RADIO
CONTACT
& TELEVISION

ENTERTAINMENT AND TIPS FOR THE FAMILY
TECHNICALITIES FOR THE ENTHUSIAST & CONSTRUCTOR

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WITH THIS ISSUE
FULL SIZE 1/- BLUEPRINT
OF A NEW
ASTONISHING 3 VALVER
THE "SENSITY SUPER"

Sensity Coils now ganged and matched!

Type AH

10/6

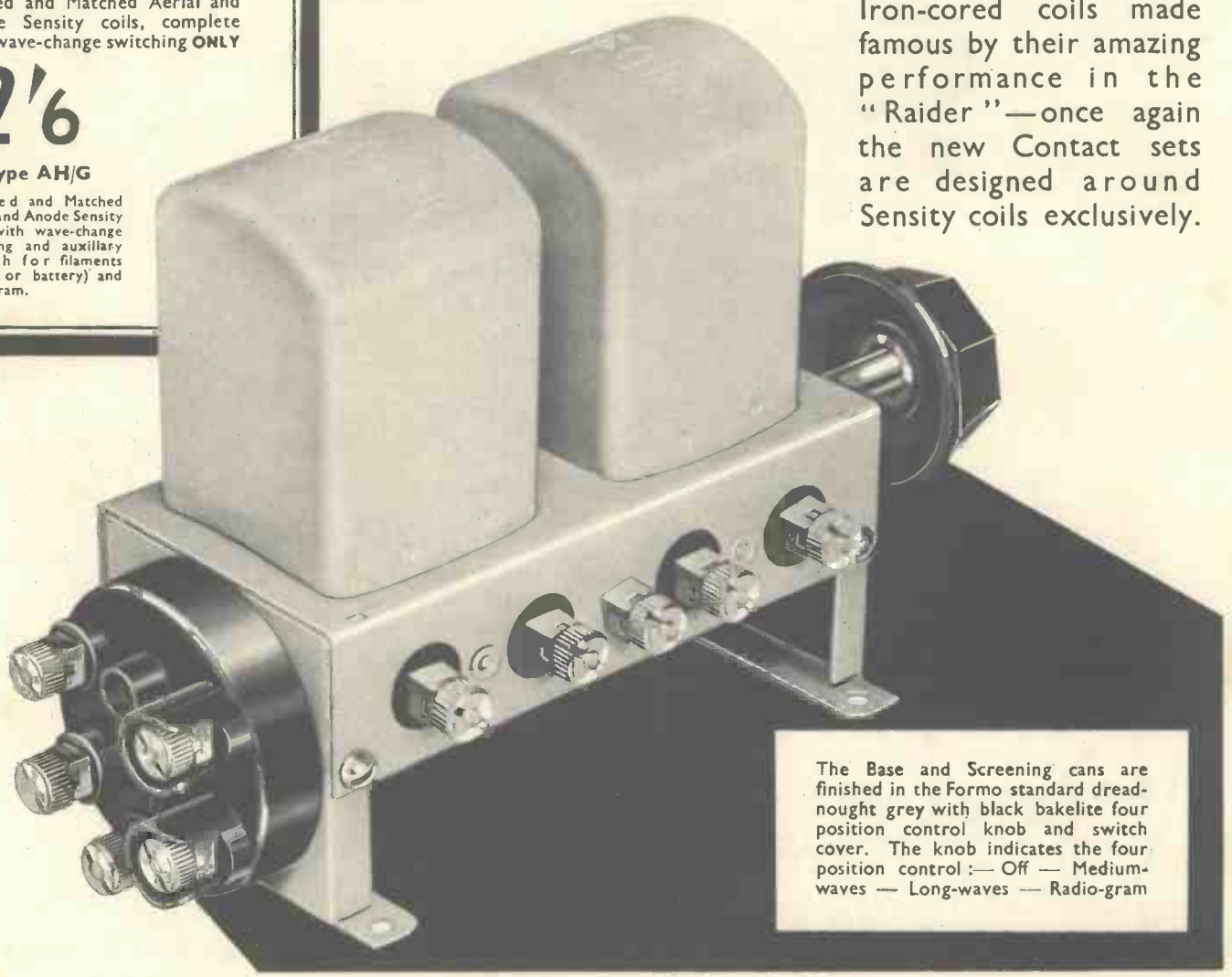
Ganged and Matched Aerial and Anode Sensity coils, complete with wave-change switching **ONLY**

12/6

Type AH/G

Ganged and Matched Aerial and Anode Sensity coils, with wave-change switching and auxillary switch for filaments (mains or battery) and radio-gram.

For the first time in the history of radio, constructors are now offered ganged and matched coils with solo control of two wave-bands, radio-gramophone and filaments, the auxiliary switch being suitable for either mains or battery operated receivers. The coils are the popular Sensity Iron-cored coils made famous by their amazing performance in the "Raider"—once again the new Contact sets are designed around Sensity coils exclusively.



The Base and Screening cans are finished in the Formo standard dreadnought grey with black bakelite four position control knob and switch cover. The knob indicates the four position control :— Off — Medium-waves — Long-waves — Radio-gram

"The finest Coils ever handled"

FORMO PRODUCTS

9th January, 1935.
Stoke-on-Trent.

Messrs. Formo Products Ltd.,
Bromley, Kent.

Dear Sirs,

I have built 9 different wireless sets during 1934, and have been in the wireless game as an amateur since 1917, and I must confess that the new Sensity Coils of yours, of which I have 4 in the set I have just finished, are the finest Coils I have ever handled, both for Sensitivity and Selectivity.

I bought three from you direct and one from Messrs..... Ltd., Stoke-on-Trent, and have ganged together the three matched ones I bought from you and am working the fourth Coil from a separate tuner.

I have seen Sensitive Coils before and I have seen Ultra Selective Coils before, but this is the first time I have ever found both points very much in prominence in one coil.

If you have a complete catalogue of parts, I would like to have it, and am enclosing 3d. in stamps to cover postage.

Yours truly,

E.J.H.

FORMO
IRON-CORED
SENSITY COIL

FOR FULLY ILLUSTRATED CATALOGUE OF ALL FORMO RADIO COMPONENTS
write to
FORMO PRODUCTS Ltd.
Masons Hill, Bromley, Kent.

FORMO SENSITY IRON-CORED COILS 5/-

Represent the greatest advance in scientific coil design in recent years. Comprehensive tests in all parts of the United Kingdom, under widely varying conditions, indicate their enormous possibilities.
The Litzendraht winding is disposed on a bobbin moulded of an entirely new material and is mounted on a white Steatite base having negligible H.F. losses. The screening can, finished in dreadnought grey, adds just that touch of distinction to an already distinguished design.

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A well-constructed Grid Leak of the Carbon type, available with the normal conical ends or with terminals for connection direct in the wiring. All values from ¼ to 5 megohms. Kone Kap type. PRICE **9d.** Standard type. PRICE **10d.**

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A BIG ACHIEVEMENT

GRAHAM FARISH

For the first time in the history of electrical reproduction the idea of "compensating"—or balancing out—the defects between "mike" and record finds expression in this superb component.

Many superlatives have been used to describe Pick-ups manufactured hitherto, but until the principle of true compensation was applied to Pick-up design even approximate "realism in response" was not obtainable without complicated networks of correctors, etc. with their attendant reduction of output.

The Graham Farish "Compensated" Pick-up dispenses with all such devices. It is new in its conception, a revelation in reproduction and, connected to the simplest amplifier, gives an incomparably closer rendering to the original recording than has ever been achieved before.

Boxed complete with Fitting instructions. **14/6**

Incorporating Volume Control as illustrated **18/6**

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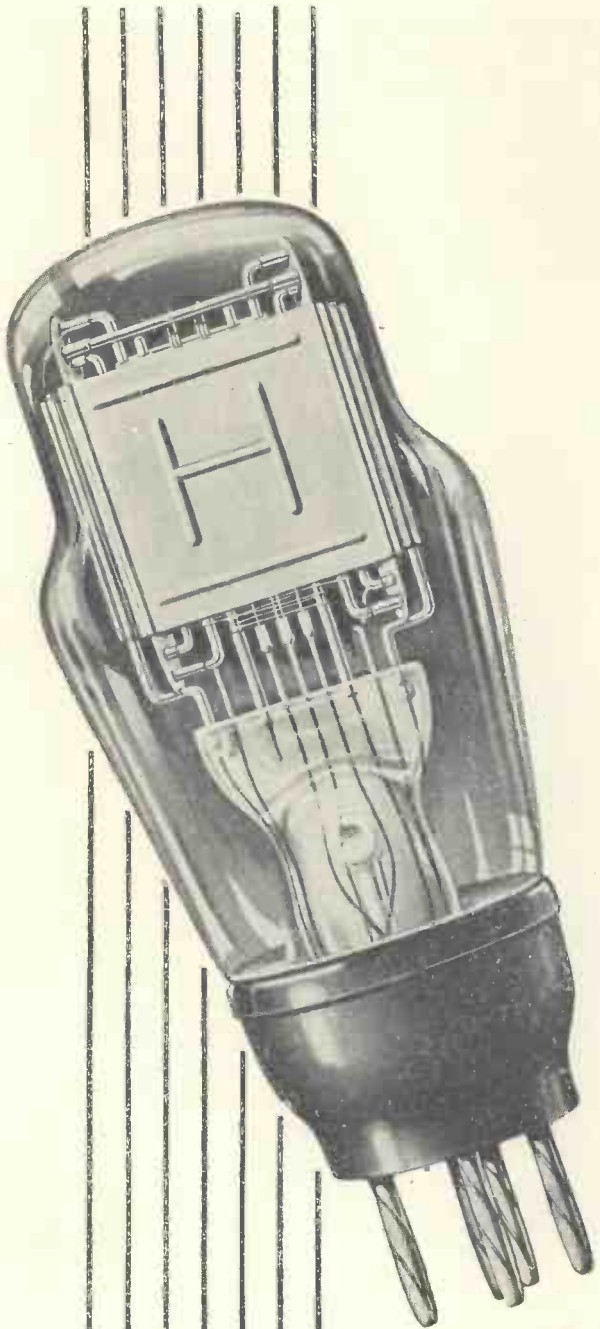
GRAMOPHONE

PICK-UP

Built to a new principle—the Graham Farish COMPENSATED Pick-up will reveal new and unsuspected beauties in your records, adding enormously to the pleasure they give you.

GRAHAM FARISH LTD, BROMLEY, KENT



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ENTERTAINMENT & TIPS FOR THE FAMILY
TECHNICALITIES FOR THE ENTHUSIAST & CONSTRUCTOR

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EDITORIAL & ADVERTISEMENT OFFICES:
"CONTACT," 153, MASONS HILL,
BROMLEY, KENT.

March, 1935.

IT is with much pleasure that I write these few introductory words for the second issue of CONTACT. You will probably have noticed that No. 1 had no foreword from my pen, but then it must be appreciated that our first issue had to be judged, not by me, but by you, and I could not presume therefore, to discuss its merits until I had learnt just how our readers would like it.

Its success has been wonderful—so much so, that we were unable to distribute any free copies whatever, and many firms, both in the publishing and radio trades, had to accept a reduction in their orders to enable us to cope with the demand.

If further proof were needed, the many letters amply testify the high esteem of our readers, and therefore with confidence I look for a really stupendous circulation for this number.

I would like to feel that you regard CONTACT as your own magazine, published for your own personal interest and amusement. Give me an idea of the articles you would like to read, the types of sets you want to build, and within reason you shall have them. Tell me what you think of CONTACT generally — your praise is valued for the good feeling it shows, your harshest criticism will help to make No. 3 just the paper you want, and if for no other reason I welcome it on this score.

The Editor

Radio Gossip

By THE EDITOR

MY FAN MAIL.

The vast number of letters which our first number of CONTACT brought in its train convinces me that I must anticipate a really enormous demand for the second number, for which these few notes are intended. Under such circumstances I must not make this introductory chat long because I know full well readers will be anxious to see, not what I have to say, but just what "meat" has been served in the way of new sets.

THE "SENSITY SUPER."

This is a really brilliant design and an achievement far surpassing anything previously put out by our designers. Chiefly they are indebted to the new Ganged and Matched Sensity coils just released by the Formo people. I believe I am right in saying that this is the first time in the history of radio that constructors have had offered to them a Ganged Coil with an auxiliary switch controlling filaments (mains or battery), two wave-bands, and radio-gram.

The "Sensity Super" is the direct result of the enormous mail mentioned above. Most constructors appear to want a three-valve set which can be economically run off dry batteries or a standard mains unit. It must have ample loud-speaker punch from a really wide variety of British and overseas stations at excellent quality. Finally it must be reasonably priced—something within the range of the humblest purse. I am more than satisfied that these demands have been adequately met, and it is pleasing to note that our designers have been able to add many luxuries which you probably dared not ask for or expect.

"RAIDER-GRAM."

The name of this set will readily indicate to readers of our first issue that this is an adaptation of the "Raider"—the most successful of the 1934 sets. So far as the chassis is concerned, the only possible improvement has now been incorporated, and once again I take off the editorial hat to Formo. Their new Ganged and Matched coil complete with Switch, takes the place of the two single coils hitherto used. I feel sure that most "Raider" owners will immediately change over and be more than satisfied with the results.

To new readers, here is the ideal battery radio-gram. The specially designed L.F. end of the "Raider" provides volume equal to and even surpassing many powerful mains receivers. The reproduction of Gramophone records via the new Graham Farish Compensated Pick-up is uncannily realistic and a revelation.

The W.B. Baby Stentorian speaker handles this tremendous volume with impertinent ease, and I am pleased to note that the designers are once again relying on this very well-known make of speaker for all Contact sets.

By the way, if new readers wish to refer to the first editorial of the "Raider," a few copies of CONTACT No. 1 (mailed free for 4½d. in stamps) are obtainable from this office.

WHITHER TELEVISION ?

As this article is being written, the full details of the new television report have been made public, and by the time this is in print will be old news. It is interesting to see that short-waves are to be used exclusively for the vision broadcasts, and I know one or two manufacturers who will be catering very fully for the constructor's needs for both short-wave components and those required for the remaining apparatus. Unless a very strong call is made by readers for something else, I expect our next number will deal with a short-wave receiver, and you can rely on it being something very special and quite suitable for the television transmissions later on.

RADIO AND THE ARTIST.

Glancing in desultory fashion through an auctioneer's catalogue a few days ago my interest was aroused by a lot number which referred to a battery wireless set in

magnificent solid mahogany cabinet —" A unique example of the cabinet maker's craft." I was sufficiently interested to " view," and without doubt it was certainly a very " unique example." The wood was undoubtedly of the finest, the workmanship was excellent, but the design was execrable.

My mind travelled back to a small studio I had visited just previously with the Contact set designers, and I wondered what our artist friend would have made of such material.

Laurence is a name new to the ranks of cabinet designers, and I believe his art to be something new also to radio. A rough layout—a few deft touches, and the result is the birth of the really glorious cabinet illustrated elsewhere in these pages. It is interesting and encouraging to note that due attention is at last being paid to cabinet designs for home constructed sets. In the past it has been extremely difficult to find a cabinet maker with sufficient enterprise to market cabinets which will really do justice to many of the beautifully constructed chassis now available to home constructors.

I am told that Graham Farish Limited were fortunate enough to secure exclusive rights to future Laurence designs for " Contact " sets.

OUR CONTEMPORARIES.

It is my pleasure to welcome in this number, and to gratefully acknowledge the greetings of our contemporaries, Mr. F. J. Camm—Editor of *Practical Wireless*, Mr. Hugh F. Pocock—Editor of the *Wireless World*, and Mr. Norman Edwards—Editor of *Popular Wireless*, all of whom represent the technical press of this country. When I say this country I am under-stating the case, for their papers are read and followed by a vast number of constructors throughout the world. It is largely through their efforts to cater for the needs of home constructors that the British Broadcasting Corporation has obtained its funds for the completion of the finest broadcast service in the world to-day.

BOUQUETS GRATEFULLY ACKNOWLEDGED

F. J. CAMM.

CONTACT ! I have often stood upon the tarmac at an aerodrome and heard the mechanic utter that magic word to the pilot in the cockpit. Just a touch of two small pieces of metal and an aerial leviathan can be rendered inert or made to spring into life. I take it that the title of this journal is intended to convey in an electrical sense that it supplies that vital touch between good radio and bad. I am glad of this opportunity of making contact with the many thousands of readers of this journal, even though it be only by means of a metaphorical handshake and as warm a greeting as cold print can convey. This journal provides an interesting link between the manufacturer of famous products and the many thousands of users of them. It is a worthy effort to popularise home construction and I wish it well. Heartiest greetings to you and it.

F. J. CAMM,
Editor " Practical Wireless."

May I be allowed to send my very best wishes for the success of the second issue of your excellent magazine CONTACT ?

I am very glad to hear you are bringing out another issue because it all helps to stimulate and encourage the new generation to take an interest in what is undoubtedly —as you will agree—the most fascinating of all scientific hobbies. And, having disposed of the second issue of CONTACT, *I hope you and your " merry men " will get busy with the preparation of No.* 3 !

NORMAN EDWARDS,
Editor " Popular Wireless."

Dear Sir,

All good wishes to the new number of your magazine !

I hope that the success of No. 2 of CONTACT *will be even greater than that of the first number and that it will be the means of introducing set-building as a hobby to many new enthusiasts.*

Yours faithfully,
HUGH F. POCOCK,
Editor " Wireless World."

YOUR LOCAL DEALER.

He's a useful person—your local dealer ; a mine of information and experience which he freely dispenses to all and sundry who seek his aid.

I suppose in no industry, with the possible exception of the motor trade, is the dealer such an important and valuable link in the chain between manufacturer and public.

Radio apparatus has to-day reached an extremely high pitch of perfection, yet when one considers the enormous number of small items which, unimportant in themselves, are vital to the functioning of the receiver as a whole, it is remarkable how few troubles are experienced.

These troubles do occur, however, and if one's own set won't work it is small satisfaction that 25,000 others are perfect and a joy to their owners. This is where the local dealer, like Mark Tapley " comes out strong." Most of his jobs are small matters—a loose connection, a coil incorrectly wired, etc., but he can put right in a few moments a spot of trouble which might take hours of finding for the inexperienced.

Having this in view we have compiled a list of the leading radio dealers throughout the country whose interests are for the home constructor, and who carry stocks of parts and blue-prints for Contact sets.

This list is by no means complete—we do not pretend that, but we do ask you to patronize any of the dealers listed in this issue if you want both prompt supplies and considerate service after purchase. In short we want you to get the utmost value from Contact sets, and you achieve this best by purchasing from a Contact dealer. And whilst we are on the subject, may we extend to those dealers omitted in this issue our sincere apologies. In compiling such a directory many firms are inadvertently omitted. Write us on your business letter heading if you are capable of giving a "straight deal" and good service to the home constructor and wish to be included in our subsequent issues.

The Raider

AN ECONOMY 2 WATT BATTERY

The designers make no apology for bringing out a second version of the "Raider." It is, after all, only in keeping with the policy of this magazine to keep up with the latest developments. At the same time, even with the present rapid advances of radio technique, it was hardly to be expected that the essentials of the "Raider" design would not remain completely up-to-date.

Let us see why the new receiver came to be developed. Firstly, the wonderful quality and volume obtainable from the "Raider" made it ideally suitable for conversion to a radio-gram. Secondly, no receiver would be considered complete without the wonderful new Sensity Dual Coil. Both these improvements were incorporated at one stroke by means of the new Coil unit with its remarkable combined on-off, wave change, and radio-gram switch. This switch carries out all these duties by the turning of a single knob.

For the benefit of those who are technically minded, and did not see the description of the original "Raider," let us go briefly over the essential points of the design.

The signal, after being picked up by the aerial, is applied to the primary of the aerial transformer through the series aerial condenser, which conveniently lets through the signal, but prevents the damping of the aerial from affecting the selectivity of the Coil. The signals thus induced in the secondary are applied to the grid of the H.F. valve in the usual way. This valve is one of the new variable-mu high frequency pentodes, which combines the advantages of a convenient and distortionless volume control with an almost unlimited signal handling capacity and extremely high amplification.

The amplified signals now appear in the primary of the H.F. transformer. By virtue of the very complete internal switching arrangement of the Coil, this primary winding is perfectly proportioned on all wavelengths to suit the characteristics of the H.F. valve, and also the requirements of the secondary.

Having reached the secondary, our signals are rectified by the second valve. Rectification takes place by the leaky grid method, and this is specially arranged to give maximum possible sensitivity. After rectification and further amplification by this valve the signals now appear in its anode. The rectified signals now pass through the H.F. choke, to be further amplified. Some of the H.F. or unrectified signals also reach the anode, and are prevented from going any further by the H.F. choke. These signals are, of course, used to apply reaction, and are fed back to the grid circuit via the reaction coil and differential reaction condenser. The differential method of applying reaction is a most important feature, as it provides smoother reaction, and also—a fact not so well known—improves selectivity by cancelling out the damping of the grid circuit, which would otherwise be caused by the valve.

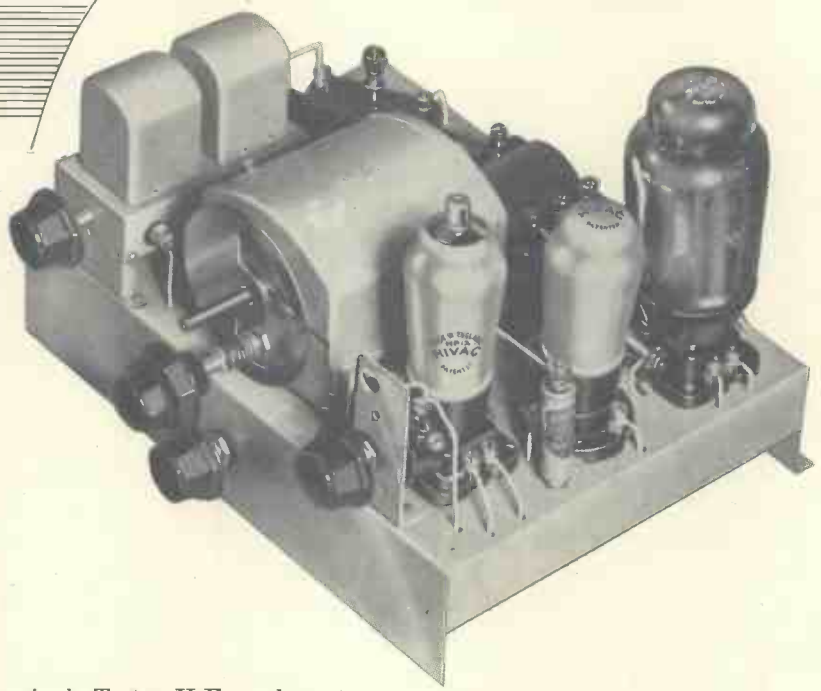
Our rectified signals, then, have reached the other side of the H.F. choke, and are fed to the "Quip" L.F. transformer, through the .25 mfd. coupling condenser by the parallel feed method. This prevents the detector anode current from passing through the primary of the transformer, and enables us to use a special high-permeability alloy for the core, giving an exceptionally high primary inductance. Here we have the clue to the wonderful bass response of the Raider-gram. In addition, the transformer provides an amplification of no less than eight times.

Now we come to the output valve. As you probably know, this remarkable valve really consists of two valves in one, giving twice the volume ordinarily obtainable with one valve. This is not the whole story, however. One naturally assumes that two valves would consume twice the anode current of one—they would, of course, if used in the ordinary way. The special Q.P.P. method, however, gives double the volume, but only consumes the same anode current as a single valve. The essential principle is that the valves are made to consume just the necessary current for the strength of signals being received at any instant. This means, of course, that the anode current is

Gram

WITH MONO-CONTROL SWITCHING

RADIO-GRAM



varying all the time when a programme is being received. It also provides you with the comforting thought that during an interval in the programme a large amount of H.T. current is not being wasted.

It should be noted that it is absolutely essential for the speaker to be connected to the set by means of a centre-tapped transformer of the correct ratio to match the output valve. The W.B. Stentorian specified is, of course, fitted with such a transformer.

"RAIDER-GRAM" MOUNTING AND WIRING.

Under-side of Chassis.

1. Mount the following :—

2—.25 mfd. Screened Paper condensers at back of chassis, having first scraped away the enamel on the chassis.
H.F. Choke—scrape enamel under the head of earthing screw E.
.01 mfd. Fixed Mica condenser.
.0003 mfd. Differential reaction condenser. The washer provided goes behind the chassis.

Above Chassis.

Mount :—

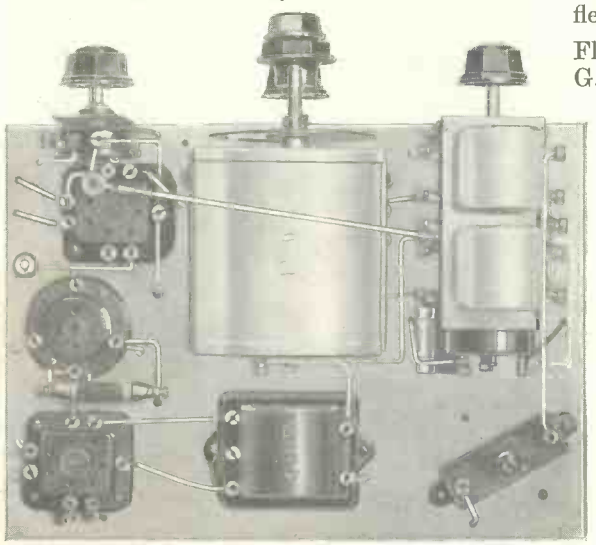
The three valve-holders in the positions shown.
The Quip transformer.
The Formo-densor.
Bracket and Volume control.
Twin-gang condenser.
Twin-coil unit.
.1 mfd. Screened Paper condenser—having scraped enamel away.

WIRING.

1. .0002 mfd. Tubular condenser. One wire to coil terminal No. 10 and the remaining wire to switch, terminal B.
2. .25 mfd. Tubular condenser. One wire to terminal on the H.F. Choke, remaining wire through chassis to Quip transformer terminal C.
3. Terminal T to H.F. valve-holder terminal 1. (Scrape enamel from both sides of chassis when fitting terminal T.)
4. H.F. valve-holder terminal 1 to volume control terminal C.
5. Volume control terminal C to H.F. valve-holder terminal 3.
6. H.F. valve-holder terminal 3 to H.F. valve-holder terminal 4.
7. H.F. valve-holder terminal 4 through the chassis to Detector negative filament terminal.
8. Detector negative filament terminal through chassis to Q.P.P. valve-holder terminal 4.
9. H.F. valve-holder terminal 5 through chassis to Detector positive filament terminal.
10. Detector positive filament terminal through chassis to Q.P.P. valve-holder terminal 5.
11. Q.P.P. valve-holder terminal 1 to Quip transformer terminal G2.
12. Q.P.P. valve holder terminal 2 to Quip transformer terminal G1.
13. Detector terminal G through chassis to switch terminal A.
14. Detector terminal G to one terminal on the 1 meg. Grid Leak.
15. Remaining grid leak terminal to detector positive terminal.
16. Detector terminal P through chassis to Reaction condenser terminal P.
17. Reaction condenser terminal P through chassis to coil terminal No. 2.
18. Coil terminal No. 2 through chassis to terminal on the H.F. Choke.
19. Terminal 7 on the H.F. valve-holder to terminal on the .1 mfd. Screened Paper condenser.
20. Terminal of the front section Twin-gang condenser to terminal No. 2 on the H.F. valve-holder.
21. Volume control terminal B through the chassis to one terminal of the .01 mfd Fixed Mica condenser.
22. Terminal of .01 mfd Fixed Mica condenser through the chassis to Coil terminal No. 6.
23. Coil terminal No. 7 to terminal on front section of Twin-gang condenser.

RAIDER-GRAM—*continued.*

24. Coil terminal No. 10 to terminal on rear section Twin-gang condenser.
25. Coil terminal No. 8 to earthing terminal on rear end of Twin-gang condenser.
26. From earthing terminal on Twin-gang condenser to terminal E on Quip transformer.



The "Raider-Gram" Plan View, showing Top Chassis Layout.

27. Coil terminal No. 4 through chassis to terminal R on Differential condenser.
28. Differential Reaction condenser terminal E to terminal T.
29. Terminal T to one terminal on .01 mfd. Mica condenser.
30. Terminal of .01 mfd. condenser through chassis to coil terminal No. 3.
31. Coil terminal No. 1 through chassis to terminal of .25 mfd. Screened Paper condenser furthest from H.F. choke.
32. Terminal of same .25 mfd. Screened Paper condenser to one terminal of 5,000 Ohmite.
33. Other terminal of 5,000 Ohmite through chassis to Q.P.P. valve-holder terminal 6.
34. Same terminal of 5,000 Ohmite to one terminal of the 10,000 Ohmite.
35. Other terminal of 10,000 Ohmite to terminal of .25 mfd. Screened Paper condenser nearest to H.F. Choke.
36. Terminal of same .25 mfd. Screened Paper condenser to terminal of 40,000 Ohmite.
37. Other terminal of 40,000 Ohmite to terminal on H.F. Choke.
38. Earth socket to terminal of .01 mfd. Mica condenser.
39. Aerial socket through chassis to one terminal on the Formo-densor.
40. Coil terminal No. 3 to switch terminal E.
41. Coil terminal No. 5 to remaining terminal on Formo-densor.
42. Coil terminal No. 9 to anode terminal at top of the H.F. valve. (This wire may be flexible if desired.)

Flexible leads :—

G.B.—7.5v. Through chassis to Volume control terminal A.

H. T. 60/72. Through chassis to terminal 7 of the H.F. valve-holder.

L.T.—Through chassis to switch terminal D.

H.T.—To terminal T.

G.B.+To terminal T.

G. B. — 15v. Through chassis to terminal GB on Quip. Transformer.

H. T. 120 v. Through chassis to terminal 6 on the Q.P.P. valve-holder.

T.L.+Through chassis to terminal 5 on the Q.P.P. valve-holder.

SPEAKER C.T. Through chassis to terminal 6 on the Q.P.P. valve-holder.

SPEAKER 3 ... Through chassis to terminal 3 on the Q.P.P. valve-holder.

SPEAKER O ... Through chassis to Q.P.P. valve - holder terminal 7.

PICK-UP .... Switch terminal C and G.B.—1.5v.

Before housing in cabinet, connect two leads (about 18 in. long) to the two terminals on the dial lamp socket. When the set is in position these two leads then may be connected to terminals 4 and 5 on the Q.P.P. valve-holder.

Great care should be taken not to damage the covering when passing a wire through a hole in the Chassis, and especially where several wires go through the same hole.

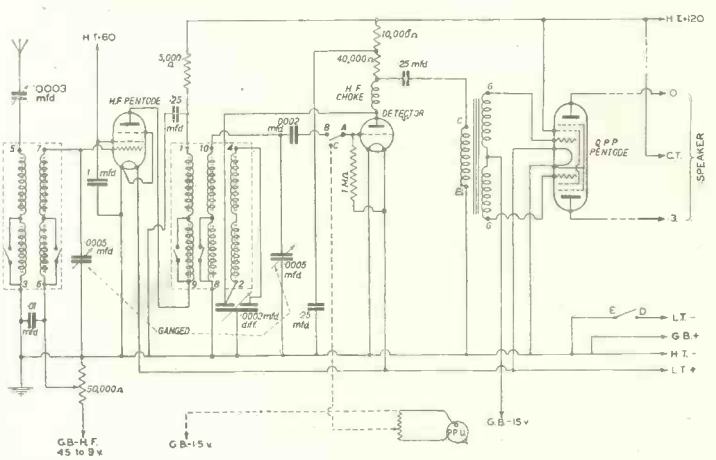
You are strongly advised to use two colours, say red and black for the flexible leads, using red for all the positive leads. This will make the connecting up of the batteries much simpler, especially if you plait together the wires of each group, i.e., the Grid Bias, H.T. and L.T. and Loud Speaker leads.

Two further suggestions—use spade tags for the accumulator connections, and an H.T.— Wander plug which is fitted with a fuse bulb. This latter will avoid the risk of burning out any valves if you happen to have made a slip in the wiring.

Having finished the construction of the Raider-gram, you will, of course, be anxious to try it out. It will be best to do this before fitting in the cabinet, just in case something has been missed.

Connect up the aerial and earth to their respective terminals and the H.T.—, L.T. and grid bias leads. Be very careful to connect the latter correctly, otherwise you may damage the output valve. Connect the speaker leads to the correct terminals on the speaker transformer and switch on the filaments. To do this, turn the switch knob anti-clockwise as far as it will go, then turn it one stage in a clockwise direction. The dial should now light up, the switch being in the medium wave position. Now insert the 120 volt H.T. plug. This should give you a loud plop in the speaker. If not, the wiring of the L.F. and output side of the set should be checked. Assuming this is correct, putting in the H.F. pentode screen plug at about 70 should also give a sound in the speaker.

Now turn the volume control (right hand knob) to maximum volume, i.e., clockwise, and the reaction control (lower centre knob) back to zero, i.e., anti-clockwise. Screw up the Formo-densor moderately tightly and proceed to gang the receiver. An article fully describing this simple operation appears on page 14.



The "Raider-Gram" Circuit in Tabloid Form.

RAIDER-GRAM—*continued.*

Having done this, you will now be ready to give the receiver a trial run.

Just one or two small points in connection with the operation of the receiver.

See that the loudspeaker leads come straight out from the underside of the receiver, without being disorderly. It is most important to keep them away from the lead going to the grid of the detector valve from the switch. If this is not done, instability and L.F. oscillation may result.

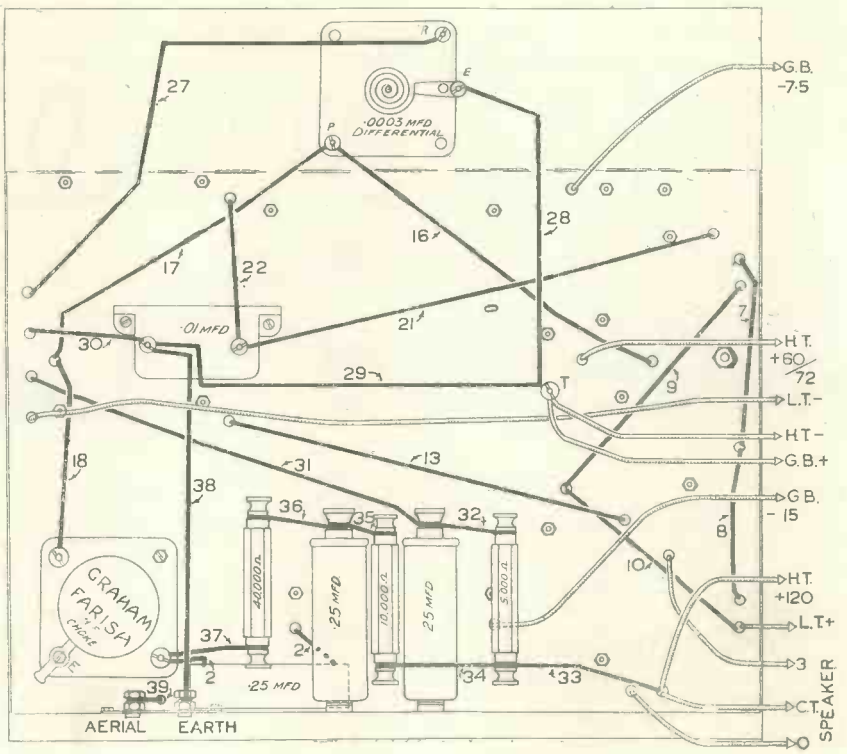
With valves of the Q.P.P. type it is not uncommon for the circuit to have a tendency to oscillate. This has nothing to do with the reaction in the H.F. part of the set, but is a kind of L.F. oscillation, which may not be audible, but may cause slight distortion, and increase H.T. current consumption. If, therefore, you find that the reproduction is a little harsh, or the anode current is unduly high (the total standing current should be about 14 ma.), it is a sign that this trouble is occurring.

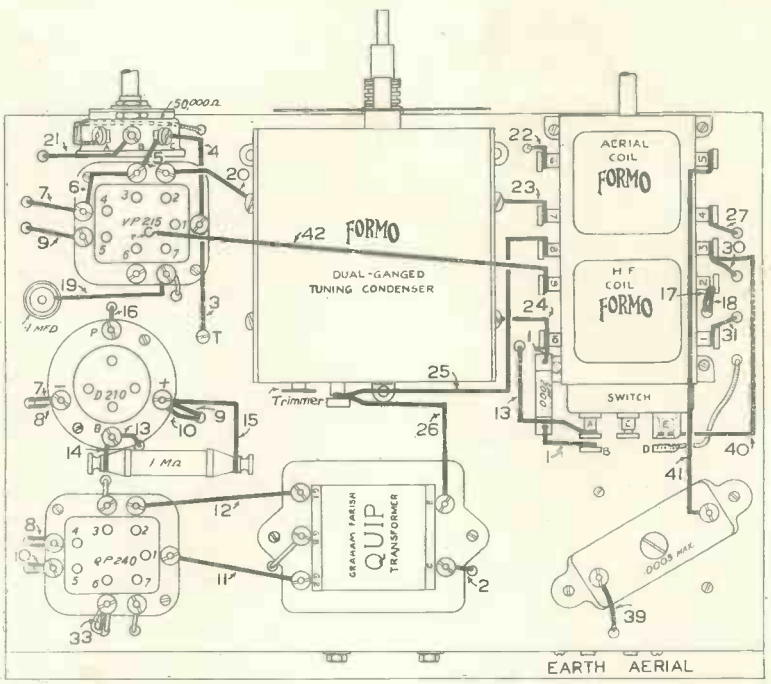
A certain cure can be effected by inserting a 100,000 ohm Ohmite resistance in each of the leads which go from the Q.P.21 valve-holder to terminals G.1 and G.2 on the Quip transformer.

Incidentally, if you find a definite alteration in quality when you touch terminal G.1 and G.2, this is a certain sign that this oscillation is taking place.

Observant constructors may query the fact that the volume control is permanently connected across the grid bias. This, however, is quite unimportant since the current passed is so minute that the battery will not run down any quicker than it would in the ordinary course of events due to deterioration with time, and there is no cause to worry on this account.

If you happen to be reaching out for distant stations and for this reason require the maximum sensitivity of which the set is capable, it is worth trying the effect of shorting out the Formo-densor which is connected in the aerial lead. This may increase volume slightly, but may at the same time reduce selectivity due to the effect of the aerial damping, so this experiment is only worth trying when you are not troubled by a station interfering with the one you wish to receive. It will, of course, be necessary to make a slight re-adjustment of the front trimmer if you do this. You will readily understand the reason for this, if you have read carefully the article on ganging.

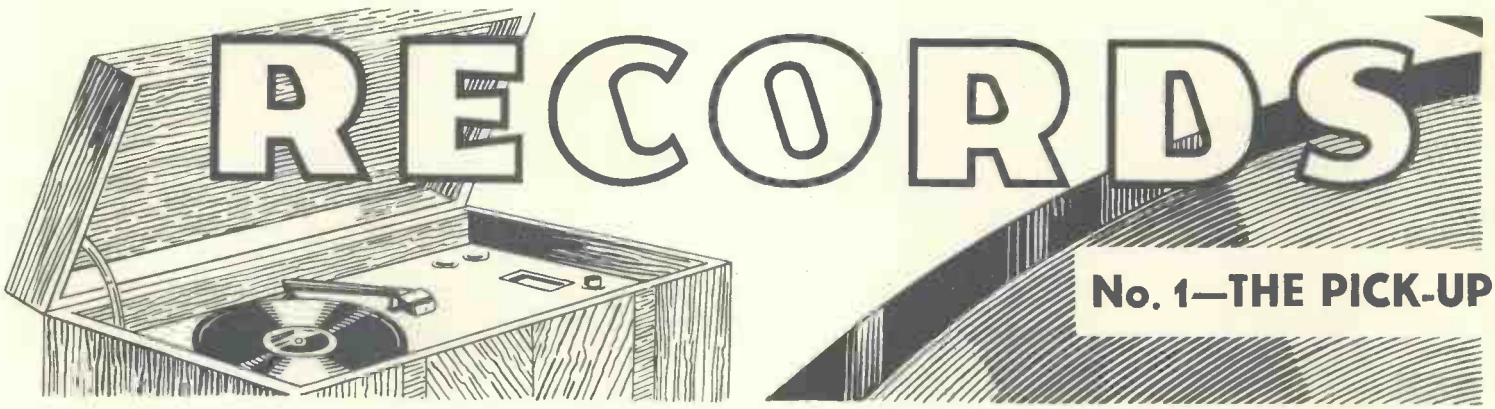




Here is the "Raider-Gram" Wiring Chart. A full-size Blueprint (complete with all details for converting the "Raider" to the "Raider-Gram") is obtainable, price 1/-, post free.

