

ENLARGED CHRISTMAS NUMBER

Popular Wireless

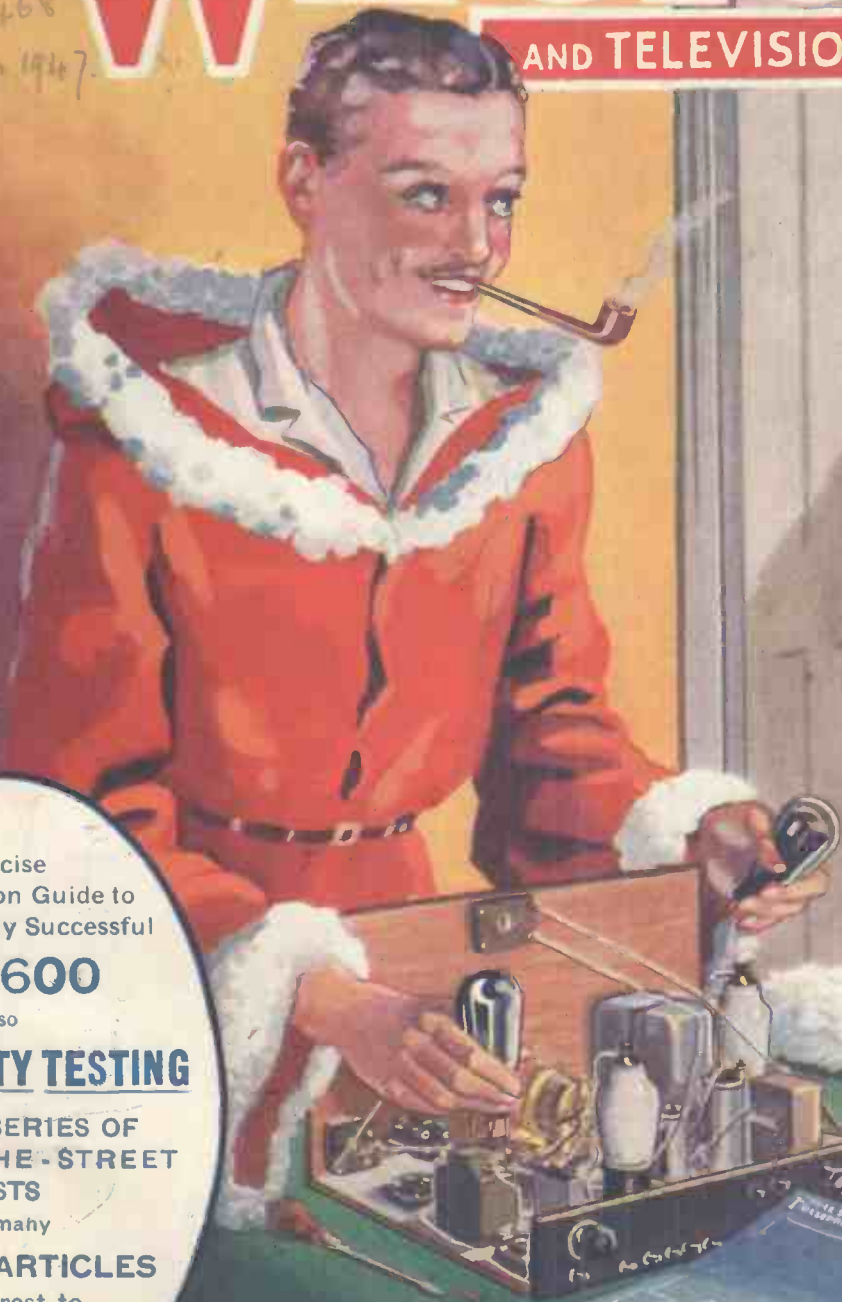
PRICE 4^D

AND TELEVISION TIMES

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December 8th, 1934.

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as a Newspaper.

*Page 468
Readon 1947*



Concise
Construction Guide to
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S.T.600
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COMMUNITY TESTING

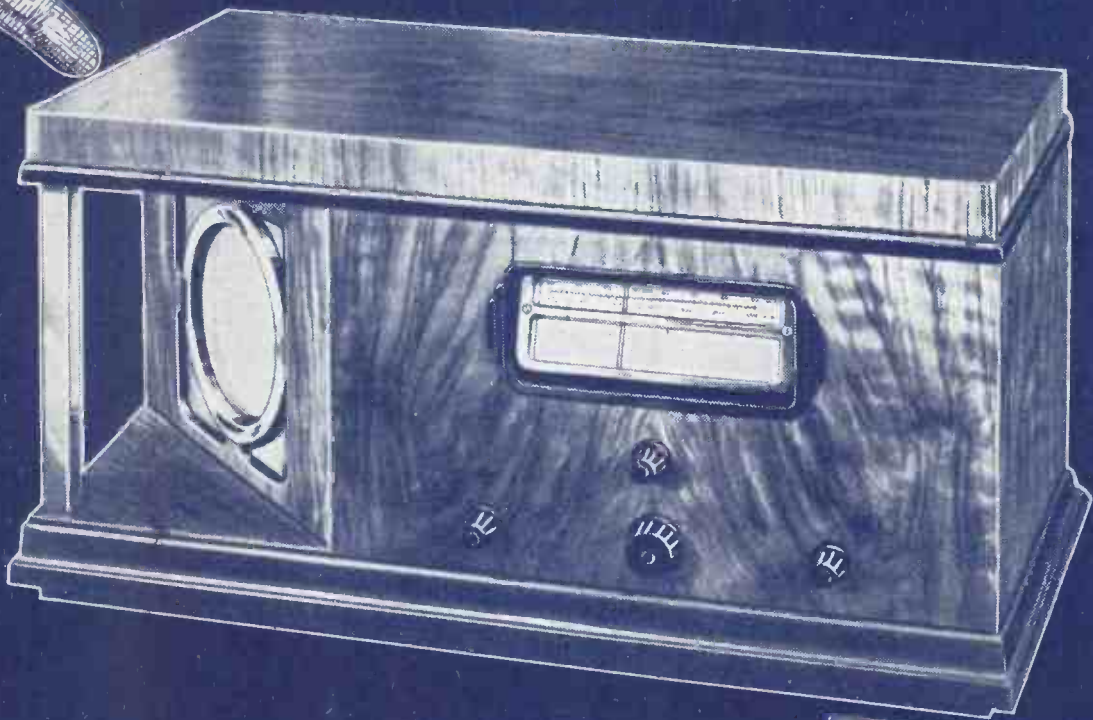
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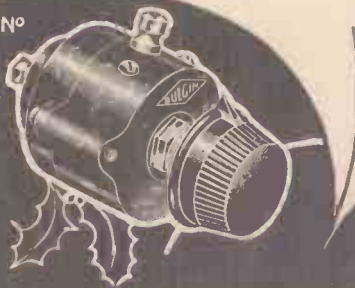
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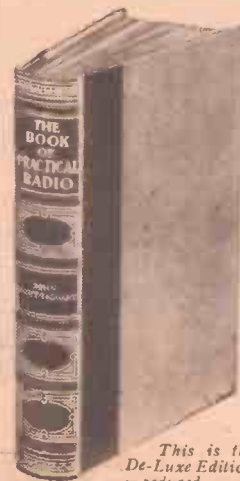
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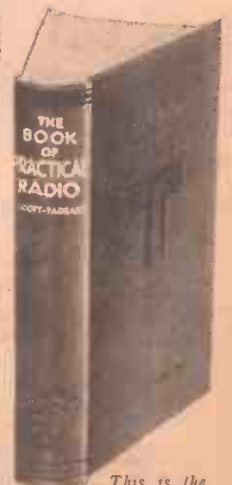
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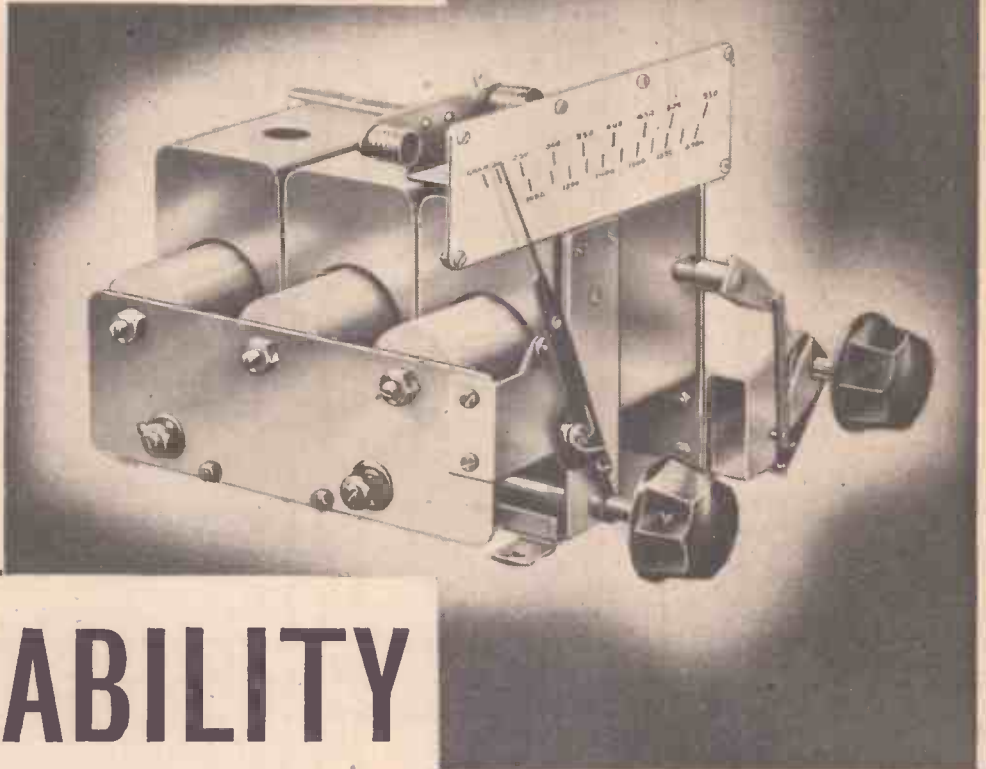
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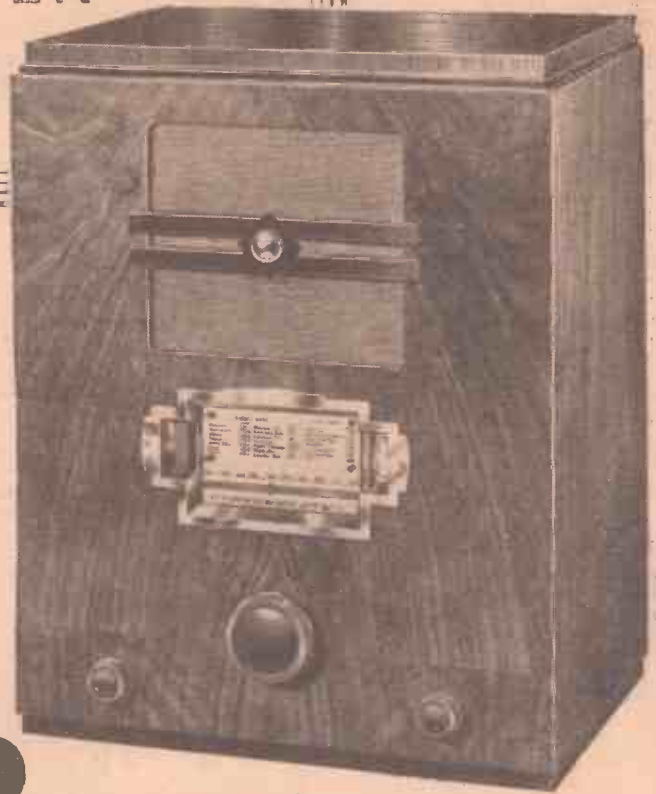
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P.W. 8/12/34.

L.120



MANAGING EDITOR: N. EDWARDS.

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GREETINGS!
HEARING AUSTRALIA
B.B.C. TRAGEDY
RADIO COOKING

RADIO NOTES & NEWS

"RED HERRINGS"
HUIZEN
"SPARKS" FORWARD!
WIRELESS ALARM

Our Special Number.

ONCE more we are brightening the bookstalls with "P.W.'s" Special Christmas Number—a knock-out issue, as you have already observed, I expect.

It gives me my annual chance to doff my high hat and salute you seasonably, which I do forthwith and forthrightly! We've had our ups and downs since the last Yuletide, haven't we? But Christmas is still Christmas. There'll be the pudding and—with luck—a flutter under the mistletoe.

There'll be the 600, and that business of the kids' stockings again, and cracker caps asked and all that! Happy Christmas!

What is the Limit?

MOST listeners know that it is possible to receive American broadcasting on ordinary (not short-wave) sets, and many are aware that even South America can be heard in this way. But how many believe it possible to pick up an Australian medium-wave station in this country?

Recently I reported that Mr. Orton, of Uxbridge, appeared to have the U.S.A. in his pocket; but his latest is "an Australian station which was playing the 'Peanut Vendor,' and which closed down at 2 a.m. G.M.T. This was a Sydney station, but the call was not clear. It was on approx. 282 metres and was presumably 2 K Y."

Although everyone agrees that reception conditions are now uncommonly good, this savours of the miraculous!

New Air Station.

TRAVELLERS to Jersey by air—and there have been as many as 150 per day on a monthly average—will be glad to hear that the new airport for the island will be ready for use by June. This will render unnecessary the landings on the beach, and, more important still, it will provide a wireless service at the Jersey end.

That will take the sting out of bad visibility; and as the six new air liners will be of the four-engined Diana class (as used for the Singapore-Brisbane mail service), the Jersey trip is already figuring in the schedules of far-seeing holidaymakers.

News in Brief.

THE number of licences for wireless in force at the end of October was 6,509,000—an increase of well over three-quarters of a million in the year.

The P.O.'s proposal to erect a micro-wave transmitting station for a cross-Channel service at Wyn Green, on the Wiltshire Downs, has been opposed on the grounds of beauty-spot disfigurement.

Charles Crook, aged 8, fell from a sky-

Current and Voltage.
TO B. J. R. E., of Birches Barn, Wolverhampton, I am indebted for a cutting from the "Express and Star." His eagle eye and orderly mind objected to the following statement:

"Technicians from Birmingham, Wolverhampton and other Midland towns saw a current of a million volts handled with ease."

As you see, that's wrong. But the author of the statement goes on to say: "It is not easy for the layman to grasp what is meant by one million volts." He's right there, anyhow!

The Ghost Train.

THE ghostly radio train which goes clanking through the programmes on readers' sets all over the country continues to provide plenty of evidence, but very few explanations of it are being offered.

"It sounded just like a rather old railway engine" (says H. B. C., of Moston), "with very loose side-connecting rods, running light. Then it gave one high-pitched whistle and clanked off."

That was on the long waveband, but others hear it on medium waves. (It is often on wavelengths far removed from Moscow's, thus making it unlikely to be a confusion with the Moscow train interval signal.)

I should like still more particulars, especially from those who have heard the train several times.

Medicinal Radio.

STUDENTS who are interested in the effects of short waves on the human body will be glad to know of "Radio Round the World," a book recently published at 5s. It tells how the doctors are using the very high frequencies to treat internal troubles, and how localised "fevers" have been produced with beneficial results that could not have been achieved otherwise.

As a vivid illustration of the possibilities the author cites the cooking of the yolk of an egg—without breaking the shell and leaving the white raw!

Science is now wondering whether it will be possible to warm the cockles of your heart in the same way.

(Continued on next page.)

To All "P.W." Readers.

The Editor and Staff take this opportunity of wishing every reader of "Popular Wireless"

A Happy Christmas.

light of the B.B.C.'s Number 10 studio and was killed. He was trying to retrieve a ball.

FUTURE BROADCASTERS?



This delightful study of Henry Hall, the B.B.C. Director of Dance Music, shows him at home with his two children, Betty (aged 9) and Michael (aged 6). Apparently they are being coached to "follow in father's footsteps." Details of Henry's programme plans for the Christmas season appear elsewhere in this issue.

The Vexed Question of Huizen



Those Moonstruck Herrings.

I AM glad that the B.B.C. arranged a programme on "Moonstruck Fish," for it is an interesting subject. Mr. Maconochie himself could not have admired the succulent herring more than I, and scientific approval of the idea that it swims up to the surface to look at the full moon confirms me in my high opinion of it.

No wonder we talk of the "good red herring"—a poet at heart and a delight at table.

The New French Stations.

SOME definite information of the dates on which the new French Regionals will be brought into service is now available.

Toulouse and Lyons are in the trial periods at the moment of writing, and Nice should be testing during December.

Lille is to take the air in January. And in February Marseilles and the new Paris Regional will lift up their voices. Finally, the improved Rennes will regale us with entertainment, his entr'acte tests being timed to conclude next July.

A Pronounced Success.

AN old friend of mine, writing recently in the "News Chronicle," gives such good advice about the pronunciation of Huizen that I must quote him verbatim:

"The ignorant pronounce it HIZEN,
A way the Dutchman finds surprizen;
While those more clever call it
HWEEZEN,
To rhyme with 'bulbs are now in season';
The well informed who call it HOIZEN
Despise the ignorant like poison;
But only one in every thousen'
Pronounce it correctly—HOUSEN."

Now you know!

Quality of Mercy.

A YOUNG German who was summoned at the West London Police Court for working a wireless transmitter without a licence was recently fined £5. Directing that the set should be forfeited, the magistrate said: "That is treating you a good deal lighter than you would be treated in other countries."

In the first country that I thought of that offence would have just about qualified him for playing a harp—and not a Jew's harp either!

Televisionaries Task.

SINCE Britain's Television Committee sent some of its members abroad an amusing yarn has been going round. It is said they looked at this, at that and at the other, and had almost determined to admit tentatively to a cautious optimism when the newspapers came out with "television across the Atlantic is not now merely a possibility. It is a certainty."

Backed by the greatest name in radio, such a statement makes it impossible for the committeemen to shiver on the brink indecisively. Either we are *in* for television or we are *out*.

The Old Gang.

I AM asked by "Late Sparks" to inquire if there are any "reunions" held nowadays for ex-wireless operators, presumably on the usual "dinner-first-and-do-you-remember" lines.

He omits to say whether he was Army, Navy, Air Force or Mercantile Marine. (I judge the latter, because he says: "I'm sorry Poldhu has gone, though I cursed his gruff voice every night for years!")

As this is a question in which many ex-Servicemen will be interested, I shall be glad to hear from "hon. secs.," provided they can give me several weeks' notice of the "do."

Fire-Damp Sentinel.

NOT long ago an ingenious French amateur perfected a scheme for summoning firemen by wireless. There was a button in the fire station and an alarm in every fireman's home. When the fire bell rang the button was pressed, and—*voilà!*—the boys arrived, *avec* helmets!

Now the idea has been modified to give the alarm from a mine, the button being replaced by a device which is sensitive to the noxious gas.

It certainly sounds promising.

Hungry Weather.

THE B.B.C. has been paid an unusual compliment by a Bradford baker. He says if the weather forecast is for rain and cold he knows there will be but little demand for cakes and such, so he curtails accordingly. But if for warmth and sunshine he knows he will need a big batch, and thus he saves his wireless licence fee many times over.

Do bakers in their districts find it is when the sun shines that the populace sally out for the succulent Sally Lunn? Or does not a cold, wet day sharpen their appetites for currant bread and cakes as they sit round the fire and yell over "Grandfather's Whiskers"?

Cross-frontier Radio.

THE diplomats are busy again with wireless, this time their aim being to prevent incitement or provocation to war by radio propaganda.

Under the instructions of the League of Nations, the International Institute of Intellectual Co-operation is drawing up draft plans to be submitted to the Governments when sorted and sifted.

ARIEL.

Give Yourself for 2/10 CHRISTMAS

JOHN SCOTT-TAGGART'S great new work, "The Book of Practical Radio," represents the essence of this famous author's 22 years of practical radio experience as applied to radio receivers. It is a complete compendium of all the really practical advice which Mr. Scott-Taggart has never previously made available, and if you obtain this splendid book it will be like having John Scott-Taggart at your side showing you how to get the most out of your set, how to construct a design and how to put right a set which does not work correctly.

Superbly bound in silken-finished green cloth, "The Book of Practical Radio" contains 384 pages, with 63 pages of art plates and over 160 diagrams and circuits.

From the first paragraph of this book you will be lured on from chapter to chapter by the fascination



This Marvellous PRESENT!

of the author's style and the very practical information conveyed. And there will be scores of occasions when you will reach this handsome volume down from your bookshelves in order to obtain the free advice of a consulting engineer who has advised the greatest radio concerns on both sides of the Atlantic.

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CAN BE YOURS IN TIME FOR CHRISTMAS!**

Don't miss this opportunity to obtain a work of lifetime utility. If you have six consecutive coupons, send them in at once to "Popular Wireless" Presentation Book Department (G.P.O. Box No. 184a), Cobb's Court, Broadway, London, E.C.4, with a P.O. for 2/10d. (or 4/6d. if you require the De-Luxe Edition), and your "Book of Practical Radio" will be sent to you immediately, carriage paid and fully insured.

Some Seasonal

Hints

BY
G.V.D.



NOT so very far from the Bayswater Road, in the Wild West of London, there is a little club run on rather non-stop lines. When the orchestra rests, dancing is continued with the aid of a large radiogram. By the way, that word "radiogram" was originated by "P.W." Curious that no one had thought of this obvious description before we did! However, to get back to the club. One evening while I was there the radiogram packed up suddenly. A young lady tinkered hopelessly with it. I wondered if I should volunteer to service the wretched instrument.

Try Kicking It.

For five minutes or so I mentally considered the sociological duties of a radio expert confronted by a dud radio outfit while "off duty." Finally, I compromised by advising the young lady to give the thing a hefty kick. Which she did, curiously enough without questioning my advice, and the instrument at once sprang into life and continued to work satisfactorily the whole time I was there. "You must know a lot about wireless," said the Y. L. admiringly. "A lot," I smirked. Whereat I was at once obviously disbelieved. Strange how the popular idea is that to be clever you must be modest!

As a matter of fact, punching a radio set may be a perfectly sound "running" repair or emergency palliative in certain cases. That radiogram packed up suddenly, but there had been one or two little hiccups previously which indicated the probability of a loose connection. The biff temporarily made good the contact.

Those Indifferent Meters.

You can sometimes get hours and hours of extra light from an electric lamp that has broken by leaving it in its socket with the switch turned on and tapping it. That is, if you can vibrate the ends of the broken filament together. They touch and fuse into a more or less solid join.

I often wangle quite big breaks in this way. When there is only about two-thirds of the filament left working you get a few hours of extremely bright light. But don't try this stunt with a radio valve. You might short something!

Some service men take this tapping business too seriously, though. It always amuses me to see one tapping his voltmeter or ammeter just like you or I tap a barometer. Tapping barometers must surely be one of our primal instincts! Yet no one would think of walking over to the clock on the mantelpiece and tapping it vigorously.

"Servicing" a radiogram—"Repairing" electric lights—People who will tap Mae West again—Keeping the audience amused—That A.T.B.—AND Grandfather's Whiskers.

But knowing when and how to tap is a fine art—if not an exact science. I once watched a B.B.C. engineer walking round one of those big, polished B.B.C. transmitters. He tapped *all* the dials—dozens of them. "Heard that story of the man who spent forty years tapping the wheels of railway carriages with a hammer and didn't know why he did it?" I asked conversationally. "No, I don't think I have; tell it to me," said the engineer, giving a voltmeter a smart rap with the knuckle of his first finger.

That reminds me of a Mae West joke I recently devised. She is supposed to have written to the Minister of Transport as follows: "Dear Mr. Belisha-Beacon,—I am honoured that you should have named a road after me—the Great West Road; but now I feel sore at you, for someone tells me you have since lined it with big raspberries on poles."

A Little Patter.

But let me say here and now that I am not the author of *any* of the remaining nine hundred and ninety-nine Mae West yarns.

Which is all straying away from my subject. Or is it? That yarn might help you to fill an awkward pause in the Christmas proceedings, if and when the set breaks down. All eyes on perspiring you while you fiddle with the innards of the completely unresponsive set. Why not prepare some good "patter" in advance? Something like this:

"No music?" as Adrian said when he Bolted into the fishmonger's to bye a Reith. Oh, very crafty! Let's have a look at the valves. Do you bi-valves? I like winkles, too. *What a chassis set!* And I don't mean maybe, baby. Up with the lid. But there ain't no lid. Let's knock its bottom off, then. No good; it's got a tin bottom. Bring me a tin opener, somebody. O.K.; a penknife will do. No deception: nothing up my sleeve. Two digs and a twist. Ah! Sorry, sir; bad steel in these foreign penknives—what? Aw, heck! Let's forget the radio and play postman's knock."

Poor Neighbours!

And the average constructor might as well when faced with a commercial set that has developed a serious internal fault. You've got to be pretty expert to be able to tackle a job like that. Especially if it's a mains set.

A young friend tells me that he put out the neighbours' lights because, as he said, he'd done something to a mains set belonging to a maiden aunt who was living with him. "Not that it mattered much," he said callously, "for our own lights weren't affected." I told him I thought it was a "tall story," whereat he smartly rejoined that

(Continued on page 500.)

ON THE STAGE OF ST. GEORGE'S



The people in this apparently casual group are artists actually broadcasting one of the recent musical comedies from the stage of St. George's Hall. In order to ensure accuracy the positions of the feet of the microphone stands are marked with chalk circles, while for dance items by the Dancing Daughters the stage of the hall is marked in lettered squares, some of the dividing lines of which can be seen in this illustration.

COMMUNITY TESTING!

A SERIES OF UNIQUE "MAN-IN-THE-STREET" TESTS

IT will have been apparent from past history that "P.W." is nothing if not resourceful. The enviable position that it holds of being the leading weekly wireless journal is one which we of the staff intend to maintain, and in the realisation of that ideal we are constantly faced with the various problems besetting the listener, and to the best of our ability we endeavour to overcome them.

Not so very long ago we were seriously concerned at the alarming increase in the numbers of commercial receivers—an increase which, as we viewed it, could only lead to greater confusion on the part of the potential buyer.

Five Thousand Different Sets.

With not far short of 5,000 possibles from which to choose, it was difficult even for the technician to put his finger on the best receiver for any particular set of requirements without almost interminable considerations; and if we found it difficult, how much more difficult was it likely to be for the non-technical listener—the ordinary man in the street?

Without entering any further into a discussion of the pros and cons, suffice to say that our solution to the difficulty was to inaugurate a weekly Listeners' Service for the purpose of giving authoritative guidance to listeners.

The scheme caught on from its inception, as it was almost bound to do, for it was, and still is, the only weekly Triple-Test service available in the country.

By a lengthy and tedious process of elimination we weeded out from the 5,000 commercial sets available all but just the outstanding ones, and it is from these sets, all of which are above a certain standard, that our weekly test set is selected.

But that in itself is not enough. It is one thing to give in print a carefully

tests the desirable atmosphere of "what the other fellow thinks," we instituted a unique series of man-in-the-street tests to supplement our own views.

Each time a test is done by us we invite an ordinary listener to test that set for himself, and without fear or favour his views are faithfully recorded. More often than not this chance-chosen critic is intercepted in the street—somebody as completely unknown to us as the set we invite him to test is to him.

Suspected of Selling Matches.

Sometimes we get refusals, sometimes we are suspected of selling matches, sometimes we are threatened with the arm of the law for plausible touting on the public highway, and sometimes we are given what is popularly known as "the air." But it is all very well worth while, and because of its value in creating confidence in the minds of those who read of the experiences of other "ordinary listeners" we are confident that our readers attach the proper significance to these man-in-the-street tests.

So much, then, for "P.W.'s" Listeners' Service. But this is the special Christmas Number—the one occasion of the year when the question of presents is uppermost in the minds of most people. But do not mistake us. We are not suggesting for one moment that a wholesale interchange of complete receivers for presents is either likely or necessary! The country may have recovered, but not quite to that extent.

(Continued on next page.)

WHAT IS SUBURBIA'S CANDID OPINION OF 1935'S RECEIVERS?

In the belief that the answer to this question is of real value to all who are faced with the difficult problem of choosing a new set, "P.W." has taken steps to find out. This unique series of tests, carried out with average aerials, average earths and under average home conditions, has been conducted by a group of ordinary listeners selected absolutely at random. The intrinsic value of this "community-testing" experiment lies in the fact that none of our chance-chosen critics had previously encountered the receivers that they were asked to test until the models were actually delivered at their respective homes. And all of them had little or no experience of modern set operating. What they can do—well, so can you!

prepared technical report of a particular receiver, but, as we have found from past experience, it is quite another to impart into the mind of the reader that with his perhaps limited knowledge of set operation he will be able to emulate our results!

The fact that we, too, are ordinary men in the street when it is all boiled down to domestic considerations seems to want a lot of swallowing, however true it may be!

However, human psychology being what it is, and in order to introduce into our

But the fact remains that Christmas-time is considered in the trade to be a peak season for the sale of commercial receivers, which can only lead to the conclusion that a lot of people buy their new sets in time for Yuletide.

The Value of These Tests.

With that fact in mind, when it came to the question of "P.W.'s" special Christmas Number, we felt that something a little more ambitious than our usual Listeners' Service was desirable in order not to confine ourselves just to one set, but to cater for all shades of opinion in the one issue. With a representative range from which to choose, the intending purchaser, we felt, would have much more scope for obtaining complete satisfaction.

The thought was father to the deed! In less time almost than it takes to say Jack Robinson we had hit upon a plan which represented an ideal solution.

Why not, for once, "community testing"? Why not enlist the co-operation of the manufacturers and arrange for the delivery of five different receivers to five consecutive houses in a typical

include as representative a range as possible. There is a battery model, a table-model superhet for A.C. mains, a superhet

WHY NOT LET THESE UNIQUE AND IMPARTIAL TESTS BE THE DECIDING FACTOR IN THE CHOICE OF YOUR NEW SET?

for universal mains operation, a superhet console model and the very latest thing in superhet portables.

of the instruments referred to therein. Dealing with them in order of price, the first of the five is the Aerodyne "Merlin." It will have been apparent to all battery users that until comparatively recently set manufacturers generally can hardly be said to have given proportionate attention in the number of battery designs available.

Catering for the Battery User.

Aerodyne is definitely not one of the firms to be included in this general observation, for almost since their inception they have made a point of catering for the battery user. Little wonder, therefore, with so much start on others, that the Aerodyne "Merlin" should have turned out so commendably successful.

The "Merlin" is a three-valver—variable-mu screened grid H.F. pentode, triode detector, and pentode output—and the set incorporates a sensitive permanent-magnet moving-coil speaker. The price of 9 guineas is inclusive of batteries and valves.

The Marconiphone model "296"—the set which was recently chosen by Sir Dan Godfrey—is a five-valve (including rectifier) table

THE CONVOY ARRIVES!



Community deliveries for community tests! Here are the five sets arriving at the respective houses in Caithness Road, Mitcham.

THE SETS AND—

- (1) The Kolster Brandes "383" superhet table model for universal mains operation.
- (2) The Marconiphone "296" 5-valve (including rect.) table model superhet for A.C. mains operation.
- (3) The Aerodyne "Merlin" de-luxe 3-valve S.G. battery receiver.
- (4) The Ekco ADT 95 9-stage transportable for universal mains operation.
- (5) The G.E.C. "A.V.C.5" 5-valve (including rect.) superhet console model for A.C. mains operation.

—THE CITIZENS

- No. 71.—Mr. H. W. Denston
- No. 73.—Mr. W. H. Champ
- No. 75.—Mr. H. Ellis
- No. 77.—Mr. S. J. Clark
- No. 79.—Mr. E. Bowman

suburban district so that those householders could try the sets for themselves?

Great idea! And so it was!

On a recent Saturday morning the sets were duly delivered to the houses concerned, and through the courtesy of the manufacturers, who are deserving of special credit for the enterprising way in which they entered into the spirit of the tests, the householders were left with them for several days.

The results of this unique experiment are faithfully recorded on the following pages. It is information upon which the potential purchaser can place the utmost reliability by the very nature of the conditions under which the tests were conducted. Average aeriels, average earths and average men in the street. Men who, perhaps like yourself, had never previously encountered the sets that were left with them, and whose knowledge of general operating procedure was necessarily limited.

We are indebted to the residents of from Numbers 71 to 79 inclusive, Caithness Road, Mitcham, for the part they played in these tests, and we take this opportunity of thanking them for the thorough and whole-hearted manner in which they participated. The jury is excused from further service for ten years!

And now just a word about the sets.

It has been our aim, as far as possible, to

The reports which follow on other pages will not in all cases represent complete technical reports, because the method of approach in each case has been left entirely to the discretion of our Mitcham friends. But technicalities to most listeners are of quite secondary importance.

The Receivers Chosen.

It is "what it will do" that matters every time, and from this point of view it must be admitted that these tests are unique. The fullest possible technical details of any one of these sets will gladly be sent to any "P.W." reader who cares to write direct to the manufacturer concerned and mention POPULAR WIRELESS.

