

Wireless

VOL. I.
JANUARY

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1935

AND TELEVISION REVIEW

PRICE

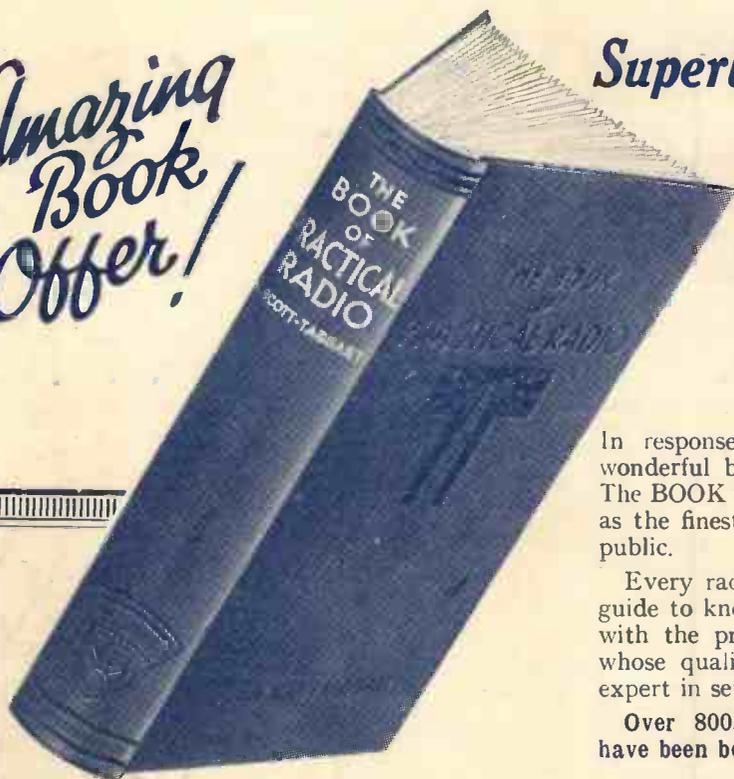
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has the "Manual of Modern Radio" will want to miss this new book. It is beautifully bound in green cloth and printed in clear type, and gives practical information and advice which every person interested in radio requires.

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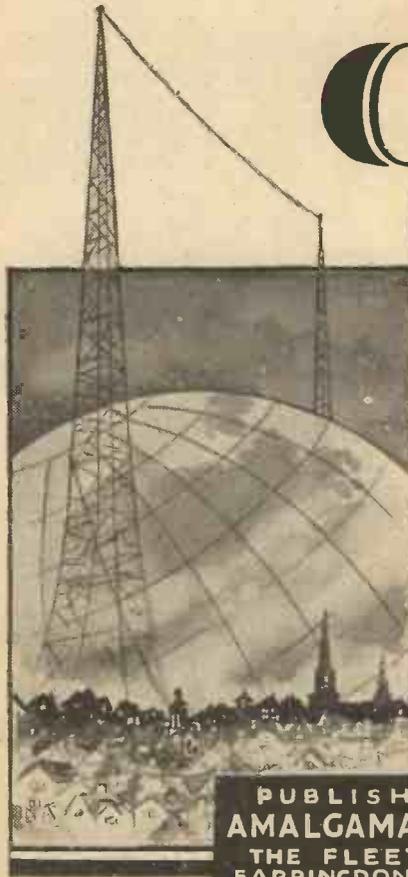
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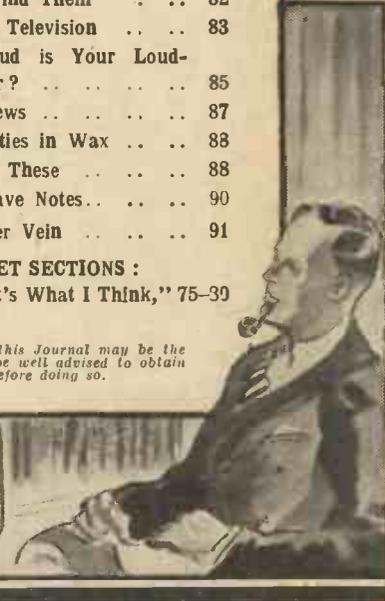
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As some of the arrangements and specialties described in this Journal may be the subjects of Letters Patent the amateur and trader would be well advised to obtain permission of the patentees to use the patents before doing so.



