 volts A.C. without damage. Makers: Graham Farish, Ltd. Price: 2s.

BRITISH RADIOPHONE GANGED CONDENSER

A WELL-MADE three-gang condenser, the new British Radiophone midget, is built into a U-section type chassis with large end plates, which carry the fixing lugs and also support the metal cover. Individual earthing tags are provided on each section and the trimmers, which have a mica dielectric, are arranged to be operated from the top of the condenser. The end plates of the rotor section of the condenser are of the split variety, thus enabling accurate matching to be obtained over the whole scale.

Test Results

The high-frequency resistance was measured at 400 metres and was found to be approximately 1.3 ohms per section; this is a commendably low figure and indicates that the condenser may be used satisfactorily with really efficient tuning inductances.

The capacity range of the condenser was approximately 35 to 500 picofarads, while the maximum capacity of the trimmers was approximately 100 picofarads.

The matching between the sections is excellent.

Makers: British Radiophone, Ltd.
Price: £1.

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WORLD-WIDE
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AND AUSTRALIA ALL ON ONE
SET AT LAST**



**CHASSIS KIT
COMPLETE WITH
FOUR VALVES
£5.12.6**

At last the day of All-World Radio has arrived, and you can build with your own hands the first receiver to give you not only England and Europe, but America and Australia direct. The Lissen All-Wave, All-World "Skyscraper" 4 tunes from 12 to 2,100 metres. It brings two complete new wavelength ranges within reach of the ordinary listener—stations and programmes which before he was never able to receive—Ultra-short and Short-wave transmissions from the ends of the earth. And, remember, you get these stations through Double-balanced Pentode Output giving brilliant reproduction on a Moving-coil Speaker—as much power as a Mains Set from ordinary high-tension batteries. Lissen have made this All-Wave, All-World Radio available to Home Constructors first, because it brings back the thrill of conquest to hear America and Australia direct on a set you have built yourself, it makes you an enthusiast to realise what a wonderful thing you have created!

- ULTRA SHORT**
- SHORT**
- MEDIUM**
- LONG WAVES**

**DOUBLE
BALANCED
PENTODE
OUTPUT &
MOVING COIL
LOUDSPEAKER**

The output stage of the All-Wave, All-World "Skyscraper" 4 is Quiescent Push-Pull output at its best, incorporating TWO BALANCED LISSEN POWER PENTODE VALVES and giving you brilliant reproduction on a Moving-coil Speaker. You get mains volume from this set, yet it works from ordinary high-tension batteries and is an economical set to run.



**WITH WALNUT
CABINET & MOVING
COIL LOUDSPEAKER
£8.2.6**

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

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"SKYSCRAPER"



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Strange Figures!



WE know how many listening licences are issued each year, and radio manufacturers know how many sets they sell, but we have no means of knowing more intimate details about the use of radio and the habits of listeners, although these would be very interesting to every one connected with the industry.

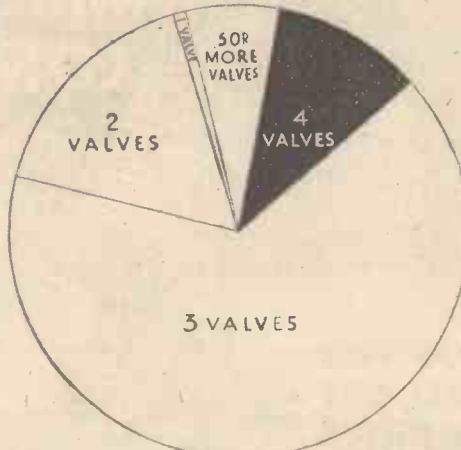
Some of these facts have emerged from a nation-wide census into the social conditions and spending habits of its readers just made by *John Bull*. Over 30,000 people filled in a ninety-five-question form and it is found from the answers that the three-valve set is easily the most popular with 65.3 per cent. of the homes, and two-valve sets in 16.3 per cent. and four valves in 10.7 per cent.

Manufacturers say that most people renew their sets at the end of three years—an indication of how rapidly wireless technique advances and makes the apparatus out of date.

Yet 25.8 per cent. of the sets in use are more than three years old, and there are even some seven, eight, nine and more years old. The average age is two years eight months.

In spite of the high efficiency and cheapness of the modern mass-produced receiver, the amateur constructor still holds his own. In 16.6 per cent. of the homes in which there is a set, "wireless construction" is given as the principal hobby of some member of the family. The amateur-built set accounts for 22.8 per cent. of the sets in use, while the big manufacturers enjoy 45.6 per cent. of the demand and local dealers who put together their own sets for their customers supply 22.8 per cent.

Many readers will be surprised to learn that there are so many as 631 different makes of receivers, 135 makes of valves, 272 makes of high-tension batteries, and 218 makes of accumulators.



Percentages of various types of sets used by "John Bull" readers

Late Sittings

CONDITIONS being such as they are, it is now worth while sitting up later to hear Transatlantic broadcasts, of which reception of many are now being reported. A casual search may prove onerous and unfruitful; there is a greater chance of success in making a dead set for certain channels.

One of the best "possibles" is 256.3 metres to hear WCAU (Philadelphia), one of the Columbia stations relaying WABC, New York; the setting will be about half way between that of Gleiwitz and Frankfurt-am-Main.

Try also for WTAM (Cleveland) on 280.2 metres and WTIC (Hartford) on 282.8 metres, both in the N.B.C. red network and relaying programmes from WEAJ, the New York "key" station.

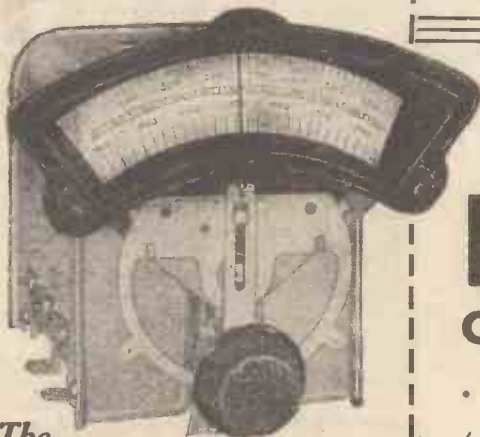
Set your dial for Heilsberg and slowly—very slowly—work up; towards 1 a.m., or even before, you should pick up the N.B.C. interval signal of three notes, followed by the call.

Listen for Buenos Aires

Finally, towards the same hour, there is a good chance of hearing broadcasts from Buenos Aires, namely, from Radio Splendid and Radio Nacional; the former works on 303 metres (between North National and Bordeaux P.T.T.) the latter on 316 metres.

Another transmitter worth trying for is Radio Excelsior (LR5) on 361 metres; it is one of the most powerful at present operating in the Argentine capital and gives out a three-note interval signal somewhat similar to that adopted by the N.B.C. studios of North America.

A little patience and some little judgment in selecting a small portion of the waveband for a careful scouring of the ether, on most nights will give you very successful results in the way of long-distance reception. J. G. A.



The POLAR STAR MINOR THREE-GANG WITH "ARCUATE" Full-vision DRIVE

Steel Frame with cover. Trimmers operated from top. Sections matched within 1/2 per cent. or 1 mmfd. (whichever is the greater). Price complete as shown - **24/6**

Prices of Star Minor Condensers

- 2 X .0005 - - - - - 12/6
- 3 X .0005 & Super-Het - - - 18/9
- 4 X .0005 & Super-Het - - - 25/-

With full-vision "arcuate" (as shown) "horizontal" or "semi-circular" drive, 5/9 extra.

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POLAR CONDENSERS ?

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- (a) of their reliability,
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- (c) of their accurate design and precision workmanship,
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USE POLAR. It is the variable condenser which enables you to control your choice of programmes. Make certain it's POLAR.

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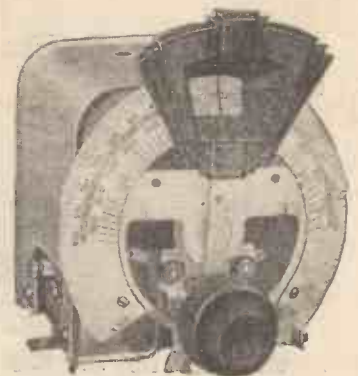
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2 X .0005 - - - - - **18/6**

Supplied with either of the new Polar Full-vision Drives at 1/3 extra.



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These are the parts the Author used:—

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|----|--|----|---|---|
| 1 | PETO-SCOTT Metaplex chassis, 16 by 10 by 3 1/2 in. | 2 | 5 | 0 |
| 1 | BRITISH RADIOGRAM standard H.F. choke, type No. 40. | 3 | 6 | |
| 1 | TELSEN, type W341, H.F. choke | 2 | 6 | |
| 2 | LISSEN iron-cored screened coils, type No. 5391, and No. 5392 | 1 | 5 | 0 |
| 1 | LISSEN iron-cored screened coil, 126 kilocycles, oscillator No. 5381 | 12 | 6 | |
| 1 | GRAHAM FARISH .00005-mfd. mica fixed condenser | 1 | 0 | |
| 2 | GRAHAM FARISH .0001-mfd. mica fixed condensers | 2 | 0 | |
| 1 | GRAHAM FARISH .0005-mfd. mica fixed condenser | 1 | 0 | |
| 1 | GRAHAM FARISH .002-mfd. mica fixed condenser | 1 | 0 | |
| 3 | TELSEN 25-mfd., type W.229, fixed condensers | 4 | 6 | |
| 2 | TELSEN 1-mfd., type W.227, fixed condensers | 3 | 6 | |
| 1 | TELSEN 2-mfd., type W.226, fixed condenser | 2 | 6 | |
| 1 | GRAHAM FARISH .01-mfd. mica fixed condenser | 1 | 6 | |
| 1 | TELSEN, type W.305, twin-gang .0005-mfd variable condenser | 12 | 6 | |
| 1 | TELSEN Single .0005-mfd, type W.339, variable condenser | 7 | 6 | |
| 1 | SOVEREIGN .0003-mfd. pre-set variable condenser | 1 | 3 | |
| 4 | CLIX four-pin chassis-mounting valve holders | 4 | 8 | |
| 1 | CLIX five-pin chassis-mounting valve holder | 1 | 3 | |
| 1 | BRITISH RADIOGRAM anti-breakthru unit and switch coupler | 5 | 0 | |
| 1 | VARLEY battery economiser, type D.P.44 | 15 | 6 | |
| 10 | BELLING LEE marked wander plugs | 1 | 3 | |
| 2 | BELLING LEE spade terminals, marked: L.T., + L.T. | 1 | 3 | |
| 3 | LISSEN terminal blocks | 3 | 0 | |
| 1 | BELLING LEE wander fuse, marked: H.T. | 1 | 0 | |
| 4 | GRAHAM FARISH fixed resistances—500 ohms, 5,000 ohms, 40,000 ohms and 1 megohm | 6 | 0 | |
| 1 | SOVEREIGN 50,000-ohm variable resistance with combined 3-point switch | 4 | 6 | |
| 1 | BRITISH RADIOGRAM 2-in. metal mounting bracket for potentiometer | 2 | 6 | |
| | Connecting wire and sleeving, screws, 5 yds. thin flex, 2 ft. shielded sleeving | 2 | 3 | |
| 1 | VARLEY Niore II L.F. transformer | 11 | 6 | |
| 1 | LISSEN 126-kilocycle intermediate-frequency transformer with reaction, No. 5305 | 7 | 6 | |
| 1 | LISSEN 126-kilocycle intermediate-frequency transformer without reaction, No. 5391 | 8 | 6 | |

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The B.B.C. and Television

A New Series of Experimental Transmissions

TELEVISION enthusiasts have been anxiously waiting for some statement concerning the future policy of the B.B.C. towards television. Because of the recent announcement that the present agreement with the Baird Company would terminate at the end of next March it was rumoured in some quarters that this date would mark the abandonment of the television broadcasts. Actually, however, the B.B.C. is very keenly interested in television, and increased facilities are to be given to assist development and research. That announcement merely indicated the end of an agreement which is due to expire at that date.

New Series of Transmissions

It is now officially stated by the B.B.C. that it proposes to carry out experiments on high-definition television through its ultra-short-wave transmitter at Broadcasting

House, and that the first series of tests will be with apparatus installed by the Baird Company. These are to continue until the end of the present year. A second series of tests will begin in January, 1934, with apparatus installed by Electrical and Musical Industries, Ltd., a combination of the Marconiphone Co., Ltd., the Gramophone Co., Ltd. (H.M.V.), and the Columbia Graphophone Co., Ltd. (Columbia).

Other companies are to be given similar opportunities of installing high-definition television apparatus if in the opinion of the B.B.C. it is considered suitable. Naturally, these tests will be of an experimental character and their primary object is to obtain data and assist development of the new science.

No decision has yet been made regarding the continuance of the present thirty-line transmissions. This would mean looking nearly six months ahead, and in that time

there might be many developments which would make it unwise for the B.B.C. to commit itself to any specific policy. Interest in television is steadily increasing, so it is probable that these transmissions will be continued assuming that there is nothing better to take their place.

No concern need be felt that television apparatus will become obsolete with any change in scanning frequency. Some slight modification may be necessary, but the main part of the apparatus will still be suitable. For example, with a mirror-drum receiver an alteration would have to be made in the case of the drum (or a multiplier used), but the other items—such as the motor, light modulator, and amplifier—would still be quite suitable under the altered conditions. With cathode-ray television the matter is more simple still, the alteration in this case being quite a trivial matter of a few minutes.

Building a Cathode-ray Time Base

The Second Step in Cathode-ray Television

IN order that readers will have a clear idea of the requirements for cathode-ray television it will be well to recapitulate at this point what apparatus, auxiliary to the actual cathode-ray tube, is required for the reception of television by this system. First of all, there is the cathode-ray tube exciter unit which is for the purpose of supplying current for the filament of the tube, the correct value of grid bias and the high-tension to the anode. This simple piece of apparatus was described in No. 592. Secondly, there are two time bases, also simple pieces of apparatus, and the first of these is described below. Finally

getting accustomed to the handling of the tube.

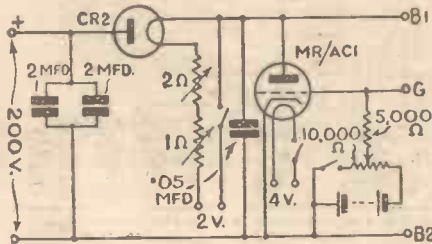
The idea that seems to prevail that cathode-ray television apparatus is very complicated may be dismissed. When it is all assembled as one unit it may have this appearance, but care has been taken in the present design to allow of the units being made up separately and so simplifying the construction and the operations of the set.

Before proceeding with a description of the first time base, there are two more points to be noted in using the cathode-ray tube, which will be of importance when the linear time base (described below) is connected. These are:

- (1) The earthing of the tube and its connections;
- (2) The centring of the beam.