In the meantime, we propose only to give just a brief outline of the sets in question in order that the reader may approach the "test reports" on the following pages with a clearer mental picture

model superhet for A.C. mains operation. It incorporates visual-tuning indication, and one need say no more concerning the reason for this set's inclusion other than that it is a Marconiphone set, and a Marconiphone set at only 13½ guineas into the bargain!

Next in order of price comes the Ekco model A.D.T. 95 transportable, a 15-guinea instrument for universal mains operation which combines the advantages of a really good modern superhet with those of a portable receiver. The A.D.T. 95 is termed a transportable, but the fact that it will receive all the worth-while stations in Europe without either aerial or earth is one that will render the design of instant appeal to thousands of ordinary listeners.

The G.E.C. Console Superhet A.V.C.5 costs 17 guineas. On the score of both appearance and performance it might easily be taken for an instrument costing twice the amount. That is one of the reasons why G.E.C. designs are so consistently successful.

The last of the five, the Kolster-Brandes model "383," will perhaps make its widest appeal to the more ambitious listener. It is a seven-valve superhet for universal mains operation, and, true to K.B. traditions, it is in every way a most outstanding design. It is 19 guineas.

Now turn to the following pages and "see what the other fellow has to say."

"No. 71" TRIES THE KB MODEL "383"

"Quite a revelation" says
Mr. Denston.

"IT'S been quite a revelation to me," was Mr. Denston's first remark when we called to see how he had got on with the Kolster Brandes "383" receiver during the week-end. The Hilversum programme was flooding the room with a volume that made Mr. Denston hasten to tone it down so that we could converse in comfort.

"That's one of the things that has amazed me most. No matter how loud I turn it on I can't seem to overload the loudspeaker. The quality is always perfect, and even when the

THE SET IN BRIEF

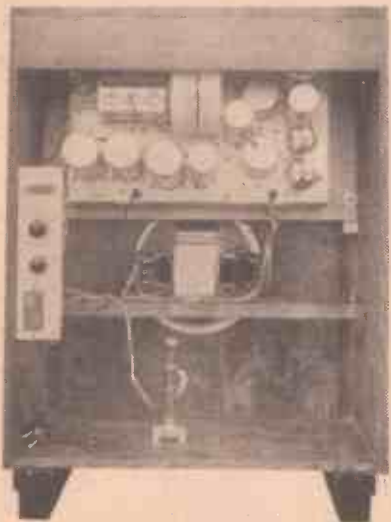
The KB "383" is a seven-valve superheterodyne receiver. The rectifier is of the half-wave type, and the remaining six valves act as frequency changer, I.F. amplifier, combined second detector and L.F. amplifier, noise suppressor valve, and output stage. The latter has two high-slope pentodes in parallel.

Capable of being worked on mains of any voltage between 195 and 255, the set is of the universal type for A.C. or D.C. supplies. A variable selectivity control is fitted, and quiet delayed automatic volume control incorporated. The price is 19 guineas, or first payment of 43s. (including 3s. insurance) and 12 monthly payments of 33s.

volume is turned down to a mere whisper the reproduction is just as good."

Of course, knowing the KB reputation for turning out first-class receivers, we were not a bit surprised to hear the reproduction was magnificent over the whole range of the volume control. But Mr. Denston had some more to say about the quality.

"What makes it so pleasing to listen to," he continued, "is the way all the 'small bits' and the 'background' come up." He wasn't



Never judge a book by its cover. But when you see such a workmanlike interior as this—the KB Model "383"—you can rest assured that the set is a good one.

referring to "background noise," for the KB "383" is one of the quietest superhets available, but to the "atmosphere" which one gets when listening on a good set to, say, an O.B. of a dance band. Put technically, one would say that the transient response was especially good.

"I listened to Troise and his Mandoliers last Saturday afternoon, and the timbre of the instruments was amazingly real." Mr.



The Kolster Brandes Model "383" is pleasingly modern in design.

Denston told us, "and other instruments which simply come to life on this set are the piano accordion and violin.

"I used to think my set was good, but this . . ." He broke off, lost for words to describe the enjoyment he had obtained.

For a moment he toyed with the tuning control, pausing as each programme jumped into life; then:

"Do you know, not a single station interferes with the adjacent one on this receiver? I've given it a thorough trial on both wavebands, and the foreigners simply tumble in.

"THAT'S WHAT I THINK"

"No. 73" (Mr. W. H. Champ) describes, in an interview, his experiences with the famous Marconiphone Model "296."

WE visited Mr. W. H. Champ twice in connection with his test of the Marconiphone receiver: first to connect it up—for he does not profess to be in any way technical—and later on to hear how he had liked it in place of his usual set.

"We've done more listening-in this week than for a long time," he said. "Not just because we've been asked to try the set out, but because it has proved so enjoyable to listen to.

Extremely Easy to Handle.

"Even when I've been at business my wife has had the set on. What I like about it is the ease with which it is handled. I've generally used it with the volume control knob pulled out, because then only the powerful stations of real programme value come in."

We should explain here that the volume control has two positions—"pushed in" and "pulled out." In both positions it can be turned to control volume, but when pulled out all background noises and static clicks are suppressed, and distant

"It's a set that would appeal just as much to the real novice as to the man who knows something about radio, because, in spite of the stations that come in and their remarkable quality, the set is simplicity itself to operate. And the neon light which indicates when a station is properly in tune is a great advantage.

"Quite apart from ensuring that you are dead in tune, it saves that swinging backwards and forwards of the tuning control which is necessary with an ordinary set to ensure that you get the best setting. And then, again, anyone who has rather an unmusical ear will not set the tuning just off the right position if he watches the neon light."

We did not interrupt Mr. Denston's flow of appreciation, for quite obviously he had had sufficient experience of radio receivers to give a reliable and unbiased opinion. His next remarks concerned the calibration of the tuning.

" . . . Anyone who bought one of these sets would be bound to be pleased with it, no matter what his ideas on sets were, for it is a masterpiece from all points of view. . . ."—No. 71

"Calibration is dead to the mark. You can set the tuning exactly to a station according to the mark on the dial and then check up tuning on the neon, and you will find it is absolutely accurately set. I've never seen or heard anything like it!

"Anyone who bought one of these sets would be bound to be pleased with it, no matter what his ideas on sets were, for it is a masterpiece from all points of view. It is the last thing in appearance and would blend with almost any furnishing scheme.

"Finally, the noise suppressor. If you get any hisses or clicks you can cut them all out. The makers must have gone a long way to produce such a fine control."

We thanked Mr. Denston, and asked him if he had any criticisms of the receiver.

"Not one," was his reply: "not from any aspect whatever."

So we bade him good-night.

stations that can only come in to the accompaniment of interference are cut out.

"The gadget in the middle," said Mr. Champ, indicating the visual-tuning indicating device, "is a great idea. Somehow it

(Continued at foot of next page.)

VISUAL TUNING FOR SIMPLICITY OF OPERATION



The rising-column-of-light device, to indicate correct tuning, greatly facilitates operation and ensures perfect quality of reproduction. It is a feature of the Marconiphone Model "296."

AT HOME WITH THE AERODYNE "MERLIN"

The enthusiastic occupant of "No. 75" relates to a "P.W." representative what happened during his tests of this popular battery model.

MR. H. ELLIS, who lives at No. 75, Caithness Road, and took part in our "Community Tests," has a three-valve battery receiver which he made himself and which he runs from an H.T. eliminator. So he had an excellent basis on which to judge the Aerodyne "Merlin" set, since this is also a three-valve battery instrument.

When he had unpacked the "Merlin" it didn't take Mr. Ellis long to get it connected up, everything being perfectly clear from the instruction sheet. The only items unusual to him were the two long controls for the clock

HOW'S THIS FOR AN IDEAL CHRISTMAS PRESENT?

that is mounted on the panel, the winder and hand-adjuster which project at the back of the set. They are fitted in a moment.

Mr. Ellis found that this clock added considerably to the appearance of the receiver, which was very attractive, even ignoring the timepiece. As a matter of fact, he confided in us that he would have had the set going much sooner than he did had it not been for the time he spent gazing at it because of its novel and pleasing cabinet design.

What he particularly liked about it were the

(Continued from previous page.)

seems very comforting to a non-technical man to have his tuning settings confirmed for each station tuned in.

"And the tone control: the effect of that is most marked. I've heard some people say that very often it's a job to notice much difference when these controls are adjusted, but they could not have been referring to this particular model. Personally, I like reproduction to be brilliant, and it's very nice to be able to avoid 'that mellow tone,' that, nevertheless, appeals to many, by simply turning a knob."

No Eye-Strain.

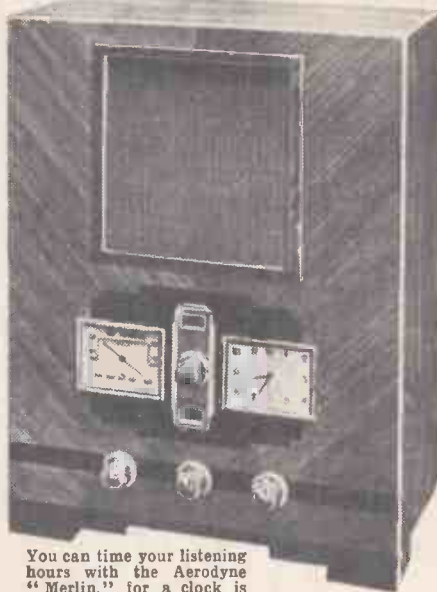
At this point we digressed for a moment to explain to Mr. Champ why stations on the long waves each encompassed a wider band of wavelengths than on medium. Though not technical, Mr. Champ had noticed this fact from the dials, and it cropped up when he was telling us how remarkably effective he had found the station separation.

Continuing, he remarked:

"I like the tuning dials because they are so easy to read and do not strain the eyes, even after a long spell at the controls. Similarly, there is no strain about listening. The tone is just right.

"I don't know whether you have noticed it," he said, "but I find that some sets, although the quality seems excellent, tire the ear when one has been listening for an

TIME, LISTENERS, PLEASE!



You can time your listening hours with the Aerodyne "Merlin," for a clock is incorporated on the front.

hour or so. But it's certainly not the case with this receiver. I've been listening all the afternoon and shall probably go on listening all the evening."

Just then Mrs. Champ came in, and after exchanging greetings we asked her what she thought of the set.

"There's only one criticism," she said, "and that is, too many foreign stations come in well. The result is my husband cannot make up his mind which one to listen to, and keeps jumping from one to the other."

"Don't you believe it," interrupted Mr. Champ. "Anyway, I've certainly made up my mind that it's a marvellous set.

"Shall Miss It."

"It's so very simple, and there are no 'ifs' or 'buts' about it at all. The cabinet also is so pleasing, it is neither ugly nor does it shout at you like some. Just

refined and neat. Then there's the question of absence of interference even with the volume control pushed in, for we found all the usual punks and bangs to which we are accustomed were entirely absent. We shall certainly miss it when it's gone!"

NOTE:—The Marconiphone "296" receiver costs 13½ guineas cash, or £1-10-0 first cost and 12 monthly payments of £1-2-9.

chromium-plated knobs and fittings and the neat clock dial for the tuning, which proved an admirable companion to the clock itself. "And" he told himself, "if the performance is up to the appearance, it will indeed prove a fine set." As you will see, he had his proof without a doubt.

In describing his experiences to us he put the question of quality first. This he had found most excellent and far in advance of any other battery set he had heard, the most outstanding feature about it being the life-like reproduction of the smaller sounds, due to a particularly good transient response.

As a matter of fact, he told us that he had had three different people come to see him who had absolutely fallen in love with the set, and who found the quality just as good as that given by most mains receivers. These people had also commented on the silent background, and considered that the set scored appreciably on these grounds over many mains receivers.

Then Mr. Ellis let us into a little secret. He had been so anxious to test out the set, and had connected the earth lead in such a hurry, that he had not noticed an electrical break in the wire.

"... In describing his experiences to us he put the question of quality first. This he had found most excellent, and far in advance of any other battery set that he had heard..."

And he had already come to the conclusion that it was a jolly fine set, capable of bringing in many stations and especially sensitive on the long waves, before he spotted the fact that only about three feet of wire were attached to the earth terminal.

Of course, when he had rectified this little matter things were "even miles" better, and, good as it had been, it was nevertheless nearly a hundred per cent improved. What was most noticeable was that, whereas before he had to make a fair amount of use of the reaction control for distant stations, he could now leave it at minimum.

The only times that reaction was needed were in the cases of very weak stations or when great volume was required from distant foreigners. To all intents and purposes he found it more like operating a superhet.

There was only the tuning knob to turn and stations came in one after the other, and, most important of all, selectivity was ample to separate them properly from one another. This in spite of the fact which he pointed out that he was using quite a biggish aerial.

Mr. Ellis' wife was also most enthusiastic about the "Merlin," saying that she found the tone most pleasing, and that she would far,

TECHNICAL SPECIFICATION

The Aerodyne "Merlin" is a de-luxe three-valve S.G. battery receiver. The H.F. valve is a variable- μ pentode, and a pentode is used in the output stage. It has band-pass tuning, a moving-coil loudspeaker and provision for plugging in a gramophone pick-up.

There is a 130-volt H.T. battery, provision for an external speaker, and illuminated wavelength scale. It has a veneered walnut cabinet.

The price is £9 9s., and purchase by deferred payments can be arranged.

far rather have its self-contained neatness to the bundle of wire to which she was used. But perhaps that was hardly fair, for radio is Mr. Ellis' hobby and he likes to do a considerable amount of experimenting.

Having a clock on the panel was another thing that struck Mrs. Ellis, who considers it a most logical place for it, since all radio items are run so exactly to time, and the loss of half a minute in switching on may easily spoil a whole hour's listening because some announcement or opening remarks have been missed.

As a matter of interest, Mr. Ellis, who is a keen constructor, worked out the approximate cost of the parts to build a set like the "Merlin," and found in comparison that the nine guineas charged for it is amazingly low. As he pointed out, it would be low enough even if the set was merely just average, but in view of its fine performance as well it makes the set, as he put it, "a sound investment."

"WELL, what can I do for you?" asked Mr. S. J. Clark when I went to interview him in connection with his test of the Ekco model A D T 95.

I explained that it was our desire to tell readers what he thought of the receiver, and that I proposed to ask him a few questions about it.

"That's a good idea," he replied, "because you can ask about just those things that they would want to know if they were considering buying a new set."

That being agreed upon, I started off by asking him what he thought of a really modern set after his two-valve battery receiver.

A Marvellous Set.

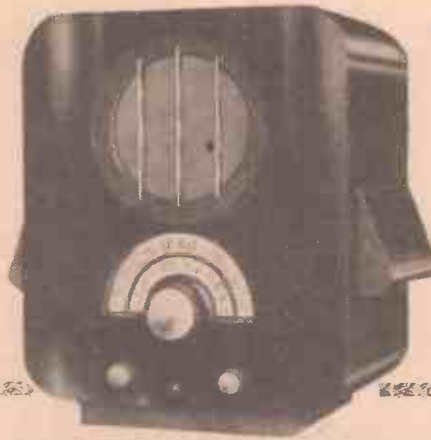
"I am simply astounded at the volume obtainable," Mr. Clark said, "and particularly am I impressed with the strength at which the foreigners come in. They are certainly far better on this set than on any mains receiver I have heard."

"Have you been able to tune in a lot of foreigners?" I asked.

"A lot?" Mr. Clark sounded quite surprised at my question. "Why, on the medium waves there's hardly a single degree without its station. It's really rather marvellous."

There seemed little else to be said about sensitivity, so I steered the conversation round to the question of selectivity by asking:

"Did you have any difficulty in



MY WEEK-END WITH THE EKCO TRANSPORTABLE

"Hardly a single degree without its station..." says Mr. S. J. Clark in his summary of the ADT 95's performance.

"The tuning was surprisingly exact," I was informed. "When the shadow was dead over the station name, then that station was tuned in at its best."

"You like the form of shadow tuning employed?" I queried.

"Most certainly; and I like the knob provided for operating it. This is of generous proportions and enables small and

steady variations of the tuning to be made with ease."

At this point Mr. Clark turned the tables on me somewhat by saying:

"And now I would like to ask you a question.

"Since I seem to get all the stations in Europe on the aerial incorporated in the set, why do the makers trouble to provide sockets for aerial and earth? I gather from the instruction book that results may be a little better with an outside aerial, but I don't see how mine possibly could!"

I was on my guard immediately in case there was a catch in this question, and hedged by saying:

New Turntable Use.

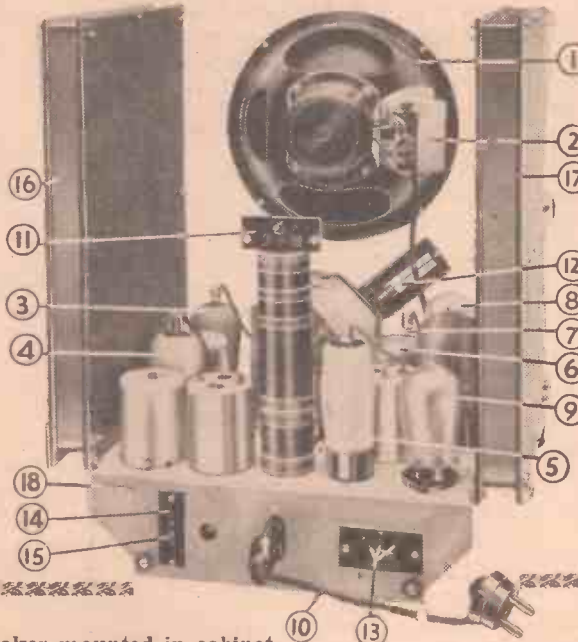
"That is really a question for the designers. But I expect the D X man who is out for getting the most from every tiny station, and who likes to try for America, would find an outside aerial and an earth of some advantage. Also these would probably prove beneficial in making the

set ideal for localities where reception conditions were very poor."

"Yes," agreed Mr. Clark, "but I consider it a very good point that they are not necessary, as on most sets these days. It makes it so easy to have the radio in whatever room you like, and there is no need to bother about extension loudspeakers. The set is light and the lugs on the sides of the cabinet make it very easy to carry about."

THE CHASSIS EXPLAINED

The Model ADT95 transportable is one of the latest additions to the popular Ekco range. It is a seven-valve (including rectifier), 9-stage superhet receiver for universal mains operation, and it incorporates practically every worth-while modern refinement. The circuit is provided with full delayed automatic volume control, and an ingenious optional static suppressor is included for the elimination of "man-made" static interference troubles. The price of the set in a walnut bakelite cabinet is 15 guineas, but it is also available on hire purchase for a first payment of 27s., followed by twelve monthly payments of 27s.



"I am simply astounded at the volume obtainable, and particularly am I impressed with the strength at which the foreigners come in..."

—Mr. S. J. Clark.

separating any of the stations from one another?"

"Not a bit," was the reply. "But that's rather surprising to me, seeing there are so many of them, and seeing they are so close together."

Then Mr. Clark asked me about the circuit, and I explained that it was a nine-stage superheterodyne arrangement, there being seven valves including the rectifier.

To which he replied:

"Considering it is such an elaborate circuit and gives such powerful results, it is amazingly simple to operate. But," he added, "I reckon the station calibration helps."

With that I agreed heartily, and asked how accurate he had found the calibration.

"How do you like the turntable fixed on the cabinet?" I asked next.

"Well, the set is not very critical on direction, but sufficiently so for the direction it is pointing to help to cut out noise interference sometimes. Personally, I like the turntable because it enables the set to be swung into the best position for operating and for directing the sound towards listeners in any part of the room."

That, to me, was a new use for a turntable, but I think readers will agree it is quite a sound one.

"Thank you, Mr. Clark."

"Not at all. The pleasure's been all mine. And I hope my remarks will lead to others enjoying one of these unique receivers." C.M.

- 1.—Speaker mounted in cabinet.
- 2.—Output transformer.
- 3.—H.F. amplifier valve.
- 4.—Detector-oscillator valve.
- 5.—I.F. amplifier valve.
- 6.—2nd Detector and A.V.C. valve.
- 7.—L.F. amplifier valve.
- 8.—Output pentode valve.
- 9.—Rectifier valve.
- 10.—Mains lead and plug.
- 11.—Mains voltage adjustment panel.
- 12.—Pilot lamp.
- 13.—Tone control sockets.
- 14.—Aerial socket.
- 15.—Earth socket.
- 16.—Medium-wave frame aerial.
- 17.—Long-wave frame aerial.

THE approach to No. 79, Caithness Road lies over a tree-bordered pathway some 150 yards or so from the main Streatham road. It was only the second time in my life that I had walked down that road when I set out to discover what experiences had befallen our "community-testing" friend with the G.E.C. Console Superhet A.V.C.5.

Past number seventy-one, seventy-three, seventy-five and seventy-seven—all with lights burning and all with radios going (yes, no doubt that they were all faring well)—until—ah, number seventy-nine—"my" house!

I listened. Yes, that set was going too; in fact, it was going more than "too." It was going twenty times "too"—forte!

As one about to interrupt what I felt must be inside a delightfully informal "try-out" of a set that I knew from experience to be good, I paused on the threshold, listening. After hearing a brief excerpt from seven different programmes one after another, I was reminded physically that a November evening is not an ideal time to choose for standing about. So I knocked.

"... I should think I have heard every station in Europe that's worth hearing during this last week-end, and what amazes me is that they nearly all seem to be up to the strength of the London stations. . . ."

Mr. E. BOWMAN

Mr. Bowman was all smiles when he came to the door.

"Good-evening!" I said. "And what's the news?"

"Well," he said, "it's almost unbelievable news. This set's a marvel." And then, as an afterthought: "I suppose it wasn't specially 'hotted up' for me?"

"Not the remotest chance," I assured him, "for, as a matter of fact, the makers were not given notice of this community-testing idea until a few hours before the set was required for delivery, and it was taken straight out of stock."

"H'm!" he mused. "I hardly thought that it could be a special one. All the same, it's a very remarkable model."

"So it's been acquitting itself very well, eh?" I queried. "Well, tell me what you have been doing with it."

Many Stations Received.

"Almost be quicker to tell you what I haven't been doing with it, I think," continued Mr. Bowyer. "I should think I have heard every station in Europe that's worth hearing during this last week-end, and what amazes me is that they nearly all seem to be up to the strength of the London stations."

"That is probably due to the automatic volume control scheme incorporated," I explained. "As you may have noticed, the set is called the Console Superhet A.V.C.5, and those three letters stand for automatic volume control. From your experiences, it is apparently well named."

"It certainly is," observed our chance-chosen critic. "And the volume—why, if you run the set all out it's enough to fill a hall—much too loud for any of my rooms."

"Talking of volume, what do you think of the quality?" I asked.

"I like it. It seems to me that the bass response is exceptionally good; on music it is much more true to life than one usually hears."

"You were saying just now, Mr. Bowman, that when the set is being used at

"I should say definitely not. For that is how I have been using it all this week-end, and it is my opinion that the quality is good at any volume."

"How did you get on with the controls?" was my next question.

Mr. Bowman smiled as if reading my thoughts.

"Well, you'd have to be a pretty incapable sort of person not to get satisfactory results out of that set."

I agreed with him.

Continuing, he added:

"The settings for all the worth-while stations are indicated by name, and the colour-illuminating scheme for differentiating between medium

and long-wave stations renders confusion impossible. You simply have to adjust the line of light to the station you want—and, apart from the possibility of having to adjust the volume control, that's about all there is to it."

"What about the tone control?" I asked. "Did you find it useful?"

"Well, yes; but I used that least of all. You see, I used it when the set first arrived to obtain the results that I like, and

The G.E.C. 5-valve superhet automatic volume control series comprises a table model, a console and a radiogram—all for A.C. mains operation. It is the console model which is the subject of the present test, and it costs 17 guineas. On hire purchase it is available for a first payment of 30s., followed by twelve monthly payments of like amount.

since then I haven't had occasion to touch it."

"So you didn't have occasion to use it for cutting out high-pitched heterodyne interference whistles?"

"Do you mean those sort of oscillating noises?" queried Mr. Bowyer.

I nodded.

"Well, no. I didn't find very many of them, and I thought it was impossible to get rid of them in any case."

"It is, really," I assured him, "but the use of a good tone control does sometimes help. By the way, talking of heterodynes, how did you find the selectivity of the set?"

"I had no trouble at all. All the stations that I heard—and there must have been dozens of them—were quite separate from one another."

Outstanding Cabinet Design.

"Well, Mr. Bowman I think I have worried you quite enough. But before I go, may I ask just one more question?"

"I should just like to know what you think of the cabinet."

"Oh, yes! I meant to have mentioned that before, for I think it is one of the most outstanding features of the whole set. It's an excellent piece of work, and it is certainly in keeping with the remarkable set that it houses."

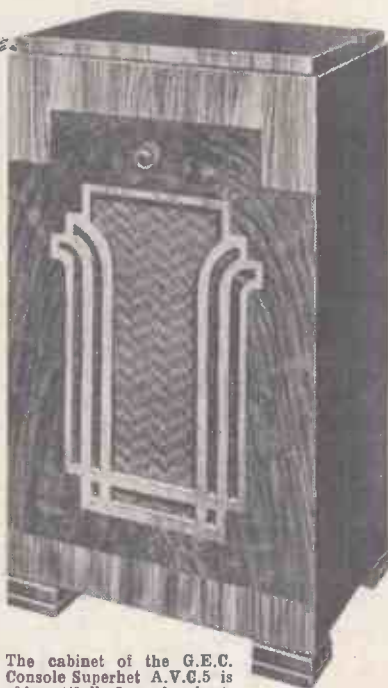
"So you like it, eh? Good! Well, I certainly must thank you for the helpful way in which you have recounted your experiences, and with that I will take my leave."

And I did, convinced more than ever that these man-in-the-street tests are invaluable as a guide to listeners.

L. O.

"A VERY REMARKABLE MODEL"

Sensitivity, selectivity and quality are the outstanding features of the G.E.C. Console Superhet A.V.C.5. in the estimation of Mr. E. Bowman, the fifth of our chance-chosen critics.



The cabinet of the G.E.C. Console Superhet A.V.C.5 is of beautifully figured walnut.

maximum volume it is much too loud for normal domestic use. Do you think that the quality of reproduction suffers in any way when the volume is reduced to comfortable room strength?"

ABOUT THE RECEIVER

The G.E.C. Console Superhet A.V.C.5—the set which is the subject of this unique test—is one of a range of luxury receivers designed and made by the General Electric Co., Ltd. It is a five-valve (including rectifier) band-pass superhet, with pentode-frequency changer, variable- μ screened pentode intermediate-frequency amplifier (125 kcs.), double-diode-triode second detector and resistance-capacity-coupled super-power output pentode.

The circuit incorporates a particularly effective full-delayed and amplified system of automatic volume control, and an ingenious sensitivity switch can be brought into use when desired for the suppression of background noises. This switch changes the bias on the frequency changer and I.F. valves, and thereby reduces the overall sensitivity of the set for the interference-free reception of the more powerful stations only.

The controls are simple, and consist of one for tuning, one for tone, one for volume, and a wave-change/gramophone switch. The full-vision "vertical" tuning scale incorporated is marked with both station names and wavelengths.

The design provides for the connection of pick-up and external speaker, and a special type of "wound-up" aerial is fitted to the back of the instrument. By extending this aerial a large number of the more powerful stations can be received without any other aerial.

The total power consumption of this particular model is 70 watts.

FEW Christmas parties are so "cut and dried" in their arrangements beforehand that even the organisers know exactly what everyone is going to do. That is the state of the arrangements for the Christmas Day Party which John Watt and Max Kester will produce, and which the Light Entertainment Department at Broadcasting House has for some time been hoping will prove to be one of the outstanding features of the Yuletide broadcasts.

No doubt that everything will be well and truly fixed before the great day, but at the moment only a general outline can be given of how the party will be built.

To begin with, there must be games. No Christmas party was ever a success without them; but how to play them in such a way that millions of unseen people can also join is now agitating the minds and ingenuity of the producers. The problem is not so easy of solution as it may seem, but I have sufficient faith in John and Max to bet they will win through.

I hear that a Punch and Judy show is a possible item for the party, as is also a short relay from a London pantomime. Old-fashioned dances there must be, old English songs too, and carols and pantomime songs. A ghost story? Yes, and perhaps one from Hans Andersen. Bits from shows already broadcast—"In Town Tonight," variety shows and some "Songs from the Shows"—might not come amiss. But who knows? Final details will not be worked out until Christmas afternoon, even though Henry Hall and the B.B.C. Dance Orchestra, the Variety Orchestra and the Wireless Singers have been definitely booked to help with the show.

* * *
"Dick" Sheppard on Daily Living.

Canon H. R. L. Sheppard, now of St. Paul's, is again accepting regular microphone engagements. In addition to taking some of the week-day morning studio services, Dr. Sheppard is giving "Hints for Daily Living," a series of short heart-to-heart messages dealing with the common difficulties, troubles and triumphs of daily life. These talks will be given from 5.15 to 5.30 p.m. in the National Programme on the following Sundays: January 13th, February 10th, March 3rd and 17th.

* * *
"The London Theatre."

This is the title of a new feature which will appear in the programmes for the first time on January 4th. The idea, originated by Val Gielgud, B.B.C. Drama Director, is literally to bring the London stage to Broadcasting House. Instead of relaying excerpts from the theatres, these will be transferred to the studios. This method of treatment should produce better programmes. For one thing, the varying character of the relays will be eliminated; also the entertainments will be adapted to the microphone. The feature will be given fortnightly throughout the winter and early spring.

* * *
The B.B.C. and Morality.

The talks programme for the period from January to March contains a series of talks to be given on Sunday afternoons from 5 to 5.15 by the Rev. Hugh Martin. The subject of the series is "Morality, Old

and New." There will be an introductory talk by Mr. Martin on Sunday, December 9th. The series promises to be sensational, the subject of the last address being "The Relations of Men and Women."



Albert Sammons, the famous violinist, has phenomenal gifts as a sight reader. He first appeared before the microphone on the Duke of York's wedding day.

* * *
Sir John Reith in South Africa.

Sir John Reith has received many congratulations on his work in South Africa, where special attention has been directed to his refusal to accept a fee. Many people thought he would be getting as much as

THE B.B.C. XMAS PARTY

Arrangements for the Festival Season

And other News from the Big House

five thousand guineas; others were convinced that the amount would be not less than ten thousand guineas. Despite his extremely strenuous exertions and his failure to get any holiday at all, Sir John remained adamant, and is believed to be the first Commissioner in South Africa to

SOME CHRISTMAS PROGRAMMES.

The Buggins Family is due to arrive in the Children's Hour on December 24th, and will join the staff in a real Christmas party with a distinct Buggins flavour. (National.)

"A Christmas Stocking," woven and filled by Derek McCulloch, will contain carols, games and songs. On Christmas Day. (National.)

"Hansel and Gretel," adapted for the Children's Hour on December 29th. (National.)

"Prophecy" Programme. Outstanding personalities in every phase of achievement have been invited to give forecasts as to developments in their own crafts during 1935. The programme will be strung together in an amusing manner by a well-known compère. December 29th. (National.)

"The Show Goes Over." A lively hour devised by Denis Freeman and Austen Croom-Johnson. December 29th (National) and December 30th (Regional).

adopt this attitude. Sir John's attitude was that he was doing a public and Imperial service.

* * *
Mr. Rendall Installed.

Mr. R. A. Rendall, nephew of Dr. Montague Rendall, a former Governor of the B.B.C., has now taken up his duties as Director of Programmes for the West of England and Wales. Mr. Rendall is undertaking an extensive reorganisation of the arrangements. Amongst other difficult duties, he will soon tackle the vexed problem of programmes in Welsh, attempting to reconcile the legitimate requirements of the Principality with those of the more populous western English counties.

* * *
"Yes, Madam."

Entertainment Hour is always good value. That arranged for Friday, December 14th, should be particularly attractive, since it is to contain an excerpt from the Hippodrome success, "Yes, Madam," in which Binnie Hale and Bobbie Howes will be heard in one of their greatest hits, a duet called "What are you going to do?"

* * *
An End-of-Term Sing-Song.

Taunton School—of which J. C. White, the famous Somerset and All-England cricketer; A. H. Chadder, the well-known Corinthian who "skipped" England in amateur "Soccer"; and R. A. Gerrard, the International Rugby three-quarter, are old boys—is holding its end-of-term sing-song on Saturday, December 15th, and arrangements have been made for it to supply what will undoubtedly prove to be an attractive relay for West Regional listeners.

The sing-song will take place in the School Memorial Hall, which was recently reconditioned in memory of the late headmaster, Dr. C. D. Whitaker, and Mr. J. G. Loveday, one of the assistant masters who was connected with the school for an uninterrupted period of sixty-three years.

The programme will consist of items by Graham Leaman (treble) and the Taunton School-choir and orchestra.