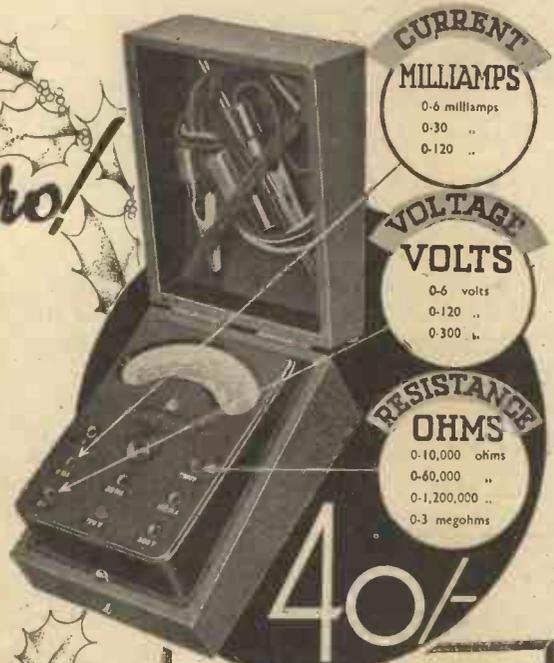
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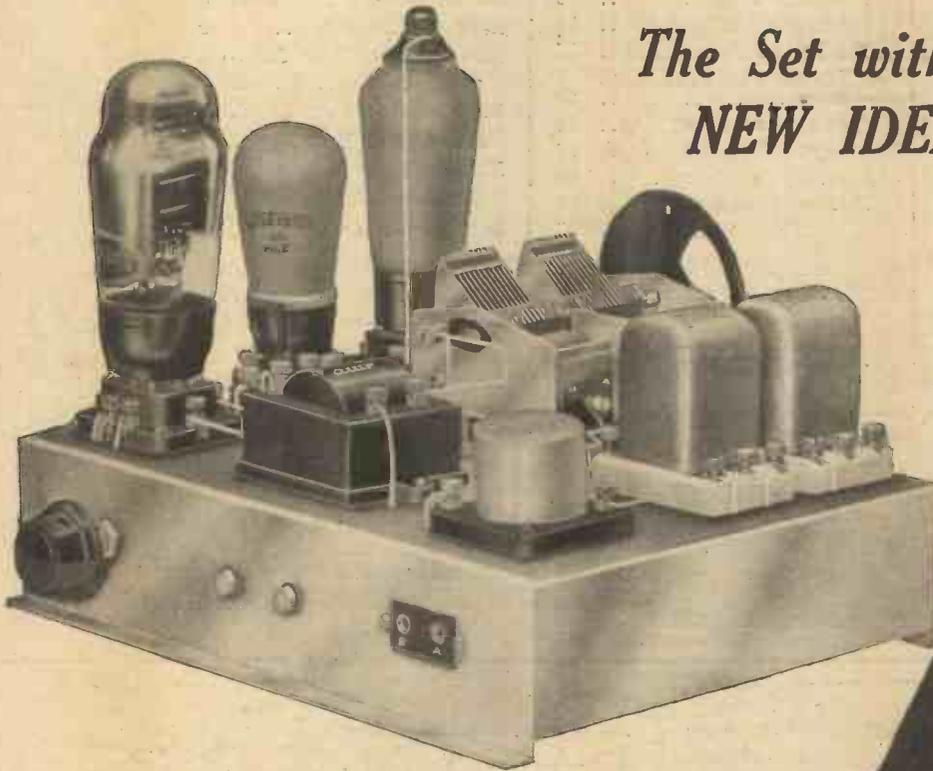
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Prepare for the Christmas Programmes.. build the "RAIDER"

*The Set with the
NEW IDEAS*

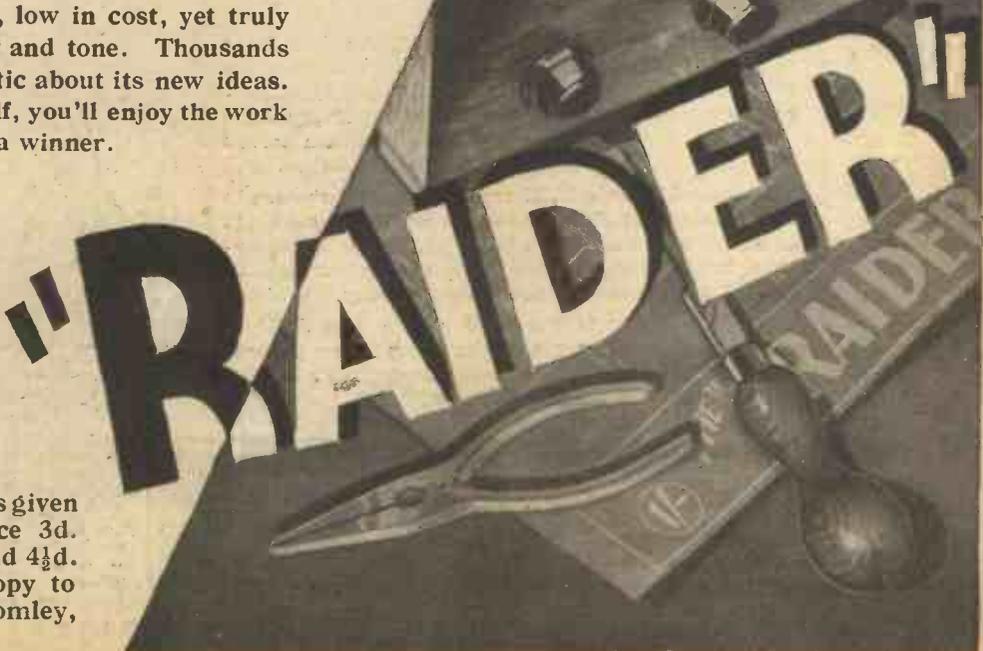


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Intriguingly simple to build, low in cost, yet truly amazing in sensitivity, range and tone. Thousands of Constructors are enthusiastic about its new ideas. Build the "RAIDER" yourself, you'll enjoy the work and you'll admit the result is a winner.