RAIDER-GRAM. List of Parts Required.

		s.	d.
2—7 pin Valve holders	Graham Farish	2	6
1—4 pin Valve-holder	Graham Farish		6
1—Quip transformer	Graham Farish	10	6
1—50,000 ohm Volume control	Graham Farish	2	9
1—T Type J Formo-densor	Formo Products	1	6
1—Twin coil Unit type A/HG with switch	Formo Products	12	6
1—Twin gang condenser	Formo Products	12	6
1—.0002 mfd. Tubular condenser	Graham Farish	1	0
1—.25 mfd. Tubular condenser	Graham Farish	1	6
1—.01 mfd. Fixed Mica condenser	Graham Farish	1	6
2—.25 mfd. Screened Paper condenser ...	Formo Products	3	0
1—.1 mfd. Screened Paper condenser ...	Formo Products	1	6
1—5,000 Ohmite	Graham Farish	1	6
1—10,000 Ohmite ...	Graham Farish	1	6
1—40,000 Ohmite ...	Graham Farish	1	6
1—.0003 mfd. Differential	Graham Farish	2	0
1—H.M.S. Choke... ...	Graham Farish	2	6
1—Chassis	Graham Farish	3	0
1—1 meg Standard Grid Leak ...	Graham Farish		10
CABINET: Graham Farish "Laurence" Design...		25	0
LOUDSPEAKER: W.B. "Stenorian Baby"...		22	6
VALVES: Hivac VP215 (H.F. Pentode)		10	6
Hivac D210 (Detector) ...		3	9
Hivac QP240 (QPP Output)		19	6
BATTERIES: H.T. 120v. G.B. 16.5v. L.T. 2v.40 amp. hour.			



ONE of the most valuable additions to home entertainment brought about by the advance of Radio is the development of electrical reproduction from gramophone records. It is interesting to realise that electrical recording and electric gramophones might well have come into being without the discovery of wireless transmission. As it happened, the thermionic valve amplifier was introduced and developed mainly for Radio purposes, and so record reproduction and amplification have followed instead of leading.

Electrical recording became general only about ten years ago, and the great improvement in fidelity which it brought about will be evident to those who still have some of the old mechanical records. The full improvement, however, will not be appreciated unless the record is also reproduced electrically. The ordinary mechanical gramophone does not do justice to the record. I well remember completing my first radio-gramophone some years ago, using one of the early moving coil speakers, and sitting enthralled, regardless of meals or anything else, while I played over twice my whole collection. I seemed to have a new batch of records.

Small Expense

The association of "Radio" with "gramophone" suggests a comparatively large and expensive piece of furniture, but it is quite wrong to imagine that you cannot enjoy good electrical reproduction without expense. The results obtainable from an ordinary home receiver fitted with a pick-up are infinitely more satisfactory than those from the usual portable gramophone. There must be tens of thousands of homes where both a radio and a

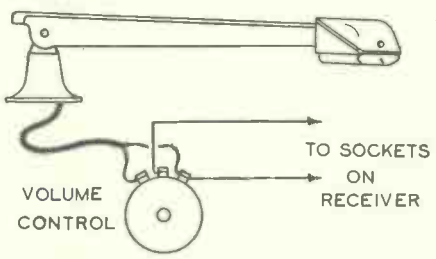


Fig. 2

gramophone are to be found, but where the simplicity of combining them is not realised, and a real enjoyment missed.

Naturally the amount of volume you can get without distortion will depend on the type of set you possess—or intend to build. That is, it will depend only on the portion used to amplify the pick-up input—the L.F. stages, the output valve, and the loud speaker. If you try to obtain noise enough to dance to from a small battery-operated power valve, you will be disappointed both with the music and the amount of it.

The range and selectivity of the set, that is, the H.F. portion, do not affect its performance as a gramophone. A two-valve local station

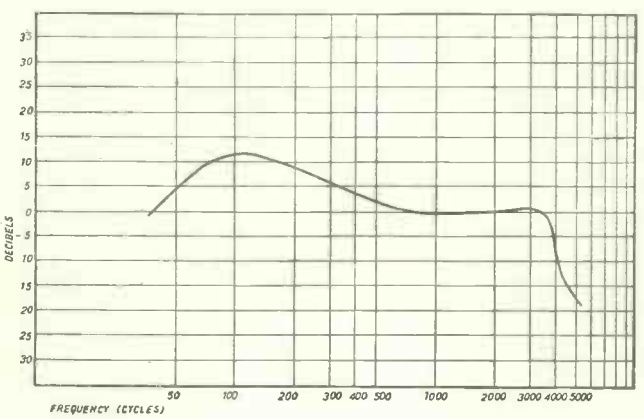


Fig. 1

receiver capable of good quality (such as the "Mystic Q" described in "Contact" No. 1) will render quite as good an account of itself as a long range superhet of similar L.F. proportions.

We will assume then that you have a receiver capable of giving out satisfactory volume and quality, and a loud speaker worthy of it. In these days of cheap moving coil speakers there is no reason for putting up with anything inferior. You will probably have a gramophone of sorts to drive the disc. An electric motor is a luxury worth having, but by no means necessary.

All you will need now is a pick-up and volume control (which may be bought as a combined unit, or separately), so that the total expenditure can be well under 20s.

Choice of Pick-up

Dealing first with the pick-up, there is a fairly wide choice available, and it may be of interest to discuss a few points to look for when purchasing.

The main consideration is the frequency response, usually given in the form of a curve showing the output at different parts of the musical scale. It might appear at first sight that this should be level over the whole range, but further investigation shows that this would not be satisfactory. In the first place, it is generally known that, in recording, the amplitude of the lower frequencies (or notes) has to be limited in order that the grooves shall not run into one another on loud passages. Unless, therefore, the pick-up or amplifier is compensated, the resulting reproduction will be lacking in depth.

Secondly, the amplifier (and its associated speaker) should be designed to give a more or less level output when being fed from the radio or H.F. portion of the receiver, the input from which is by no means level. It is evident that we require the pick-up to give an input to the amplifier of the same character as it gets "on radio," which usually comprises a higher input in the base, with a falling away towards the upper register. This is counteracted by a "rising characteristic" in the L.F. side of the set, especially where a pentode output valve is used, so that a satisfactory balance is obtained.

The properly designed pick-up, then, gives a "compensated" response, with a higher output at the lower end of the scale. Fig. 1 shows the output curve of the Graham Farish Pick-up. It will be observed that, after reaching a steady level at about 700 cycles, the pick-up curve falls away fairly sharply from about 4,000 cycles. This is done in order to minimise needle scratch. If this "cut off" occurs too early, crispness and clearness will be lost, as well as needle scratch. It is desirable to leave a small trace of "hiss" if the reproduction is not to lose much of its brilliance and become "woolly." However, methods of tone control, by which this may be varied according to taste, are described below.

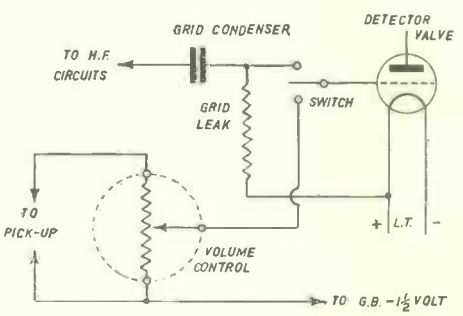
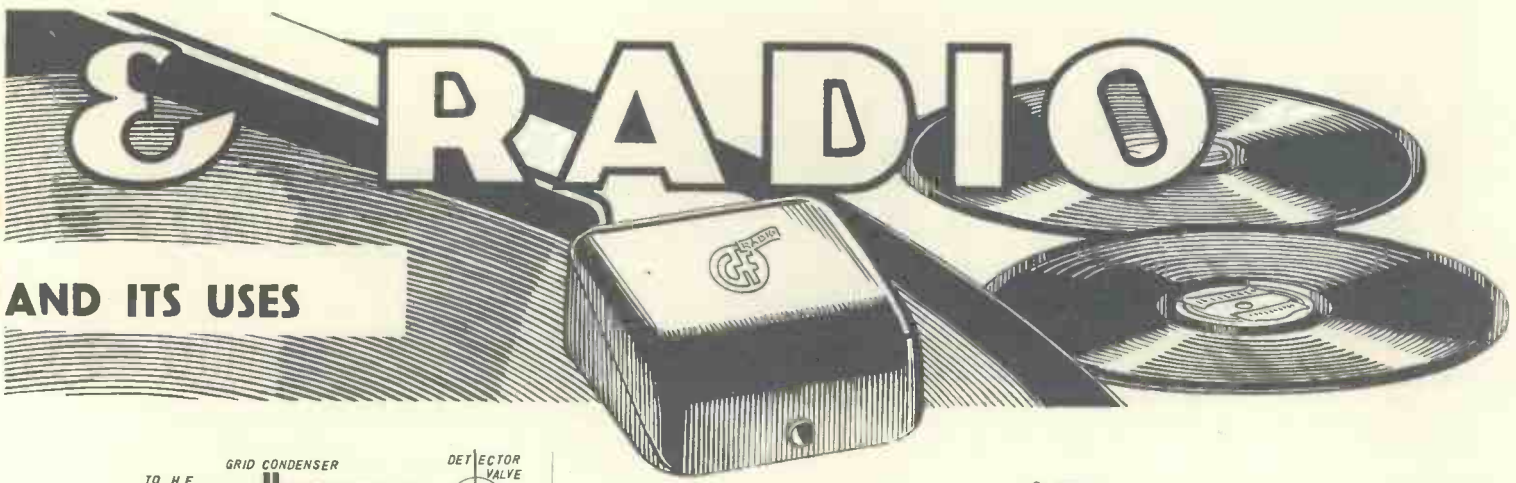


Fig. 3

A volume control (or potentiometer) is essential. Apart from the fact that one of the chief advantages of electrical reproduction is that the volume can be varied to suit the occasion, it is necessary to guard against overloading the amplifier, and thereby causing distortion. Moreover, in dealing with the output curve of

& RADIO

AND ITS USES



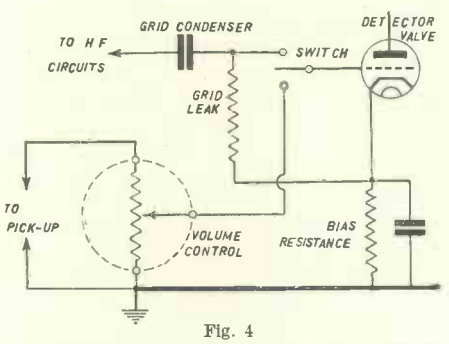


Fig. 4

the pick-up, a volume control of suitable resistance is assumed to be connected across it. The manufacturers will invariably specify what value should be used for normal results. The use of a lower value will damp out the upper register, whereas a higher value may cause shrillness.

On the "Sensity Super" and on certain commercial receivers the radio volume also operates when a pick-up is in use. In these cases it may be necessary to connect a resistance of appropriate value across the pick-up to restore the tone balance, and also to reduce the possibility of overloading the first amplifying valve.

Connections

Connecting up is a simple matter. Most commercial receivers have a pair of terminals or sockets provided for the purpose, and Fig. 2 shows the necessary connections. Figs. 3 and 4 show respectively suitable connections and switching for a battery and A.C. receiver not so fitted. A separate volume control is shown in each case but this of course may be in one unit with

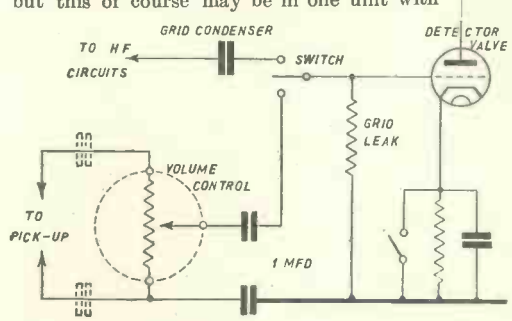


Fig. 5

the pick-up. In commercial receivers the necessary switching is sometimes incorporated. Where there is no switching, it is simple to avoid receiving radio and gramophone input together by removing alternatively the pick-up or aerial leads.

Possibly the neatest solution for the home constructor is the switch attachment made by "Snap" Switches Ltd., for the Formo Twin Coil Unit, which combines all switching with the wave change. (This is also obtainable as a separate radiogram switch.)

The self bias connections to the detector of the A.C. receiver in Fig. 4 are arranged so that the appropriate bias is applied when in use as a gramophone amplifier, and cut out when on radio. Alternatively, the grid leak may be returned to earth and the biassing resistance short circuited by a simple switch for radio reception, as in Fig. 5.

A word of warning is necessary regarding D.C. receivers. The insulation of a pick-up is not intended to withstand mains voltages,

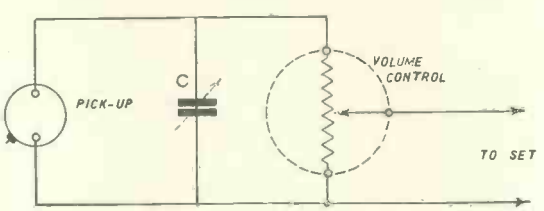


Fig. 6

and it should therefore be connected to a D.C. set only through two fixed condensers of at least 1 mfd. as shown in Fig. 5. In this case the pick-up cannot transfer any bias voltage, so that a high resistance, which may as well be the grid leak must be retained between grid and earth. This is not necessary however, if the volume control is built into the set and has an insulated spindle, when the isolating condensers may be connected in the positions hown dotted.

Tone Correction

It may be that the balance between record, pick-up, amplifier and speaker still leaves a deficiency in some respect. The keen experimenter, even if satisfied with the results obtained as above, may derive considerable interest and pleasure from trying the effect of altering the response. By a simple combination of resistances, condensers, or chokes, it is possible to raise or lower the output at

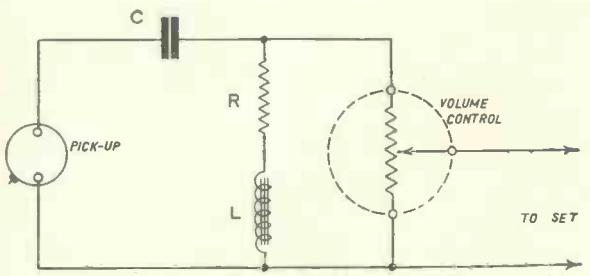


Fig. 7

either end of the scale, or even at some intermediate point.

The usual "tone control" in a receiver consists merely of a condenser connected across either the input or output circuit of the last valve. The effectiveness of this condenser is regulated by means of a variable resistance in series with it. The only effect, however, is to cut out more or less of the "top" response, and although this may seem to lower the general tone and increase depth, actually the bass response is neither greater nor deeper. All that has been done is to take the "edge" off the reproduction, usually with serious loss of brilliance and intelligibility. Now in combination with a pick-up it is possible actually to increase output in the bass without impairing the brilliance and vice versa.

Fig. 6 illustrates the connection of a condenser for increasing top. Its value will affect the frequency at which the "boost" occurs, and this will also depend on the make

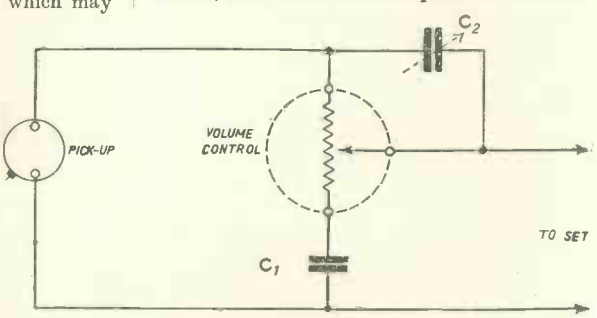
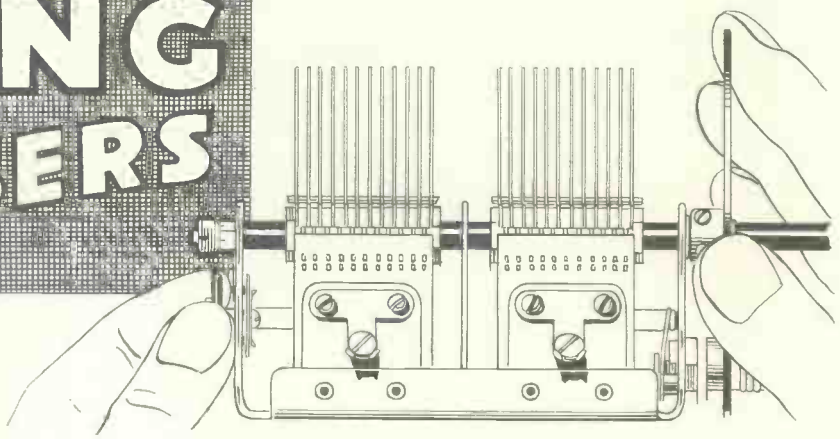


Fig. 8

of pick-up. With the Graham Farish pick-up .0005 mfd. will resonate at between 4,000 and 4,500 cycles. Values between .0004 and .0006 should be tried, and this could readily be done by using a type "G" Formodensor (maximum capacity .001), and adjusting it for best results.

Continued on page 52, column 2.

GANGING CONDENSERS



SIMPLE JOBS SIMPLY EXPLAINED

BEFORE going into the actual process of ganging, let us first see what it really means, and why it is necessary.

You know that a tuned circuit consists of a coil and a condenser—or, to put it more scientifically, an inductance and a capacity—and that the wavelength to which it tunes depends on the values of these two quantities. This wavelength can be varied by altering either the inductance or the capacity, or both. It is, of course, normal practice to vary the capacity when tuning, and only to change the inductance in large steps by means of switches.

To obtain sufficient selectivity in a highly sensitive receiver it is necessary to use more than one tuned circuit. The "Sensity Super" and the "Raidergram" each have two, and this means that there are two variable condensers. In the early days of radio, each tuned circuit had a separate variable condenser, controlled by separate knobs, and for this reason sets were sometimes difficult to operate. Nowadays, however, the condensers are usually ganged together, both sets of moving vanes being rotated by the same knob.

Now to receive a signal properly, it is necessary for both circuits to be accurately tuned to the wavelength being received. Provided you have two coils with exactly the same inductance, and a two-gang condenser whose sections give identical capacities at all settings of the movement you would think that everything should be quite easy. Things are not quite so simple, however. Before the coils and condensers can be of any use, other component parts have to be connected to them, as well as valves, aerial and earth. The trouble is that all these things, including the leads connecting them, have both inductance and capacity themselves. Fortunately the inductance happens to be so small that we need not worry about it. This capacity, however, although admittedly small, is sufficient to alter the tuning slightly. This would not really matter if it altered the tuning of both circuits to the same extent, so that they still kept in tune with one another. This very rarely happens, and since we cannot eliminate this added or "stray" capacity, the only thing we can do is to make it equal in both circuits, and this is what the trimmers are for. These consist of very small variable condensers connected across each of the main tuning condensers. Now supposing the detector circuit has less stray capacity than the aerial circuit; then what we need to do is to add some capacity to it by means of its trimmer, until the total capacity is the same in both circuits. If, on the other hand, the aerial circuit has less strays than the other, we must add capacity to it. It is not necessary for one trimmer to be set at zero while the other is making up the deficiency of capacity in its circuit. As long as we can equalise the capacities, it does not matter if we raise the total capacity of both circuits.

The actual process of trimming is extremely simple. If you remove the cover from the condenser you will see that the trimmers each consist of a small metal plate fixed to the frame but insulated from it by a thin sheet of mica. The aerial circuit trimmer is at the front and operated by the small front knob, while the detector circuit trimmer is at the back, operated by the small star wheel. The capacities are increased by bringing the plates closer to the frame.

Set both trimmers about half open and replace the cover. Now tune in a station near the lower end of the scale by means of the main tuning knob. It will be possible to tune in approximately, even though you have not yet made any adjustments to the trimmers. The reason for choosing a station at the lower end of the scale is that the trimmers then form a larger proportion of the total capacity, and the adjustment can be done with greater accuracy. Use plenty of reaction so that the tuning point is determined mainly by the detector circuit (since it is to this circuit that reaction is applied). Now adjust the front trimmer for loudest signals. It may happen when doing this that the signals disappear with a plop, indicating that the set has burst into oscillation. If this does happen, reduce the reaction slightly until it stops. Incidentally this oscillation usually occurs just when the two circuits are brought into tune with each other, and therefore forms a useful rough indication of this condition.

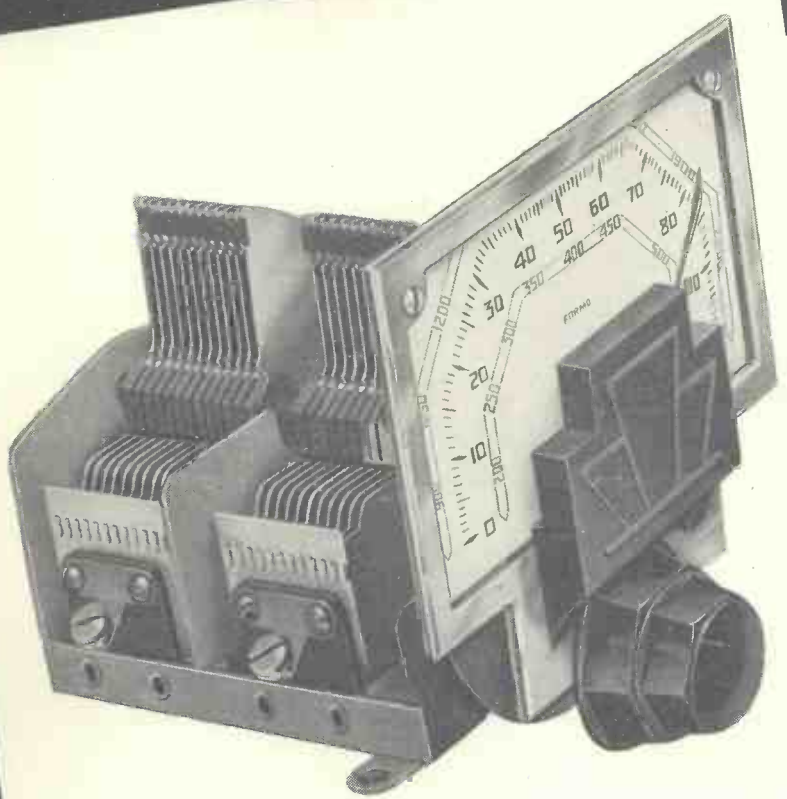
It is best to arrange matters so that the front trimmer is about half-way open when properly tuned. If you find that it has to be almost completely open, or you cannot open it enough, screw up the back trimmer a little and re-tune. If you have to screw up the back trimmer completely to obtain proper control on the front trimmer, this means that the capacity added by the aerial-earth system is excessive, due to having a large aerial close to the ground, trees, roofs, etc., or possibly also a long earth lead. A Formo-densor type J (.0003 mfd. max.) connected in the aerial lead is almost certain to prevent this trouble, but if it does occur even under these circumstances unscrew the Formo-densor, adjusting knob a little and also the back trimmer.

Now, having done all this you may find that the wavelengths received do not correspond exactly with those indicated by the dial; this can easily be corrected as follows:—If the dial reads too high, close both trimmers slightly; if too low, open both trimmers slightly, but re-gang after any adjustment.

Do not forget that any alterations you may make to the set, or to the aerial-earth system, may alter the ganging adjustments. If for example at some future date you increase the length of your aerial it will be necessary to open the front trimmer a little to allow for the increase in added aerial capacity. This may bring it too near the fully open position for convenient adjustment, but this may easily be remedied as described above, either by screwing up the back trimmer slightly or by unscrewing the Formo-densor a little. A change of valves may also affect matters slightly.

In some receivers the addition of Pick-up leads, one of which is permanently connected to the grid of the detector valve, would increase the capacity in the detector circuit, and it would then be necessary to reduce the setting of the back trimmer. However, in the Contact sets described in this issue this is not necessary, as the Pick-up is completely isolated from the detector valve when it is not used.

Precision-Tested Condensers of Advance Design & Quality !



FORMO TWO-GANG CONDENSER

Constructed on really robust lines and with a minimum of dielectric in the static field, thus reducing losses to a negligable quantity.

For convenience in matching adjustable trimmers are provided in both sections.

The escutcheon of the "Mystic" Drive (which requires no special panel cut-out) is of extremely handsome design, combining chromium and bakelite in a most artistic manner. The front bakelite cover is instantly removable to enable replacements of the illuminating bulb to be effected without trouble.

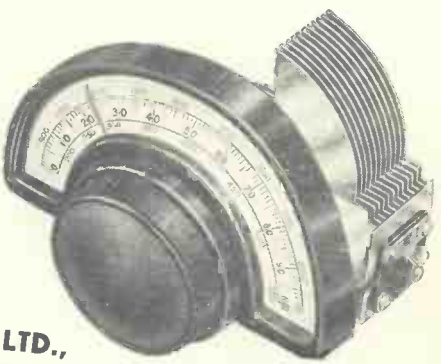
The new Formo dreadnought grey finish has been applied to the heavy steel frame and dust cover, while the flood-lit tuning scale is engraved in two colours.

Two-gang Condenser, complete with Chrome and Bakelite full-vision flood-lit drive. PRICE **11/-**

Dust cover to match. extra **1/6**

FORMO Type SU5 SINGLE UNIT TUNING CONDENSER

A really substantial Slow Motion Condenser, supplied complete with full-vision "Mystic" Drive which requires no special panel cut-out. Simplicity of mounting is its keynote, yet the appearance is such that it will be an ornament to any receiver.
The Condenser has an all-steel frame of most rigid design. whilst the slow motion device is of hardened and ground steel friction surfaces. The losses on this Condenser are extraordinarily low and, in consequence, a sharpness of tuning is obtainable which noticeably improves the results from any set.
The Condenser is finished in dreadnought grey.
The full-vision floodlit scale of the "Mystic" drive is engraved in dual colours for degrees and wavelengths.
·0005 mfd. capacity with "Mystic" Drive - - - **6/6**



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FORMO PRODUCTS, LTD.,
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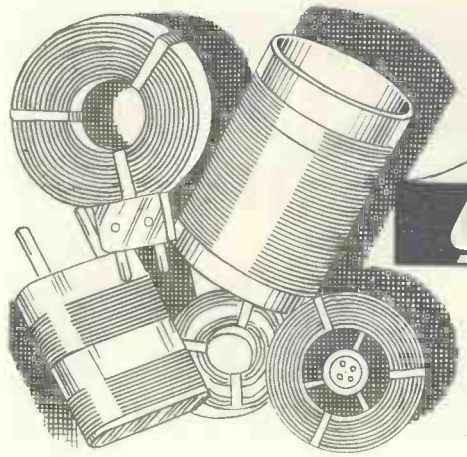
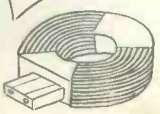


REPLACE your obsolete COILS



POSSIBLY the greatest bugbear—and at the same time the greatest interest—in radio is—obsolescence. The set of a year ago is —well, not *quite* what you would like it to be—not quite as good as the one next door—lacking in some detail, unimportant at first sight, but which nevertheless grows on one, as one realises what a difference it makes to programme enjoyment. "That little more—and how much it is!"

This is only one of the directions in which the home constructor scores over his less enterprising neighbour who buys a factory-built set. Whereas the latter must usually scrap his set or trade it in for next to nothing as soon as it gets too obsolete to be tolerated, the home constructor can, by a few inexpensive touches, bring his old favourite right up-to-date, and derive renewed pleasure from his hobby.

Have you ever stopped to consider what part of your set it is that becomes obsolete soonest? Up to a few years ago the changes were rung fairly evenly over the set, variable condensers, transformers, valves, speakers, cabinets, and so on. All were in a state of flux, and very little of a two-year-old set was fit for use in a new circuit. But I venture to suggest that over the last two or three years, at least, it has been coils that have needed changing whilst the rest of the set was still quite serviceable. Improvements in coil design have continued steadily.

First we had plug-in coils in great variety; then the first dual range coils, bulky affairs wound on big tubes. Then neater (but still clumsy by modern standards) editions of the last on moulded bakelite formers, which later had some sort of switching incorporated. All these were open and innocent of screening of any kind. When any screening was necessary, ugly biscuit tin erections had to be resorted to. This led to the first canned coils, where progress stood still for a while, until the "dust-iron" core was introduced, which put all previous standards of performance in the background.

To-day a set without iron-cored coils, and by that I mean the latest and best type of iron-cored coils, is definitely out of date. And this is the reason.

THE CALL FOR SELECTIVITY.

It is safe to say that the predominating advances in radio design and construction in recent years have centred on the H.F. side. That is to say, that the reception and selection of stations has been the problem which has received greatest attention. Although considerable improvements have come about with regard to quality of reproduction from battery valves, it is the ability to receive and separate more stations which has shown rapid and continuous advance. Probably the main reason for concentration on this section of radio science has been the general increase in power of broadcasting stations. The first effect of these increases was to bring within receiving range a larger number of stations. This apparently desirable result was soon offset by the realisation that although in some parts of the waveband one or two new programmes were readily and consistently obtained, the general result was that fewer programmes could be enjoyed without a background of interference from other stations.

One temporary palliative which was seized upon by many sufferers was to cut down the input to their receivers by inserting a condenser of some description in their aerial lead. This had a twofold effect. Although it reduced the volume from the wanted station, the latter was still usually quite loud enough for programme value, whereas the corresponding reduction in the strength of the unwanted station often reduced the interference below audible level, so that it could only be heard while the wanted station was silent.

But apart from this overall reduction of input, the series condenser has another effect —the reduction of aerial damping, sometimes called loading, which is dealt with more fully in the paragraph on losses, and this was often the real cause of the improvement. Very soon it was realised that these expedients were limited in their usefulness, and it became necessary to get down to the root of the problem—selectivity. It is generally realised that selectivity depends on the number and efficiency of the tuned circuits in a receiver; and the efficiency of a tuned circuit depends on the design of the *Coil*. This is where the designers' problems begin.

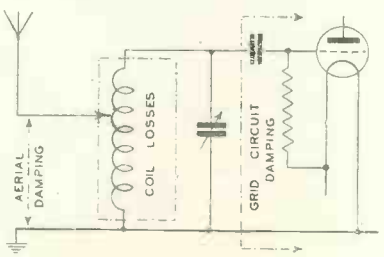


Fig. 1

COIL DESIGN.

It may be of interest to follow the question of coil construction a little way along the path of the designer.

The first and obvious requirement of a coil is that it must tune over the required waveband in conjunction with a variable condenser of given value—which is another way of saying that it must have a certain inductance.

This decides the relation between the diameter of the coil and the number of turns of the main winding. From the accumulated results of much experiment, the best relation for an air-cored or iron-cored coil can be determined. Now here is where the iron-cored coil scores. The inductance per turn on a dust-iron core of quite small diameter is equal to that on an air-core (or hollow tube) of quite formidable dimensions, so that although the winding diameter of the iron-cored coil is only a fraction of the other, the number of turns is also reasonably small, and therefore the *length of wire* needed is very much smaller. It is easy to see how the H.F. resistance of the winding is very considerably reduced. Moreover, since the bulk of metal in the wire is so small, what is known as "copper loss" is also cut down in proportion. It is true that against these gains we must set the new introduction of iron loss, but where by proper design this is kept down to a negligible amount, the iron-cored coil wins all along the line.

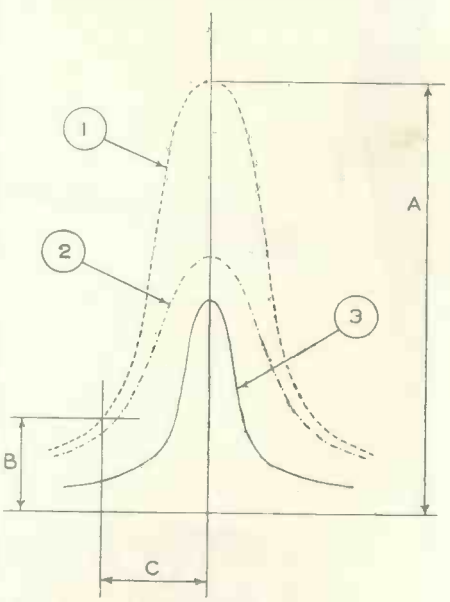


Fig. 2

COIL LOSSES.

What else can the designer do to keep down to a minimum the losses inherent in any coil? Let us consider the wire. If a thicker wire is used, the H.F. resistance will be reduced, but the "copper loss" will go up. Since the

high frequency currents travel almost entirely on the surface of the wire, we must aim at increasing surface without increasing bulk. This can be done by using Litzendraht (as on the Formo Sensity Coil), which is made of a large number of fine strands, about the thickness of a human hair, each one insulated from the other by a microscopic coating of enamel. This, then, further cuts down the H.F. loss without any compensating disadvantage.

What other losses must we take into account? There is the very serious matter of the insulation. Wire must be wound on a former or bobbin of some sort, and unless we are careful, the losses here will nullify all our good work. Most coils employ a former of some bakelite compound, but in the Formo Sensity Coil a new material called Trolitul is employed, which has rather remarkable properties. Similar to celluloid in appearance, it is of quite different chemical structure. Electrically, it is one of the best insulators known from a high frequency point of view. Its power factor is actually better than that of fused quartz, and is only topped by a few rare minerals such as mica and raw quartz, and some of the ceramics recently developed for ultra-short wave work. Moreover, its dielectric constant is lower than those of any of these high-grade insulating materials.

It is particularly important that the material of which the coil is wound should introduce as little loss as possible, but it is also desirable to keep down the losses in the material surrounding the terminals. For this reason Steatite is used for the coil base on the individual Sensity Coils, whereas on the twin coil unit high grade ebonite is used, the quantity in the electrostatic field being kept small.

We have seen the steps taken to minimise losses throughout the coil, and we have now a tuned circuit of really remarkable efficiency. If that were the end of the matter we should not have much worry about selectivity, but unfortunately coil damping does not arise solely from within the coil.

EXTERNAL LOSSES.

Fig. 1 shows in rough diagrammatic form how the tuned circuit is "damped" down by losses occurring (1) within itself; (2) in the proceeding circuit (here shown as an aerial); (3) in the succeeding circuit, in this case a grid detector with tuning condenser and grid leak.

It is of little use to minimise (1) if we allow the result to be swamped by (2) and (3).

Dealing with the grid circuit first, as being the less serious, all the components mentioned can introduce appreciable loss. However, if the insulating materials used are of reasonably good quality, and the grid leak has not too low a value, the damping is not serious.

All these losses affect the results in the same direction. If curve 1 in Fig. 2 represents the response curve of the undamped coil, curve 2 shows the effect of losses in the aerial and other associated circuits. It will be seen that not only is the peak of the curve lowered, which means that the voltage developed across the coil is reduced, but the skirt of the curve is now wider in proportion to its height, which means that selectivity has been impaired. The degree of selectivity is indicated by the ratio of skirt width to peak height. (A) represents the voltage induced in the coil by the signal to which the circuit is tuned, and (B) represents the voltage induced by an interfering signal of frequency (or wavelength) difference indicated by (C). If (B) is to be, say, 1-10th of (A) in order to be just audible, then the width (C), in relation to (A) corresponds to the band width over which interference would be objectionable, often called "station spread."

Now we can reduce the "spreading" effect of aerial damping by two methods. One method, as we have seen, is to reduce in effect the aerial dimensions by putting a series condenser in circuit. Another, and better method is to reduce the coupling of the aerial circuit in the coil. This may be done by tapping down the coil (Fig. 1), or by using a separate (primary) winding (Fig. 4), which is preferable. The effect of these is again to lower the peak somewhat (curve 3, Fig. 2), but also to sharpen it up considerably, i.e., to improve the peak-skirt ratio, and therefore

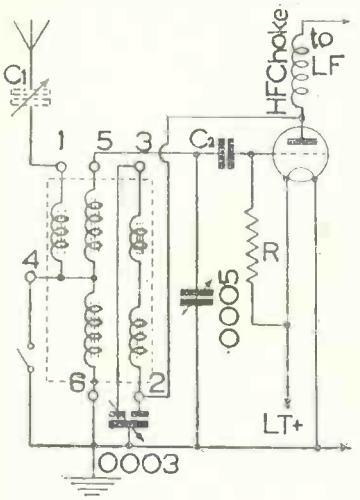


Fig. 3

restore selectivity. Now there is a best compromise for a given coil and aerial, above which we lose selectivity unduly and below which we lose "punch" unduly. In the case of the Sensity Coil much experiment was undergone to find this best point with an average aerial. Unfortunately aerials vary considerably, and therefore a compromise was adopted suitable to a good aerial, i.e., one not too long and well insulated, with fairly low damping. This winding would be too closely coupled for a long and inefficient aerial, so that if such a one is unavoidable, the balance may be restored by inserting a series condenser between it and the coil.

The problem in the design of coils for the intervalve positions is a little more complex, but as regards selectivity the tendency is the same. Here the anode circuit takes the place of the aerial. By reducing the coupling we sharpen up tuning, but also lose amplification. Various factors such as anode impedance and step-up ratio complicate the theory, but again an optimum point has to be found. The use of a low-loss coil enables this best coupling ratio to be more favourable than if the coil has normal losses. Where two coils are used, the overall selectivity must be considered in conjunction with the fact that an extra stage of amplification is in use, and that only one of the coils will have reaction applied, usually the intervalve coil.

SWITCHING.

The designer's work is not finished without fullest investigation of reaction windings and waveband switching. The best reaction winding for both wavebands under normal circuit conditions must be found. Further, having settled the best winding ratios as above for each waveband, the results must be combined on a coil with a reasonable number of terminals, and practicable switching arrangements.

On the Sensity Coils (sold in single units or matched pairs) the switching arrangements are simple, and enable waveband switching to be carried out with a minimum of wiring and complication. In fact, the two coils of a matched pair are switched by a single three-point Snap switch, which may be mounted conveniently near and connected by two wires only.

On the Sensity Twin Coil unit, the construction allows of comprehensive switching which gives the designer free rein with his winding arrangements, and full advantage has been taken of this latitude. Complete separate primary windings are used on both coils.

CHOICE OF TYPES.

Having realised that the coil is the heart of the receiver, and considered the rejuvenation of your (or your friend's) receiver, do not be deterred by any imaginary difficulties in fitting new coils. People frequently write in asking whether Sensity Coils are suitable for this or that circuit. Of course they are. There has been a certain air of mystery surrounding coil types which is quite unnecessary. For any "straight" set (by which I mean excluding superhets only), there is a suitable arrangement of Sensity Coils, and the selection is quite simple. It does not matter whether your receiver is home built or factory built, unless it is of the type where a tin-opener is necessary to get at anything, when you may justifiably fight shy of the mechanical problems involved.

If your set is of the single-tuned-circuit type, such as the ever popular "detector and two L.F.," where only one coil is employed, you require a type A.1. This contains the necessary reaction winding, and is designed for this type of circuit. Switching is effected by a single two-point switch, and connecting up according to the instructions supplied is simplicity itself.

If your set employs a stage of H.F., as in the screen-grid-detector-L.F. type, you have a choice of two alternatives. You may either fit a matched pair of Sensity Coils, or a twin-coil unit with switching incorporated. You may well let the switching decide the matter. If the twin coil unit cannot be mounted without spoiling the symmetry of your controls, you may prefer the matched pair, and use either an existing switch, or mount the necessary three-point switch in a position which fits in with your panel layout.

A matched pair comprises a type T.1 and a P.P.1, which have been specially designed for the purpose. You will not get the same results with two type A.1 Coils, even if they "gang up" properly. Although the circuit is similar, and the set will therefore work with them, the windings are not the same.

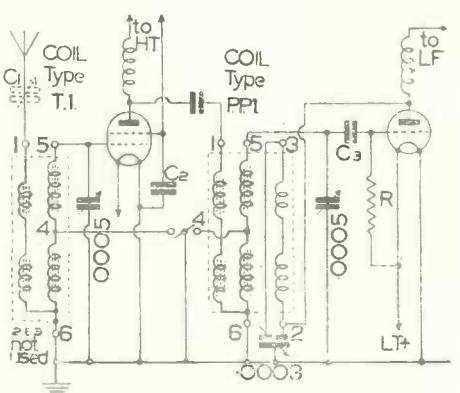


Fig. 4

Type P.P.1, which is the intervalve coil, must be fed by a choke and coupling condenser, as shown (Fig. 4).