* * *
Volunteers' Reunion Concert.

The First Rifle Volunteers Old Comrades' Association, which was formed to perpetuate the memory of the 1st Rifle Volunteers—the first volunteer regiment to be formed in this country in 1852—and which, upon the passing of the Territorial Act in 1908, became the present 4th Battalion Devon Regiment, is holding an after-dinner smoking concert at Deller's Café, Exeter, on Monday, December 10th.

There are still many of the old volunteers who will look forward to a relay of the proceedings.

* * *
A Treat for Scottish Listeners.

Scottish listeners have a big treat in store on Monday, December 10th, when the great Harry Gordon, the famous Scots comedian, is taking part in a concert with the studio orchestra.

Harry's concert-party shows have been a big feature of holiday life at Aberdeen for some years, and his microphone appearances are always eagerly anticipated by every Scot in Scotland. O. H. M.



LESS THAN 5/- PER WEEK



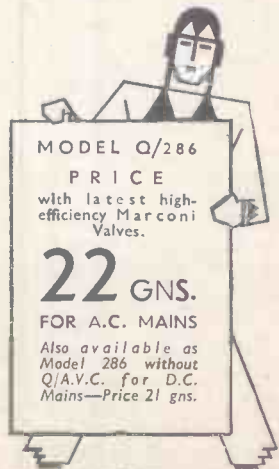
The New

MARCONIPHONE

5-VALVE • 7-STAGE • SUPERHET RADIOGRAMPHONE

● The very last word in radio engineering, with every technical feature necessary for perfect entertainment, including 'Quiet' Automatic Volume Control — a new and valuable refinement which eliminates all noise between stations as well as maintaining your programme at constant strength. Tuning is by an illuminated station scale, there is a superb new moving coil speaker, a robust electric motor, latest multiple Marconi valves, etc., while the cabinet is beautifully built from selected walnut. See your local Marconi-man to-day, or if you prefer it, write to the address below for full details of this remarkable instrument.

Technicalities: The circuit is an advanced 7-stage band-pass A.C. Superheterodyne with heptode frequency-changer, Vari-Mu I.F. valve, double-diode-triode for 2nd detection and 1st L.F., followed by a resistance coupled pentode and indirectly-heated heavy-duty rectifier. The 'Quiet' position of the A.V.C. can be varied at will (thus forming a highly-efficient static-suppressor) or switched out to give ordinary delayed A.V.C. and full sensitivity on weaker stations. The undistorted output is two watts and there is provision for extra speakers, mains aerial, etc.



MODEL Q/286
 PRICE
 with latest high-efficiency Marconi Valves.
22 GNS.
 FOR A.C. MAINS
 Also available as Model 286 without Q/A.V.C. for D.C. Mains—Price 21 gns.



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better
radio at
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UNIVERSAL MODEL (Type B.P.U.) Complete 65/-
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J. B. LINACORE



At Christmas, more than at any other time, your radio entertainment must be at its best. So use a J.B. Linacore tuner for your set—it gives a 3-valve set performance equal to a Superhet. There are three models.

Send 4d. in stamps for a copy of 'VIVID RADIO'—a large broadsheet with three full-size blue-prints to help you incorporate a Linacore tuner in your set.

OF THE SHORT WAVES—Page 2.

OBSERVANT readers will doubtless have noticed that the heading on the previous page looks a bit "under the weather," with snow covering the tops of the letters. This, of course, is supposed to indicate the spirit of Christmas—a thing I've never been able to understand, because Christmas Day is nearly always warm and wet as far as this country is concerned.

Christmas Day for me, and doubtless for many other short-wave enthusiasts, is something of a paradox. It is the occasion of the one and only B.B.C. programme of the year which I really *would not* miss—no, not for all the short-wavers on the face of the earth. I really and truly shun short waves and all their works on Christmas Day, and settle down after lunch to listen to that wonderful world-wide programme.

One of the Early Sets.

But where the paradox? Ah! Think again! Here it is: That wonderful programme couldn't be done if it weren't for short waves—so by sitting downstairs by the fire we're not really getting away from short waves a bit.

Christmas is usually a season of reminiscences, so let me "reminisce" for a bit. My first radio Christmas—A.D. 1921, with no B.B.C., no modern radio conveniences, practically nothing at all except the Eiffel Tower time signals!

The receiver: even then a single-valver, with a bright-emitter having a characteristic like a cow's hind leg, taking 1 amp. at 4 volts, and costing, I believe, 22s. 6d.—a quarter's pocket-money! Two variable condensers of quite unbelievable dimensions, "slab"-wound coils, home-made fixed condensers and grid leak (remember the old pencil-line stunt?), the whole thing occupying a space about 4 feet by 3 feet.

"Short" Waves.

Let me reconstruct that beautiful day on which the young idea of short waves was born into at least one youthful head. The morning programme consisted of time signals from the Eiffel Tower at 11 a.m. and 11.40 a.m. on 2,600 metres—spark. This was followed by a similar display from Nauen, P O Z—also spark—on 3,100 metres at about noon.

Now let's go down to 1,000 metres and listen to the amateurs and Croydon. What, won't oscillate? Dear me, this set wasn't meant for short waves (very short, 1,000 metres). Well, something's got to be done about it. Let's try a bigger reaction coil—how's that? Wow! What an earful! No, something in between those two sizes, I think. Ah, that's better!

Goodness me, here's some *telephony*—chalk this up as a red-letter day. Amateurs, too. *Amateurs*, they call them—more like gods to me! What's this chap saying? "Going down to 440 now, old man. We

RANDOM JOTTINGS

Remembering this to be a Christmas number, W. L. S. becomes filled with the spirit of good cheer and recalls a few interesting incidents of the distant past!

get much better ranges down there on half the power. Doubt whether you'll ever hear me up here on 1,000 again—why don't you have a shot at 440 yourself? Want about 75 turns in the helix—tune the aerial in series and you'll get down all right—"

Well, thought I, that's probably torn it. No more amateurs for me—they've all gone down on these blessed ultra-short waves. Here am I, all alone with Croydon, and his generator noise drowns his speech, anyway. (How on earth did the pilots ever get their weather reports in those days?)

So down we go to the "ultra-short" wavelength of 440 metres. *What a squeeze it was!* And what a wonderful thing it was that we got any results at all with the components we were using then! And the "layout" of the parts!

Why, I remember I had one receiver then that had the tuning condensers on a

and time again our local radio society proved that nothing below 150 metres could possibly behave as a wireless wave at all.

We should be in the unknown stratum that came between wireless waves and light waves, and goodness knows what might happen—it might even be dangerous! And here we are, in 1934, reading of reliable communication on wavelengths of 18 centimetres, with all the wavelengths between 10 and 200 metres cram-full.

And still the amateur transmitter survives, with many of his original characteristics. I don't know whether the local amateur is still a god-like being in the eyes of youthful listeners who overhear his work; perhaps the talkie-star has taken his place. But I vow that no modern flapper thinks more of Clark Gable than I did of the first amateur transmitters I heard on the air.

What of the Future?

Well, I wonder what we shall be thinking of to-day's efforts when another thirteen years have passed by? Will they be as funny, seen in retrospect, as the 1921 affairs are to-day? I shouldn't be surprised if they are even funnier.

Imagine scraps of conversation among radio engineers (if, indeed, such people exist then) in 1947. "Fancy broadcast on 300 metres—can you imagine it? How on earth did they ever work it there? Why, there's only room for one of our modern stations in the old band that they used to cram with everything in Europe. Nine kilocycles per station, eh?"

"Yessir—look at our local station now, working on 55 centimetres—speech and music modulation up to 20 kc. and television up to 1½ megacycles. And their receivers—I'm told half of them didn't reproduce below 50 cycles—but I can hardly believe it."

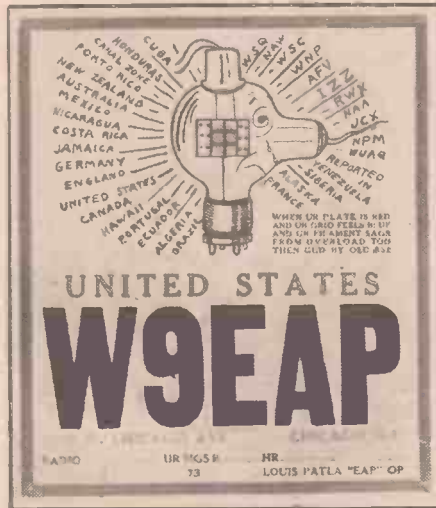
"Oh, that's quite right, old man. I had one myself that would really reproduce down to about 35, and I was quite proud of the 'bass' response. *What a set!*"

Drop a Line.

Still, this sort of thing makes your head ache. We can't possibly tell what lines we shall be working on then—but you can be quite sure that what we now call "ultra-short" waves will, in 1947, be the every-day wavelengths in use for local short-distance transmissions. Write to me on Christmas Day, 1947, and tell me if I'm right.

I expect I shall still be here then, I certainly hope so, but whether I shall be interested in radio is another matter altogether. If a batch of letters reaches me in the fastness of my rural poultry-farm, I shall think of Christmas, 1934, and "P.W."!

That will still be going strong!



SOME TYPICAL Q.S.L. CARDS



Interesting Q.S.L. cards picked at random from W.L.S.'s collection. Those on the right come from Australia, New Zealand, New Jersey and Canada.

table and the coils hanging up on the wall at the back, with three-foot lengths of twin flex joining them up. And it worked, too. It was on that that I received the first broadcast put out from Manchester, 2 Z Y, in (I believe) November, 1922.

Still Going Lower.

We soon got used to the amateurs on 440, Whittle on 400 and Marconi House, 2 L O, on 365 metres, and by the time we had stopped regarding those as short waves half of the gang had disappeared down to 150 metres, which really *was* short. Time

AT LAST.. *a High Efficiency Pick-up...at your price*



Now comes a big Graham Farish surprise... a high-efficiency Gramophone PICK-UP at half the price you'd expect! Fourteen and sixpence only, yet in performance, output, design and finish the GRAHAM FARISH PICK-UP invites comparison with any on the market. Fit one in time for the Christmas festivities, it will give your records a new interest. But to avoid disappointment order NOW, such big value is certain to create a big demand.

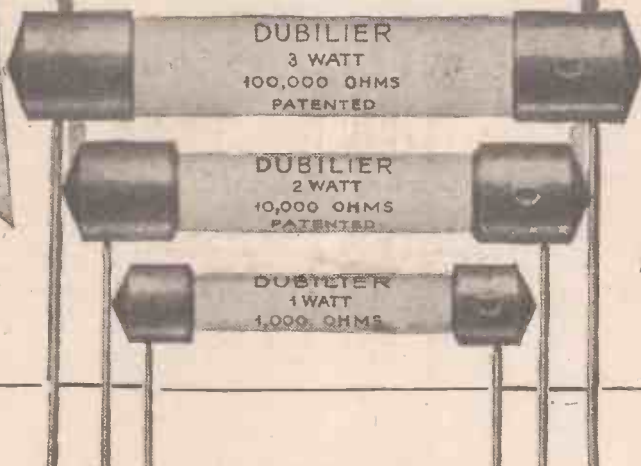
Graham Farish Pick-up and Tonearm. The Armature unit gives undistorted reproduction of remarkable purity and a high voltage output. From treble to bass the finest tonal shading is rendered with total absence of resonance even at full volume. The design of the Pick-up and the special frictionless swivel between arm and pedestal combine to reduce record wear to vanishing point. Beautifully finished in polished Bakelite complete with simple wiring instructions for connecting to all-mains and battery sets. Volume Control (50,000 ohms) if required, 2/9. Ask your dealer to demonstrate.

14'6

A
GRAHAM
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PICK-UP FOR ONLY **14'6**

DUBILIER RESISTANCES

OVERSHADOW ALL RIVALS FOR RELIABILITY



This Christmas rectify the little faults that have appeared in your set during the year. Scrap your old resistances and substitute Dubilier Resistances. They assure trouble-free reception to the listener and a minimum of servicing to the manufacturer. Yet they cost no more!

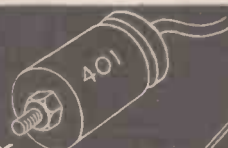
One Watt 1/- Two Watt 2/- Three Watt 3/-
Write for free illustrated literature.
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RESISTANCES

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GETTING READY TO DANCE

By A. S. CLARK



PHOTO BY COURTESY OF MA...

LET'S dance!" This is a familiar cry at Christmas-time, when festivities are the order of the day. And it's usually the radio which has to supply the music.

As a matter of fact, providing dance music is the chief use to which the wireless set is put during the parties which take place at this time of the year. And, surprising though it may seem, it is at this job that your set is most likely to disappoint you unless suitable precautions are taken.

There is a world of difference between two or three people quietly listening to Henry Hall and a room full of "exuberant spirits" dancing to the strains of jazz from a loudspeaker. The main point of difference is in the volume of sound required.

Preparing the Room.

How you can make the most of the volume available from your set, and how it can be increased, are the subjects which form the basis of this article.

Right away let me advise you, if you think there is a likelihood of your guests wanting to dance, to prepare a room beforehand. First of all, you will take up the carpet or carpets, leaving plain boards or oilcloth for dancing on.

You will find that this simple preliminary has made the set sound louder, because the floor will now reflect sound instead of absorbing it. But this removing of sound absorbers must be carried much farther if you are to benefit by it.

Although the set may sound terribly loud in an empty room, by the time the latter has been filled by a throng of shuffling people you may find it difficult to follow even the time. So clear the room of everything you possibly can.

Items to Avoid.

Christmassy decorations will not matter much so long as you restrict the number of paper chains. Heavy curtains and soft chairs are the main items to avoid.

Having cleared the room, what about the disposition of the loudspeaker, or loudspeakers for preference? (By the way,

Will you be dancing to your radio this Christmas? It's the most popular use of wireless where parties are concerned, and the hints and tips in this article will enable you to make the most effective use of your receiver. By following them you can ensure that the dancing will be an unqualified success.

don't forget a few boracic acid crystals to make the floor slippery. This is hardly a radio point, but it does help to reduce the shuffling noise from the feet.)

SOUND ABSORPTION



Soft chairs, carpets and other furniture all absorb sound, and should be avoided as far as possible in a room used for dancing to the radio.

If you can possibly run two loudspeakers, so much the better. Even if the addition of

another speaker to your set cuts the volume from the original one down a bit, it does not matter. So long as the total volume is about the same as before, all is well. You will score by the better distribution of sound.

The best position for the loudspeakers is above head level. When in this position they should be tilted to point downwards. If they are on an ear level, point them straight out, and if below this point arrange them to point upwards.

Using a Pick-up.

In the case of receivers with incorporated speakers, a table or home-made stand should be used, if possible, to raise the height of the loudspeaker. But if you can arrange to use a separate speaker instead of the one in the set, so much the better.

It is always more desirable to have the set in another room, or just outside the door, and run extension leads. This gives more room for dancing, and there is less likelihood of records suffering damage.

This is the first mention of records, but a pick-up and some dance recordings are necessary adjuncts. The dance bands in the programmes are often on late or on at the wrong times, and records are then the only alternative.

As a matter of fact, if you can "raise" a microphone and connect it up with a change-over switch to go on to the pick-up terminals, you can have quite a lot of fun announcing the records.

And now let's see how you can increase the volume available. The need for this is most likely to be felt in the case of a battery receiver.

Increasing Volume.

Of course, without altering the actual design of the set, more volume will mean more H.T. But that is not likely to worry you for just once in a while.

You can safely increase the voltage on the output valve up to 150 volts. If you have been using around

(Continued on next page.)

CHRISTMAS TIME— —IS RADIO TIME



Loudspeakers arranged high up like the one on the bookcase should be tilted to point downwards, as shown. The baffle speaker to the right, on the other hand, should not tilt down, because, as you can see, it is at about ear level, and the sound would be directed at the floor.

GETTING READY TO DANCE

(Continued from previous page.)

100 volts this increase alone will make a considerable difference.

Then, again, perhaps you can obtain a larger power valve or a pentode and connect into the circuit for the occasion. Anyway, one thing is certain: you will find that a little overloading—which might worry you considerably in the ordinary way—will pass muster for dancing purposes.

With sets that have tone controls it is worth experimenting with more bass than usual. After all, the time is obtained from the lower notes, and time is a very important part of dance music.

Running Two Sets at Once.

In the case of a mains receiver the problem of increasing volume is not so easy to tackle, but at the same time is less acute. The best thing to do in these circumstances is to ask a friend to bring his mains receiver along with him and to run them both at once. This suggestion also has possibilities where battery sets are concerned.

Actually, of course, the use of more than one receiver need not stop at two. There's no reason why three or even four should not be employed, particularly where a large room is to be used for dancing.

Like the use of two loudspeakers on one set, the use of more than one receiver helps to distribute the sound evenly throughout the room. But there is an added advantage when a separate receiver drives each speaker; no difficulties of matching loudspeakers and output valve arise.

At first thought it might be assumed that, by running two independent sets, one was restricted to radio dance music alone, and that records were right out of the

question. Surely, it might be argued, even supposing two pick-ups, two motors and two similar records were available, it would be next to impossible to start the records

"HULLO, EVERYBODY—



at exactly the same time. Or even supposing they were started together, to keep them in step throughout their whole playing would be a hopeless task.

All that is true; but the matter hangs on much simpler considerations—why not supply both sets from the same pick-up? If you connect two high-resistance potentiometers in parallel across the pick-up you can supply and control each set more or less independently as though it were the only one in use.

Balancing Up the Speakers.

The question of matching speaker impedance and output valve has already been mentioned. But a little more detailed explanation will not come amiss.

When two speakers are connected in parallel or series their effective impedance

is altered, and consequently they may not match up properly with the valve in use. Also it is not improbable that if their impedances are considerably different from one another, one will take most of the power, with the result that the other will not be of much use.

The only thing to do when you have an extra speaker available is to try both at once and see what happens. Connect them first in parallel and then in series, and keep to the arrangement which proves most effective.

And that, I think, brings to an end these hints and tips. Keep them in mind and your friends will retain pleasant memories of the dancing.

—HERE IS A WALTZ—



If you run extension leads for your loudspeaker, the provision of quite an inexpensive microphone will enable you to add considerably to the effect by means of suitable announcements. This will add considerably to the fun.

PLUG-TOP VALVE CONNECTORS.

RECENTLY a new type of connection for the bulb-top points of valves has come into use. It takes the form of a small, solid, cylindrical shaped piece of metal.

No doubt it has its merits; but constructors—or, at least, many of them—will probably sigh for the simple terminal which, even if it has faults, is easy to handle.

The cylinder without its special cap connector is incomplete, for one can make only a poor job of the connection by wrapping wire round it! Soldering? No, it would be a bad move to try to solder a wire directly to it.

However there are special connectors easily obtainable and extremely inexpensive. For example, Messrs. Belling-Lee have several patterns each perfectly satisfactory.

For the modest sum of one penny a straightforward Plug-Top Valve Connector is available, having a soldering tag for joining to the lead.

For twopenny an adaptor type of the Belling-Lee Plug-Top Valve Connector can be purchased. This converts a valve top of the cylindrical type into a terminal which can accommodate leads or ring or spade terminals in the usual acceptable manner.

The aristocrat of the range is a shrouded Connector. This has an insulating-jacket, so that when a lead is joined to it and it is fitted on the valve there is no bare metal exposed either on the valve or its connection.

Belling-Lee connectors for making contact with the new bulb-top points on valves.



MAKING THINGS EASIER FOR THE CONSTRUCTOR

The lead is taken through a side hole and retained by screw pressure. The price of this Connector is fourpence.

PIFCO DE-LUXE ROTAMETER.

THERE is still a certain amount of unjustifiable suspicion of combination testing meters. Probably this is due to the fact that on some the one scale has to be applied to all the various ranges.

And we can sympathise with the constructor who says to himself: "How can the same markings give accurate readings for such different things as voltages and currents?"

Actually there are no reasons why they should not serve several purposes; but, even given that "multi-accuracy" is not only possible but is frequently accomplished, there is still a further drawback to be considered, and that is the confusion in the minds of all but the expert in translating the one set of readings for this or that purpose.

In the Pifco Rotameter none of these objections applies. It provides no less than eight different ranges of voltage, current and other useful tests, but is no more the popular idea of an "eight-in-one" device than eight people riding eight different bicycles can be said to be travelling on an eight-in-one vehicle!

There is a knob at the side of the Pifco Rotameter, and this knob is plainly marked with the ranges covered by the instrument. When the knob is turned to, say, a 0-400 range the scale of the instrument is changed, so that for all intents and purposes the meter is a voltmeter having the above range. Turn the knob again to, say, 0-10 milliamperes and it becomes a milliammeter of that range.

You simply can't go wrong. The particular Pifco Rotameter we have before us as we write is the Rotameter De-Luxe, which retails at 42s. And very inexpensive it is, too, when the fact is borne in mind that the price gives you eight

accurate moving-coil instruments—almost a complete testing laboratory, as it were. Complete enough, anyway, for any test the constructor or listener is ever likely to want to make.

Yes, it really is a moving-coil instrument, and technically minded readers can note that it has the high resistance of 500 ohms per volt, which means it can be widely used for voltage testing with the assurance that the meter itself does not take enough current appreciably to affect any of the readings.

The eight ranges are as follows: 0-5 volts, 0-20 volts, 0-100 volts, 0-400 volts, 0-10 milliamperes, 0-50 milliamperes, 0-250 milliamperes and a resistance up to 50,000 ohms without any external addition. But if desired this last range can be greatly widened by using an external battery of suitable value.

By the way, it should be mentioned that adaptor sockets for use in testing seven- and nine-pin valves are available at 3s. each.

It would be quite impossible in the space at our disposal to list all the tests which can be carried out with this Pifco De-Luxe Rotameter, but the potentialities of no less than eight so well-chosen ranges must be obvious to all.

We have carefully noted a number of readings on the Pifco Rotameter De-Luxe in comparison with readings taken under similar conditions with separate calibrated meters, and are amazed at the degree of accuracy achieved by it. It is a versatile, very well-made instrument, which should command a big sale in view of its wide usefulness and the value for money it represents.

Eight different scales are provided on this Pifco Rotameter testing instrument.



Sensitivity is "A SOURCE OF WONDER"

says 'Popular Wireless' (1/12/34)

The new vivid clarity provided by the unique "Whiteley" speech coil—the extra sensitivity given by the developments in magnetic material **exclusive** to W.B. Stentorians—and the hundred technical refinements to improve balance of tone and reliability—together bring a **startling new standard of performance** which has amazed technicians throughout the country.

Thousands of listeners have increased the enjoyment of broadcast entertainment this new way. **You, too, can obtain from your set a new majestic volume and an illusion of reality you never believed possible.**

Nine dealers out of ten stock "these fascinating instruments" (as "Popular Wireless" calls them).


Hear one today you will be amazed!





Model PMS1
Stentorian Senior (PMS1) 42/-
100 per cent. dust protection. Oversize cone.
Stentorian Standard (PMS2) 32/6
Stentorian Baby (PMS6) 22/8



Other Experts:

 **Mr. A. K. Jowers, "AMATEUR WIRELESS":** "A definite advance in design."

 **Mr. F. J. Camm (Editor, "Practical Wireless")** says:—"As near perfection as I believe perfection possible."

 **Mr. H. J. Barton Chapple, Wh. Sc., B. Sc. (Hons. Lond.), A.C.G.I., D.I.C., A.M.I.E.E. Hon. M.I.W.T.** (the great radio and television authority): "For tonal quality it is the best speaker I have heard so far."

and Private Users:

● "When I connected up your speaker my set became transformed . . . Distant stations which were really distant come rolling in now with a richness I can hardly believe." G. M. B., Dunfermline.

● "I was and still am, amazed at the all-round supremacy of the STENTORIAN Senior. It definitely gives greater volume and better tone balance than any I have heard." W. B., Birmingham.

● "The sensitivity is enormous, the quality beautiful, and bass response is perfect." A. E. G., Edmonton.

● "Your advertisements in no way exaggerate the superiority of STENTORIAN Speakers." C. A. N., New Milton.

100% protection from dust.

Oversize cone.

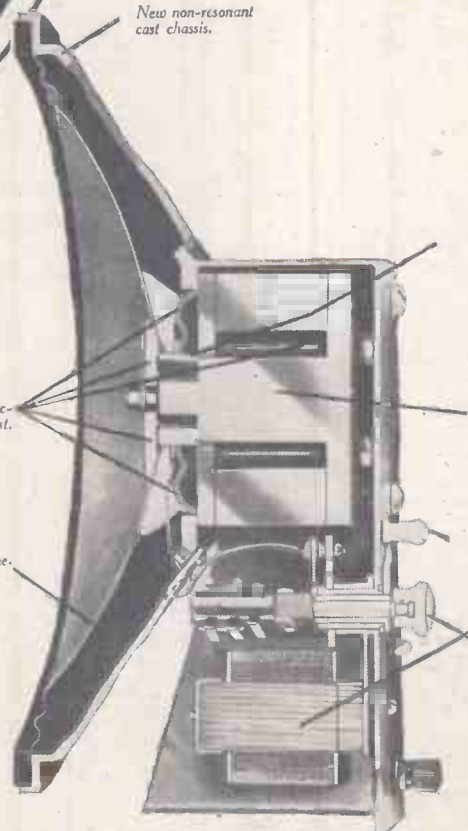
New non-resonant cast chassis.

New Whiteley Speech Coil exclusive to W.B. Stentorians.

"Mansfield" Magnet incorporating the amazing new alloy exclusive to W.B. Stentorians.

Improved "Microlode" feature giving accurate matching.

Throwover switch in "Microlode" circuit to adjust for use as "extra speaker."



Write for the new W.B. Stentorian leaflet.

Let the incomparable
STENTORIAN
breathe life into YOUR RADIO!

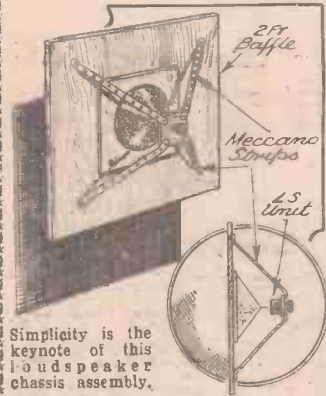
Whiteley Electrical Radio Co., Ltd., Dept. P, Radio Works, Mansfield, Notts. Sole Agents in Scotland: Radiovision Ltd., 233 St. Vincent Street, Glasgow, C.2. Sole Agents in I.F.S.: Kelly & Shiel, Ltd., 47 Fleet Street, Dublin.

RECOMMENDED WRINKLES



A LOUDSPEAKER BAFFLE.

A GOOD loudspeaker baffle with fixtures can be made for only a few shillings. A two-foot baffle with fretwork pattern costs about 2s. This can easily be stained. A 12-inch cone to fit costs about 1s. 6d. or 2s. Fix the cone to the baffle with four nuts and bolts, and then procure four Meccano strips 12 inches long. These are bent up about three holes from the end and fixed by nuts and bolts to the



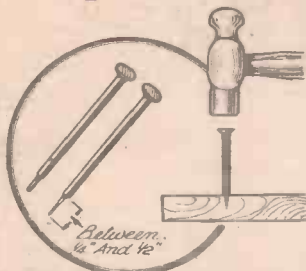
Simplicity is the keynote of this loudspeaker chassis assembly.

cone and baffle. Another piece of wood is fixed to the other end of the four strips, which are bent for fixing. This will make the support for the unit, which should be of a light type.

USEFUL BRADAWLS.

WHEN screwing components to a wooden baseboard it is practically a necessity to use some form of bradawl. A useful tool for this purpose can be made quite easily as follows, and costs practically nothing:

Obtain a few six-inch nails and proceed to adapt them in this way: First file a shoulder on the pointed



Holes cannot be made too deep with these bradawls.

end. The piece which has been filed down should now be brought down to a fine point. This tool is used by tapping in with a hammer up to the shoulder, which prevents any splitting of the wood.

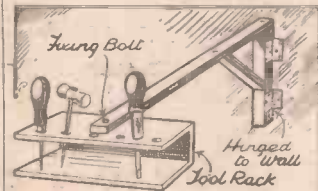
A MOVABLE TOOL RACK.

I SUGGEST the following as an original idea, useful for keeping small tools in tidy order and, when required, within easy reach:

Obtain some strip wood not less than 1 in. square and construct a simple bracket, as shown in diagram, to project from the wall about half the width of the bench.

Drill a hole in the end of the arm to take a bolt of convenient size. Bolt a suitable shelf to the end of the arm (see diagram) so that the shelf may twist in a horizontal plane, having previously drilled it to take the necessary tools (such as files, screwdrivers, etc.).

A second light shelf may be fitted to take twist bits, etc. When tools are required the shelf is pulled from the wall and is held within easy reach by the bracket.



Your tools will always be handy with this rack available.

When finished with the tools in question, replace in rack, and a slight push will cause shelf to go back to the wall. This returning action may be made quite automatic by fixing a light spring or piece of elastic between the bracket and the wall.

Two arms of this type may be used to support a larger shelf for larger tools, if required.

Many other uses will no doubt suggest themselves, such as for carrying a small electric motor with a flexible drive for drilling, etc., or an electric lamp.

OPENING OUT HOLES QUICKLY.

TO open out holes quickly is of great advantage, and for this purpose there is no better method than to use broken round files in the lathe or hand-vice. But there is a snag in it. The file must be revolved in the opposite direc-

tion to that usually applied. In this way the taper end of the round file can be used to start with, and by revolving in the opposite direction the file will not stick in the hole and will cut its way in and open the hole to the size required.

The method may be applied to ebony or metal with equal success, and the result is much neater than filing or opening out with tangs of files or other crude methods.

advantage. You have simply to bend the tips of the spade terminals at right angles and you will find it almost impossible for them to slip off.

MAKING HAMMER HEADS SECURE. MANY amateurs have trouble with their hammer shafts coming off. If the wedge is of iron, it may not stay



been screwed on "finger-tight," thereby causing considerable damage to the wireless set. The sketch illustrates a hint which will overcome this dis-

ONE GUINEA FOR THE BEST WRINKLE!

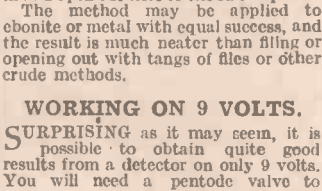
Readers are invited to send a short description, with sketch, of any original and practical radio idea. Each week £1. is will be paid for the best Wrinkle from a reader, and others published will be paid for at our usual rates.

Each hint must be on a separate piece of paper, written on one side of the page. Address your hints to the Technical Editor, "Popular Wireless," Tallis House, Tallis Street, E.C.4, marking the envelope "Recommended Wrinkles."

Will readers please note that the Editor cannot, in any circumstances, guarantee to return rejected Wrinkles, and that payment for published hints is not made until ten days after they appear?

The best contribution in our last selection of Wrinkles, published on December 1st, was sent by Mr. R. Taylor, Fernbank, Spring Road, Wrexham, North Wales, to whom a guinea has been awarded.

WORKING ON 9 VOLTS. SURPRISING as it may seem, it is possible to obtain quite good results from a detector on only 9 volts. You will need a pentode valve to



A very low H.T. voltage is the feature of this circuit.

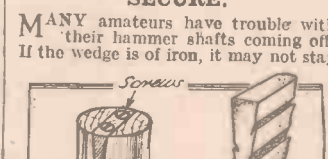
advantage. The sketch illustrates a hint which will overcome this disadvantage.

Complete details of the fitting of an extension arm to a radiogram switch.

of sets with long grid wires going to the pick-up when the gram. is not working. The whole can be fitted either above or below the baseboard.

USING UP OLD HIGH-TENSION BATTERIES. IT is a fact that an H.T. battery has to be thrown away when it is only half exhausted—a regrettable but necessary circumstance.

In the case of the writer, however, when he found that his Q.P.P. output was not giving satisfaction owing to the H.T. battery running down, the



How a reader obtained long life from an H.T. battery. The old auxiliary battery is used a section at a time.

set was made to give a much increased output by the following procedure:

Au old H.T. battery (which had lost only half of its voltage) was connected in series with the other. I hasten to explain that only a portion at a time was used, usually two tappings.

When one portion showed a very low reading on a voltmeter, I changed to another. In this way several extra months' service was obtained.

Three different ways of dealing with the shaft of a hammer.



**ACCURATE
UNIFORM
RELIABLE**



T.M.C. HYDRA CONDENSERS

T.M.C.-HYDRA condensers are made in England by Telephone Manufacturing Company Ltd.

for your S.T. 600

TO get the best results from your ST600 you need T.M.C.-HYDRA condensers as specified by Mr. Scott Taggart.

ACCURACY is essential for successful working. Strict scientific control of every manufacturing process ensures the accurate rating within the narrowest of limits of every T.M.C.-HYDRA condenser.

UNIFORMITY Similarly, you can be sure when buying T.M.C.-HYDRA condensers that the characteristics of any given type are always exactly the same no matter when or where you buy.