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2 in 1 VALVES
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The
Editor's
Chat

Wireless

& TELEVISION REVIEW

Christmas and the New Year—The Listeners' Circle—The Roberts Three—"Wireless" Free Gifts.

THIS is the "new year" issue of WIRELESS, but as it is published before Christmas we can take the opportunity of wishing all our readers a very merry Christmas as well as a happy and prosperous New Year.

1935 lies stretched out before us, and we are convinced that it is going to be a good year for radio in general and WIRELESS in particular.

We have received a very great number of appreciative letters from readers, and there can be no doubt at all but that the widening of the scope of the journal has proved an extremely popular step.

Our "Listeners' Circle" feature, for example, has apparently "caught on" to a greater extent than even we anticipated. It is for that reason that we have increased the space devoted to it this month.

We have also been able to obtain opinions from a number of "celebrity critics," and, together with these, the WIRELESS commercial set section must be the strongest and most interesting in the whole field of journalism.

You Can't Go Wrong

It will undoubtedly be to the advantage of every listener to refer to WIRELESS before purchasing a new set. There are nearly five thousand different radio sets on the market, so that it is a hopeless task for the unguided listener to make his selection from them without risking disappointment.

Our "Listeners' Circle" presents both expert and layman opinions of a carefully chosen and definitely limited number of models. Those who follow the "Circle" can't go wrong.

We should also like to direct the attention of our readers to another feature, one which makes its bow in this issue. We refer to the Television Notes by Dr. Roberts, our Scientific Adviser.

Welcomed by Constructors

Dr. Roberts has no rival for the easy and interesting exposition of scientific subjects. He has a facile pen and a depth of knowledge that only those who have the honour of knowing him personally can fully appreciate.

"When in doubt ask Dr. Roberts" has become almost a catchword among the staff of WIRELESS, which, after all, is as it should be in view of the fact that he is our scientific adviser. We can assure you that he is very active in this appointment.

His set, the Roberts Three, has been given a most enthusiastic welcome by constructors; and that is hardly surprising, for it really is a first-class instrument. We can honestly say that it is the best three-valve set which we have yet handled.

It is sound radio engineering of the highest order, and you must not let yourselves under-rate it because of its obvious simplicity and inexpensiveness.

Our invitation to readers to submit ideas for future gifts in WIRELESS has met with a great response. But at the time of writing we haven't received anything which stands out from a number of good and ingenious suggestions.

Yes, there are some really excellent ideas in this postbag, but unfortunately in many instances there are also snags. The most common one is that of cost in manufacture.

Our Offer Still Open

It is not practicable for us to choose a gift of the nature of a metal gadget with two or more moving parts nor one which is large or heavy.

However, our offer is still open, and the five-pound note will be paid to the reader who produces the practical and original "brainwave" which we are looking for.

Several correspondents profess to be mystified at the necessity of us giving free gifts at intervals. They say WIRELESS does not need to offer inducements.

May we modestly say that we agree with that as far as it goes, but the idea of a free gift widely advertised is to induce new readers to make the experiment of purchasing their first copies.

When they have done so and have taken them home to read, then that is when the contents of the journal reveal their value in making casual purchasers into regular readers.



Marchese Marconi speaking via short waves from Rome to America. Television has been receiving his attention lately, and his views on future prospects in that field of radio are given on page 84.

BROADCASTING IN SPAIN

In this article you are taken for a short tour of Spanish broadcasting stations, and given details of the way they are organised.

By
C. W. LUSTY



A
VIEW
OF THE
SAN SEBASTIAN
STATION IN ITS
RURAL
SURROUND-
INGS

I FIRST visited the San Sebastian station which, I found, was very popular locally, and in addition to its own Basque programmes, often relayed its parent, E A J 7 Madrid. As at all the Spanish stations and studios—in contrast to many European radio centres—I found no precautions taken against seizure of the transmitters.

The Licence Payments

From the Puerta del Sol (the Gateway of the Sun), the heart of Madrid from where the chimes are relayed and where fierce fighting has ensued, I visited the modernistic Paris-Madrid building, the headquarters of Union Radio which operates the present chain of Spanish stations. Here Señor Ricardo Urgoiti, who visited London for the June assembly of the International Broadcasting Union, put me through the A.B.C. of Spanish radio.

Broadcasting in Madrid, I learned, started about 1924, the present estimated number of listeners being between 500,000 and 1,000,000. Payment of the annual licence fee of five *pesetas* (about 2s. 6d.), however, was more honoured in the breach than in the observance as the State's attempts at collection were very luke-warm. Paradoxically, the Madrid Post Office has a special department—indicated by prominently painted arrows—reserved for issuing licences, and I found the same Gilbertian position in Barcelona.

Opera, I found, was the most favoured programme feature,

while musical comedy or *zarzuela* was also very popular. Your Spaniard, however, unlike we devotees of Henry Hall, is not so keen on dance music. We are brothers under the same skin when it comes to criticism though, and the Union Radio letter-bag is as well filled by complaining listeners as that of our B.B.C.