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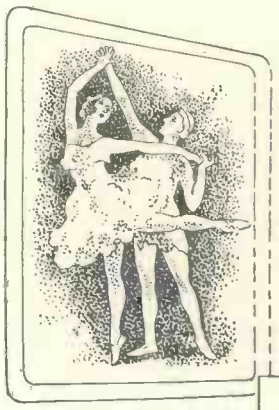


Short waves and TELEVISION

NOTES ON RECENT DEVELOPMENTS

DURING the past few years hot television news has been repeatedly slapped into the front page headlines of the more sensational daily newspapers indicating that television had, at last, arrived. The spasmodic nature of these sudden announcements must have led the public to believe that the papers concerned are merely making a shot in the dark in the optimistic hope that their news might luckily tally with statements from a more authoritative source. Invariably the true facts have been misrepresented or embellished to make the articles as sensational as possible—such is journalism!

Bearing in mind the report presented to the Postmaster-General by the Post Office Committee on Television, and having also a certain experience of the development of television behind the scenes over the past few years, let us try to present to you an entirely unbiassed view of the present position of television and as it will affect you.

Many technical and manufacturing problems have yet to be overcome, and there is not the slightest doubt that television is still not in a form suitable for general public use. Even at the time this article is written it *is* possible to purchase a televisor and to have it installed in your home ready for the reception of television transmissions. The cost of such a receiving instrument must represent a comparatively large sum of money. One might argue that a broadcast receiver in the early days of sound broadcast also cost a very large sum when compared with present day prices, but at least listeners were, even in those days, given a 10 or 12 hour service. With television this is not the case. Your present day televisor can only be used for a very limited period on certain days of the week. Secondly, the programmes received are extremely limited in variety, and are apt to become monotonous after the first interest has flagged. Furthermore, the instrument upon which so much money has been spent will, without the slightest doubt, be quite obsolete in the very near future. This latter is due to its poor definition and limited scope in comparison with the results now being obtained in the experimental laboratories, and which will be available to the public at an earlier date than you probably imagine at the moment.

It is not disputed that, technically, television has arrived and is now an established fact. Nevertheless much has to be accomplished before "looking in" can be made a hobby for the million. There are still, as there have been for several years past, a number of scientific and manufacturing obstacles hindering rapid development, but the commencement of the erection of the first of the B.B.C. Television Transmitting Stations is a real step in the right direction, and since it has official blessing it is safe to say that further developments will rapidly follow.

Another move forward of the greatest importance, not yet fully realised by the public, is the introduction and development of the Electronic Gun or Cathode Ray tube. The limited space at my disposal makes it impossible to fully describe this invention in these columns, but its importance, which is probably parallel with the introduction of the thermionic valve in the early days of broadcasting, cannot be too greatly stressed, and I would advise all my readers to study the specifications now available from many of the radio valve manufacturers.

Television, then, will be largely a matter of suitable receiving apparatus, and it is with reception that we are most concerned. Assume that the television transmitting station is installed and a service put into operation, how can you begin to make use of it? First you will require a receiver capable of tuning to the wavelengths of the new transmissions, which will operate between six and seven metres. This much is necessary to receive anything at all. Secondly, the Low Frequency amplifying qualities of this receiver will have to be of a very high order. Its frequency response must be almost dead level between a range of 30 cycles and one million cycles. This range of frequencies is abnormal for ordinary broadcast apparatus, but it is absolutely essential for clear and high definition of television reception. There is no doubt that at the next Radio Exhibition television receivers will be on sale. Having in mind the high prices that will be charged, and the rapidity with which they will become obsolete, there is every reason to suppose that the home constructor will be in a very advantageous position. Not only will the initial outlay on your set be considerably lower than a factory-built article, but keeping your set up-to-date as television technique progresses will be a comparatively simple and inexpensive matter.

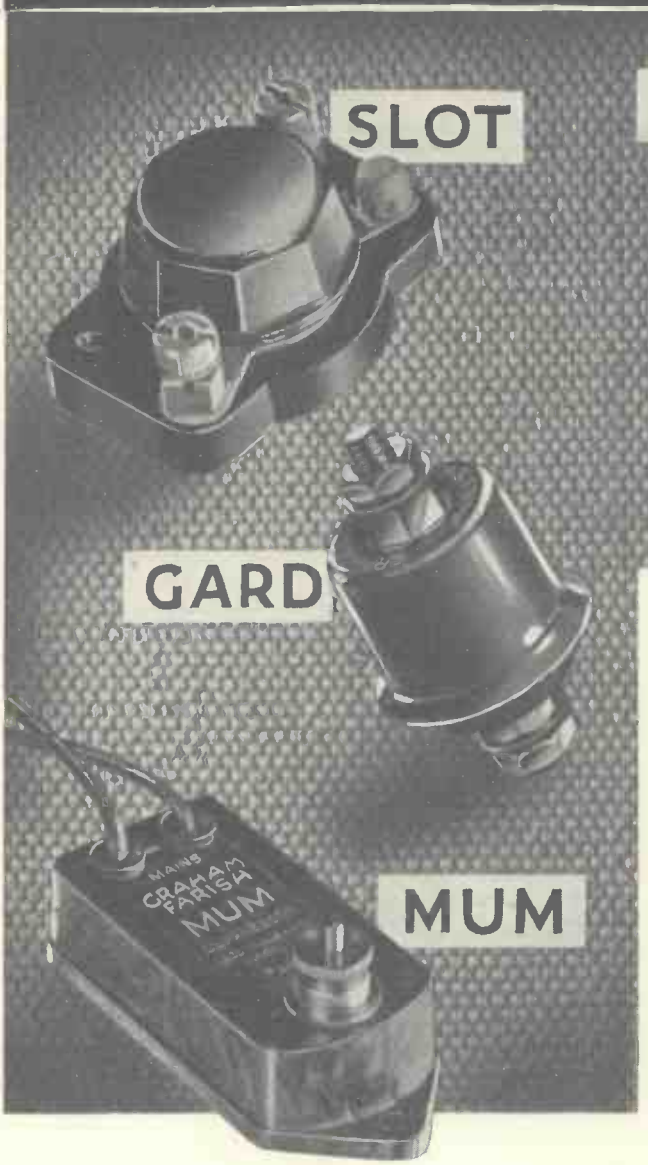
The ultra short waves need cause you no undue alarm. This magazine will, during following issues, proceed gradually to the requirements of television and will develop ultra short wave receivers suitable for the constructor. It is possible that the designs will not go directly to the frequencies desired, but will be capable of modification at very little cost, to go down ultimately to the required wavelength.

Although reception on the ultra short wavelengths is not quite such a simple matter as on the medium and long wave broadcast bands, the construction of the necessary receiver is even less involved. Already the Formo people have been good enough to show me many of their designs and models for ultra short wave components, and if their future designs are based on similar lines then home constructors can look forward to a hobby far surpassing in interest anything hitherto achieved. Already the possibilities of home constructed televisors are fast becoming certainties. The flexibility, economy, and ease of service of the home constructed receiver, as in radio, will keep the owner in line with the rapid improvement and development of television.

Before mass production can be made possible stability of design must exist, and who can dare prophesy such a state during the first 12 months? If I might risk a prophesy I would say that short wave double-channel receivers designed for home construction will be available at a very early date, while the components necessary for high definition amplification will follow in the natural sequence of events.

GRAHAM FARISH

WIRELESSENTIALS



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Imitated, but never equalled, FILT improves reception, often to an astonishing degree, by providing an Earth that is 100% efficient.
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This famous quartette is virtually a necessity to every listener who would get the utmost from his Set—whatever its make or type. FILT provides that vital factor—an earth that is 100% efficient. SLOT increases Selectivity and filters out unwanted Stations. MUM minimises the bug-bear of Mains noises, and GARD AUTOMATIC LIGHTNING ARRESTER is a safeguard that no aerial should lack. These products cost but a trifle to buy yet so well proved is their value that thousands are installed every week.

MUM INTERFERENCE SUPPRESSOR

Telephones, domestic electrical devices, Trains, Trams—they all aggravate mains disturbance and spoil Radio reception. MUM is the cure ! MUM is inexpensive, it's easy to fit, but it effects an amazing improvement in reception. Easily fitted by the veriest novice. **2/-**

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The price of a GARD Automatic is a trifle to pay for **permanent** lightning protection. No need to worry with GARD on guard—no need ever to switch off. Clip GARD to your aerial lead-in, forget the lightning, enjoy your radio throughout the storm. Every GARD is flash-tested and carries a £200 GUARANTEE. **2/-**
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MAINS SUPPRESSION

THE radio reception obtained by many listeners is still, quite unnecessarily, marred by unpleasant extraneous noises due to electrical interference caused by all types of electrical wiring and apparatus such as Trams, Trains, Neon signs, Fans, Vacuum cleaners, etc.

The noises usually take the form of crackles, bangs, sizzles, etc., and are quite distinct from atmospheric static.

The majority of listeners suffer this form of interference with a kind of helpless indignation and assume that little can be done to rectify the trouble, or alternatively if it can be cured, such a cure is expensive and a troublesome business. This is definitely wrong, however, and in the majority of cases elimination can be effected at a small cost and the use of a little common sense.

Before fitting any kind of Suppressor a slight understanding of the causes of mains interference is necessary so that the problem can be attacked in an intelligent and logical way.

Interference takes many forms and is of rather an intangible nature, so that a method that will cure one form may be entirely useless for another. You have probably noticed that the breaking of electrical circuits, such as switching off a light, causes a sound in the receiver, and you can readily understand that any loose contacts in an electrical circuit, even though they do not reveal themselves by fluctuation of light or other visible means, can cause a considerable amount of interference, particularly when traffic vibration is severe. The obvious thing to do first is to examine closely all points of contact, such as fuses, switches, lamp sockets, lamps, plugs and sockets, ceiling roses etc., and their associated screw connections and see they are tight.

A point often overlooked is also the earthing contact which earths the wire casing or metal tube conduit. This clip is usually installed close to the meter and is shown in Fig. 3.

The medium by which interference can reach the radio receiver can be divided roughly into three classes as follows:—

Class 1.—The mains wiring acting as a direct carrier of interference through the mains connections to the set.

Class 2.—The mains wiring acting as a radiating aerial for the transmission of interference. This type of radiation can be experienced up to a distance of 50 feet, especially when the wiring is not cased, or the casing is not efficiently earthed.

Class 3.—Radiated external interference picked up by the aerial and earth.

We are fortunate in as much as there has recently been marketed by Messrs. Graham Farish a compact and neat suppressor which, while it fulfils its function efficiently, can be purchased for only 2s. Since this type will, in the majority of cases, cure interference, and is the type of Suppressor recommended by the G.P.O., we will give a few hints as to its uses.

Class 1 is usually the easiest form of interference to cure and Fig. 1 illustrates the usual type of socket used to connect a wireless receiver to the electric mains. It is sufficient to connect the earth terminal of the Mum Suppressor to the earth wire utilised for earthing the receiver, but generally it is found advantageous to use a separate earth entirely. An important point to remember is that all the connecting leads to the Suppressor must be kept as short as possible. To this end the "Mum" is only supplied with short leads, and additional lengths should be avoided. The earth wire should also be as short as possible.

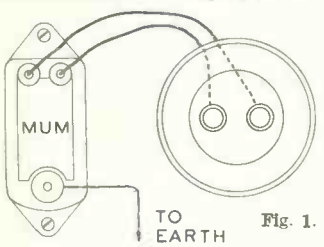

Fig. 1.

If it is found that the above arrangement partly eliminates the interference, but not entirely, it may be assumed that either (*a*) extra Suppressors are required, or (*b*) the interference also consists of one or both of the other two classes.

In the case of (*a*) an extra Mum Suppressor can be added as shown in Fig. 2. In case (*b*) it is advisable to leave the Suppressor in position and fit a further one as described for Class 2. If the interference is not affected in any way the Suppressor can be removed and the instructions under the second class followed.

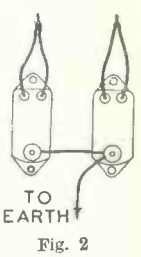

Fig. 2

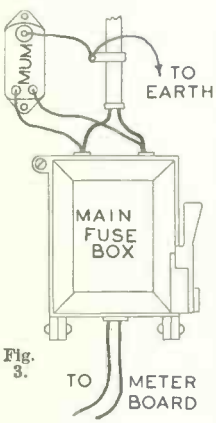

Fig. 3.

Class 2. This class is a little more difficult to cure, but if intelligently undertaken much can be achieved. Fig. 3 illustrates the apparatus found in practically every modern installation. It consists of the sealed mains (or Company's fuses) which must not under any circumstances be interfered with. The wiring then goes to the meter and then on to the main fuse and switch box. It is on the house wiring side of this box that the Suppressor should be fitted. Shutting off the main switch enables you to open the box in which two fuses side by side are placed. Removing these fuses will make accessible the two terminals, and it is to these that the house wiring is connected. Unscrew these terminals and insert one of the Mum wires in each one and tighten up again, making sure that the wires are securely held under the screws. The earth terminal should now be connected with as short a wire as possible to the earth clip used to earth the outer casing of the wiring, as shown in the diagram. If for any reason the earth wire is connected while the current is switched on, a small spark may be observed, but this can be regarded as normal. It should be emphasised that the wires connecting the Suppressor to the mains should NOT be interfered with when the mains switch is ON. Fig. 4 illustrates another type of fuse box and switch which exists in the older type of installations, and a similar procedure can be carried out, the illustration showing where the Suppressor is joined. If there are a number of distribution, or fuse boxes (illustrated in Fig. 5) placed in different parts of the building, then it is advisable to fit a Suppressor to each individual box, making sure that the main switch controlling the box is switched OFF before fitting. This method should

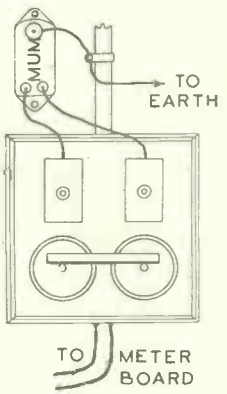

Fig. 4.

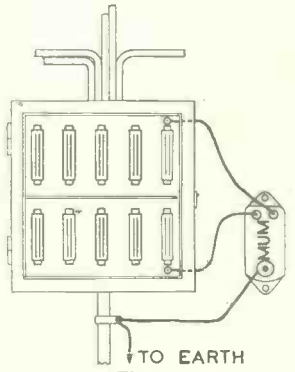

Fig. 5.

effectively cure the interference due to causes coming under Class 2. If the cure is only

Continued on page 52, column 1.

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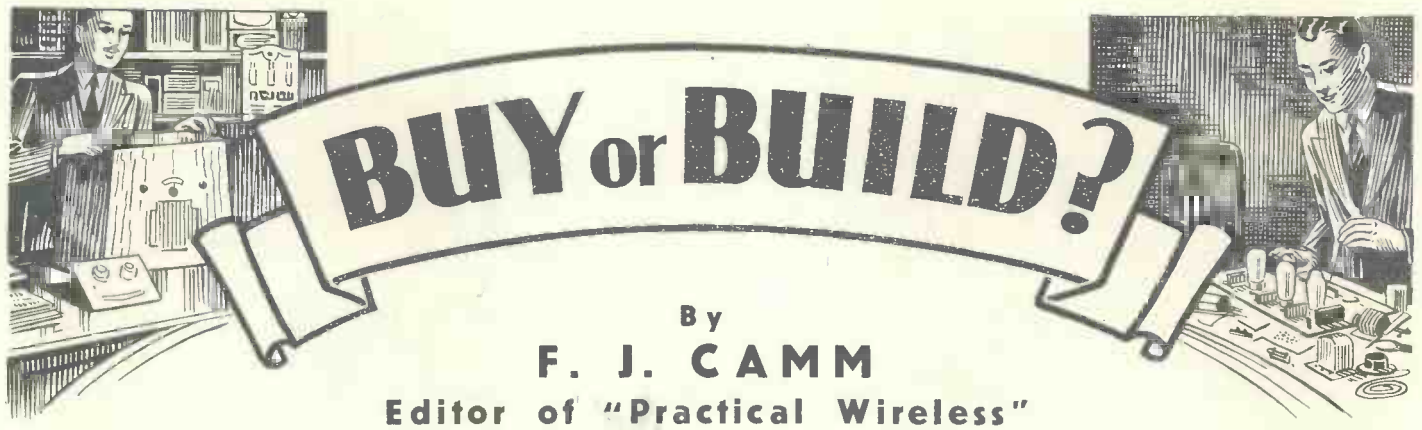


BUY or BUILD?

By
F. J. CAMM
Editor of "Practical Wireless"

I find it a refreshing experience for once to find myself in the position of *a* contributor to instead of *the* contributed to. I know that this article is going to be eagerly scrutinised by *your* editor and I have a premonition that his wand of office—the blue pencil—will slash some of my choice paragraphs with perhaps even greater avidity than mine! The Editor, however, has a duty to perform to his readers and I do not in the least object to being sub-edited, but in accepting his offer to contribute to CONTACT, I am assailed by the same feelings of hope and doubt which must assail every contributor.

However, I am not going to violate my chances in the future by indulging in a lengthy preamble, and I will proceed to dive into the subject—the inviting subject which the title implies. To buy or to build? I cannot refrain from apostrophising the famous Shakespearian phrase (and thereby risk incurring the wrathful displeasure of many set manufacturers) by suggesting that the problem resolves itself into this: "Whether 'tis better to the mind to build a set and bear the slings and arrows of outrageous fortune, or to buy a set and take up arms against a sea of trouble!" Shakespeare, having suitably turned in his grave, I will further suggest that this adaptation is not far from the mark; mind you I make qualifications and reservations.

There are many excellent commercial receivers on the market of impeccable quality, which will do all that the makers claim for them. We cannot deny that there is a large market for commercial receivers. There must always be, for the very good reason that many thousands have neither the time, the inclination, nor even the necessary ability to make a receiver from a blueprint.

HOME-BUILT SETS STILL POPULAR

But hundreds of thousands of people continue after twelve years of radio to build receivers and there must therefore be a very sound reason for this. If we find the reason we have answered the question asked by the title. Many will suggest that home constructors are so impecunious that they make a set in the hope that they will have radio at a cheaper price than if they purchased a ready-made receiver. This might be so in a few cases, but I do not conceive that it is the real reason, because anyone may now purchase a receiver and components to make them on hire-purchase terms.

Others may suggest that it is possibly because these thousands of constructors have in the course of ten years accumulated sufficient components to be able to test out new circuit arrangements merely by purchasing one or two extra parts. Here again I think the reason is far from the point, for the fact is that few of the old components can now yield good service and cannot for a variety of technical reasons fit in with modern circuit design. Another reason which I have heard expressed is that people build sets to impress their friends. They like to swagger with a blueprint and appear to be very clever. I cannot believe that this vainglorious motive applies in many cases.

I am positive (and I am in a prime position to be able to judge) that most constructors build receivers because they can by that means enjoy superlatively better radio. They can enjoy the quality of a hand-made job and the sturdy reliability which alone can come from a hand-made job. Having built a receiver, a constructor, so to speak, knows his way about it. Any little defects which may occur he can immediately trace and remedy; as new ideas are produced he can cheaply try them out; he can select the best components for his purpose and buy them as he wants them. With many commercial receivers he may have to put up with a compromise. I do not suggest that commercial receiver manufacturers are offering poor value for money, but I do suggest that in mass producing receivers they must solve many problems in a manner best suited to manufacturing methods and not necessarily from the point of view of pure efficiency.

A HOBBY WITH A THRILL

The bald truth is that hundreds of thousands of readers continue to build receivers. Most of these readers could well afford to purchase a ready-made set and do not do so. If you are among the unconverted and have not yet built a wireless set, a fascination and a thrill you have not yet experienced awaits you. It is an intriguing experience, having built a receiver, to connect the aerial and earth and tune in. It provides you with one of the supreme moments of life, and I still (having built some hundreds of receivers), experience that same fascination as I did when many years ago, I tuned in morse on my first crystal set.

Conditions now are vastly changed. In the early days of radio the technical press created the interest in home construction. There was no industry to back it up, and readers had perforce laboriously to assemble every part of the set. There may be many readers of this journal who cannot recollect it, but it is a fact that constructors had to make their own variable condensers, transformers, and tuning coils. It does not pay them nowadays to do this, for there are many firms who have specialised on the manufacture of components and now produce them at a price which does not make it profitable to build them for yourself. There are still constructors who make these components, but they are highly technical experimenters equipped with expensive apparatus and one can scarcely include them in the field for which this journal caters.

Every conceivable component required for every conceivable circuit is now available—high quality components backed by the manufacturer's guarantee and by his service.

Earlier in this article I took the liberty of adapting Shakespeare. I mentioned the phrase "Sea of trouble." I hope that these random remarks have indicated that there is no sea of trouble, for the ocean of radio difficulties has been charted, the snags noted and eliminated. In asking the question, I hope I have supplied the answer, and if I may end on a high note it is this: The constructor often builds better than he knows; and in gathering together your components for any receiver which may be described in this paper you may rest assured that it is a far far better thing which you do now than you have ever done before—if you have never built a receiver before. Another famous poet will turn in his grave!

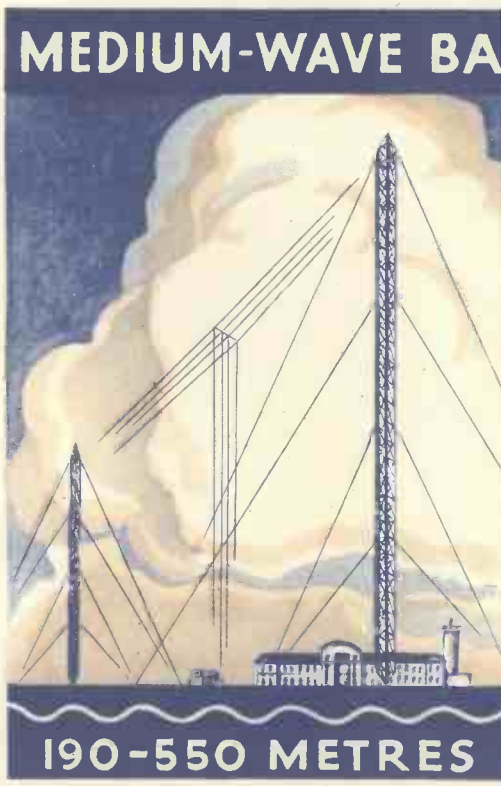
A symphony in
contour and colour.
A delight to the
eye and ear—

The "Sensily Super"

MONO-CONTROL

for

FILAMENT, MEDIUM-WAVE, LONG-WAVE and RADIOGRAMOPHONE

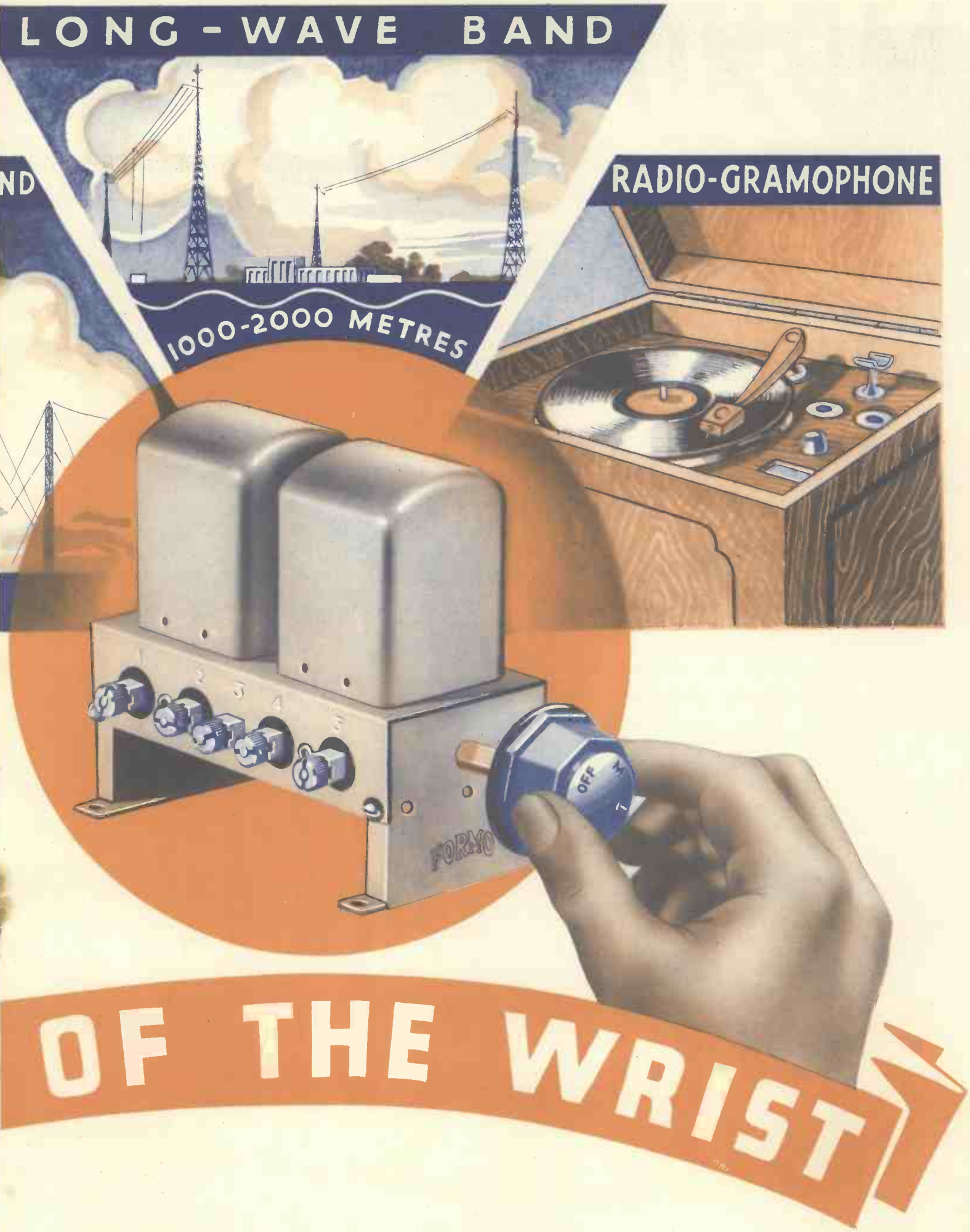


ONCE again modern receiver design goes hand in hand with the ingenuity of the coil designer. Pictorially we illustrate "Mono-Control" — incorporated in the "Sensity Super" and introduced to the home constructor for the first time.

Gone are the days of multitudinous controls, the crackling, hit-or-miss push-pull contact. Instead, one single rotary control does the work of three or more.

A turn of the wrist — a snappy, satisfying "click"! and your set jumps to action. The whole European net-work of broadcast stations is yours to command and if you tire of entertainment from the ether, if the colossal power at your finger tips fails to thrill you and hold your attention, then let the world's celebrities console you on gramophone records. They are on the same switch!

WITH A TURN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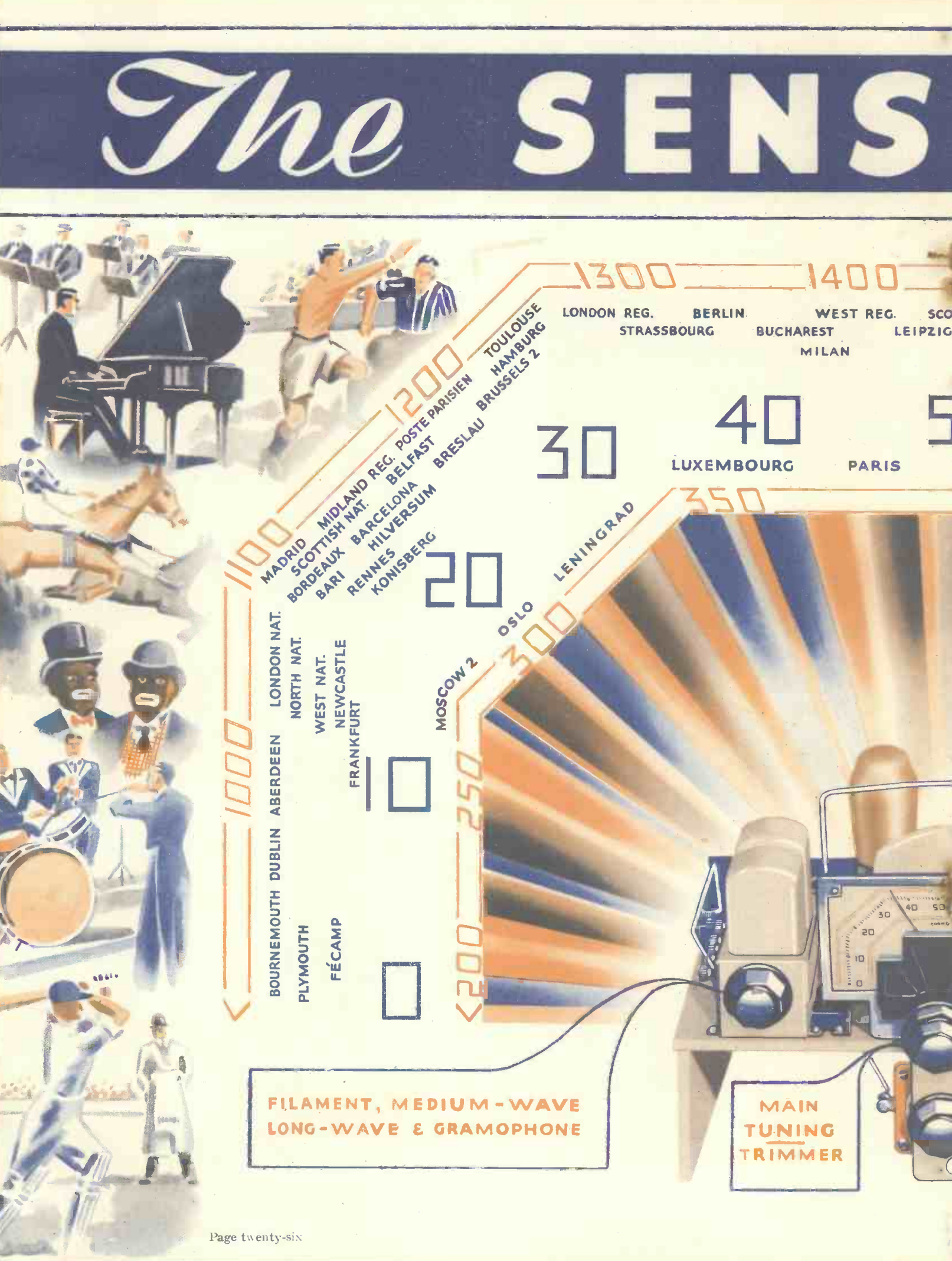
1000-2000 METRES
RADIO-GRAMOPHONE
OFF
OF THE WRIST

The SENS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NORTH NAT.
WEST NAT.
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FRANKFURT
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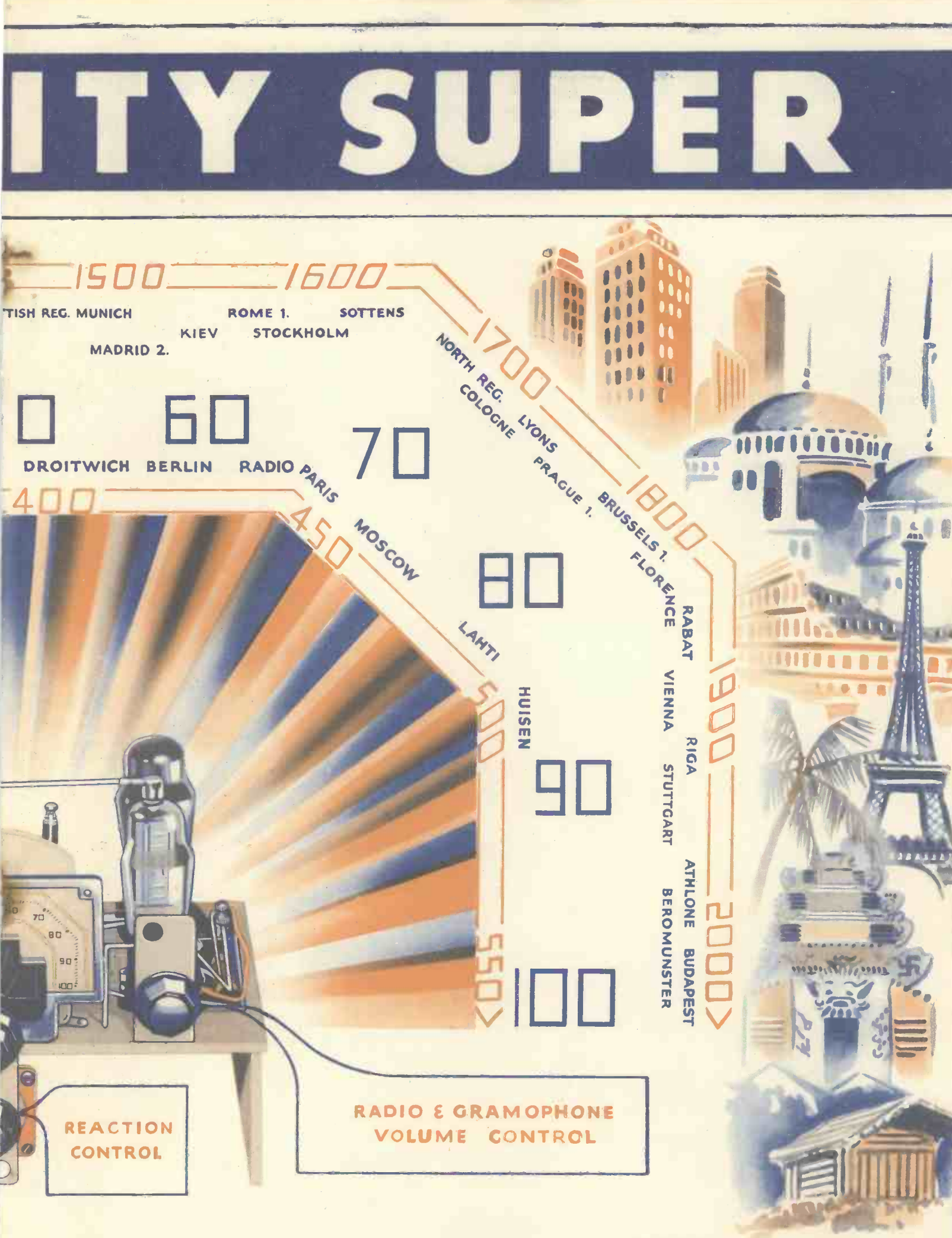
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VIENNA
RIGA
STUTTGART
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LAHTI
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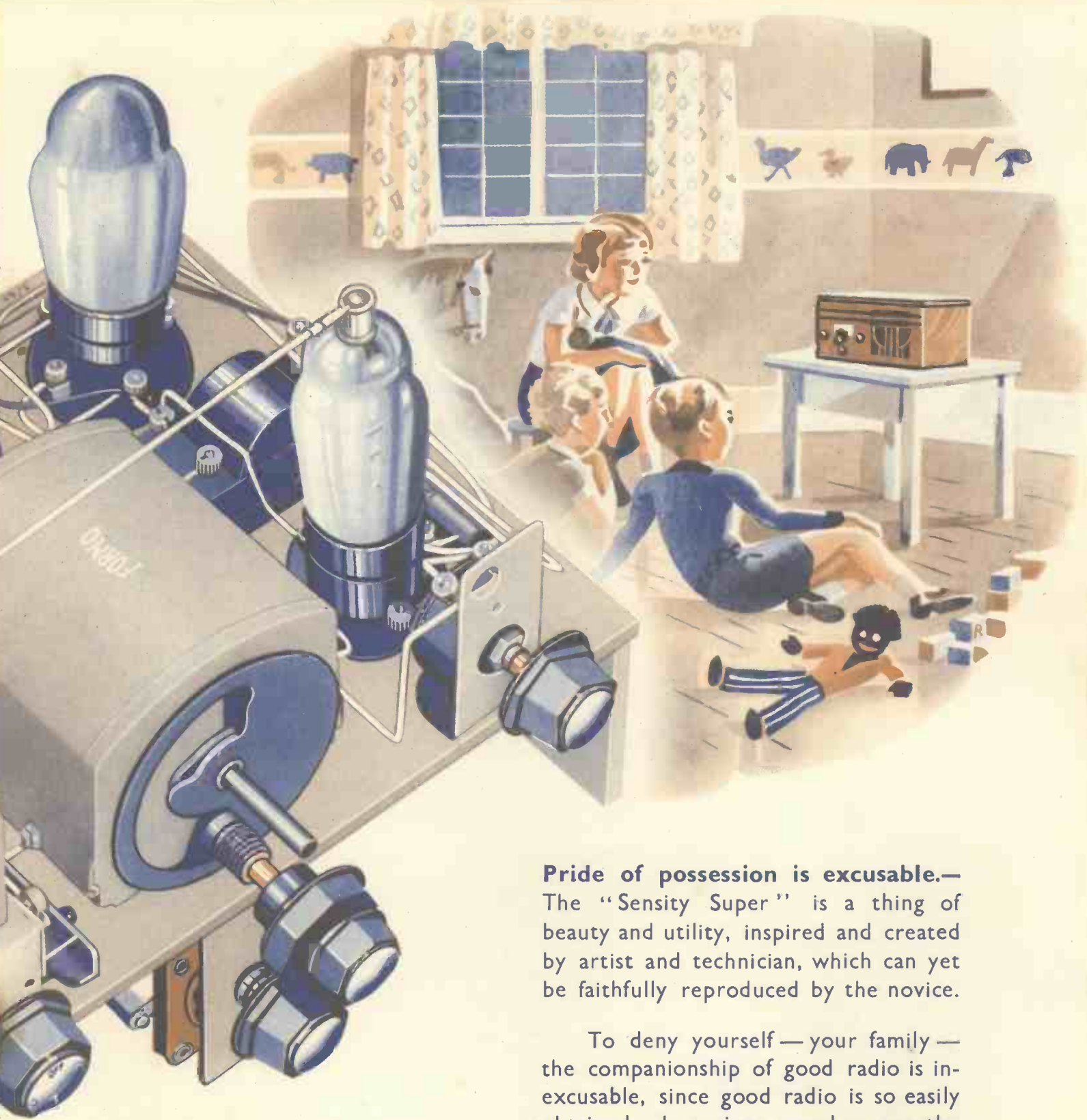
RADIO & GRAMOPHONE VOLUME CONTROL



The "Sensity Super" Chassis

Pride of possession is excusable.— The "Sensity Super" is a thing of beauty and utility, inspired and created by artist and technician, which can yet be faithfully reproduced by the novice.

To deny yourself — your family — the companionship of good radio is inexcusable, since good radio is so easily obtained. In serious mood or gay, the "Sensity Super" will fill those leisure hours—perfectly! Whether you are an experienced constructor, or whether this is your first attempt, you can easily build it in less than an evening. A screwdriver and a pair of pliers is all you need.

And now to begin!

Remember — "Well begun is half done." The urge to rush the job and switch on can be understood, but a little care taken in the initial stages may quite easily save disappointment and regrets later.

The "Sensity Super" constructional work is delightfully simple. The following pages describe each stage of wiring in clearest detail, whilst the general layout, though strictly conforming to the technical requirements of the receiver, is so arranged that all the snags of fixing, mounting and wiring have been entirely forestalled and eliminated.

IT is impossible to buy a 3-valve factory-built receiver to equal the performance of the "Sensity Super" — and yet your building cost is less than 50/-

"Matched efficiency"

THE "SENSITY SUPER" IS A PERFECTLY MATCHED TEAM OF COMPONENTS—EMBODYING THE VERY LATEST DEVELOPMENTS IN RADIO DESIGN.

BEFORE turning to circuit diagrams, layouts, blue-prints, and the 101 minute details which combine to make the "Sensity Super" just what it was intended to be, let me briefly refer to the inspiration behind this amazing set.

New developments, and by that I mean important developments such as you will find in the "Sensity Super," must affect hundreds of thousands of home constructors throughout the British Isles, and my constant aim must always be to pull "something out of the hat" when it is most badly needed. This in itself was probably my greatest inspiration when developing the "Sensity Super," and who can fail to be thrilled by the thought that the translation of an idea can interest a community of hundreds of thousands? The several new departures embodied in a set which I consider to be my best effort yet, must be apparent to the veriest novice, and I will deal with these at greater length and in more detail on the following pages. In the meantime spare a few moments to study carefully the beautiful illustrations reproduced on the preceding pages.

From the moment the circuit was first conceived, right up to the time when the "Sensity Super" was put into tangible form, it was considered essential that at long last the constructor should be given an opportunity of building a set which in every way compared favourably with the best of those produced by skilled workers with all the resources of the greatest English factories behind them.