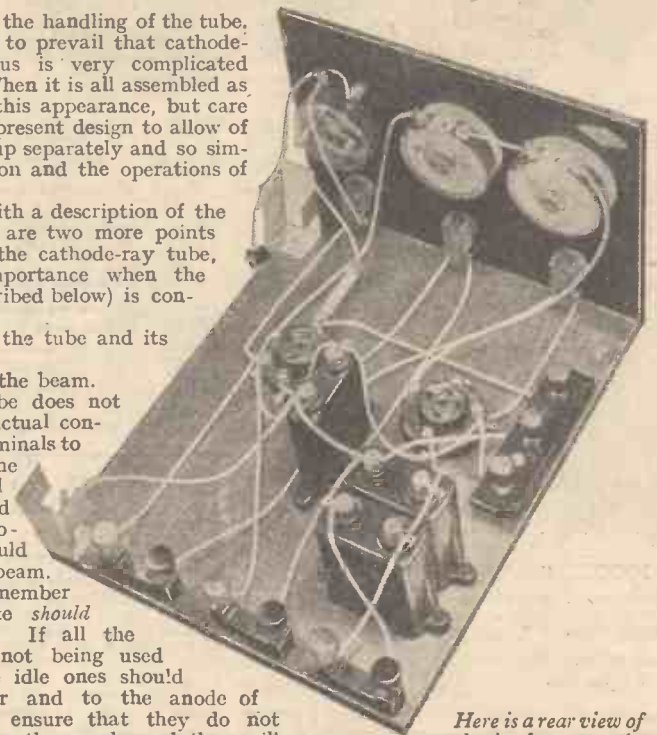
"Earthing" the tube does not necessarily mean the actual connection of the tube terminals to earth, but rather the connection of the metal parts together to avoid accumulating electrostatic charges which would otherwise upset the beam. It is important to remember that a deflector plate should never be left isolated. If all the deflector plates are not being used at the same time, the idle ones should be connected together and to the anode of the tube. This will ensure that they do not differ in potential from the anode and thus will not affect the beam on its way past them. In

Continued on page 776



The circuit of the time base for horizontal scanning

there is the receiver which will follow in due course. In last week's issue a simple piece of apparatus was described for use in experiments deflecting the beam; this is not used for television purposes, but is merely a piece of apparatus useful in



Here is a rear view of the time base; note the simple construction

TELSEN

SCREENED H.F. CHOKE

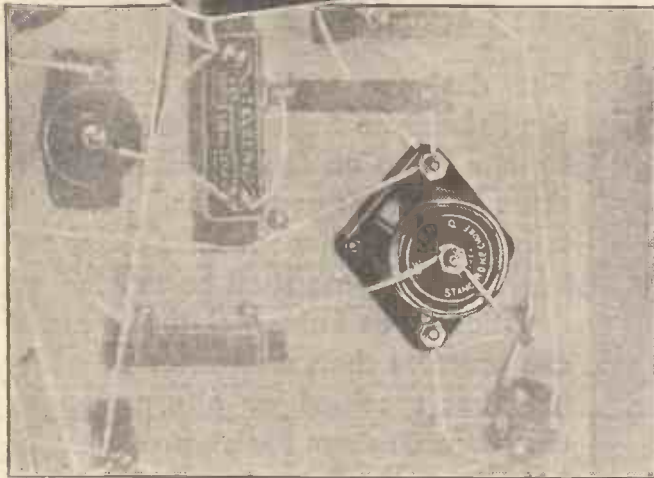
specified for the A.W.

"Etherdyne Super"



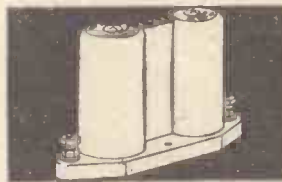
THE "Etherdyne Super" justifies its claims for up-to-the-minute efficiency by its use of the latest screened components, one of which is the new Telsen Standard Screened H.F. Choke. The metal screen, which is connected to an earthing terminal, entirely prevents interaction with other components, the design and construction throughout being such as to ensure consistently high efficiency over the entire waveband for which it is intended. 100 to 2,000 metres - - -

2/6

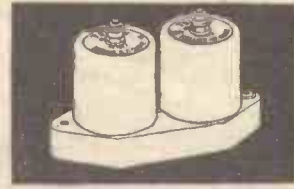


The illustration above shows the position occupied by the Telsen Standard Screened H.F. Choke in the built-up Etherdyne Super.

TELSEN COVER EVERY H.F. CHOKE REQUIREMENT



TELSEN BINOCULAR H.F. CHOKE 3/6



TELSEN ALL-WAVE SCREENED H.F. CHOKE 4/6



TELSEN SHORT WAVE H.F. CHOKE 2/6



TELSEN STANDARD H.F. CHOKE 1/6



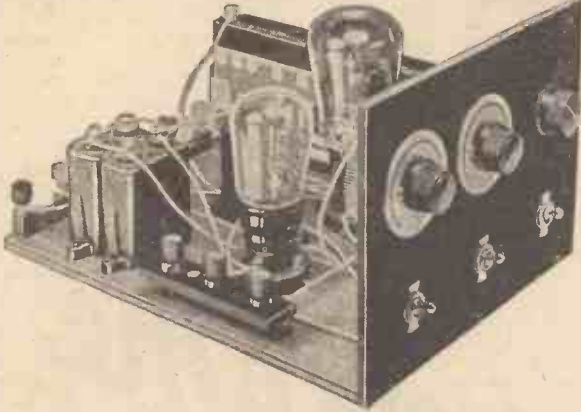
TELSEN SHORT-WAVE SCREENED H.F. CHOKE 3/6

TELSEN FOR EVERYTHING IN RADIO

ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON, BIRMINGHAM

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"Building a Cathode-ray Time Base"—Continued from page 774



Panel-and-baseboard construction is adopted for the cathode-ray time base

fact, the anode may be used as the "zero" point to which common points of the circuit can be connected.

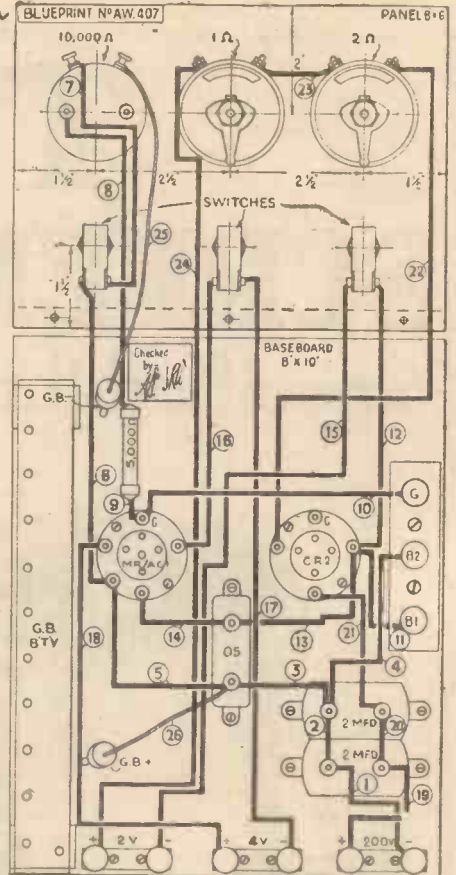
For Safety

At first this may sound "upside-down"—making the anode the earth as it were, but actually it is safer from the user's point of view since there is less liability of shock from metal parts to the anode, and the only part of the circuit which is "live" is then the low-tension battery supplying the cathode. Accordingly, if metal chassis are used, or metal screens, the rule should be: Connect

Continued on page 777

COMPONENTS REQUIRED FOR THE TIME BASE

- BASEBOARD**
1—Peto-Scott, 10 in. by 8 in.
- CONDENSERS, FIXED**
1—Dubilier .05-microfarad, type BB (or Telsen, Lissen).
2—Dubilier 2-microfarad, type BB (or Telsen, Lissen).
- HOLDERS, VALVE**
1—Telsen four-pin, type W222 (or Lissen, Benjamin).
1—Telsen five-pin, type W223 (or Lissen, Benjamin).
- PANEL**
1—Peto-Scott, ebonite, 8 in. by 6 in.
- PLUGS, TERMINALS, ETC.**
2—Belling-Lee wander plugs marked: G.B.+, G.B.— (or Clix, Eelex).
3—Telsen terminal blocks (or Lissen).
- 3—Belling-Lee terminals, type R (plain) (or Clix, Eelex).
- RESISTANCES, FIXED**
1—Dubilier 5,000-ohm (or Lissen, Telsen).
- RESISTANCES, VARIABLE**
1—Igranic 1-ohm type baseboard mounting.
1—Igranic 2-ohm baseboard mounting.
1—Lewcos 10,000-ohm (or Telsen, Lissen).
- SUNDRIES**
Pair—Bulgin grid-bias battery clips, type No. 1.
1—Peto-Scott terminal strip, 3½ in. by 1 in., and insulating supports.
Connecting wire and sleeving (Lewcos or Goltone).
2 ft. thin flex (Lewcos).
- SWITCHES**
3—Bulgin single-pole toggle, type S 80.



The layout and wiring diagram. A full-size blueprint is available, price 6d.

Use Graham Farish Products



The designer stakes his reputation on the Etherdyne Super. Just as surely do I stake mine on the Graham Farish products he advises you to use. And, because it is a point of honour that every product bearing my name shall be as efficient and dependable as human skill can make it, I can promise that, no matter whether they are first specified or alternative choice, the more Graham Farish products you use in building the Etherdyne Super, the more certainly will results delight you.

Graham Farish

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all metal parts together and to the anode terminal of the tube. When any deflector plates are not used these must also be connected to the anode. If any special precautions are required in later circuits, these will be noted at the time.

Now, when the time base is connected to the deflector plates, the beam will probably be pushed off to one side owing to a small D.C. voltage being applied permanently to the plates. Note that the condenser will not discharge to zero potential when the thyratron flashes, but will actually remain charged to about 20-30 volts. The beam will thus be "biased" by this amount, and in order to bring it back to the central position, an equal and opposite bias can be applied to one of the plates. This can be from a small high-tension battery which is plugged

in series with the lead from the time-base to the plate. The actual polarity is found by trial and error—the wrong polarity will push the beam farther off. This bias battery can always be used to centre the beam in either the vertical or horizontal plane, and does not usually need adjusting unless the swing of the beam is altered.

The time-base about to be described is for the horizontal scanning, and how simple is the construction will be evident from the photographs and the layout diagram. A full-size blueprint is available of the latter (price 6d.).

Panel and baseboard construction has been adopted and the size is such that the second time base can be built to correspond. The components as given in the panel on page 776 will be required for its construction.

The first procedure is to drill the panel according to the measurements given in the layout diagram, or if the full-size blueprint is obtained, then this can be laid on the panel and the drilling centres lightly punched through. The panel can next be screwed to the baseboard and the components fixed in position. It will be observed that two 2-microfarad condensers are used. One 4-microfarad would answer equally well, of course, but the 2-mfd. are easier to obtain. Particular attention should be paid to the position occupied by the terminals at the side of the baseboard, as these correspond with those on the second time base, the idea being that the two can be placed together with the simplest connections. The testing and operation of this time base will be described next week.

German Television Receivers

Intensive research and development is being carried out in Germany with different systems of television and, as the tabulated particulars given on the next page show, considerable progress is being made

GERMANY is taking television very seriously, for no fewer than seven important concerns in addition to the German Post Office have developed transmitters and receivers and demonstrated them in public. Three of these firms have pinned their faith (for the time being, at any rate) to mechanical methods, two to the cathode-ray system, and two to both systems. Progress has been assisted

by reason of the fact that some sort of standardisation has been arrived at, largely due to the interest that the German Post Office has taken in the subject. For example, a picture ratio of 3 to 4 has been commonly accepted together with a picture frequency of 25 per second, which is, of course, just twice the number at present employed here. Horizontal scanning is also general.

Much Ingenuity

With the exception of the foregoing, however, there is little that is common in German development, for receiver design shows considerable diversity and ingenuity, particularly in receivers of the mechanical type. Two of these receivers are very outstanding, one the mirror screw which employs a number of flat metal plates

Continued on page 778

for the Etherdyne Super



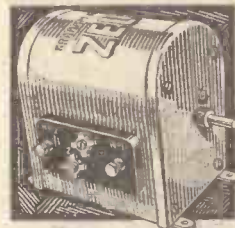
L.M.S. CHOKE 4/6



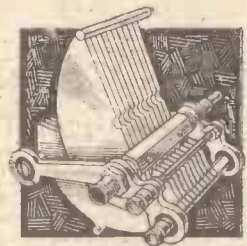
FIXED CONDENSERS. . . from 1/6



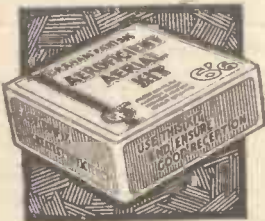
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 1/2 mfd., 1/6 1 mfd., 2/-
 1 mfd., 1/9 2 mfd., 3/-



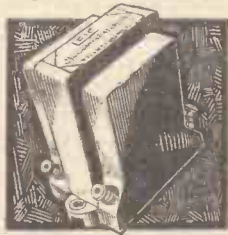
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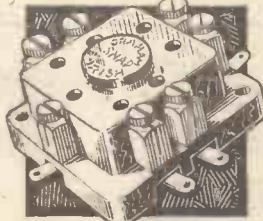
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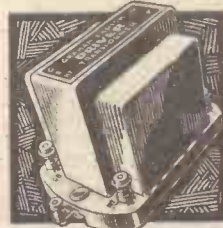
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"German Television Receivers"—Continued from page 777

assembled in echelon formation and with the edges of the plates as the reflecting surfaces, and the other the Mihaly inverted mirror stationary mirror drum which was described in "A.W." last week.

No common basis has been arrived at for the scanning frequency the present range being from 80 to 180, the lower figures being employed with mechanical apparatus.

Below are some interesting statistics relating to the different German television systems, compiled by Mr. Ernest Traub, a contributor to "A.W." and published during a recent lecture given before the Television Society. The comments regarding detail, intensity, and flicker are based upon his

actual observations during demonstrations of the various receivers.

Picture Frequency

The choice of a picture frequency of 25 per second has an important bearing on the question of synchronisation, as with this frequency motors can be used for both transmitters and receivers which can be driven from standardised 50-cycle alternating-current mains. The picture size ratio is also a very convenient one, for it conforms to the standard used by talking films, and therefore makes the system equally suitable for either film or life transmissions without any alterations. A study of the

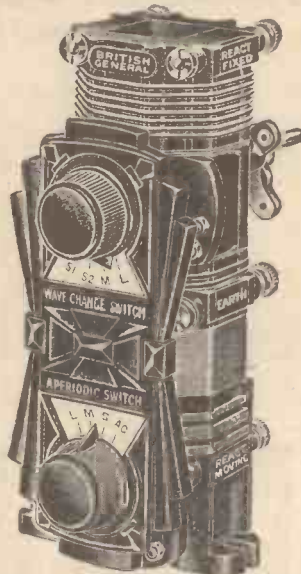
table will show that above a certain figure the number of scanning lines used does not result in greater detail, though naturally the efficiency of the system used has a bearing on this, and therefore it is hardly fair to draw conclusions. The general impression, however, is that 120 lines will give very satisfactory definition.

It is interesting to note which receivers are suitable for projection purposes, and those with which the picture must be viewed directly. In the former, of course, the size of the picture is not limited provided that sufficient illumination is available. All cathode-ray receivers must be viewed directly, and so must the mirror-screw type.

FIRM:	FERNSEH. A.G.			TEKADE.			TELEFUNKEN		LOEWE	MIHALY	R.P.Z.			H.H.I.	v. ARDENNE
Scanner..	disc	Cathode Ray Tube	Mirror Screw	Mirror Screw	Mirror Screw	Cathode Ray Tube	Mirror Drum	Cathode Ray Tube	Mirror Ring	Cathode Ray Tube	Cathode Ray Tube	Cathode Ray Tube	Mirror Screw	Cathode Ray Tube	
Light Source ..	Kerr Cell	Sodium Lamp	Neon Lamp	Neon Lamp	Neon Lamp	Karolus Cell			Neon Argon L.				Mercury Lamp		
Lines ..	120	180	90	90	90	180	96	180	90	90	180	180	90	80	
Points ..	19,200	43,200	6,000	10,800	10,800	43,200	12,000	43,200	10,800	10,800	43,200	43,200	10,800	8,750	
Images/p.sec. ..	25	25	25	25	25	25	25	25	25	25	25	25	25	20-25	
Ratio ..	3:4	3:4	3:4	4:3	3:4	3:4	3:4	3:4	3:4	3:4	3:4	3:4	3:4	3:4	
Image Size ..	6x8ft.	4½x6in.	6x4½in.	4½x6in.	7½x10in.	5x7in.	3x4ft.	6x8in.	4½x6in.	3x4in.	3x4in.	6x8in.	4½x6in.	up to 12x16in.	
Colour ..	white	white	pale yellow	pink	pink	yellowish green	white	white	strong pink	pale green	yellow green	yellow	pale blue	pale blue	
Detail ..	fair	excellent	excellent	v. good	v. good	v. good	v. good	excellent	good	good	v. good	good	v. good	good	
Intensity ..	v. bright	v. bright	v. bright	bright	bright	v. bright	good	v. bright	fair	bright	bright	bright	extremely bright	extremely bright	
Flicker ..	none	none	none	none	none	slight	none	none	none	none	none	none	slight	considerable	

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Well, there's no need for this. With Multitone TRUE TONE-CONTROL in your Super-heterodyne you will get the same range and selectivity plus first-class reproduction under all conditions.