RELIABILITY The extreme care taken in manufacture, and the fact that only the finest materials are used, produces a condenser the reliability of which is unquestioned.

You can obtain T.M.C.-HYDRA condensers from all good radio dealers.

Write for complete Price List to :

T.M.C.-HARWELL (SALES) LTD.
Britannia House, 233 Shaftesbury Avenue
London, W.C.2. Telephone: Temple Bar 0055 (3 lines)



TABLE OF CONDENSERS FOR ST600

* Fixed (paper) condensers required for the S.T.600

Quantity	Capacity	Type		Price
2	1 μ F	25	—	2/3 each
† 2	2 μ F	25	—	3/- each
† 1	0.006 μ F	T.15/5	Tubular	9d.
1	0.1 μ F	T.24	"	1/3

* Fixed (paper) condensers required for the S.T.600 "All-Electric"

Quantity	Capacity	Type		Price
2	4 μ F	30	—	5/6 each
or 1	4 μ F + 4 μ F	B1001	Block condenser tested 1,000 v. D.C. 400 v. D.C. working.	9/6
3	0.1 μ F	T.24	Tubular	1/3 each
1	1 μ F	30	—	2/5
1	1 μ F	25	—	2/3
1	2 μ F	25	—	3/-
1	0.02 μ F	T.19	—	1/-

* T.M.C. -HYDRA condensers for ACCURACY and RELIABILITY

† Actually specified by Mr. Scott Taggart as his first choice.

Balance specified as alternatives.

Your Present This Xmas

Why not choose radio gifts for some of your friends this year? There is a wide choice of useful items, and some helpful suggestions are made on this page to guide you.



The instrument on the left is the D.C. Avo Minor. Price 40s.

First of all there are meters and testing instruments. These are items which all constructors long to possess, but for which few seem to be able to spare the cash.

Any meter, either for reading voltage or current, will be welcomed, but the gift *par excellence* in this line is the multi-range meter. There are many types and makes of these available. The one illustrated

This universal instrument costs 15s. 6d. complete; that is to say, it incorporates the rectifier, which does not therefore constitute an additional expense.

Easily Added to the Set.

Although not an item which is completely external to the receiver, it is certainly in the add-on class. Another item which is certainly in the same class is a pick-up and tone-arm, but it is as well to make sure your friend has not already got one.

JUST now the annual question of "What shall I give him" is bothering people, as it ever does at this time of the year.

Of course, one can ask the future recipient of the gift just what he would like, but that method somewhat detracts from the pleasure of a present. After all, half the fun, both to the giver and to the lucky recipient, is the element of surprise.

Perhaps that is why more people do not choose their gifts from amongst radio items. They feel that their gift may be a white elephant unless they ask what is wanted. They are afraid of giving some component that is no use for the next set and will have to be relegated to the spares shelf.

Plenty of Gifts.

But there is no need for this to happen. There are plenty of radio gifts that can be useful whatever the set employed, and this applies whether the set is home constructed or one of proprietary make.

Simple precautions must be taken against doing such things as giving an H.T. battery to the user of a mains set. But anyone with even the slightest technical knowledge can avoid such mistakes as this.

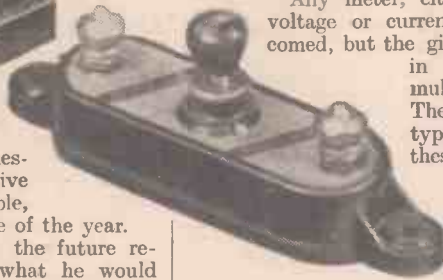
FOR SILENT BACKGROUND



This interference suppressor is very quickly plugged between the mains and a radio set or electric domestic appliance. Price 40s.

Incidentally, an H.T. battery, while not of much use to the mains-set owner, would be very valuable to the man who runs a battery set. After all, they are things that he has got to buy at some time or the other.

Each photograph on this page is representative of a wide range of components of similar nature that make excellent gifts. Let's examine them one at a time.



Why not give two or three Polar pre-set condensers? Price 1s. 6d. each.

To the right is the Graham Farish earthing device. Price 2s. 6d.

is taken from the range made by The Automatic Coil Winder Co., and at 40s. is extremely good value for money. It is known as the D.C. Avo Minor, and has in all 10 ranges.

Next on our list come pre-set condensers. Although usually found inside receivers, they have several uses externally, such as joining in the aerial lead to increase selectivity.

The one illustrated is a Polar made by Wingrove & Rogers. Different values up to .001 mfd. are available at 1s. 6d. If two or three of differing values are given, the present becomes really valuable, and enables the recipient to experiment and find the best value for his purpose.

Improve that Earth.

Similarly, a selection of varying values of fixed condensers or even resistances can be very welcome to the experimentally minded. Connected across the loudspeaker leads they form useful tone controls.

Perhaps you have a friend whose results are not too good, and you suspect that the earth, as is often the case, is not efficient. Perhaps you do not like to suggest this fact, particularly as he has gone to some pains to sweat a lead to a water-pipe that goes no farther than the cistern in the loft.

You can drop a useful hint as well as make a practical gift by giving him a "Filt" earthing device for Christmas. This is made by Graham Farish, Ltd., and costs but 2s. 6d.

And now we come to a money-saving present. It is the Varley "Power Puncher" H.T. Economiser. This unit is suitable for use with all common types of output valves, and provides a big saving in current consumption from the H.T. battery.



Interference units and filters are available in great variety of price, both for fitting to the apparatus which is causing the trouble and for inserting between the mains and the receiver to keep interference out of the latter.

An attractive proposition as a gift is the Belling-Lee which costs 8s. 6d. It is



This Varley economiser would be welcomed by any battery-set user. Price 15s. 6d.

for fitting across interfering apparatus, such as electric sewing-machine motor, and is provided with twin fuses. Other types of suppressors are also made.

The Dubilier choke condenser filter, which costs 40s. is also very suitable as a gift. It is a single-stage filter for use in the mains lead of a radio set or domestic appliance, and is available in 1-, 2-, or 3-amp. ratings. A two-stage filter is also

(Continued on page 508.)



Ideal for providing radio in an extra room. This W.B. Stentor-an P.M.S.2 speaker has a special matching transformer. Price 32s. 6d.

RADIO ROBOTS

Here are some ideas for the enthusiastic home constructor and for the amateur transmitter. Why not get some of the schemes working for Christmas, and mystify your friends ?

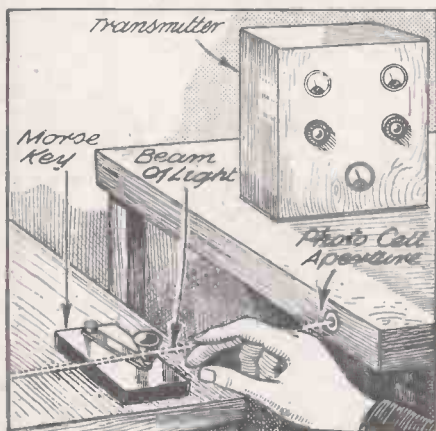
By T. S. POLLARD.

THE word "robot" has always had an uncanny fascination for most of us, although it has been sadly misused of recent years. Practically any piece of electrical apparatus that does a job of work might be called a "robot," and we have quite lost the original implication of the word.

Some of the ingenious devices that the writer has been introduced to, however, certainly are uncanny in the way they perform a number of complicated actions in response to one simple movement on the part of the operator.

Many of them have been evolved by amateur transmitters, mostly in the United States, and it is with these that we will deal first. Imagine the operation of switching on a high-power transmitter, with all the attendant details. First one

VERY HANDY



"His hand interrupts a beam of light shining on a photo-electric cell, which causes an impulse to pass through the relay which switches on the filaments."

switches on the filaments and, after they have been given time to heat up, the grid-bias supplies and the H.T. Then one probably has to change over the aerial from the receiver to the transmitter.

Switching on the Transmitter.

An amateur in Dakota has arranged a "robot" to perform all these operations for him while he does no more than move his right hand from the receiver to the transmitting key in the usual way. On its way there his hand interrupts a beam of light shining on a photo-electric cell, which causes an impulse to pass through the relay which switches on the filaments.

He then sends one short "dot" on the key, and that operates the second relay, which combines the functions of changing over the aerial and switching on the main power supply. Then he carries on as usual,

and when he takes his hand away from the key it once more interrupts the light beam and switches everything off!

As a matter of fact, the actual time saved in this way is probably not very great, but, being a true amateur, its ingenious designer has rigged it up simply for the love of experimenting, and he certainly has a station that is "plus a little something the others haven't got."

Controlled by the Microphone.

Another has designed a similar but rather more complicated scheme for operating a telephony transmitter. He also uses a light beam, but there are two other circuits in addition. He reaches out his hand for the ordinary table-type microphone, operating the photo-cell as he passes across the beam (filaments "on"). He lifts the microphone stand towards him, releasing a spring contact that works another relay (H.T. "on"). Finally he lifts the microphone from the hook (modulator "on" and aerial changed over).

The automatic telephone with which we are all familiar is almost a "robot" on its own, but an amateur in New Jersey has put the dial to some curious uses. Amateurs who work on C.W. telegraphy only have a certain number of "stock" calls that they want to put out. Why should one have to send all these by hand? The Morse characters can easily be arranged on a perforated strip driven by a small motor, or on a rotating drum or disc.

This New Jersey enthusiast has a whole number of tapes for calling "CQ" (all stations)—"CQ Europe," "CQ Asia," "Test," "Test 56 mc." (for 5-metre working) and so on. This, in itself, saves a bit of time. But he caps it by arranging so that they automatically go into operation when he "dials" the correct number on an ordinary table telephone.

Dialling the Call.

If he dials "1" the whole transmitter starts up and calls "CQ" until he tells it to stop by dialling "1" again! If he dials "9" it just sends strings of "V's" in the best commercial style. The system of relays used must be a highly complicated affair, but they work. The writer has often heard the station in question, and so "automatic" is the operation that it sounds like a commercial.

Now let us turn our attention to "robots" put to service in connection with broadcast receivers. First comes the automatic remote volume control. Is the transmission too loud? And are you in your comfortable armchair on the other side of the room and far too lazy to walk across to the set and turn down the volume control?

Why worry? Just pick up that small

electric torch by your side and flash it on the little aperture in the top left-hand corner of the baffleboard, and the volume goes down by about 10 per cent. If it's still too loud, repeat the process. If a lot of advertising matter comes along, do it half-a-dozen times and the transmission will fade right out!

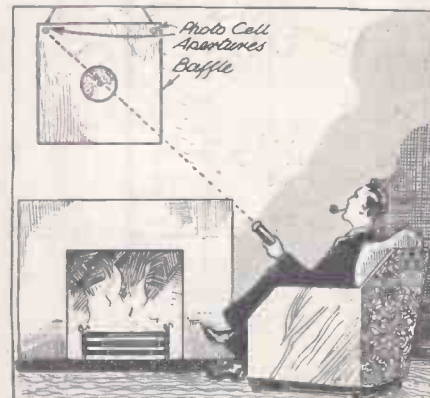
To bring it back, shine the torch on the top right-hand corner, where there is (yes, you're right) another photo-cell, and back comes the programme. Radio for lazy people, indeed!

Suppose you sit down to dinner at 7.30 and want to hear a programme item timed for 7.50. If it's a good dinner, it's about ten to one that you'll forget all about it. But why worry? A little clock, set beforehand, will switch on the set at about 7.48 and fade in the volume control to a predetermined value at 7.50. Furthermore, another little adjustment that you have made at the back of the clock will fade the programme out when it finishes at 8.20. Fade out, mark you—not switch it off with a nasty "clonk."

Largely Made from "Bits."

Of course, all these robots cost money, and therefore appeal only to two classes of people. One is the wealthy man who wants the best set that money can buy, complete with all the trimmings. The other is the real hard-boiled amateur who makes the whole business out of a broken gramophone-motor, an alarm clock, some bits of wire and the kitchen table. As a matter of fact, it's surprising how cheaply much of the apparatus can be made. It doesn't always

ALL IN A FLASH



"Just pick up that small electric torch . . . and the volume goes down by about ten per cent."

work to schedule, it's true, but that's all the more fun. And when your home-made delayed-action super-time-switch suddenly switches the set on at 4 a.m., the merriment is enjoyed by all!



THE time is Christmas Eve in the year 1964, and the scene is the lounge of Scott's Cross Hotel and Sanatorium, latitude 79 degrees south, a few miles from One Ton Camp and twenty minutes easy flying from the South Pole, provided that the World's Transport Radio Beam No. 73 stands up against the South Magnetic Pole and all its tricks.

Bill Brewer, who had buzzed in on his natty portable Autogiro for a little ski-ing on the Beardmore Glacier before joining his wife and small son for New Year's Day, was chatting with two fellow-guests, Sir Lionel Meade and Professor Broodle, grey-beards of incredible antiquity, each having known London when pedestrians were allowed above surface.

Synthetic Smoking.

Bill, who was twenty-three years old, knew about twice as much as Bacon, Shakespeare, Newton and Milton together would have known had each lived to be ten score, and was a characteristic product



of his generation. In addition, he thought that he knew everything worth knowing. Scott's Cross, under which lay the imperishable bodies of Robert Falcon Scott and his three heroic companions, now floodlit by the Royal Geographic Society from the World's Energy Pool at Moscow, and carefully tended by the hotel authorities, appeared to him as little more than a somewhat unnecessary reminder that there were no autogiros in 1912.

He lit a cigarette and inhaled its fumes. Tobacco had vanished from popular use in favour of shredded asbestos impregnated with chemicals which, ignited, produced Suavine, an alkaloid of non-toxic properties

Thirty years hence! That is the time chosen by the author of this short story for his picture of scientific achievement—of radio and television completely harnessed to the service of man.

and which exerted a sedative influence upon the cerebellum.

"Have you had a good day, Brewer?" asked Sir Lionel. "No bruises, I hope? They tell me that the Beardmore Glacier Run is becoming the playground of the vulgar. Just like the Cresta in 1934."

"I have had a very exhilarating day, thank you," replied Bill, omitting the "Sir Lionel," because that was a relic of those days of old. "The air up there is better than Suavine, sir."

"How can you take that synthetic muck into your system?" growled Professor Broodle. "It hasn't a quarter of the kick of a pipeful of Navy Cut."

"Nor any of its poison, professor."

"Bah!"

"That's what the League of Nations said to war, sir. Yet look at 1950."

"Now then, you two—at it again!" said Sir Lionel. "Mr. Brewer is right. Nicotine is the poison which destroyed the dignity of the 18th century."

"And a darned good job, too!" retorted Bill. "There's no room for dignity in a world which is ruled by humbug. Let's have a cocktail."

Not Like The Old Days.

He stepped up to a disc of metal, flush with the wall, pressed a button and raised his head.

"Gin and It, George."

"Contact, sir."

A yellowish ray proceeded from the disc.

"Put a little more It into him, George."

The ray became a deeper yellow.

Bill gasped slightly, lowered his head, put a coin in the slot and stepped back to the fireside.

"Ah-h-h! That's good. My father told me that in the old days people used to pour cocktails—and very much more terrible compounds—direct into their tummies. How crude! Now we simply let the Cocktail Ray strike upon the back of the throat, thereby assimilating the drug into the blood-stream without mucking up the digestion."

"We did, young fellow," said Professor Broodle. "And it was the Electron's Night Out." Prof. Broodle then rocked back and forth, like an old woman crouched over a fire, moaning slightly.

"I remember," said Sir Lionel, "that

Christmas about 1921 when Aubrey ffoulkes brought out a bottle of '70 port and—"

"Silence, Lionel!" snapped the Professor. "I was there, too. I can't bear it. *Suavine! Pah!*"

"But surely you will admit that everything is better than in the Pedestrian age. Look at our physique! Look at communications and transport! Look at our operationless surgery! My father told me that they actually used to cut people open, whereas now the doctors have a ray for everything. Why, an aunt of mine had her—"

"That's pretty good—if you will forgive my saying so—from a man who would be all the better for having his tonsils out," interposed the Professor.

A Draughty Place.

"Oh, those! Thanks for the tip. There's a special ray treatment for 'em. (George, see the M.O. and ask him to turn on Glandray 36 in my room at eleven to-night.) As I was saying, all those old, crude, mistake,



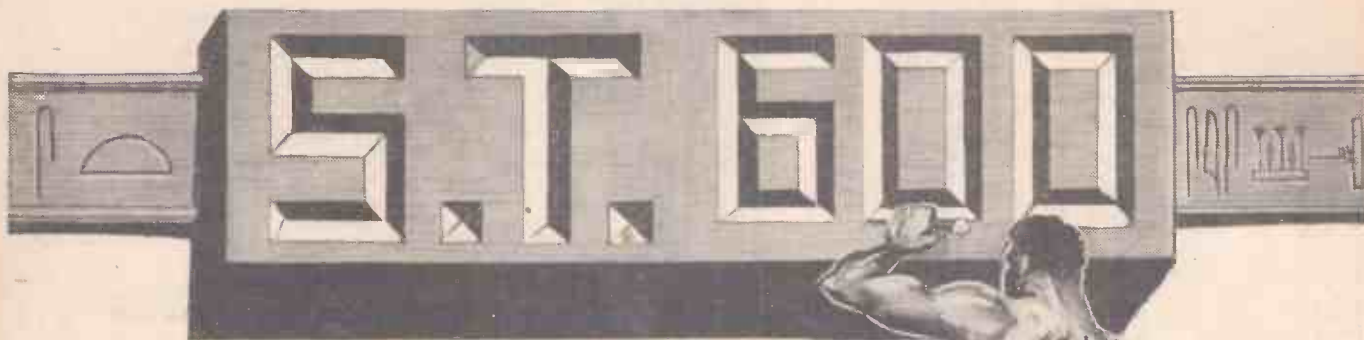
dangerous practices have been abolished; disease is conquered—"

"Yet my lumbago strangely refuses to accept that fact," said Sir Lionel.

"Fear is something to be ashamed of. Take my wife, for instance. When I told her that I was going to week-end here, she coolly announced that she intended to giro to the Mount Everest Hostel with the baby—that's Bill, my son—and that I had better pick her up there. I told her that I thought Everest a trifle too draughty for young Bill, but there was no moving her."

Sir Lionel did not miss the flash of anxiety which passed over the young

Continued on page 494.



By JOHN SCOTT-TAGGART, M.C., M.I.E.E., F.Inst.P.



It is not often that a double-helping of a receiver design can be offered without grave fears of technical or psychological indigestion affecting the reader.

The Editor has, however, told me that there are many signs and portents that the S.T.600 has awakened such interest that it is obvious that many late-comers will want a concise summary of the constructional details of this set.

From the beginning I have deplored the plethora of receiver designs, many of them conflicting and mutually destructive, which, as I once said, are flung like handfuls of burrs at the reader in the hope that one will stick.

In what follows I speak, of course, only for myself. But what I say is this: The S.T.600 is my 'big' set for 1934-1935. There is nothing more from me for POPULAR WIRELESS for twelve months and nothing competitive anywhere for a couple of years.

If I appear to be repeating this too often it is simply because I want new readers not to feel that they have "missed the boat." The old idea was that if a reader did not build a new design within the first fortnight he would not build it at all.

This situation arose because the technical Press generally would, as likely as not, issue a completely new, revolutionary, epoch-making and amazing design a fortnight later! It was a case of "this is a new design, that was."

My own policy is to design sets in which reserves of selectivity and performance are such that the receiver does not even begin to become obsolescent for at least a year. Having designed such a set, I then avoid—in fact, I could not, even if I wished—competing with it.

Anyone, therefore, can build the S.T.600 now or in six months' time with absolute confidence. The hectic issue of design after design was bound to defeat its own ends. When you build an S.T. set you get security. There will be no "new models" to mar your satisfaction

or enjoyment of the S.T.600.

It has taken time for the public and trade to become accustomed to the "long-run" system, but my big sets are made as confidently after six months as when first issued. Moreover, the builder has before his eyes the accumulated testimony of very many other readers who have heard and seen and built the S.T.600.

There are always about ten thousand constructors ready to build my big annual set without having seen or heard it or without hearing the opinions of others. To these I am deeply indebted and grateful. They form the backbone of the amateur movement. But there are many thousands of others who are now hearing of the good results their friends are obtaining with the S.T.600 and desire to know something about the set. Well, here is a brief outline—quite enough to build the set.



is and always has been correct, and a small printed reproduction of the blue print appears on the following page.

A few warnings are called for: I emphatically state that no responsibility whatsoever will be taken for results if you use other components or valves than those specified on page 484. Should you experience trouble in getting any apparatus, I suggest you write to

the firms direct. Do not permit a small delay in getting apparatus to encourage you to buy other apparatus which may be totally unsatisfactory. The various H.T. voltages are approximate. If your battery is tapped differently, try the nearest voltage above or below (try both). Do not connect anything to pick-up terminal: you are sure to want to connect this terminal to the loudspeaker or H.T. battery; in the latter

case you may injure the third valve. Check your connections before making them. Under no circumstances forget the wire which connects the G.B.—1 and L.T.+ terminals on the terminal strip.

A paper dial card with 103 station names printed on it was issued with the S.T.600 number of POPULAR WIRELESS. Since then I have arranged with Money Hicks, Ltd., to supply a beautiful replica in ivory-coloured celluloid; this new dial is otherwise identical to the card. It is washable and will take the "dots" in pencil or

ink, which can be removed at any time with a damp cloth. Naturally, this new dial gives the set a real "professional" finish, besides adding enormously to the advantages of my "Spot-On" system.

S.T.600: MORE CONSTRUCTORS' SUCCESSES

Dear Sir,—Having made up the A.C. S.T.600, and had it working for a week, I am writing to let you know how pleased I am with it.

My aerial is 35 ft. high, about 70 ft. long, and is therefore not what you would call selective, and I was doubtful whether I should succeed in cutting out Droitwich.

However, I find that the set does all you claim for it. It will completely extract Droitwich, leaving Radio Paris, Luxembourg, etc., to be tuned in without interference.

On the medium waves, from Fecamp to Budapest over the whole range, about 45 stations are received at great strength, the aerial reaction bringing the weaker stations up to the strength of the higher-powered ones.

Two "P.W." readers, strangers to one another, came to hear and declared it was the most selective set they had heard. The quality of the set also impressed them.

Both are now busy building their own S.T.600's.

Any person who desires to hear the set may do so with pleasure.

F. G. EDMUNDS,—172, Formans Road, Sparkhill, Birmingham.

★ ★ ★

Dear Sir,—Although somewhat disappointed that you did not include Ulster in your "600" tour (you will perhaps remember I offered you my aerial), I simply cannot help writing to let you know how delighted I am with your new set.

I have had experience of your sets before, having built the "300," "400," and "500," but the "600" is miles ahead of any of these, and this naturally puts it leagues ahead of any other set going.

Its amazing sensitivity, ease of tuning and the effectiveness of the Extractor circuit have simply thrilled me.

J. C. DEALEY,—23, Marsden Gardens, Cavehill Road, Belfast.

The data is exactly the same as given in the original Oct. 27th issue of POPULAR WIRELESS, except that a mistake in Stage 10 of the original "Hi-Speed" wiring series has now been corrected. The blue print

S.T. 600 A.C. VERSION KIT "A"

CASH or C.O.D. Carriage Paid **£9:15:0**
 ● OR YOURS FOR **17/9**
 Balance in 11 monthly payments of 18/-.

Comprises complete Kit of Components as FIRST specified by Mr. John Scott-Taggart, including ready-drilled terminal strip and Metaplex baseboard, less valves, cabinet and speaker.

KIT "B." As for Kit "A," but including set of 3 Specified Valves. Cash or C.O.D. Carriage Paid, **£12 8/6**.
 OR YOURS FOR **22/9**
 Balance in 11 monthly payments of 23/-.

KIT "C." As for Kit "A," but including Valves and Specified Peto-Scott A.C. S.T. 600 Cabinet with Speaker Baffle and Mains Unit Shelf, less Speaker. Cash or C.O.D. Carr. Paid, **£13 18/6**.
 OR YOURS FOR **25/6**
 Balance in 11 monthly payments of 25/9.

● VALVES: Set of 3 Specified Valves, **£2 13/6**, or 5/- deposit and 9 monthly payments of 6/-. Rola Speaker if required with the above, add **£1 15/0** to Cash or C.O.D. price, or 3/3 to deposit and each monthly payment.

Peto-Scott Guaranteed H.T. ELIMINATORS

For A.C. Mains, 200/250 volts.
 3 Tappings: S.G. 60 v.,
 Detector 80 v., Power 120-150 v.
 Output 25 m/a. Incorporates Westinghouse rectifier. Send only 2/6, balance in 9 monthly payments of 4/-, Cash or C.O.D. Carriage Paid, **£1 15s. 0d.**

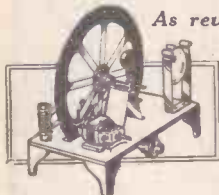


2/6
DOWN

D.C. Model for D.C. Mains only. Similar specification, but without rectifier. Cash or C.O.D. Carriage Paid, **17/6** or 2/6 deposit and 7 monthly payments of 2/6.

B.T.S. INDIRECT DRIVE DISC TELEVISION KIT

As reviewed in this issue.



Every part for instant assembly with FULL SIZE BLUEPRINT and assembly, wiring and operating instructions.

KIT comprises B.T.S. Universal Ball-bearing Television Motor for Mains or Battery operation; resistances; laminated and ready assembled chassis with all component fixing holes marked. 16 in. Scanning disc and stand; lens and holder; improved type TELE-LUX NEON Lamp and Holder. TYPE K12 for A.C. (40-60 cycles) and D.C. Mains. Cash or C.O.D., Carriage Paid **84/-**. TYPE K13 for 6-volt Battery. Cash or C.O.D., Carriage Paid **78/-**, or 10/- deposit and 11 monthly payments of 6/9.

YOURS FOR **10/-**
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W.B. Stentorian Senior Model. Cash or C.O.D. Carriage Paid, **£2 2/0**, or 2/6 deposit and 11 monthly payments of 4/-. For Power, Pentode and Glass "B." Send only 2/6; balance in 11 monthly payments of 3/-. Cash or C.O.D. Carriage Paid, **£1 12/6**.



2/6
DOWN

W.B. Stentorian Baby Model. Cash or C.O.D. Carriage Paid **£1 2/6**, or 2/6 deposit and 9 monthly payments of 2/6.

PILOT AUTHOR KIT EXACT TO SPECIFICATION

COMPRISING MR. JOHN SCOTT-TAGGART'S FIRST SPECIFIED AND USED PARTS

S.T. 600 BATTERY VERSION KIT "A"

CASH or C.O.D. Carriage Paid **£4:19:6** OR YOURS FOR **7/6**

7/6

Deposit and 12 monthly payments of 8/6

For full and detailed lists of parts, see our previous advertisements, Oct. 27, Nov. 3, 10 and 17.

KIT "A" Comprising complete kit of components, as first specified by Mr. John Scott-Taggart, including Peto-Scott Ready-drilled Walnut-faced Panel, Metaplex baseboard, Ready-drilled plywood platform and Terminal Strip, and copy of "Popular Wireless" with free full-size blue print and S.T.'s 100 STATION "SPOT-ON" DIAL and other "P.W." FREE GIFT, less valves, cabinet and speaker.

KIT "B" As for Kit "A" but including set of 4 first specified valves, less cabinet and speaker. Cash or C.O.D. Carriage Paid, **£7 4/0**, or 12 monthly payments of 13/3.

KIT "CT" As for Kit "A" but including valves and Peto-Scott S.T. 600 Table Cabinet, less speaker. Cash or C.O.D. Carriage Paid, **£8 1/6**, or 12 monthly payments of 14/9.

KIT "CC" As for Kit "A" but including valves and Peto-Scott S.T. 600 Console Cabinet, with speaker baffle and battery shelf, but less speaker. Cash or C.O.D. Carriage Paid, **£8 19/0**, or 12 monthly payments of 16/6.

PETO-SCOTT S.T. 1935 Permanent-Magnet Moving-Coil Speaker recommended; if required, add 1/9 to deposit and each monthly payment.

VALVES: Set of 4 Specified Valves **£ 2 4 6**

S.T. 600 FINISHED INSTRUMENTS

BUILT EXACT to Mr. John Scott-Taggart's FIRST SPECIFICATION



S.T. 600, built by Peto-Scott technical experts in the Peto-Scott cabinets specified and used by Mr. John Scott-Taggart. Aerial tested on actual broadcasting. Complete with B.V.A. valves.

CONSOLETTÉ MODEL (as illustrated) with Peto-Scott S.T. P.M. moving-coil speaker. Cash or C.O.D. Carriage Paid, **£11 11/0**, or 12 monthly payments of 21/3.

TABLE MODEL (as illustrated) in "Popular Wireless," Oct. 27th, 1934. Cash or C.O.D. Carriage Paid, **£9 12/6**, or 12 monthly payments of 17/9.

S.T. 600 CABINETS AS FIRST SPECIFIED

● READY POLISHED

CONSOLETTÉ MODEL (illustrated). With baffle-board and battery shelf. Cash or C.O.D., **35/-** (Carriage and part packing 2/6 extra) or yours for 5/- and 6 monthly payments of 6/- (including carriage and packing).
TABLE MODEL, with lift-up lid. Cash or C.O.D., **17/6** (Carriage and part packing 2/6 extra). Or yours for 2/6 and 4 monthly payments of 5/- (including Carriage and Packing).

● FOR HOME POLISHING

Both cabinets are also available in the white ready-assembled, sand-papered, and ready for polishing. Consolette Model, complete with silk **25/-** (Carriage and part packing, 2/6 extra). Table Model **12/6** (Carriage and part packing, 2/6 extra). PETO-SCOTT S.T. 600 (A.C.) Walnut Cabinet, as specified. Cash or C.O.D., **£1 10/0**.

● In the white, ready for home polishing **£1 10/0** Cash or C.O.D.

S.T. 600 STRUCTAKIT

Comprising Peto-Scott Ready-Drilled Walnut-faced Panel, 16 in. x 9 1/2 in.; Metaplex Baseboard, 16 in. x 10 in.; Ready-Drilled Terminal Strip, 16 in. x 3 in. and Platform, 4 in. x 4 in. Exactly as FIRST specified by Mr. John Scott-Taggart. Cash or C.O.D. 6/6. With FREE copy S.T. 600 issue "P.W." including S.T.'s 100-STATION "SPOT-ON" DIAL and other "P.W." FREE GIFT. Postage 6d. Extra.

6/6

S.T. 400 to S.T. 600

Comprising all FIRST Specified S.T. 600 Components necessary to convert your existing S.T. 400 to the S.T. 600, including copy of "Popular Wireless," Oct. 27th, 1934, with full-size Blue Print and S.T.'s 100-STATION "SPOT-ON" DIAL and other "P.W." FREE GIFT. SEND FOR DE-YOURS FOR TAILED LIST OF PARTS SENT BY RETURN OF POST. Cash or C.O.D. Carriage Paid, **£3 8/6** or 12 monthly payments of 6/3.

6/3

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Comprising all FIRST Specified S.T. 600 Components necessary to convert your existing S.T. 500 to the S.T. 600, including copy of "Popular Wireless," Oct. 27th, 1934, with full-size-Blue Print and S.T.'s 100-STATION "SPOT-ON" DIAL and other "P.W." FREE GIFT. SEND FOR DE-YOURS FOR TAILED LIST OF PARTS. SENT BY RETURN OF POST. Cash or C.O.D. Carriage Paid, **£3 8/0** or 12 monthly payments of 6/3.

6/3

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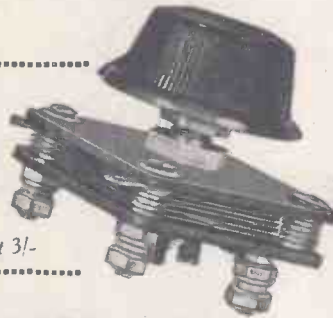
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One Polar-N.S.F. '006-mid. Tubular Condenser	1 3
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A DEFECTIVE resistance can completely ruin the enjoyment of radio—and frequently does. Moreover, it is often difficult to trace the fault, as none but the most expensive testing equipment can definitely locate it.

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They are colour coded, compact and sturdy, and all values are *wire-wound*, this method of construction giving the most reliable form of resistance.

See the Editorial opinions on Amplion Resistors on page 499 of this issue.

PRICE 1/- ALL EACH VALUES

From all Dealers.

SEE AMPLION LION SPEAKER ADVT ON PAGE 487



AMPLION (1932) LTD. 82-84, ROSOMAN STREET LONDON, E.C.1.



"A topping Christmas present, Dad I bet you'll use it as much as I do though!"

The eyes of the Radio enthusiast will sparkle with delight at the sight of a Pifco ROTAMETER De Luxe. This wonderful instrument enables every kind of test to be made, and saves much valuable time in the tracing of Radio faults. It is finished in black bakelite, and supplied complete with leads, in velvet-lined case. The turn of a knob brings the required scale into operation.