The amazing performance of the "Sensity Super" is something which cannot be adequately described. It is impossible to interpret in terms of printers' ink and paper the delightful appearance of its "dressing."

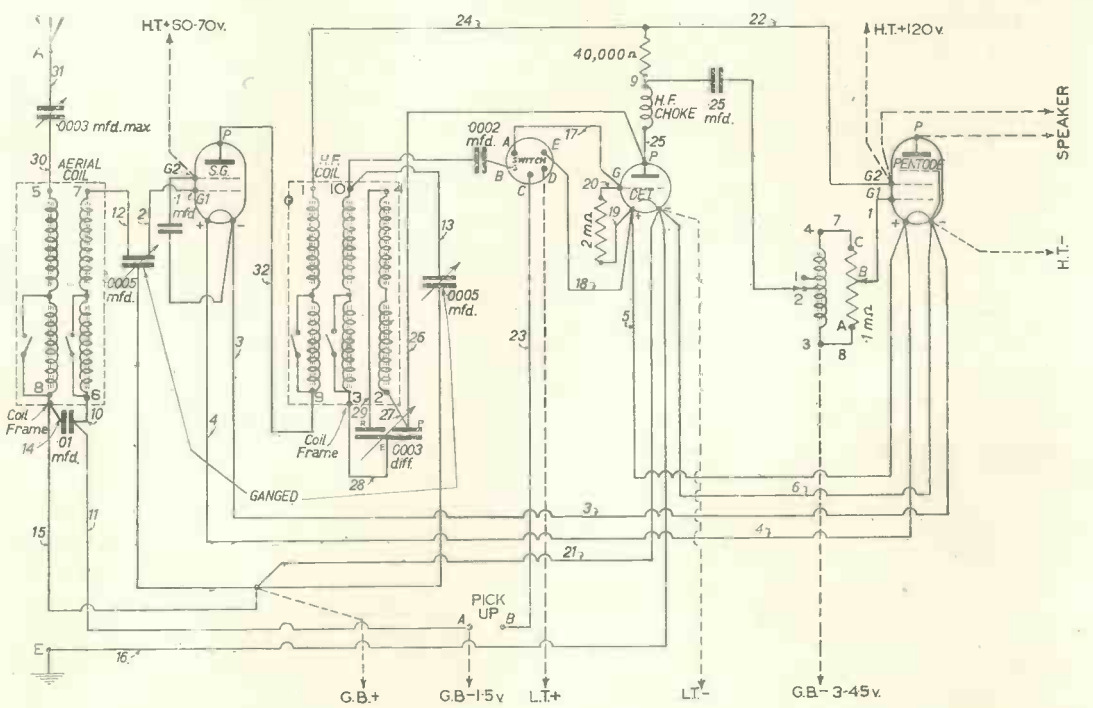
Co-operating as I do with a certain limited number of component manufacturers I demand uniformity of design and finish on every component chosen for my design. The final result is not, as in most home constructed sets, just a mass of assorted components, but a beautiful chassis of uniform layout, contour and colour—perfect in every little detail, with the bearing and stamp of a thoroughbred in every line.

If you think I am congratulating myself too readily on this new production I must ask you to be patient and to reserve your criticism. As soon as you have the "Sensity Super" in front of you, reproduced just as I have shown you in the following pages—when the final touches have been given, and the tuning indicator travels smoothly over the illuminated Mystic Dial to an accompaniment of the most glorious broadcasts which the whole European Continent can offer, then you will understand my enthusiasm.

Let me impart to you something of this urge to create and to build. Give yourself a fair chance to enjoy to the utmost the entertainment which you can draw from the ether for such a modest outlay. Scrap those ancient and decrepit atrocities whose abilities are entirely limited to the distortion of really magnificent transmissions, and compel yourself to understand the infinite variety and magnitude of the entertainment which only good radio can offer.

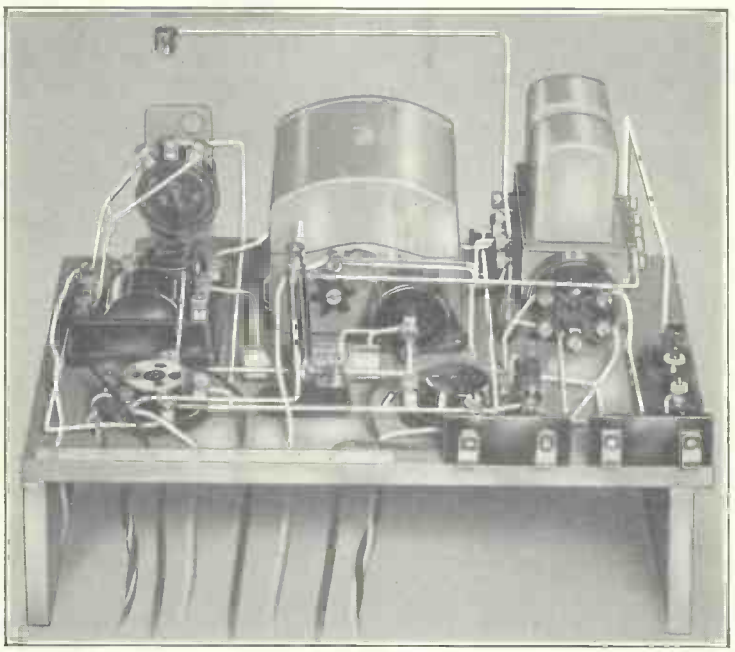
And now let us study the "Sensity Super" in greater detail.

Looking at the circuit diagram, you might justifiably say that it is similar to what you have seen before, and there appears to be nothing new about it. Fundamentally that is possibly true, but I can say without fear of contradiction that it was not possible to build such a receiver a month ago. Moreover, I mean that it was not possible to build a receiver as modern and efficient. The reason behind this is in the component parts themselves, and in the manner in which they have been matched up to each other. To those interested, and who of you are not? the "Sensity Super" is really bristling with features which are not only new, but are of real genuine technical value, and the whole is well worth going into in closer detail.



Terminal mounts. Since it is usual, and for no other reason, we will start from the aerial terminal, and it is worth while pausing here to say a word about the new Graham Farish terminal mounts. These terminals are long overdue on wireless receivers. They combine instantaneous terminal grip to all types of wires or pins, whether it be 7/22 aerial wire, or a pin such as is used on telephone and pick-up leads, and I for one became very thankful that they were available during the many experiments on the receivers built up for this design.

Constant Aerial Loading. This terminal is connected through a Formo-densor to the aerial coil. The Formo-densor is definitely not a selectivity aid, but is used purely for adjusting the aerial load to some known constant, which enables the designer to combat the enormously varying factors and circumstances under which the receiver will operate.



Iron Cored Ganged Coils. All our various improvements would be of little use if the coil design lagged behind the ever increasingly difficult conditions of the ether. A designer is always limited to the materials he builds with, but a large proportion of the praise which this receiver merits is due to the makers of this coil. The efficiency bottled up within its small dimensions and its flexibility of use under varying circumstances are sufficient to delight the heart of a designer.

Let us examine with a critical eye what it offers. On the radio side, the wave-band switching is integral with the design, and while most of you undoubtedly consider this from the point of view of ease of operation, I as a designer am far more concerned with what it means with regard to efficiency and layout. Separate switching, although sometimes necessary and convenient from the layout point of view, always has and will be, a stumbling block, due to stray fields, capacity and H.F. loss. It has often meant a serious loss of efficiency through two circuits being coupled together at the switch. This trouble automatically disappears and enables one to go for a much higher stage gain in the H.F. valve. At the terminal mounting, where the " magnification " of a coil can be very seriously pulled down, a special ebonite material was introduced, much in the same way as the Formo Single Sensity coils introduced Steatite. The windings of the Aerial coil have been specially designed for use in the " Sensity Super " and it is here we find the reason for the Formo-densor. To gang accurately—and you MUST—the aerial capacity load is a serious drawback. The most perfectly matched coils or condensers are utterly thrown out of balance the moment an aerial-earth system is connected. Were this constant in any way it could be reckoned with, but with no two aerial-earth systems alike most designers make a compromise. " Compromise " is a word I hate, for it usually means putting up with the second best, so I have attempted and, I think succeeded, in reducing the aerial-earth load to something at any rate within certain limits, and moreover controllable. With this in hand, I have specified certain windings for the Aerial coil that I know will give a definite result under practically all conditions. The Aerial coil is a full transformer, and both primary and secondary windings are controlled by the integral switching. This also enables the ratio of both long and short wave to be adjusted to the maximum efficiency without having to consider any other detail. In order to follow the design through in its natural sequence, let us consider the coil as two separate parts, viz., the Aerial coil and Anode coil, and pass on to the S.G. valve stage.

Steep Slope H.F. Amplification. Since the coil and circuit design at last enabled me to go for a really high stage gain, I looked round for a valve with a high amplification figure, but was disappointed to find that while there were plenty to satisfy me in this respect, they usually showed signs of distress when receiving local strong signals. Now the obvious thing to do is to use a Variable-mu type valve with bias control, or alternatively some form of aerial circuit control, but I particularly wanted to avoid the necessity for this. I wanted, for reasons explained afterwards, to use a control in the L.F. stage. It seemed impossible to solve the problem until recently, when I was sent a new Hivac valve—the new Steep Slope SG220. Here is a valve with a high amplification factor, and yet will handle a good generous input, while being equally sensitive over a varying range of H.T. voltages. It will be noted that the grid earth return of the valve is taken to a negative bias voltage, and this is done for the sake of economy in anode consumption. As I have just explained, the valve is not at all critical, and one might as well save what precious H.T. we have. If you find, connecting this lead to zero bias volts gives improved results then by all means do so, but remember that the same bias lead is used to bias the detector valve when used for Pick-up, and it should, therefore, be replaced when used for this purpose.

High Gain Anode Circuit. " You cannot get something out of nothing " is a good and true saying, but when it is apparently possible to do so, one can be justly proud. In this stage I have managed to obtain a greatly increased gain without any loss in selectivity—in point of fact selectivity has been improved in both this and the aerial circuit. Hitherto an increase in selectivity has been at the expense of sensitivity, or vice versa, hence the old saying quoted above. The combination of the High Slope S.G. valve and correct primary windings on the H.F. transformer with its associated low loss characteristics have made this possible. Here again in the anode circuit as in the Aerial, coil a

full transformer is used, dispensing with the usual H.F. Choke, which in itself enables a greater efficiency for a given valve to be applied.

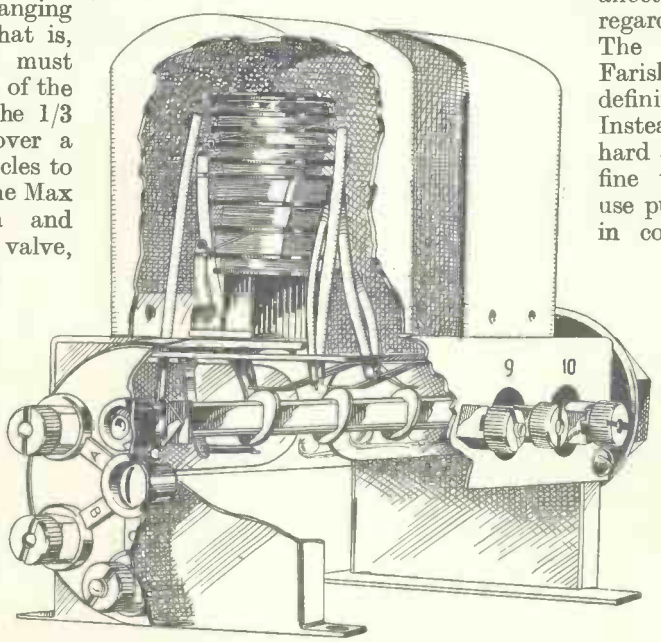
I am certain that no two tuned circuits have ever before given such an efficiency of combined sensitivity and selectivity. Whether you live in Land's End or John o' Groats, whether you have an indoor aerial, or one of those super semi-transmitting

More about Mono Control

structures, you will find that these two tuned circuits will give you more than you have ever been offered before, because they are designed to suit your conditions, irrespective of what they are. There is no compromise in the "Sensity Super."

High Quality Amplification. The use of a parallel feed high inductance auto transformer in the L.F. stage gives practically straight line amplification of the input. This auto transformer called the Max, is really not known so well as one would expect from its performance or price. Consider that only a short while ago there was not a transformer comparable with it outside the 30/– class of instrument! Its high primary inductance of 75 henries, with a ridiculously low self capacity of the secondary windings, ensures a very fine performance. It is small, and it is cheap, and I can only assume that it is not generally realised what is possible from such a transformer. It certainly is miles better than some of the transformers I have tested and which were ranging from 7/6 to 25/– in price. That is, however, by the way, and I must keep to the point. The response of the Max transformer when using the 1/3 ratio is practically uniform over a range of frequencies from 40 cycles to 10,000 cycles. Used normally the Max would, in conjunction with and due to the pentode output valve, tend to over accentuate the higher frequencies. It is quite normal practice to put a fixed condenser across the anode and filament of the pentode valve, either directly, or in series with a resistance to counteract this tendency, but this only provides a top cut-off which, when reaction is applied is still further reduced, to the detriment of the quality of reproduction. What I have done is to make reproduction on the higher frequencies constant, whether used for the strong local station or the weak foreign transmission. The Low frequency volume control operating across the secondary of the transformer also reduces the reproduction of the higher frequencies. We therefore have a very happy combination of controls which both have the same effect on quality and yet are operated independently. We benefit from this as follows:

On strong local signals the Volume control is used to reduce volume. This control counteracts the characteristic of the Pentode and forms the correction factor. Now when you receive a weak signal or foreign station, the Volume control is full on and the reaction applied has the same effect, and in this case it is the correction factor. Hence we are able to obtain exactly the same uniform amplification on either local or foreign stations. You will notice the exceptional clarity of foreign reception and the absence of top cut-off or woolly effect so inseparable from the use of reaction on the ordinary receiver. Reference to the article on "Records & Radio" will give some hints on tone control which are very readily adaptable to this circuit, and simple experiments can be carried out by those who so desire to adjust this side to individual requirements.



The new Sensity Coil broken open to show switch arrangement.

The Pentode output valve I have used is the Y220 which has a useful sensitivity combined with a fairly generous grid swing latitude. Its undistorted output is approximately 500 milliwatts which is ample for normal domestic purposes. If, however, high tension consumption is a matter of little importance the use of the Z220, which is electrically a bigger valve, will provide a greater **power** output.

There are one or two other little details I would like to go over with you regarding the less important details, and yet which contribute to the general high performance of the receiver.

It will be noticed that whereas tubular condensers are used in other parts of the receiver, in the case of the grid bias lead to the aerial secondary coil a flat Mica condenser is chosen as a bye-pass. There is a very good reason for this. A fixed condenser is normally regarded as a component which, provided it possesses capacity of the value required and will not puncture or break down at the voltage it will be used for, that is all there is to it. This is definitely not the case, and I warn intending constructors that any condenser will **not** do. In this position the condenser is actually in series with the coil and consequently a high H.F. resistance will seriously affect the working of the receiver with regard to selectivity and stability. The construction of the Graham Farish Fixed Mica condenser is a definite guard against such loss. Instead of copper foil, which is usually hard and springy when rolled to such fine thicknesses, the manufacturers use pure tin foil plates. These plates, in conjunction with fine unstained Ruby Mica compressed under very high pressure, ensure a perfect surface contact between the di-electric and metal plate, and which will remain so during its life, having no natural stresses to distort it, the metal being almost inert. For the grid condensers, both for detector circuit and transformer feed, a tubular of the oil immersed type is used. It is not generally known that the Graham Farish Tubular condensers, which have been marketed for the

last 18 months, are of the oil type which has recently been given prominence as being a new departure. A .25 mfd. Tubular coupling condenser is used for the auto transformer which, in conjunction with the 1/5 ratio is just right. If the ratio is altered to 1/3 less amplification will be obtained, but a greater bass response will be available, and if this suits your taste can be used.

Mono Control Switching. One must not overlook the coil switching control. This left hand knob of the receiver is really a genuine control. It fulfils every switching arrangement required, and integral with the coil is the waveband switching, but, it does not stop there. The filament switch is also included. This switching has self-cleaning contacts and is absolutely noiseless even under vibration. It is of the quick make and break type and is suitable for mains use in addition to battery. It will satisfactorily break a current of 2 amps. and thus can be used on mains receivers using up to 500 watts mains input. Nor even is this the complete story. A gramophone switch is also provided and which, when suitably wired, will switch over the detector valve grid from radio to gramophone. We have then a four position control—(1) Off; (2) Medium Wave; (3) Long Wave, and fourthly, Gramophone. This obviously means that the set is ideal for a combination of radio and gramophone, especially since I have designed the Low Frequency stage so that the same volume control will control either radio or gramophone. For those who may be inclined to utilise the receiver in this way, and I can assure them that provided they use a good quality pick-up, the small extra cost and labour entailed is very well worth while. I intend to go into the details of such an arrangement, but will leave it for the moment while we go through the rest of the details.

Although one takes a speaker for granted, I would like to say that I have tested quite a number since I specified the "Baby Stentorian" for the principle receiver in Contact No. 1 issue, and it is sufficient to note that I am again including this very excellent little job six months after. Many of you wrote to me about the use of various speakers with regard to my previous sets, and while I agree one does not necessarily want to replace what is probably a good speaker and what is already giving satisfaction, yet surely you must be using or be able to use an extension speaker. What worries me is that I want you

to get my results—the results which you can get if you follow my lead. Whatever speaker you do use however, do make sure that it is correctly matched with the output valve, otherwise as far as you are concerned a lot of my work has been wasted.

And now just finally a word about the cabinet in which I have housed this receiver. It is in itself a really beautiful example of craftsmanship. I personally regard the cabinet just as important an item as I do the quality of reproduction. You may tolerate poor quality in either of these details, but they will never give you the same pride of ownership when your receiver is open to criticism, as when it provides entertainment for your family and your friends. Realise that there are many hours in a day that you do not use your receiver, and it becomes simply a piece of furniture. I may be finicky over such points, but I am sure that while it is said that one must not judge a book by its cover, one can very often judge a receiver by its cabinet. I have known this fact to be borne out repeatedly in actual fact, and of the many thousands I have inspected from time to time, I have found that the quality of the cabinet was invariably borne out by the quality of the work contained inside. The cabinet designed by Laurence, which name covers the identity of a well-known artist, is a fitting finish to a thoroughly thought-out and well designed job. In the design of this set, right throughout, I have aimed at one thing as my principal objective. It has not been low cost, nor sensational journalism, both of which are easy to achieve for one who has designed receivers over a large number of years. My primary object has always been the set for the million, and I feel convinced and it has been proved in the past, that you are capable of shrewdly judging the value and merits of not only the receiver, but of the cabinet I recommend for it, and I am content to leave it at that. You will find the cabinet supplied complete with the proper baseboard suitably finished, and in addition, the baffle for the speaker. When the receiver is in the cabinet there is adequate room for both the H.T. and L.T. batteries, making the job entirely self-contained.

THE "SENSITY SUPER" AS A RADIO-GRAM

Elsewhere in this issue you will find described a radio-gram based on my previous design of the "Raider." The cabinet, motor, etc., can be equally well used to house the "Sensity Super" if it be desired. All the instructions can be followed, and the drilling template for the smaller cabinet can be used for the radio-gram. There is only one point to remember—whereas the Raider-gram requires a separate control for the Pick-up, the "Sensity Super" does not, and so a Pick-up without control can be used. It should be remembered that if a control is not fitted directly across the Pick-up its place should be taken by a 50,000 ohm. resistance to maintain the response as designed by the Pick-up manufacturers. I am directly referring to the Graham Farish Pick-up which I have used for this receiver and which is very suitable. Its output is just sufficient to fully load the first valve, when biassed with 1½ volts negative.

If however, you do not want a full radio-gram, then it is only necessary to have a Pick-up and Turntable in addition to the receiver. How you mount your motor and Pick-up is a matter for you to decide. It can be a portable type of gramophone with Pick-up screwed on to the motor board, or one of those clever folding up affairs marketed by one or two firms and which can be stowed away in a corner when not in use.

Now to get down to "brass tacks." The actual construction and building is very simple, but we are dealing very thoroughly with it, and it is well worth while not to skip any of the following instructions. We ourselves have built this set many times, and you can rest assured that the way we show you is the quickest and most efficient way it can be done.

CONSTRUCTIONAL DETAILS

BASEBOARD.

If you have bought a "Laurence" cabinet, you will also have the special baseboard provided with it, and you can proceed with the marking out and screwing down of the components, but if not, you will have to make or have made locally, a baseboard to the instructions given on the Blueprint.

MARKING OUT.

In addition to the blueprint, there is provided on the same sheet a baseboard dimensioned layout. This, and NOT the wiring blueprint, should be used. Cut out round the edges to the same size as the baseboard, and keep in position with drawing pins or heavy weight. At all points shown with a cross, pierce through with a sharp bradawl. These will give you the positions for the components, and if you are in any doubt, place the actual component over the position indicated. The component position is indicated by the wiring diagram. Where holes are indicated, a hole must be drilled through for wires to pass through the baseboard, if not already provided. To mark the position of the reaction condenser bracket on the underside of the baseboard the template can be placed in position on underside, or alternatively the position marked out by measuring with a ruler.

ASSEMBLING.

Wood Screws used—
2 No. 4 x $\frac{5}{8}$ Rd. Hd.
11 No. 4 x $\frac{1}{2}$ Rd. Hd.
16 No. 4 x $\frac{3}{8}$ Rd. Hd.

(Size wood screws used is indicated after each component.)

1. Screw down in position bracket on under side of baseboard. (No. 4 x $\frac{3}{8}$.)
2. **Gang Condenser.** Handle this component carefully, and if the cover is not in position keep the vanes fully closed to avoid damage to the moving vanes. Pull out the two front fixing tabs which turn on their rivets, and see their position coincides with the marked points on the baseboard. Put the two front screws in first (No. 4 x $\frac{3}{8}$), leaving the back screw for the following item.
3. **H.F. Choke.** The left-hand side is screwed down with the same screw that fixes the back of the gang condenser. (No. 4 x $\frac{1}{2}$.)
4. **.01 Fixed Condenser.** This is screwed flat to the baseboard. Do not screw too tightly, otherwise the bakelite brackets may break with undue pressure. (No. 4 x $\frac{3}{8}$.)
5. **Ganged Coil.** When fixing this, take care not to apply pressure to the screening cans. If these are forced out of position, damage to the internal connections may result. (No. 4 x $\frac{3}{8}$.)
6. **Formo-densor.** No. 4 x $\frac{3}{8}$.
7. **Detector Valveholder.** Make sure position is correct. Grid to aerial side. (No. 4 x $\frac{1}{2}$.)
8. **Vertical Resistance Holder.** (No. 4 x $\frac{1}{2}$.)
9. **Pentode Valveholder.** Grid aerial side. (No. 4 x $\frac{1}{2}$.)
10. **H.F. Valveholder.** Grid towards Gang Condenser. (No. 4 x $\frac{1}{2}$.)
11. **Max Transformer.** Terminals 1 and 2 towards Gang Condenser. (No. 4 x $\frac{5}{8}$.)
12. **Pick - up and Aerial - Earth.** Terminal Mounts. (No. 4 x $\frac{3}{8}$.)
13. **Volume Control Bracket.** (No. 4 x $\frac{3}{8}$.)
14. **Reaction Differential Condenser.** Fix to underneath bracket, keeping centre terminal towards coil side. The insulating washers are only packing pieces and are not intended to insulate the bush.
15. **Volume Control.** Fix to Bracket with terminals on top. Same applies to washers as No. 14, above.
16. **40,000 Resistance.** Fix in vertical holder by means of terminals.

Step by Step Wiring

Eliminates all possibility of error

Required — Two 10-ft. coils Glazite No. 20 or equivalent tinned copper wire and sleeving ; 4 yds. rubber-covered flexible wire, red and black.

By following the wiring table in conjunction with the easy stage wiring diagrams and blue print this can be carried out speedily—without error. Count and check all wires at the end of each stage. It may be necessary and advisable to occasionally glance at the photographs of the receivers to assist in the relative height of the wiring in order to be as nearly identical with the original receiver as possible.

STAGE 1.

Wire No. 1. Terminal G1 Pentode—flat along baseboard up to centre terminal B volume control.

Wire No. 2. Terminal G1 Screen Grid valve to front section tuning condenser. When tightening up terminal screw on condenser do not use too much force and damage the alignment of the vanes.

Wire No. 3. Terminal negative filament S.G. valve across Max transformer to negative filament terminal Pentode.

Wire No. 4. Terminal positive filament S.G. valve along baseboard to positive filament terminal Pentode.

Wire No. 5. Terminal positive filament Pentode to positive filament terminal Detector valve. This wire has no bends.

Wire No. 6. Terminal negative filament Pentode to negative filament terminal Detector valve. This wire also has no bends.

Wire No. 6a. These two wires are already connected to the .1 mfd. condenser. One end is connected to terminal G2 S.G. valve and the other to negative filament terminal S.G. valve.

Wire No. 7. Terminal C volume control down to terminal 4 Max transformer.

CHECK ALL CONNECTIONS OF THAT STAGE.

STAGE 2.

Wire No. 8. Terminal A volume control down to terminal 3 Max transformer.

Wire No. 8a. These wires are already connected to the .25 mfd. tubular condenser. One goes to terminal 2 Max transformer and the other to the upper terminal of H.F. Choke. The condenser lies on the baseboard.

Wire No. 9. Upper terminal H.F. Choke to terminal resistance holder.

Wire No. 10. Terminal No. 6 Twin coil to terminal .01 mfd. fixed condenser. Do not make this wire longer than absolutely necessary.

Wire No. 11. Terminal .01 mfd. condenser to terminal A Pick-up terminal mount.

Wire No. 12. Terminal 7 Twin coil to front section terminal Gang condenser.

Wire No. 13. Terminal No. 10 Twin coil to back section terminal Gang condenser.

Wire No. 13a. These wires are already connected to the .0002 mfd. Tubular condenser and one side is connected to terminal No. 10 Twin coil Unit and the other to terminal B Coil switch.

Wire No. 14. Terminal 8 Twin coil to terminal .01 Fixed condenser.

CHECK ALL CONNECTIONS OF THAT STAGE.

STAGE 3.

Wire No. 15. Terminal 8 Twin coil to rear (earth) terminal Gang condenser.

Wire No. 16. Terminal negative Detector valve along baseboard to earth terminal on Terminal Mount.

Wire No. 17. Terminal A Coil Switch to terminal G Detector valve.

Wire No. 18. Terminal positive Filament Detector valve to terminal E Coil switch.

Wire No. 19. Terminal positive Filament Detector valve to terminal 2 meg. Grid Leak. The Grid Leak is suspended by the connecting wires.

Wire No. 20. Terminal Grid Leak to terminal G Detector valve.

Wire No. 21. Terminal negative Filament Detector valve to back terminal Gang condenser.

Wire No. 22. Terminal G2 Pentode valve to top terminal 40,000 ohm resistance.

CHECK ALL CONNECTIONS OF THAT STAGE.

STAGE 4.

Wire No. 23. Terminal B Pick-up terminal mount to terminal C Coil switch.

Wire No. 24. Terminal 1 Twin coil to top terminal 40,000 resistance. This is a long wire and reference to the photographs will indicate its form.

Wire No. 25. Lower Terminal H.F. Choke to terminal P Detector valve.

Wire No. 26. Terminal P Detector valve through hole in baseboard to terminal P Reaction condenser.

Wire No. 27. Terminal P Reaction condenser under chassis and up through hole to terminal No. 2 Twin coil.

Wire No. 28. Terminal 3 Twin coil through hole in chassis to terminal E Reaction condenser.

Wire No. 29 Terminal 4 Twin coil through hole in chassis to terminal R Reaction condenser.

Wire No. 30. Terminal 5 Twin coil to terminal Formo-densor. This wire should run about 1″ above the other coil terminals and brought down again above the Formo-densor terminal.

Wire No. 31. Formo-densor terminal to aerial terminal.

CHECK ALL CONNECTIONS TO THAT STAGE.

STAGE 5.

These connections are all flexible wires for battery, speaker, etc., excepting :—

Wire No. 32. From terminal 9 Twin coil to anode cap of S.G. valve. This wire can be either in Glazite or flexible. Personally, I prefer Glazite because it stays put when disconnected from the valve and does not get mixed up in the rest of the wiring. Now the flexible connections. You will find on the blueprint an identification strip for these which can be cut out and pasted down in front of the holes through which the flexible wires pass. Easy and rapid identification of the various battery leads is thus ensured. Looking at the back of the receiver, and reading from left to right we connect up as follows :—

H.T. +60 volts. G.2 S.G. Valveholder, leaving 18″ loose end.

L.S. These are speaker leads and can be from 14″ to 16″ long. Connect one to terminal P on Pentode valveholder, and the other to terminal G2 of the same valve.

Grid Bias —3/4½ volts. This lead only requires about 12″ and is connected to terminal 3 Max Transformer.

H.T. +120 volts. This is connected to terminal G2 of the Pentode, length about 14″.

H.T.—. Connected to terminal negative filament of Pentode valve. Length about 16″.

G.B.+. Connected to back terminal of gang condenser. Length about 12″.

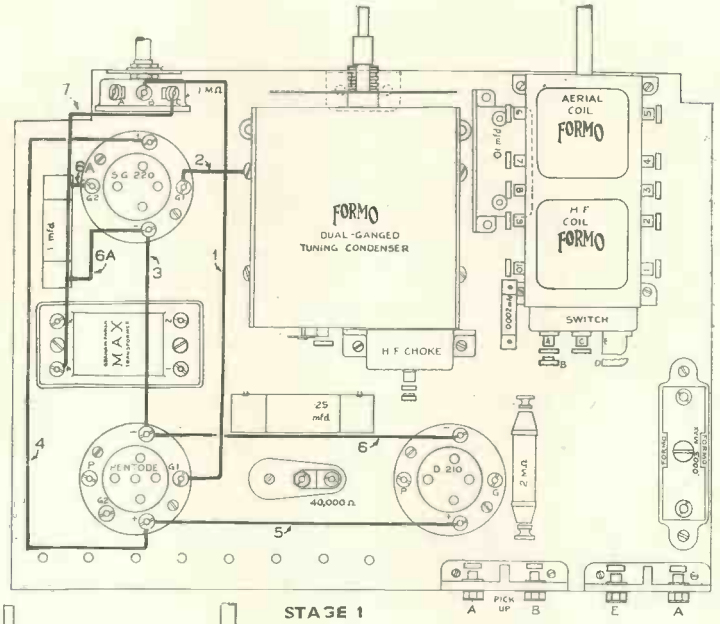
G.B. —1½ volts. Connected to pick-up terminal A. Length 12″.

L.T. Two wires with about 12″ left free from the chassis will be enough. The positive wire goes to Terminal D switch, and the negative wire to negative filament terminal of the detector valve.

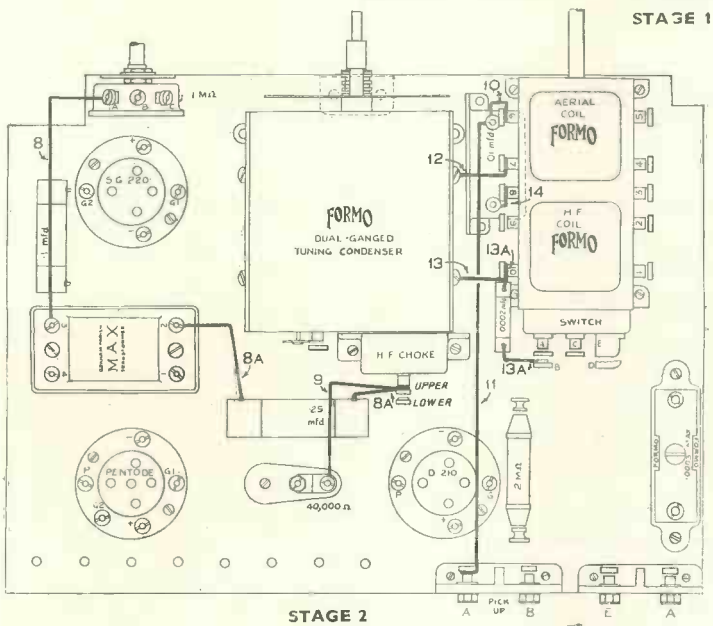
Stage by Stage Wiring Diagrams

IMPORTANT

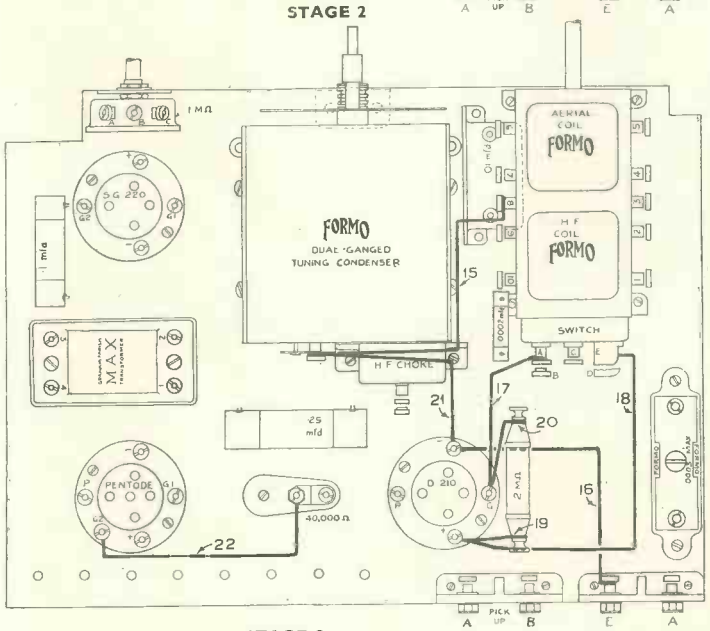
CHECK ALL WIRING AFTER EACH STAGE



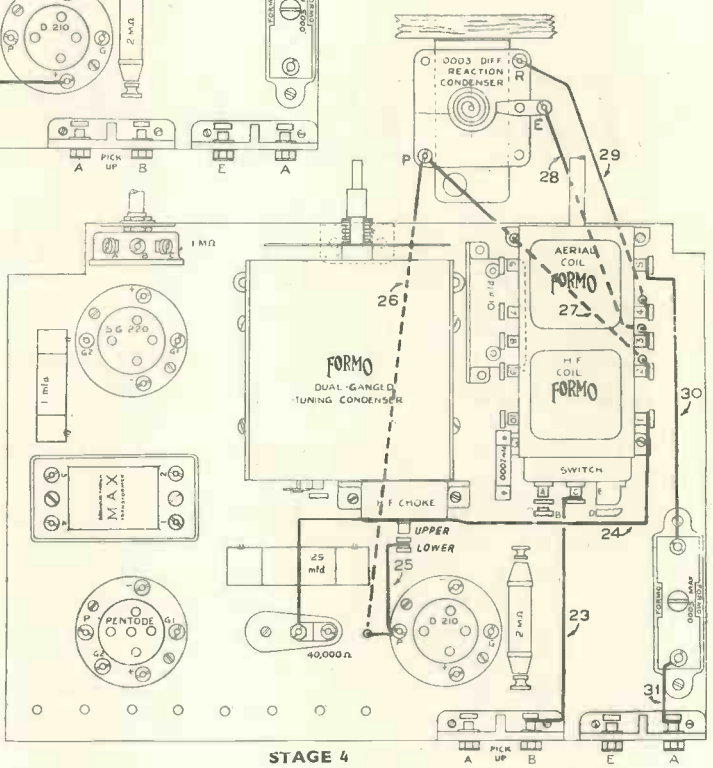
STAGE 1



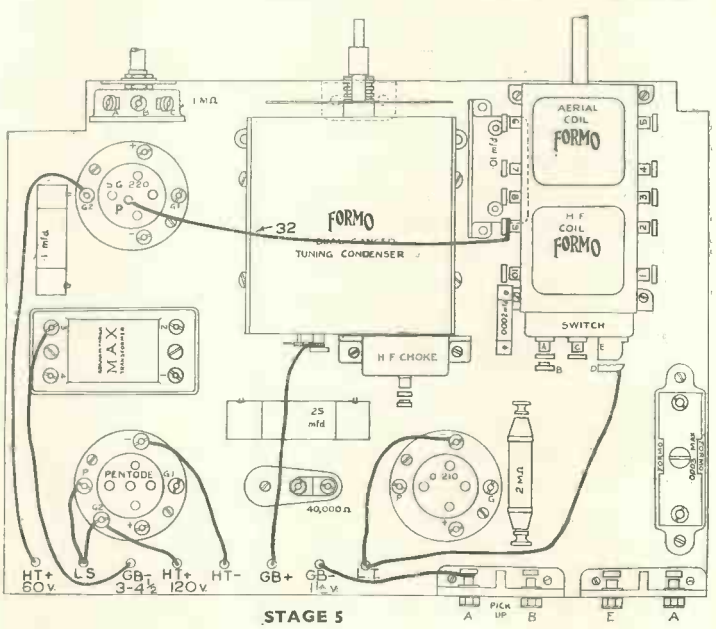
STAGE 2



STAGE 3



STAGE 4



STAGE 5

The Real Thrill

Operating the "Sensity Super"

ASSUMING that you have followed my recommendations with regard to cabinet, it now only remains to put the finished chassis into the cabinet together with the speaker, and connect up. While this part is quite simple, and remembering that the cabinet is highly finished, it is well worth while to take quite a reasonable amount of care, proceeding methodically to avoid any errors. Remember that if you drill a hole in the cabinet in the wrong place, it is going to be mighty difficult to fill it up again. You will find on the blueprint a drilling template for the cabinet. This gives you the relative positions of the holes required in the face of the cabinet, but does not show you the actual positions of these in relation to the cabinet. This is where a little care is required. Slide your completed chassis into the cabinet, keeping it to the extreme right-hand side. The first spindle to touch the inside front of the cabinet will be the small trimming spindle on the ganged condenser. With a fine pointed pencil mark the position of this, and then drill through from the back, a hole about $\frac{1}{4}$" diameter. Now before using the template to mark out the rest of the holes, first compare it with the actual receiver, to ensure that you have positioned the components correctly on the baseboard. If they are all right, then by placing the template square on the face of the cabinet and locating it by means of the hole you have already drilled, the other holes can then be marked through. There remains now to drill these, using a proper wood bit of the correct size. Please do not attempt to make these holes with anything but the proper tools, since you will only regret it if, by a slight slip, you spoil the cabinet. It is far better to pay a few pence and let your local carpenter or handycraft shop carry out this work for you. You will notice the four small holes in the template are for the dial of the tuning condenser. If you intend to use the metal screws provided with nuts on the back, then these should be drilled through, but if on the other hand you would rather use a wood screw, then only the position should be marked. You can now go ahead and complete the operation.

With regard to fixing the dial, detailed instructions are contained in the ganged condenser packing.

A baffle is provided with the cabinet and should be removed and laid flat on the table, and the speaker screwed to it. The baffle then can be screwed back into the cabinet, and all is ready for connecting up.

Do not yet put the valves in their sockets. I do hope you have finished the ends of your wires off nicely with proper wander-plugs and spade ends. I know too well that there is a tendency to finish the job quickly and overlook these small details, with the result that one suffers subsequently from noisy contacts and a lot of straggly connections. Use really good large spade connections for your filament wires. A good deal of trouble has been traced to silly little spade ends, which rapidly corrode, due to the accumulator acid, and set up all kinds of high resistance, and intermittent contacts. The G.B. battery can be very conveniently disposed underneath the chassis, and for this reason the G.B. leads have been kept shorter than the others. Make sure your bias leads are correct.