The station has its own symphony orchestra and string combinations, and presents news, children's, educational, and other concomitant sessions of modern broadcasting. "O.B." work is not neglected, and relays of bull-fights with commentaries by toreadors such as Bel Monte play a part. The company receives no share of the licence revenue, but derives its income through commercial broadcasting.

THE CONTROLS AT MADRID



Before the engineer as he sits in front of his controls at the Madrid station is a glass panel through which a view of the studio is obtainable.

After conducting me round the studios and the transmitting rooms—these, in the case of Madrid, are in the same structure—Señor Urgoiti introduced me to his *débonair* announcers, Carlos del Pozo, Luis Medina, and Lola Agullo, with whose racy diction many WIRELESS readers are familiar.

Letters from Britain

At Seville, I found the *cante jondo* or *Flamenco*, the captivating Andalusian song with guitar accompaniment, predominating in the broadcast fare. Incidentally, when in Morocco, I heard this little station much better than Algiers.

Barcelona has no broadcasting house proper, and the studios, which played such a dramatic part in the revolution, are in a building in the Calle de Caspe, near the beautiful Paseo de Gracia, where machine-guns and artillery were employed to repel the rebels. The transmitter is situated on the hill of Tibidabo, outside the city, and the aerials were also bombarded.

The director, Señor Cordoves, showed me piles of appreciative letters from English listeners to Barcelona's opera. Very often, he informed me, instead of having the performances relayed from the opera houses, theatrical companies are specially brought to the studios to permit improved microphone treatment of the presentations.

A "Phantom" Announcer

Your Catalan also has a bias for opera and comic opera, and the Barcelona programmes are to a large extent similar to Madrid. Here the accent is definitely Catalan, and there is no lipping of the C and Z into the TH of "thin," as at Castilian Madrid, and no San Sebastian Basque nor Sevillano patois.

I had the pleasure of meeting "Señor Miliu," who, I understand, is the world's only phantom announcer. "Señor Miliu" is heard (you may have caught his high-pitched voice) but never seen. He is Señor Toresky, and presents—and even offers of marriage—reach him from all Spain.

(Please turn to page 93.)

The Roberts Three

FURTHER DETAILS AND OPERATING DATA CONCERNING THE SPECIALLY DESIGNED THREE VALVER DESCRIBED LAST MONTH

BY
JOSEPH HARRISON ROBERTS,
D.S.C., F.INST.P.

WITH the full constructional details of my receiver given last month, I now come to the question of operation—the simplest matter in a thoroughly straightforward and simple set.

Constructors of the Roberts Three will have found no difficulty in building it—everything used in it is perfectly standard and easily obtainable, and the chassis method of construction makes wiring simple and

and constructors can rest assured that it will get them with a quality of music and speech that will satisfy the most fastidious ear. The set is destined to give a really good rendering of “top,” but at the same time means are provided whereby the amount of “top” can be preadjusted—by the simple expedient of increasing the size of the capacity placed between L.S.— and the 5,000-ohms resistance.

station is urgently required regardless of the quality of reception, for it cannot be denied that with straight tuning circuits, such as are used in the Roberts Three, excessively sharp tuning (such as that which would obtain in the above conditions) must inevitably upset the quality of reception slightly, though it may reduce interference.

PROMINENT FEATURES OF THE SET

1. Enormous sensitivity and range.
2. Knife-edge selectivity.
3. Perfect tonal balance.
4. Complete stability.
5. Distortion free volume control.
6. Simplicity of construction and operation.
7. Inexpensive to build and run.
8. Handsome, up-to-date appearance.
9. Battery or mains unit operation.

THE FINEST THREE-VALVER YET DESIGNED

straightforward. That, as was explained last month, is one of the beauties of the over-and-under method of construction, and that was why it was chosen.

Good Quality

In discussing the operation of the set it must be borne in mind that two very important features were considered, ease of handling and quality of reproduction. The latter was considered of almost paramount importance, for the set was designed for the benefit of the genuine listening household, as distinct perhaps from the more experimentally minded enthusiast who likes a lot of controls which urge him on to try to get everything in Europe.

It is not claimed that my set will get a colossal number of stations, but it will get a goodly number,

set is of a high order, but the tuning is not so “peaky” as to engender serious side-band cutting. The sharpness of the tuning is to a certain extent variable in that, with a reduction of the amplification of the screened pentode valve (by means of the volume control) and an increase of reaction, full volume can be obtained on a great number of stations with a very high degree of selectivity.

This is an advantage where interference is rife and the

On the other hand, if even more prominence to the high notes is desired, the resistance can be increased in value, the capacity being left as shown in the diagram—as .006 mfd.

The selectivity of the

Accurate Calibration

Simplicity of tuning, with a reasonably accurate metre and also “degree” calibrated tuning scale, was one of the aims of the set, and accounts for the ease with which stations can be picked out. If the trimming has been carried out as directed last month, it will be found that the scale is wonderfully accurate, a state of affairs that is not easy to obtain without hand calibration.

The net result of the simplifications in the set I designed is that the tuning is carried out by one operation only,

The designer of the set, Dr. J. H. Roberts, is here seen making a grid bias adjustment to the Roberts Three during the tests in his London laboratory.



volume control is carried out by another, plus assistance occasionally on weak transmissions from the reaction.

Selectivity variation is obtained by the volume and the reaction controls together.