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- 1—0.5 volts.
- 2—0.20 volts.
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- 4—0.400 volts.
- 5—0.10 milliamperes.
- 6—0.50 milliamperes.
- 7—0.250 milliamperes.
- 8—Resist/valve test.
- 9—Plug-in test for valves.

PIFCO ROTAMETERS
 PIFCO ON THE SPOT WILL TRACE YOUR TROUBLES LIKE A SHOT

RAPID CONSTRUCTION GUIDE

FOR THE S.T. 600

USE THESE INSTRUCTIONS IN CONJUNCTION WITH THE REPRODUCTION OF THE BLUEPRINT AND THE "HI-SPEED" WIRING SERIES

If different components than those used by myself are employed, slight obvious variations from this guide are called for, e.g. hole positions in panel.

(A) Collect and examine required components. Handle the gang condenser and Extractor coil gently. Check size of baseboard and panel. If you have the cabinet, see that they will fit. See that back and front trimmers open and close correctly; if not, avoid repairing these yourself. See that no soldering tags will touch other terminals, or the metallised baseboard when in position.

(B) Tighten terminal fixing-nuts (not terminal heads) on components. Avoid tightening those on Wearite coil assembly unless absolutely necessary, as excess pressure will split insulating washers on the inside.

(C) Lay baseboard on table with the Metaplex surface uppermost and farthest from you.

(D) Mark out and drill gang condenser platform (which is of plain plywood) unless bought drilled. Take gang condenser and swivel the two front fixing lugs outwards so that the holes in the lugs come over the appropriate holes in platform. Place a round-headed wood-screw (1 used $\frac{1}{4}$ -in. No. 6 brass round-headed wood-screw) through back fixing lug and appropriate hole in platform. Screw this screw through the platform into the baseboard, checking the condenser position from the diagram, thus fixing down one end of condenser and its platform. Complete the fixing by two screws through the front lugs.

(E) Using the reproduction of the blueprint on page 480 as a check on their positions, screw down the following components in the order given: Main coil assembly, V1 valve holder, aerial reaction choke, 1-mfd. screen decoupling condenser (Graham Farish), 1-mfd. Bubbler 9200, .00005-mfd. Lissen grid condenser, Ferranti 1-megohm detector grid leak (which is next grid condenser), using bits of cork or metal washers at each end to raise this component about one-eighth inch above Metaplex, V2 valve holder, $\frac{1}{2}$ -mfd. Dubbler condenser, the two 2-mfd. condensers, V3 valve holder, 1-megohm Ferranti grid resistance (which is near V3 valve holder and requires no raising from baseboard), .0003-mfd. Lissen condenser lying flat on baseboard, B.T.S. anode reaction choke, Nictet (do not screw fixing screws tightly at this stage), V4 valve holder, Extractor coil (treat this coil gently and handle it by its base only).

(F) Mark out and drill terminal strip, in accordance with the dimensions on page 496 (unless bought ready drilled).

(G) Fit terminals loosely to terminal strip, which is then fixed to edge of baseboard, using three countersunk-head brass screws (I used $\frac{1}{4}$ -in. countersunk-head brass screws). If the holes are not countersunk do not use countersunk-head screws, as they would split strip.

(H) Mount .00075-mfd. tone control condenser and .0005-mfd. Ormond Extractor condenser on terminal strip.

(J) **WIRE BASEBOARD** (Wires (1) to (54)) with stiffish insulated wire. Some of the new pull-back (some call it "push-back") wires are very easy to work with, as this insulation is pulled back instead of being scraped off. To save the reader time and trouble I have numbered the wires in their most convenient order for connecting. Reasons are not given, but you will find them out if you depart from the order. The numbers of wires are the same on all drawings. As regards connections (but not

precise shape) the reproduction of the blueprint on page 480 is the final authority, in case of doubt. You can find the wires very easily by looking first at the "HI-SPEED" wiring series on pages 486 and 488. This series can be used alone without consulting the wiring diagram, and surpasses the rather long-winded description of each wire given in previous guides. At the top left-hand corner of each "HI-SPEED" drawing are given the numbers of the wires shown on that drawing; cross these out in turn as you complete the connections.

Do not tighten any terminal head finally until you are sure there are no more wires going to that terminal.

The following series of hints on certain of the wires as numbered enables the constructor to avoid even the smallest snags:

Wire (1). This is for earthing the Nictet core. Slack off both Nictet fixing screws. Bare and loop one end of wire (1) for later connection under the head of one fixing screw. Bare $\frac{1}{2}$ in. of the other end, bend it to a V or hook shape, and slip it between the Nictet and the metallised surface of the baseboard. Remove one fixing screw and slip it through the prepared looped end of wire (1). Do not screw down tight until

Wire (11). Is stiffish and is for later connection to the top (anode) terminal on the valve in V1 valve holder. When in position it should stand off a little from metallising on valve.

Wire (13). Must be clear of (11) and the base-board metallising.

Wire (16). Must not foul the Extractor Condenser moving vanes.

Wire (19). Runs from the frame (chassis) terminal at the rear of the two-gang condenser to one of the two-gang condenser front fixing screws.

Wire (21). Must be short and clear of (19) and (20) (the 0-1 tubular condenser).

Wire (23). Must be short.

Wire (24). Must be short and clear of (19).

Wire (25). Must be short and clear of metallised baseboard.

Wire (28). Must be short and clear of metallised baseboard.

Wire (29). Must not foul the star wheel which adjusts the rear trimmer on the two-gang condenser.

Wire (40). Is stiffish and is for later connection to the top (anode) terminal of valve in V2 valve holder.

Wire (43). Is a .006-mfd. tubular condenser running from the anode reaction H.F. choke to the 1-megohm grid resistance.

Wire (47). Runs from the F- terminal on V3 valve holder to the Nictet fixing screw. Both screws fixing the Nictet should now be tightened.

Wire (53). Runs from the anode terminal A on V4 valve holder to the terminal strip.

(K) **MARK OUT AND DRILL PANEL**, unless it has been bought ready drilled. The drilling diagram (see page 496) is symmetrical, and so is the same for the front and back of panel with the exception of the countersinking of the panel fixing holes.

Mark the hole positions on the back of the panel. Do not draw pencil lines, because they may become unwanted leaks. Hold the panel front against a wooden or cardboard surface and drill small pilot holes through from the back. If the front surface of the panel is not supported the pilot drill may split the veneer round the hole. Drill the holes to full size from the front. Countersink the three fixing holes unless you intend using round-headed screws.

(L) Slip the panel into position and fit the three fixing screws (countersunk only if holes are countersunk). The two spindles of the two-gang condenser and the wavechange switch spindle of the two-coil assembly should come through the appropriate holes.

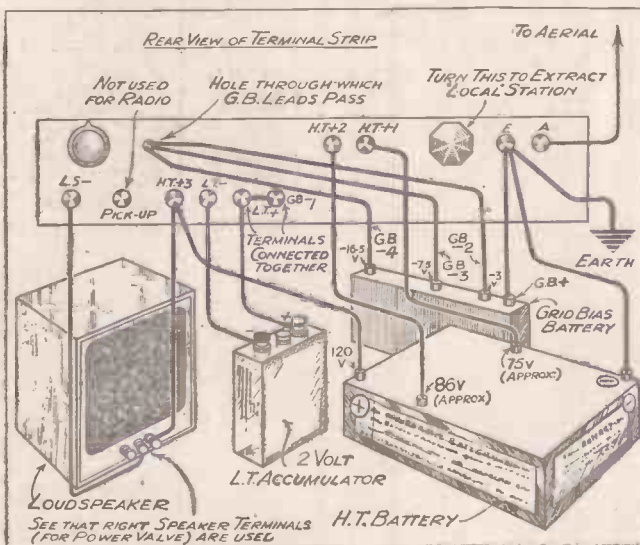
(M) Fit the aerial reaction (.0005-mfd.) condenser (keep the moving vanes terminal and tag clear of baseboard to which they would otherwise short-circuit), Volume control, Anode Reaction Differential (.0003-mfd.) (keep the lower fixed vanes terminal clear of baseboard to avoid short-circuit, and Aerial Coupler (.0005-mfd.). Do not fit the control knobs at this stage.

(N) **CONTINUE WIRING 55 to 69.** The following notes will be of assistance:

Wire (55). Is on Bulgin vol. control.
Wire (58). Goes straight from terminal (12) on the main coil assembly to back of the panel and runs along the panel just above the upper spindle of the two-gang condenser. Keep this wire clear of the two-gang condenser circular brass drive plate.

(Continued on next page.)

THE TERMINAL STRIP CONNECTIONS



An exceptionally clear sketch showing how the batteries, speaker, and aerial and earth are connected to the S.T.600. Note that the positive connection to the loudspeaker is taken to H.T.+3, while G.B.+ and H.T.- are connected to the E terminal.

wire (47) is in position. If the transformer you use has no core which can be earthed, this wire (1) is omitted.

Wire (3) runs along the baseboard, rising only at each end.

Wire (4). Keep this wire short, and clear of baseboard and wire No. 2.

Wire (5) runs along baseboard.

Wire (6). Must not foul the Extractor Condenser moving vanes when they are fully out.

Wire (8). Must be clear of No. 3 and the baseboard metallising.

Wire (59). Goes straight from terminal (11) on the main coil assembly to back of panel and runs along the panel. Keep this wire clear of (58) and the two-gang condenser drive plate.

Wire (63). Must be clear of the metallised surface of the baseboard.

Wire (66). Connects G.B.—1 and L.T.+ terminals on the terminal strip. Have some consideration for me and don't forget this connection. Hundreds will forget about it.

Wires (67), (68) and (69) pass through a hole in the terminal strip, and so each wander-plug should only be fitted when the rest of the wire is in position.

(O) **THE "SPOT-ON" DIAL.** Hold the "Spot-On" dial in position with the Formo dial (not frame).
The Formo dial should lie so that the upper spindle of the two-gang condenser comes mid-way between, and on the same level as, the 0 and 100 marks on the Formo chart.

(P) Support the panel and prepare holes with a bradawl for fixing screws through the two upper holes in the Formo chart.

(Q) Fix the Formo frame over the Formo and "Spot-On" dials first with the two countersunk-head screws through the prepared holes.

(R) Next prepare holes in the panel for the two lower frame fixing screws, and fit the two screws.

(S) The outer edge of the "Spot-On" dial can be held to the panel in any of the following ways:

THE ACCESSORIES

BATTERIES—H.T.: Ever Ready, Lissen, Siemens, Drydex, G.E.C., Vidor or Block H.T. Accumulators.
G.B.: Ever Ready, Lissen, Drydex, Siemens.
L.T.: Exide, Block, Lissen.

MAINS UNITS—Atlas, Ekco, Heayberd, Regentone.
SUITABLE LOUDSPEAKERS FOR S.T.600
W.B., Rola, Amplion, Celestion, Wharfedale, Gramplan, Blue Spot, R. & A., Magnavox, Ferranti. (No significance attaches to the order of makes.) J.S.-T.

- (a) Drawing-pins;
- (b) "Seccotine," glue, etc.;
- (c) Household pins cut diagonally $\frac{1}{2}$ in. from the head and pushed into holes prepared by any sharp-pointed instrument;
- (d) A frame cut out of thick card or bakelite sheet and screwed or otherwise fixed down.

I, personally, used (c), which is neat and does not distract attention from the chart.

(T) Turn the lower spindle of the two-gang condenser until the moving vanes are fully engaged with the fixed vanes. Slip the long pointer bush

on to the upper spindle. Before tightening the grub-screw into the bush make certain that:

- (a) The pointer is straight and in line with its bush;
- (b) The pointer is pointing horizontally to the right;
- (c) The inside edge of the pointer is just clear of the Formo chart frame.

You may find that the pointer fouls the frame when it is pointing to the left and not to the right. This probably means that the two-gang condenser is not lying at right angles to the front edge of the baseboard. If the trouble is not very serious you can put it right by slacking off the three fixing screws of the gang condenser and skewing it before re-tightening.

(U) The Formo moulded bakelite boss-cover should now be fitted. This is done by slipping part of the back of the moulding behind a roughly semi-circular tongue on the Formo frame.

(V) Fit knobs on to all the controls, including the Extractor condenser and tone control.

(W) When the set is fitted into a cabinet you may find it advantageous to secure the panel to the cabinet front and so give the panel extra support. Your set is now finished. J.S.-T.

* Those who do not possess the "Spot-On" dial card given away with the Oct. 27th issue should note that special ivoryine dials for the S.T.600 are obtainable and are advertised elsewhere. ED.

THE BATTERY MODEL S.T.600—KEEP STRICTLY WITHIN THIS LIST

Component.	Make Used by J. Scott-Taggart.	Suitable Alternative Makes.
Tone Control : 00075-mfd. solid dielectric variable condenser	POLAR (Compar)	Telsen W.357, Graham Farish, Ormond, J.B.
Aerial Coupler : 0005-mfd. solid dielectric var. condenser.	TELSEN (Reaction type W.358)	Graham Farish, Polar, B.T.S., J.B.
Aerial reaction condenser : 0005-mfd. mid-log line	GRAHAM FARISH (Litlos)	Polar, Telsen, B.T.S., J.B., Ormond
Main coil assembly : S.T.600	WEARITE	Colvern S.T.600
Extractor coil : S.T.600 Ferrocart	COLVERN	
Two-gang condenser : with long pointer, but without dust-cover	FORMO	
Fixed condensers : 1-1-mfd.	GRAHAM FARISH (Mansbridge type)	J.B., Polar, Telsen, Ormond.
" " 1-1-mfd.	DUBILIER (type 9200)	A special S.T.600 condenser by J.B. is available for use with a "Spot-on" dial. The other alternative makes are the standard types.
" " 2-2-mfd.	T.M.C.-Hydra, 250v. working	T.C.C., Dubilier, T.M.C.-Hydra, Ferranti, Lissen, Telsen, Bulgin, Goltone
" " 1-00005-mfd.	LISSEN (Mica)	T.C.C., Graham Farish, T.M.C.-Hydra, Ferranti, Lissen, Telsen, Bulgin, Goltone
" " 1-0003-mfd.	LISSEN (Mica)	T.C.C., Graham Farish, Dubilier, Ferranti, Lissen, Telsen, Bulgin, Goltone
" " 1-006-mfd. (tubular)	T.M.C.-Hydra	T.C.C., Graham Farish, Dubilier, T.M.C.-Hydra, Ferranti, Telsen, Bulgin
" " 1-0-1-mfd. (tubular)	T.C.C. (type T.250, 350 D.C. working)	T.C.C., Graham Farish, Dubilier, T.M.C.-Hydra, Ferranti, Lissen, Telsen, Bulgin, Polar-N.S.F., Goltone
" " 1-0-5-mfd.	DUBILIER 9200	T.C.C., Graham Farish, T.M.C.-Hydra, Ferranti, Lissen, Telsen, Bulgin, Goltone
Anode differential reaction condenser : 0003-mfd. solid dielectric	GRAHAM FARISH (Litlos)	Polar, Ormond, Telsen, B.T.S., J.B.
Resistances : 2-1 megohm, mounted in holders	FERRANTI (new type G.H.1)	Graham Farish (with holders). The following may be used with Telsen 2-terminal blocks W.204: Erie, Dubilier, Polar-N.S.F., Bulgin, Telsen
" " 1-25,000 ohms 1 watt	DUBILIER (metallised)	Graham Farish, Polar-N.S.F., Erie, Ferranti, Bulgin, Telsen
" " 1-75,000 " "	DUBILIER	Graham Farish, Polar-N.S.F., Erie, Ferranti, Bulgin, Telsen
" " 1-20,000 " "	DUBILIER	Graham Farish, Polar-N.S.F., Erie, Ferranti, Bulgin, Telsen
" " 1-300,000 " "	ERIE	Graham Farish, Polar-N.S.F., Dubilier, Ferranti, Bulgin, Telsen
" " 1-50,000 " "	ERIE	Graham Farish, Polar-N.S.F., Dubilier, Ferranti, Bulgin, Telsen
Reaction choke : 1 (used for anode reaction)	B.T.S.	Lissen, Graham Farish Snap or H.M.S., Telsen, Wearite, Bulgin, R.I., Lewcos
" " 1 (used for aerial reaction)	LISSEN	B.T.S., Graham Farish Snap, or Telsen standard H.F. choke (old type)
10 terminals : A, E, H.T.+1, H.T.+2, H.T.+3, L, T.+1, L.T.—, L.S.—, G.B.—1. Pick-up	BELLING-LEE (type R)	Clix, Bulgin, Eelex, and Goltone
Wander plugs : G.B.—2, G.B.—3, G.B.—4 (G.B.+ is an external connection)	CLIX	Belling-Lee, Eelex, Goltone
H.T. plugs : H.T.—, H.T.+1, H.T.+2, H.T.+3	CLIX	Belling-Lee, Eelex, Goltone
Volume Control : Combined 25,000-ohm graded volume control for variable- μ with terminals, and 3 pt. on-off switch with terminals	BULGIN (type G.M.25)	Colvern S.T. 5 C/S, with battery on-off switch
Extractor tuning condenser : ordinary 0005-mfd. air-dielectric tuning condenser, complete with terminals and knob	ORMOND (mention S.T.600 type complete with knob)	Telsen W.132, Polar No. 4 direct drive, J.B. Popular Log, Formo direct drive. (These all require purchase of a knob.)
L.F. transformer	VARLEY Niclet (Standard 1:3:5)	Ferranti, R.I. Hypermite, Lissen Hypermlk, Bulgin, Telsen type G.S.4, Multitone 1 to 4, Lewcos L.F.T.6A. Slektun 1 to 4. (Any transformer mentioned may be used on a battery set, but if a mains unit is employed the Varley Niclet should be used, as otherwise receiver would require designing to suit each individual transformer.)
Terminal strip : 16" x 3" x $\frac{1}{8}$ "	PETO-SCOTT	Goltone
Baseboard : With part Metaplex, 16" x 10" x $\frac{1}{8}$ " (Metaplex covers 16" x 7 $\frac{1}{2}$ ")	PETO-SCOTT	
Panel : Walnut or oak ply, 16" x 9 $\frac{1}{2}$ " x 1"	PETO-SCOTT	Goltone. Or locally purchased.
Valve holders : 4-4-pin anti-microphonic	BENJAMIN Vibroider	Or locally made
Platform for gang condenser : 4" x 4" x $\frac{1}{8}$ " plain ply (not metal covered)	PETO-SCOTT	
Wire	B.R.G. "Quikon"	Bulgin "Quikwyre," Brit. Radiophone "Pull-Back," Lewcos "Glazite."
Cabinet	PETO-SCOTT	

Optional Aerial and Earth Equipment : Aerialite "Levenstrand," Electron "Superial," Goltone "Lektrite," "Metocel" screened down-lead, Bulgin Lightning Switch, Graham Farish "Fit" Earthing device.

2 Cossor 210 V.P.T. (4-pin metallised type)

1 Mullard P.M.2D.X.

1 Mullard P.M.202

NOTE.—This is my official and only list of components. The makes in black capitals are those actually used in my original set and illustrated and referred to throughout the description and diagrams. Any statements regarding apparatus for the S.T.600 should be carefully checked against the official list on this page. (Sd.) JOHN SCOTT-TAGGART.



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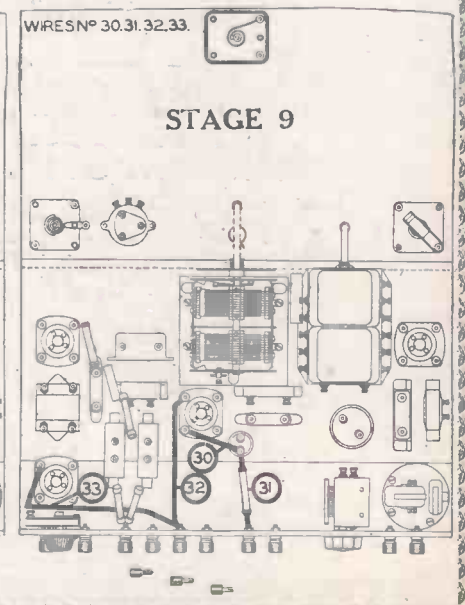
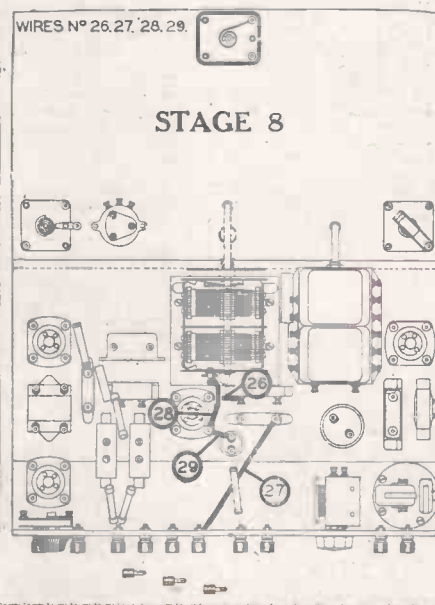
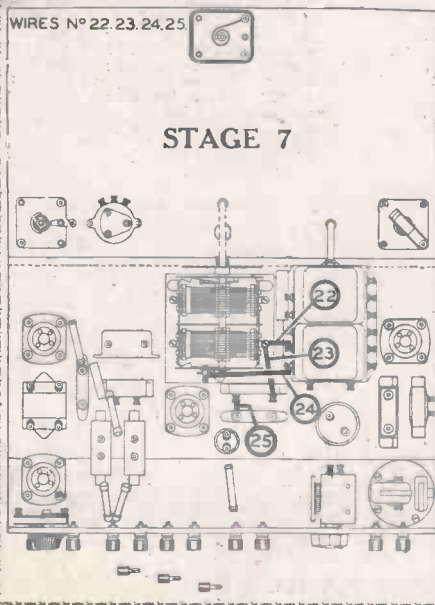
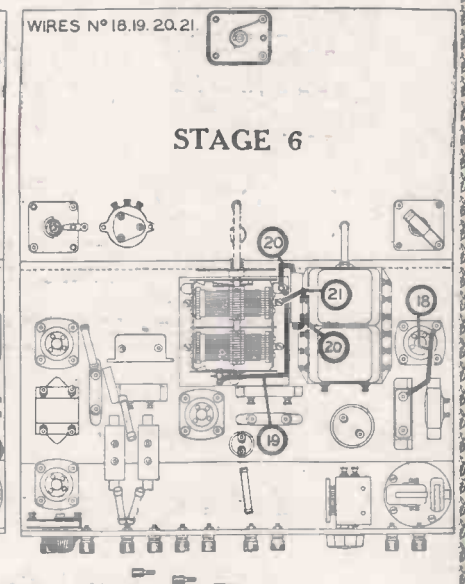
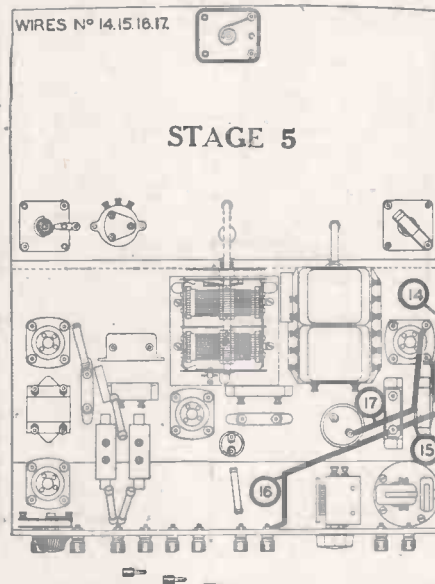
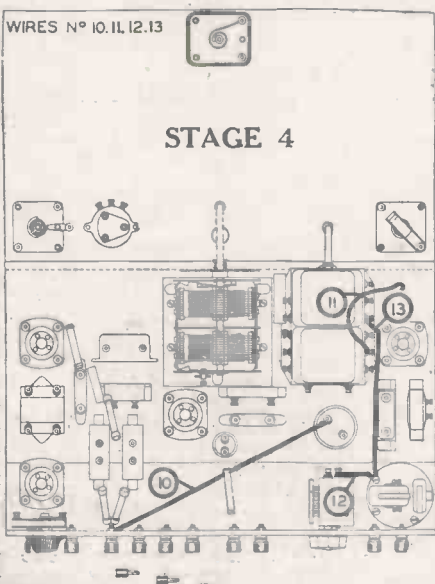
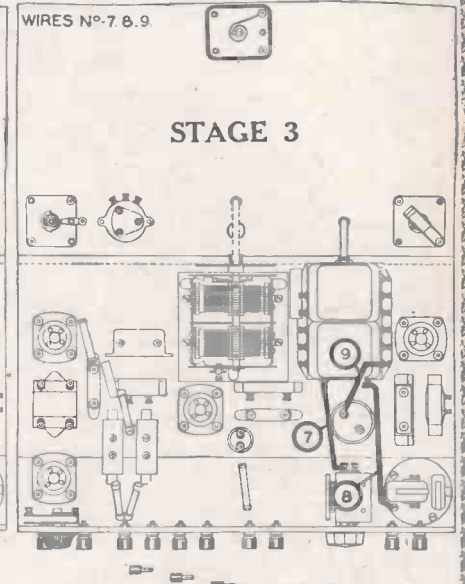
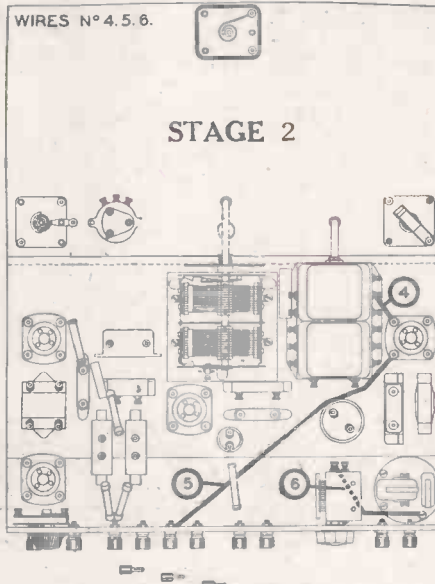
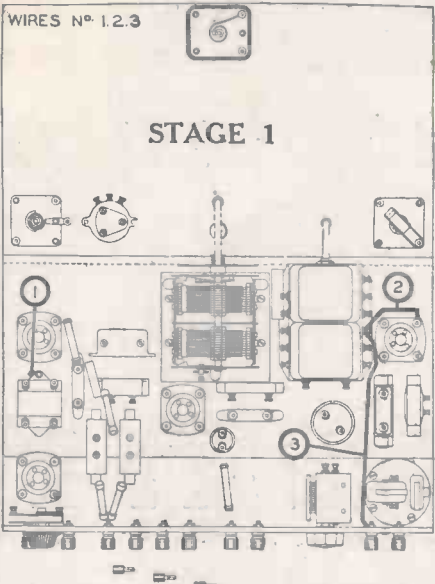
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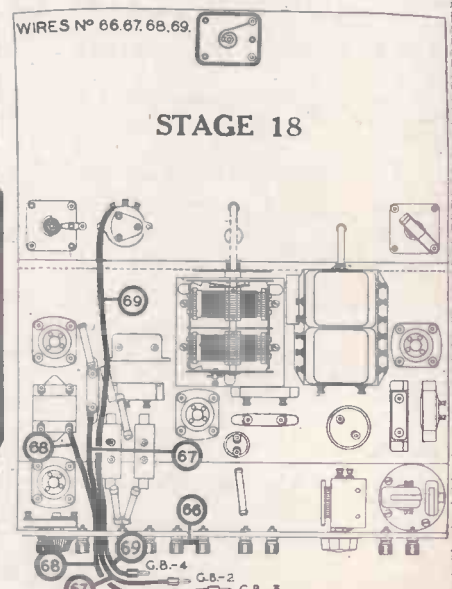
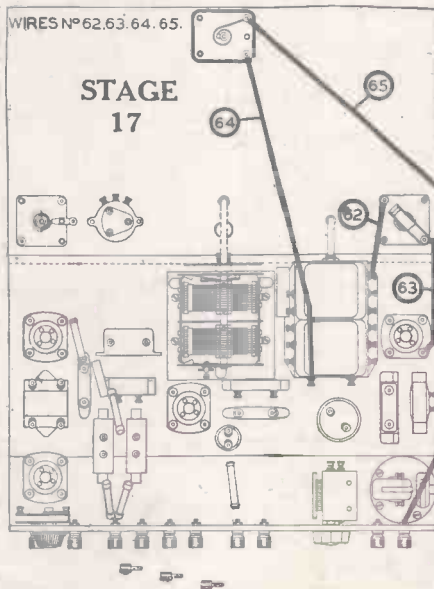
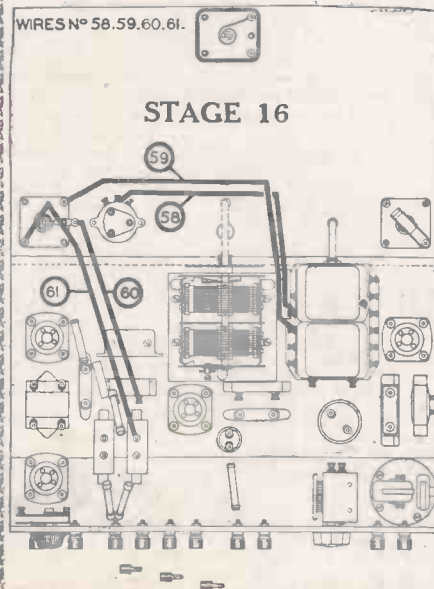
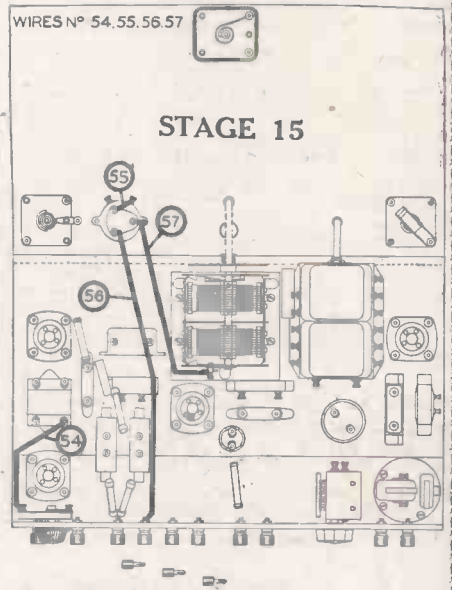
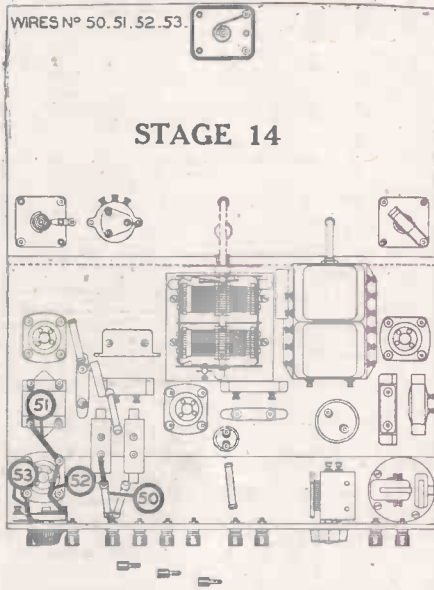
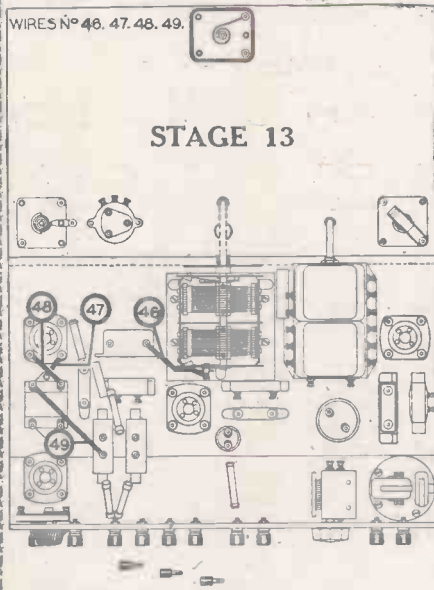
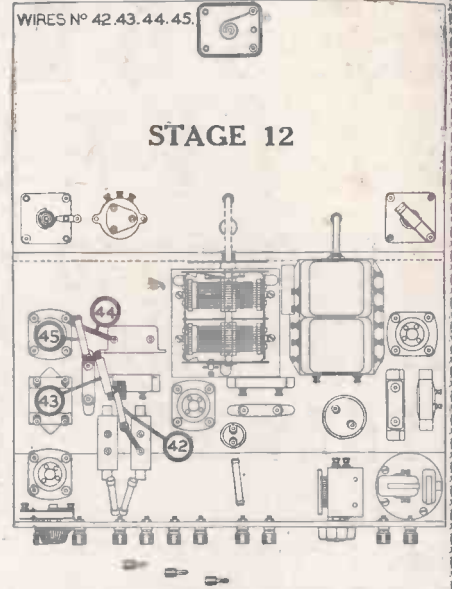
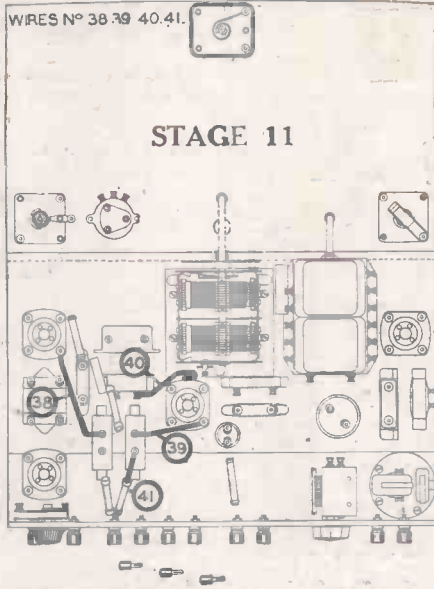
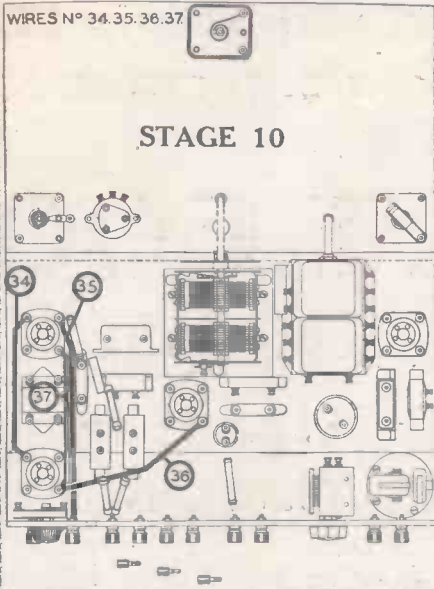
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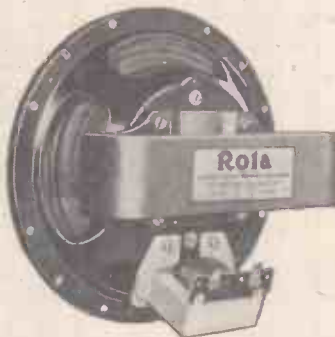
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OPERATING THE S.T.600

How to Get the Best Results from this Magnificent Receiver



THE installation of the S.T.600 calls for little comment. First of all, connect up the batteries, loudspeaker, aerial and earth as per the sketch on page 483. Do not connect the pick-up terminal to the loudspeaker or to the H.T. battery.