They should be as follows : G.B. + is obvious. G.B. - 1.5 v. is the lead which goes from terminal A on the pick-up terminal mount. This is the negative bias to the H.F. valve. There is only one other bias lead, and this for a Y220 pentode should be plugged at 4.5 v. If a Z220 type valve is used, then the bias plug should be fixed at 7·5 volts. The two L.T. leads both run through the same hole, and if you have distinguished these between positive and negative by means of red and black flexible wires, then the red wire which should go to switch terminal D is readily distinguishable. Do not make your leads any longer than necessary, otherwise they will present an untidy appearance. The H.T. negative which is fixed to the filament terminal of the pentode valve should also be in black coloured wire, while the H.T. 60 volts which goes to G.2 of the S.G. valve, should be in red. It is quite a

LIST OF COMPONENTS REQUIRED :—

			s.	d.
2	4-pin Valve-holders	Graham Farish	1	0
1	5-pin Valve-holder	Graham Farish		8
1	Disc H.F. Choke	Graham Farish	2	0
1	Max Transformer	Graham Farish	4	6
1	Formo-densor Type J	Formo Products	1	6
1	.01 mfd. Mica Condenser	Graham Farish	1	6
1	DU5 Twin-gang Condenser	Formo Products	12	6
1	.0002 mfd. Tubular Condenser	Graham Farish	1	0
1	.25 mfd. Tubular Condenser	Graham Farish	1	6
1	.1 mfd. Tubular Condenser	Graham Farish	1	6
1	1 meg. Ohmite Volume Control	Graham Farish	2	9
2	Component Brackets	Graham Farish		8
1	AH/G Twin Coil Unit. With Switch	Formo Products	12	6
1	2 meg. Standard Grid Leak	Graham Farish		10
1	.0003 mfd. Differential Condenser	Graham Farish	2	0
1	Vertical Ohmite Holder	Graham Farish		6
1	40,000 ohm Ohmite	Graham Farish	1	6
2	Terminal Blocks	Graham Farish	1	0
VALVES :	Hivac SG220		10	6
	Hivac D210		3	9
	Hivac Y220		10	6
CABINET and BASEBOARD :	"Laurence" design	Graham Farish	25	0
BATTERIES :	H.T. 120 volts	Any good make.		
	G.B. 9 volts			
	L.T. 2 volts 40 amp.			
LOUDSPEAKER :	W.B. "Baby Stentorian"		22	6

Aerial and Earth Accessories : A good set deserves a good earth—fit "FILT."

Laugh at Lightning and fit a "Gard Automatic" Lightning Arrester in your aerial.

good plan to tie a knot in this wire near to the battery plug, in order that it may be readily distinguished from the 120 volt H.T. lead which should also be in similar colour. Now the valves can be placed in position, and the aerial and earth connected. Put the coil switch in the off position, which means that it should be turned fully anti-clockwise. Now the speaker leads should be connected, one going to No. 0 terminal, and the other to No. 2 terminal on the Speaker transformer. Then all is ready. Turning the switch to the first position in a clockwise manner, switches the receiver on, and at the same time places the wave change switching into the medium wave position. The receiver, providing everything appears to be in order, and some signals are received, should now be ganged. This is a most highly important operation, since to a very large extent the selectivity of the receiver depends upon its being correctly and accurately carried out. It is simple once the operation is understood, and reference to the page dealing with this operation, appearing in another part of this issue, will describe the whole thing very clearly and concisely. There is little else to tell you about the "Sensity Super" because I assume that you have correctly carried out all my instructions, and in this case you now have a receiver which will give you every satisfaction. It is simple to operate, and will give you practically everything in the way of entertainment that can be obtained from radio. I might finally wind up on one or two words of warning. When your set is accurately adjusted, do for goodness sake, leave it alone, and not attempt to make any other improvements or additions, except what I have previously suggested. Moreover, very often when fitting up a new receiver, the handling that the aerial and earth wires receive sometimes disturb some very doubtful connections, and it may be worth while to renew some of these. Remember also that your earth may have been installed many years ago, and upon inspection, you may find that it wants either renewing or if it is to a waterpipe the clip can be removed and the contact cleaned with advantage. If by any chance you experience trouble of any description, write to me, but remember in 99 cases out of 100, it will be entirely your own fault. Don't send me a budget of tales of woe, since this will only delay my reply to you. State clearly and concisely exactly what trouble you are experiencing, and what efforts you yourself have made, if any, to cure it, and with what results. Remember, I shall have to diagnose your trouble on the information you give me, and I would also draw your attention to the list of dealers which is displayed at the end of this magazine. One of them should be able to help you, and in any case, you could have the whole receiver serviced for a matter of 4/- or 5/-. If you have to write to me, don't forget the coupon, otherwise your query will not be dealt with.

LONDON, E.C.

District Supplies Ltd., 143, Aldersgate Street.
New Plan Books, 38, Clerkenwell Green.
Barkers Wireless Ltd., 1, Gresham Street.
District Supplies Ltd., 2/4, Paul Street.
District Supplies Ltd., 256, Bishopsgate.
District Supplies Ltd., 282, Bishopsgate.
District Supplies Ltd., 53/55, Worship Street.
Elkay Wireless, 225, Bishopsgate.
Pearl & Pearl, 190, Bishopsgate.
District Supplies Ltd., 65, Fenchurch Street.
E. E. Edwards & Co., 1, Cullum Street.
A. Munday Ltd., 45/49/51, Eastcheap.
B. B. H., 49, Farringdon Street.
B.B.H., 84, Fetter Lane.
The Farringdon Electrical Supply, 73, Farringdon Street.
S. Stern, 115, Fleet Street.
J. & F. Stone, 84, Fleet Street.
W.G. Wireless Stores, 11 St. Bride Street.
The City Stores, 161, City Road.

LONDON, E.—*continued*

S. Grey & Co., Ltd., 355 Barking Road, Plaistow.
S. Grey & Co., Ltd., 745, Barking Road, Plaistow.
Regent Radio Co., 4, Terrace Road, Upton Manor.
J. & B. Gordon, 53, West India Dock Road.
Poplar Radio Supplies Ltd., 29, St. Leonards Road, Poplar.
St. Leonards Radio, 104, St. Leonards Road, Poplar.
J. & F. Stone, 223, East India Dock Road, Poplar.
J. & F. Stone, 4A, Chrisp Street, Poplar.
Elcon Radio, 104, Vicarage Lane, Stratford.
"Georges Radio Repair Experts," 61, Forest Lane, Stratford.
S. Grey & Co., Ltd., 176, The Grove.
Leytonia Radio, 126, High Road, Leyton.
Plaistow Radio Service, 178, Plaistow Road, West Ham.

LONDON, N.—*continued*

Sports & Radio Stores, 112, High Road, N. Finchley.
A. E. Ball & Co., Ltd., 10, Woodhouse Parade, N. Finchley.
District Supplies, Ltd., 50, High St., Finchley.
E. J. Bedford, 133, Bowes Rd., Palmers Green.
District Supplies Ltd., 353, Green Lanes.
Janes & Adams, 60, Green Lanes, Palmers Green.
Janes & Adams, 386, Green Lanes, Palmers Green.
Comet Radio, 126, High Road, Tottenham.
District Supplies Ltd., 15, West Green Road, Tottenham.
T. Harris, Corner Radio, Seven Sisters Road, Tottenham.
A. G. Stevens, West 418, Green Road, South Tottenham.
G. E. Wensell, 529 & 359, Seven Sisters Road, Tottenham.
Alfred Marsh, 15, Bradbury St., Kingsland.

At your Service—

LONDON, N.W.

W. H. Allan Ltd., 94, Hampstead Rd., Euston.
A. Fudge & Sons Ltd., 41/42, Bendall Street.
M. Singer, 13, Princess Rd., Regent's Pk. Rd.
Station Radio, 1, Kentish Town Road.
New Plan Books, 76, Seymour Street.
E. V. Silman, 241, The Broadway, Cricklewood
Drazin, 59, Heath Street, Hampstead.
Kirby's, 93, Church Road, Hendon.
Scholes Radio, 4, Park Road, Hendon.
Tufnell Park Wireless Stores, 139, Fortess Road, Kentish Town.
Currys Ltd., 335, High Road, Kilburn.
District Supplies Ltd., 40, High Road.
J. Morris, 297, High Road, Kilburn.
E.S.G. Radio, 162, The Broadway, W. Hendon.
Howe's Radio Service, 793, Harrow Road.
Modern Utilities, 906, Harrow Road.
K. Raymond Ltd., 56, High Street.
Venn's Stores, 212, High Street, Harlesden.
J. & F. Stone, 35, Golders Green Road.
Archer Electrical & Radio, 61B, Abbey Road.
J. Taylor, 87, Church Road, Willesden.

LONDON, W.C.

S. T. Corry & Co., 52a, Southampton Row.
V. Zeitlin & Sons, Ltd., 144, Theobald's Rd.
Pearl & Moore, 168, Strand.
K. Raymond Ltd., 27/28A, Lisle Street.
West End Radio Stores, 14, Lisle Street, Leicester Square.
Shaftesbury Supplies, 224, Shaftesbury Ave.

LONDON, E.

District Supplies Ltd., 16/17, Norton Folgate.
District Supplies Ltd., 9, Norton Folgate.
Levys Ltd., 19/20, High St., Whitechapel.
J. & F. Stone, 249, Whitechapel Rd., Mile End.
Cleartone Radio Supplies, 147, Hackney Rd.
J. Glickman, 475/9, Cambridge Road.
H. A. Wireless, 13, Hackney Rd., Shoreditch.
H. A. Wireless, 139, Bethnal Green Road.
Mack's Wireless, 29, Hare St., Bethnal Green.
H. E. Morris, 277, Hackney Rd., Shoreditch.
Louis Saveria, 19, Roman Road, Bow.
T. R. Williams, 124, Bow Road.
Cane & Botten, 3, Kenninghall Rd., Clapton.
Clapton Radio, 1, Median Road, Clapton.
S. Grey & Co., Ltd., 86, High St. S., E. Ham.
S. Grey & Co., Ltd., 31, Barking Rd., E. Ham.
R. Landau, 126, High St. North, East Ham.
E. J. Price & Son, 286, Barking Rd., E. Ham.
E. J. Gunn, 34, Green Street, Forest Gate.
A. W. Lay, 10, Station Road, Forest Gate.
Trutone Radio, 265, Green St., Forest Gate.
Dawson's Radio Supplies, 251, Dalston Lane, Hackney.
J. Morris, 171/173, Mare Street, Hackney.
Williams Lighting Co., 21, High Street.
R. Browning, 55, Cadogan Terrace.
District Supplies Ltd., 396, Mare Street.
E. Pryer, 20, Homer Road.
A. H. Smith, 333, Wick Road.
South Store, 159, Well Street, Hackney.
Cook's Radio, 422, High Road, Leyton.
Davis's Radio Stores, 359, High Road.
Elite Radio & Cycles, 52, Capworth Street.
W. Flower, 623, Lea Bridge Road, Leyton.
Lea Music & Lighting Salon, 632, Lea Bridge Road.
Shenstones, 226, High Road, Leyton.
Trumbles, 424, High Road, Leyton.
G. E. Matthews, 305, High Rd., Leytonstone.
Felix Radio, 943, Romford Rd., Manor Park.
C. N. Northcott, 259, High Street North.
Supreme Radio & Cycle Co., Ltd., 746 Romford Road.

The "Contact" Radio dealers indicated on these pages are pledged to help you. If you fail to get adequate service and complete satisfaction, please communicate details of your complaint to the Commercial Manager, "Contact" Editorial Offices, 153, Masons Hill, Bromley, Kent.

Stratford Wireless Ltd., 284, High Street, Stratford.
Wireless Supplies Unlimited, 278, High Street Stratford.
S. Grey & Co., Ltd., 160, Barking Road, Canning Town.
S. Grey & Co., Ltd., 318, Barking Road, Canning Town.
Regent Radio Co., 473, Prince Regent's Lane, Custom House.
W. T. Cooper, 2/16, Station Rd., Walthamstow.
S. Grey & Co., Ltd., 219, High Street, Walthamstow.
S. Grey & Co., Ltd., 220, Hoe Street, Walthamstow.
E. A. Jarrett, 432, Hoe Street, Walthamstow.
R. Landau, 79, Hoe Street, Walthamstow.
Saville Pianos Ltd., 240, Hoe St., Walthamstow.
Sloane & Chapple, 130, Palmerston Road, Walthamstow.
Station Radio, 20a, St. James St., Walthamstow.
Stanson's Elec. & Radio Co., 107, Wood St., Walthamstow.
J. Stevens & Co., 72, Wood St., Walthamstow.
R. Wilkin, 12, Blackhorse Lane, Walthamstow.

LONDON, N.

F. Beck, 22, 24 & 26, Camden Passage, Islington.
W. E. Biddick & Son, 360, Caledonian Road.
Dawson's Wireless Stores, 227, Balls Pond Rd.
M. Kleiner, 63, Upper Street.
J. Roberts, 141, Caledonian Road.
J. & F. Stone, 7, Upper Street.
J. & F. Stone, 79, Upper Street.
Janes & Adams, 101, High Road, E. Finchley.
The London Radio Electric Co., Fortis Green.
Wireless Electrical Cycle Sports Service, 140, High Road, E. Finchley.
Radio & Camera Craft, 1, Hendon Lane, Finchley.
Bright Home Supplies, 9, Stroud Green Road, Finsbury Park.
Fonthill Battery Service, 136, Fonthill Road, Finsbury Park.
Francis Radio, 166A, Hanley Road, Stroud Green.
J. Morris, 385, Green Lanes, Harringay.
Radio & Accessories (1933), Ltd., 499, Green Lanes, Harringay.
Tridgell, 60, Grand Parade.
Wightman Radio Stores, 42, Wightman Road.
Fred White, 121, Highbury Park.
Pugh Bros. (Holloway), Ltd., 87, 95,99, 101, Holloway Road.
W. L. Gray, Muswell Hill.
Sports & Radio Stores, 21, Queen's Parade, Friern Barnet.

Modern Lighting & Radio Co., 212 High Street, Stoke Newington.
Saville Pianos Ltd., 22 & 24, High Street, Stoke Newington.
District Supplies Ltd., 466, High Road, Tottenham.
Hackney Wireless Stores, 614, High Road, Tottenham.
S. Grey & Co., Ltd., 26, Silver St., Edmonton.
Ernest Bros., 28, Junction Road, Highgate.
Thomas Harper (Pianos) Ltd., 498, Hornsey Road.
The Holloway Stores, 748/50, Holloway Road.
M. Kleiner, 660A, Holloway Road.
District Supplies Ltd., 43, High Road, Wood Green.
Goodisons Ltd., 71, Westbury Avenue, Wood Green.
C. C. Goodwin, 6A, Broadway.
Modern Radio, 2A, Acacia Road, Wood Green.
Bright Home Supplies, 334, Green Lanes, Palmers Green.

LONDON, W.

L. Apple, Ltd., 13, Brewer Street.
Gordon Radio, 56, Old Compton Street.
Winter's Radiolectrico, 147, Whitfield Street.
Daines & Brewster, 32, Bishops Road.
Faeritone Radio, 57, Praed Street, Paddington.
Mecca Wireless Stores, 137, Praed Street, Paddington.
H. L. Smith & Co., Ltd., 287/289, Edgware Rd.
J. & F. Stone, 274, Edgware Rd., Paddington.
Wireless Marketing Co., 29, Praed Street, Paddington.
Eldridge & Co., 137, The Vale, Acton.
A. Fudge & Sons, Ltd., 62, High Street, Acton.
Charles Gage, 214, Horn Lane, Acton.
K. Raymond Ltd., 24, Western Avenue.
J. & M. Stone, 165, High Street, Acton.
Bush Radio Stores, 129, High Road, Chiswick.
J. & M. Stone, 217, High Road, Chiswick.
Andrews & Pitt, 100, South Ealing Rd., Ealing.
City Radio Stores, 37, Bond Street.
J. & M. Stone, 37, High Street.
The Western Wireless Co., 6, Spring Bridge Road, Ealing Broadway.
J. & M. Stone, 123, King St., Hammersmith.
The Genuine Co., Ltd., 522, Harrow Road.
Harpers' Music Stores, 87, Golborne Road, North Kensington.
Keene's, 349, Ladbroke Grove.
Queen's Park Radio Service, 12, Mozart Street.
Service Radio Supply Co., Ltd., 61, Silchester Road.
Sudds & Sons, 47, Ledbury Road.
Bush Radio Stores, 184, Railway Approach, Shepherds Bush.
L. Leaman, 97, Northfield Avenue, Ealing.
J. & M. Stone, 61, Broadway, W. Ealing.

RADIO DEALERS—*continued*

LONDON, W.—*continued.*

Beresford Electric Co., Barons Court Station.
Eclipse Radio Electric Co., 115, Hammersmith Road.
Service Radio Supply Co., Ltd., 12, Milson Road, W. Kensington.
Shaftesbury Supplies, 46, Gt. Titchfield St.

LONDON, S.W.

A. Freeman & Co., 68, Lupus Street.
A. Freeman & Co., 27 Strutton Ground, Victoria.
H. Ponton & Co., 55, Sloane Square.
K. Raymond, Ltd., 72, Wilton Road.
Barker's Wireless Ltd., 358, Kings Rd., Chelsea
J. H. Lambert, 9A, Anderson St., Kings Road.
Dempsey & Co., 69, South Side, Clapham Com.
Smart & Co., 104, Army Street.
Ultrex Radio Ltd., 25, York Terrace.
Thurgood's, 296, Wandsworth Br. Rd., Fulham
W. A. Clarke, 9, Jerdan Place.
McNeils, 551, Fulham Road.
G. Pryce, 106, Lillie Road.
J. & M. Stone, 341, North End Road.
Economic Radio Co., 96/98, S. Lambeth Road.
John E. Hyams, 9, Silverthorne Road.
Smart & Co., 373, Wandsworth Road.
Atlantic Radio Stores, 58, Atlantic Road, Brixton.
J. & F. Stone, 373, Brixton Road.
West End Radio Stores, 382, Coldharbour Lne.
L. H. W. Wyatt, 6, Robsart Street.
F. C. Allen, 342, Battersea Park Road.
District Supplies Ltd., 268, Lavender Hill.
District Supplies Ltd., 43, St. John's Road.
Park Cycle & Gramophone Stores, 271A, Battersea Park Road.
L. E. Barnard, 83A, Battersea Park Road.
Polchar's Wireless Ltd., 175, High Road, Balham.
Riverside Wireless Store, 648, Garratt Lane.
B.P. Radio, 340, Battersea Park Road.
White's Radio, 50, Battersea Rise.
White Bros., 12, Brassey Square.
White Bros., 58, Glycena Road.
Balham District Wireless Supply Co., 155, Balham Hill.
A. Roberts & Co., 57, Bedford Hill
J. & M. Stone, 37, High Road.
Hellyar & Sons, Ltd., 169, Church Road, Barnes.
G. A. Westley, 1, Sheen Lane, Mortlake.
Kams Radio Electric, 7/9, High St., Putney.
J. & M. Stone, 66, Upper Richmond Road, Putney.
J. & M. Stone, 10, High Street., Putney.
Jackson's Radio Service, Radio House, Mitcham Lane.
J. & F. Stone, 122, High Road, Streatham.
J. & M. Stone, 8, High Street, Tooting.
R. W. Jacob, 355, Garratt Lane.
G. C. Langton, 68, Vanderbilt Rd., Earlsfield.
J. & M. Stone, 179, High Street, Wandsworth.
F. V. Collins & Co., 155, Kingston Road, Wimbledon.
The Electric Installation Co., 17, The Broadway, Wimbledon.
North Wimbledon Electric Co., 34, The Ridgway, Wimbledon.
The Redstone Electrical Co., 86, Kingston Road, Wimbledon.
W. Rolfe, 80, High Street, Colliers Wood.
J. & M. Stone, 51, Broadway, Wimbledon.
J. & M. Stone, 6, Hill Road, Wimbledon.

LONDON, S.E.

District Gramophone & Wireless Co., 315/323, Old Kent Road.
Gentry Bros., 189/191, Old Kent Road.
Jackson's Radio, 79, Old Kent Road.
Marsh Radio & Cycle Stores, 93/94, Lower Marsh.
Old Kent Radio, 270, Old Kent Road.
One Day Accumulator Service, 103, Southwark Bridge Road.
T. Page, 17, Borough Road.
Abbey Wood Radio, Abbey Wood.
Butcher Curnow & Co., Ltd., 33/35, Tranquil Vale, Blackheath.
C. Woollcombe, 109, Hamber Road, Westcombe Park.
Brockley Music Stores, 287, Brockley Road.
Wm. Crisp's Radio Service, 49, Camberwell Grove.
Freeman's, 348, Camberwell New Road.
C. E. Mace, 276, Albany Road.
S. Stern, 12, Camberwell Road.
J. & F. Stone, 303, Southampton Street.
District Supplies Ltd., 1, The Broadway.
District Supplies Ltd., 2, Springfield Park Crescent.
S. Grey & Co., Ltd., 111B, Rushey Green.
B. & E. Hardman, 220, Brownhill Road.
Polchar's Wireless Ltd., 83, Rushey Green.
L. A. Gardiner & Co., 58, Church Lane.
Deptford Lighting & Wireless Co., 159, High Street.
Polchar's Radio, 96/98, High Street.
J. & F. Stone, 40, High Street.

LONDON, S.E.—*continued*

The Eltham Radio Service, 71. High Street.
S. Grey & Co., Ltd., 203, High Street.
Deptford Lighting & Wireless Co., 148, Trafalgar Road.
J. F. Murray & Son, 93, Trafalgar Road.
J. F. Murray & Son, 22, Nelson Street.
N. & W. Radio, 10, Bridge Street.
W.D. Radio, 122, Lambeth Walk.
M. Zains, 127/129, Lambeth Walk.
Austin Radio, 8, Loampit Hill.
Bedfords, 11 & 13, High Road, Lee.
B. & E. Hardman, 116, Lewisham Road.
B. Johnson & Co., Station Approach, Hither Green.
Martin's, 27, Staplehurst Rd., Hither Green.
Phœnix Wireless Supplies Co., 227, High Road, Lee.
J. & F. Stone, 74, High Street, Lewisham.
J. & F. Stone, 161, High Street, Lewisham.
H. W. Sutton, 41, Lewis Grove, Lewisham.
Azenby Radio, 95, Azenby Road.
Loujay Radio, 162, High Street, Peckham.
Peckham Gramophone Stores, 141, High St.
Peckham Radio Supplies, 152A, Rye Lane.
Peckham Park Charging Stn., 160, Peckham Park Road.
Ray's Service, 88, Rye Lane.
J. & F. Stone, 194, Rye Lane.
J. & F. Stone, 174, Rye Lane.
J. & F. Stone, 80, High Street, Peckham.
F. W. Terry, 25A, Hall Road, Peckham Rye.
Albion Radio Supplies, 89, Union Road.
Deptford Lighting & Wireless Co., 199, Southwark Park Road.
Eddy for Wireless, 186, Jamaica Road, Bermondsey.
J. Fersht, 176, Jamaica Road.
Wm. Scorer, 247, Lower Road, Rotherhithe.
W. E. Watling (junr.) & Co., 85A & 87A, Jamaica Road.
Blackfriars Radio, 80, Walworth Road.
Manor Radio & Electrical Installations, 210, Manor Place.
J. & F. Stone, 331, Walworth Road.
Alandale Radio & Television Co., Ltd., Woolwich.
G. H. Ayre, 175, Plumstead Common Road, Plumstead.
E. Davis & Son, 246, Plumstead High Street.
The Electro Radio Co., 70A, High Street, Plumstead.
T. W. Foster, 13, Albion Road, Woolwich.
S. Grey & Co., Ltd., 32, Greens End, Woolwich.
S. Grey & Co., Ltd., 33A, Greens End, Woolwich.
Maxam Ltd., 18, Hare Street, Woolwich.
E. E. Parker, 67, Wellington St., Woolwich.
A. T. Stearman, 84A, Burrage Rd., Plumstead.
J. & F. Stone, 49, Powis Street, Woolwich.
J. & F. Stone, 56, Hare Street, Woolwich.
Woolwich Radio, 22, New Road, Woolwich.
District Supplies Ltd., 7, Westow Hill, Upper Norwood.
S. Visick, 12, High Street, Penge.
Aneloy Radio, 36, Hindmans Rd., E. Dulwich.
Dulwich Radio & Sports Depot, 118, Lordship Lane, East Dulwich.
Universal Wireless & Cycle Co., 94, Grove Vale, East Dulwich.
Bostock & Stonnill, 1, Westbourne Terrace, Park Road, Forest Hill.
Ray's Service, 23, Norwood Road, Herne Hill.
C. H. P. Nutter, 245, Selhurst Road, South Norwood.
The Bell Wireless, 28, Bell Green, Sydenham.
Jefferies & Co., 91, Wells Road, Sydenham.
S. Stern, 374, Norwood Road.

ANGLESEY.

Holyhead :—
H. Edwards & Sons, Victoria Square.

BEDFORDSHIRE.

Bedford :—
Clarabut Radioelectric Service, Dame Alice Street.
Golling & Ayres, 21, The Broadway.
Joseph Gadsden, Houghton Conquest.
Norman Mickle, 37, Bromham Road; and 20, Harpur Street.
John David, Benson.
Utility Radio, 17, Iddesleich Road.
District Supplies Ltd., 78, High Street.
Curry's Ltd., 67, High Street.
Daventry Supplies, 62, Harpur Street.
Barker's, 80, Midland Road.
Curry's Ltd., 67, High Street.

Biggleswade :—
H. Gale, Straton Street.
H. G. Bairoms, 94 & 96, Shortmead Street.
E. J. Cakebread, Church Road, Henlow.

Dunstable :—
Cycle & Wireless Ltd., 40, High St. North.
J. Hughes, 14, Ashton Street.
R. C. Althorpe, High Street North.

Leighton Buzzard :—
Wing Wireless & Electrical Service.

BEDFORDSHIRE—*continued.*

Luton :—
The Coventry Company, 191, Dunstable Road.
The Coventry Company, 36, Castle Street.
Whitelock & Co., 7, Cheapside.
S. F. Garside, 26, Park Street.
Cyril Chappin, 26, Cumberland Street.
Stanley J. Griffin, 108, High Town Road.
F. Warren, 88, Wellington Street.
District Supplies Ltd., 64, George Street.
Curry's, Ltd., 1, Park Street.
A. N. Brown, 36, Park Street.
S. F. Garside, 47, Park Street.
Brown 36, Park Street.

BERKSHIRE.

Didcot :—
L. E. Paine, Broadway.

Hungerford :—
W. G. Razey, Bridge Street Radio Shop.

Maidenhead :—
J. & M. Stone, 144, High Street.
Curry's, Ltd., 7/9, Market Street.
J. & M. Stone, 104, High Street.

Newbury :—
Vincent & Co., 54-55, Bartholomew Street.
Curry's Ltd., 38, Northbrook Street.

Reading :—
F. N. Thompson & Co., 177-9, Oxford Road.
Frank Gale & Son, Ltd., Friar Street.
A. J. S. King, 10 & 12, Whitley Street.
A. Herbert & Sons, 22, St. Mary's Butts.
Quartermain's Quick Service, Oxford Road.
Curry's Ltd., 5, West Street.
J. & M. Stone, 44/45, Market Place.
Reading Radio Supplies, 32, Castle Street.

Sunningdale :—
Electrical Installations, High Street.
Electrical Installations, Station Parade.
Pack's, Corner Shop, London Road.

Sunninghill :—
J. Chapman & Sons.

Thatcham :—
G. L. Barker, 32, Broadway.

Windsor :—
C. Taylor, 1, Oxford Road.
Tom Ward's, 77, St. Leonards Road.
Curry's Ltd., 37, Peascod Street.

BUCKINGHAMSHIRE.

Amersham :—
Radiocraft, Sycamore Corner.
A. C. Beckley, Oakfield Corner.

Aylesbury :—
E. J. Johnson, Long Crendon.
G. C. Cowan, 35, Cambridge Street.
Curry's Ltd., 23, Market Square.

Buckingham :—
A. C. Marriott, Castle Street.

Chesham :—
A. C. Beckley, 6, High Street.

Datchet :—
H. G. Best & Son, The Green.

Great Missenden :—
A. L. Wheeler.

High Wycombe :—
J. & M. Stone, 12A, Church Street.
Curry's Ltd., 1, Paul's Row.
Curry's Ltd., 6, Oxford Street.
A. W. Gill, 124, Desborough Road.

Hitcham :—
E. L. Osbourne, Nearway Road.

Slough :
Kervis Electrical Service, High Street.
J. & M. Stone, 144, High Street.

West Wycombe :—
R. Stone, High Street.

Woburn Sands :—
Wynn's Radios, Radio House.

CAMBRIDGESHIRE.

Bassingbourn :—
R. Dellar.

Cambridge :—
V. Davis, 6, Fair Street.
W. K. Islip, 42, Chesterton Road.
R. Lathbury, 86/88, Castle Street.
Renboro Wireless Service, 33, East Street.
J. Harvey & Son, Aylestone Road.
Elec. Wiring & Repair, 5, 15, 15A, Corn Exchange Street.
Curry's, 38 Regent Street.

Ely :—
The Walbro Cycle & Motor Works, Radio Dept.
Curry's Ltd., 15/17, High Street.

Nr. Wisbech :—
A. H. Whitfield, Guyhirn.

Nr. Ely :—
Victor Cycle & Motor Co., Haddenham.

Isleham :—
F. Reed's Radio Service.

Littleport :—
F. A. Davies, 3, Granby Street.

Manea :—
Edwards & Barmes.

March :—
Curry's Ltd., Broad Street.
G. E. Dunkling, High Street, Benwick.

RADIO DEALERS—*continued.*

CAMBRIDGESHIRE—*continued.*

West Wratting :—
B. D. Williams, Rose Cottage.
Wisbech :—
Curry's Ltd., 18, High Street.
Curry's Ltd., 111/112, Norfolk Street.

CHANNEL ISLANDS.

Guernsey :—
Leale Ltd., 7, Bordage.
Jersey :—
W. H. Cole, 61, Halkett Place, St. Helier.
Hettich Ltd., 1, King Street.

CHESHIRE.

Altrincham :—
Harry Brown, 1, Cross Street.
T. J. Furness, 26, Regent Road.
A. Matley, 44/46, Lloyd Street.
"Rardo" Radio & Television Co., 62, Stamford New Road.
Birkenhead :—
Conway Radio Co., 24/90, Conway St.
J. H. Moores, 221, Church Road, Higher Tranmere.
J. McKenzie, 27/29, Grange Road West.
W. V. Shallcross, 157/9, Laird Street.
Regent Radio Stores, 111, Grange Road.
R. Jones, 347, Price Street.
Home Radio Service, 103, Chester Street.
Chester :—
Cestrian Elect. Co., Northgate.
Claude Crimes, Delamere Street.
Curry's, 20, Frodsham Street.
Crewe :—
Curry's, Market Street.
W. H. Gibson, Primo Radio House, Edleston Road.
The Morris Store, 163, Edleston Road.
Connahs Quay :—
G. M. Coppack, 80, High Street.
Congleton :—
W. P. Alcock, 3, Mill Street.
Curry's Ltd., 25, High Street.
Cheadle Hulme :—
North Cheshire Elect., 48, Station Road.
Hazel Grove :—
Allen Gosling, 91/93, London Road.
Hoylake :—
Hoylake Radio Service, Radio House, Market Street.
E. J. Shipton, 96, Market Street.
Hazel Grove Radio Service, 171, London Road.
Hyde :—
W. Lister, 272, Market Street.
Stamford Radio, 45, Market Street.
Mallard, 59, Mottram Road.
Kelsall :—
The Kelsall Wireless Service.
Knutsford :—
Frank Groves, Over Peover Garage.
Elstone & Price, 38, Princess Street.
A. Bleasdale, 103, King Street.
Macclesfield :—
B. Mellor, 39, Church Street.
G. E. Hudson, 11, Roe Street.
Nantwich :—
R. Smith, 31, Pillory Street.
G. E. C. Tomkinson, 10, Pepper Street.
Northwich :—
R. Y. Moore, 195, Witton Street.
F. G. H. Hindley, 86, Runcorn Rd., Barnton.
Poynton :—
Firth's Radio Stores, 89, Park Lane.
Rock Ferry :—
J. J. Peters, 334, Old Chester Road.
Runcorn :—
G. A. V. Betty, 40, Regent's Street.
T. E. Allman, 36, Halton Road.
Storey Bros., 79, Church Street.
Surrey Motor Co., Greenway Road.
Stockport :—
Central Radio & Elect. Co., 98, Prince's Street.
Curry's, 32, Lower Hillgate.
Edgeley Radio Centre, 42, Castle St., Edgeley.
Haughton & Rowland, 210, Chester Gate.
J. W. Heaps, 54, Wellington Road.
J. T. L. Mallard, 13/15, Sandy Lane.
Olympia Radio, 126, Prince's Street.
R. & J. Radio Service, 79, Gt. Portwood St.
Universal Electric Supply Co., Ltd., 76, Prince's Street.
Stalybridge :—
F. Edwards, 72, High Street.
S. Nield, 15, Cheetham Hill Road.
Saltney :—
A. A. McDonald.
Sale :—
Searles, 138A, Marsland Road.
Tarporley :—
Cluetts of Tarporley.
Tranmere :—
E. Davies, 121, Old Chester Road.
Wallasey :—
Express Supply, 43, Poulton Road.
Cheshire Wireless Co., 98/100, Brighton Street.
F. S. Salisbury, 71, King Street.

CHESHIRE—*continued.*

West Kirby :—
S. B. Prescott, 8, Banks Road.
Whaley Bridge :—
F. Hulme, "Botany House."
Wilmslow :—
G. Cooke Co., Station Road.
Wirral :—
A. Reed, Bridge Street, Neston.

CORNWALL.

Bude :—
Wroe & Briggs, The Strand.
Callington :—
H. W. Brown, Fore Street.
Calstock :—
E. Pengelly, "Fernleigh."
Camborne :—
Sandow & Tregenza, 6, Church Street.
Tonkin & Co., Melody House, Basset Road.
Falmouth :—
J. H. Cooper, 83, Killigrew Road.
J. H. Deeble & Sons.
Gunnislake :—
F. E. Martin, Garage.
Launceston :—
W. J. Crowells, Moor View, Lewannick.
Liskeard :—
S. J. Matthews.
Looe :—
S. I. Armstrong, Fore Street.
S. I. Armstrong, The Quay.
Lostwithiel :
W. McLean, 1, Albert Terrace.
Newquay :—
C. C. Gerry, 36, Bank Street.
Bathes Ltd., 51B, Bank Street.
Penryn :—
L. C. Rowse, 60, Lower Market Street.
Penzance :—
The Penzance Garage Ltd., 69A, Market Yew Street.
Hosking's Garage.
W. H. Lawley Bros., Gainsborough House, The Terrace.
"Radio House," Morrab Road.
Port Isaac :—
North Cornwall Transport Co., Ltd.
Redruth :—
Remfry Jarvis & Co., 89, Fore Street.
St. Agnes :—
G. F. Moore.
St. Austell :—
Maydn Whetter, London House.
W. Jacob & Son, The West End Wireless Stores.
St. Blazey, Par :—
R. E. Osborne.
St. Dennis :—
Tom Morcom & Sons, Greenwich House.
C. F. Miller, Service Garage.
St. Ives :—
R. Paddon, Chapel Street.
St. Tudy, Bodmin :—
B. R. Lewarne, The Garage.
Tintagel :—
W. C. Grose.
Charles Grose & Sons.
Truro :—
G. H. Lawrance & Co., Ltd., King Street.
E. Soloman, Kenwyn Radio, Kenwyn Street.
Dorrington & Davys, 10/11, Cathedral Lane.
Wadebridge :—
Napier's Music Salon, Molesworth Street.

CUMBERLAND.

Carlisle :—
Edwin S. Roberts, 107, Botchergate.
Egremont :—
William Smith, 92, Main Street.
Keswick :—
J. Denwood, jr., 30/32, St. John's Street.
Maryport :—
Elliotts, Radiotricians & Electrical Engineers, Curzon Street.
Penrith :—
William Pears, 4, Great Dockray.
Thos. Altham & Son, Burrowgate.
Whitehaven :—
T. S. Bell & Co., 35, Tangier Street.
M. J. Beckett, 60, Roper Street.
Wigton :—
George Pape, Radio Dealer, 47, High Street.

DENBIGHSHIRE.

Colwyn Bay :—
Chargrite Radio, The Rialto, Abergele Road.
J. Hackiug, Abergele Road.
Cefn Mawr :—
E. Emlyn Evans, Trevor House, Railway Rd.
Llanrwst :—
J. R. Williams, Denbigh Street.
Wrexham :—
R. & W. E. Jones, 20, Bank Street, Rhos.
Curry's Ltd., 40, Hope Street.
Sterling's, 1, Mount Street.

DERBYSHIRE.

Alfreton :—
Curry's Ltd., High Street.
Ashbourne :—
S. Richardson, 12, Market Place.
Breaston :—
H. Walker, Post Office.
Bakewell :—
F. C. Evans, The Radio Shop.
D. C. Drabble, "Radio House," 1, 2, 3, Church Alley.
Chesterfield :—
Brook Hardcastle, 20/22, South Street.
Curry's Ltd., 33, Burlington Street.
Black's Radio Stores, 63, Low Pavement.
E. Austin, 1, Station Road, Whittington Moor.
Clowne :—
W. Monks, Mill Street.
W. Simmarette, North Road.
Derby :—
Hulme & Son, 8/9, Sadler Gate.
H. Keeling, 122, Peartree Road.
Graham & Hopkins, 125/7, Peartree Road.
F. H. Brookes, 58, Burton Road.
Pedder Bros., 188, Upper Dale Road.
Curry's Ltd., 59/61, London Road.
Curry's Ltd., 43, East Street.
J. & F. Stone, 22, Corn Market.
Glossop :—
T. O'Neill & Sons, 62A/64, Victoria Street.
Heanor :—
H. Bingham.
A. E. Richards, 41, Ray Street.
Ilkeston :—
Curry's Ltd., 66, Bath Street.
E. Dean, 155, Cotmanhay Road.
Long Eaton :—
Belton & Reid, 53, Derby Road.
C. Gilbert, 79, High Street.
Marple Bridge :—
Pearce & Mills, 1, Town Street.
Matlock :—
S. Fearn.
Ripley :—
Curry's Ltd., 4, Chapel Street.
Smalley :—
H. B. Eaton, Yew Tree Cottages.
Staveley : —
H. E. Drabble, High Street.
Swadlincote :—
M. McCaun, 62, Alexander Road.

DEVONSHIRE.

Abbotskerswell :—
G. E. Laurence, "Park View."
Bideford :—
W. S. Darch, 34, Mill Street.
F. Lucas, 6, Mill Street.
Arnold, The Quay.
Cullompton :—
W. H. Terry, 26, Fore Street.
F. H. Stevens, 8, Belle View.
F. H. Stevens, Fore Street.
Colyton :—
T. J. Butler, Car Radio Service.
Exeter :—
Fildews, 177, Sidwell Street.
Curry's, 5, Sidwell Street.
Curry's, 204, High Street.
A. J. Davis, Bridge Street.
H. Pincott & Sons, 36, Bridge Street.
Exmouth :—
Fildews, The Parade.
Braid's Wireless Service, 13, The Parade.
Hatherleigh :—
F. C. Gooding & Sons, Bridge Street.
Holsworthy :—
J. P. Whitlock & Sons.
Kingsbridge :—
W. H. Furnemore, 14, Dule Street.
Newton Abbot :—
J. H. Pollard, Queen Street.
R. H. Whittaker, 27A, Highweel Street
Okehampton :—
F. G. Gilbert, 35, Crediton Road.
Paignton :—
Central Radio, 1, Palace Avenue.
Millward Maxey, 23, Palace Avenue.
R. Harris & Sons, 52, Hyde Road.
H. V. Barker, 79, Manor Road.
Plymouth :—
A. Brand, Mutley Plain.
Curry's, 15, Union Street.
Stonehouse Radio, 54, Union Street.
R. L. Turner, 6, Athenæum Arcade.
Plympton :—
E. W. Burt, Ridgeway.
Sheepwash :—
W. H. Meast, Radio Shop.
South Molton :—
E. Kingdon. Barnstaple Street.
Rogers & Mannings, 139, East Street.
Tavistock :—
A. E. Graves, 74, West Street.
Tiverton :—
H. Pincott & Sons, Gold Street.
W. Morrell, 23, Gold Street.
Topsham :—
Osborne's Elect., 28, Fore Street.

RADIO DEALERS—*continued*

DEVONSHIRE—*continued*

Torrington :—
Beaford Garage, Beaford, Winkleigh.
Torquay :—
Curry's, 130, Union Street.
Bradshaw's, 130, Union Street.
T. Kay, 190, Union Street.
Teignmouth :—
R. F. Poole.
Devonport :—
Pioneer Cycle Works, Tavistock Street.

DORSETSHIRE.

Bridport :—
Cox & Humphries, West Street.
Best & Sons, West Street.
W. O. Knell Ltd., 18, East Street.
Blandford :—
H. Robinson, 9, Salisbury Street.
Dorchester :—
Curry's Ltd., 2, Cornhill.
Near Dorchester :—
F. L. Bollen, Radio Engineer, Piddletrenthide.
Gillingham :—
H. A Read, Newbury Street.
Parkstone :—
Reliance Charging Co., 107A, Commercial Rd.
Welric Radio, 27, Church Road.
Harold Taylor, Radio Engineer, Liliput Sq.
Poole :—
Curry's Ltd., 64, High Street.
Portland :—
Comben, 130, Fortuneswell.
Swanage :—
Albany Music Stores (A. G. Howell), 9, Station Road.
Radio Repairs (C. J. Smith), 35, Station Road.
Upper Parkstone :—
Wellstead & Son, 308, Ashley Road.
Weymouth :—
W. Darch, 43, St. Thomas Street.
W. O. Knell & Co., 70, St. Thomas Street.
W. Smith & Son, 23, Crescit Street.
Rand Radio Service.
Wimborne :—
H. J. Evans, 43, East Street.
F. C. Jameson, 3, King Street.