There are two other controls—the wavechange and the on-off switches. Five in all, all perfectly simple and, except when two are used together for the purpose of selectivity increase, completely independent. So on many stations you can set the tuning and volume with the set off, switch on—and there is the transmission you require. Alternatively, the tuning can be carried out with the volume control hard over to the left, giving “silent tuning,” and then when the position of the station is reached by the pointer the volume control is brought “up” to “fade-in” the station.

Local Listening

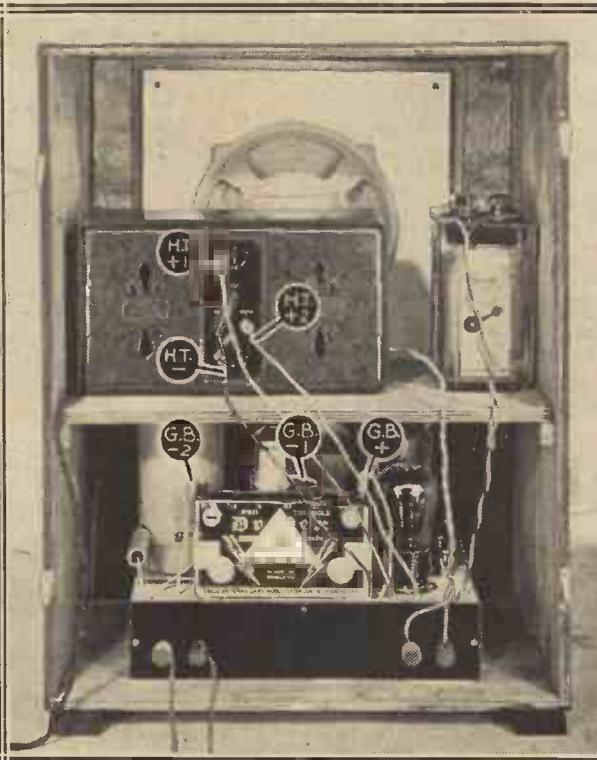
There is one point concerning the volume control that may be worth noting by those who are very close to a powerful “local.” If it is found that it is not possible to reduce the volume to zero, or practically so, the grid bias on G.B.—1 should be increased. This will make the control of distant stations a little more rapid, but it will enable the local to be reduced to

proportions that may be more convenient for quiet listening.

In another article details of mains units suitable for the receiver are given, and the use of a power pack for H.T. supply will make the set quite inexpensive to run. It is not really heavy in H.T. when one

considers its capabilities, for the total consumption is below 20 milliamps. even when listening to foreign and weak transmissions, while the reduction of volume necessitated by local stations reduces the consumption by virtue of the multi-mu pentode.

USING A POWER UNIT



Here is the Roberts Three with a mains unit in place of the H.T. battery. The various H.T. and G.B. leads are clearly indicated, and special attention should be paid to the relative positions of the former in the Ekeo power unit, which is the type D.C. 12/25.

When searching for distant stations it is, of course, best to have the volume control fully “up” and to use the reaction so that the detector is just on the verge of oscillation, but station-finding should not be difficult for the wavelength calibration of the dial will enable rapid station selection.

This scale will hold good indefinitely for, although we are promised a wavelength shuffle sometime in the New Year, when the Midland Regional goes to Droitwich, this will not render the dial obsolete, or in any way affect it.

Dial Calibration

For those who find that the wavelength calibration is not detailed enough, the “degree” scale is valuable, and they can, if desired, keep a log or chart of stations against degree readings. This may appeal to the ardent station searcher, while “the family” will probably prefer to work by the wavelength markings.

THE COMPONENTS EMPLOYED FOR BUILDING THE ROBERTS THREE

- 1 Polar “Midget” 2-gang tuning condenser, each section .0005-mfd.
- 1 Polar semi-circular drive for above:
- 1 Colvern 2-gang coil unit (types K.G.O. and K.G.R.):
- 1 T.C.C. 2-mfd. fixed condenser, type 50.
- 1 T.M.C.-Hydra 1-mfd. tubular fixed condenser, type T.24.
- 1 Dubilier 1-mfd. tubular fixed condenser, type 4403.
- 1 Dubilier .006-mfd. fixed condenser, type 670.
- 1 Dubilier .0002-mfd. fixed condenser, type 620.
- 1 Dubilier .0001-mfd. fixed condenser, type 620.
- 1 Dubilier .00005-mfd. fixed condenser, type 665.
- 1 J.B. .0003-mfd. differential reaction condenser, solid dielectric type.
- 1 Graham Farish 2-meg. Ohmite grid leak.
- 1 Graham Farish 25,000-ohm Ohmite resistance in horizontal holder.
- 1 Dubilier 5,000-ohm 1-watt type resistance.
- 1 Erie 25,000-ohm potentiometer.
- 1 Bulgin 3-pt. shorting on/off switch, type S.36.
- 2 Graham Farish screened H.F. chokes, type H.M.S.:
- 1 Ferranti L.F. transformer, type A.F.8.
- 1 Clix 7-pin chassis-mounting valve holder.
- 1 Clix 5-pin chassis-mounting valve holder.
- 1 Clix 4-pin chassis-mounting valve holder.
- 1 pair Bulgin G.B. battery clips, type No. 1.
- 1 Peto-Scott ebonite panel, 12” x 7”.
- 1 Peto-Scott ebonite terminal strip, 10” x 2½”.
- 1 Peto-Scott “Metaplex” (both sides) chassis, 10” x 8”, with 1½” runners.
- 4 Clix indicating terminals.
- 5 Clix wandlet-plugs.
- 2 Clix accumulator spades.
- 1 Belling & Lee wander fuse.
- 2 coils B.R.G. “Quikon” connecting wire.
- Screws, flex, etc.