Also connect the H.T. negative and the grid-bias positive to the actual earth terminal on the set as shown, and not to the negative of the accumulator. Any careless short-circuits to earth will then not affect the valves.

The set should first be tried, of course, outside the cabinet. Put the speaker to the right of the set. The position of the speaker in the sketch is merely to show the connections. Batteries go behind the set. Loudspeaker leads should not trail round the aerial end of the set.

Set aerial reaction to zero (full left). Accustom yourself to the effect of the aerial coupler, volume control and anode reaction.

The aerial coupler is used exactly as in my previous sets, while the volume control is used in the same way as you would use an anode coupler.

When selectivity is desired I favour the use of a low value of aerial coupler and volume control turned partly down (towards left). Then bring the signal up with anode reaction.

The most common fault in operating all sets is to expect the reaction to do good when signals are already loading up the valves. Before applying reaction, signals should be comparatively weak.

Aerial Reaction Control.

When applying aerial reaction, signals should be either naturally weak or made so by reducing aerial coupler (not volume control this time). The full merits of selectivity are thus obtained.

Note that anode reaction can be applied even with the volume control turned right down. This is not so with aerial reaction, because when volume is turned down a larger negative bias is applied to the control grid of the first pentode; this makes it more difficult to get enough aerial reaction.

When aerial reaction is used, you must not turn down the volume control too far. Reduce signals, if desired, by turning the aerial coupler to the left.

Aerial reaction may be applied alone with the volume control sufficiently to the right, but with anode reaction at zero. This is very useful when desiring selectivity and signal strength on the bottom half of the dial especially.



S.T.600—BRITAIN'S FINEST SET

But usually a little anode reaction, together with some aerial reaction, would be used.

Incidentally, none of the controls affects tuning, but, as one may be originally slightly off-tune, the main tuning knob is adjusted when required.

The Front Trimmer.

The little knob which seems part of the main knob controls a small variable condenser of its own. This is called the "front trimmer." It ensures that both tuned circuits are always exactly in tune. You then get exactly as good results as when two separate condensers are employed. If you had not a front adjustable trimmer you would on some stations be a little off-tune.

The way to tune and put the dot under the station name is to set the aerial coupler about half-way and the aerial reaction to zero. With volume control sufficiently to the left, apply anode reaction until the signal is well received. Then turn the front

trimmer until signals are loudest, checking up with a slight movement of the main tuning knob. Then put a dot on line under the station name where the pointer rests.

The Extractor adjustment is carried out by tuning in to one of the local stations and turning the volume control down till signals are fairly loud, but not blasting. The knob of the Extractor tuning condenser is turned until the local is not heard, or only heard faintly. On each side of this adjustment the local will be heard loudly,

so do not miss the silent point by tuning the Extractor quickly. Having obtained a silent point, you can turn up the volume control. This may bring back the local, owing to the greater sensitivity of the set, and a very accurate adjustment of the Extractor may then be made.

The whole process from beginning to end is only a matter of seconds.

When close to the local it is unlikely that it will completely disappear. It can, however, if desired, be reduced to the strength of a weak foreign station. You can then bring it up for ordinary reception by increasing the volume control and applying reaction. An alternative method is to have the Extractor condenser a little off-tune.

You can cut out the effect of the Extractor at any time, either by shorting the Extractor condenser terminals or, what is more convenient, simply turning the Extractor condenser to its maximum capacity position.

Do not leave the Extractor condenser at any old position, because, wherever it happens to be, it will extract that particular station! It is safe to set it to one of your locals on the medium waves and either full-in or on Droitwich when on the long wave-band.

Using the Tone Control.

Nothing has yet been said about the tone control. This should normally be at zero, the moving vanes "full out." By turning the knob (which is on the terminal strip, of course) the tone can be made mellow, as desired. This is very useful for "singing-off" feeble heterodyne whistles which occasionally are encountered on every set.

Remember, above all things, to keep the aerial coupler and volume control at low values if signal strength permits. The set possesses colossal reserves of sensitivity and will give full loudspeaker results on extremely weak signals. Do not, therefore, overload it by excessive high-frequency input. Low values

(knobs anti-clockwise) of aerial coupler and volume control also mean greater selectivity on the two circuits. When aerial reaction is used, the aerial coupler will need to be low, but volume control not too low, otherwise you will not get proper reaction.

When working on a very small aerial you will use more aerial coupler and more volume control, but these do not affect tuning.

The ganging of the two-gang condenser is very simple. There is a rear trimmer

(Continued on page 496.)

"THE FINEST BATTERY SET YET PRODUCED"

Dear Sir,—I wish to add my appreciation to your latest set the S.T.600, which I have just finished building. (Consolette Model.)

One need only add, I think, that the set will really do all that you claim for it, to prove that it is the finest battery set yet produced.

I am more than pleased with its all-round efficiency and general performance.

M. NEILSON.

Gravel Hill, Wimborne, Dorset.

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Build it with a "GOLD-MINE" Guaranteed KIT

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S.T. 600 57/6

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 SYMBOL OF SECURITY, SERVICE & VALUE, INTRODUCED IN 1932 TO FULFIL A LONG FELT WANT & NOW STANDING THE TEST OF TIME!

S.T.600 £5 KITS FOR 57/6
OFFERED WHOLESALE DIRECT TO THE PUBLIC

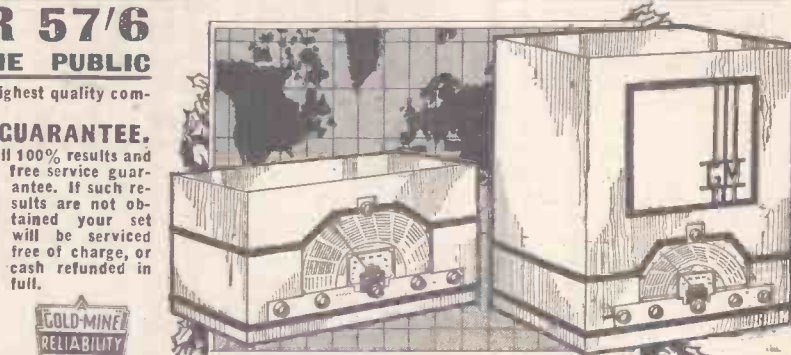
Every Kit exact to author's specified values throughout, and of the highest quality components procurable as listed below.

EVERY KIT CARRIES 100 PER CENT. RESULTS GUARANTEE.

The GOLD-MINE S.T.600 Kit is the only S.T.600 Kit which carries a full 100% results and free service guarantee. If such results are not obtained your set will be serviced free of charge, or cash refunded in full.

BUY YOUR KIT DIRECT RETAIL PRICES OUR PRICES

No.	COMPONENT	MAKE	s.	d.	s.	d.
1	Tone control, .00075-mfd.	Telsen.....	2	6	1	2
1	Aerial coupler, .0005-mfd.	Telsen.....	2	6	1	2
1	Aerial reaction condenser, .0005-mfd.	Telsen.....	2	6	1	2
1	Extractor coil	Colvern.....	2	6	8	6
1	Extractor tuning condenser	Ormond.....	3	0	3	0
1	Main coil assembly (illustrated)	"G.M.".....	19	6	11	0
1	2-gang condenser	Formo.....	1	4	0	2
2	1-mfd. fixed condensers	T.C.C.	9	4	4	4
2	2-mfd. fixed condensers	T.C.C.	9	4	4	4
1	.00005-mfd. fixed condenser	T.C.C.	9	4	4	4
1	.0005-mfd. fixed condenser	T.C.C.	9	4	4	4
1	.006-mfd. fixed condenser	T.C.C.	9	4	4	4
1	0-1-mfd. fixed condenser	Wego.....	1	6	7	8
1	0-5-mfd. fixed condenser	Wego.....	1	9	8	9
1	Anode differential reaction condenser, .0003-mfd.	Wavemaster.....	2	6	1	4
2	1-megohm resistances	Dublier.....	1	0	4	8
1	25,000-ohm 1-watt resistance	Franklin..	1	0	4	4
1	75,000-ohm 1-watt resistance	Franklin..	1	0	4	4
1	20,000-ohm 1-watt resistance	Franklin..	1	0	4	4
1	300,000-ohm 1-watt resistance	Franklin..	1	0	4	4
1	50,000-ohm 1-watt resistance	Franklin..	1	0	4	4
1	Anode reaction choke	Sovereign..	2	3	10	10
1	Aerial reaction choke	Sovereign..	2	3	10	10
1	25,000-ohm volume control & 3-pt. switch	Centralab..	7	6	2	2
1	L.F. transformer	Magnacore..	10	6	2	2
4	4-pin valve holders	Eve.....	4	0	1	0
10	Terminals	"G.M.".....	1	2	9	5
8	Wander plugs	"G.M.".....	1	0	5	5
1	Terminal strip, 16" x 2" x 1/2"	"G.M.".....	1	0	5	5
1	Baseboard, 16" x 10" x 5/16" (metalised section 16" x 7 1/4")	"Goldplex" ..	1	10	1	0
1	Panel, 16" x 9" x 1/2"	"G.M.".....	3	0	1	6
1	Platform for gang condenser, 4" x 4"	"G.M.".....	2	0	9	9
2	Rolls Glazite, screws, sundries	"G.M.".....	2	0	9	9
Complete as Above—Kit A			£5	157	6	
2	Variable-mu H.F. pentodes	Clarion.....	22	0	17	0
1	Detector	Clarion.....	5	6	3	9
1	Super-power	Clarion.....	6	6	3	9
1	S.T.600 cabinet, 17" x 10" x 10 1/2" as illustrated	"G.M.".....	17	6	11	6
1	S.T.600 cabinet, 17" x 10" x 10 1/2" (illustrated)	"G.M.".....	29	6	22	0
1	Set batteries	Lithanode..	35	0	17	6
1	S.T.600 A.O. eliminator	"G.M.".....	24	0	24	0
1	Ormond P.M. speaker	Ormond.....	27	6	15	6
1	Rola P.M. speaker	Rola.....	35	0	22	6
1	Conversion Kit S.T.500-600	Ref. A.56 ..	58	3	37	6
1	Conversion Kit S.T.400-600	Ref. A.46 ..	79	6	49	0
1	S.T.600 A.O. MODEL	Kit A.....	£10	99	6	



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here is a new S.T.600 coil assembly, PRECISION BUILT and of 100% efficiency. You will get the best possible results with this unit. FIT ONE TO-DAY.

AMPLE, WELL SPACED SCREEN
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9/6

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SMOOTH ACTION SWITCHING

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CONVERSION KIT

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A.46 Converts the new S.T.400 to the new S.T.600 Receiver. In sealed carton. **49/-**

KIT B

Kit A, with the addition of set of Clarion fully guaranteed valves. (A.C. Model 81/- £6/12/6.)

A.C. S.T.600 99/6

KIT C

As Kit B, with addition of Walnut finished screened table model cabinet (as illustrated), Ormond P.M. Speaker 15/6 extra; Rola 22/6. (A.C. Model, £7/7/6.)

PRICE 92/6

Cabinet to hold set and speaker, 9/6 extra

KIT D

Kit C together with set of high-grade British batteries.

PRICE £5/10/0

A.C. Model. **KIT D**, as Kit C, with Console in lieu of table cabinet, and Rola 2,000-ohms speaker £8/15/0.

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TELEVISION

A SPECIAL PRACTICAL SERIES FOR ALL READERS

By L. H. THOMAS

Full details, and a test report of extended trials, of a complete television kit, which enables anyone to "look-in" for about £4, are contained in the following article of our television section.

IN the article in this series which appeared in the November 17th issue of "P.W."

I used these words: "It is just plain truth—and no flight of fancy—to say that if you have a fairly decent receiver (and we all have nowadays), television is yours for the expenditure of £4 or less."

Two or three readers have challenged me to prove this, and seem to be quite sceptical about it. As one way of convincing them I can do no better than describe the "B.T.S." kit for home assembly of a disc-type viewer. I have been using one myself for the last few weeks to gain first-hand information on the subject.

The Items in the Kit.

The kit includes the following parts: A wooden chassis, with slot cut for disc and all fixing-holes marked; a special ball-bearing television motor; fixed and variable control resistance; 16-in. scanning disc and stand; lens and lens holder; neon lamp and holder.

The whole business of assembling the kit should not take more than an hour or so, as there are no operations requiring the aid of anything more elaborate than a screwdriver and a pair of pliers.

The kit, when assembled, has an appearance similar to that shown in the photograph on this page. It is neat and workmanlike without being elaborate. It may easily be housed in a cabinet if one wishes to make a piece of furniture of it.

There is no reason why any reader of this journal who possesses a receiver that will give an output of $1\frac{1}{2}$ watts or more should not be receiving perfectly good television by 11 p.m. on a Wednesday if he starts assembling such a kit as this by 8 p.m. or thereabouts. It is only necessary to substitute the neon lamp for the loudspeaker—with reservations concerning the provision of a source of "striking voltage"—and to tune to London National at the appropriate hour.

Having dealt, in previous articles, with the little technical problems that may concern one, I propose to keep to results for the present.

"Televising" Musical Programmes.

My own kit was assembled on the day before a television transmission was due, and I therefore had ample opportunity of testing it out by "televising" musical programmes, so to speak. Next day, within less than one minute of the commencement of the transmission, I was receiving quite good television.

A good feature of this "B.T.S." kit is

the indirect drive from the motor to the scanning disc by means of a very flexible rubber band. A particularly smooth and steady drive is obtained in this way.

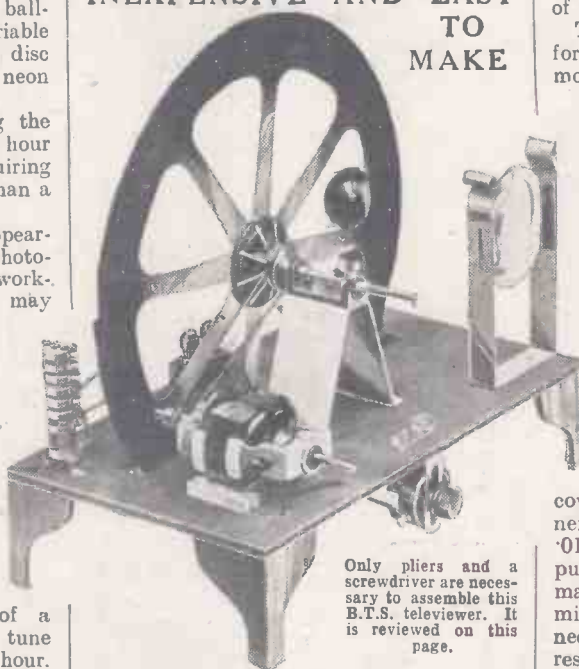
A Stroboscopic Device,

The disc itself is equipped with an 8-line stroboscopic device which, when viewed in the light from 50-cycle A.C., gives an infallible indication when the correct speed of 750 r.p.m. is reached. It also has eight spokes, and 50-cycle light seen through the disc also gives one this indication.

The neon tube is of the "Telelux" type, already reviewed in these columns. Briefly, it consists of the ordinary bee-hive type,

★.....★

INEXPENSIVE AND EASY TO MAKE



Only pliers and a screwdriver are necessary to assemble this B.T.S. televiewer. It is reviewed on this page.

★.....★

covered with a reflecting surface and provided with a frosted aperture of suitable size for the picture. The result is that the "bee-hive lines" are barely perceptible and that the illumination is practically constant over the whole of the image.

The actual size of the latter is about $1\frac{1}{2}$ in. by $\frac{3}{4}$ in., but the four-inch lens, mounted about six inches in front of the disc, gives an image of quite comfortable size. It may be viewed very easily by three or four people without the necessity of peering over one another's shoulders.

The disc itself appears to be excellent. The holes are cut with sufficient precision to ensure absence of vertical "streaks" in the picture, either from overlap or "underlap." One or two of the holes were found to have a very minute angular displacement, resulting in a slight "step" effect, but this was barely noticeable in the image and showed up most in the black synchronising band.

Incidentally, the disc has since been replaced by another from which these little irregularities are entirely absent.

Requires Little Adjustment.

The motor appears to be excellently suited to the job, and if it is allowed to run for ten or fifteen minutes before the transmission commences it will settle down to a very steady speed and will require little adjustment. It also has the advantage of being very quiet-running.

This kit is priced at 78s. (with motor for 6-volt battery), or 84s. with universal motor for A.C. or D.C. mains.

It must be emphasised that the kit as detailed above is perfectly adequate for the reception of television. Those who require something a little more elaborate and effective, however, will probably desire to add a toothed-wheel synchroniser, which is simply clamped to the front bearing of the shaft on which the scanning disc runs.

This is also supplied in kit form, the assembly consisting of a mild steel frame with end bobbin supports, two ready-wound bobbins, two laminated pole pieces, a laminated toothed wheel and two ebonite handles for framing adjustment.

The method of using synchronising gear of this kind has already been covered, and further details appear on the next page. Using the coils, shunted by a .01-mfd. condenser, in series with the output of the receiver and the neon tube, a marked steadying of the image is noted, and minute variations in motor speed do not necessitate a readjustment of the control resistance.

"Framing" the Picture.

"Framing" adjustments are made by the simple expedient of rocking the pole pieces by means of the ebonite handles provided. The toothed wheel, of course, is mounted on the same shaft as the disc.

This synchronising gear kit, which may be assembled in a few minutes without tools, costs 27s. 6d.

By way of conclusion I might remind readers—particularly as this is a Christmas number—that such a kit as the one under review makes an excellent and original present for a radio enthusiast.

TELEVISION—Page 2.

IMPROVING SYNCHRONISM

How to use a tuned transformer

ALTHOUGH it is quite possible to receive excellent television without any artificial means of synchronism whatever, the connoisseur is always trying to improve the steadiness of his picture and to reduce the amount of hand adjustment necessary.

The well-known magnetic toothed-wheel synchroniser is an admirable piece of apparatus, but unless one feeds it with a fairly strong signal it is not always capable of "taking charge" of the motor speed, especially in the face of such little annoyances as variations of the mains voltage.

Those who really want to abolish all necessity for manual control cannot do better than adopt the scheme shown in the diagram on this page—i.e. the use of an extra stage of L.F., with a resonant transformer, for the sole purpose of feeding the synchronising coils.

Tremendously Increased Efficiency.

An ordinary transformer-coupled stage of L.F. will help matters considerably; but when a tuned 375-cycle transformer is used the efficiency will increase tremendously. The transformer shown in the photograph produces a tremendous peak at 375 cycles, and is obtainable from the Radio Reconstruction Co., Ltd., 33, Alfred Place, W.C.1, at the price of 12s. 6d.

The diagram shows the method of connecting the extra stage. Part of the output from the normal last valve of the set is fed through the primary of the transformer, in series with a variable resistance and a fixed condenser.

The secondary is wired in the grid circuit of an extra valve, the anode current of which passes through the synchronising coils. It must be emphasised that this extra valve is not used in any way for the production of the image; and that the quality of the output from it is therefore not important.

Actually, of course, the output is almost entirely confined to the frequency of 375 cycles, and therefore is *all* useful for the purpose for which it is intended. Over-biasing of this last valve, if economy of H.T. current is a consideration, does not upset matters at all. In point of fact, one test showed that biasing the valve down to very nearly zero gave an *improvement* in synchronism rather than otherwise.

A Strong Pull Obtained.

As far as results are concerned, it is safe to say that synchronism is practically perfect under all ordinary conditions. Using a P.X.4 as the normal output valve and another for synchronising, such a strong pull was obtained from the pole pieces of the toothed-wheel synchroniser that it was almost impossible to vary the motor speed by means of the control resistance.

Suddenly turning up the resistance to an extent which would normally send the

pictures flying off upwards merely produced a slight rocking of the image, after which it immediately settled down again into a steady state.

Sudden variations in mains voltage produced the same effect to a lesser degree. It was definitely possible to sit back in one's chair for the entire forty-five minutes without touching a control anywhere. Usually, however, one likes to make tuning adjustments and to alter the setting of the volume control, and possibly the D.C. voltage applied to the neon lamp. Some of these adjustments result in a momentary upsetting of synchronism, which can be troublesome when there is not much in hand.

The Image is Rock Steady.

With the extra stage, however, one has only to get the motor somewhere near the correct speed and the image will suddenly "jump to attention" and remain rock steady.

In passing, it is advisable to mention

IT PEAKS AT 375 CYCLES

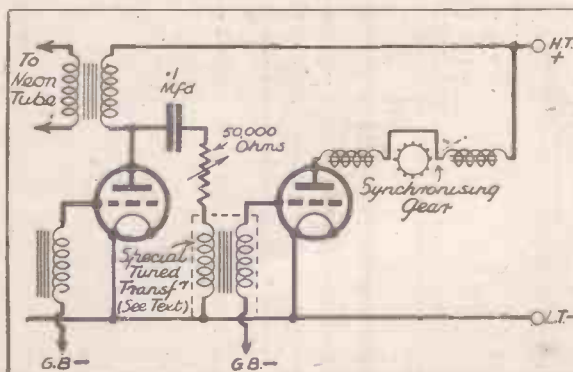


This transformer is specially designed for use with a stage of synchronising amplification.

that this method will not be so successful if the neon tube is wired directly in the plate circuit of the output valve.

When an output transformer is used, as shown in the diagram, one is virtually "choke-feeding" the primary of the synchronising transformer. A neon tube in the plate circuit of the output stage naturally has a very low impedance, and very materially reduces the 375-cycle component handed on to the extra valve.

FOR STEADY PICTURES



With the arrangement illustrated in this diagram hand adjustments of motor speed are reduced to the bare minimum, and the pictures remain remarkably steady.

I have confirmed, however, that it will work, even under these circumstances, sufficiently well to give a marked improvement in steadiness over the ordinary system.

SHORT-WAVE TELEVISION

Explaining the importance of ultra-short waves

IT is, of course, a matter of plain fact that high-definition television, as we know it at present, cannot possibly be transmitted on the normal broadcast wavelengths. It has been calculated that if London Regional were to transmit 180-line television at 25 pictures per second, the necessary modulation would cause a "spread" that would embrace the entire medium-wave broadcast band!

Obviously, the ultra-short waves are the only part of the spectrum that can be used to accommodate such a transmission, and it is significant that these waves are being developed enormously in the U.S.A. with the use of directional transmitting aerials.

As we go to press we hear of a regular two-way schedule on 5 metres between two amateur stations nearly 300 miles apart, one of them being situated in quite low-lying country.

An Important Matter.

The development and "taming" of the ultra-short waves is a matter of as much importance as the development of television itself, so closely are the futures of the two branches of research tied up.

Receivers, we are told, need not cause much trouble, since the problems of obtaining efficient detection and amplification have been practically solved. Transmitters, similarly, present only the most straightforward of problems. The real trouble lies between the two—in the ether—and it is the *propagation* of ultra-short waves that constitutes the most important link in the chain.

The current issue of "QST" contains details of practical communication on a wavelength of 125 centimetres, over a distance of 35 miles, also using directional aerials for transmission. The advantage of these *really* short wavelengths, of course, is that a scientifically designed system of directional aerials is small enough to be erected in the average dwelling-room!

We have become so used to calling 5-metre waves "ultra-short" that we shall surely have to invent a new name for these 125-cm. affairs. It is more than likely that we shall be hearing quite a lot about them in the near future.

An Ideal Design.

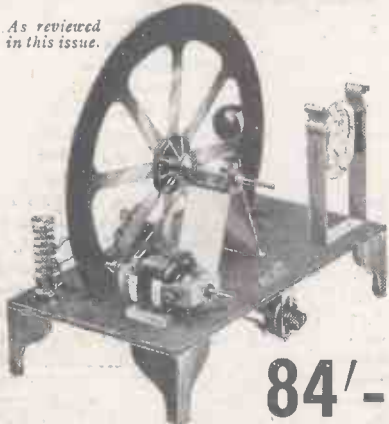
The writer is at the moment attempting to design a 5-10-metre receiver that is no more difficult to construct than the average broadcast receiver, and that will give a sufficient audio output to be suitable for high-definition television.

It is possible, by the way, to hear quite a few television transmissions on the "ordinary" short waves. For the last month there has been an elusive station working on about 37 metres, and one of the American broadcast stations in the neighbourhood of 49 metres has been putting out a transmission.

B.T.S. TELEVISION

B.T.S. INDIRECT DRIVE DISC TELEVISION KIT

As reviewed in this issue.



84/-

THE B.T.S. DISC TELEVISION KIT comprises EVERY PART for instant assembly, including B.T.S. Universal Ball-bearing Television Motor for either Mains or Battery operation as required; controlling resistances; laminated and ready assembled chassis with all component fixing holes marked. Stroboscopic 16 in. Scanning disc and stand; lens and lens holder; improved type TELEX NEON Lamp and Holder. FULL SIZE BLUE PRINT WITH ASSEMBLY WIRING AND OPERATING INSTRUCTIONS WITH EVERY KIT.

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A.C. (40-60 cycles) and D.C. Mains for 6-volt Battery

B. T. S. TELEVISION MOTOR



Runs with perfect precision. Heavy cast aluminium frame ensures freedom from mechanical vibration and absence of noise. Ball-bearings provide even running. Suitable for both 16 in. and 20 in. Scanning Discs. Cat. No. M/1 Universal A.C. or D.C. Mains, 200-240 volts. A.C. 40-60 cycles or Battery Model. Cat. No. M/2 6-volt. Price

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B.T.S. Motor Stand for above 2/6.

B. T. S. SCANNING DISCS



Centre-boss is an 8-ribbed black Bakelite moulding faced white to give true Stroboscopic effect. Scanning holes perfectly punched to secure uniform scanning. Made in 2 sizes Cat. No. D/3 16 in. diam. Cat. No. D/4, 20 in. diam. 12/6. 7/6

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A QUEER CONTROL ROOM

"RELAYED from Sadler's Wells Theatre . . ."

That phrase frequently appears in the programmes. I went along to Sadler's Wells recently to see just how the relaying was done. It was a dusty job finding out!

By crawling right under the stage I found what must be the strangest B.B.C. control room anywhere. Indeed, to call it a "room" is ludicrous. It is merely a corner of a gloomy under-stage region littered with lighting and trap-door gear and odd-looking theatre "props."

Here were a couple of the B.B.C.'s "O.B." men—an engineer and a balance-and-control expert. They sat before a mixing panel and amplifier, both of which were duplicated. Should a breakdown occur during a relay, the duplicate apparatus can immediately be brought into circuit by the pressing of a switch.

Mixing the "Mikes."

The leads from five microphones came down from the stage above. Two of these mikes are the newer condenser "torpedo" type; the others are of the familiar octagonal-shaped Reiss carbon pattern. All five hang from the rail of the orchestra pit.

The stage at Sadler's Wells being comparatively small, there is no need to have any microphones actually on it to pick up players who move about during the performance. (This has to be done at Covent Garden.) If there is much movement of the artists a B.B.C. engineer stands in the wings, and by a system of flicking lights informs his colleagues below which of the five microphones the artists are nearing or are moving away from, so that the strength of these microphones can be modulated to suit their movements.

The relay had started when I visited Sadler's Wells. The balance-and-control expert, with the score of the relayed opera before him, was balancing the output of all five microphones in correct relation to each other and to the score, and only a foot above his head were the boards of the stage creaking and cracking with the rumblings and stampings caused by the dramatic movement of the artists! I have an intense admiration for that man's power of concentration! K. W. B.

'Twas Ever Thus!

(Continued from page 478.)

husband's face at this point of the oration. But he tested the matter by asking in a very casual tone:

"By the way, I hope they had a comfortable trip. They would do it in a few hours, I suppose."

Mr. Brewer's hand shot towards his pocket.

"Matter of fact, I'm waiting for a call now. She's late. That's Anne all over. Probably altered her mind and gone to Tokio. Excuse me a moment."

He took his Universal Communicator from his pocket, opened it out and polished the Vision Disc on his sleeve.

"M'm! Where's the Main Lines plug hole? Oh, here we are!"

He plugged in, placed the Receiving Disc to his left ear and began to speak to London.

"What? Oh, yes. Everest Hostel. Name of Brewer. Thanks."

Suddenly the Vision Disc became illuminated, and then a semblance of a woman's face appeared on it.

"Are you focused? London calling."

"Yes, thanks. Ah, there you are, Anne! Everything all right? What? Good gracious! When? How much? Phew! Right! I'll buzz off at once. Goo'-bye, dear."

Off to Everest.

Brewer unplugged and turned to his friends, with a comical look of distress.

"I say, I'll have to get on to Everest now. Where's my giro? Phew! Just what I expected. Nasty, draughty place."

"Young Bill's got a cold in the nose!"

"What about one of those rays?" suggested Sir Lionel, mildly sarcastic.

"Good heavens! This is serious, sir. Those confounded quacks can't cure even a simple thing like a cold. Bah!"

"Don't forget your Suavine," added the Professor as Brewer rushed out.

Two hours later, whilst seated before a bottle of Pre-Suavine Port, they called him up as he whizzed over Asia.

"How's the baby?" asked the Professor.

"Temperature gone up a degree!"

Sir Lionel took the Communicator.

"Just to warn you not to let young Bill go too near the yaks. They haven't abolished them yet."

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(Described page 252 of "P.W." dated 27/10/34.)

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S.T. 600

READ WHAT THESE TWO
ENTHUSIASTS SAY

AMAZING RESULTS.

Dear Sir—I had the luck to be present at your demonstration, and I feel it is my duty to thank you, as I was an uninvited guest; only my friend asked me to come along, and so I did, and I was very glad, too.

I wish to state my astonishment at the amazing results which were obtained. The clarity of reception, the width of range, the freedom from jamming and side-splash show that this set is quite out of the ordinary run of receivers.

The novel thing that I was most interested in was the way the Extractors remove all trace of monkey chatter after tuning; it struck me as extraordinarily effective.

Moreover, the fact that the set was used without an aerial, with little alteration in its range and power, will be a boon to flat-dwellers and others who have difficulty in finding the necessary space for an aerial.

I can only say that the S.T. 600's performance has to be heard before it can be believed, and I have no hesitation in recommending it to the public.

I think, when a set can pull long-wave stations in without an aerial, the set will speak for itself, as it did when I was at the demonstration.

F. J. SLAUGHTER, 63, Senegal Road, South Bermondsey, London, S.E.

61 STATIONS RECEIVED IN 2½ HOURS!

Dear Sir—As a builder of your S.T. 300, 400 and 500, I think I am qualified to criticise your latest set. The knife-edge selectivity will appeal to those with the wanderlust for foreigners, and your new gadget, which you call the Extractor, for cutting out the locals completely, surely and instantly, will fill the bill for those who have been troubled with these in the past.