COUNTY DURHAM.

Barnard Castle :—
R. G. Jackson, 17, The Bank.
Billingham :—
G. H. Dean, 28, Mill Lane.
Northern Radio, 34, Station Road.
Bishop Auckland :—
D. Latham, 38, Market Place.
G. Brown, Rosemount Garage, South Church.
Blackhill :—
J. S. Hall, 23, Durham Road.
Chester-le-Street :—
J. W. Oates, 16, Covered Market.
Jos. Emerson, Front Street.
Coxhoe :—
Hudson & Brown, Front Street.
F. C. Head, Linden Terrace.
Crawcrook :—
J. L. Morley, Main Street.
Crook :—
J. Dodds, Church Street.
Darlington :—
Northern Radio Supplies, 61, Skinnergate.
R. & S., 47, Tubwell Row.
F. Cowburn, 120, North Road.
Reeves Radio, 43, Bondgate.
Curry's Ltd., 44, High Row.
Armstrong & Co., 8, Stone Bridge.
Butcher Radio Stores, 260, Whessoe Road.
Butcher Radio Stores, 73, Brinkburn Road.
Durham City :—
Kelly & Co., 23, Elvet Bridge.
Esh Winning :—
E. James, 3, Station Avenue.
Ferryhill :—
Jones Prompt Service Dept., Darlington Rd.
W. Stapleton, 4, Commercial Street.
Gateshead :—
J. F. Haugh, 135, Sunderland Road.
E. Ridsdale, 10, Derwentwater Road.
R. Spink.
F. Starr, 394, Askew Road West.
J. Urwin & Co., 223, High Street.
Hebburn-on-Tyne :—
C. Fraser, 28, Argyle Street.
Jarrow-on-Tyne :—
J. Kearney, 58, Grange Road.
Langley Moor :—
J. Barber, 51, High Street.
J. F. Mawston, 27, High Street South.
Murton Colliery :—
R. G. Adams, East Murton.
New Silksworth :—
Drewery Radio (R. Wharton).
Newcastle :—
Curry's Ltd., 11, New Bridge Street.
Sacriston :—
A. Nesbitt, Findon Hill.
Seaham Harbour :—
J. Rubens, New Arcade.

COUNTY DURHAM—*continued*

Shildon :—
Elwell's Wireless, 5, Church Street.
South Shields :—
T. Holdsworth, 19, Meldon Terrace.
R. Tully, Central Wireless Stores, 4, Alfred St.
South Moor :—
W. Simpson, 254, Park Road.
Spennymoor :—
E. & F. Cator, 43, High Street.
Stanley :—
C. N. Grundy, Wireless and Elect. Stores.
H. Hobbs & Son, 52, Front Street.
Stockton-on-Tees :—
Curry's Ltd., 107, High Street.
J. H. Gibbeson, 6, Albert Place, Norton Rd.
V. Adams, 79A, High Street.
Smarts Ltd., 28, Dovecote Street.
Sunderland :—
Albany Eng. Co., Albion Place.
Maurice Behrman, 3, Brudar Road.
H. Brechner, 26 & 28, New Arcade.
F. Childs, 6, The Arcade.
R. S. Herrow, 24, Crowtree Road.
Howards, 10, Hudson Road.
J. Hurrell, " Red Shop," Crowtree Road.
C. E. Raine, 6, Villette Road.
West Hartlepool :—
Ilderton's, 79, Musgrave Street.
Empire Radio Supplies, Freeman Street.
Jackson & Dunn Ltd., 107, York Road.
Radio Supplies, 39, York Road.
Express Wireless Service, Murray Street.
Willington :—
Routledge's Radio, 73, Commercial Street.
Wingate :—
J. Thompson, Front Street.

ESSEX.

Althorne :—
A. A. Ford & Co.
Barking :—
F. Baxter & Son, 515, Barking Road.
Gibbs' Radio, 357, Ripple Road.
S. Grey & Co., Ltd., 83, East Street.
Becontree :—
Castle Sports Depot, Bennetts Castle Lane.
Braintree :—
Curry's Ltd., 42, Bank Street.
Nicholls Bros., 74, High Street.
W. Chapman, 32, South Street.
B. L. Long, Wethersfield.
Brentwood :—
Reasonable Radio, 92, High Street.
T. Ellis, 129A, High Street.
Burnham-on-Crouch :—
A. A. Ford & Co., 45, High Street.
Canvey Island :—
Canvey Accumulator Service, 5, The Arcade, High Street.
Tower Radio Stores, High Street.
Chadwell Heath :—
Arthur G. Field, 27, Station Road.
Chelmsford :—
" King's of Chelmsford," 120, Baddow Road.
Flexman's, 75, Duke Street.
Curry's Ltd., 62, High Street.
Green's, 2, Mildmay Road.
F. J. Webb, Anchor Street.
A. R. Hunt, Post Office, Writtle.
C. T. Baker, 33, Broomfield Road.
Scott Bros., Gt. Baddow.
Clacton :—
Galley's, Old Road.
Superadio, 60, Rosemary Road.
Colchester :
Curry's Ltd., 45/46, High Street.
Curry's Ltd., 20, St. Botolph's Street.
C. Godfrey, 41, North Hill.
Gillard Filmay, Ltd., 2, Short Wipe Street.
S. J. Grubb, Finginghoe, Nr. Colchester.
H. E. Williams & Co., Ltd., 152, High Street.
The Elmstead Cycle Depot, Elmstead, Nr. Colchester.
Dagenham :—
Gillard Filmay Ltd., 9, Goresbroor Road.
Castle Sports Depot, Heathway.
S. Grey & Co., Ltd., 285-7, Heathway.
Castle Sports Depot, 242/4, Bennett's Castle Lane.
Castle Sports Depot, 18, Woodward Road.
Dunmow :—
A. Archer & Sons, 35, High Street.
A. C. Knight, High Street.
Frinton-on-Sea :—
Frinton & Walton Radio Ltd., Connaught Ave.
Goodmayes :—
Highten Accumulator Co., Green Lanes.
Grays :—
S. Grey & Co., Ltd., 12, Clarence Road.
T. H. Grylls, 21, Clarence Road.
Hainault :—
Parker & Bailey, New North Road.
Harlow :—
W. Collins & Son, Fore Street.
Harold Wood :—
G. J. B. Millest, Church Road.
Harwich :—
Harwich Radio and Gramophone Supplies, 69, Church Street.

ESSEX—*continued.*

Ilford :—
R. S. Shereeno, 326, Ilford Lane.
Supreme Radio Co., 129, Ilford Lane.
Curry's, Ltd., 345, High Road.
S. Grey & Co., Ltd., 216, High Road.
G. Siebert, 65, Ilford Lane.
Laindon :—
J. F. Johnson, Laindon Radio Service.
Leigh-on-Sea :—
H. Richardson, 76, Broadway.
Leytonstone :—
George E. Matthews, 305, High Road.
Maldon :—
Baden-Saville.
J. W. Colleer, Radio Stores, Heybridge.
Marks Tey :—
Express Cycle Works, London Road.
New Barking :—
Symphonie Salons Ltd., 68, Longbridge Road.
Ongar :—
R. Mossley, Radio and Music Stores.
Orsett :—
W. L. Freeman, Cycle and Radio Stores, High Street.
Romford :—
Gillard Filmay Ltd., South Street.
Rayleigh :—
Colvin, High Street.
Saffron Walden :—
" Walbro," High Street.
Seven Kings :—
Arthur G. Field, 693, High Road.
Mogfords, High Road.
Shoeburyness :—
F. H. Prentis, Grove Works.
H. Owen & Sons, 72, High Street.
Southend-on-Sea :—
Bridge's, Warrior Square.
W. T. Burrell, 5, Victory Parade, Sutton Road.
Curry's Ltd., 32, Southchurch Road.
District Supplies Ltd., 85/89, High Street.
S. Grey & Co., Ltd., 39, Southchurch Road.
Ley's Radio, 301, Southchurch Road.
Kenwood Radio Stores, 141, Woodgrange Dr.
Stanford-le-Hope :—
L. Rayner, 3 & 4, High Street.
Thaxted :—
Parrish Bros., High Street.
Westcliff-on-Sea :—
W. G. Morgan, Westboro Radio, 420, Westboro Road.
Kingstone, 695, London Road.
" Chalkwell Electric," 881 & 881A, London Road.
Dennant, 179, West Road.
West Mersea :—
Digby's.
Wickford :—
Wickford & District Accumulator Service, Runwell Road.

FLINTSHIRE.

Flint :—
Stanley Riley & Son, Apothecaries Hall.
Holywell :—
Hywel Jones, High Street.
Rhyl :—
J. R. Williams, Elwy Street.

GLAMORGAN (WALES).

Cardiff :—
Curry's Ltd., 23, St. Mary Street.
Curry's Ltd., 18, Albany Road.
J. & M. Stone, 40, Queen Street.
Port Talbot :—
T. J. Phillips, 57, Station Road.
Swansea :—
Glickson & Co., 174, High Street.
Curry's Ltd., 17, High Street.
Robins (Radio) Ltd., 18A, Oxford Street.
Photo Supplies Ltd., 38, Castle Street.

GLOUCESTERSHIRE.

Avonmouth :—
Silverthorn Bros., 3, Gloucester Road.
Berkeley :—
G. W. Miles, Cannonbury Street.
Bristol :—
Ernest Blizzard, 37, Alma Vale Road, Clifton.
O. W. H. Ovens, 163, Fishponds Rd., Eastville.
Old Richmond Charging Station, 110, West St., Bedminster.
Curry's Ltd., 139, East Street, Bedminster.
Westbury Radio Co., 63, Westbury Hill, Westbury-on-Trym.
Shaftesbury Supplies, 61, West St., Old Market
Polchars Wireless Ltd., 37, East St., Bedminster.
E. V. Frost, 14, Filton Road, Horfield.
Polchars Wireless Ltd., 20, Bridge Street.
H. G. Weaver Ltd., 22, Princess Victoria St., Clifton.
Curry's Ltd., 13/14, Peter Street.
J. & M. Stone, 38, Castle Street.
Bristol East Radio, West Street, Old Market.

RADIO DEALERS—*continued.*

GLOUCESTERSHIRE—*continued.*

Cheltenham :—
Gramo-Radio, 164, High Street.
F. H. Bastin & Son, 230, Bath Road.
F. H. Bastin & Son, 86, Winchcombes.
Curry's Ltd., 156, High Street.
Syd Tonge, 92, Winchcombe Street.

Cinderford :—
F. J. Lucas, Radio House.

Cirencester :—
C. F. Edwards, Castle Street.
G. J. Miller & Sons, 72A, Castle Street.
Curry's Ltd., 17, Market Place.

Coleford :—
C. E. Collett, The Garage, Christchurch.

Gloucester :—
The Westgate Radio Co., 126, Westgate Street.
L. C. Mitchell & Co., 52, Northgate Street.
Caer Glow Battery Co., 161, Westgate Street.
Battery Services, 7, Stroud Road.
Curry's Ltd., 12, Eastgate Street.
J. & M. Stone, 18, Northgate Street.

Nailsworth :—
Hurns Radio, Market Street.

Stonehouse :—
G. E. Law, Eastington.

Stow-on-the-Wold :—
H. Heath, Church Street.

Stroud :—
R. Clack, Wireless Depot, Thrupp.
General Radio Service, Brimscombe, Nr. Stroud.
Curry's Ltd., 14, High Street.

Tewkesbury :—
Haywards (Tewkesbury) Ltd., 126, High St.
Curry's Ltd., 131, High Street.

Thornbury :—
W. J. Blizzard, Warrington House.

HAMPSHIRE.

Aldershot :—
Curry's Ltd., 12/14, Union Street.
E. Standing, 2, Short Street.
G. Fagins, 13, Union Street.
W. Lofthouse, 29, Grosvenor Road.

Alton :—
Wm. H. Hay, 15, Market Street.
Andrews Bros., Anstey Road.

Andover :—
Curry's Ltd., 84, High Street.
W. J. Randall, 4, Bridge Street.

Basingstoke :—
Curry's Ltd., Church Street.
H. J. Gifford Ltd., 22, Winchester Street.
Prior's Stores, North Warnborough.

Bordon :—
F. Kennett, Headley.

Bournemouth :—
Adams Bros., 8, Grand Parade, Westbourne.
Bartlett & Holden, 341, Holdenhurst Road.
Bartlett & Holden, 42, Castle Lane, Moordown.
British Radio Supplies Corp., Charminster Rd.
D. Brown, 1143, Christchurch Road.
Brown's, 366A, Holdenhurst Road.
Brown's Radio Stores, Pokesdown Hill.
A. F. Claxson, 98, Charminster Avenue.
Corbin & Lockyer Ltd., 146, Commercial Road.
Curry's Ltd., 410, Wimborne Road, Winton.
Curry's Ltd., 154, Old Christchurch Road.
Curry's Ltd., 644, Christchurch Rd., Boscombe
Dawson's, 5, Post Office Parade, Seamoor Rd., Westbourne.
Excello Agencies, 687, Wimborne Rd., Winton.
Gardners Radio Ltd., West Southbourne.
Grace Bros., 6, Post Office Buildings, Winton.
E. P. Hall & Co., 321/3, Wimborne Road, Winton.
Hill & Co., 874, Christchurch Road.
Holford & Co., 84, Poole Road, Westbourne.
Joy's Radio, 172, Old Christchurch Road.
Moordown Cycle Stores, 856, Wimborne Rd.
The Northbourne Elec. Co., New Rd. Junction, Northbourne.
Pauline Radio, 791, Christchurch Road, Boscombe.
Pokesdown Wireless Depot, 914, Christchurch Road, Boscombe, E.
Radio Service Co., 512, Christchurch Road, Boscombe.
Scott's, 232, Holdenhurst Road.
Wm. Taylor, Ltd., 92, Ashley Road, Parkstone.
Walls Radio, 224, Old Christchurch Road.
Wellstead & Son, 1174, Christchurch Road, Boscombe East.
Wessex Home of Melody, 184, Holdenhurst Rd.
Winton Wireless, 743/5, Wimborne Road, Winton.
Fry's Music Stores, 422, Wimborne Road, Winton.
Parker & Son, 445, Wimborne Road, Winton.

Christchurch :—
Barton Radio Service, Barrack Road.
W. J. F. Colliss, 32, Purewell.

Eastleigh :—
City Radio, 76, Market Street.
H. H. Stacey, 32, High Street.
W. Brice Slade, 78, Southampton Road.

Fareham :—
See & Burgess, 147A, West Street.

HAMPSHIRE—*continued*

Farnborough :—
R. Marshall, 38, Camp Road.

Fordingbridge :—
Hay & Lewin Ltd., Avon House.

Fleet :—
C. & E. Brothers.

Lymington :—
C. S. Barron, 79/80, High Street.

New Milton :—
L. Nicholson & Co., Ltd., Station Road.
Radio Installations, Old Milton Road.

Portsmouth :—
Chappell & Churchill, Russell Street.
Curry's Ltd., 118, Kingston Road.
Curry's Ltd., 217, Commercial Road.
W. E. Harding, 116, London Road, North End.
E. Heffren, 71, Stanshaw Road.
E. & A. Patrick, 79, Chichester Road.
Pearce & Taylor, Stanston Road.
J. & M. Stone, 8, Lake Road.
J. & M. Stone, 103, Commercial Road.
Twyford Elec., Twyford Avenue.
Wild Bros., 125, Arundel Street.
Wild Bros., 60, Fratton Road.

Southampton :—
Regent Radio, 105, High Street, Shirley.
Bailey & French, 82, Bevois Valley.
Bargate Wireless, High Street.
G. E. Bell, 61, Onslow Road.
Curry's Ltd., 2, Prospect Place, Nr. Junction, Above Bar.
Curry's Ltd., 52, East Street.
A. W. Haines, 129, Highfield Lane.
Kingsway Radio, Commercial Road.
Matons, 208, Shirley Road.
H. H. Mills, The Valley Radio, 46, Bevois Valley.
J. & M. Stone, 59, Above Bar.
F. R. Orman, Station Road, Netley Abbey.
Shaftesbury Supplies, 17, St. Mary Street.
Arthur Gibson, 38A, Portsmouth Road, Woolston.
Arthur Gibson, 8, Victoria Road, Woolston.
Gay's Radio, 66, St. Mary's Road.
Gardner's Radio, 22 & 49, Victoria Road, Woolston.

Southsea :—
Russell & Russell, 269, Milton Road.
Brompton Eng. Co., 172, Albert Road.
T. S. Cocks, 219, Milton Road.
Curry's Ltd., 4, Russell Street.
Stokes & Son, 94, Highland Road.
F. G. Webb, 209, Somers Road.
Norfolk Wireless Exchange, 10, Norfolk Street.

Winchester :—
Curry's Ltd., 144, High Street.
Dick's Ltd., 149, High Street.
Handcock & Sons, Jewery Street.
Watson & Childs, 7, City Road.

HEREFORDSHIRE.

Bromyard :—
Edmund Williams, 41/42, High Street.

Hereford :—
"Cons" Wireless, 11, Widemarsh Street.
C. F. King, & Co., City Garage.
Curry's Ltd., Lloyd's Bldgs., High Town.

Leominster :—
Colston Davies, 29/31, Etnam Street.
Regent Cycle & Radio Stores, 15, South Street.

HERTS.

Barnet :—
District Supplies Ltd., 113, High Street.

Berkhamsted :—
"Eric's Radio Supplies," 27, Lower King's Rd.
A. Hart, 222, High Street.

Bishop's Stortford :—
Curry's Ltd., 13, Potter Street.

Cheshunt :—
Radio Service & Supplies, High Street.

Croxley Green :—
Collett & Quantrill, 1, Station Parade.

Hertford :—
F. S. Taieb, Honey Lane.
Curry's Ltd., 8, Maidenhead Street.
G. Ditton, 36, St. Andrew Street.
Quelch & Brown, 13, Fore Street.

Hemel Hempstead :—
Pyle's Music Stores, 12, Alexandra Road.
The West Herts Electric Co., Marlowes.

Hitchin :—
H. Shadbolt, 6, Tilehouse Street.
R. S. Sanders & Sons, Ltd., Central Wireless Stores.
Curry's Ltd., 19, Market Place.
Frank Gray, 1A, Verulam Road.
Wren & Son, Kimpton.

Hoddesdon :—
The Central Radio Stores, 12, Lord Street.

King's Langley :—
A. T. Cooper Ltd., 53, High Street.

New Barnet :—
Russell Wood (Barnet) Ltd., 22, Greenhill Parade.

Redbourn :—
E. Ostler, 96, 98, 98B, High Street.

HERTS—*continued*

Rickmansworth :—
Beeson & Sons, Ltd.
Summet Wireless Stores, High Street.
Express Radio Service, 214, Uxbridge Road.

Royston :—
Pepper & Haywood, Melbourn Street.

St. Albans :—
Alma Radio, 43, Alma Road.
District Supplies Ltd., 18A, St. Peter's Street.
Jarvis, 1, The Broadway.
G. W. Linsell, 26, London Road.
H. Smith, 1, Verulam Road.
S. F. Garside, 1B, London Road.
Shenley Motors, Shenley.

Stevenage :—
W. E. Hall, 83, High Street.

Tring :—
W. P. Fancourt, 47, Frogmore Street.

Waltham Cross :—
H. & P. Marsden, 79A, High Street.

Ware :—
F. Higgins, 74, High Street.
Thompson, 17, High Street.

Watford :—
Curry's Ltd., 142, High Street.
District Supplies Ltd., 123, St. Albans Road.
District Supplies Ltd., 54, High Street.
F. Luckhurst & Son, 1, Sidney Road.
Russell's, Queen Street.
D. & R. Willison, Ltd., 192, St. Albans Road.
G. Harry Gray, 57, Queen's Road.
W. Collin Perks, 199, St. Albans Road.
T. Williams, 219, St. Albans Road.

Welwyn Garden City :—
Welwyn Stores (1929) Ltd.

ISLE OF MAN.

Douglas :—
Express Radio Service (R. W. Caren).

ISLE OF WIGHT.

Cowes :—
Frampton's Motor & Cycle Garage, Cross St.
F. E. Dominey, 20, Shooters Hill.
H. Millard, 25, Clarence Road, East Cowes.

Newport :—
W. A. Cheverton (The New Firm) Ltd., 81, High Street.

Ryde :—
Young's, 16, High Street.

Ventnor :—
Bannister's, 3, Spring Hill.
Direct Supplies, 37, High Street.

KENT.

Ashford :—
Curry's Ltd., 9, Bank Street.

Barnehurst :—
T. J. Cole, 9, The Parade.

Belvedere :—
P. H. Radio Service, 117, Picardy Road.
E. Davis & Son, 20, Station Road.

Benenden :—
G. Baldwin & Sons.

Beckenham :—
District Supplies Ltd., 276, High Street.

Bromley :—
J. & F. Stone, 114, High Street.
J. & F. Stone, 79, High Street.
Leeves & Allen, 64, College Road.
F. H. Perry, 59, Chatterton Road.
G. W. Palmer, 23, Mason's Hill.

Brompton :—
F. H. Stone, 44, High Street.

Canterbury :—
S. W. Bligh, 1 & 2, North Lane.
S. W. Bligh, 11, St. Dunstan's Street.
Curry's Ltd., 13, High Street.
John Walker & Co., 18, High Street.
Modern Radio Co., 5A, St. Peter's Street.

Chatham :—
Deptford Lighting & Wireless Co., 220, High Street.
East End Cycle & Wireless Stores, 392, High Street.
H. W. & L. E. Finn, 392, High Street.
J. & F. Stone, 193, High Street.
Wackett Bros., 302/304, High Street.

Dartford :—
J. & F. Stone, 12, Hythe Street.
Woodyer & Sons, 39, Lowfield Street.
Dartford Battery Service, 56, Spital Street.

Deal :—
"Walders for Wireless," 34A, High Street.
Edward W. Smith, 20, Queen Street.
E. D. Newing, 138, High Street.

Dover :—
Curry's Ltd., 51/52, Biggin Street.
F. Morecroft & Sons, 100, High Street.
E. W. Bond, 1, Bridge Street.

Downham :—
Gayne & Co., 487, Bromley Road.

RADIO DEALERS—*continued*

KENT—*continued.*

Erith :—
Electrical Services (Erith) Ltd., 353, Bexley Road.

Faversham :—
Curry's Ltd., 4/5 ,West Street.

Folkestone :—
Curry's Ltd., 25, Rendezvous Street.
A. C. Parish, Radio Stores, George Lane.
J. M. Guilding, 149, Dover Road.
J. M. Guilding, 49c, Tontine Street.
Adams Bros., 7, Tontine Street.

Foots Cray :—
J. S. Haan, Main Road.

Gillingham :—
Baker's Wireless Stores, 77A, High Street.
Baker's Wireless Stores, 133, Trafalgar Street.
Curry's Ltd., 110, High Street.
The Rhodes Wireless Co., 318, Canterbury St.
J. & F. Stone, 121, High Street.

Gravesend :—
A. E. Barnes, 1, Berkeley Crescent.
J. F. Stone, 74, High Street.
De Wardt Radio, 10, Windmill Street.

Hadlow :—
P. F. White & Son, High Street.

Headcorn :—
A. H. Hyde & Sons, High Street.

Herne Bay :—
H. W. Chase, High Street Garage.

Hythe :—
Boxall, 164, High Street.

Longfield :—
F. W. Pain, Station Road.

Maidstone :—
Curry's Ltd., 125/127, Week Street.
F. T. Gilbert, 118, Week Street.
W. W. Jones, 109, Upper Stone Street.
Owen's Wireless Service, 41, Lower Stone St.
J. W. See & Sons, 12, Earl Street.
H. Smith, 20A, Stone Street.
J. & F. Stone, 2, Middle Row, Bank Street.
J. & F. Stone, 45, High Street.

Margate :—
V. & G. Joyce, 93, High Street.
Thornton Bobby, Ltd., 242, Northdown Rd.

Meopham Green :—
F. W. Pain.

Northfleet :—
Frost's Radio Stores, 16/17, High Street.

Orpington :—
The Orpington Radio, Station Approach.
B. E. Stokes & Co., 222, High Street.

Pembury :—
J. J. Glendinning, High Street.

Ramsgate :—
Curry's Ltd., 28, High Street.
W. E. Stock Radio, 15, Addington Street.
N. Raffell, 133, Hereson Road.

Rochester :—
R. L. Bartlett, 161, High Street.
Featherstone's Ltd., 357, High Street.
Gentry & Bayley, 342, High Street.

Rolvenden :—
A. J. Barker, Regent Motor Works.

Sandwich :—
B. Simms, 32, King Street.

St. Mary Cray :—
Cray's Electrical & Radio Supplies, Reynolds Cross.

Sheerness :—
Sheppey Motor Co., Ltd., The Broadway.
Wackett Bros., Ltd., 23, High Street.

Sidcup :—
Butcher Curnow & Co., Ltd., 121, Station Rd.
Sidcup Radio Service, 253, Blackfen Road.
Leake & Hickmott, 43, Sidcup Hill.

Sittingbourne :—
Curry's Ltd., 124, High Street.
W. E. Nailor, 23, West Street.

Snodland :—
E. Baldock & Son, Holborough Road.

Staplehurst :—
Bourne & Sons, High Street.

Tonbridge :—
Curry's Ltd., 146, High Street.
C. Hatfield & Co., 27, High Street.
J. R. Brooks, 187, High Street.

Tunbridge Wells :—
J. H. Field, 66, High Brooms Road.
Percy Powell, 54, High Street.
Scott's Radio Service, 74, Camden Road.
F. R. Freeman, 47, St. John's Road.
Central Wireless, 1, Camden Road.

Walmer :—
E. R. Newing, 1, The Strand.

West Wickham :—
W. F. Rogers, 3, Central Parade.

West Malling :—
Pennell Bros., The Radio Shop.

Welling :—
A. F. Mills, 58, High Street.

Whitstable :—
Day's Garage, 6, Oxford Street.
E. C. Spray, 12 & 13, Harbour Street.
A. S. Tyler Ltd., 93, High Street.

LANCASHIRE.

Accrington :—
G. Bordycoat, 38, Union Street.
J. L. Catlow, 481, Manchester Rd., Baxenden.
Al. Sharples, 261, Blackburn Road.

Ashton-in-Makerfield.:—
Unsworth's Radio Stores, 5, Garswood Street.

Ashton-under-Lyne :—
Lawton Bros., 284, Stamford Street.
Olympia Radio Ltd., 182, Stamford Street.
H. Richardson, 78, Bentink Street.
Stamford Radio Co., 199, Stamford Street.

Askam-in-Furness :—
Smart's, 71, Duke Street.

Atherton :—
W. Lee, 81A, Market Street.

Bacup :—
J. Crawshaw, 149, Market Street.

Banks :—
S. Baxter, Bonds Lane.

Barrow-in-Furness :—
National Radio Co., 150, Dalton Road.
Smart's 288, Rawlinson Street.

Blackburn :—
H. Bolas, 29, Bottom Gate.
Douglas Hull, 33, Ainsworth Street.
Kleertone Wireless, 53, Copy Nook.
J. Longworth, 11, Fleming Square.
T. Snape, 63, Darwen Street.
Universal Elect. Supply Co., Ltd., 109, Darwen Street.
J. Walsh & Sons, Ltd., 72, Northgate.

Blackpool :—
Cleaver's Radio, 210, Central Drive.
S. Matthews, 118, Central Drive.
Pollards (B.) Ltd., 71, Bolton Street.
The Radio Stores, 2, Cedar Square.
Stewart's Radio, 6A, Alfred Street.

Bolton :—
Elect. & Radio Services, 489, Blackburn Rd.
T. Francis & Sons, 174, St. George's Road.
Grimshaw, Market Hall.
E. P. Lees, 201, St. Helen's Road.
Olympia Radio Ltd., 74, Bradshawgate.

Bootle :—
C. Lace, 97, Knowsley Road.
L. A. Wireless Co., 304, Stanley Road.

Burnley :—
Hartley Clegg, 75, Brennand Street.
A. Hartley & Co., 37, Standish Street.
S. T. Hughes, P.O. Fence.
Northern Radio Exchange Co., 150, Trafalgar Street.
Smith, Coal Clough Lane.
F. Thornton, 18, Yorkshire Street.
R. Towler, 81, Accrington Road.
Universal Elect., 1/3, Westgate.

Bury :—
Boardman's, 19, Stanley Street.
Bell Radio, 90, Bell Lane.
Jack Greenless, 17, Richard Burch Street.
Jack Greenless, 45, Brierley Street.
Moorgate Radio, 52, Moorgate.
Roberts, 178, Tottington Road.
Roscow, Crostons Road, Elton.
Wales, 78, Bridge Street.

Cark-in-Cartmel :—
Cark & District Elect., Flookborough.

Castleton :—
Stott & Sons, 786/794, Manchester Road.

Colne :—
Superior Radio Co., Swan Croft.

Dalton-in-Furness :—
Smart's, 150, Market Street.

Darwen :—
J. Duxbury, 4, Blackburn Road.
R. Hansell, 32, Redearth Road.
Maulkin, 207, Bolton Road.
Wrighton & Woods Ltd.

Denton :—
Walford, 643, Manchester Road.

Didsbury :—
Cable & Smith, 288, Fog Lane.

Droylesden :—
S. Sutton, 17, Market Street.

Eccles :—
Pennington & Sons, 316, Liverpool Road.

Failsworth :—
Broadbent, 460, Oldham Road.

Farnworth :—
Graveson & Sons, 141, Market Street.

Fleetwood :—
E. Owen, 202, Lord Street.

Gt. Harwood :—
J. Walton, 29, Blackburn Road.

Haslingden :—
Cooper & Son.

Haydock :—
Pennington & Son, 389, West End Road.

Heywood :—
Handfield, Church Street.
H. Allen.
Romney's (Bury) Ltd., 52/54, Market Street.

Hollinwood :—
Foster, 514, Manchester Road.

Liverpool :—
Beaver Radio Co., 60/62, Whitechapel.
Bennets Radio Co., 91, Victoria Street.
Bennets Radio Co., 54, Manchester Street.
Burton's, 226, Rice Lane, Walton.

LANCASHIRE—*continued.*

Cass, 179, Whitefield Road, Ansifield.
City Wireless Co., Ltd., 80, Whitechapel.
Wm. Clarke, 198, County Road, Walton.
Curry's Ltd., 70, Renshaw Street.
Dix Radio, Cycle & Battery Service, 89, Prescot Street.
A. Edwards, 492, Prescot Road.
C. Elliott, St. Mary's Road, Garston.
C. Elliott, 167, Park Road.
Evans, 105, Linacre Road, Litherland.
Formby Elect. Co., 17, Three Tuns Lane, Formby.
Gladwin Radio, 25/27, Whitechapel.
Halewood & Co., 14, Moor Lane, Gt. Crosby.
Hayes, 22, Longmoor Lane, Aintree.
W. Hignett, 513, W. Derby Road.
Imperial Radio Service, 62, Dale Street.
J. D. Wireless Co., 195, Breck Road.
Leyland, 90, Lark Lane, Liverpool.
Molyneux's, 52, Mount Pleasant, Waterloo.
Morris & Co., 53, Booker Avenue.
Morris & Co., 230, Smithdown Road.
Myerscough, 22, South Road, Waterloo.
Olympia Radio Ltd., 59, Whitechapel.
Owen & Sons, 265, County Road.
Rowland's, 77, Garston Old Road, Cressington.
J. Sawle, Radio & Elect. Service.
A. Shaw, 97, Liverpool Road, Gt. Crosby.
Smith Bros., 244, Walton Road.
Stanley's Radio (1930) Ltd., 178/180, London Road.
Street's Wireless Dept., 16, Wavertree Road.
Strode, 1A, Marlborough Road, Tuebrook.
Super Radio Co., 112, Whitechapel.
Warner's Elect. Trust Ltd., 32/46, Whitechapel.
T. W. & G. Warbrick, 5, Cook Street Arcade.
Wood Bros., 77, Windsor Street.

Lancaster :—
Curry's Ltd., 62, Penny Street.
Gunningham, 19, Brock Street.
Lancaster Radio, 3, Brock Street.

Leigh :—
Leigh Radio Services, 53, Railway Road.
Darlington, 2, Queen Street.
Boardman's Ltd., 14A, Railway Road.

Littleborough :—
L. Chadwick, 24/26, Hare Hill Road.
Carter, 4, Church Street.

Lytham :—
J. Scott, 20, Wharton Street.

Manchester :—
Bryce Electrical Co., 246 & 120, Stockport Rd. Levenshulme.
Allen, 182, Hulme Hall Lane, Miles Platting.
Osborne Andrews, 27, New Bailey St., Salford.
Barratt & Co., 2, Grange Terr., Wilmslow Rd., Rusholme.
Beal & Sons, 54, Church Street, Eccles.
Boardman & Son, 398, Rochdale Road.
H. & D. Borgen, 378, Stretford Road, Hulme.
Bowker, 530, Stretford Road, Old Trafford.
Burke & Co., Ltd., 548, Chester Road, Old Trafford.
Butler, 178, Princess Road, Moss Side.
Tom Cash, 30, Regent Road, Salford, 5.
Chadderton's, 29, Market Place, Middleton.
Charlesworth Ltd., 81, Rusholme Road, Chorlton-on-Medlock.
Charlesworth, 76, Hyde Road, West Gorton.
Clark's, 101, Crumpsall Lane, Crumpsall.
Coleman, 40, Yew Tree Road, Rusholme.
Coleman, 35, Upper Moss Lane.
Connett's, 102, Clarendon Road, Pendleton.
Curry's Ltd., 20, Corporation Street.
F. Dawes, 90, London Road.
Dawler Radio Stores, 189, Langworthy Road, Seedley.
Fleming, 67, Moss Lane West.
Forrester, 651, Rochdale Road.
Gaffney, 3, Highfield Street, Cheetham.
Glen Elect. & Cycle, 8, Cromwell Road.
Glen Elect. & Cycle, 135, Ellor St., Pendleton.
Goodwin's, 1206, Ashton Old Road, Hr. Openshaw.
Goodyear, 1, Moss Lane West, Brooks Bar.
R. Gray, 144, Shrewsbury Street, Brooks Bar.
Hewart & Cairns, 137, Gt. Clowes Street, Lr. Broughton.
Hilton, 36, Whittaker Lane, Heaton Park.
Holt, 130, Lower Moss Lane.
Hopwood, 39, Blackfriars Road, Salford.
H. P. Electrical Co., Ltd., 25, Eccles New Rd., Salford.
International Radio Bureau, 260, Deansgate.
Johnson, 98, Upper Lloyd Street, Moss Side.
F. Kinsey, Bury Street, Salford.
Lister, 3/5, Devonshire Road, Morecambe.
J. Loffet & Co., Ltd., 85, Dole St., Milnrow.
Lomax, 162, Cross Lane, Salford.
Mather & Loft, 215, Regent Road, Salford, 5.
Meta Ltd., 70, Manchester Road, Chorlton-cum-Hardy.
Motler's Stores, 113, Liverpool Rd., Patricroft.
Nelson Cycle & Radio, 1A, Nelson Rd., C-on-M.
Nightingale Radio, 436, Wilbraham Road, Chorlton-cum-Hardy.
Northamp. Radio Co., 50, Liverpool Street, Salford.

RADIO DEALERS—*continued.*

LANCASHIRE—*continued.*

Northern Battery Service, 6, Rock Street, Hr. Broughton, Salford.
North Manchester Radio, 808, Rochdale Road, Queen's Park.
Nuttall, 236, Manchester Road, Denton.
Oldfield Elect., 65, Blackfriars Road, Salford.
Olympia Radio, Ltd., 49A, Shudehill.
Olympia Radio Ltd., 3, Hanging Ditch.
Olympia Radio Ltd., 7, Corporation Street.
Over, 196, Mauldeth Road, Kingsway.
Park Wireless, 37, Raby Street, Moss Side.
Pennington, 1164, Chester Road, Stretford.
Percival, 51, Lower Seedley Road, Seedley.
Perkins, 256, Upper Brook Street, Chorlton-on-Medlock.
Pickering & Son, 102, Gt. Ancoats Street.
Quarmby, 204, Regent Road, Salford, 3.
Radio Shop (L. Alexander), 490, Oldham Rd.
Range Radio Supply, 162, Manchester Road.
Rex Radio Co., 242, Regent Road, Salford, 5.
Richardson, 84D, Rochdale Road, Harpurhey.
Riley, 83, Stockport Road, Ardwick.
Russon's, 27, King Street, Stretford.
Seymour Radio Co., Talbot Rd., Old Trafford.
Smith & Peacock, 179, Stockport Road, Levenshulme.
W. Snelson, 2, Ruth Street, Salford.
Station Radio Co., Ltd., 67, Corporation St.
W. Stewart, 6, Stovell Avenue, Crowcroft Park, Longsight.
A. Sutcliffe, 74, Brook Street, Chorlton-on-Medlock.
Super Radio (All Saints) Ltd., 32, Withy Grove
Taylor & Co., 754A, Oldham Rd., Newton Hth.
Turner Ltd., 20, Cooper Street, Withington.
Universal Elect. Supply Co., Ltd., 4, Brown St.
A. Underwood, 101, Eccles New Rd., Salford.
Weaste Radio, 65, Tootal Rd., Weaste, Salford.
Wellworth Wireless Co., 8, Withy Grove.
Whitehead & Co., Upper Brook Street.
Wilday & Co., 356, Eccles New Rd., Salford, 5.
Wright, 571, Didsbury Road, Heaton Mersey.
Wyse & Son, 50, Walmer Street, Rusholme.
Yardley, 315, Gt. Western Street.
Nightingale Radio, 58, Wilmslow Road, Withington.

Nelson :—
Bond's, 159, Leeds Road.
H. Catlow, 46, Hibson Road.
Universal Wireless Supply Co., 67A, Railway Street.

Newton-le-Willows :—
W. & A. Raymond, 75, High Street

Northendon :—
Barratt & Co., 21, Palatine Road.

Oldham :—
J. Bailey, 188A, Huddersfield Road.
H. Gilbert, 141, Yorkshire Street.
F. Hinchcliffe, 156, Ashton Road.
E. Rainford, 124, Glodwick Road.
Wildbore's Radio Ltd., 68, Yorkshire Street.

Ormskirk :—
P. F. Ireland, 37, Moor Street.

Padiham :—
W. H. Rayment, 1A, Veevers Street.

Patricroft :—
Elec. & Wireless Supplies, 107, Liverpool Rd.

Pendlebury :—
Stewart Radio Supplies, 668, Bolton Road.
Hamlett's.

Pilling :—
F. J. Gornall, Nr. Garstang.

Preston :—
A. A. Cotterall, 36, Church Street.
Friargate Radio Stores, 89, Friargate.
J. Milsom, 9, Park Road.
Central Wireless, 115, Lancaster Road.

Radcliffe :—
F. Emerson, 34, Ainsworth Road.
P. N. Kay & Sons, 49 & 51, Blackburn St.
G. Walton, 323, Ainsworth Road.
Turner & Booth, The Bridge.

Rawtenstall :—
Ball Bros., 20, Bank Street.
H. Sykes, New Hall, Hey Road.

Rochdale :—
Barlow & Jones, 237, Oldham Road.
T. Crabtree, 471, Edenfield Road, Norden.
A. & J. Dearnley, 63, Oldham Road.
A. Hopley, 110, Oldham Road.
F. Ludlow, 9, Milkstone Road.
The Magnet Service, 19, Milnrow Road.
H. W. Marsden, 20, Heights Lane.
F. Merrick, 112, Bolton Road, Marland.
Olympia Radio, 2A, Toad Lane.
D. Potts, 537, Market Street, Whitworth.
Wilsdon & Robinson, 18, Lord Street.

Royton :—
B. Spencer, 14, Sandy Lane.

St. Anne's-on-Sea :—
W. Haworth, 144, St. Albans Road.
H. E. Raymond, 40, Rossendale Road.

St. Helens:—
J. Critchley, 18, Elephant Lane, Thatto Heath.
Red Rose Super Battery, 136, Robins Lane, Sutton.
Cawley Wireless Service, 4, Church Street.
Central Radio, 55, Ormskirk Street.
Robert Johnson, 134, Peters Street.