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BEPU DRIVER TRANSFORMER Ratios 1/1, 1.5/1, 2/1

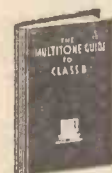
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That is the result of over 40 years experience in the manufacture of dry batteries. Since 1887 Hellesens batteries have been the best in the world. Now the new Hi-Life batteries, the latest addition to the Hellesens range, have reached an even higher standard of performance than before, and are offered to you at a price competitive with any other quality battery.

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Readers' Views on This and That

Listeners' Letters

MOST POPULAR STATION?

To the Editor, "Amateur Wireless"

SIR,—I have often wondered which broadcasting station is the most popular with the keen listener. Probably many fellow readers will agree with me when I give the crown of popularity to the famous Dutch station, Hilversum.

Its excellent orchestral music is beyond comparison; the transmission has a pleasing resonance and punctuality is characteristic of the programmes. Delightful intermezzo gramophone concerts combine to make a programme of 100 per cent. interest and real enjoyment.

It would be interesting to hear other readers' views.
Ridgewell, Essex. FRANCIS A. BEANE.

CRYSTAL RECEPTION

SIR,—With reference to Mr. Sherrin's letter regarding crystal reception, I agree with nearly all he says.

The simplicity, reliability, and quality of the set are beyond question and must clearly have a wide appeal.

But what of the headphones? Until some manufacturer considers it worth while to turn out a pair of these which is at least within measurable distance of a good loud-speaker in quality, headphone reception can never appeal to those who like music.

But the manufacturer who does this will find a ready market, I am sure. Amongst his customers, he can certainly count

Hull. G. B. HARGREAVES.

SIR,—I was rather pleased to see the letter by Mr. Geo. C. Sherrin in your issue of October 7, and admire your fairness in putting it in your paper.

I know many people who would not have a loud-speaker in the house. For myself, I always aim at having two good valve sets and two loud-speakers in going order—one on an outside aerial and one on a frame. I still, however, wish to have a good crystal set for use with earphones—for the bedroom, to use at night or when one is unwell.

Unfortunately, being a long way from a broadcasting station, I do not get good results. I have had bad luck with the pre-set crystal and the catwhisker variety is rather too tricky. I would also rather use an indoor aerial. Help from any reader placed as I am would be appreciated.

I have to thank the "A.W." for the Class-B Favourite 3 circuit which I recently made up. It is good.

Bungay, Suffolk. R. G. NORMAN.

COLOUR CODING

SIR,—What's all this colour-code business for fixed resistances? Went into my radio dealer's last evening and found he'd just had some in. Took him ten minutes to work the values out, and then, when I got home, blessed if I could tell t'other from which. What, precisely, is the big idea, anyway?

Thanking you for your excellent publication.
Lake, Sandown. B. R. SNOW.

RESULTS WITH MODERN SETS

SIR,—I thank C. L. H. H. (Seacomb) for his challenge to my claim for headphones where distinguishing between the tones of certain orchestral instruments is concerned. I note that on behalf of the "speaker" he stops short at "flute and clarinet," while I added "oboe, cor anglais and horn."

I grant him his flutes on a decent speaker; but not my other instruments. Perhaps he has never heard them in a concert hall? C. L. H. H. couples piano bass notes with "headphones," using the word generally. I spoke specifically of "reed-type" phones, which alone render the metallized low notes of the instrument.

He surmises that I have never listened to the best modern sets. Well, I have heard the _____ and the _____. They both gave me a beautifully toned picture of an orchestra, but neither of them could "do" both Elgin and Stravinsky.
London, N.W. L. L.

P. W. H.'s MASCOT

SIR,—I was very interested in Mr. Westcott's letter, in your issue of October 7, headed "P. W. H.'s Mascot," as about a year ago I built P. W. H.'s Mascot 3.

I was much impressed with the design immediately I saw it as being just what I was wanting, but now I find it has even surpassed my expectations, as I never expected such good tone, volume, and selectivity with a set so economical in high tension.

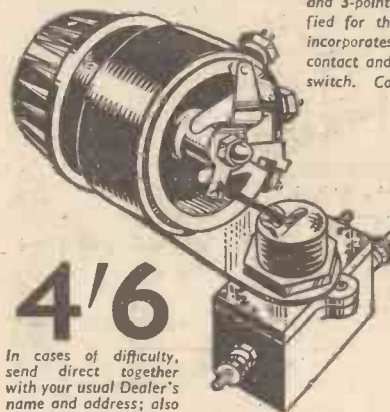
I have been intending to express my thanks to Mr. Harris for giving us such a fine set.

And with regard to the suggestion that Mr. Harris might be persuaded to modernise his Mascot, this sounds very interesting, but as we are situated here, I should not like to alter mine if it would mean a greater consumption of battery power.
Millom, Cumberland. W. BUSFIELD.

ETHERDYNE

COMBINED VOLUME CONTROL and 3-PT SWITCH
ENTRUSTED TO SOVEREIGN ALONE

The designers of the ETHERDYNE have chosen SOVEREIGN to serve a key position in this wonderful circuit. But if QUALITY alone is sufficient recommendation for inclusion of the Sovereign Combined Volume Control and 3-Point Switch in this set, how much greater is its value when you consider price. Electrically and mechanically perfect, you can rely on this component completely—because it is made by Sovereign and backed by "A.W." Use Sovereign wherever you can when building your ETHERDYNE; there is a wide range of suitable components.



4'6

In cases of difficulty, send direct together with your usual Dealer's name and address; also for Free Components Catalogue to—

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Combined 50,000 ohms, Volume Control and 3-point on-off Toggle Switch as specified for the Etherdyne. Volume Control incorporates patent spring diaphragm contact and accurately set arm to operate switch. Complete with pointer-knob.

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3 A.W.

Your Set—

and the Law of Copyright

BROADCAST reception is generally a purely domestic affair. One listens to the programmes whilst seated comfortably at home in the midst of the family circle.

But there is another and more public side to the broadcast service, particularly in the case of hotels, restaurants, cafés, or dance halls, where it is frequently made use of as an inexpensive substitute for orchestral music.

At first sight one might say that there does not seem to be any great difference between listening to one's favourite dance music over the radio, at home, or seated in a café or restaurant, but the law has just decided otherwise.

Some months ago a test case was brought in the High Courts to decide whether or not the proprietor of a certain hotel in Yorkshire was entitled to use a wireless set for the entertainment of the guests of the hotel. The decision was that, in spite of the fact that he held the usual Post Office licence, he could not do so without infringing the law of copyright.

"Private" and "Public" Reception

As the point affected a large section of the radio community, the case was taken to a higher court on appeal. The ruling of the Court of Appeal has now been given, and it upholds the previous decision. In both cases the judges drew a clear distinction between what they called "private" reception—in one's own home—and "public" reproduction, where the object is to entertain a number of visitors or customers on what may be called a business footing.

A little reflection will, perhaps, make this distinction clear.

Before they can transmit up-to-date dance music—all of which is, of course, protected by copyright—the B.B.C. must agree to pay something for the privilege, since the original composer of the music depends largely upon his copyright fees for a living. In actual fact the bargain the composer makes with the B.B.C. and the amount of the fee that is paid is based on the definite understanding that the microphone transmission is for private reproduction only.

If in spite of this the transmitted music is reproduced for the benefit of hotel visitors, or to entertain the customers in a restaurant or café, then the broadcast service is being used by the proprietor of those premises as a source of profit.

One must assume that the public pay for their entertainment, directly or indirectly—and also that there is a bit over for the proprietor—otherwise the set would not be installed. In other words it is definitely a business proposition.

Earning an Excess Profit

In these circumstances the owner of the copyright takes the view that since his music is earning an excess profit from the public, that is, one not contemplated in his original agreement with the B.B.C., then he is entitled to have his share of that profit as well as the owner of the hotel or restaurant.

The Court of Appeal upholds this point of view. It says, in effect, that for "public" reproduction a special copyright licence must be obtained, over and above the ordinary 10s. P.M.G. licence, which only authorises the holder to receive the broadcast programmes in his own home.

The new copyright position has been established by the activity of the Performing Right Society, which represents and protects the interests of most of the owners of musical and dramatic copyright in this country. The Society is prepared to issue licences covering hotel and similar "public" loud-speaker installations at an annual fee which varies on a sliding scale according to the size or value of the premises concerned. M. B.

... from the 'W.B.' postbag

"It was the finest speaker I heard at the Exhibition—I think you ought to be congratulated on such a product, not only upon the amazing fidelity of the reproduction, which is superb, but also upon the marvellous 'Microlode' feature. I wonder how many listeners realise (as I did when trying out the 'Microlode' pointer) how much volume is lost or wasted when the speaker is not correctly matched to the output valve."

(From the Secretary of a leading Radio Society.)
"In addition to its ability to handle considerable power (choke-fed PP5/400 was used) I was struck with the remarkable absence of resonance peaks. The even range of response is a great feature." (and later)

"An extended test confirms my early impression of the remarkable evenness of response."
"It is equal in tone and volume to many speakers of twice its price that I have heard."

"I have spent quite a lot of time and money in the quest for the perfect speaker, the first satisfaction I got was with your PM4a, which is really a marvel at the money."

"Anyone need not go any further than a PM4a of 'W.B.' as they could not get anything better at three times the price."

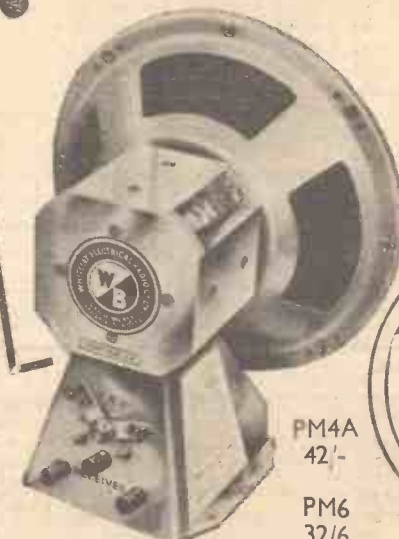
"It is the best speaker I have EVER heard."

There are solid reasons for the universal enthusiasm over W.B. 'Microlode' speakers.

A unique magnetic system giving sensitivity and even response otherwise unobtainable. The 'Microlode' feature, providing the even balance of tone which only accurate matching can ensure—

And the innumerable small points of superiority which together place the speaker in a separate class. Until you hear one on your own set you will never realise what a difference this speaker can make.

Originals of these and many others may be seen at Head Office at any time.



PM4A
42/-

PM6
32/6



"MICROLODE" MOVING-COIL SPEAKERS

Whiteley Electrical Radio Company Ltd., Dept. A., Radio Works, Mansfield, Notts.

Your Remote Control



Trying out the Etherdyne with Bulgin plugs and wall jacks, wired on the twin-wire extension system

WIRELESS in every room is now quite easy if you take the trouble to fit up suitable extensions for the loud-speaker. With a set such as the Etherdyne, which has plenty of spare volume, you can carry out extensions with the assurance of success.

This idea enables you to install the set in the most suitable room for the lead-in wires of the aerial and earth, and yet to have the great convenience of radio wherever you happen to want it—dining-room, living-room, study, bedroom or kitchen.

If you are keen on this radio-house idea you should certainly consider the special components made for the job by A. F.

sions on the Bulgin system are neat and have the further advantage that it is impossible to sustain a shock when plugging in.

This system, as we have already indicated, would be an ideal accessory for the Etherdyne Super. The ample volume provided by the pentode output valve of this set will certainly supply a loud-speaker with plenty of energy, even over quite long extension leads. The great convenience of the Bulgin components has been proved.

Bulgin & Co., Ltd., of 9-11 Cursitor Street, Chancery Lane, E.C.4.

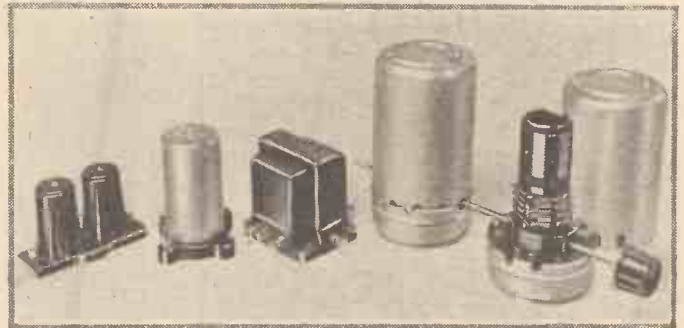
For example, there are the Bulgin wall jacks, which are mechanically and electrically sound and available in every finish to suit the various decorations throughout the house. The wiring can be concealed, so that apart from the loud-speaker itself no one need know that the house is "radio wired." Parallel wire exten-

New Parts

MANY components of interest to the home constructor are included in the new Amplion range. The coils will specially appeal on account of their good design features and low price. A coil for high-frequency coupling, completely screened and with dual-range windings, is available, price 8s. 6d.

Other coils include twin band-pass coils at 17s. the pair, again totally screened and for both wavelength ranges.

Another useful component is the new Amplion screened choke, price 3s. 6d. This has a D.C. resistance of 700 ohms, an inductance of 500,000 microhenries and a self-capacity of only 4.5 micro-microfarads.



Some of the interesting new components recently brought out by Amplion, including screened dual-range coils

To the keen experimenter the Amplion class-B components will make a strong appeal. Driver transformers and output transformers and chokes at very reasonable prices are included. Write to Amplion (1932), Ltd., of 82-84 Rosoman Street, Rosebery Avenue, E.C.1, for further details.

THE TRUTH ABOUT MAINS DISTURBANCE SUPPRESSION

A GREAT deal of non-sense has been published about this subject both in the form of advertisements and in articles.

An investigation of 16,000 cases show the Post Office Engineers that 80-90 per cent of Man-made Static is due to H.F. carried by the Mains, re-radiated by the house wiring, and picked up by the aerial system of the set.

They state that a condenser unit such as that produced by Belling & Lee, Ltd., will considerably reduce and generally entirely eliminate the disturbance.

Such a unit should be fitted at the source of the trouble, and next best at the listener's Mains switch. No relief can be expected if the unit is fitted to the set.

ITS APPLICATION TO THE "ETHERDYNE"

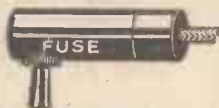
If reference is made to the paragraph above set in bold type, it will be clear that a Disturbance Suppressor is as effective with either a Battery of Mains driven Set. As all parasitic noises are amplified to an enormous degree by using a Superheterodyne Receiver a Suppressor unit is more than ever desirable.

A treatise on this subject has been prepared—it is available to those sending the coupon.



Mains Disturbance Suppressor. List No. 1118. Each 10/6

"ETHERDYNE" SPECIFICATION



- 1 Wanderfuse at 1/-.
- 10 Midget Wanderplugs at 2d., lettered H.T.+ , H.T.+1, H.T.+2, H.T.+3, H.T.—, G.B.—1, G.B.—2, G.B.—3, G.B.+ (two).
- 2 "Spring-Grip" Spade terminals at 2d. lettered L.T.+ , L.T.—.
- 1 S.G. Anode Connector at 4d.

A Refinement. 4 R type terminals at 3d., A, E, LS+, LS—, and 2 Belling-Lee terminal mounts at 6d. (extra to specification 1/-).

BELLING & LEE LTD
CAMBRIDGE, ARTERIAL ROAD, ENFIELD, MIDD.X.

TO: **BELLING & LEE LTD**
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Name

Address

A.W. 28/10/33

HIGH IN QUALITY



LOW IN PRICE

IMPORTANT TO ALL BUILDING THE "ETHERDYNE SUPER"

'AMATEUR WIRELESS' when reporting on HIVAC valves said:—

"... and in practice we have found them entirely satisfactory."

Required for the "Etherdyne Super"

- 2 HIVAC VS210 ... 10/6 metallised
- 1 HIVAC SG210 ... 10/6
- 1 HIVAC D210 ... 5/6
- 1 HIVAC Z220 ... 12/6

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HIVAC VALVE GUIDE "A" gives our complete range, and a comparative table of other makes and their HIVac equivalents.

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THE SCIENTIFIC VALVE

HIGH VACUUM VALVE CO. LTD.,
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**DEEPEST
BASS**
to
**HIGHEST
TREBLE**

You get every note
if you use

REGD. TRADE MARK
EVER
McMichael Super
Ranger Port. needs these
For best performance fit these Ever
Ready Batteries: H.T. Port. 18; L.T.
2401—both made specially for this set.
Or simply ask your dealer for the
Ever Ready List, showing all popular
makes with their special Ever Ready
batteries. Your set will be powered
perfectly by its appropriate Ever
Ready Batteries.