ACCESSORIES

- 1 Peto-Scott special cabinet.
- 1 W.B. Stentorian Baby loudspeaker,

BATTERIES

- 1 2-volt block accumulator, type B/45.
- 1 120-volt Full-o’-Power standard H.T. battery.
- 1 9-volt Drydex G.B. battery.

VALVES

	*S.G. Pentode	Det.	Output
Cossor	210 V.P.T.	210 H.F.	220 H.P.T.
Dario	—	T.B.282	T.C. 432
Hivac	V.P. 215	H. 210	Y. 220
Mazda	V.T. 215	H.L. 2	Pen. 220
Marconi	V.P. 21	H.L. 2	P.T. 2.
Mullard	V.P. 2	P.M.1 H.L.	P.M. 22A.
Osram	V.P. 21	H.L. 2	P.T. 2
Tungsram	—	H.R. 210	—

* Standard 7-pin type.

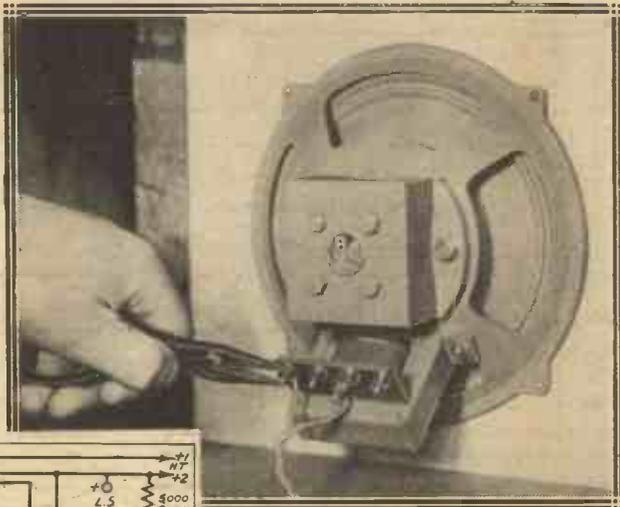
Someone has already written to ask if he can use a certain mains unit on the set, but is worried because the unit has *three* taps. He can understand the maximum and the S.G. taps, but what shall he do with the detector ?

An Extra Tapping

He can do either of two things. He can ignore it, or he can use it by slightly altering the wiring of the set. He would have to free the H.T. end of the 25,000-ohm. resistance under the baseboard, without depriving other parts of the circuit of their H.T. connections, of course, and take the

home with it, and he should on his first evening with it find that he has gained mastery over the few operating details.

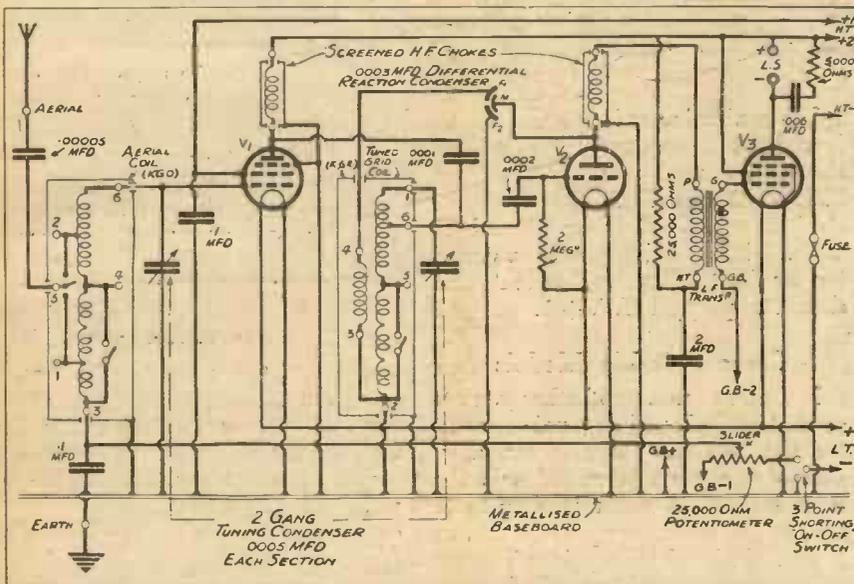
Finally, may I plead with the constructors of my set to give it as much chance as possible —be fair to it. I have seen so many cases of aerials and earths that are but



Tightening the nuts on the input transformer of the W.B. Stentorian Baby loudspeaker. It is essential that these connections be tight or they may work loose during the use of the set.

The theoretical circuit of the Roberts Three is easy to understand and perfectly straightforward. The 5,000-ohm resistance and the .006-mfd. condenser mentioned in the article can be seen across the loudspeaker terminals.