LANCASHIRE—*continued*

Olympia Radio Ltd., 29, Westfield Street.
F. Cholerton, 52, Birdge Street.

Seaforth :—
J. Myerscough, 7, Sandy Road.

Southport :—
Rad-Autogram, 39, Tulketh Street.
Sparks Radio, 26/26A, King Street.
Wesley Wireless, 3, Wesley Street.
Storry's Ltd., 143/5, Eastbank Street.

Tyldesley :—
H. Boardman, 192, Elliott Street.

Ulverston :—
J. Newby Parker, 17, Fountain Street.

Urmston :—
Granville Wireless Depot, 1A, Gladstone Rd.
J. Wride, Flixton Road.
Utilities, 138, Flixton Road.
J. Brierley, 8, Crofts Bank Road.

Walkden :—
L. Farnworth, 37, Bolton Road.
A. Yates, 40, Bolton Road.

Warrington :—
F. Burton, 23, Bewsey Street.
Radiomes, 129/131, Bridge Street.
F. Holden & Son, 730, Knutsford Road, Latchford.
Curry's Ltd., 110, Bridge Street.
Fultone Radio Service, 16, Wilderspool Causeway.
S. & A. Dykes, 75, Buttermarket Street.
S. & A. Dykes, 66, Church Street.

Waterfoot :—
J. R. Ward, 121, Burnley Road.

Whitefield :—
Turner & Booth, 228, Bury New Road.

Widnes :—
L. Coombes, 84, Derby Road.
G. Warne, 64, Widnes Road.

Wigan :—
J. W. Atherton, 151, Manchester Road, Ince.
A. Evans, 22/24, Station Road.
F. & H. Jolley, 20, Mesnes Street.
J. H. Jolly, 294, Wallgate.
L. Cookson, 41, Darlington Street.
Ralco, Marsden Street.
C. W. H. Elec., 53A, Standishgate.

LEICESTERSHIRE.

Burbage Hinckley :—
M. Brightmore, 61, Sketchley Road.

Coalville :—
Curry's Ltd., 9, Belvoir Road.

Leicester :—
Curry's Ltd., 24, High Street.
Curry's Ltd., 15, Haymarket.
Curry's Ltd., 5, St. Nicholas Street.
Evington Elec. Service, 5, Beckingham Road.
R. Birch, 19/21, Russell Square.
Fred Watkin, 32, Catherine Street.
W. G. Page, 261, Uppingham Road.
F. Holton, 268, Narborough Road.
Imperial Radio Stores, 100A, Wood Hill.
R. Burton & Co., 35, Wharf Street.
Griffin's Stores, 102, High Street.
Modern Wireless Co., 36, Belgrave Gate.
A. Patrick, 148, Belgrave Gate.
Harper's Cycle Co., Ltd., 34, Belgrave Gate.
J. F. Stone, 80, Granby Street.

Loughborough :—
Curry's Ltd., 7, Swan Street.

Lutterworth :—
Wheeler Bros. & Son, Church Street.

Melton Mowbray :—
Sharman & Ladbury, Ltd.
Curry's Ltd., 4, Cheapside.
Harper's Cycle Co., Ltd., 47, Sherrard Street.

Rothley :—
L. Brewin, Woodgate.

LINCOLNSHIRE.

Bardney :—
W. Lee, Radio & Electrical Engineer.

Barnetby :—
H. Peart, Queen's Road.

Barton-on-Humber :—
Parks Bros., 11, King Street.

Brigg :—
Curry's Ltd., Market Place.

Bourne :—
Curry's Ltd., 4, Market Place.
E. Parce & Co., Ltd., 32, North Street.

Boston :—
Curry's Ltd., 18/20, Straight Bargate.
Wain & Sharp, 11, Wormgate.
J. E. Dawson, Bridge Street.
T. A. Vantoen, 28, Horncastle Road.
Ashley's, Bridge Street.

Gainsborough :—
Curry's Ltd., 9, Market Street.
J. A. Reeson, 14, Church Street.
Barratt's Store, 20 Hickman Street.

Grantham :—
F. Bates, 20, Wharf Road.
Brook Hardcastle Ltd., Market Place.
Curry's Ltd., 85, Westgate.

Nr. Grantham :—
R. S. Clark, South Witham.

LINCOLNSHIRE—*continued*

Grimsby :—
Brook Hardcastle Ltd., 140, Cleethorpes Rd.
Curry's Ltd., 160/162, Cleethorpes Road.
Curry's Ltd., 143, Freeman Street.
H. Broadbent, 220, Victoria Street.
J. G. Jelley, 81, Pasture Street.
H. A. Joahnnesen Ltd., Fish Dock Road.
Abbey Motors, Radio House.
Altman's Radio Stores, 220, Cleethorpes Rd.

Hagworthingham :—
C. E. Dracass.

Holbeach :—
Curry's Ltd., West End.
Crown Cycle & Radio Stores, East End.

Horncastle :—
Curry's Ltd., 6, High Street.

Lincoln :—
Curry's Ltd., 304, High Bridge.
R. Penistan, 195/7, Monks Road.
Norman F. Dixon, 116, Burton Road.
F. W. Edinboro', 258, High Street.

Louth :—
Curry's Ltd., 102, East Gate.

Scunthorpe :—
Brook Hardcastle Ltd., High St.
Curry's Ltd., 43, High Street.

Skegness :—
R. L. Parker, 36, High Street.

Sleaford :—
Curry's Ltd., 19, Southgate.
Curry's Ltd., 7, Southgate.

Spalding :—
Curry's Ltd., 26, Hall Place.
Curry's Ltd., High Bridge.

Nr. Spalding :—
Donington Radio Supplies, Donington.

Stamford :—
Curry's Ltd., 74, High Street.

Sutton-on-Sea:—
W. H. Pemberton, 31, High Street.

Winterton :—
G. W. Waterlow & Son, 2, King Street.

MIDDLESEX.

Brentford :—
Willmott's, 50, High Street.
Brentford's Best Radio Stores, 99 & 214A, High Street.

Edgware :—
Hersey Electrical, 20, Kingsbury Parade, Burnt Oak.

East Twickenham :—
"Tiger" Cycle & Radio Stores, 363 & 370, Richmond Road.

Enfield :—
Windsor's, St. Mark's Road.
Windsor's, London Road.
Jim's Radio Stores, 70, Main Avenue.
J. Malme, 154, Ordnance Road.
District Supplies Ltd., 23, Church Street.
Howards (Enfield) Ltd., 8, Southbury Road.

Greenford :—
The Green Radio Ltd., 9, The Broadway.

Harrow :—
Norman Stanley, 267, Station Road.
Hillside Radio Ltd., Sth. Hill Ave., S. Harrow.
Hillside Radio Ltd., 344, Pinner Road, N. Harrow.
Grey's Radio, 327, Kenton Road, Kenton.
Curry's Ltd., 26, St. Anne's Road.

Harrow Weald :—
Weald Radio, 10, Weald Parade, High Road.

Hayes :—
W. Jordan, 11, Clayton Road.

Hounslow :—
Margaret Radio, 312, Staines Road.
W. A. Tarry, 250, Staines Road.
W. Waldren & Sons, Ltd., 60 & 62, High St.
Sanders' Electric & Radio Service, 119, Staines Road.
Curry's Ltd., 142/4, High Street.
J. & M. Stone, 130, High Street.

Ponders End :—
Wm. R. Bellman, 146, High Street.
Verity Electrical Co., 192A, High Street.

Shepperton :—
F. V. Clarke, Wireless Engineer, Highfield Rd.

Southall :—
S. L. Chapman, Radio Stores, 46, The Broadway.
Reed's, 4, The Romans, The Green.
H. F. Hardy & Sons, 55, King Street.
J. & M. Stone, 37, The Broadway.

Staines :—
L. Caspell, 7, Thames Street.
Staines Electrical Co., Electric House, Clarence Street.
Curry's Ltd., 106, High Street.
Liscombe & Son, 15 & 17, Church Street.

Sunbury-on-Thames :—
Sunbury Radio Service, 63A, Thames Street.

Twickenham :—
K. Raymond Ltd., 10, York Street.
K. Raymond Ltd., 13/15, London Road.

Uxbridge :—
Glenard's, 217, High Street.
J. & M. Stone, 34, High Street.

Wembley :—
C. D. King, 121, Wembley Park Drive.

RADIO DEALERS—*continued.*

MONMOUTHSHIRE.

Abergavenny :—
F. W. Richards, 47, Frogmore Street.
Abertillery :
F.A. Stibbs, Radio Specialist, 49, Somerset St.
James Henry Smith, Royal Radio Stores, Six Bells.
J. G. Price, Radio & Electrical.
Blaenavon :—
W. J. Creemer Ltd., 20, Broad Street.
Blaina :—
J. Jones, 75, High Street.
Monmouth :—
W. E. Day, Agincourt House.
Taylor & Jones, 13, Monnow Street.
Newport :—
C. Reade & Co., 31A, Commercial Road.
J. F. Paull, 196, Dock Street.
A. G. Preston, 18, Caerleon Road.
Curry's Ltd., 54, Commercial Street.
Rhymney :—
D. H. Evans, 3, High Street.
Tredegar :—
E. Nicholls, Park Electrical Stores.

MONTGOMERYSHIRE.

Newton :—
Chas. C. Hislop, 15, Shortbridge Street.

NORFOLK.

Dereham :—
Utting & Buckingham Ltd.
East Dereham :—
Curry's Ltd., Market Place.
Diss :—
Curry's Ltd., 27, Mere Street.
Fakenham :—
Bennett's Radio, Holt Road.
Gorleston-on-Sea :—
Leslie & Co. (Gorleston) Ltd., High Street.
Great Yarmouth :—
G. R. Popay, 21, Blackfriars Road.
Curry's Ltd., 9, Market Place.
T. Fielding & Co., 18, King Street.
T. Fielding & Co., 35, Market Row.
Harleston :—
The Bazaar (G. G. Smith).
King's Lynn :—
Fuller's, 103, London Road.
Curry's Ltd., 82, High Street.
Mattishall :—
A. Grief, The Radio & Cycle Centre.
Northwich :—
Curry's Ltd., 25, Witton Street.
Norwich :—
A. G. Saunders & Sons, New Buckingham.
D. E. Davy & Son, The Stores, New Buckingham.
F. G. Arthurton, 16, St. Stephen's Street.
E. Priert & Co., St. George's Works.
C. W. Thayne, 38, St. Stephen's Street.
Willmott's Stores, 43/51, Prince of Wales Rd.
O.K. Wireless Co., 21 Prince of Wales Rd.
"Trevelyan Radio" (A. R. Cundell), 17, White Lion Street.
M. David, M. Woodcock, Radio Engineer, 89, York Street.
Curry's Ltd., 22, Haymarket.
Collins & Smith, 2A, Aylsham Road.
T. Fielding & Co., 11, Prince of Wales Road.
T. Fielding & Co., 19, St. Stephen's Street.
T. Fielding & Co., 24, Magdalen Street.
S. K. Fulcher, 5, Timber Hill.
North Walsham :—
Curry's Ltd., Market Place.
Sheringham :—
Alfred Pretty, The Wireless Stores, Station Approach.
Snettisham :—
R. D. Baker, The Pharmacy.
Nr. Luddenham :—
William John Cole.
Welney :—
J. Prior.

NORTHAMPTONSHIRE.

Daventry :—
H. Berwick, 41/43, Sheaf Street.
Electrical Supply Stores, 63, High Street.
Kettering :—
Jessop, Newland Street.
Curry's Ltd., 41/43, High Street.
F. G. Payne, 158, Mill Road.
Northampton :—
V. O. Curtis, 86, Wellingboro' Road.
W. Clapham & Co., 83, Wellingboro' Road.
J. & F. Stone, 9, Gold Street.
F. W. Warren, 189, Kettering Road.
Oundle :—
F. W. Lane, West Street.
Peterborough :—
Leslie Neaverson Ltd., Radio House.
Curry's Ltd., Bridge Street.
District Supplies, 36, Bridge Street.
F. G. Gascoigne, Main Street, Farcet.
Rushden :—
Lektro Radio Stores, Newton Road.
Curry's Ltd., 87, High Street.

NORTHAMPTONSHIRE—*continued*

Towcester :—
Farey's, Radio Dealers.
Wellingborough :—
J. W. Rogers, Stanley Road.
Curry's, 37, Market Street.

NORTHERN IRELAND.

Armagh :—
Robert Hazleton, Woodhouse St., Portadown.
Rosemary Radio Company, English Street, Armagh.
Rowley Deans, 48, Scotch Street, Armagh.
Ballymena :—
C. F. McHenry, Hryan Street.
Nichol Bros., Wellington Street.
Belfast, Co. Down :—
W. H. Bailie, 18, Belmont Road.
Geo. McCartney & Co., 8, Gt. Victoria Street.
Murray's Radio Stores, 75, Castle Street.
Repair Specialists, Riley Cycle Works, 40, Bridge End.
Rosemary Radio Co., 31, Rosemary Street.
The Ulster Radio Supply Centre, 44, Queen St.
Wm. Collins, 2, Castlereagh Street.
Carrickfergus, Co. Antrim :—
J. Donaldson, Albert Road.
Dromore, Co. Down :—
Neeson's, Church Street.
W. H. Creighton Ltd., Enniskillen, Fermanagh.
Lisburn, Co. Antrim :—
William MacHenry, 16, Castle Street.
Londonderry :—
P. Deery, Strabane and Lifford.
J. O. Graham, 43, Strand.
H. B. Phillips, Shipquay Street.
J. Reynolds & Co., Magazine Street.
H. E. Young, Strand.
D. Boyd, Limavady.
Tyrone :—
C. H. Gould, Omagh and Trillick.
Arthur McCombe, Irish Street, Dungannon.
M. McSorley & Son, 3/5, Bridge St., Omagh.

NORTHUMBERLAND.

Alnwick :—
Knox Bros., 37, Bondgate Without.
Amble :—
Wade's Garage, 53, Queen Street.
Ashington :—
Bullen & Chicken, 86, North Seaton Road.
Blyth :—
Sep. Mole & Son, 11, Havelock Street.
Simpson's Radio, 1, Maddison Street.
H. Clark, 6, Bondivar Terrace.
M. B. Donkin, 7/9, Havelock Street.
Hexham :—
J. J. Cresswell, 40, Priestpopple.
Morpeth :—
G. R. Gibbon, 61, Bridge Street.
Lawson's Ltd., 84, Newgate Street.
Newcastle-on-Tyne :—
E. H. S. Baker, 87/89, Shields Road.
Pilgrim Radio Service, 130, Pilgrim Street.
Walter Cox, 556, Welbeck Road.
T. W. Jeans & Son, 37, Heaton Park Road, Byker.
J. E. Johnson, 264, Chillingham Road.
The Wireless Shop, 28/30, Pick Lane.
J. W. Cook, Accumulator Construction Co., Powdene House, 40, Pudding Chare.
McLeod & Gibson, 4, Bridge Cres., Scotswood.
North Shields :—
G. Swan, 9, Railway Street.
P. F. Tunnah, 11, Nile Street.
S. Marshall, 12, Albert Terr., Tynemouth Rd.
Wallsend-on-Tyne :—
Redhead's Radio Repair, 148, High St. West.
Wooler :—
John Hope & Son, Ramsey Lane.

NOTTINGHAMSHIRE.

Alfreton :—
Curry's Ltd., High Street.
Beeston :—
C. Hall & Sons, 68, High Road.
Bulwell :—
M. Healey, junr., Broomhill Road.
Doncaster :—
George Wm. Neall, Cycle & Wireless Dealer, Weststockwith.
Heanor :—
Curry's Ltd., 37, Market Street.
Kimberley :—
Henry Buxton, 31, Main Street.
Kirkby :—
The Standard Gramophone Co., 37, Station St.
Long Eaton :—
Curry's Ltd., 49, High Street.
Mansfield :—
Brook Hardcastle, Market Place.
Curry's Ltd., 25, Church Street.
Curry's Ltd., Alberts Street.
Curry's Ltd., 16, Leeming Street.
Brook Hardcastle Ltd., 46, Leeming Street.
T. Richards & Co., 72, Rosemary Street.
A. C. Vallance Ltd., 69, West Gate.

NOTTINGHAMSHIRE—*continued*

Netherfield :—
J. P. Clark, 17, Victoria Road.
Newark :—
Brook Hardcastle, Stodman Street.
Curry's Ltd., 13, Market Place.
Hunt & Co., 26, Stodman Street.
Frederick Suter, 16, Lombard Street.
Nottingham :—
Curry's Ltd., 5, Hounds Gate.
Curry's Ltd., 35, Clumber Street.
Curry's Ltd., 2-4-6, Carlton Street.
J. & F. Stone, 48, Parliament Street.
J. & F. Stone, 89, Carrington Street.
Claude B. Barton Ltd., 23, Union Road.
Jordans Ltd., 133, St. Ann's Well Road.
University Radio Stores, Shakespeare Street.
A. E. Poole, 69, Mansfield Road.
Eunice Radio Co., 135, Alfreton Road.
Bennett's Electrical Supplies, 72, Peveril St.
World Radio Supply Stores, 78, Radford Bvd.
The Super Radio Co., Ltd., top of King Street.
S. & M. Glencross, 188, St. Ann's Well Road.
C. Roberts, 23, Radford Road.
Retford :—
Brook Hardcastle Ltd., 66, Carolgate.
L. A. C. Hurslands, 16, Bridgegate.
Edgar Welchman & Son, Grove Street.
Curry's Ltd., 30, Market Place.
Sports Supply Co., 52, Carolgate.
Southwell :—
C. C. Bond, Westgate.
William Carey, 13, Queen Street.
Sutton-in-Ashfield :—
Brook Hardcastle Ltd., Forest Strect.
Curry's Ltd., Market Street.
Shepperson Bros., Market Place.
Worksop :—
Brook Hardcastle Ltd., Clumbers Bldgs.
Curry's Ltd., 37, Bridge Street.
Russell's Radio, 26, Gateford Road.
H. Y. Wigfall & Son, Ltd., 52, Bridge Place.
Worksop Co-operative Society, Ltd., 16/20, Eastgate.
Warsop :—
E. Poynton, Market Place.

OXFORDSHIRE.

Banbury :—
Curry's, 19, High Street.
Bloxham :—
N. L. Rivers, Church Street.
Chipping Norton :—
Hartwell's, 19, High Street.
Headington :—
S. H. Wiggins, 120, London Road.
Henley-on-Thames :—
Bushell's (Radio Dept.), 5, Hart Street.
Horley :—
S. A. Coutts, Radio House, Victoria Road.
Oxford :—
Curry's, 92, Cowley Road.
Curry's, 30, Queen's Street.
F. F. C. King, 235, Banbury Road.
J. & M. Stone, 20A, Queen Street.
Harmony Electric Ltd., 226, Cowley Road.
S. H. Wiggins, 159, Cowley Road.
Thame :—
S. F. Betts, 19, Buttermarket.

RADNORSHIRE.

Llanbadarnfynydd :—
D. A. Stephens, Ithon Valley Gar.

SCOTLAND.

Aberdeen :—
Clydesdale Supply Co., 206 George Street.
Angus :—
Clydesdale Supply Co., 13. Crichton St., Dundee.
Argyll :—
A. P. MacGrory, 16-18, Main St., Campbeltown.
Ayr :—
Cyldesdale Supply Co., 256, High Street.
Banchory :—
Disney Cran, High Street.
Crieff :—
Frank Thompson.
Dumbarton :—
David Lockhart, 9, Chalmers St., Clydebank.
Edinburgh :—
A. P. Alexander, 38, Haddington Place.
Clydesdale Supply Co. Ltd., 64, South Bridge.
Clydesdale Supply Co., Ltd., 5, Lindsey Place.
Clydesdale Supply Co., Ltd., 1, Frederick St.
Clydesdale Supply Co., Ltd., 63, Home Street.
Clydesdale Supply Co., Ltd., 367, High Street.
Restalrig Radio, Restalrig Road.
R. Kilgour & Sons, Nicholson Street.
Castle Charging Station, 8, Upper Bow.
Miller's Wireless, 51, Leith Street.
Morton's Wireless Ltd., 9, So. Clerk Street.
A. S. Robertson A.M.I.E.E., 6, Crighton Place
R. Brown, 87-9, Gorgie Road.
P. H. Ronaldson, Fowler Terrace.
Baby Carriage Saloon, Antigua Street.

RADIO DEALERS—*continued.*

SCOTLAND—*continued*

Falkirk :—
Clydesdale Supply Co., Ltd., 27, Vicar Street.
Fife :—
Clydesdale Supply, 15, Bridge St., Dunfermline.
Glasgow :—
Clydesdale Supply Co., Ltd., 2, Bridge Street.
Wm. Blackadder, 101, Union Street.
Clydesdale Supply Co., Ltd., 63, Renfield St.
Clydesdale Supply Co., Ltd., 160, Sauchiehall Street.
E. W. Hutchison, 496, Crow Road.
W. Blackadder, 236, Argyle Street.
Edwards, 119, Dumbarton Road, Partick.
J. H. Murricane & Sons, 558, Gallowgate.
Greenock :—
Clydesdale Supply Co., Ltd., 37, Cathcart St.
Kirkcaldy :—
Clydesdale Supply Co., Ltd., Rialto Arcade.
Kincardine :—
A. L. Paterson, 38, High Street.
Lanarkshire :—
Jas. Caird, 2, Main Street, Cambuslang.
Leith :—
W. J. Haynes, 41, Giles Street.
Ard Radio, Bonnington Road.
Peter Campbell, Trafalgar Street.
Clydesdale Supply Co., Ltd., 106, Kirkgate.
Loanhead :—
A. Donachie & Sons, 51, Clerk Street.
Motherwell :—
M. Dermant & Young, 146, Muir Street.
Penicuik :—
White Bros., Bridge Street.
Peterhead :—
John Thow, 15½, Kirk Street.
Perth :—
Clydesdale Supply Co., Ltd., 148, South St.
Paisley :—
Clydesdale Supply Co., Ltd., 44, High Street.
Clydesdale Supply Co., Ltd., 9, Moss Street.
Roslin :—
Neil & Co.
Renfrew :—
David Lockhart, 15, High Street.
Stirlingshire :—
Robert Waugh, 168, Glasgow Road, Denny-loanhead.
Stirling :—
Clydesdale Supply Co., Ltd., 38, Port Street.

SHROPSHIRE.

Bridgenorth :—
F. J. B. Whitfield, Whitburn Street.
Fred Walmsley, Castle Terrace.
Brosely :—
H. Burns, Town Hall Garage.
Bull Ring :—
The Handy Wireless Stores, Bull Ring.
Clun :—
A. H. Wood, Clunside Garage.
Donnington :—
J. F. Martin.
Ellesmere :—
Irwin Evans, 37, Scotland Street.
Hadley :—
L. Corfield, High Street.
Ironbridge :—
W. Phillips, Waterloo Street.
Jackfield Ironbridge :—
John Bertram, Shinton.
Ludlow :—
Regent Cycle & Radio, 17, King Street.
M. E. Raulins, 9, Broad Street.
Madeley :—
T. Dorsett.
Market Drayton :—
C. W. Livesley, 19, Shropshire Street.
Oakengates :—
W. Owen, 58, Market Street.
T. E. Dawes, The Green Radio & Cycle Stores.
Oswestry :—
Curry's Ltd., 13, Church Street.
J. E. Lewis, Smithfield Street.
Redman Radio, 75, Beatrice Street.
Shrewsbury :—
Curry's Ltd., 61, Mardol.
Foulkes Gornall, 5, High Street.
Thomason Ltd., High Street.
W. Alcock & Son, 16, Mardol.
Foulkes, Gornall & Co., Ltd., Welsh Bridge.
A. R. Mitchell, Radio House.
Salop :—
E. W. Jones, 19, New Street.
Wellington :—
C. Allbutt, Mill Bank.
Curry's Ltd., 45, New Street.
E. W. Jones, New Street.
R. E. Eatough, Bridge Road.
Whitchurch :—
Edge, Son & Davies, Watergate Street.
H. T. Fisher, High Street.
The Bargates Cycle & Radio Co.

SOMERSETSHIRE.

Bath :—
Curry's Ltd., 7, Southgate Street.
Curry's Ltd., 28, Westgate Street.
Lear Bros., Rivers Street Place, Julian Road.
Richmond & Co., 38, Claverton Street.

SOMERSETSHIRE—*continued*

A. J. Burcombe, 11, St. James St., St. James Square.
H. V. Gerrard, 9, Claverton Buildings.
H. V. Gerrard, 26, Claverton Street.
T. C. Inskip, Kingsmead Square.
C. F. Vanstone, 7, Walcot Street.
Bridgwater :—
Curry's Ltd., 14/16, Eastover.
Burnham-on-Sea :—
Burnham Cycle Co., 12, Victoria Street.
H. R. Clapp & Son, 30, Adam Street.
Clevedon :—
Blackmore Bros., 17, Triangle.
Gramo-Radio Co., Triangle.
Chard :—
David Ridgway, Radio & Music Salons.
Glastonbury :—
Wafedwards, The Radio Shop.
Taunton :—
Curry's Ltd., 2, East Street.
Wellington :—
Lloyd's Radio, High Street.
Weston-super-Mare :—
Betteridge Bros., Magdala Buildings.
Yeovil :—
Curry's Ltd., 22, Middle Street.

STAFFORDSHIRE.

Bilston :—
H. Hammond & Co., 33, Oxford Street.
Radio Supplies, Hall Street.
Blackfords :—
H. Gorfield, 31, Cannock Road.
Blackheath :—
Roland C. Harris, Birmingham Street.
Bloxwich :—
J. Blewitt, Wolverhampton Road.
W. H. Tomkinson, 163, High Street.
Brierley Hill :—
Jones Bros., High Street.
Burslem :—
Bancroft Bros., Newcastle Street.
Burton-on-Trent :—
Banton Bros., 67, Market St., Church Gresley.
Curry's Ltd., 178, Station Street.
Bushbury :—
Bushbury Radio, Stafford Road.
Cannock :—
Barber & Wilkes, Market Place.
Coven Heath :—
M. W. Evans, Stafford Road.
Darlaston :—
L. Mitchell, Pinfold Street.
Hanley :—
R. Cornes, Waterloo Street.
Olympia Radio Ltd., 14, Upper Market Square.
John Templeman, 15 & 17A, Percy Street.
Heath Town, Wolverhampton :—
Maybrooke Radio, 187, Wenesfield Road.
Hednesford :—
J. Hardman, Sheffield House.
Netherton :—
Netherton Wireless Stores, 10, High Street.
Newcastle :—
W. Barratt, Newcastle Street, Silverdale.
Robert Beresford (Newcastle, Staffs.) Ltd., 49, High Street.
H. V. & C. P. Greaves, Bridge Street.
Quarry Bank :—
F. H. Beach, 162, High Street.
Stafford :—
Curry's Ltd., 20, Greengate.
Gaol Road Service, Gaol Square.
Stan Jones, 39, Gaol Road.
Stoke-on-Trent :—
Curry's Ltd., 25, Liverpool Road.
H. R. Hook, London Road.
Swadlincote :—
Curry's Ltd., 13, High Street.
Wroughton's Radio Service, High Street.
Tipton :—
D. Lyons & Sons, 74/75, Owen Street.
J. Clarke, Owen Street.
Walsall :—
W. Bates, Lichfield Street.
Caledon Radio Services, 211, Wednesbury Rd., Pleck.
Ellmore Cycle, 654B, Bloxwich Road, Leamore.
James Cycles, Green Lane.
Palfrey Battery Service, 3, West Bromwich Rd.
Radio Accessories Co., Ablewell Street.
J. & F. Stone, 10, Park Street.
W. E. Tomkinson, King Edward Garage, Ablewell Street.
West Bromwich :—
Bert Bliss, High Street.
Price & Bayliss, 6, Carter's Green.
Thomas & Co., Gt. Bridge Street.
Willenhall :—
Maybrooke Radio, 4, Wolverhampton Street.
G. Williams & Son, New Road.
Wolverhampton :—
Claremont Radio, Dudley Road.
Creed's Radio, Market Street.
Fenwick's Radio, Gt. Brickkiln Street.
D. W. Hingley, Dudley Road.
W. Mansell, 24, Bilston Street.
G. J. Morrison, Pipers Row.
H. Shilvock, 20, Cannock Rd., Park Village.

STAFFORDSHIRE—*continued*

J. & F. Stone, 12, Queen Street.
West End Radio, Kimberley Street.
Wolverhampton Radio, Victoria Street.

SUFFOLK.

Bury St. Edmunds :—
Leslie Baker, 21, Brentgovel Street.
Curry's Ltd., 22, Buttermarket.
Snell's, 8, Risbygate Street.
Ipswich :—
Curry's Ltd., 21, Tavern Street.
District Supplies Ltd., 23A, Tavern Street.
Wakelin's Wireless Co., Ltd., 66, Norwich Rd.
Lowestoft :—
Curry's Ltd., 59, London Road, N.
Curry's Ltd., 176, London Road, Kirkley.
T. Fielding & Co., Ltd., 65, London Road N.
Newmarket :—
Curry's Ltd., High Street.
Woodbridge :—
Curry's Ltd., 70, Thoroughfare.

SURREY.

Capel :—
F. Chennell, Radio Stores.
Chertsey :—
E. A. Hyde, 58, Gnildford Street.
Croydon :—
Electrico, 77, George Street.
Curry's Ltd., 82, Church Street.
W. Davis & Sons, 156, Cherry Orchard Road.
G. H. Hindley, 48, South End.
Radiomart, 22, South End.
J. & F. Stone, 78, High Street.
J. & F. Stone, 59, London Road.
J. & F. Stone, 59, North End.
Dorking :—
Curry's Ltd., 59, High Street.
Farnham :—
C. A. Rogers, 105, East Street.
Godalming :—
R. H. Gastrell, 33, Bridge Street.
A. Grove, High Street.
Guildford :—
Coles, 4, Market Street.
Curry's Ltd., Swan Lane.
A. Grove, High Street.
E. L. Rogers, 74, North Street.
Guildford Radio.
Wilmot & Son, 62, North Street.
Hersham :—
T. Brothwell, Molesley Road.
Horsham :—
Curry's Ltd., 30, West Street.
Kenley :—
F. J. W. Pearce, Godstone Road.
Kingston :—
J. & M. Stone, 1D, Richmond Road.
J. & M. Stone, 7, London Road.
Surbiton Park Radio, 61, Surbiton Road.
New Malden :—
G. E. Frewer, 8, Malden Road, New Malden.
Perrins Bros., Ltd., 47, Malden Road, New Malden.
Redhill :—
Curry's Ltd., 3, High Street.
Richmond :—
A. R. Jewell & Son, 61, Kew Road.
J. & M. Stone, 18, Hill Street.
Surbiton :—
Hoffer Ltd., 34, Victoria Road.
Sutton :—
J. & F. Stone, 39, High Street.
Thornton Heath :—
F. C. Cooper, 256, London Road.
Parchmore Electrics, 84, Parchmore Road.
K. Raymond, 23, Brigstock Road.
Beulah Radio Supplies, 75, Beulah Road.
Walton-on-Thames :—
W. E. Birkhead.
Weybridge :—
E. W. Farrow, 42, High Street.
W. L. Lewis & Sons, 51, Church Street.
E. Rogers & Sons.
Woking :—
Curry's Ltd., 16, High Street.
W. Pearce, Chobham Road.
E. Stent, 43, Chobham Road.
Surrey Radio & Elect. Services, 29B, Guildford Road.
E. T. Trotman, 8, Bath Road.

SUSSEX.

Brighton :—
Alexandra & Conner, 41, New England Rd.
A. & F. Ball, 128, Edward Street.
E. Butlin, 143, Preston Road.
W. S. Cooper, Lewes Road, Tram Terminus.
Curry's Ltd., 25, York Place, London Road.
E. H. Field, 291, Preston Road.
H. G. Gordon, 80, London Road.
Hay & Son, North Street.
E. Newman, 9, Bond Street.
S. Newman, 43, Upper Street, James Street.
A. J. S. Russell, 138, London Road.
R. E. Walker, 16, Albion Street.
Webb's Radio, 94, St. Georges Road.

RADIO DEALERS—*continued.*

SUSSEX—*continued*

Chichester :—
Curry's Ltd., 65, South Street.
Hastings :—
Curry's Ltd., 29, Queen's Road,
Horsham :—
W. T. Dalton, 62, East Street.
A. T. Quick, 54, West Street.
Targetts, 21, North Street.
Hove :—
Curry's Ltd., 52, George Street.
The West Hove & Portland Radio, 456/56A, Portland Road.
A. G. Hill, 42, Boundary Road.
Shirley Radio Repair Service, 38A, Goldstone Villas.
Walls Radio, 24, George Street.
Littlehampton :—
Curry's Ltd., 16/18, Surrey Street.
Shoreham-by-Sea :—
W. J. Groves.
St. Leonards-on-Sea :—
E. G. Page 46, Bohemia Road.
Worthing :—
Curry's Ltd., 49, Montague Street.

WARWICKSHIRE.

Birmingham :—
S. Allen, 10, Windmill Lane, Smethwick.
W. H. Allen, Regal Radio, Soho Road, Handsworth.
W. H. Allen, Regal Radio, 58, Booth St., Handsworth.
Birmingham Radio Electrical & Cycle Co., 550A, Coventry Road.
Curry's Ltd., 14, Bull Ring,
V. Evans, 15, Formans Road, Sparkhill.
P. M. de Groot, 697, Bristol Rd. South, Northfield.
L. G. Heaver, 551, Warwick Rd., Tyseley.
A. H. Harris, 6, Warwick Road, Sparkhill.
Hadley Bros., Radio Corner.
R. G. Jones, 1197, Warwick Rd., Acocks Green.
Marshall's Radio, 13, Oak Tree Lane.
A. Marston, Witton Road, Aston.
Martin & Newman, 1154, Pershore Rd., Stirchley.
Olympia Radio, Ltd., 29, Martineau Street.
P. W. Pulford, 876, Bristol Road, South, Northfield.
E. A. Patterson, 1012, Stratford Rd., Hall Green.
E. W. Page, 222, Winson Green Road.
Dunton Radio, Quinton.
Radio & Cycle Stores, 6, Short Heath Rd., Erdington.
J. & F. Stone, 94, Bull Street.
J. & F. Stone, 20, High Street.
T. W. Salisbury, 21, Raddlebarn Road, Selly Oak.
T. Smith, 131, Hockley Hill.
Arthur Tonks & Co., 30, Shaftmoor Lane, Acocks Green.
Wallace & Co., Pershore Road, Cotteridge.
Frank Whitworth Ltd., 112, Spring Hill.
(Jack's) J. E. Taylor, 248, Newtown Row.
Boynton & Co., Ltd. 65/68 Stafford Street.
Boynton & Co. Ltd., 3/5 Hill Street.
Boynton & Co. Ltd., 139, Corporation Street.
Coventry :—
Max Buch, Wireless Hall, Lower Ford Street.
Curry's Ltd., 52, Smithford Street.
Curry's Ltd., 7, Bishop Street.
F. G. W. Probert, 215, Longford Road.
J. & F. Stone, 12, City Arcade.
Leamington :—
Curry's Ltd., 17, Bath Street.
Radio Supplies Co., 66B, Regent St.
Nuneaton :—
Curry's Ltd., 128, Abbey Street.
Rugby :—
J. T. E. Brown, 6, 10, Albert Street.
Curry's Ltd., 19, Sheep Street.
Ward's Radio Stores, Railway Terrace.
Stratford-on-Avon :
W. M. Ford, 20, Greenhill Street.
C. M. George, 24, Henley Street.
Sleaths (S.-on-A.), High Street.

WILTSHIRE.

Chippenham :—
Arthur R. Fox, The Bridge.
Devizes.
Curry's Ltd., 29, The Brittox.
Malmesbury.
George Sabey, 5, Oxford Street.
Salisbury.
Clayton Bros., 4, Winchester Street.
Curry's Ltd., 27, Butcher Row.
Parson & Gould, 41A, Castle Street.
Radio Services, 5, Winchester Street.
Western Wireless, 33, Fisherton Street.
Modern Radio, 74B, Commercial Road.
Swindon :—
Curry's Ltd., 33, Bridge Street.
Trowbridge.
Curry's Ltd., 55, Fore Street.

WORCESTERSHIRE.

Bromsgrove :—
England & Thompson, 47, Broad Street.
Cradley Heath :—
J. Hughes, High Street.
Alan Price, High Street.
Dudley :—
H. Broom, 33, Flood Street.
Curry's Ltd., 113, Hall Street.
J. C. Enser, Wolverhampton Street.
Alan Price, Castle Street.
Radio Services, King Street.
H. A. Sherratt, 145, Wolverhampton Street.
W. N. Smith, King Street.
G. H. Wainwright, Wolverhampton Street.
Kidderminster :—
Curry's Ltd., 7, Swan Street.
J. H. Russell, Coventry Street.
Lower Gornal :—
J. Littlewood, Five Ways.
J. Smith, 20A, Temple Street.
Lye, Nr. Stourbridge :—
Sim Taysor's.
Netherton :—
Radio Requisites, High Street.
Redditch :—
Curry's Ltd., 6, Market Place.
Stourport :—
T. Vale & Sons, Ltd., Stourport.
Worcester :—
J. J. Anderson, 19, Friars Street.
Curry's Ltd., 9, Broad Street.
A. N. Cutler, Bridge Street.

YORKSHIRE.

Barnsley :—
Eldon Wireless Depot, 2A, Eldon Street North.
J. D. Taylor, "Radio House," Peel Square.
Batley :—
Harry Cash, 69, Commercial Street.
Beverley :—
Curry's Ltd., Toll Gavel.
Bradford :—
Passinghams (Bradford) Ltd., 19, Leeds Road.
J. & F. Stone, 6, Market Buildings, Kirkgate.
Castleford :—
Brook Hardcastle Ltd., Carlton Street.
Dewsbury :—
Brook Hardcastle Ltd., Daisy Hill.
Curry's Ltd., 10, Bradford Road.
C. A. Hazzlewood Ltd., Queensway.
Doncaster :—
Brook Hardcastle Ltd., 21, Cleveland Street.
Brook Hardcastle Ltd., 18, Printing Office St.
Curry's Ltd., 61, Hall Gate.
J. & F. Stone, 27/28, Baxter Gate.
Goldthorpe :—
Brook Hardcastle Ltd., High Street.
Goole :—
Brook Hardcastle Ltd., High Street.
Curry's Ltd., 50, Boothferry Road.
Halifax :—
Clement Ambler, 3, Woolshops, Old Market.
Harrogate :—
"Mairfields," Bilton Radio, 82, King Edward's Drive.
Hemsworth :—
Brook Hardcastle Ltd., 7, Market Street.
Huddersfield :—
Olympia Radio Ltd., High Street.
Olympia Radio Ltd., 72, John William Street.
J. H. Taylor & Co., Macauley Street.
Hull :—
Curry's Ltd., 6, Silver Street.
Curry's Ltd., 9, Prospect Street.
District Supplies Ltd., 53, Whitefriargate.
Leeds :—
Curry's Ltd., 80, Vicar Lane.
Radio & Cycle Services, 240, Hunslet Road.
J. & F. Stone, 90, Briggate.
Warwick's Radio, 170, Cardigan Road.
Wilson's, 105, Westfield Road.
Brook Hardcastle Ltd., Queen Street, Morley.
Malton :—
Curry's Ltd., 19, Wheelgate.
Mexborough :—
Brook Hardcastle Ltd., 4, Main Street.
Middlesbrough :—
Curry's Ltd., 96, Linthorpe Road.
Albert E. Dorrell, 21, High St., N. Ormesby.
Ossett :—
Reader Electrical Co., Dale Street.
Pateley Bridge :—
C. Todd, High Street.
Pontefract :—
Brook Hardcastle Ltd., Ropergate.
Rotherham :—
Brook Hardcastle Ltd., Wellgate.
Brook Hardcastle Ltd., Chantry Buildings.
Scarborough :—
Gray Radio, 82, Westborough.
G. W. Moore Ltd., 4/6, Nelson Street.
Selby :—
Brook Hardcastle, Gawthorpe Road.
Curry's Ltd., 13, Gowthorpe.