READY

made
particularly
to power your set

WIRELESS BATTERIES

The Ever Ready Co. (Gt. Britain) Ltd., Hercules Place, Holloway, N.7.

**Superhet Efficiency by
Merely Changing Coils**

MICRION



The Only
DUST IRON
COIL
with
ADJUSTABLE
INDUCTANCE

(Micrometer
adjustment
on both medium
and long waves)

SUPERHET
EFFICIENCY
FOR

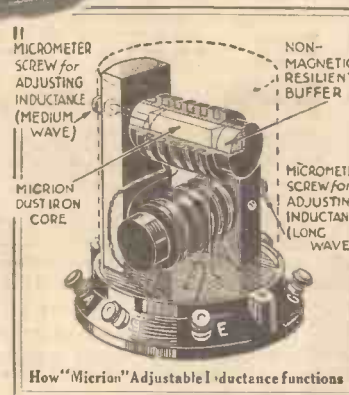
12'6

List No. B.Y.
36. Actual size,
2 7/8 ins. diameter,
3 ins. high.

**IMPEDANCE
TUNING
IS AN ENTIRELY
NEW SYSTEM**

which makes the ad-
vent of the "Micrion"
Coil a milestone in
the progress of radio
development; it is the
outstanding achieve-
ment of 1933/34.

By substituting the
"Micrion" Coil (or
coils) for most existing
coils, your old set
may be brought right
up to date and
given an almost un-
believable increase in
selectivity and range.



How "Micrion" Adjustable Inductance functions

**PARTICULARLY DOES THIS
APPLY TO CONSTRUCTORS
WHO HAVE BUILT SETS
WITH THE FAMOUS AND
POPULAR DUAL-RANGE COIL**

which, although in its day giving
truly remarkable results, is now
superseded by the "MICRION"
Coil, that is designed for modern
broadcasting conditions which
now render older coils obsolete.

The "MICRION" Coil replaces
most existing coils and thus
renders old sets modern without
costly and difficult alterations
to the circuit and calibration.

**ASK YOUR DEALER FOR
THE "MICRION" FOLDER**



Advt. of Radio Instruments Ltd., Croydon, Surrey.

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

Centimetre

"HALLO, hallo, St. Inglevert! Hallo, this is Lypmne calling St. Inglevert. I hope you are getting us better now. Hallo St. Inglevert, hallo amateur listeners; we should be glad to receive reports on reception from you."

As he spoke these words into the microphone, the chief wireless operator at Lypmne Aerodrome smiled. And not without reason, because his words were being transmitted by the beam system on the almost optical wavelength of 17.5 centimetres.

This station is the first commercial one of its kind to be built, and it is now almost completed and undergoing final tests and adjustment. It has been designed to work with a sister station at St. Inglevert (40 miles away, in France) for the transmission of confidential messages. Absolute secrecy is obtained by the use of this ultra-short wavelength as the radiations can be focused with practically no spread by parabolic reflectors to ft. in diameter.

Structural steel frames erected on the top of reinforced concrete hanger door housings support the reflectors, one at each end of the hanger. Part of the apparatus, including the 1 1/4 in. long aerial, is mounted in such a way at the geometrical centre of the reflectors that the position of the aeriels can be altered slightly to accurately focus and locate the beam.

Other stages of the transmitting and



Two interesting views of the aerial system of the 17.5-centimetre aerial assembly erected at Lypmne for testing with St. Inglevert (France)

Make Full Use This Winter—and Tell Your Friends to Do So, Too—of the Station Identifier Given with This Issue

receiving plant are mounted under semi-circular cowling behind the reflectors, and from here cables run down to the control room at the side of the hanger. The control room contains a small vertical panel about 6 ft. high and 2 ft. wide. On the wall behind the panel are two metal rectifiers, and on the opposite wall is a bank of accumulators.

Experimental apparatus of a similar

Reception!

kind, erected on the cliffs 20 miles farther north, near St. Margaret's Bay, has been successfully worked with a similar station across the Channel for some time and has contributed valuable data for the design of the Lypmne station.

When the station is in full working order it will be used to operate a teleprinter in addition to its normal telephonic traffic. B. G. R. H.

[The object of these transmissions is to obtain maximum reliability with minimum power and simple apparatus. Centimetre transmissions are comparable to local/distance telephone calls and quite as secret.

Much has already been done with apparatus of this kind by Marconi using a wavelength of 57 centimetres. The record held by him is 168 miles for a two-way conversation.

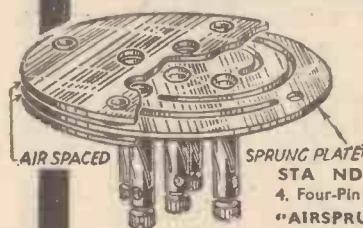
Apparatus for the propagation of these microwaves has been erected on the roof of the new Marconi buildings on the Embankment, London.

It must be emphasised that these microwaves are of little practical interest to the amateur at the moment, as all of the components must be home-constructed. This does not apply to keen amateurs within a radius of five miles or so of the beam between Lypmne and St. Inglevert, who may find it worth while to construct simple apparatus to receive these test transmissions.—Ed.]

CLIX

Specified for the "ETHERDYNE SUPER"

The designer has chosen and you require these CLIX CHASSIS MOUNTING VALVEHOLDERS



Clix New "Airsprung" Anti-microphonic Valveholder is designed to—
 —Damp out actual physical shocks to the valve.
 —Insulate the valve from consistent vibration set up by the transformer on the chassis.
 —Counteract and absorb the air pulsations set up by the increased acoustic output of modern receivers.

"A MATTER OF CONNECTION"
 Clix New Folder "A" gives details of over 30 Components for Perfect Contact. Write for a copy now.

CLIX
 CHEAPES-VALVEHOLDERS
 LECTRO LINX LTD., 79a Rochester Row, S.W.1



GET THEM ONE AT A TIME WITH AN AIRCLIPSE

There will be an amazing improvement in selectivity immediately you fit the AIRCLIPSE in place of your present aerial. Not another gadget, not a condenser, but an auto-inductive aerial that filters incoming signals, bringing in each programme separately sharp and clear. Unsightly masts and wires are dispensed with entirely. Fits inside or outside the set. Makes any set "portable."

Another delighted purchaser writes: "I purchased an Airclipse with the usual misgiving, and am pleased to find that I was wrong. Selectivity is certainly improved, and as regards clarity of tone, I was agreeably surprised."

AIRCLIPSE
 5/- AUTO-INDUCTIVE AERIAL
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 Of all radio dealers or direct from:-

AIRCLIPSE LTD., 182, Vauxhall Bridge Rd. London, S.W.1
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MICROPHONE BUTTONS 1/-




Usually sold at 3/6. Our price has always been 1/-. We have supplied thousands to home users. MICROPHONES FOR ALL PURPOSES. MATERIALS AND PARTS.

Ask for our Mike List "A." We are makers and carry the biggest and most varied stock in London. Hand Mike in 2-in. Casing, 5/6. Pedestal 10B, 10 in. high, 12/6. P.A. Mikes and complete outfits by B.T.H., Brown, Marconi, and Siemens, cheap. State details of your wants.



S. G. BROWN'S BATTERY SUPERSEDER makes H.T. from your L.T. 2-volt battery, rectified and smoothed; 3 tappings. A boon to those who are not on the mains. Reduced from £3/15/-. New and Guaranteed, 37/6.

PHOTO CELLS. We have some £5 Bulbs for talkies, light tests, timing controls, etc., at bargain prices. Light response, 50 micro-amps per lumen. King B.T.P. type, 15/-. R.C.A., as illustrated, 25/-. Holders, 1/-. Beck Prisms, 5/6. Focus Lens, 3/6.

SELENIUM CELLS. Light sensitive resistance, gold grids, moisture proof, L to D ratio 5-1, at 5/-. Mounted in bakelite, 7/6. Super Model in oxy-brass body, with window, 10/-. 

LESDEX SERVICE CHARGERS A.C.—D.C.

We have 25 models to offer and our prices are low for special requirements. Three popular sizes are the AC109A for 36 cells, the AC106 for 108 cells, and the Lesdex Super 8ix for 200 cells.

Write for "Charger" Leaflet "A." **ELECTRADIX RADIOS,** 218, UPPER THAMES STREET, LONDON, E.C.4. 

Potted Biographies—3

Vernon Bartlett

Expert on International Affairs

If you want a real live wire, Vernon Bartlett is your man. He is not yet forty, but has done enough one way or another for sixty. He has been connected with the London office of the League of Nations Secretariat for many years, which fits him to be a broadcaster on anything that can be said to come under the heading of the Way of the World. What he does not know about the world and its ways is hardly knowledge.

It is perhaps strange that he has drifted into novel writing, but *Topsy-Turvy*, *No Man's Land*, and *Calf Love* prove that he did not make a mess of it, once he began.

You may remember also that he was part-author with R. S. Sherriff when *Journey's End* was made into a novel.



Vernon Bartlett

Mr. Bartlett first broadcast in August, 1927. In January of the following year he began his series of straightforward talks on international affairs called *The Way of the World*. Now we generally get him on *The Week* *Abroad*.

He was educated at Blundell's, but left school earlier than most boys do

and began to travel in Germany, Italy, Spain, and France in order to absorb enough languages to get into the Consular Service. Unfortunately money ran short and he had to take a job as a teacher of English in a language school in Berlin. This he obtained by lying about his age.

Mr. Bartlett had just begun to study seriously at the Sorbonne in Paris when war broke out. He joined up before war had been declared a month and spent his twenty-first birthday in a hospital train on the way from Hill 60 to the base.

In 1915 he was invalided home. Then followed two years of severe illness. As soon as he was well enough, Mr. Bartlett took up journalism. He was on the *Daily Mail* for some time before becoming attached to the Peace Conference for Reuter's. He went to Switzerland for *The Times*.

A Stormy Petrel

From this time onwards Vernon Bartlett became a sort of journalistic stormy petrel. His job was to look for trouble—no matter where—and then go right into it. He found a good deal in Poland, and was with the Polish army against the Soviet in 1920. During minor revolutions he was forced to lie for hours face downwards in a ditch or wherever he could take cover. When he was not occupied thus he says he was acquiring expensive tastes in hotels at a time when the English pound could buy almost anything.

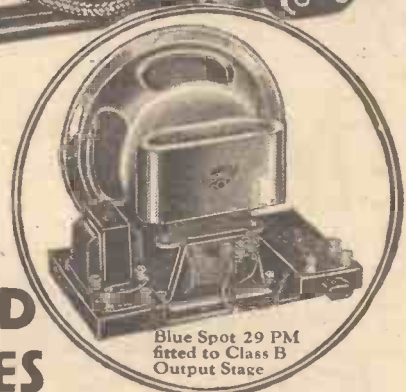
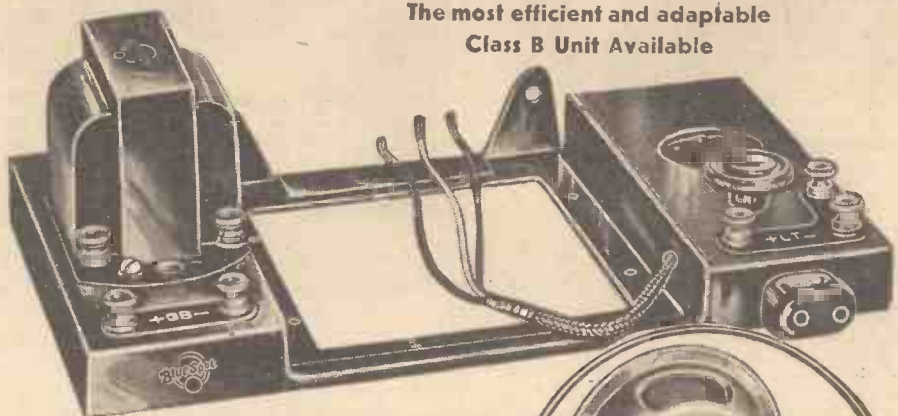
Mr. Bartlett was for two years correspondent to *The Times* in Rome. He actually left a few days before Mussolini came into power. He was then appointed Director of the London office of the League of Nations.

Naturally his public position and his strongly expressed opinions occasionally get him into hot water. One day he received a letter so insulting in character that he wrote to the author of it and told him if he cared to meet him beneath the clock at Charing Cross he would have much pleasure in knocking him down.

Altogether, it has been a full life up till now, and not without its dangers. —W. W.

AN EVENT OF IMPORTANCE
NEW BLUE SPOT
CLASS B
OUTPUT STAGE

The most efficient and adaptable
Class B Unit Available



Blue Spot 29 PM
fitted to Class B
Output Stage

FOR ALL
CONSTRUCTORS
FOR ALL STANDARD
& ALL RECENT TYPES
BLUE SPOT MOVING COILS
66 R UNITS & CABINET MODELS

Literally thousands of listeners who own Blue Spot Speakers, and thousands more besides, will welcome the introduction of this new Blue Spot Class B Unit. It is so essentially adaptable, so simple to fit, so completely efficient, so thoroughly representative of Blue Spot quality and value. The addition of this unit enables any Battery set owner to enjoy Class B output at little expense.

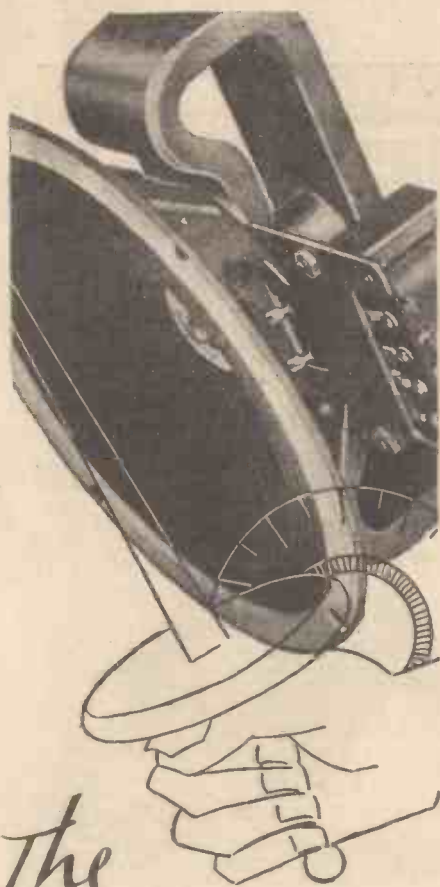
The unit can be fitted in a few seconds and in the case of Blue Spot Speakers simply by means of bolts which bind unit and speaker together as a complete rigid unit. The assembly is then ready for fitting to the Speaker baffle, to the baseboard, or fitting inside any Blue Spot Speaker cabinet. Among the features of the new Unit are: Tone control to match Unit with Set and minimise high frequency disturbances such as heterodyne whistles or background noises. Provision for Grid Bias for Class B valve where required. Full particulars and instructions are contained in Leaflet No. A.W.83.0 which will be sent post free on request.

Price without valve . 29/6

Price with Osram B21 . 43/6

The British Blue Spot Company Ltd., Blue Spot House, 4/96 Rosoman Street, Rosebery Avenue, London, E.C.1. Telephone: Clerkenwell 3570. Telegrams: "Bluespot, Isling, London." Distributors for Northern England, Scotland and Wales: H. C. RAWSON (Sheffield and London), Ltd., 100 London Road, Sheffield; 22 St. Mary's Parsonage, Manchester; 177 Westgate Road, Newcastle-upon-Tyne; 7, 8, 39 Clyde Place, Glasgow.





The M.C.22

The Amplion M.C.22 is particularly suited to super-het requirements and, as such, is the specially recommended speaker for the "Etherdyne Super."

A super-size Magnet and rigid cone-housing are special features of the M.C.22, while great power handling capacity and sensitivity to distant signals are added advantages with all Amplion speakers.

The universal transformer provided enables suitable connection to be made with every type of set.

- The M.C.22 (7 in. cone) 39/6
- "AUDIOLA" (9 in. cone) 49/6
- "SONETTE" (5½ in. cone) 27/6

AMPLION

AMPLION (1932) Ltd., 82/84, Rosoman Street, E.C.1.