The tone and volume is far in advance of your previous S.T.'s, and only a stone-deaf person could wish for more.

The fact that, with North Regional working, it was possible to receive Lyons and Sottens is a tribute to the new set. My log of foreigners was 61—47 on medium waves and 14 on long waves: and I consider this a tidy bag for one evening of about 2½ hours.

The tuning will appeal to everyone whose chief grouse previously has been "too many knobs," whilst the ease and silent working of the usual reaction and volume control knobs will not offend the most fastidious.

The aerial reaction acted with precision and brought up stations that were not audible before, and your "Spot system" of finding the stations is a great idea. The midget aerial was a good test for any set, and it made little difference to either reception or volume.

Altogether, I think it is a great set, and will far out-distance your other efforts in popularity, as the general arrangement of components seems to be far easier to get at than such sets as the "400" or "500."

I thank you for your kind invitation to see and hear your latest set, and I know that its builders will not be disappointed when they sit back to hear the S.T. 600 in all its glory. Wishing you all the success you desire,

J. E. DRAPER, 48, Wynford Street, Eccles New Road, Salford.

IN TUNE WITH XMAS
TUNE IN WITH COLVERN



Colvern coils for S.T. 600... the
most successful set of 1934

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SPECIFIED FOR THE S.T. 600

A.C. RECEIVER: 1

S.T. 600 Coil assembly.

Type D.S. Per pair 12/6

1 S.T. 600 Ferrocart

Extractor Coil. Type

T.F.6 - Each 8/6

1 Volume Control

5,000 ohms graded,

with on/off switch. Type

S.T.S. C.S. - Each 5/3

BATTERY RECEIVER: 1

S.T. 600 Coil assembly.

Type D.S. Per pair 12/6

1 S.T. 600 Ferrocart

Extractor Coil. Type

T.F.6 - Each 8/6

1 Volume Control

25,000 ohms graded,

with on/off switch with

terminals. Type F.T.5

C.S. - Each 5/9

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B.4.

If you would like a copy of our Ferrocart Booklet please put a X here.....

OPERATING THE S.T.600

(Continued from page 490.)

consisting of a metal disc which, by turning a star-wheel at the back, is made to move near to or farther from the back part of the condenser. Particularly avoid screwing up this star-wheel too tightly, as it may then slip and the condenser becomes useless. Also avoid unscrewing it tightly in the opposite way.

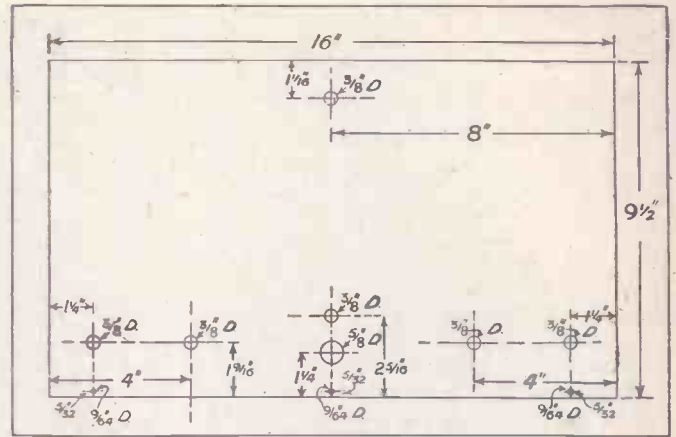
Once the star-wheel turns without giving the trimmer disc a full movement, the condenser should be returned to the makers.

When you first get the condenser you should look closely to see that both trimmers open and shut properly. If either were to stick or not open adequately, it would be useless. But in the test, and when ganging, do not use excessive force at the end positions.

The way to gang the Formo condenser is as follows: Arrange both trimmers wide open. This is done on the front trimmer by turning the little concentric trimmer knob at the front full right (clockwise, looking from the front). The rear trimmer is opened by turning the star-wheel to the right (i.e. clockwise), looking from the back

of the set. I advise you actually to look at the movement of the trimmers. I shall speak of opening and closing the trimmers; opening results in decreasing the capacity, while closing increases the capacity. The rear trimmer star-wheel is conveniently turned by poking at the spokes with the end of a pencil held vertically.

A rough-and-ready way to gang is as follows: Close the rear trimmer to about half-way. Then tune in to a station towards the bottom end of the medium waveband, using anode reaction. The front trimmer is adjusted until loudest results are obtained. It is necessary to use plenty of anode reaction for this test, and the signal must not be too strong; if



The S.T.600 panel drilling dimensions are given in this diagram.

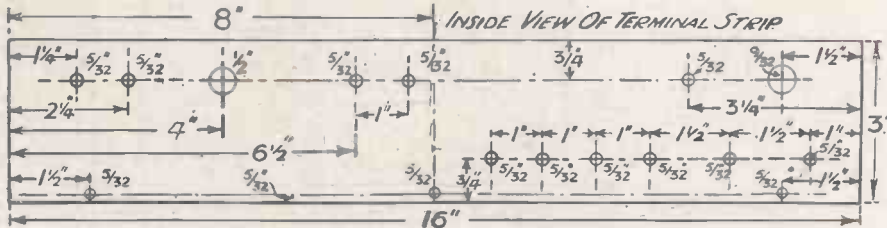
strong, you must cut it down with the volume control.

The Lower End of the Band.

The above method is strongly advised for all. If you find the front trimmer has to be fully closed to receive the station at its loudest (after tuning the main knob), you should close the rear trimmer more. If best signals are obtained with the front trimmer wide open, you should open the rear trimmer more.

There is only one point where the beginner needs guidance. He may find that he can obtain stations perfectly well, but that he cannot quite "get down to," say, Bournemouth or Fécamp. If this is so, he should slacken off (i.e. open wider) the

(Continued on next page.)



The S.T.600 terminal strip and the positions of the holes required are indicated above.

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OPERATING THE S.T.600

(Continued from previous page.)

rear trimmer until, after the usual operation of the main knob and front trimmer, these stations are perfectly received.

My own method of ganging is simply this: Set both trimmers wide open. Turn the front trimmer knob just less than half a complete turn anti-clockwise (to the left). You can watch the grub-screw. Tune in Fécamp, using anode reaction. With a pencil held vertically give the rear star-wheel little pokes to turn it slightly. After each little poke remove pencil and tune the main knob till Fécamp is loudest. As you go on poking, Fécamp will no doubt get louder and louder. When at its absolutely loudest the set is O.K. Another poke and signals would begin to fall off.

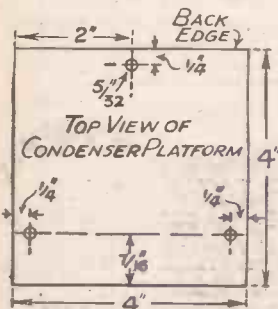
The final test for ganging is this: A movement either way of the main tuning knob should weaken signals. Also a movement either way of the front trimmer should weaken signals. If this happens you are perfectly ganged.

This operation is the simplest ganging process in any radio set designed. Ganging has acquired a reputation for some difficulty, but not on this type of condenser or circuit.

The job takes only a few minutes, and is thereafter never altered.

S.T.600 Mains Unit Connections.

Mains units, sometimes called eliminators, work excellently with the S.T.600. The



Cut and drill the gang condenser platform in accordance with these details.

decoupling in the standard set is generous, and is specially designed so that the set, without any alteration whatsoever, will work perfectly off these useful devices. The only condition is that you use the Niclet transformer specified.

Other transformers may call for special decoupling, and the extra cost of this would exceed the cost of the Niclet. The set works very well on either the Atlas A.C.244 or the Ekco A.C.18, but later or bigger models can be thoroughly recommended.

The H.T. +1 terminal of the S.T.600 is connected to the S.G. socket. If there are two sockets marked "High" and "Low," insert the plug first in the "Low" one. The H.T. +2 terminal is connected to the middle voltage on the mains unit. For example, the A.C.18 has sockets marked "VAR. 50-80"; the H.T. +2 may be connected to the middle voltage first.

The H.T. +3 is always connected to the MAX. voltage on the eliminator.

J. S.-T.

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Prices: Chassis only.

Type M6, 25/-

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In M6 Cabinet, 22/6 extra.

Other Models up to £10.

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A LOUDSPEAKER IMPROVEMENT

Details of a new material for rendering cabinets non-resonant.

IF you want to get the very best results from a loudspeaker and are prepared to waive other considerations, then the last thing you should think about is a cabinet.

You should use a large baffleboard, the larger the better. But not many of us are desirous of accommodating six-foot-square or larger heavy wooden screens, and so it can be said that, for all practical purposes, loudspeakers of necessity have to be housed in cabinets.

True, there is the further alternative of having neither baffleboard nor cabinet, but that alternative carries with it the drawback that all the low notes are lost.

By using a cabinet a very fair proportion of the low notes emitted from the front of the diaphragm can be protected from the nullifying effects of those which wander round from the back.

But when a mass of air is enclosed there is a danger of resonance effects, and it is cabinet resonance or boom which tends to mar the performances of many otherwise good speakers.

Much research has been directed at the elimination of "box resonance," and with mixed success.

The newest development in this quarter is due to Radio Acoustics Co., of 15, Pembroke Road, Walthamstow, E.17. This company has produced a substance known as "Non-Resona." It is of paste-like consistency, and can be applied to the interior of any cabinet or to the surface of a baffleboard just as easily as a coat of paint.

A layer of about an eighth of an inch in thickness is applied, and the surface broken into irregular lines or waves with the aid of a special tool which is supplied.

The substance sets very hard, and it is truly claimed that, in addition to its acoustic properties, it strengthens the cabinet mechanically. It is also a good insulator, is non-inflammable, and remains hard and firm and unaffected by either age or atmospheric conditions.

Eliminates Reflection and Resonance.

The theory of its action is that it breaks up the sound waves generated inside the cabinet and does not allow wave reflection and resonance to occur. We ourselves would add that "Non-Resona" also adds to the thickness and density of the cabinet walls and prevents them from being contributory causes by vibrating.

We conducted our tests of the substance in this way: We had two cabinets exactly identical in construction, each embodying exactly similar loudspeaker units. A change-over switch from our standard amplifier was arranged.

The one cabinet had its interior treated with "Non-Resona" and the other was quite normal. It was quickly apparent that "Non-Resona" is a success. The difference between the two instruments was most marked, the one treated with "Non-Resona" giving a noticeably cleaner response. As a check, two different loudspeaker units were brought in, but the result was unaltered.

(It should be mentioned that the two cabinets were supplied to us by Radio Acoustics, but we were easily able to calculate that their natural characteristics in an untreated condition were, as we have said, exactly similar. The speaker units and all the other apparatus employed in the tests belong to our Research Department.)

It costs only 5s. 6d. per pint, and this is sufficient to treat a medium-sized cabinet.

FACTS ABOUT RADIO WAVES

DID you know it was possible to cook the yolk of an egg and leave the white untouched? Probably your first reaction to that question is to ask: "What on earth has that got to do with radio?" and then, getting a little curious: "How is it done, anyway?"

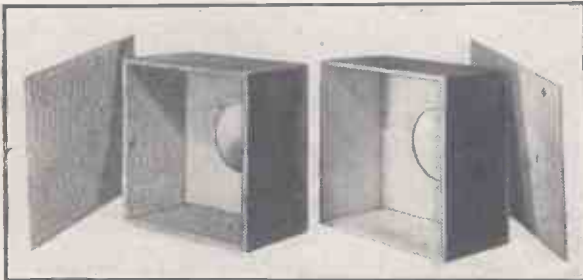
Well, it's done by subjecting the egg to ultra-short radio waves of a certain frequency. And now you know how it's done, you also know what it's got to do with radio.

It is certainly a very interesting fact, but so are all the other facts contained—and explained—in "Radio Round the World," by A. W. Haslett. This is one of the most interesting books connected with radio that I have read for some time, and is well worth the 5s. which it costs.

This book tells you: What wireless waves are; how they travel round the world; and how the sun helps them on their way; their world-wide applications in television, medicine and communication. In addition, day-to-day problems, such as atmospherics and fading, are explained and solved.

In fact, this work tells you *everything* about radio waves in a very readable and easily understood manner. And no knowledge of radio theory is presupposed.

Personally I found Mr. Haslett's book, which is published by the Cambridge University Press, as absorbing as a good novel. A. S. C.



The cabinet on the left has been treated with "Non-Resona," while that on the right is untreated. These are the two cabinets used in the "P.W." tests.

PEP UP your Set for Xmas

There is no better way of improving your set than fitting a new Blue Spot Speaker. You will be astounded at the difference. The realism, the beauty of tone, the increased clarity will delight you. There is no need to buy a new set—a new Blue Spot Speaker is all you need. And by the way, Xmas is just the time to fit up extension speakers throughout your house. Ask your dealer.

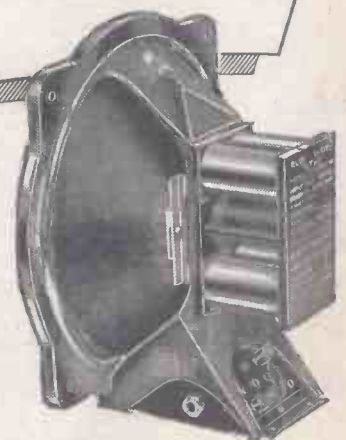
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4. Universal matching to any set in a second or two.
5. Independent on/off switch.
6. Die cast chassis.
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8. New speech coil design.

REMOTE VOLUME CONTROL & ON/OFF SWITCH. A special addition to the "Star" speaker which confers the unique advantage that this speaker can be controlled from the armchair. A valuable Christmas present. Price 10/6. Send for pamphlet P.W.2 about Loudspeakers. It will interest you.

BLUE SPOT "STAR" JUNIOR. This is an exceptionally fine speaker at a very attractive price. The "Star" Junior gives a greatly extended response and the reproduction is amazingly natural and vivid in every detail of speech, song, or instrumental music. Price 35/-. Cabinet model in oak and chromium, 48/6.



CHASSIS PRICE 70/-

Cabinet Model in Walnut and Chromium 98/-

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With universal transformer, 1-20 ohms and 2,000 to 40,000 ohms. 7" Cone. Cash or C.O.D. Carriage Paid, 47/6. No extra cost for easy terms. 5/- down and balance in 10 monthly payments of 4/3.



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As supplied to B.B.C.

65/- Polished Cabinet for 35/- No Middle Profits!

Famous maker offers finest Radio Furniture. As Supplied to B.B.C. A Quality and Value impossible to better. Beautifully hand polished! GUARANTEED Piano Tone Acoustically.

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AMPLION WIRE-WOUND RESISTORS

An efficient and inexpensive range covering all values.

AS we believe we have pointed out before, Amplion's great popularity as manufacturers of good loudspeakers may tend to make some constructors overlook their other important activities of value and interest to all who assemble sets.

For example, they make a full range of dependable resistors of the wire-wound type. In the accompanying photograph you see a full show-card of them.

There are no less than thirty values ranging from 50 ohms to 100,000 ohms. They are colour-coded; that is to say, their values are denoted by means of plain, bright colours.

The colour of the body indicates the first figure in the value: Brown for 1, Red for 2, and so on. One end or tip is coloured to indicate the second figure, while a spot of colour on the body is indication of the number of final noughts.

This code is, of course, standardised by all the manufacturers, but not carried through with equal success, in our opinion. In some cases the colours are rather flat and not quite as distinctive as they might be.

This cannot be said of the Amplions, for, as we have already said, their colouring is bright and clean.



Look out for this card in your dealer's window.

The actual code is printed in full at the bottom of the display card you see in the photo, although we don't expect you will be able to read it owing to the necessary reduction in size.

Now, it should be noted that these Amplion 1-watt wire-wound resistors are of the wire-end type. Instead of either terminals or soldering tags or metal tips for connecting to a holder there are pliable tinned leads at the ends.

Wire ends can only be used with small, light components; in the case of resistors they are ideal and make it easy to wire them into circuit with or without soldering.

The Amplion resistors are also distinctively and efficiently designed. The windings are carried on tiny insulating formers, the ends of which are left open. Thus, even if there were appreciable temperature rises, which there are not, so long as they are not asked to carry current in excess of that for which they are designed, the heat would be quickly dissipated through the most satisfactory system of all—air ventilation of extremely generous proportion.

We tested the resistances of the full range of samples sent—the whole thirty different values—and found them to be accurately rated. Certain tolerances are permissible, but in instances the Amplions were found to be dead right, while such plus or minus deviations as did exist were completely negligible.

As for their reliability, in our opinion constructors will find the Amplion resistors entirely dependable. And in giving prominence to a dependable wire-wound resistor which sells at the most attractive price of 1s., we feel that we are doing the constructor movement a good turn.

Your Volume of
THE BOOK OF PRACTICAL RADIO
is Now Ready.
See page 450.

Easy Terms

ALL MANUFACTURERS' COMPONENTS and ACCESSORIES in STOCK. SEND US YOUR ENQUIRIES.

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For Power, Pentode and Class B. Send only 2/6, balance in 11 monthly payments of 3/-. Cash or C.O.D. Carriage Paid, £11/12/6.

2/6 DOWN

W.B. Stentorian SENIOR Model. Cash or C.O.D. Carriage Paid, £22/2/0. or 2/6 deposit and 11 monthly payments of 4/-. W.B. Stentorian BABY Model. Cash or C.O.D. Carriage Paid, £11/2/6, or 2/6 deposit and 9 monthly payments of 2/6.



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EVERY PART GUARANTEED—MATCHED—PROVED—TESTED. Complete with FIRST Specified FORMO 2-GANG CONDENSER, COLVERN S.T.600 MAIN COIL ASSEMBLY and COLVERN S.T.600 EXTRACTOR COIL, and with FREE FULL-SIZE BLUE PRINT and copy S.T.600 issue of "Popular Wireless," including S.T.'s 100 STATION SPOT-ON DIAL and other P.W. Gift.



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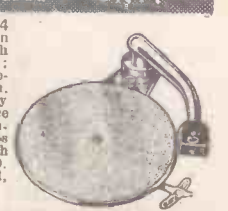
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WHAT I THINK

Candid Comments by our Broadcasting Critic on Recent B.B.C. Programmes.

IT has been a week of only average interest. I was disappointed with the opening of "Charing Cross Road," for the music and singing were not the kind to set one humming or beating time with one's fingers or feet as one sat by the fire. However, we were rewarded for hanging on, for the dialogue proved to be quite interesting.

Undoubtedly, the piece will be long remembered because of the fine bit of work by George Carney as McWilliam, the old professional and boarding-house keeper. He sounded as human as anyone I have ever heard on the wireless, and, so far as "Charing Cross Road" is concerned, he must be awarded the palm. I think the show would go on this alone, if enlarged, and most of the music cut out.

I have long held that radio authors cannot attach too much importance to the opening scenes of their productions. On the stage a poor beginning can always be retrieved. Indeed, an audience will often completely forget it when the thing begins to grip them. In the case of a wireless production a poor start often means an abrupt switching off, and the good wine that is kept in reserve is never tasted. I mention this because there have been one or two things of late that have been a long time getting off the mark.

It is not often that Mr. Val Gielgud comes to the microphone, but when he does he always has something interesting and sensible to say. His little statement about the Drama Department's New Year's plans showed that he has paid the closest attention to the huge post he received following his appeal for the listener's point of view. May we say,

Are You Buying a NEW SET FOR CHRISTMAS?

IF YOU ARE don't miss the SPECIAL "LISTENERS' SERVICE" SECTION NEXT WEEK.

IF YOU ARE NOT don't miss it just the same, it is Full of Interest to all Readers of "P.W." NEXT WEDNESDAY. Price 3d.

in passing, how much we appreciated the opportunity he gave us on that occasion?

As a Gielgud he is, of course, all for Shakespeare, and his special mention of comparatively unknown "Troilus and Cressida" will no doubt give rise to some discussion, besides causing the production to be eagerly looked forward to. I was glad he referred to the all-important question of "How long should a radio play be."

Probably, on Sunday, time need not be seriously considered when a Shakespearean play is presented; but on week-days, when most of the family want something of their own special fancy on the wireless, there is bound to be a certain amount of unrest if a play runs too long. It is too much to ask all those in the room to be as still as mice, and it is quiet that is required for a play more than for any other item.

Readers of these notes are familiar with my views on Tchekov and such depressing plays as "Ivanov." I fancy a good many other people are in agreement with me and have bombarded Mr. Gielgud with letters of protest, for he made special reference to the next Tchekov production. His judgment appears to favour the Russian author's work, and his plea for a further trial was so excellently put forward that it behoves us to give "The Three Sisters" a fair hearing.

As Drama Director Mr. Gielgud has to be on duty on most play nights, but it would pay him, I'm sure, to be, now and again, one of a party listening in at an ordinary suburban home.

There have been few more outstanding parts on the radio than "Mary" in "Chimera," Roland Crossley's play broadcast recently. Gwendolen Evans excelled herself, and in no scene more than the love-making episode with "Bill" (Philip Wade) in Hyde Park. "Chimera" may be dismissed by many as a play for lowbrows only. But is it not a faithful interpretation of the working of an ordinary woman's mind?

I sometimes wonder whether broadcasting has increased the number of things that appear to be happening these days, or whether these things had always happened before the days of broadcasting, only we remained in blissful ignorance of them. It is a fact, however, that broadcasting programmes (I am thinking principally of talks now) do, as the seasons come round, always provide us with a fresh series of lively topics.

It is also interesting to note that the manner of spreading this information via the ether isn't by any means fixed. Last week in these notes I was content to say about the item "Moonstruck Fish" that it was intensely interesting. I would like to say a little more on the subject this week. I am quite certain that, had the story of the herring been told in the old-fashioned way, the stage comedian's repertoire would have been enlarged to the extent of at least one more joke.

It is a controversial question, of course, as to how a wireless talk can best be given, but I have no doubt in my own mind that the method of "Moonstruck Fish" is as near the ideal as at present one can conceive the ideal. There is always the danger of over-acting a part, and broadcasting is particularly exposed to such a danger.

But provided that the people concerned exercise reasonable restraint and realise the present limitations of the microphone, they won't go far wrong. We listeners recognise the experimental nature of their work, and we realise also that experiments can be failures as well as successes. Anyhow, carry on with the good work, you pioneers, and good luck to you. C. B.

SOME SEASONAL HINTS

(Continued from page 457.)

the set was on the ground floor. But there's a moral there—if you can find it.

It's a grand picture to think of hundreds of thousands of constructors all over the country bending over their friends' wireless sets putting them right during the season of good will; but there's no more chance of the average constructor locating a fault in a dud commercial set than there is of his finding currants and sugar in a Belisha beacon.

No, it's best to leave those things—the commercial sets, I mean—to the service men. But there are still the millions of home-built radios which are fair game for all the roll-your-own fraternity. Things to look for in these are: dud valves, worn-out batteries, loose connections, dust and cigarette ends. Extraordinary what a little tobacco ash can do to a Bach Cantata!

My Latest Set

Talking about sets, which I am supposed to be doing, I bet there aren't more than a score of readers who know the name of the last set I designed. And yet it has been handled by at least three million people already, and it's still going strong. Stronger than ever, in fact.

While you are thinking out the answer to that one I'll tell you about the constructor who wouldn't build the "P.W." "Air-sprite" because of its A.T.B., as he had a weak chest. (No, Percy, A.T.B. means Automatic Tone Balance.)

My last set? A set of cards—"Grandfather's Whiskers." Alone I done it; and if all you "P.W." readers don't buy at least one pack each I'll never write to you again.

HENRY HALL GETS READY FOR CHRISTMAS

BROADCASTING HOUSE, as most people may have heard, is inadequate to the requirements of the B.B.C. as regards studio accommodation.

One of the problems has been to accommodate Henry Hall and the B.B.C. Dance Orchestra, who, with their rehearsals and daily appearances before the microphone for broadcasting, require the continuous use of a studio for themselves.

Henry and the "Boys" have already had several changes in studios at Broadcasting House, and with the opening of the Maida Vale studio they were pushed over to the old No. 10 studio on the other side of Waterloo Bridge.

At one time it was not anticipated they would remain there for long, and negotiations were started to take another studio for their exclusive use near the London Palladium in Argyll Street.

Staying at No. 10.

Now the chances are distinctly in favour of the B.B.C. being able to retain the use of No. 10 until 1936, so here Henry and the "Boys" are to remain, at any rate for a time, even for Mr. Hall's "guest-night" broadcasts, which may or may not seem quite the sort of place to which to invite distinguished people.

In due course a new studio, specially constructed for dance-band requirements, will probably be built at Maida Vale. If and when that happens, Henry Hall and the Dance Orchestra will have yet another home, which may serve them for a long time.

Meanwhile, quite undaunted by small things, Henry Hall is busy with his arrangements for some interesting features for the Christmas season.

Some are designed for the children, others for entertaining parties.

The normal dance-music transmissions will go on as usual, and Henry is also organising a special feature consisting of reminiscences of pantomime, in which he hopes to bring some of the stars from various London pantomimes to work their "hits" into his programmes.

Let me give you a glimpse of Henry's plans for the Christmas season.

Saturday, December 22nd: "Guest Night," with a seasonable presentation of London stage stars.

Special Kiddies' Programme.

Monday, December 24th: Feature programme for the children, with tunes for games and, of course, dancing. Don't forget that Henry has kiddies of his own and knows the sort of stuff that youngsters like.

Tuesday, December 25th (Christmas Day): A Christmas party programme from 7.30 till 9.30 p.m., with comedy numbers by the Band and lots of other frolics. Then from 9.40 p.m. straight dance music will be played.

Wednesday, December 26th (Boxing Day): A 5.15 p.m. feature for the children, with tunes the youngsters can sing or play games to.

Henry Hall and the Band will also take part in the New Year's Eve programme, as will also the Savoy Bands. O.H.M.

CHRISTMAS DELIVERIES

Ensure early delivery of your radio requirements by entrusting your order to us. Our central position enables us to supply much equipment of which at present there is a shortage.

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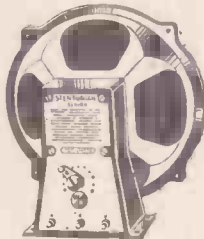
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Complete kit of parts for this remarkable set exactly as used by Mr. Scott-Taggart.

KIT A Complete parts. Cash or C.O.D. £4/19/6

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Senior P.M. Speaker.

Cash Price £2.2.0 or 2/6 with order and 11 monthly payments of 4/-

Standard P.M. Speaker.

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Secures delivery

New Rothermel - Brush Piezo-Electric Pick-up. Cash price £2.2.0 or 5/6 with order and 8 monthly payments of 5/-.

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Graham Farish Raider Kit, with valves. Cash price £5.6.8 or 10/- with order and 11 monthly payments of 9.8.

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Every type of valve replacement supplied on convenient terms. 3 Valves, Mullard, Cossor or Marconi, S.G., Det., Power. Cash price £1.5.0 or 5/- with order and 5 monthly payments of 4/7.

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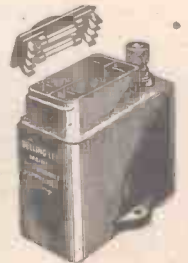


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JOHN SCOTT-TAGGART, M.I.E.E., F.Inst.P., who has granted us the sole concession.

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Every S.T.600 builder will need one of these handsome dials which will give the S.T.600 the true professional touch.

Our dials are given a special finish, which enables the "spots" to be put on with either pencil or Ink, and

THESE DIALS ARE WASHABLE

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Orders should be sent direct to us accompanied by Postal Order for 2s. 6d. The Dial will be sent by return post. Kindly use form below.

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Please send by return post one S.T.600 Ivorine Dial. I enclose Postal Order 2s. 6d. to cover all costs.

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Transformers and Headphones, 4/-, Eliminators, Mains Transformers and Moving Coils quoted for. 24-Hour Service. Trade Discount. Clerkenwell 9069. E. MASON, 44, EAST ROAD (nr. Old Street Tube Station), LONDON, N.1.

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RADIOTORIAL

QUESTIONS AND ANSWERS

ADDING TRIMMERS TO AN OLD GANGED CONDENSER.

F. G. A. (Hammersmith, London, W.6).—"I have a twin ganged condenser which I wish to use, but it has no trimmers on it. Is there any other method of trimming them, or do you think that it won't make that much difference?"

"I would not ask you this if I could afford to buy another, only I am like many others, unemployed."

It is quite possible to add small condensers to act as trimmers. But they must be mounted very close to the sections which they trim, they must be of low capacity, and they must be finely adjustable.

The close mounting is easily managed in most sets of basboard design. And the other two requirements are well met by the old types of "neutrodyne" condenser, especially by those with long extension handles for adjustment.

(Generally speaking, the very low-capacity pre-sets are worth trying, but the more robust "neutrodyne" with their rotating action are better.)

CORRECT RATIO OF THE L.F. TRANSFORMER.

J. H. (Glasgow, W.3).—"What is the ratio of the low-frequency transformer in the 'Double-X Three'?"

"I think the one I am using is the wrong transformer, it being ratio 1:3; but I understand that a circuit with only one low-frequency stage requires a transformer of 1:4 or 1:5 ratio."

The 1:3 ratio (or 1:3½) is suitable for the "Double-X Three." It is not a rule that higher ratios should be used for one stage of L.F. amplification.

A ONE-VALVE REGENERATIVE CIRCUIT.

W. H. E. (Pembroke Dock).—"I have recently come across a rough diagram of a circuit suitable for a one-valve set which is called the 'Armstrong Regenerative Circuit.'"

"It is, however, so little like present-day layouts that I fear it must be rather an out-of-date system, unless, of course, it is wrongly drawn."

"I should be obliged if you could give me any information with regard to the necessary components for such a set, and also a diagram, if possible."

Although the Armstrong Regenerative is out of date in the sense that it is not in such common use as formerly, it still has much to commend it. The sensitivity and volume are amazing, and its chief drawback—a high-pitched whistle all the time it is in use—could probably be overcome sufficiently well by experimenting with an L.F. tone control in the form of a small condenser across the loudspeaker.

We have no blue print of such a circuit, but, although unusual in appearance, it can be made up quite well from the theoretical diagram if you are careful with layout.

Should it fail to oscillate at first, reverse the connections to one of the oscillator coils. But don't forget it must be used with a frame aerial, and will be prone to cause interference to neighbouring listeners owing to its strong oscillation.

RESULTS FROM AERIAL REACTION.

V. R. E. (Stockton).—"With the '600' almost finished, I want to pass on the '500' to a friend. But he has been reading up what Mr. John Scott-Taggart said about aerial reaction, and he says I have got something wrong."

"As a matter of fact I think he's right, but it was always so beautifully clear and powerful, and it got so many programmes as it was, that I did not bother to get the last ha'p'orth out of it."

"However, I should like to get it perfect before he takes it over. So can you tell me how to get proper aerial reaction?"

Unsatisfactory aerial reaction on the S.T.500 may be due to a reversed reaction winding on the aerial coil.

You can check this by changing over the connections to its 1 and 6 terminals, which will immediately right a coil if its sole fault is wrong direction of winding.

If your coil proves O.K., you should re-read what Mr. Scott-Taggart says about the set's operation in the articles he wrote about it.

Aerial reaction is usually only necessary when it is desired to increase the set's selectivity.

The Editor will be pleased to consider articles and photographs dealing with all radio subjects, but cannot accept responsibility for manuscripts or photos. Every care will be taken to return MSS. not accepted for publication. A stamped, addressed envelope must be sent with every article.

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

All inquiries concerning advertising rates, etc., to be addressed to the Advertisement Offices, John Carpenter House, John Carpenter Street, London, E.C.4.

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

Also remember that it is wrong to attempt to increase selectivity by increasing reaction without a corresponding reduction of one or both couplers (aerial and anode). They should be set quite low, to the left of their half-way position.

For medium waves you then need the aerial coupler quite near its full-left position—one-sixth of the available movement, or less, is usual. In conjunction with a moderate degree of anode coupling this will probably enable the desired effect to be obtained.

INTERFERENCE FROM ADJACENT TELEPHONE WIRES?

F. J. H. (Taffs Well, Cardiff).—"I wish to ask your advice on a matter that has been on for months. I have a straight 3 set worked from batteries. When listening on the medium band I had what sounded to me like a one-sided talk on a telephone, the strength being nearly as strong as the West Regional (our local)."

"I could only cut this out by going over to the long waves, so wrote the B.B.C. In time an engineer from the Post Office called and

(Continued on next page.)

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Listen critically to the new "All-wave Hyvoltstar Super-het Five," and we have no fear of your verdict. Fidelity of tone, volume and keen selectivity. It satisfies in every particular. ANY MAINS and VOLTAGES, either A.C. or D.C. It covers Ultra-Short Wave bands as well as Medium and Long. No Mains Transformers, Barretters or Cut-down Resistances, hence the moderate price for a super-grade instrument with every refinement. Table Model, 18 gns. Table Radiogram, 24 gns. Chassis with Valves, 14 gns.