YORKSHIRE—*continued*

Sheffield :—
Brook Hardcastle Ltd., 579, Attercliffe Road.
Brook Hardcastle Ltd., 2, Castle Hill Market.
Brook Hardcastle Ltd., 290, Rockingham St.
J. & F. Stone, 95, The Moor.
J. & F. Stone, 57, High Street.
H. H. B. Sugg Ltd., 28, Angel Street.
Thurnscoe :—
Brook Hardcastle Ltd., Lidgett Lane.
Wakefield :—
Brook Hardcastle Ltd., 67, Kirkgate.
Curry's Ltd., 8, Northgate.
W. Lodge, A.A.I.R.E., 9, Upper Kirkgate.
A. J. Tindall, 168, Kirkgate.
Barnsley :—
Brook Hardcastle Ltd., High St., Wombwell.
Brook Hardcastle Ltd., 21, May Day Green.
Brook Hardcastle Ltd., 47, Sheffield Road.
York :—
Brook Hardcastle Ltd., Petergate.
Curry's Ltd., 12, The Pavement.

OBSOLETE COILS

Continued from page 17

If you decide on a Sensity Twin Coil unit, you have the advantage of integral switching, and also, if desired, the radio-gram-on-off switch attachment, so that *all* the switching of the set is carried out by one knob. Moreover, there is a slight gain in efficiency owing to the fact that both ends of the primary winding of the H.F. transformer are brought out, and the anode of the S.G. valve may be taken direct to the coil (Terminal 9) without the use of a H.F. choke.

Where more than one H.F. stage is employed, a second type P.P.1 may be added, the connection being the same, except that another switch will be required, and reaction will not be used on at least one of them.

Sensity Coils may also be employed in a band pass circuit, and Fig. 5 shows the

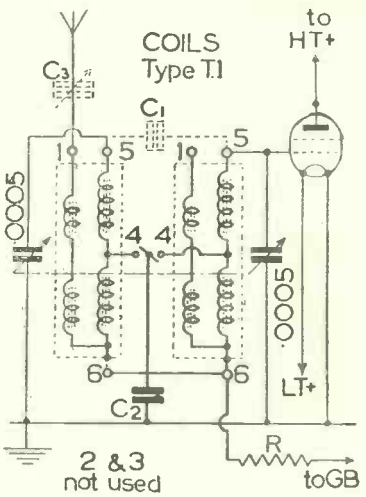


Fig. 5

connection for Type T.1 Coils. Of course, a Type P.P.1 may be used in the succeeding H.F. circuit, if any, as above.

Full instructions for fitting are supplied with all these coils, and no difficulty whatever should be experienced in obtaining the really excellent results which they are giving in thousands of receivers to-day.

MAINS SUPPRESSION

Continued from page 20

partial then a further Suppressor can be added as shown in Fig. 2. Where no effect is noticed at all, then we can assume that exterior radiation is taking place, and the source of interference comes under Class 3. It should be remembered that if your neighbour's wiring is in sufficiently close proximity it may be necessary to obtain their co-operation in effecting a similar cure to their installation.

Class 3. This is the most difficult type, mainly because the source of interference does not often come under the listener's control. A good indication as to whether the radiation is being received via the aerial is to disconnect this completely, and keeping the aerial lead well away from the receiver, observe to what extent the interference is minimised with the receiver in its most sensitive condition. If the interference stops completely under these circumstances, and all the precautions described above have been taken, one can assume that the intereference is being radiated from an outside source not controllable by you, and therefore you should communicate with the G.P.O. who will give you every assistance in their power to eliminate the interference. This should only be done after trying the methods already described, since it is essential to ensure that the radiation does not come from the house wiring, but from an outside source.

If, on disconnecting the aerial, the interference still persists, re-connect the aerial and disconnect the earth. The earth wire, especially when it is long, is a frequent source of trouble, and removal often brings elimination of interference. Where this is the case an endeavour should be made to shorten the earth wire. If this is impossible or ineffectual, a tip well worth trying is to insert a "Formodensor," type J, price 1s. 6d., obtainable from all radio dealers, in the earth lead. While this is not a cure it will more often than not considerably reduce the interference.

Since many battery receivers are operated in houses where electric wiring is installed, mains interference can be experienced under Classes 2 and 3, and the procedure can be followed as above.

"CONTACT" QUERY COUPON

The actual designers of "Contact" Receivers are prepared to answer all queries from readers in connection with the operation or construction of these sets solely on condition that only the specified component parts are used.

Readers are requested to write clearly and to state as concisely as possible the exact nature of their requirements.

Queries must have this coupon attached, together with a Postal Order for 1/-, and should be addressed to :

"CONTACT" DESIGNERS,
153 MASONS HILL,
BROMLEY - - KENT

The Editor will also be pleased to have readers' opinions on this, the second issue of "Contact," and any suggestions for articles or receivers which they wish to have dealt with in the next issue.

RECORDS & RADIO

Continued from page 13.

An advantage of this circuit is that the cut-off above the resonance is sharpened, so that brilliance can be obtained right up to the point where needle scratch becomes unpleasant.

Increasing Bass

To obtain a similar effect in the bass region is not quite so simple. To create a resonance between 50 and 100 cycles we require an inductance of L.F. choke proportions, and a condenser of much higher value than above. Since neither of these can very well be adjustable we must get the values about right to start with. The primary of an old L.F. transformer would do admirably, but we usually have no indication of its inductance without D.C. flowing. If you have an L.F. choke rated such as 40/20 henries, the higher figure will apply. Since there is no D.C. involved, if you wish to purchase a suitable inductance, the Max transformer is an excellent and economical choice, as the inductance of the various winding sections can be given here. (Table I), and it has a low self capacity.

TABLE I.—MAX TRANSFORMER.

Between Terminals.		Inductance in Henries.
1 & 2	...	13
2 & 3	...	30
1 & 3	...	80
1 & 4	...	320
3 & 4	...	720

The appropriate circuit is shown in Fig. 7. The condenser value will depend on the inductance chosen and the frequency at which we want the peak. In order to avoid going at length into the choice of values available, a table is appended showing suggested values of condenser and resistance for use with given inductances. (Table II). These values produce a resonance between 60 and 80 cycles. It will be sufficient to indicate the general effect of varying them.

TABLE II.

Inductance L = Henries.	Capacity C = Mfds.	Resistance R = ohms.
10—15	·5	—
15—25	·25	—
25—35	·2	—
40—70	·1	2,500— 5,000
75—100	·05	5,000—10,000

(*a*) Increasing the value of the inductance or condenser will reduce the *frequency* at which the resonance occurs, and vice versa. The values are not critical, and the nearest standard size of condenser may always be adopted.

(*b*) The use of a higher inductance (with a correspondingly smaller condenser) will increase the *effect* of the "boost."

(*c*) Increasing the resistance "R" will reduce the effect and spread it over a wider band, and vice versa. Where the inductance is below 30 henries this resistance is not usually necessary, since the internal resistance of the pick-up is sufficient to limit the peak.

It is advisable to get the resonance at the lowest frequency which your loudspeaker (or amplifier) will reproduce. This can be found by trying a considerably lower value of capacity than that indicated in the table, and doubling it up until the best effect begins to disappear.

Combined Correction

There are other and easier ways of emphasising the bass (and also the top), which apply when some of the output from the pick-up can be sacrificed, as in fact is usually the case. This will be better appreciated when it is realised that a smaller volume of corrected sound is more satisfying to the ear, quite apart from the fact that full output will usually be too much for the amplifier. The arrangement shown in Fig. 8 has the advantage that only two small condensers, besides the volume control, are required, and that full (uncorrected) volume is available when wanted. C1 has a value of about .1–.25 mfd. A *lower* value of condenser will increase the proportion of bass.

C2 is to retain the higher frequencies, and may well be adjustable. A Formodensor type H. will be suitable.

The degree to which the top and bottom ends of the scale are emphasised will depend on the position of the volume control slider. When on full volume the response is normal, and correction increases as volume is reduced. (Owing to the characteristic sensitivity of the ear, which cannot be discussed in this article, this is a highly desirable result.) Moreover, since in most cases more than half volume can never be used (without overloading), substantial correction is obtained at all times, and with a loud speaker of good frequency and range, the effect is most satisfying and realistic.

The combined depth and crispness bring the music "right into the room," an effect heightened by the fact that it can be quieter than before while retaining great clearness.

A Guide to 1935 RADIO PRICES

FORMO VARIABLE CONDENSERS.

2-Gang Condensers, Type DU5, with floodlit chrome Drive	11/–
2-Gang Condensers, Type DU5, with floodlit chrome Drive and Dust Cover	12/6
Single Unit Slow-Motion Condenser, Type SU5, with floodlit Mystic Drive	6/6

FORMO SENSITY IRON-CORED COILS.

Aerial Coil, T1 (without reaction)	5/–
" A1 (with reaction)	5/–
H.F. Coil, PP1	5/–
Sensity Ganged and Matched Coils :	
Type AH, Aerial and Anode Coils (complete with wave-change Switch only)	10/6
Type AH/G, Aerial and Anode Coils (complete with wave-change Switch and auxiliary switching for filaments and Radiogram)	12/6

FORMODENSERS.

Type F	·0001 mfd.	1/6
" J	·0003 mfd.	1/6
" G	·001 mfd.	1/6
" H	·002 mfd.	2/3

FORMO SCREENED PAPER CONDENSERS.

·1 mfd.	1/6
·2 "	1/6
·25 "	1/6
·5 "	1/9
1 "	2/–
2 "	3/–

GRAHAM FARISH FIXED MICA CONDENSERS.

·00005 mfd.	6d.
·0001 "	6d.
·0002 "	6d.
·0003 "	1/–
·0004 "	1/–
·0005 "	1/–
·001 "	1/–
·002 "	1/–
·003 "	1/–
·004 "	1/–
·005 "	1/6
·006 "	1/6
·01 "	1/6

GRAHAM FARISH TUBULAR FIXED CONDENSERS.

·00005 mfd.	1/–
·0001 "	1/–
·0002 "	1/–
·0003 "	1/–
·0005 "	1/–
·001 "	1/–
·002 "	1/–
·003 "	1/–
·004 "	1/–
·005 "	1/–
·006 "	1/–
·01 "	1/3
·02 "	1/6
·05 "	1/6
·1 "	1/6
·2 "	1/6
·25 "	1/6

GRAHAM FARISH MANSBRIDGE TYPE CONDENSERS.

·25 mfd.	1/6
·5 "	1/9
1 "	2/–
2 "	3/–
4 "	5/6

GRAHAM FARISH VALVE HOLDERS.

4-pin	6d.
5 "	8d.
7 "	1/3
9 "	2/3

GRAHAM FARISH LITLOS DIFFERENTIAL CONDENSERS.

·00005 mfd.	2/–
·0001 "	2/–
·00015 "	2/–
·0002 "	2/–
·00025 "	2/–
·0003 "	2/–
·00035 "	2/–
·0005 "	2/–

GRAHAM FARISH LITLOS LOG MID LINE CONDENSERS.

·00005 mfd.	2/–
·0001 "	2/–
·00015 "	2/–
·0002 "	2/–
·00025 "	2/–
·0003 "	2/–
·00035 "	2/–
·0005 "	2/–
·00075 "	3/6
·001 "	4/6

GRAHAM FARISH LITLOS REACTION CONDENSERS.

·00005 mfd.	2/–
·0001 "	2/–
·00015 "	2/–
·0002 "	2/–
·00025 "	2/–
·0003 "	2/–
·00035 "	2/–
·0005 "	2/–
·00075 "	3/6
·001 "	4/6

GRAHAM FARISH H.F. CHOKES.

Disc H.F. Choke	2/–
H.M.S. Single Screen	2/6
L.M.S. Twin Screen	4/6

GRAHAM FARISH KONE KAP GRID LEAKS.

½ meg.	9d.
¾ "	9d.
1 "	9d.
2 "	9d.
3 "	9d.
4 "	9d.
5 "	9d.

GRAHAM FARISH STANDARD TYPE GRID LEAKS.

½ meg.	10d.
¾ "	10d.
1 "	10d.
2 "	10d.
3 "	10d.
4 "	10d.
5 "	10d.

GRAHAM FARISH TRANSFORMERS.

Pip L.F. General Purpose 1–3	6/6
Pip L.F. General Purpose 1–5	6/6
Class B Driver, 1–1, 1·2–1, or 1·5–1	8/6
" Max " Parallel feed	4/6
Quip QPP, 1–8 ratio	10/6

SNAP SWITCHES.

2 point	10d.
3 "	1/-

GRAHAM FARISH 1½-watt type OHMITE RESISTANCES.

50	1/6
100	1/6
150	1/6
200	1/6
250	1/6
300	1/6
350	1/6
400	1/6
450	1/6
500	1/6
550	1/6
600	1/6
650	1/6
700	1/6
750	1/6
800	1/6
850	1/6
1,000	1/6
1,500	1/6
2,000	1/6
2,500	1/6
3,000	1/6
4,000	1/6
5,000	1/6
6,000	1/6
7,000	1/6
8,000	1/6
10,000	1/6
15,000	1/6
20,000	1/6
25,000	1/6
30,000	1/6
35,000	1/6
40,000	1/6
50,000	1/6
60,000	1/6
70,000	1/6
80,000	1/6
100,000	1/6
150,000	1/6
200,000	1/6
250,000	1/6
300,000	1/6
500,000	1/6
1 megohm	1/6
1·5 meg.	1/6
2 "	1/6
3 "	1/6
4 "	1/6
5 "	1/6

GRAHAM FARISH 3-watt type HEAVY DUTY OHMITE RESISTANCES.

(All sizes up to 100,000 ohms 2/3 each.)

GRAHAM FARISH HOLDERS.

Horizontal type	6d.
Vertical "	6d.
Universal "	6d.
H.D. Ohmite "	6d.

GRAHAM FARISH OHMITE VOLUME CONTROLS.

All sizes from 5,000 ohms to 1 megohm 2/9

GRAHAM FARISH PICK-UPS.

Compensated model (less Volume Control)	14/6
Compensated model (with 50,000 ohm Built-in Volume Control)	18/6

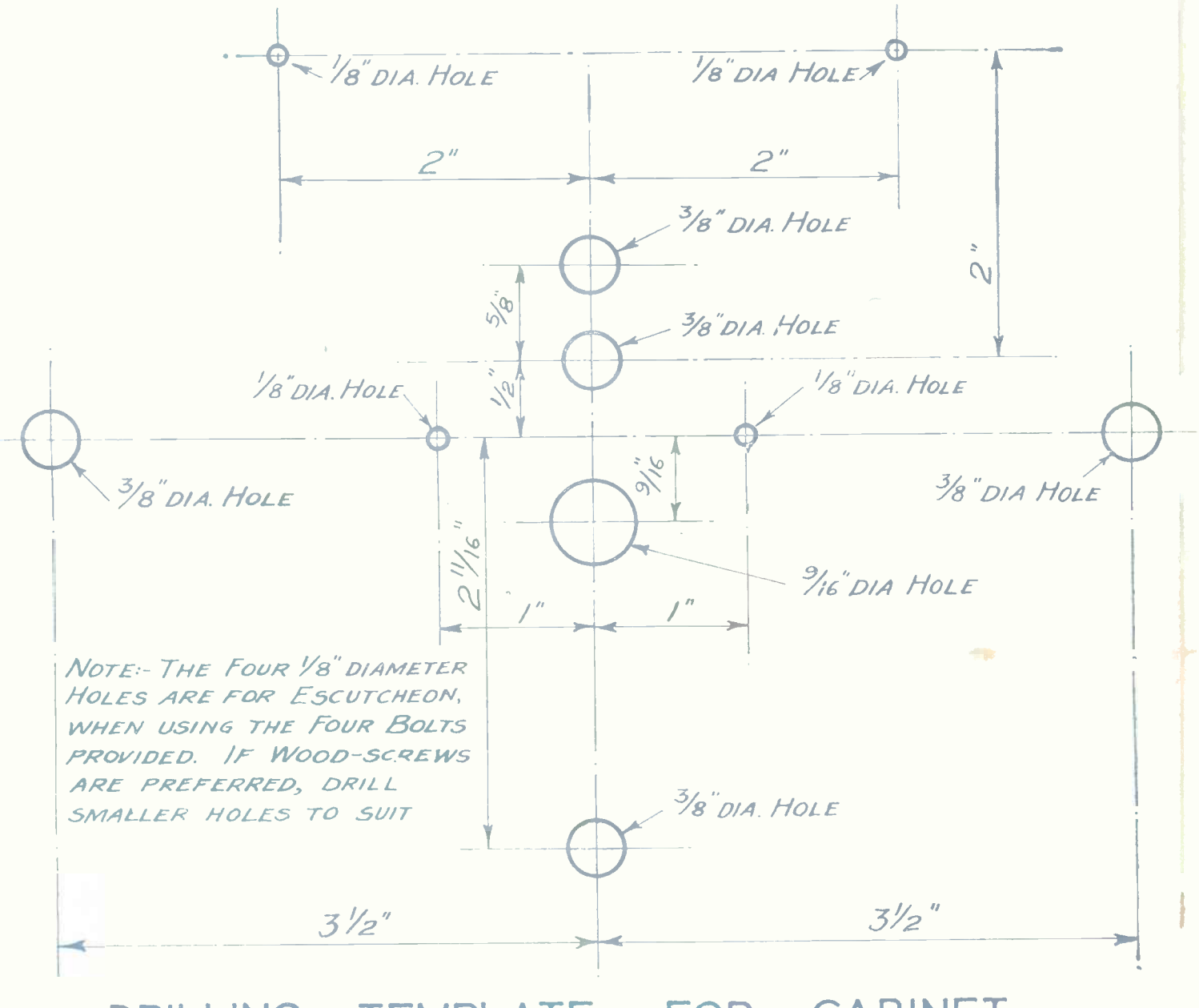
GRAHAM FARISH :

" MUM " Suppressor Unit	2/–
Filt Percolative Earth	2/6
" " " Refill	1/6
Gard Automatic Lightning Arrester	2/–
Resistance Capacity Unit	4/6
Slot Aerial Filter	2/–
Booster Unit	7/6
Base-board Pre-set condensers :	
·00005 mfd.	1/–
·0001 "	1/–
Brackets each	4d.
" POP " Two-way Terminal Blocks "	6d.

H.T. + 60v	L.S.	G.B. — 3–4.5v.	H.T. + 120v.	H.T. —	G.B. +	G.B. — 1.5v.	L.T.

Cut out and stick to baseboard.

Cut out and stick to baseboard.



DRILLING TEMPLATE FOR CABINET

Parts required for The "Sensity Super."

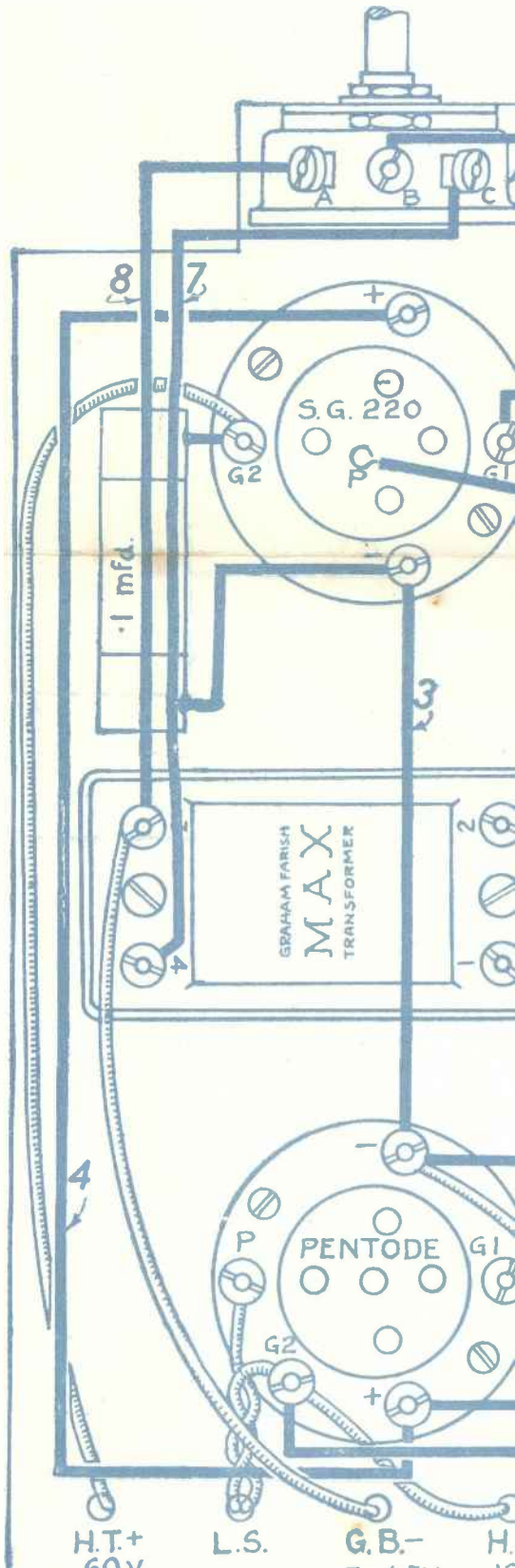
		s.	d.
2 4-pin Valve-holders	Graham Farish	1	0
1 5-pin Valve-holder	Graham Farish		8
1 Disc H.F. Choke	Graham Farish	2	0
1 Max Transformer	Graham Farish	4	6
1 Type J Formo-densor	Formo Products	1	6
1 .01 mfd. Mica Condenser ...	Graham Farish	1	6
1 DU5 Twin-gang Condenser with dust cover	Formo Products	12	6
1 .0002 mfd. Tubular Condenser	Graham Farish	1	0
1 .25 mfd. Tubular Condenser	Graham Farish	1	6
1 .1 mfd. Tubular Condenser ...	Graham Farish	1	6
1 1 meg. Volume Control ...	Graham Farish	2	9

		s.	d.
2 Component Brackets	Graham Farish		8
1 Twin Coil Unit Type AH/G ...	Formo Products	12	6
1 2 meg. Standard Grid Leak ...	Graham Farish		10
1 .0003 mfd. Differential ...	Graham Farish	2	0
1 Vertical Ohmite Holder ..	Graham Farish		6
1 40,000 ohm Ohmite	Graham Farish	1	6
2 Terminal Blocks	Graham Farish	1	0
Valves : Hivac SG220		10	6
Hivac D210		3	9
Hivac Y220		10	6
Loudspeaker: W.B. "Baby Stentorian" ...		22	6

Obtainable of all Dealers or from

GRAHAM FARISH LTD., BROMLEY, KENT.

THE "SENSITY SUPER"



FOR BASEBOARD DETAILS

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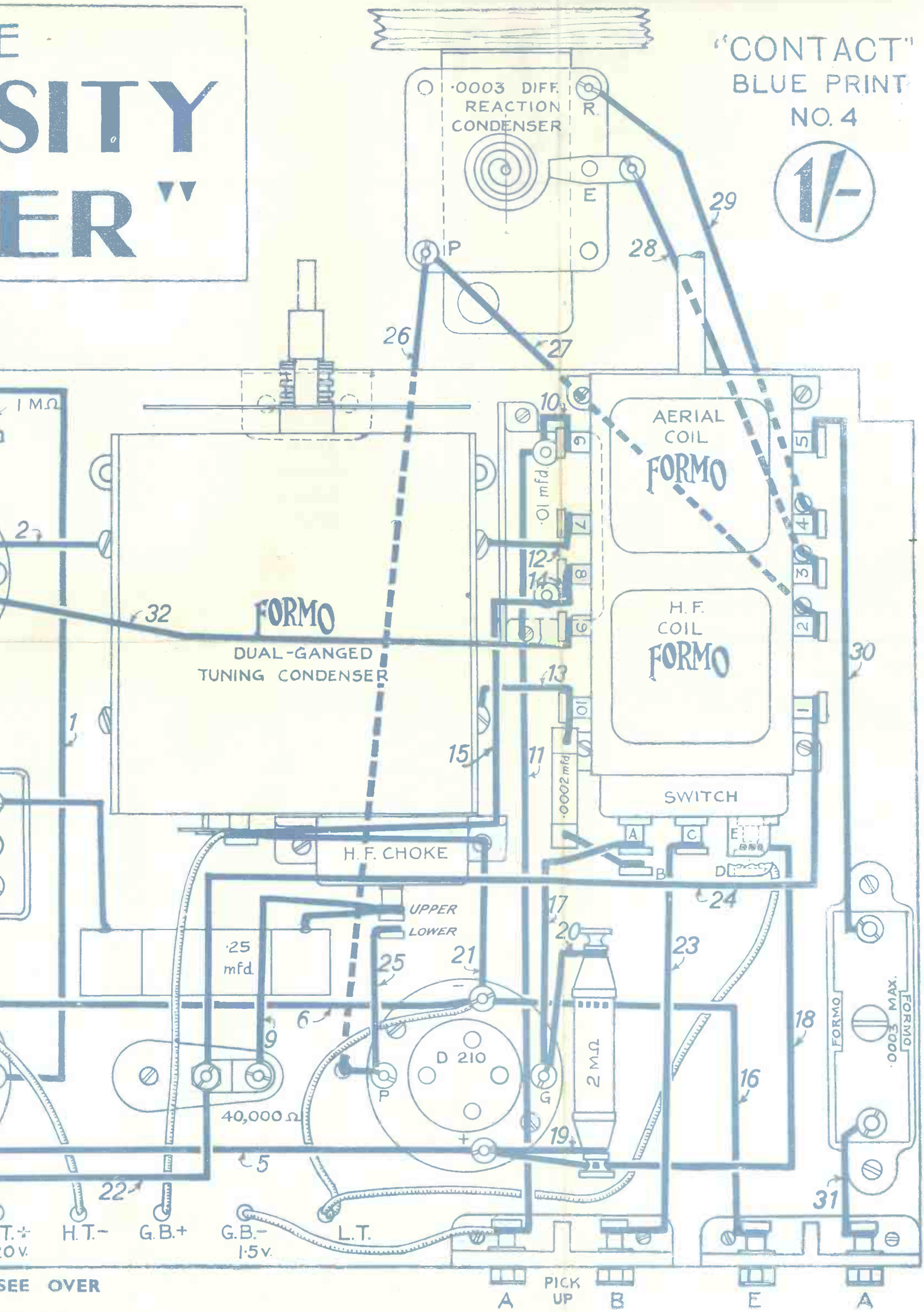
"CONTACT"
BLUE PRINT
NO. 4

1/-



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SENSITY SUPER BASE BOARD DETAILS

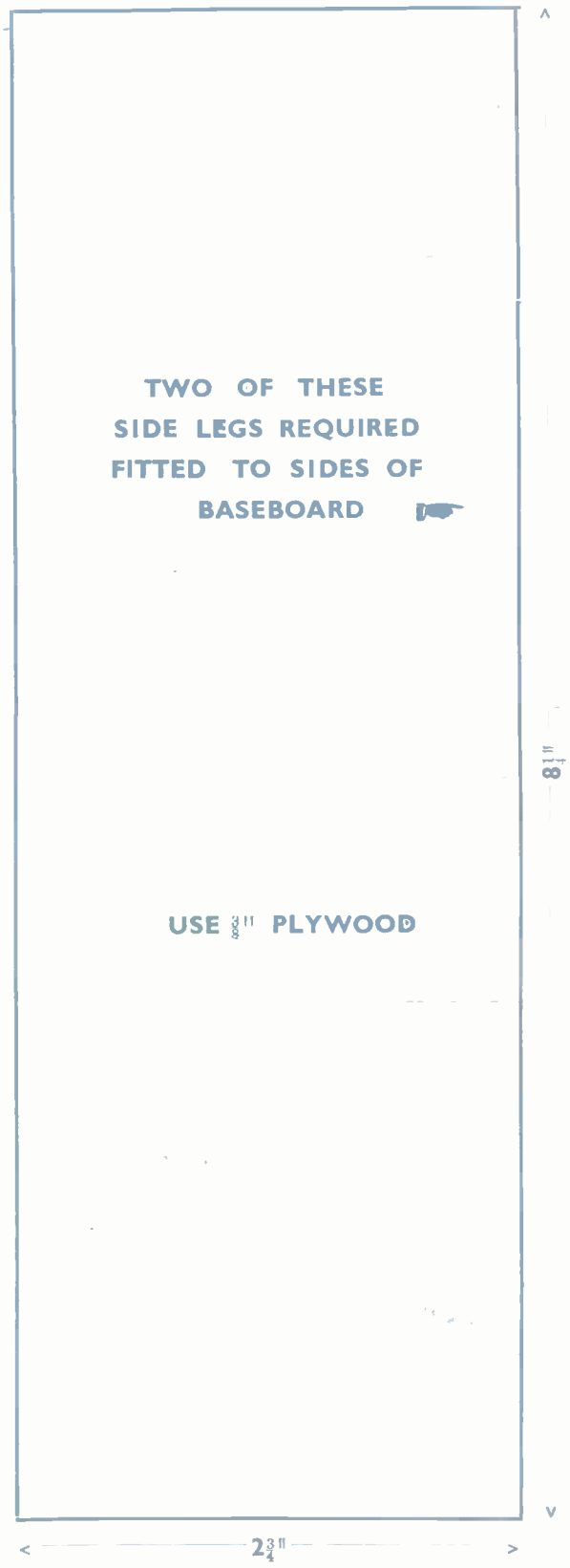
ISSUED WITH

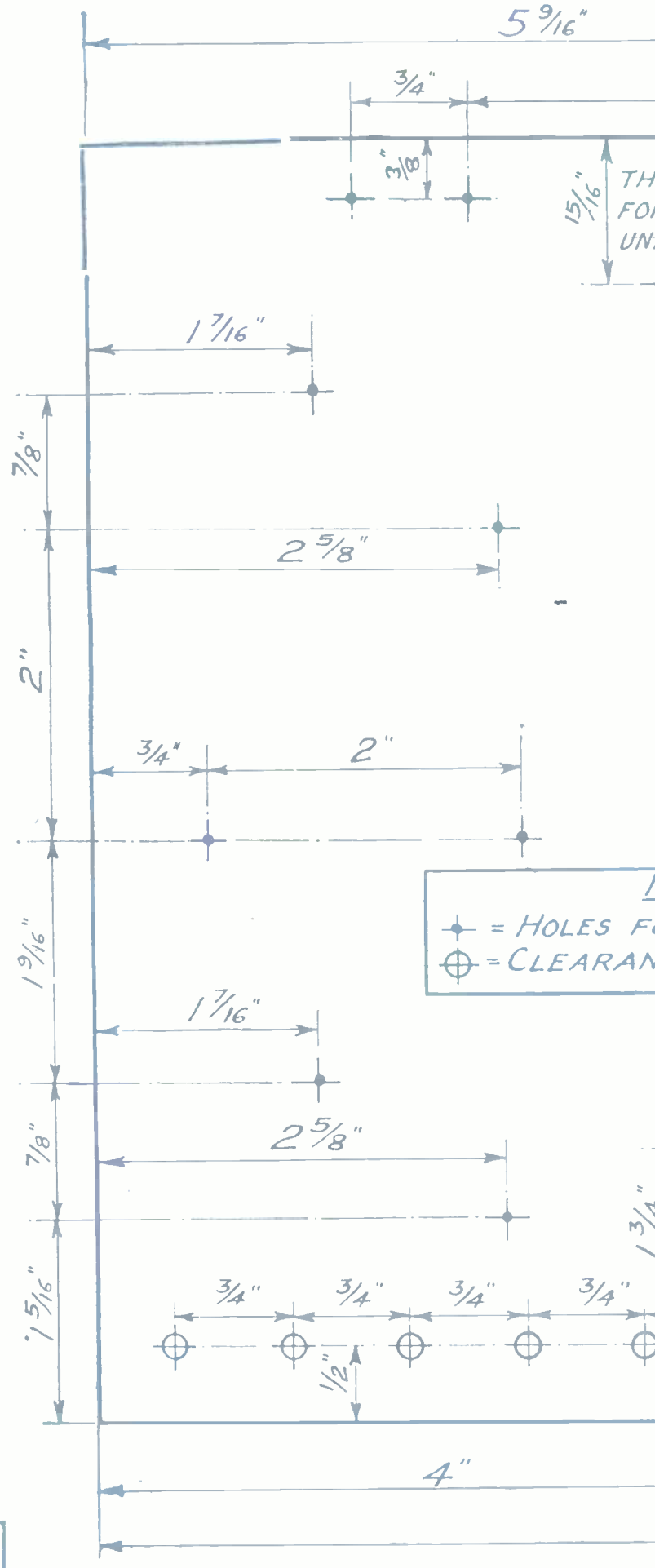
NOTE TO CONSTRUCTORS

IF you use the standard cabinet by Laurence, not only will you get a fine piece of furniture but also it is provided with a ready made baseboard and baffle. We strongly recommend the use of the Laurence cabinet to all constructors.

These plans are for drilling and may also be used for cutting out wood if it is desired to make up your own base-board.

Use 3/8" plywood and fit side legs under base-board along 8 1/4" sides. Ordinary small iron brackets or small wood blocks in the corner ensure a good strong job.

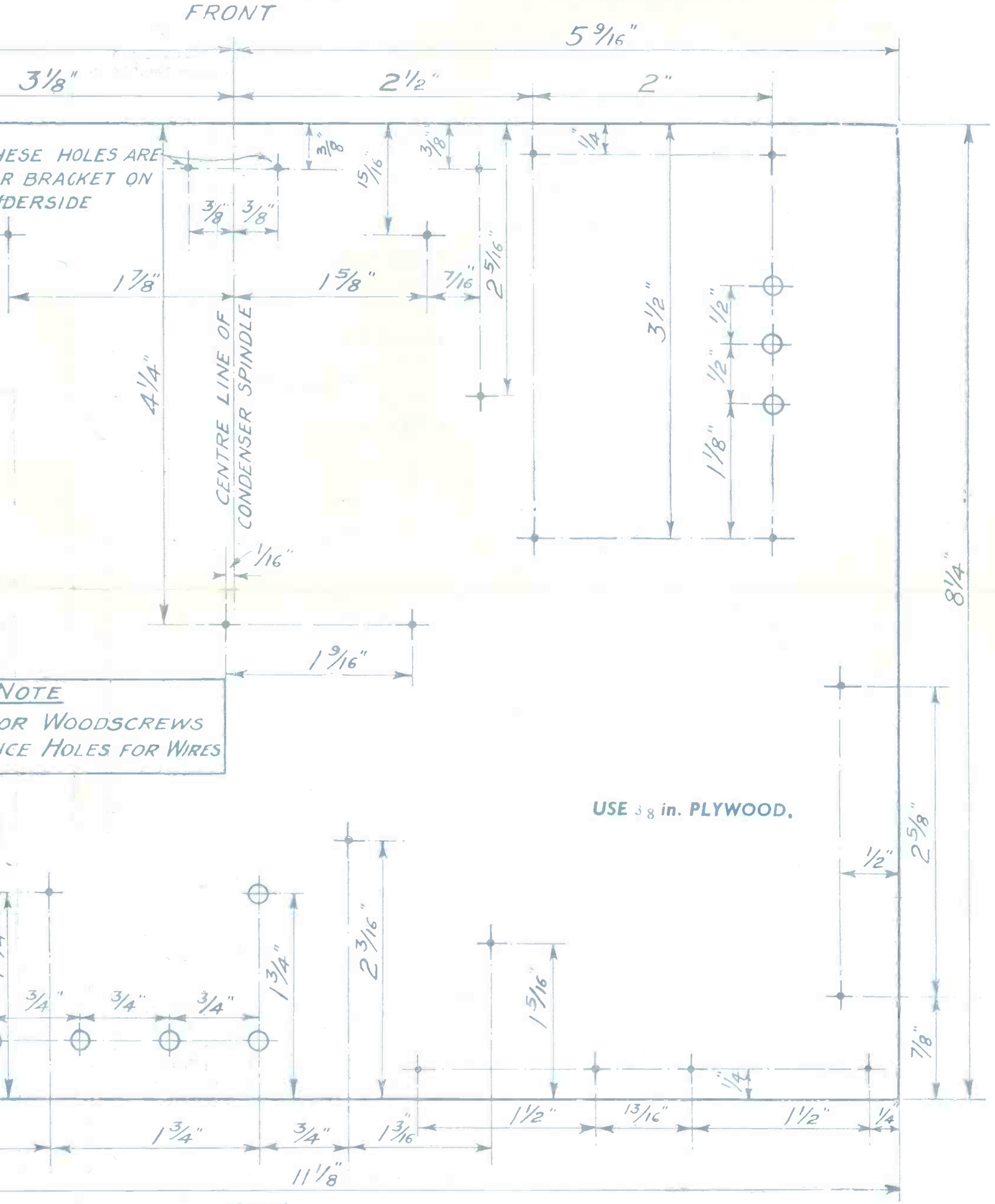




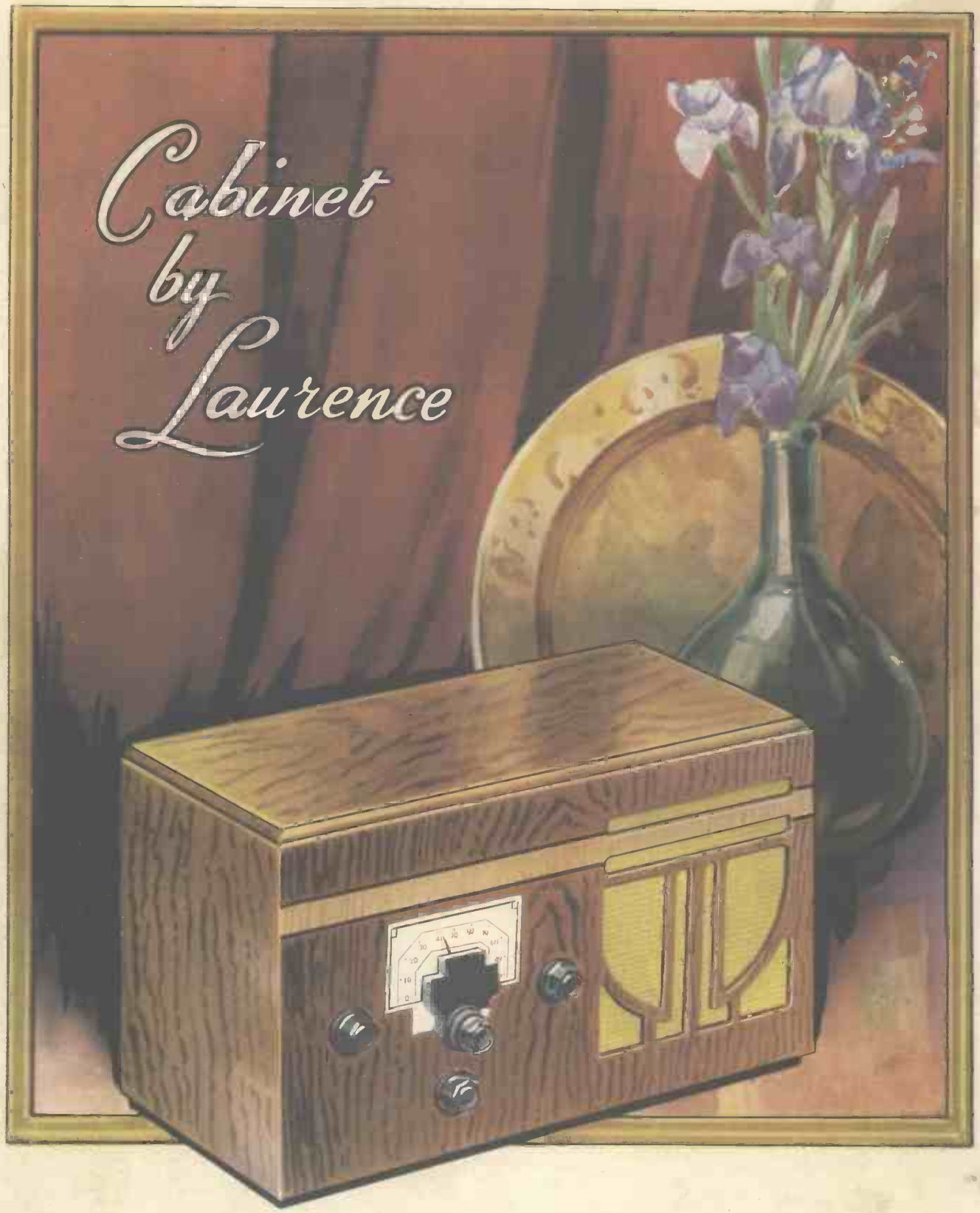
LAURENCE CABINETS are obtainable from all Dealers or direct carriage paid from **GRAHAM FARISH, Ltd., Bromley, Kent.** Price 25/- each.

DRILLI

H RADIO CONTACT No. 2 Vol. 1



NG TEMPLATE FOR BASEBOARD



Now available to radio home constructors for the first time— a genuine Laurence cabinet. Specially designed for the "Sensity Super," it is also suitable for all sets described in the first and second issues of "Contact"

25/-

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