Notes and Jottings



An enthusiastic constructor making the most of a Solon electric soldering bit and one of the new soldering pots described below

A USEFUL small soldering pot is being marketed by W. T. Henley's Telegraph Works Co., Ltd., of Holborn Viaduct, London, E.C. The pot is designed for fitting on to the end of the Solon electric soldering bit and is just a convenient size for keeping a small amount of solder in a molten state. The price of the pot is 1s.; complete with a Solon electric bit, 8s. 6d.

We have been asked by Edison Bell (1933), Ltd., to point out that although the Decca Record Co., Ltd., have been appointed sole concessionaires for the new 1s. records, they have not acquired the goodwill of the name "Edison Bell." Edison Bell (1933), Ltd., are still issuing the popular 1s. 6d. "Winner" record, which has such a good name for its finely recorded frequency ranges.

The City Accumulator Co., Ltd., have appointed Mr. R. J. Durand to take charge of their West End showrooms at 4 Surrey Street, Strand, London, W.C. Mr. Durand has been in charge of the B.B.C. reproducing equipment used at the R.M.A. exhibitions at Olympia, Manchester and Glasgow. His voice must be well known to all visitors to these exhibitions.

In connection with the recent broadcast show of famous Cochran tunes, the Columbia Graphophone Co., Ltd., have released a special record entitled "C. B. Cochran Presents." All the most famous tunes in the recent Cochran shows are played by Henry Hall and the B.B.C. Band, and Delysia, Peggy Wood and Mary Ellis sing the original numbers as they sang them in Mr. Cochran's shows.

Bush Radio, Ltd., have made arrangements for two "trailer" films to be shown at two hundred cinemas in the Gaumont circuit. The first was released on October 9 and consisted of 340 ft. of film of the thriller variety.

Next week's issue of AMATEUR WIRELESS will contain a special beginner's guide to the construction of the Etherdyne Super, the set about which everybody is talking.

"Results justify its recommendation to listeners . . . no reduction of signal strength." *Radidea—"Manchester Evening Chronicle."*

ELECTRICAL INTERFERENCE, ATMOSPHERICS, HISSES, AND CRACKLES—the Biflo Static Cut-Out, which you can fix to your set easily and quickly without technical knowledge, cuts out all these objectionable noises; and, the Biflo is the only unit of its kind in existence that does definitely do all that is claimed. Price 12/6 from your radio dealer.

SEND THE COUPON FOR PARTICULARS.

BIFLO STATIC CUT-OUT

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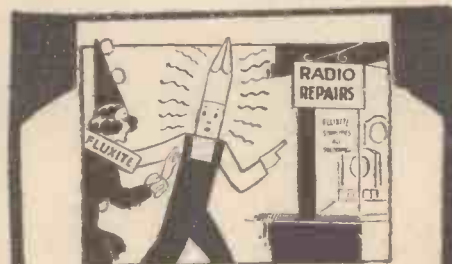
Please send me full particulars of The Biflo Static Cut-Out.

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ADDRESS

COUPON

OSDUR MANUFACTURING CO. (Dept. A.W.),
26 Adam Street, London, W.1.



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

Here is an EXPERT... that's plain to see! We're SURE of a welcome—Fluxite and Me!"

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

ALL MECHANICS WILL HAVE
FLUXITE
IT SIMPLIFIES ALL SOLDERING

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

FLUXITE LTD.,
(Dept. 326), ROTHERHITHE, S.E.16

FOR ALL REPAIRS!



Short-wave Notes

FOR many years the Philips station at Eindhoven has been one of the most reliable short-wave broadcasters, being heard all over the world. For the last two years or so this station has been silent, while it was being brought right up to date and made capable of giving a more reliable, world-wide service.

The broadcasts from this station were originally intended for reception in the Dutch East and West Indies, but they are picked up by short-wave listeners all over the world. A variety of programmes is sent out and the announcements are made in Dutch, Malay, English, French, German, and Spanish.

This station—PHI—is on the air on five days a week. On Mondays, Thursdays, and Fridays from 12.30 to 2.30 G.M.T., and on Saturdays and Sundays from 12.30 to 3 G.M.T.

Interference Avoided

I am glad that they finish fairly early, as this station is inclined to interfere with reception from W3XAL, which is still coming through fairly well during the early afternoon.

Many listeners have picked up J1AA on the 19-metre band, but how many have heard the tests with KEL on 38.07 metres, 7,880 kilocycles? These tests are quite irregular, but the signal strength is usually at least R4.

Two important stations have now closed down to make some improvements in their equipment. Vienna, UOR2, on 6,070 kilocycles, will be silent for some months, while the Polish station at Poznan, on the 31-metre band, is also off indefinitely.

As most receivers will tune up to at least 80 metres, it is well worth while searching round about 70 metres. All of the more important Atlantic liners broadcast telephony on 71.73 metres, and boats such as the *Homeric*, *Empress of Britain*, and the *Italian Rex* can be picked up quite frequently.

The Danish station OXY, which has been wandering round the 49-metre band for some time, cannot find a trouble-free channel. At the present moment I have heard quite a number of broadcasts on about 48.42 metres, but for how long this wavelength will be used I really do not know.

Conditions are improving very rapidly, particularly on the 31-metre band. I expect very shortly that the American stations, such as W3XAF, will be coming through on the loud-speaker as they did last winter. Of course, there is no doubt that the 25-metre band is still the best at the moment. W8XK, Rome, and the Berlin relays are coming through extraordinarily well, as indeed they have been now for some time.

Back to the 50-metre Band

The darker days are certainly very welcome, as they bring with them the 50-metre band stations which are not heard very well during the summer.

The South of England people seem to be very lucky with the ultra-short wave transmissions which are going about at the moment. They started off by being in the right area for picking up the 6-metre television transmissions from the Crystal Palace. Now there is the 17.5-centimetre transmissions from Lympne which are sent out daily, testing St. Inglevvert (France), a distance of about forty miles.

I don't suppose there are very many receivers about capable of picking up these transmissions, but I certainly wish I were near enough to hear what can be done. The apparatus is certainly very simple.

Quality Components for the "ETHERDYNE SUPER"



BE ASSURED OF SUCCESS

Build with the Bulgin quality products as listed below. Discriminating designers and home constructors realise that for super results one must build with the best.

LIST NO.	DESCRIPTION	PRICE
V.S.50	50,000 Potentiometer, with combined 3-point switch	5/6
H.F.12	H.F. Choke	2/-
L.F.12	Nick Alloy Transformer	6/-
H.F.10	Super Het Choke	5/6

REMOTE CONTROL FOR THE "ETHERDYNE SUPER." Easily and quickly accomplished by means of the New Bulgin Distant Control Relay (Prov. Pat.) Will control Battery, A.C. or D.C. mains sets, and in case of the "Etherdyne Super" is operated from your L.T. accumulator.

LIST NO.	DESCRIPTION	PRICE
R.C.10	Distant Control Relay	25/-
R.C.8	Control Pushes for above, each	2/-

Stocks available at all leading dealers; in case of difficulty write direct.

Send for 80-page Catalogue No. 153 A. Enclose 2/- postage.

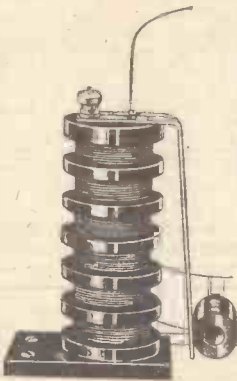


A. F. BULGIN & CO., LTD., ABBEY ROAD, BARKING, ESSEX
 London Showrooms: 9, 10, 11, Cursitor Street, Chancery Lane, E.C.4.
 Phone: Grange Road 3266 & 7. Telephone: Holborn 2073

B.R.G.

ETHERDYNE EXCLUSIVE SPECIFICATIONS

B. R. G. ANTI-BREAK-THRU UNIT B. R. G. STANDARD H.F. CHOKE TYPE No. 40



DESIGNED and developed by B.R.G. experts specially for this wonderful set. Guaranteed accurate and reliable. An exclusive product of B.R.G. indicative of B. R. G. quality and value. **5/-**

B.R.G. 2 in. Metal Bracket for Potentiometer ... 6d.

In cases of difficulty send direct with name of your usual dealer.



ACCURATELY wound on bakelite in sections to ensure constancy over both wavelengths. The windings are fully protected by cellophane shield. Use it wherever you can. **3/6**

Appointed Sole Wholesalers of the New Metaplex Baseboards.

(BRITISH) **RADIOGRAM**

Appointed Sole Wholesale Distributors of all Peto-Scott Pilot Author Kits.

BRITISH RADIOGRAMOPHONE CO. LTD. Pilot House, Church Street, Stoke Newington, London, N.16
 Telephone: CLISSOLD 6287-6289

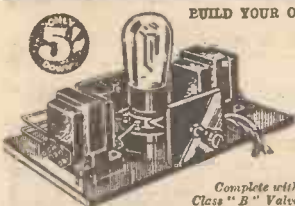
Appointed TELSEN WHOLESALE DISTRIBUTORS

E. J. HERAUD'S EASY TERMS

**BRING YOU THE BEST IN RADIO ON
7 DAYS' APPROVAL**

The dependable Mail Order House of E. J. HERAUD, Ltd., offers famous radio accessories on straightforward easy terms. Any of the following goods (except the "Class B" Kit of Components) may be had on 7 days' trial, and we Guarantee to Refund your Money if Goods are unsatisfactory and are returned undamaged. All goods are sent carefully packed and carriage paid.

CLASS B' CONVERSION KIT



BUILD YOUR OWN CLASS "B" UNIT

This Kit comprises the exact components specified by *Practical Wireless*, together with Class "B" Valve and full-size Blueprint. **SEND ONLY 5/-**. Balance by 7 monthly payments of 5/- (Cash in 7 days, 35/-)

Complete with Class "B" Valve

EPOCH CLASS 'B' SPEAKER

The EPOCH Class "B" Combination Speaker combines a complete Class "B" Adaptor and a high-class Cobalt P.M. Speaker. Simply connect to your set without any alteration and get Mains volume at very low use of H.T. **SEND ONLY 5/-**; if satisfied pay further 5/- at once, then 8 monthly payments of 7/8. (Cash in 7 days, 42/-.) Complete with Class "B" Valve and Instructions.



EPOCH CLASS 'B' ADAPTOR



If you already have a moving-coil speaker and wish to incorporate Class "B" amplification, the EPOCH Class "B" Adaptor is ideal for your purpose. It converts your set to Class "B" without any alteration whatever. **SEND ONLY 5/-**; if satisfied pay further 5/- at once, then 8 monthly payments of 5/-. (Cash in 7 days, 45/-.) Supplied complete with Class "B" Valve.



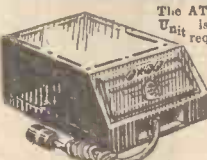
BROWN M.C. SPEAKER UNIT

An amazing bargain. List Price, 50/-; Our Price, 32/8.

New BROWN Permanent-magnet Moving-coil Speaker Unit and Chassis incorporating Tapped Transformer. Highly suitable to work with any set, giving deep, rich tone and wonderful volume without distortion. Overall size: 8 1/2 in. diameter, 4 1/2 in. deep, on baffle board 12 in. square. **SEND ONLY 2/8**; if satisfied pay further 5/- at once, then 6 monthly payments of 5/-. (Cash in 7 days, 32/8.)



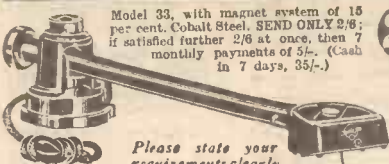
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The ATLAS Model CA25 Mains Unit is suitable for all sets requiring up to 25 mA, including sets with Class "B" and "Q.P.P." amplification. For A.C. Mains 100/125 or 200/250 volts, 40/120 cycles. Guaranteed 12 months. **SEND ONLY 5/-**; if satisfied pay further 5/- at once then 8 monthly payments of 7/-. (Cash in 7 days, 68/8.)



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Sets of the Season Tested

G.E.C. Super-het 5 Receiver

SOUND engineering and a carefully designed circuit have together produced in this G.E.C. super-het a set that really does give a good performance. The makers call it a "five"; there are four valves in the radio circuits and a fifth as rectifier for converting the alternating mains supply to direct current.

Only a casual glance is needed at the Super-het Five to see that it is the product of skilled engineers. Inside the set chassis construction is as precisely made as a gun; the cabinet work is excellent.

The controls are simple. Tuning is done with one knob in the centre, the control working a small pointer on the full-vision scale just above. This scale is calibrated in wavelengths and stations; forty-odd of the easiest-logged stations are marked and the wavelengths are calibrated in sections of 10 metres for the medium waves and 50 metres for the long.

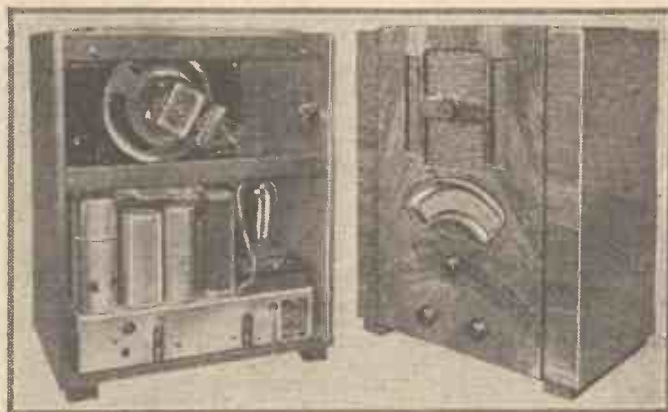
The bottom control on the left is of the combined variety: when turned to the right there is firstly the on-off switch and then the movement actuates the set's volume control. Wave-changing is done by the bottom knob on the right.

The other control on the front, in the centre of the loud-speaker fret, is a good tone control. It provides a tonal variation to suit widely different tastes. The tone-control knob is in the centre of the loud-speaker fret—a very convenient place.

can, of course, have both loud-speakers in circuit if you wish.

In this Super-het 5 the mains-adjustment panel is reached by unscrewing two small screws, which hold a protection cover over the panel. The voltage is adjusted by setting in position a movable link between the appropriate terminals.

Of interest in the circuit, which is quite standard for four valves arranged in super-het sequence, is a band-pass input to the first detector; resistance coupling is used between



These two views show the attractive appearance of the G.E.C. Super-het 5, an excellent proposition in every respect

the second detector and the output pentode. The set layout follows usual practice. Coils, valves and condensers completely fill the top of the metal chassis, and the smaller components are underneath. All the components on top, with the exception of the output pentode and the valve rectifier, are totally screened to ensure stability.

Our main tests were carried out in South London, using a standard outdoor aerial about 35 ft. long, and also the set's "internal" aerial, a piece of thin rubber-covered wire 15 in. long.

We were so interested in this piece of wire, which the makers claimed would bring in the locals at good strength, that we tried its capabilities first. This scrap of wire brought in the locals really well and also several Continental stations. Leipzig, Poste Parisien, and Breslau were logged at full strength.

On the normal aerial we were more than satisfied with the set's capabilities. Mühlacker came through with no trace of London Regional on the medium waveband, and Berlin was clear when we tried the long-wave results. All the groups of high-power stations on the medium waves could easily be separated. The two major groups, Prague, North Regional, and Langenberg; and Breslau, Poste Parisien and Milan, provided six entirely separate enjoyable programmes.

During the course of a couple of hours we picked up all Europe's worth-while stations and several of the other variety, perhaps not entertaining but good fun all the same.

Quality is particularly good for a "super." The old fault of super-hets, background noises, has been reduced to such an extent that it was barely noticeable except when listening to far-away signals. Mains hum negligible.

To sum up, this is a fine example of the four-valve super-het. It is sensitive, selective, and notable for its fine quality.

Brief Specification

Makers: General Electric Co., Ltd.

Model: Super-het 5.

Type: Four-valve A.C. super-het receiver in attractive console cabinet, with built-in moving-coil loud-speaker.

Price: £14 14s.

Valve Combination: Screen-grid first detector and oscillator (Osram MS4B), intermediate-frequency amplifier (Osram VMS4), second detector (Osram MS4B), pentode output (Osram MPT4), and valve rectifier (Osram U12).

Power Supply: A.C. mains, 190-250 volts.