Easy to control, plain-sailing tuning, and wavelength calibration as well as a "degree" scale were aims which Dr. Roberts set himself when designing this set. The five controls, two of which are only on-off and wavechange switches, are clearly shown in the lower photograph.

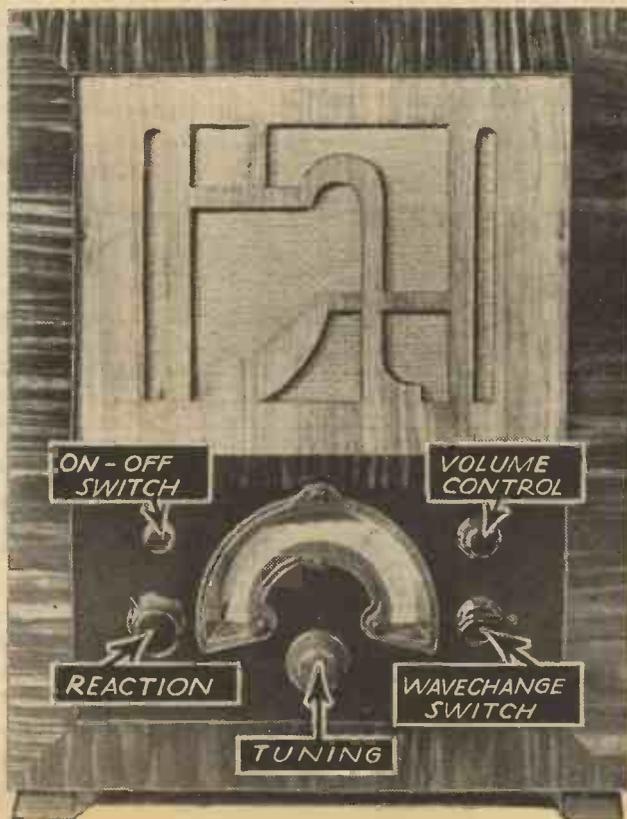


free end (that remote from the 2-mfd. condenser and transformer H.T. terminal) to the detector tap on his unit.

This will enable him, if it is variable, to adjust his detector voltage for perfect reaction control. But it is doubtful if the alteration is likely to be worth while—reaction is perfectly smooth without the need of separate detector anode voltage adjustments. That point was well thought out when the set was designed.

Simple Operation

So simple is the set that there is really little that has had to be said about the operation. Two bias plugs, two H.T. plugs, and the usual aerial, earth, L.T. and speaker leads constitute the "assembly" connections, while the panel controls have been discussed as fully as need be. A very few minutes' practice with the set will render the operator almost completely at



travesties of the real things that I cannot help being a little anxious about the sort of aerial-earth system some may use with my set.

Do not expect a colossal 100-ft. aerial and a perfect earth, such things are not often easy to obtain, but I do want the best you can arrange, not any old thing.

Getting the Best

Do not take this as any aspersion on your good sense as a home constructor, but merely as a reminder that perhaps your aerial is not quite as good as it might be, that your earth could do with an overhaul, and as an indication that I really want you to get the last ounce out of my set. If you do it justice it will not let you down.

I have designed this receiver to give you real entertainment, and I want you to have it without any suspicion of qualification.

MAINS UNITS FOR THE ROBERTS THREE

Supplying the three-valves described last month with H.T. from the mains.

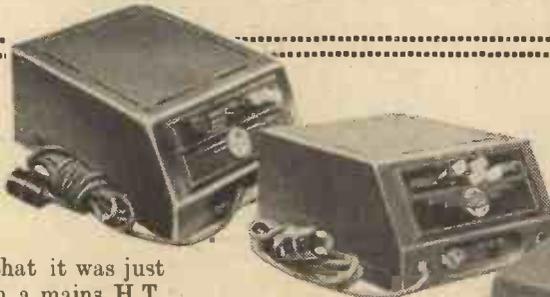
ONE of the features of the specially designed three-valver about which our Scientific Adviser told readers of WIRELESS last month, was that it was just as suitable for use with a mains H.T. unit as it was with a dry battery.

Many Types Available

As a matter of fact, the Roberts Three is particularly suited to a mains unit, and there are many types on the market having suitable outputs, and of convenient sizes to fit into the top section of the set.

The total H.T. current consumption of the receiver is between 15 and 20 milliamps, the screened pentode taking a maximum of about 7 milliamps and the output pentode about 9 milliamps. These figures vary a little with individual valves and different makes, but are approximate. They are taken at 150 volts maximum.

Such a voltage is made possible by the use of a mains unit, but H.T. battery users are advised to keep to 120 volts if they want the full economy of operation of which the set is capable.



When a mains unit is used the full voltage should be used for H.T. + 2 and H.T. + 1 should be between 60 and 80 volts. Most units give a variable tap for the "S.G. valve," and into this should be plugged H.T. + 1.

Some Suitable Models

It does not matter whether you are on A.C. or D.C. mains, a unit suitable for the Roberts Three is available. One of the most inexpensive is the Ekco D.C. 12/25 which gives up to 17 m/a at 150 volts, or up to 21 m/a at 120 v. It has S.G. tapings between 50 and 80 volts, and costs £1 12s. 6d.