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S.T.600 is a fine circuit. But why not build it to operate on ANY VOLTAGE, ANY MAINS CURRENT, A.C. or D.C., without Barretters, Cut-down Resistances or Mains Transformers. In short, build it with genuine Austrian OSTAR-GANZ Universal High-Voltage Valves. They take current direct from the mains and are far ahead of any other Universal Valve you can buy. Technical advice willingly given. Write for interesting Leaflet D, and details of our KITS for Amplifiers and Receivers.



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RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from previous page.)

tried with both the set aerial and earth disconnected.

"After the second visit this unwanted station still came in. I've tried a few fixed and variable condensers in both the aerial and earth (of different values), but somehow it does not improve matters. I have written again to the P.O. engineer and have thought of moving my pole at a different angle to what the aerial now runs, but would appreciate your advice on this matter."

Yours is an unusually difficult case, but there certainly ought to be some way of ridding yourself of the nuisance.

We suspect those telephone wires, but we admit that such a case needs investigation on the spot, so the P.O. man is better placed than we are to judge.

Keep it at Right-angles.

The aerial position which gives least aerial pick-up from the wires is the one you have adopted at present—at right-angles. So shifting to another probably won't help, unless you shorten the distance between the wires and aerial. The effect of a shorter aerial might be to give a greater reduction in the interference without much loss of signal-strength, so that is worth trying.

Another dodge, sometimes very successful, is to erect a screen between the 'phone wires and the aerial.

The screen can take the form of a number of wires, like an indoor aerial, placed between the 'phone wires and your aerial. Join them all together at one end, and earth them there.

They should be suspended to run parallel with the 'phone wires (and therefore at right-angles to your aerial), the idea being that they will tend to intercept the interference, and shunt it to earth.

H.T. DERIVED FROM HOUSE-LIGHTING PLANT.

D. S. (or D. T.) (Broomfield, Chelmsford).— "I have a three-valve battery receiver with three H.T. + leads. The lighting in my house is by a 100-volt plant (D.C. of course).

"As the highest voltage required in my set is 100 volts, would it be possible to run the H.T. from the lighting current? If so, how? And what would be required to do so?"

The supply from a house-lighting plant is usually very well suited to give H.T. to a wireless set, but upon the exact nature of the supply—whether from batteries, or generator, etc.—will depend the amount of new apparatus you will require.

In some house installations the D.C. generator is used only for recharging the batteries, and so the light-switches have to deal with pure battery current, at 100 volts. To adapt this for three wireless H.T. + tapping needs but little alteration.

Some form of two-way plug would be necessary to make a connection from the lighting mains, and one side of this would be — and the other side +.

You would need a 20,000 ohms potentiometer, capable of carrying a current of 15 milliamps or more, and this potentiometer would need to be permanently connected across the "+" and "-" terminals of the mains.

Its — terminal would then be to H.T. — on the set. The slider or variable tapping on the potentiometer would give any intermediate voltage, according to its position, and this would be the (say) H.T. +2 terminal.

It is probable that these (one — and two + terminals) would be sufficient, since two of the set's H.T. + terminals can usually be joined together in such circumstances quite successfully.

Another H.T. Tapping.

But if a third H.T. + terminal is essential it could be obtained by joining two 25,000-ohms resistances together in series across the mains, and taking an "H.T. +1" tapping from the junction of the two resistances—this would pass a current of two milliamps, and would be quite sufficient for the detector valve's H.T. supply.

All the decoupling necessary should be already in the set; so if yours is such a house-lighting system it is easily adapted to wireless usages.

But if, on the other hand, the house-lighting current does not come direct from the 100-volt battery, but is D.C. from a generator, you will need some form of smoothing apparatus as well, to prevent hum.

The easiest way to get this is to buy a D.C. mains unit—just a simple one, having an output of approximately the value of the set's H.T. current. This unit would then be connected up to the mains just like it is when used with a public electricity supply, and its terminals would then take the place of the corresponding battery terminals.

S.T.600 LET THE "SWIFT" S.T.600 BE YOUR XMAS ENTERTAINER

VARIETY, MUSIC, DANCING, CONCERTS, ETC., FROM ALL COUNTRIES AT YOUR FINGER TIPS WITH A "SWIFT" GUARANTEED KIT.

EXTRACTS FROM CUSTOMER'S LETTERS.

"I feel I must write and thank you for your prompt delivery. . . I have unpacked same and find everything in good order."—J. Mc.—GLASGOW.
 "Many thanks for prompt delivery. . . I have completed set and am well pleased with its performance."—A. F. LANC'S.
 "Thanks very much. . . Everything is O.K. and perfectly satisfied with reception."—A. A. S. KENT.

READY FOR IMMEDIATE DELIVERY.

CASH OR C.O.D.

BATTERY MODEL.

1 Colvern main coil assembly	12 6
1 Extractor coil	8 6
1 Formo 2-gang .0005 condenser with special pointer	11 0
1 Graham Farish .00075 reaction condenser	3 6
1 .0005	2 0
1 .0005 Log mid-line	2 0
1 1-mfd. mica bridge	4 0
1 2-mfd. "	6 0
1 .5-mfd. "	1 9
1 .00005 fixed mica	6 6
1 .0003	1 0
1 .006 tubular	1 0
1 .0003 differential	2 0
1 Disc H.F. chokes	4 0
4 4-pin valve holders	4 0

A.C. MODEL.

1 Colvern Extractor coil	3 6
1 main coil assembly	12 6
1 Formo 2-gang condenser	11 0
1 Mains transformer, Varley E.P.37 or Heayberd W.31	1 5 0
1 R.T. smoothing choke D.Y.51 or Heayberd 752	13 6
1 Westinghouse H.T.8 rectifier	18 0
1 B.T.S. .0005 variable condenser	3 0
1 .00015 differential condenser	3 0
1 Amplion 4-mfd. condensers	1 0
1 Colvern 5,000-ohm volume control	1 3 3
1 Bulgin 50,000-ohm potentiometer	3 6
1 "Swift" .0005 Extractor tuning condenser	2 6
1 Bulgin combined twin fuse-holder and mains connector F.15	3 0
1 Graham Farish .0005 reaction condenser	2 0
1 tubular condensers	4 6
1 .0003-mfd. mica condensers	2 0
1 .0005-mfd. "	1 9
1 .5 Mica bridge	4 0
1 1-mfd. "	3 0
1 2-mfd. "	1 4
1 T.C.C. .02 tubular condenser, type 300	2 0
1 Dubilier 50-mfd. condenser, type 3001	2 0
1 Graham Farish disc H.F. choke	2 6
1 screened H.F. choke	12 0
1 T.C.C. 8-mfd. electrolytic condensers, type 802	1 0
1 Teisen terminal blocks	2 6
1 Claude Lyons 30-ohm "Humdinger"	3 9
1 Graham Farish 7-pin valve holders	9 0
1 Erie or Dubilier 1-watt resistors, as specified	1 0
1 grid leak, 1-meg.	3 0
1 Graham Farish ohmites (500,000 and 500 ohms)	3 0
1 Drilled terminal strip, 16 x 3, with Belling-Lee terminals	FREE
1 Metal-covered baseboard, 16 x 10	FREE
Necessary wire, flex, screws, etc.	FREE

1 Colvern 25,000-ohm v/control with 3-point switch	5 9
1 Varley Njet L.F. transformer, 1-3-5	7 6
1 "Swift" .0005 Extractor tuning condenser	2 6
10 Belling-Lee type "E" terminals	2 6
1 wanders plugs	1 0
2 Athoo 1-watt grid leaks and holders, 1 meg. resistances, (specified values)	1 9
1 Polished Oak panel, 16 x 9 1/2, drilled	FREE
1 Terminal strip, 16 x 3, drilled	FREE
1 Metal covered baseboard and platform	FREE
Necessary wire, rubber flex, screws and spade terminals	FREE

COPY "P.W." with Blue Print and free gifts sent with every kit.

CARRIAGE PAID, KIT "A" £4 5 0

1 Set "362" Valves, Battery Model	£1 6 0
1 Set Hivac Valves, Battery Model	£1 4 3
1 Set "362" Valves, A.C. Model	£1 19 0

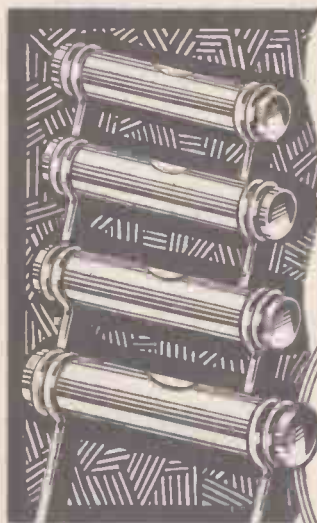
These valves are tested in an S.T.600 set and are guaranteed. Sent Carriage Paid.

LOUD SPEAKERS.

W.B. Stentorian Senior (PMS1) L/S	£2 2 0
Rola F6-P2000 L/S	£1 15 0
Rola FR5-PM1 L/S	£1 9 6

All standard components and accessories can be supplied.

The SWIFT SERVICE & SUPPLY CO.
 3 FEATHERSTONE BUILDINGS.
 HIGH HOLBORN, LONDON, W.C.1. P.W. X.N.
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"S.T.600"

Mr. Scott-Taggart SPECIFIES

ERIE RESISTORS

the safest and most stable of all carbon resistors! Eries specified for 8 out of the 10 resistors required for the A.C. "S.T.600." Eries specified for both A.C. and battery models. Every designer knows the better quality of Eries.



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Erie Resistors are safest and most economical.

PER WATT IN ALL 1/- VALUES. Hand-tested, colour-coded and labelled.

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Erie quality in a variable resistance. All values Or with built-in mains switch, 5/- 3/6

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RADIO RESISTOR CO. LTD., 1, Golden Sq., Piccadilly Circus, W.1

FOR XMAS

GIVE A—



MONARCH OF THE MAINS.

BATTERY CHARGER AND ENSURE SATISFACTION

Model.	Output	Price
A.0.2	2, 4, 6v. at 1/2 amp	40/-
A.0.3.	2, 6, 12v. at 1 amp	50/-
A.0.5.	2, 6, 12v. at 1 or 2 amps	90/-

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Name.....
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F. C. HEAYBERD & CO., 10, FINSBURY ST., LONDON, E.C.2.

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LIST PRICE £11:11:0 BARGAIN PRICE £7:17:6
Cash or C.O.D. Carr. Paid.

YOURS FOR

10/-
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Another wonderful bargain that will be eagerly and quickly secured. Brand new. Tested and guaranteed by N.T.S. Send your order now before stocks are exhausted. Absolutely complete. Ready to play.

- Single-knob Tuning.
- Illuminated Wavelength Scale.
- Combined Volume Control and On-off Switch.
- Pick-up Sockets.
- Bandpass Tuning.
- 200-250 A.C. (40-100 cycles).
- Inlaid Walnut Cabinet
- 8-in. Moving-coil Speaker.
- 4 B.V.A. Valves (including rectifier).

ATLAS "LAMBDA"

S.G.3 BATTERY RECEIVER
Cash or C.O.D. Carriage Paid. £4:19:6

BRAND NEW. Guaranteed in PERFECT ORDER. B.R.V.M.A. Valves. Moving Coil Speaker. Single Knob Tuning. Wavelength Scale 200-600, 1000-2000. Walnut Cabinet. Ready to play, including 120v. Hellenes H.T.; 6v. G.B.; Exide L.T. Accumulator.

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PLEASE be sure to mention "POPULAR WIRELESS" when communicating with Advertisers. THANKS!

TECHNICAL JOTTINGS

Notes of Interest to all Constructors.

By

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

Home Films.

I KNOW that a good many of my readers are interested in home cinematography, because I frequently get letters on this subject. Those of you who have home projectors, and particularly those who have their own cine cameras and take their own films, will be interested to know that at the recent Annual Meeting of the Institute of Amateur Cinematographers at the May Fair Hotel, London, a challenge trophy, offered by the "Daily Mail" and presented by the Duke of Sutherland, was won by two amateurs living in Hampshire. The film which won the trophy was called "Transport," and depicted different forms of transport, both ancient and modern, in various parts of the world. The material for the film was gained in India, Singapore, Java and Ceylon.

At the same time a gold medal was presented by the American Society of Cinematographers for the finest example of amateur cinematography.

Television Progress.

I am continually receiving inquiries from readers as to the state of affairs in regard to television. Most of them want to know what is happening, and what is likely to happen, in the near future—whether we are going to have a continuance of the present low-definition system or whether we are going to have a high-definition system of transmission, and what sort of material is going to be broadcast.

You must bear in mind that the whole question of television—which at the moment is more or less at a standstill—is on the knees of the gods; in other words, it depends on the result of the investigations which the Government Committee has been making, and which are not yet completed. So that without this you would be reckoning entirely without your host.

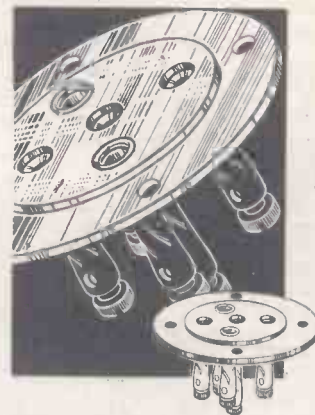
High or Low Definition.

It is impossible to say what the Television Committee are going to report, but it is the general opinion that they will, at any rate, favour a high-definition system, probably 180-line instead of the present 30-line system which the B.B.C. is using. At the moment of writing the Committee has sent two sub-Committees or sections of itself, as it were, one to America and the other to Germany, to have a final look over what is being done in those countries before completing their report.

The high-definition 180-line system would almost certainly need the use of ultra-short waves, the sort of thing I have mentioned earlier on in these Notes in another direction. One of the important technical points which arises here is that the ultra-short waves are not commonly used, or considered to be suitable, for distances over

(Continued on page 508.)

INSULATION



CLIX
Points of
Advantage

Clix obtain maximum insulation by mounting only the heads of valve sockets in thin paxolin, providing true low-loss construction, with resultant gain in efficiency. Although thin, the insulation is very strong, and will not chip or fracture with careless treatment.

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Specified
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FUN WITH YOUR RADIO. Home broadcasting and recording with our new No. 11 Home Mike, 5/6. Superior P.W. 113 Table Microphone, bakelite case, containing H.R. transfer, switch, plugs, and output terminals, new model, 15/-. Ericsson G.P.O. Standard Pedestal, with stand and mouthpiece, 4/6.

Ask for our Mike List "P." We are makers, and have the biggest and most varied stock in London. P.A. Mikes and complete outfits. HOME RECORDING TRACKING GEARS. For record making on your own grammo. Centre-drive type F. 4/6. Screw traverse spindle drive, C.M., 7/6. Blank Record Discs, 4/- doz.

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CIRCUIT BREAKERS replace fuses now. Magnetic Trip Overload Switches, A.C. or D.C. mains, 2 to 4 amps, 7/6; 6 amps, 10/-; 10 amps, 12/-; 15 amps, 14/-; 20 amps, 16/-. Trips may be remote controlled. Illustration shows with cover removed. D.P. and triple poles with trips and thermal delays. Cheap. Reyrolle Power Plugs, 15 amps, shrouded panel wall two prs. on iron box, unused, 10/-.

PARCELS of experimental odd coils, magnets, wire, chokes, condensers, switches, terminals, etc., post free. 10 lbs., 7/-; 7 lbs., 5/-, 1,000 other Bargains in New Sale List "P."

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218, UPPER THAMES STREET, LONDON, E.C.4
Telephone: Central 4611.

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3d. per Word *6d. per word for first words in heavy type.*
Minimum Charge 3/-

Remittance must accompany order. Advertisements for these columns are accepted up to first post WEDNESDAY MORNING for following week's issue.

The Proprietors have the right to refuse or withdraw advertisements at their discretion.

Postal orders, in payment for advertisements, should be made payable to the Amalgamated Press, Ltd., and crossed.

All communications should be addressed to:—Advertisement Department, "Popular Wireless," John Carpenter House, John Carpenter Street, London, E.C.4.

"SWIFT" RADIO BARGAINS.

BUY A GUARANTEED S.T.600 KIT FOR XMAS. These kits are offered as an alternative to those we advertise on Page 503 of this issue, and **DO NOT CONTAIN** any surplus or second-hand components. **YOU CANNOT OBTAIN BETTER VALUE FOR MONEY. READY FOR IMMEDIATE DELIVERY.** Cash or C.O.D.

S.T.600 KIT "A"

Battery model, comprises the following components:

- 1 COLVERN main coil assembly.
- 1 COLVERN extractor coil.
- 1 FORMO 2-gang '0005 condenser with special pointer.

- WAVE-MASTER, 1 each '00075 tone control, '0003 differential condenser, 1 '0005 extractor tuning condenser, 2 '0005 reaction condensers.
- HYGRADE, 2 each 1-mfd. and 2-mfd. condensers.

- GRAHAM FARISH, 1 each '5-mfd. Mansbridge, '00005-mfd. and '0003-mfd. fixed, '006 and 1 Tubular condensers.

- 2 GRAHAM FARISH disc chokes, 4 4-pin valve holders,

- 1 COLVERN 25,000-ohm volume control with 3-point switch.

- 1 VARLEY Niclet transformer 1-3-5.

- 10 BELLING-LEE type "R" terminals.

- 8 BELLING-LEE wander plugs.

- 2 ATHCO 1-meg. grid leaks, 1 watt and holders.

- 5 ATHCO 1-watt resistances (specified values), 1 polished oak panel 16x9 1/2 drilled, 1 terminal strip 16x3 drilled, 1 metal-covered baseboard and platform, necessary wire, flex, screws, etc.

- KIT "A" £3 15s. 0d. Carriage paid.

- "362" valves £1 6s. 0d. per set, or

- HIVAC valves £1 11s. 3d. per set. These valves are tested in the S.T.600 set, and have a six months' guarantee.

SEE EXTRACTS FROM CUSTOMERS' LETTERS IN OUR ADVERTISEMENT ON PAGE 503.

LOUDSPEAKERS. Permanent - magnet with 3-ratio transformer as shown at Olympia (22/6) 17/6.

L.F. TRANSFORMERS, LOTUS 3-1 and 5-1, 3/6.

CONDENSERS. '00015 Short-wave S/m, 6/3. LOTUS '0005 screened with disc drive, Single 6/3, Twin gang 9/3, Triple gang 12/3. Solid dielectric, Reaction type, '00075 1/9, '0005, '0003, 1/6. Differential '0003, 1/6. All complete with knobs and Terminals.

RECTIFIERS. Westinghouse H.T.S., 9/6. Microphone buttons, 7d.

All standard makes of components and accessories can be supplied.

TERMS. Cash or C.O.D. Orders under 5/- cash only. Postage charged on orders under 10/-.

THE SWIFT SERVICE & SUPPLY CO. (P.14), 3, Featherstone Buildings, High Holborn, London, W.C.1. Phone HOLborn 1336.

TELSEN COMPONENTS. SENSATIONAL OFFER BY OLYMPIA RADIO, LTD.

TELSEN Matched Screened Coils, suitable for use as Aerial or Anode Coils. Can be embodied in any Circuit. List price 7/-. Our price 4/11.

TELSEN Band-pass Coil Unit, comprising pair of accurately matched Screened Band-pass Coils, complete with Wave-change Switch, Escutcheon and Knobs. List price 14/6. Our price 8/11 per Set.

SET of Telsen Band-pass Screened Oscillator Coil Units, comprising Band-pass Coils and Oscillator Coil. Complete with Wave-change Switch for Single-knob Control. List price 21/6. Our price 8/11 per Set.

TELSEN Set of Triple Matched Screened Coils, suitable for Aerial and 2 H.F. Stages; or can be embodied in practically every modern circuit. List price 21/6. Our price 12/11 per Set.

TELSEN Radio-Grand Transformers, 3-1 ratio only. List price 7/6. Our price 4/3.

TELSEN Ace Transformers, 3-1 and 5-1. List price 5/6 each. Our price 3/9 each.

TELSEN D.C. H.T. Units, 200/250 v. Input. Output 28 m.a. at 150 volts. 3 Tappings. List price 25/6. Our price 15/6.

MARCONI 2-Valve Battery Receiver, complete with Valves and all Batteries. Self-contained Cabinet. List price 4 Guineas. Our price £2 2s. 6d.

LISSEN 2-Valve A.C. Receiver. Absolutely complete in handsome Bakelite Cabinet. List price 8 Guineas. Our price £2 19s. 6d.

ATLAS P.M. Speakers. One of the finest Moving Coils made. Complete with Transformer. Suitable for Pentode or Power Valve. List price 42/6. Our price 14/11.

ATLAS T.12 Eliminators. Output 120 v., 12 m.a. Complete with Trickle Charger. List price 77/6. Our price 45/-.

TELSEN—MORE COMPONENTS:

L.F. Coupling Units (4/6). L.F. Smoothing Chokes (3/11). Tapped Pentode Output Chokes (3/6). Class "B" Output Transformers (4/3). 313 Disc Drive (2/3). Air Dielectric '0005 Condensers (1/11). Bakelite Dielectric Tuning Condensers, '0003 ONLY (1/-). Short-wave H.F. Chokes (1/9). Binocular H.F. Chokes (3/6), etc., etc.

The above Receivers are mostly brand-new decontrolled Models. We have large numbers of slightly shop-soiled or second-hand Models in addition. Illustrated Lists post free on application. Also numerous other Bargains in Speakers, Eliminators and Components.

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All Goods Carriage Paid. Everything guaranteed O.K. Money refunded if not satisfactory. Please mention this paper when replying.

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List free. S.T.600 kit: complete kit A with specified coils, volume control and 2-gang Graham Farish variables. Ebonite panel and strip, Lotus transformer, £3. Delivery 10 days. Exact specified kit, 79/6. Amplion Super Hets stocked, highest exchange allowances. Regentone A.C. 30ma. eliminators, 32/6. Lotus double-pentode mains M.C., 79/6. Lissen 2v. mains, 60/-. Celestion P.P.M./w, 16/6. Quotations per return. Large stock. Part Exchange.—**BUTLIN, 143B, Preston Road, Brighton. Preston 4030.**

ALL READERS who have no charging facilities for their 2-volt accumulators should certainly write for particulars of the "Tonic" self-generating charger. See advertisement in these columns.

SOUTHERN RADIO'S WIRELESS BARGAINS.

RECEIVERS: G.E.C. Osram 4-valve (Actual) Sets, complete with Four Osram Valves, Permanent Magnet Moving Coil Speaker, Magnificent Pedestal Cabinet. Ready to use on all Voltages A.C. All Osram proprietary Components in original sealed cartons, £6/15/0. (List £15/15/0.) An exceptional Bargain.

CROMWELL 3-Valve Battery Sets, complete with Three Osram Valves, Permanent Magnet Moving Coil Speaker in Magnificent Walnut Console Cabinet. Brand New in original sealed cartons, £3/12/6. (List £8.)

COILS—Igranic Superhet Set of Four (1 Osc., 2 I.F. with Pigtailed, 1 L.F. Plain), 12/6. (List 50/-.)

Lissen Superhet Three-Coil Kit. Screened Ganged on Base with switch, type L.N.5181, 9/6. Same description for Band-pass or any straight circuit, type L.N.5162, 7/-.

Varley Constant Square Peak Coils B.P.5, complete with all accessories in sealed cartons, 2/3. Lewcos B.P.F./R, T.B.F./C; -O.S.C./126 (extensor) T.O.S./R, all at 3/6 each. A Full Range of Edison Bell Plug-in Coils, two-pin, at 9d. each.

PICK-UPS—Mareoni Model K25 (1935 issue), 21/- (List 32/6.)

BIFLO Static Cut-outs. Definitely Cuts Out All Electrical Interference and Unwanted Noises, without decreasing volume. Brand new and boxed with simple fixing instructions, 2/3 each. (List 12/6.) State whether A.C., D.C., or Battery Set.

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Plessy 4-Gang Condensers, Superhet type. Fully Screened with Trimmers (less Dials), any standard dial will fit, 10/6 (List 45/-). Dubilier Block Condensers, 4 mfd. (2+1+1), 1,000-Volt, 2/9; 4.5 mfd. (2+25+25), 3/-; T.C.C., 0-1+0-01, 1/3 each.

SPEAKERS. Rothermel Permanent Magnet Moving Coil Universal Transformer, 16/- (7-inch cone). Blue Spot Permanent Magnet Speakers, Universal Transformer for Power, Super Power, Pentode and Class B, 23/-. Blue Spot 66R Units, brand new and boxed, 10/6 (List 35/-). Complete mounted on Blue Spot Chassis 16/6 (List 45/-).

MISCELLANEOUS. Westinghouse Metal Rectifiers. H.T. 6, 7, 8, 9/3. Morse Tapping Keys with Flash Signal and Buzzer, complete with battery and bulb, 2/-.

Lissen General Purpose Output Chokes, 20/28 Henries, 18/60 M.A. L.N.5,301, 6/- each. Lewcos Superhet dual-wave frame aerials, 9/-.

Thousands of other bargains. Callers are assured of a tremendous saving in all branches of wireless needs by visiting any of our shops.

All goods guaranteed and sent post paid.

BRANCHES at 46, Lisle Street, W.C.2; 16, Leicester Street, W.; 271/275, High Road, Willesden Green, N.W.10.

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H.A. WIRELESS for 1935 Receivers, Kits Eliminators, etc.

S.T.600 Components and Valves supplied in Kits or separately. Only specified parts used. Approved service Agents for Shoreditch and Dalston Districts.

We can also supply the latest All Mains or Battery Receiver on Easy Payments or cash.

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WANTED FOR CASH. Second-hand Wireless Parts, Sets, etc. Bring or send. —University Radio, 142, Drummond St., London, N.W.1. Nr. Euston Station (L.M.S.). *Miscellaneous Advertisements continued on next page.*

MISCELLANEOUS ADVERTISEMENTS

(Continued from previous page.)

VAUXHALL. Magnavox permanent magnets, universal, suitable for Class B power or pentode; 7-in. cone, 17/6; 10-in. cone, 23/-; mains energised, 2,500 or 6,500, 10-in. cone, 23/-; 7-in. cone, 15/3; brand new, with humbucking coils; state power or pentode transformer; unused manufacturers' stock; immediate delivery.

VAUXHALL. Benjamin Class B transformers, 1-1½ to 1, 6/6; Niclets, 5/9; volume controls; Radiophone, with switch, 5,000 to 500,000, 3/6.

VAUXHALL. Westinghouse rectifiers; H.T.8, H.T.9, 9/-; H.T.10, 10/-; Westectors, W.4, W.X.6, 5/9; mains transformers matched with H.T.8, best London make, guaranteed 365 days and nights; H.T.8 and transformer, 17/6.

VAUXHALL. Rothemal Piezo electric pickups, 30/-; B.T.H. Minor, 16/6; Radiophone, 13/6; others from 10/-; B.T.H. Truspeed gramophone motors, 30/-; Collaro 32 model, 32/6, sealed cartons.

VAUXHALL. Dubilier condensers, 4 or 8 mfd., dry electrolytic, 500v. working, 3/-; 50 mfd., 50v. working, 2/6; tubular non-inductive, 1, 9d., 5, 6d., '002, '0002, '001, '0001, 4d. each; T.C.C. mica, '002, 2,000-volt test, 10d.; Ormond '0001, 4d.; '001, '01, 1/-; 1 mfd. Mansbridge, 1/3.

VAUXHALL. Radiophone intermediate transformers, 110-117 kc., on bases with terminals, tapped primary and secondary, 6/-; 3-gang condensers, superhet Midget, 12/6.

VAUXHALL. 3-gang condensers and set iron-cored cells, specially matched for S.G. det. pentode, complete with dial, drive, escutcheon, etc., 35/-; as above, suitable for Band-pass or R.F. superhet, 37/6; gramophone switches, 3/6.

VAUXHALL. Dubilier resistances, 1-watt type, 7d. each, all values; Clix valve holders, terminals, 7-pin, 9d., 5-pin 7d.; W.B. 5-pin, 4d.; post paid 2/6 or over, or C.O.D.

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(Continued at top of next column.)

(Continued from foot of previous column.)

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Miscellaneous Advs. continued on next page.

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See our momentous wholesale offer on page 491).

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(Continued from previous page.)

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WESTINGHOUSE Rectifiers, Manufacturers type, H.T.8 and 9, 8/11. Few only H.T. 5 and 6 at 4/9 each.
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 All-American Valves in stock. From 4/6 each.
 American Midget Superhets. M/coil speaker. Definitely the cheapest ever offered to the public. £4/10/0.
UNIVERSAL RADIO, 219 - 221, CITY ROAD, E.C.1. Telephone: Clerk 0719.

TECHNICAL JOTTINGS

(Continued from page 504.)

about 30 miles. This drawback can be got over by setting up a number of small relay stations in different parts of the country; and, as a matter of fact, it is believed that this is the scheme that the Television Committee will favour.

Television Receivers.

On the receiving side the three or four companies that are prominently identified with television, such as Bairds, Electrical & Musical Industries, Plew, Cossor and so on, are all ready for supplying sets at a reasonable price to the public, adapted either for the low-definition or the high-definition system. I happen to know that two or three of the leading radio-set manufacturers, who have not hitherto been known to be concerning themselves with television receivers in any way, are also getting ready for a big drive as soon as the Committee's recommendations are put into effect.

Some readers have asked me whether television will still be a monopoly under the B.B.C., as sound broadcasting is at present, or whether it will be assigned to some separate organisation. I may mention that a great many of my readers seem to favour the idea that television should be taken away from the B.B.C. and made a separate thing altogether.

Notwithstanding this, I think it can be pretty well taken for granted that television will be included in the B.B.C. monopoly, and if the Act and the Charter do not at present cover this arrangement, they will be altered to do so.

A Handy Book of Wireless.

The Cossor valve people, always to the fore in all matters concerning valves and receivers, have sent me a copy of their latest book, called the "Cossor Wireless Book." This is an extremely handy little manual of about 40 pages and includes a great deal of very interesting technical information about the construction of valves, followed by notes on resistances, chokes, condensers, L.F. coupling, and all manner of other points which concern every set constructor, if not every operator. There is also a chapter on the various methods of high-frequency coupling, Class B amplification, automatic volume control and so on, and a list of European broadcasting stations with necessary details of each, ending with a glossary of radio terms.

This little book is in the Cossor Company's best style, and they tell me that they will send it post free to any of my readers who mention these Notes. If you want it, don't write to me direct, but to A. C. Cossor, Ltd., Highbury Grove, London, N.5.

Soldering Enamelled Wire.

I daresay you have noticed the difficulty of soldering enamelled wire, owing to the fact that the enamel is not easy to remove. With ordinary insulated wire you can fairly easily scrape off the insulation, and often enough the wire itself is tinned, which makes it easy for soldering. Even if it is not tinned, it is generally fairly clean. With

the enamelled wire, however, you have the job of scraping it with a knife, or rubbing it with sandpaper, and if the wire is stranded this is a fiddlesome job.

A tip which is sometimes useful is to heat the wire fairly strongly, in a clean flame, such as a bunsen flame, and then to dip it immediately into methylated spirit. Needless to say, you keep the flame a fair way off the vessel containing the spirit. This heating and dipping into the methylated will generally have the effect of removing the enamel entirely,

YOUR PRESENT THIS XMAS

(Continued from page 476.)

obtainable in the well-known Dubilier range.

Finally there are loudspeakers. Most sets will take an extra speaker these days, and it is very nice to have radio in two different rooms.

Of course, any speaker will do for the job if radio is to be used in one room at a time. But when it is desired to have both speakers on together, they should match up to a certain extent.

An ideal speaker to give as a present is the W.B. P.M.S.2, which is the standard model of the sensitive Stentorians. It is provided with means of varying the output transformer ratio so that it will match up with any speaker that happens to be used with your friend's set. The price is 32s. 6d.

I think I have given enough instances to show what a useful and varied-price range of gifts are to be found in radio. A. S. C.

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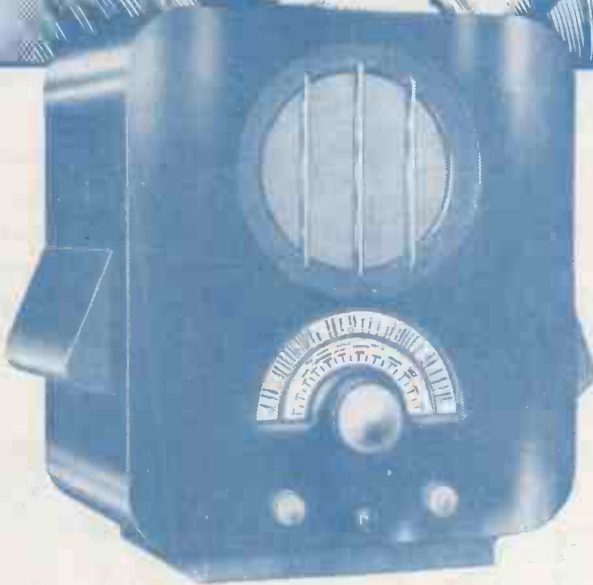
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