Remarks: A good super. Gets plenty of stations and gives good quality of reproduction. Full-vision tuning scale particularly attractive.

So much for the knobs on the front. At the back, the layout of the plug and socket arrangements, external loud-speaker switching, etc., is just as simple. At the top, on the side of the cabinet, you will see that a push-pull switch has been fitted. This is for switching out of circuit the interior loud-speaker when an external one is used. You

Next week there will be more interesting features in AMATEUR WIRELESS about that amazing new set—the Etherdyne Super. Make certain of getting a copy!

Why I Champion the Super-het

Continued from page 760

the avoidance of whistle or second-channel interference as it is called. As explained, this can, and is, avoided.

Now it is not necessary to use a separate valve as the oscillator. The oscillator actually works with the first detector and it is convenient to use one valve for the job. That is, one valve is employed as a detector and also as an oscillator. Most commercial sets have a combined detector-oscillator.

Probably the chief point about the long-wavelength or intermediate-frequency amplifier is the fixed tuning circuits. Normally, with one valve in this circuit, there would be a pair of band-pass units, one connected between the first detector and the input of the valve, and the other between the output of the valve and the second detector.

Thus, there are four tuned circuits, which add materially to the selectivity of the set. A super-het receiver therefore has a frequency-changing circuit, a long-wavelength amplifier, and the usual detector and power valves.

It is considered possible to obtain more magnification at the long wavelength used than over the medium-wave range. Thus, there is an advantage here. The tuning circuits in this amplifier, being of the fixed type, are either adjusted by the makers, or sometimes the amateur can adjust them himself. These tuned circuits can be made to pass a band of frequencies, 9 kilocycles wide.

The chief interest, however, will always lie in the design of the detector-oscillator circuits as well as the circuit coupling the aerial and the detector valve. It is here that the initial selecting and the frequency changing takes place and either makes the set a good or an indifferent one.

One Set for Both D.C. or A.C.

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Work on any mains supply without alteration.

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AMATEUR WIRELESS said:—"We are constantly coming across listeners who fight shy of mains sets because they are not sure when their existing D.C. supply is going to be changed over to A.C.

Actually, the problem is already solved, if you use the right type of valves."

vide "A.W.", Oct. 14
(See article on page 630)

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In Praise of the Super-het

From P. H. Pettyfer, commercial manager of the Igranic Electric Co., Ltd., we have received the following message in praise of super-hets:—

"In connection with your description of the Etherdyne Super, we are of the opinion that the super-het is becoming more and more necessary, in view of the number of stations which encroach upon each other's frequency band. In our opinion ideal selectivity for present-day conditions can only be obtained by the super-het, as this circuit combines selectivity, sensitivity, fidelity and reliability.

"The fidelity and tone of a super-het is equal to that of the best straight set, and the super-het receiver may be just as reliable, if not more so, than a receiver incorporating several stages of high-frequency amplification.

"The super-heterodyne is not an expensive receiver and for equal results a super-het can be constructed for less cost than a corresponding straight set. In our opinion the super-het is the only satisfactory set to cope with the present chaotic conditions of broadcasting."

New Radio Courses

TO those in need of technical instruction in the science of wireless a new course has just become available. Stated to be planned by experts, the avowed object of the courses is to give the student a sound theoretical and practical instruction. Design of components and sets is included in the course, as well as information on how the valve works, how it is used, the special types in use to-day, and the plotting of their curves.

Aerials and earths are dealt with in another part of the course. Servicing of sets and fault-finding generally is included.

Dealing with the commercialisation of the radio knowledge thus acquired is a separate course on maintenance, servicing, and personal publicity. Advice is given on every phase of the radio industry.

A prospectus of the course can be obtained from the Director of Studies, Technical and Commercial Radio College, Lloyds Place, Blackheath, London, S.E.3.

Short-wave Record

A PERFORMANCE of outstanding merit in radio telephony is credited to a leading Birmingham amateur wireless experimenter. Mr. J. S. Owner, of Moseley, who operates the experimental station G6XQ, equipped with Osram valves, has been awarded the coveted "Worked All Continents" certificate issued by the International Amateur Radio Union for having conducted two-way communication with other amateur stations in each of the six recognised Continental areas of the world—North America, South America, Europe, Asia, Africa, and Oceania.

A Television Lecture

ON Monday, October 16, Major E. Phillips, of the Post Office Engineering Dept., gave a lecture at the Institute of Electrical Engineers on "Developments in Television." Major Phillips discussed the various scanning systems with their advantages and shortcomings. He gave a short review of the very latest apparatus and expressed the opinion that mechanical television receivers at present seemed a more likely commercial proposition than the cathode-ray type. He pointed out that enormous progress had been made in television during the past twelve months, and that we would see still more remarkable progress within the next year. The introduction of high-definition television was not far distant, he said.

SECRETS OF CELESTION SUPREMACY

No. 2

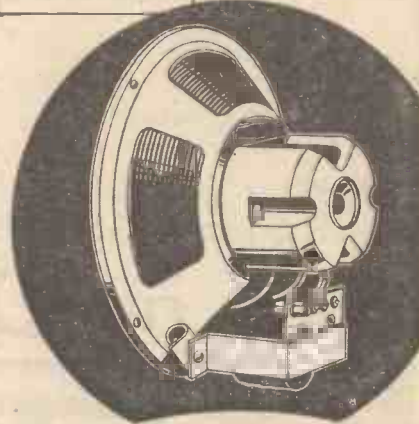
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Postcard Radio Literature

Here "Observer" reviews the latest booklets and folders issued by well-known manufacturers. If you want copies of any or all of them FREE OF CHARGE, just send a postcard giving the index numbers of the catalogues required (shown at the end of each paragraph) to "Postcard Radio Literature," AMATEUR WIRELESS, 58.61 Fetter Lane, E.C.4. "Observer" will see that you get all the literature you desire. Please write your name and address in block letters.

Baker's New Justone Reproducer

BAKERS Selhurst Radio, loud-speaker people of Croydon, have just released a new moving-coil loud-speaker which bristles with an amazing specification. One of the most interesting points about this job is that it enables the user to get twenty different ratios for triodes and pentodes and four for class-B and Q.P.P. That is not all. This leaflet also tells me that the incorporation of tone selecting devices makes at least two hundred variations of tonal quality possible. Sounds interesting!

77

Marconiphone's Complete Range

One of the most comprehensive and interesting set catalogues that I have received this season comes from Marconiphone. It is a thirty-six page publication and gives details of the Marconiphone 1934 range of a dozen sets besides several other items in the form of loud-speaker, valves, loud-speakers, and pick-up. Did you know that Marconiphone market a range of high-tension and grid-bias batteries?

78

Radio as a Career

Some useful information is contained in the prospectus that I have received from the Technical and Commercial Radio College. Perhaps you would like your son to enter the radio business as a profession or you would like to know more about radio? If so, you should certainly get in touch with these people. Their fees seem very reasonable.

79

Watmel's Hy-watt Resistances

Good resistances, these new types just marketed by Watmel! I have been looking through the new Watmel folder describing the Hy-watt series. I have learnt that the resistances are rated to carry 3 watts; they are wound on ceramic porcelain; the ends of the wire are spot-welded to avoid all chances of faulty connection and that they are marked according to the R.M.A.'s colour code. Get this leaflet; it is really interesting.

80

Reproducers by R. & A.

This well-known firm of loud-speaker manufacturers have sent me their latest list. Several unusual but sound ideas have been incorporated in their new Alpha model, which retails at the modest price of £2 12s. 6d. The construction of this moving-coil loud-speaker is unusual in that a special cone chassis reduces the possibility of any accident to the paper cone. Have you considered the merits of an extra loud-speaker for the winter? R. & A. have some useful models.

81

A Matter of Connections

Clix are good at this connecting job. They make all types of wander plugs, sockets, terminals, chassis-mounting strips, and valve holders and they do guarantee that they make good contact. How often do you find bad contacts in your set, especially when you can't get at the source of the trouble without taking half the set to pieces? Get this folder and see the methods adopted by Lectrolinx to ensure good contact. All their components are illustrated in the leaflet.

82

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3810 ♡

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The amount of the Deposit and Fee must be remitted by Postal Order or Registered Letter (Cheques cannot be accepted), addressed to

"Amateur Wireless," Advertisement Department, 58/61 Fetter Lane, London, E.C.4.

INVENTORS' POCKET-BOOK.—How to patent. Invaluable aid to selling your ideas. Expert advice. Copies from—Edwin O. Axe, A.I.M.E., 27 Chancery Lane, London.

REPAIRS TO Loud-speakers, Transformers, and Head-phones, 4/- each; Blue Spots, 5/- Moving Coils a speciality. Cones fitted, Eliminators and Sets quoted for. Satisfaction guaranteed. Prompt service. Inquiries invited. Terms to trade.—Loud-speaker Repair Service, 5 Balham Grove, London, S.W.12, Battersea 1321.

CHARGING WITHOUT MAINS.—Thousands are charging their own accumulators, why don't you? "Tonic" trickle-charger kits keep 2-volt accumulators fully charged. Ideal for remote districts. From 7/-, postage 9d. Full particulars, stamp.—Williams, Netherend, Cradley, Nr. Birmingham.

GRAMOPHONES, Radiograms, Motors, Arms, Pick-ups, Loud-speaker, Horns, Springs, Needles, Repairs, cheapest.—Catonage, Regent, 120 Old Street, London, E.C.1.

USED AND NEW RADIO COMPONENTS AND SETS ON EASY TERMS.—Dual-wave Coil, 5/6. L.F. Transformers, 4/6.—Arlin, 44 Ranelagh Road, Westminster, S.W.1.

BYRGE PRODUCTS.—Unbroken public service. Mains transformers and chokes to specification within 48 hours. Patent transformers and patent aerial system to eliminate interaction and man-made static. Send now for lists.—W. Andrew Bryce & Co., Woodfield Works, Bury, Lancs. Phone 1251.

QUALIFIED RADIO ENGINEERS are always in demand, and our Home Study Course enables you to qualify for a good post. Many students already placed this season. Prospectus free.—Northern Counties Wireless School, Preston.

WANTED.—Bankrupt and Clearance Stocks of Proprietary Sets, Kits, Components, Speakers, for cash.—"Corlic," 44 Haweside Street, Southport.

MOVING-COIL SPEAKERS, permanent magnet type large quantity available, 8 1/2 in. diameter chassis, 9/6 sensitive, work off any set; three-ratio transformer; 19/6, post free. Money refunded if speaker returned within seven days.—Milton Manufacturing Co., Milton Street, Coventry.

LESLIES supply Fuller's H.T. Accumulators, 120 volt, 6,500 millamps, carriage paid on first payment of 7/6. Lists free. Leslies pay duty to Irish Free State.—Particulars free, Leslies Radio, Catford, London, S.E.6.

MAINS TRANSFORMERS REWOUND.—Prompt service, satisfaction guaranteed. Prices on request.—The Sturdy Electric Co., Wesley Terrace, Dipton, Newcastle-on-Tyne.

REPAIRS TO ANY RADIO APPARATUS.—Quick service, guaranteed laboratory tested. Loud-speakers, etc., from 4/-; Blue Spots, 5/-. Cones fitted to moving coils, sets, eliminators, volt/amp. meters quoted for. Repairs to the trade.—Earlham Radio Services, 185 Earlham Grove, London, E.7. Phone: Maryland 4344.

TELEVISION APPARATUS.—We specialise in all components. Illustrated list free.—Sanders, 4 Grays Inn Road, London, W.C.1.

INFORMATION BUREAU

Will every querist please observe the following revised rules.

Please write concisely, giving essential particulars. A fee of one shilling postal order (not stamps), a stamped, addressed envelope and the coupon on the last page must accompany all queries.

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

The designing of apparatus or receivers cannot be undertaken.

Slight modifications of a straightforward nature only can be made to blueprints. For more serious alterations the minimum charge is 2/6.

Blueprints supplied by us will be charged for in addition, but of course, readers may send their own blueprints for alteration.

Modifications to proprietary receivers and designs published by contemporary journals cannot be undertaken. Readers sets and components cannot be tested by us. Queries cannot be answered by telephone or personally. Readers ordering blueprints and requiring technical information in addition should address a separate letter to the Query Department and should see that their remittance covers the price of the Blueprint and the amount of the Query fee.

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

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

"MELFORD" RADIO LEADS AGAIN.—All the latest kits and parts supplied same day; no waiting. Lists free. Trade Supplied.—5 Queens Place, Hove.

4-MICROFARAD CONDENSERS.—700-volt test, 3/-, post free. Improve your decoupling.—Disco, 51 Wilby Street, Northampton.

180 ACCUMULATOR CHARGERS, 1 amp., 2-6 volt., in ventilated metal case with mains flex (Westinghouse rectifiers), 7 days' trial, 10/8, postage 6d. 1 1/2 amp., 21/-.—W. Arden Agency, Wollaston, Wellingborough.

WANTED, FOR CASH, Second-hand Wireless Parts and Sets, Volt Meters, Eliminators, etc. Top prices for good modern parts. Call or write.—University Radio, 142 Drummond Street, Hampstead Road, N.W.1.

INSTRUMENT AND RESISTANCE WIRES. Transformer and Choke Stampings. Insulation. Lists free.—Lumen Electric Co., Scarisbrick Avenue, Litherland, Liverpool, 21.

LET US QUOTE FOR "A.W." SPECIFIED COMPONENTS, Speakers, Eliminators, Valves. Keenest prices; quality counts. "Skyscraper" kits.—Childs, 29 Moray Road, London, N.4.

RECEIVERS AND COMPONENTS for Sale. Write for list.—Parkhouse, Bigenor Farm, Petworth.

H.D. RADIO ELECTRICAL SERVICE.—New Boxed Set Manufacturers' Surplus Rola Speakers, all fitted hum buckers, state for power or pentode: F6, 2,000 ohms, 2,500 ohms, 4,700 ohms, 6,500 ohms, list 35/-, at 18/- each. F7, voltages as above, list 47/6, at 25/-. Permanent Magnets, F6, P.M., list 49/6, at 28/-. F7, P.M., list £3, at 33/-. Dual compensated (1) F6 and (1) F7, list £4/5/-, at 47/-. Few Class-B, state requirements. All goods carriage paid; cash with order, or c.o.d.—9 Kingly Street, Regent Street, London, W.1.

ETHERDYNE SUPER KITS, £6/5/-; S.T.500, £3/16/-; Class-B 4-valve Kits, £3/2/6. S.T.500 Coils, 5/6 pair. Class-B Transformers and Chokes, 5/6. All latest components in stock. Old sets taken in part exchange. Keenest prices quoted for anything wireless.—Servwell Wireless Supplies, 64 Prestbury Road, London, E.7.

MIRROR DRUMS.—Aluminium, 7-in. complete kit for assembling, £1.—Stamp, list, Cooks, 83 New Oxford Street, W.C.1.

THE "DIRECTOTONE" S.G.3 KIT, 22/9.—Comprised of high-class guaranteed components and sundries. Obtain this amazing bargain by sending cash or C.O.D. to—The Direct Trading Co., 65/6 York Terrace, Baker Street, N.W.1.

BANKRUPT BARGAINS.—List free with 3-v. diagram. ST300 kit, 35/-. ST400 45/-. ST500 52/6. 3-v. kit, 17/6. Meteor S.G. kits, 25/-. Class-B Stal transformers and chokes, 6/-. Seven-pin valveholders, 1/- Ormond Class-B M.C., 18/-. Screened dual coils, 2/6. ST coils, 5/6 pair. Celestion Soundex P.M. in walnut cabinet, 20/-. Large stock M.C. speakers. A.C. eliminators, Westinghouse 2s/6. Class-B units, Tritron, 16/6. Tritron Class-B valves, 9/-. All new goods. Stal screened coils, very high quality, 3-gang on base with switch, 10/-; 2-gang, 7/-. All the small parts in stock. Part exchange. Any new set or parts supplied and your old parts or set taken in part exchange. Get my offer. Anything radio supplied.—Butlin, 143b Preston Road, Brighton. Phone: Preston 4030.

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- 1531 Crystal Set ... AW308 ONE-VALVE SETS (1s. each) B.B.C. One-valver ... AW387 Portable Short-wave One ... AW354

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- Clarion-voice 2 (SG Det. Pen) ... AW371 Home Station A.C. 2 (D. Pen) ... AW374 B.B.C. National Two (D. Trans) ... AW377 Melody Ranger Two (D. Trans) ... AW388 Full-volume 2 (SG Det. Pen) ... AW392 "A.W." Iron-core Two (D. Trans) ... AW395 "A.W." Iron-core Two with Q.P.P. ... AW396 Consolectric Two (D. Pen) ... AW403 Screen-grid Two (SG Det. Trans) ... WM289 A Two for 7 Metres (D. Trans) ... WM295 New-style Radiogram (D. Trans) ... WM299 A.C. Quality Gem (D. Trans) ... WM312

THREE-VALVE SETS (1s. each)

- James Push-push Three (SG, D, Q.P.P.) (1/6) ... AW378 Everybody's Home Radiogram (SG, D, Trans) ... AW381 Home-lover's New All-electric 3 for A.C. mains (SG, D, Trans) ... AW383 Our Up-to-the-minute Three (SG, Westector, LF, Trans) ... AW384 Class-B Three (D, Trans, Class B) ... AW386 S.S.3 (A.C.) (SG, SG Det, Pen) ... AW390 "Up-to-the-minute Three" with Class B, 1/6 ... AW384B New Britain's Favourite Three (D, LF, Class B) ... AW394 A.C. Triodyne (SG, D, Pen) ... AW399 1933 Economy S.G. Three (SG, D, Trans) ... WM306 Harris Ethergram (SG, D, Pen) ... WM308 A.C. Calibrator (SG, D, Pen) ... WM309 Narrow-pass Three (SG, SG Det, Pen) ... WM314 6 1/2 bs. Radiogram (D, RC, Trans) ... WM318 Simple-tune Three (SG, SG Det, Pen) ... WM327 Tvers Iron-core Three (SG, SG Det, Pen) ... WM330 I.C.B. Three (D, LF, Class B) ... WM333 Economy Pentode Three (S.G, D, Pen) ... WM337 Three-range Three (SG, D, Pen) ... WM336 Simplicity A.C. Radiogram (SG, D, Pen) ... WM338

FOUR-VALVE SETS (1s. 6d. each)

- Melody Ranger (SG, D, RC, Trans) with copy of "A.W." 4d. postage ... AW375 "A.C. Melody Ranger" (SG, D, RC, Trans) ... AW380 Signpost Four (SG, D, LF, Class B) ... AW392 "A.W." Ideal Four (2SG, D, Pen) ... AW402 Table Quad (SG, D, RC, Trans) ... WM303 "Words and Music" Radiogram (2SG, D, Trans) ... WM307 Home Short-waver (SG, D, RC, Trans) ... WM311 "Words and Music" Radiogram de Luxe (SG, D, RC, Q.P.P.) ... WM307A Empire Short-waver (SG, D, RC, Trans) ... WM313 Calibrator de Luxe (SG, D, RC, Trans) ... WM316 D.C. Calibrator (SG, D, Push-pull Pen) ... WM328 All-metal A.C. Four (2 SG, D, Pen) ... WM329 All-progress Four (Battery Super-het) ... WM335

FIVE-VALVE SETS (1s. 6d. each)

- James Short-wave Super (Super-het) ... AW328 Simple Super (Super-het) ... AW340 Super-quality Five (2 HF, D, RC, Trans) ... WM320 Ideal Home Super (Super-het) ... WM280 Easytune 60 (Super-het) ... WM284

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- New Century Super (Super-het) with copy of "A.W." 4d., post free ... AW363 New A.C. Century Super (A.C. Super-het) ... AW365 1932 Super 60 (Super-het) ... WM269 1932 A.C. Super 60 (A.C. Super-het) ... WM272 James Class-B Super (Super-het) ... WM326 Connoisseur's Super (A.C. Super-het) ... WM1334

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- Super Senior (Super-het) ... WM256 Seventy-seven Super (A.C. Super-het) ... WM305 Q.P.P. Super 60 (Super-het) ... WM319

PORTABLES (1s. 6d. each)

- General-purpose Portable (SG, D, RC, Trans) ... AW351 Midget Class-B Portable (SG, D, LF, Class B) ... AW389 Holiday Portable (SG, D, LF, Class B) ... AW393

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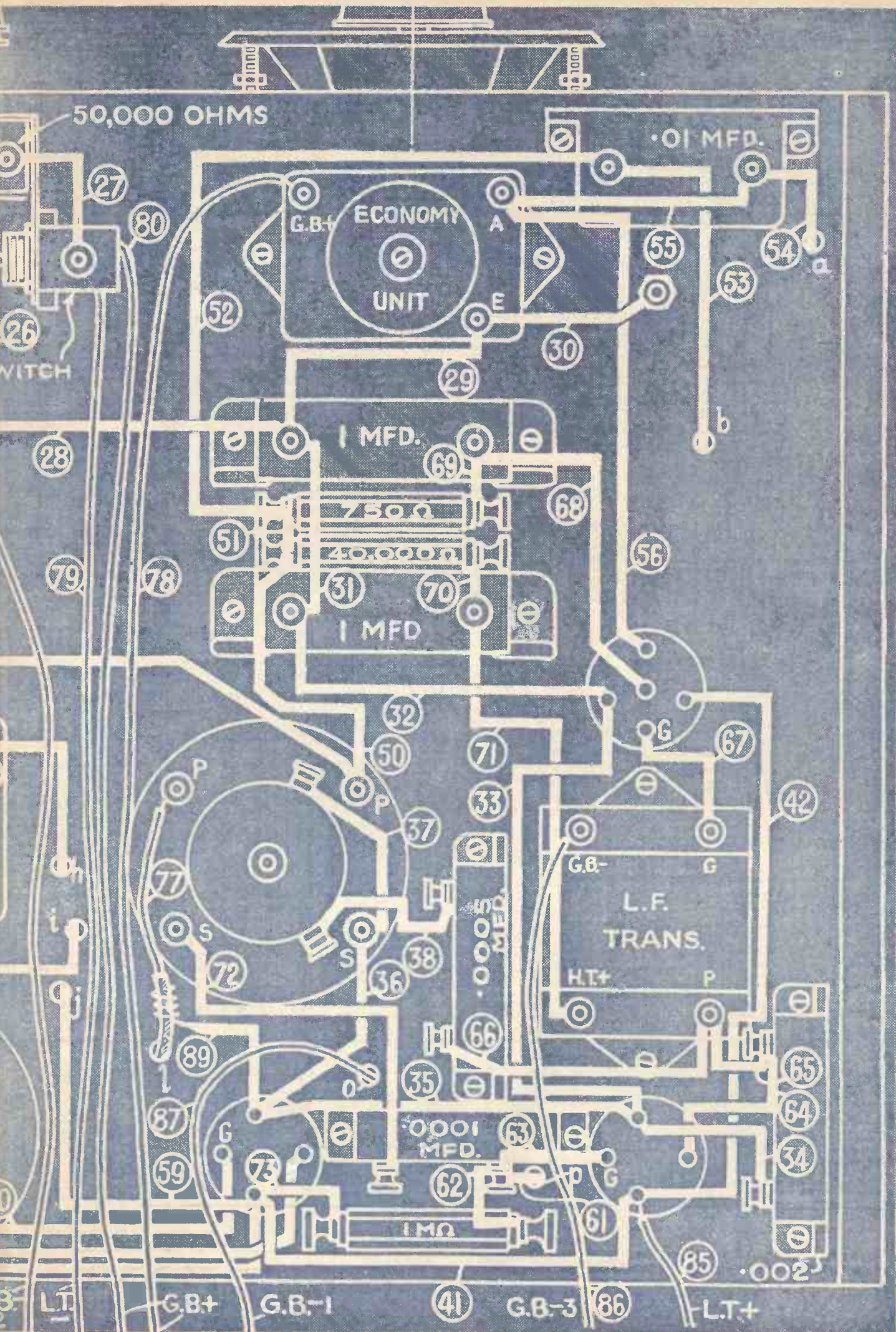
- A.W.'s Push-push Amplifier ... AW376 Universal Push-pull Amplifier ... AW300 "A.W." Record Player (LF, Push-pull) ... AW319 Battery-operated Amplifier ... AW362 Class-B Gramophone Amplifier ... AW391 Five Q.P.P. Output Circuits ... WM315

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Supplement

THE RADIO LEAGUE OF AMATEURS

AUSTRIA				
Station	Wave-length	Frequency		
Graz	352.1	852		
Innsbruck	283	1,058		
Klagenfurt	453.2	662		
Linz	245.9	1,220		
Salzburg	218.5	1,373		
Vienna	518.1	579		
Vienna (Exp.)	1,255	237		

BELGIUM				
Station	Wave-length	Frequency		
Antwerp	211.3	1,420		
Binche	220.8	1,362		
Brussels (No. 1)	509	590		
Brussels (No. 2)	338.2	887		
Brussels (Schaerbeek)	245.9	1,220		
Châtelaineau (EL)	215.3	1,393		
Liège (Cointe)	222.3	1,354		
Liège (Exp.)	202.3	1,293		
Wallonia (Esperance)	233	1,287		

BULGARIA				
Station	Wave-length	Frequency		
Sofia	318.8	941		

CZECHOSLOVAKIA				
Station	Wave-length	Frequency		
Bratislava	279.5	1,072.6		
Brno	341.7	878		
Kosice	293	1,022		
Moravaska-Ostrava	263.8	1,137		
Prague	488.6	614		

DENMARK				
Station	Wave-length	Frequency		
Copenhagen	281	1,067		
Kalundborg	1,153.8	260		

ESTONIA				
Station	Wave-length	Frequency		
Tallinn	298.8	1,004		
Tartu	582	515.4		

FINLAND				
Station	Wave-length	Frequency		
Abö	245.9	1,220		
Helsinki	368.1	815		
Lahti	1,796	167		
Oulu	690	434.7		
Pietarsaari	312	960		
Pori	453.2	662		
Tampere	560	536		
Viipuri	291	1,031		

FRANCE				
Station	Wave-length	Frequency		
Agen	452	664		
Béziers	219.9	1,364		
Bordeaux (S.O.)	237.2	1,265		
Bordeaux (PTT)	304	986		
Eiffel Tower (Paris)	1,445.7	207.5		
Fécamp	225.9	1,328		
Grenoble (PTT)	566.5	526.8		
Juan-les-Pins	249	1,205		

FRANCE—Continued				
Station	Wave-length	Frequency		
Lille (PTT)	265.4	1,130		
Limoges (PTT)	293	1,022		
Lyons (Radio)	284.9	1,053.8		
Lyons (PTT)	465.8	644		
Marseilles (PTT)	315	950		
Montpellier	286	1,049		
Nîmes	237.2	1,265		
Paris (L.L.)	370.4	810		
Paris (Poste Parisien)	328.2	914		
Paris (PTT)	447.1	671		
Paris (Radio)	1,725	174		
Paris (Vitus)	307.4	975.1		
Rennes (PTT)	272	1,103		
Strasbourg (PTT)	345	869		
Toulouse (PTT)	255	1,175		
Toulouse (Radio)	385	779		

GERMANY				
Station	Wave-length	Frequency		
Augsburg	560	536		
Berlin	419.3	715		
Berlin (relay)	283	1,058		
Bremen	267.7	1,120.3		
Breslau	325	923		
Cassel	259.3	1,157		
Danzig	453.2	662		
Dresden	318.8	941		
Flensburg	227.4	1,319		
Frankfurt a/M	259.3	1,157		
Freiburg i/B	563.1	532.7		
Gleiwitz	253	1,184		
Hamburg	372	806		
Hanover	227.4	1,319		
Heilsberg	276.5	1,085		
Kaiserlautern	560	536		
Kiel	232.2	1,292		
Königsberg	217	1,382		
Langenberg	473	635		
Leipzig	389.6	769.9		
Magdeburg	283	1,058		
Mühlacker	360.5	832		
Munich	533	563		
Nurnberg	239	1,256		
Stettin	283	1,058		
Trier (Treves)	259.3	1,157		
Zeesen	1,634.9	183.5		

GRAND DUCHY OF LUXEMBOURG				
Station	Wave-length	Frequency		
Luxembourg	1,191	252		

GREAT BRITAIN				
Station	Wave-length	Frequency		
Aberdeen	214.3	1,400		
Belfast	242.3	1,238		
Bournemouth	288.5	1,040		
Daventry (Nat.)	1,554.4	193		
London (Nat.)	261.6	1,147		
London (Reg.)	356	843		
Midland (Reg.)	398.9	752		
Newcastle	211.3	1,420		

GREAT BRITAIN—Continued				
Station	Wave-length	Frequency		
North (Nat.)	310.5	995		
North (Reg.)	480	625		
Plymouth	218.5	1,373		
Scottish (Nat.)	288.5	1,040		
Scottish (Reg.)	376.4	797		
West (Nat.)	261.6	1,147		
West (Reg.)	309.9	968		

HOLLAND				
Station	Wave-length	Frequency		
Hilversum	296.1	1,013		
Kootwijk	1,875	160		
Scheveningen-Haven	1,071.4	280		

HUNGARY				
Station	Wave-length	Frequency		
Budapest(1)	550.5	545		
Budapest(2)	840	357		
Magyarovar	209.8	1,430		
Miskolcz	209.8	1,430		
Nyiregyhaza	267.4	1,122		
Pecs	209.8	1,430		

ICELAND				
Station	Wave-length	Frequency		
Reykjavik	1,200	250		



OF NATIONS

The Countries of Europe and Their Broadcasting Stations

IRISH FREE STATE

Station	Wave-length	Frequency
Athlone	413	725
Cork	224.4	1,337
Dublin	217	1,382

ITALY

Bari	269.8	1,112
Bolzano	368.1	815
Florence	500.8	599
Genoa	312.8	959
Milan (Siziano)	331.5	905
Milan (Vigentino)	453.2	662
Naples	319	941
Palermo	537.6	558
Rome	441	680
Trieste	247.7	1,211
Turin	273.7	1,096

LATVIA

Riga	525	572
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LITHUANIA

Kaunas	1,935	155
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NORTH AFRICA

Station	Wave-length	Frequency
Algiers	364	824
Rabat (Radio Maroc)	416	721.1

NORWAY

Aalesund	447.1	671
Bergen	364	824
Bodö	453.2	662
Christiansand	235.5	1,274
Fredriksstad	368.1	815
Hamar	574.7	522
Notodden	447.1	671
Oslo	1,083	277
Porsgrund	453.2	662
Rjukan	447.1	671
Stavanger	240.6	1,247
Tromsö	453.2	662
Trondheim	495.8	605

POLAND

Cracow	312.8	959
Katowice	408	734
Lodz	235	1,283
Lvov	380.7	788
Poznan	335	896
Warsaw	1,411	212.5
Wilno	563	533

PORTUGAL

Lisbon	282.2	1,063
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ROMANIA

Bucharest	394	761
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RUSSIA

Archangel	453.2	662
Kharkov	937	320
Kiev	1,034.5	290
Leningrad	348.8	860
Leningrad	857	351
Minsk	1,107	271
Moscow (Noghinsk)	1,481	205.5
Moscow (T.U.)	1,000	300
Moscow (P.T.T.)	720	416.6
Moscow (T.U.)	424.3	707
Murmansk	403.8	743
Novosibirsk	1,380	217.5
Odessa	453.2	662
Oufa	486.2	617
Petrozavodsk	779	383
Samara	743	404
Simferopol	413.8	725
Smolensk	564	531
Stalino	385.1	779.2
Taschkent	11,71.5	256
Tiflis	1,071.4	280
Tiraspol	358	838

SPAIN

Station	Wave-length	Frequency
Barcelona (EAJ1)	348.8	860
Barcelona (EAJ15)	252	1,193
Bilbao	203	1,477
Madrid (EAJ7)	424.3	707
Madrid (España)	424.3	707
San Sebastian (EAJ8)	453.2	662
Santiago (Galicia)	368.1	815
Seville (EAJ5)	368.1	815
Valencia	267.6	1,121

SWEDEN

Boden	1,229.5	244
Boras	207	1,450
Eskilstuna	245.9	1,220
Falun	307	977
Gävle	204	1,470
Göteborg	322	932
Halmstad	216	1,391
Halsingborg	201.4	1,489.8
Hörby	257	1,166
Hudiksvall	226	1,327
Jonkoping	201.2	1,490.2
Kalmar	247.7	1,211
Karlskrona	196	1,530
Karlstad	217	1,382
Kiruna	245.9	1,220
Kristinehamn	201.9	1,485.6
Malmberget	436	689
Malmo	231	1,301
Motala	1,354.4	222.5
Norrkoping	232.2	1,292
Orebro	237.2	1,265
Ornskoldsvik	205.5	1,460
Ostersund	770	389
Saffle	245.9	1,220
Stockholm	436	689
Sundsvall	452	554
Trollhattan	252	1,193
Uddevalla	229	1,310
Umea	231	1,301
Uppsala	453.2	662
Varberg	249.6	1,202

SWITZERLAND

Basle	244.1	1,229
Berne	245.9	1,220
Beromuenster	459.4	653
Geneva	760	395
Monte Ceneri (Lugano)	1,126.6	265.75
Sottens	403	743

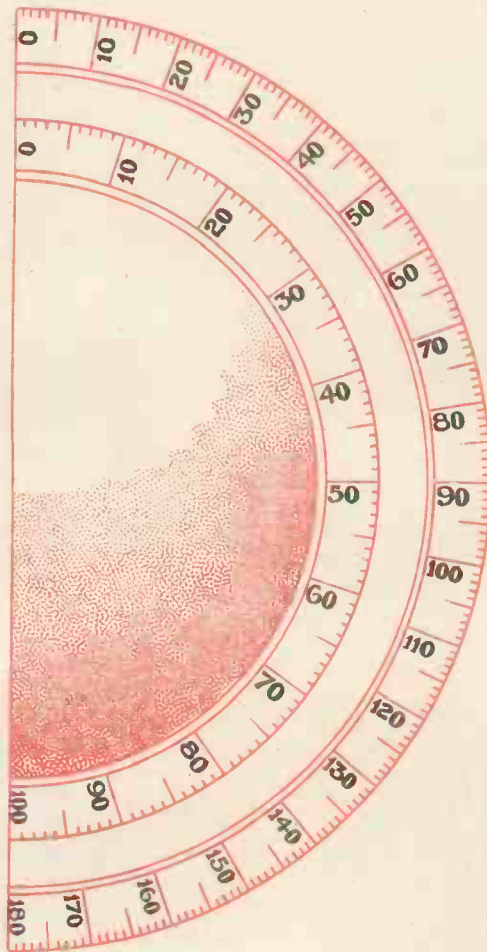
TURKEY

Ankara	1,538	195
Istanbul	1,200	250

YUGOSLAVIA

Belgrade	430.4	697
Ljubljana	577.5	519.4
Zagreb	307	977

When a station has been identified by its call sign draw a line from the dial reading to the column on the right



Keep this station identification chart near your set—it will be appreciated by every member of the family who tunes in the receiver

Medium-wave Stations

Wavelength METRES	Station Details.
211.3	NEWCASTLE (England).
214.3	ABERDEEN (Scotland).
224.4	CORK (I.F.S.). Relays Dublin. Call: <i>Glaodach radio Corkaighe e seo.</i>
225.9	FÉCAMP (France). Call: <i>Ee-ci radio Normandee.</i> (Sponsored concerts for British listeners.)
242.3	BELFAST (N. Ireland).
247.7	TRIESTE (Italy). Relays Milan, etc. Call: <i>Eh-yah radio Tree-ess-tay.</i> (Operas.)
253	GLEIWITZ (Germany). Relays Breslau.
259.3	FRANKFURT-AM-MAIN (Germany). Call: <i>Ach-toong. Here Soodwest-foonk or Sender-groop-pe West.</i> (Political talks, music.)
261.6	LONDON NATIONAL; WEST NATIONAL (England).
263.8	MORAVSKA-OSTRAVA (Czechoslovakia). Relays Prague.
269.8	BARI (Italy). Call: <i>Eh-yah rah-dee-owe Bahr-ee</i> (or <i>Roma, Napoli, Bari</i>). (Operas.)
273.7	TURIN (Italy). Call: <i>Eh-yah rah-dee-owe Turino.</i> Relays Milan.
276.5	HEILSBERG (Germany). Call: <i>Here oast-marken roond-foonk Keunigs-bairg oond Dant-zish.</i>
279.5	BRATISLAVA (Czechoslovakia). Relays Prague.
288.5	BOURNEMOUTH (England), SCOTTISH NATIONAL (Scotland).
296.1	HILVERSUM (Holland). Call: <i>Here Hilver-soom.</i> (Gramophone records, dance music, etc.)
301.5	NORTH NATIONAL (England).
304	BORDEAUX-LAFAYETTE (France). Call: <i>Allo! Ee-ci Bordo pay-tay-tay.</i> (French plays, etc.)
309	WEST REGIONAL (England).
325	BRESLAU (Germany). Call: <i>Ach-toong Here Schlay-zischer Roondfoonk Sender Brays-lav oond gly-veets.</i>
328.2	POSTE PARISIEN (France). Call: <i>Hallo! Ee-ci poste Parea-zee-yan.</i> (Concerts.)
331.5	MILAN (Italy). Call: <i>Eh-yah rah-dee-owe Nord Ee-tall-ee-ya.</i>
338.2	BRUSSELS (Belgium). Call: <i>Here Brüssel.</i> (Flemish only.) (Gramophone records.)
345	STRASBOURG (France). Call: <i>Allo! Ee-ci rah-dee-owe Strars-boor pay-tay-tay.</i> (Concerts.)
356	LONDON REGIONAL (England).
360.5	MÜHLACKER (Germany). Call: <i>Ach-toong! Here Sood-foonk or Here Sender-group-pe West.</i>
372	HAMBURG (Germany). Call: <i>Here dee Noragsender Hamboorg Bray-men, Keel, Han-owe-ver oond Flens-boorg.</i>
376.4	SCOTTISH REGIONAL (Scotland).
385	TOULOUSE (France). Call: <i>Allo! Ee-ci rah-dee-owe Too-looze.</i>
389.6	LEIPZIG (Germany). Call: <i>Here mittel-doytsch-aye sender Lyp-sish oond Drays-den.</i>
398.9	MIDLAND REGIONAL (England).
403	SOTTENS (Switzerland). Call: <i>Allo! Ee-ci Rah-dee-owe Swiss Row-mande.</i>
413	ATHLONE (I.F.S.). Call: <i>Se séo radio Ath Luain ah-goose radio Corcaighe.</i> (Sponsored concerts.)
424.3	MADRID (EAJ7) (Spain). Call: <i>Ay-ah rhotá see-yet-aye oon-ee-own-aye rah-dee-owe Madreed.</i>
436	STOCKHOLM (Sweden). Sec Motala.
441	ROME (Italy). Call: <i>Eh-yah rah-dee-owe Roe-ma</i> (ay <i>Nar-polly.</i>) (Operas, concerts.)
459.4	BEROMUENSTER (Switzerland). Call: <i>Here Schwyt-zeriseher landes-sender.</i> (Brass bands, yodellers, symphony concerts.)
473	LÄNGENBERG (Germany). Call: <i>Achtoong! Vest-doytcher roond foonk or Here Sender-group-pe West.</i>
480	NORTH REGIONAL (England).
488.6	PRAGUE (Czechoslovakia). Call: <i>Allo Praha.</i> (Symphony concerts, dance bands.)
509	BRUSSELS (1) (Belgium). Call: <i>Allo! Ee-ci Brew-sale ee-en-air (I.N.R.).</i>
518.1	VIENNA (Austria). Call: <i>Hallo! Rah-dee-owe Veen.</i> (Concerts, dance music.)
533	MUNICH (Germany). Call: <i>Here Buy-er-ischer roon-foonk Mewnschen, Noornbaig Owgsboorg oond Kaisers-lowtairn.</i>
550.5	BUDAPEST (Hungary). Call: <i>Hallo! rah-dee-owe Booda-pesht.</i> (Gypsy orchestra.)

"AMATEUR STAT IDENTIFI CHA

Other Europe

Wavelength METRES	Station
201.9	KRISTINEHAMN (Sweden).
203	BILBAO (Spain).
204	GAVLE (Sweden).
209.8	MAGYAROVAR, PECS, MISKOLCZ (Hungary).
215.3	CHATELINAU (EL) (Belgium).
217	DUBLIN (I.F.S.), KOENIGSBERG (Germany).
218.5	SALZBURG (Austria), PLYMOUTH (England).
219.9	BEZIERS (France).
220.3	BINCHE (Belgium).
227.4	FLENSBURG (Germany), HANOVER (Germany).
231	MALMÖ (Sweden).
232.2	KIEL (Germany).
235	LODZ (Poland).
235.5	CHRISTIANSAND (Norway).
237.2	NIMES (France), BORDEAUX (S.O.) (France).
238.9	NURNBERG (Germany).
240.6	STAVANGER (Norway).
249	JUAN-LES-PINS (France).
252	BARCELONA (EAJ15) (Spain).
255	TOULOUSE (PTT) (France).
257	HÖRBY (Sweden).
265.4	LILLE (PTT) (France).
267.4	NYIREGYHÁZA (Hungary).
267.6	VALENCIA (Spain).
267.7	BREMEN (Germany).
272	RENNES (PTT) (France).
281	COPENHAGEN (Denmark).
282.2	LISBON (Portugal).
284.9	LYONS (RADIO) (France).
286	MONTPELLIER (PTT) (France).
291	VIIPURI (Finland).
293	LIMOGES (PTT) (France).
298.8	TALLINN (Estonia).
307	FALUN (Sweden).
307.4	PARIS (VITUS) (France).
312.8	GENOA (Italy).
315	MARSEILLES (PTT) (France).
318.8	SOFIA (Bulgaria).
319	NAPLES (Italy).
322	GÖTEBORG (Sweden).

WIRELESS" COMMUNICATION ART

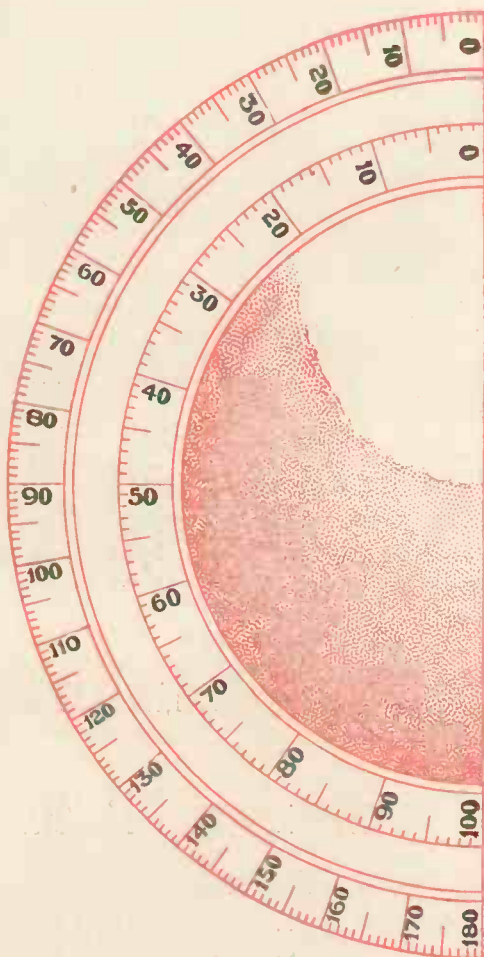
European Stations

Wavelength METRES	Station
335	POZNAN (Poland).
341.7	BRUNN (Czechoslovakia).
348.8	BARCELONA (EAJ1) (Spain).
352.1	GRAZ (Austria).
364	ALGIERS (N. Africa).
368.1	HELSINKI (Finland).
370.4	PARIS (L.L.) (France).
381	LVOV (Poland).
394	BUCHAREST (Roumania).
408	KATOWICE (Poland).
416	RABAT (RADIO MAROC) (N. Africa).
419.5	BERLIN (Germany).
424.3	MOSCOW (T.U.) (U.S.S.R.).
430.4	BELGRADE (Yugoslavia).
447.1	PARIS (PTT) (France).
452	AGEN (France).
453.2	SAN SEBASTIAN (Spain).
453.2	MILAN (VIGENTINO) (Italy).
465.8	LYONS (PTT) (France).
495.8	TRONDHEIN (Norway).
500.8	FLORENCE (Italy).
525	RIGA (Latvia).
537.6	PALERMO (Italy).
542	SUNDSVALL (Sweden).
560	TAMPERE (Finland).
563	WILNO (Poland).
563.1	FREIBURG (L.B.) (Germany).
566.5	GRENOBLE (PTT) (France).
577.5	LJUBLJANA (Yugoslavia).
582	TARTU (Estonia).
720	MOSCOW (PTT) (U.S.S.R.).
770	OSTERSUND (Sweden).
833	HESTON AIRPORT (Eng- land).
840	BUDAPEST (2) (Hungary).
857	LENINGRAD (U.S.S.R.).
900	CROYDON AIRPORT (England).
937	KHARKOV (U.S.S.R.).
1,034.5	KIEV (U.S.S.R.).
1,071.4	TIFLIS (U.S.S.R.).
1,107	MINSK (U.S.S.R.).
1,171.5	TASHKENT (U.S.S.R.).
1,200	ISTANBUL (Turkey).
1,380	NOVOSIBIRSK (U.S.S.R.).
1,538	ANKARA (Turkey).

Long-wave Stations

Wavelength METRES	Station Details.
1,000	MOSCOW (T.U.) (U.S.S.R.). Concerts, operas, talks. 1,000
1,071.4	SCHEVENINGEN-HAVEN (Holland). Call: <i>Heer de Zakker-liquor omroopte Skay-venningen-Harven.</i> (Commercial news only.) 1,071.4
1,083	OSLO (Norway). Call: <i>Hallo Ouzlo hare.</i> (Talks, concerts, dance music.) 1,083
1,126.6	MONTE CENERI (Lugano, Switzerland). Call: <i>Radio Svits-tayra Ee-tal-ee-ah-na.</i> (Concerts, Italian plays.) 1,126.6
1,153.8	KALUNDBORG (Denmark). Call: <i>Kee-yob-en-harven Karl-oond-borrog Denmarks Kort-bolge-sender.</i> (Concerts, outside dance band broadcasts.) 1,153.8
1,191	LUXEMBOURG (Grand Duchy). Call: <i>Ee-ci Rah-dee-owe Lux-am-boerg.</i> (Concerts for foreign listeners.) 1,191
1,200	REYKJAVIK (Iceland). Call: <i>Utvarpstöo Eecelands ee Ray-kee-ar-veek.</i> 1,200
1,255	VIENNA (Exp.) Austria. Call: <i>Hallo Radio Veen.</i> 1,255
1,354.4	MOTALA (Sweden). Call: <i>Stockholm-mottallah.</i> 1,354.4
1,411.8	WARSAW (Poland). Call: <i>Hallo (twice) Pols-key rah-djo Var-shah-va.</i> (Symphony concerts, operas, dance bands.) 1,411.8
1,445.7	EIFFEL TOWER (Paris, France). Call: <i>Allo ! Ee-ci poste Nar-see-owe-nal de la Two-er Ay-fell.</i> (Concerts, plays.) 1,445.7
1,481	MOSCOW (U.S.S.R.). Call: <i>Sloo-shah-eet-yay Moskva Komin-turn-ah.</i> (Talks in foreign languages.) 1,481
1,554.4	DAVENTRY NATIONAL (England). 1,554.4
1,634.9	DEUTSCHLANDSENDER (Germany). Call: <i>Ach-toong Doytsch-land-sender.</i> (Talks, military bands, outside broadcasts.) 1,634.9
1,725	RADIO PARIS (France). Call: <i>Ee-ci ay-miss-ee-yon rah-dee-owe Par-ee.</i> (Plays, concerts, gramophone records.) 1,725
1,796	LAHTI (Finland). 1,796
1,875	KOOTWIJK (Holland). Call: <i>Here Hoy-zen.</i> (Concerts, gramophone records.) 1,875
1,935	KAUNAS (Lithuania). Call: <i>Allo (twice) Let-ou-voss Radio Kow-nass.</i> 1,935

When a station has been identified by its call sign draw a line from the dial reading to the column on the left



In the left- and right-hand columns the most powerful European stations are listed; wavelengths of other transmitters appear in the centre