At 39s. 6d. there is another D.C. unit, by Atlas and giving 25 milliamps at 150 volts. It has excellent regulation and several H.T. tapings.

The next in price is the Ekco A.C. 10/20, an A.C. model which is priced at £2 2s. 6d. and which gives either 120 or 150 volt outputs, with up to 17.5 milliamps at 120 volts. This is suitable for anyone who does not want more than 120 volts.

Another Ekco is the K. 10/20 which gives a similar output but provides an L.T. charger for a 2 volt L.T. battery. This is a particularly useful refinement. The cost is £2 12s. 6d.

With trickle charger also is the Atlas T. 10/30, which provides 10, 20 or 30 milliamp maximum at 120 or 150

Three Atlas power packs that are eminently suitable for use with the Roberts Three. They are, from left to right, the D.C. 12/25B, T.10/30, and A.C. 300.

volts—a most accommodating unit! Variable voltages for the S.G. valve are given and the charging rate is .5 amp. The unit costs £3 9s. 6d. and is designed for A.C. mains.

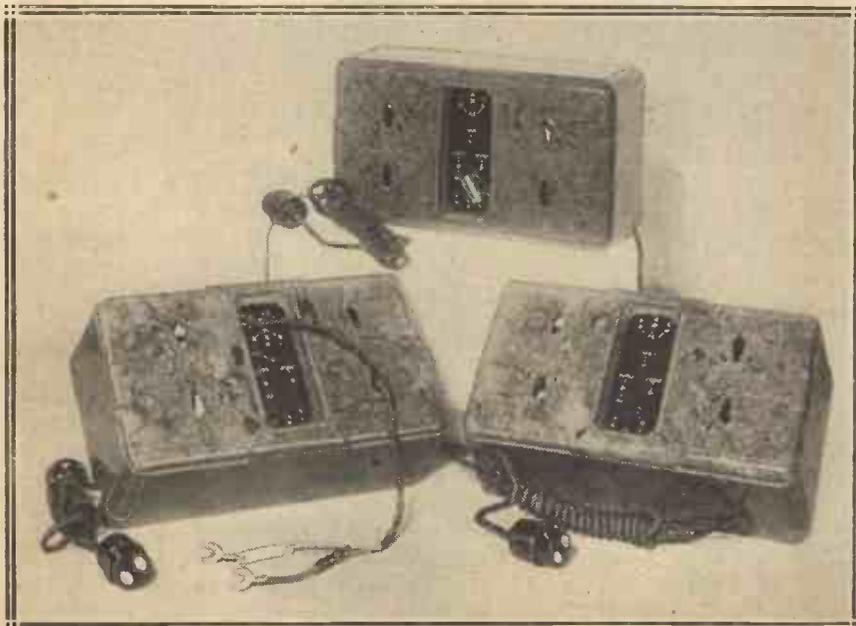
Yet another well-known unit which is eminently suitable for the Roberts Three is the Heayberd 15/50 for A.C. mains. It gives up to 50 milliamps and down to 15 milliamps with practically constant voltage. It is thus an excellent unit for the man who feels that he may later wish to add to his set and does not want to have to change his power pack.

Plenty of voltage variations are incorporated for S.G. and detector stages (latter is not needed in this set) and the unit is of the highest quality. The cost is £4 8s. 6d.

The Grid-Bias Question

A further choice in our list is the Atlas A.C. 300, another "big" unit that provides not only H.T. and L.T. trickle charger, but also grid-bias tapings of 1½, 3, 9, and 16 volts independent of the high tension. This unit is for A.C. and gives up to 25 milliamps at 150 volts. The cost is £6 10s.

And now a word about the grid-bias voltages. Those given last month are suitable for an H.T. voltage maximum of 120, but little alteration is required if 150 volts are going to be used. G.B. — 1 should be left at 9 volts, and G.B. — 2 raised to 4.5 volts—that is all.



Ekco mains units that are recommended for supplying the H.T. for the three-valver described last month. They are the K.10/20, the A.C. 10/20, and the D.C. 12/25.

Questions I am Asked

Q. 117. Why is it possible to receive a station at the top of the medium waveband at the bottom of the long waveband? Is there any cure for this?

A. This is commonly known as break-through and there are two causes of it. It may be due to lack of selectivity of the long waveband circuits, or due to a combination of this and the unintentional tuning of an "aperiodic" coupling coil to a wavelength round that of the station breaking through. There are other occasional causes of the effect, such as subsidiary resonances in a tuned circuit which coincide with the frequency of the interfering signal.

Let us take the first case: A plain tuned circuit such as the grid circuit of the first valve is not very selective and when tuned to the bottom end of the long waveband the circuit will offer an impedance to the strong medium-wave station. An ideal circuit would offer no impedance to the undesired and consequently no potentials would arrive at the grid of the first valve.

Sometimes, the H.F. due to the undesired station gets over by capacity coupling to the grid, the tuned circuit acting only as a defective and inadequate short-circuit.

As the long-wave tuning condenser is increased to a large capacity, the interfering potentials on the grid become less and less.

The whole effect of break-through can be made far more serious if one unintentionally "tunes" an aerial coupling circuit to the interfering medium-wave station. The aerial coupling coil of a transformer input type of receiver coil may, together with the aerial capacity and aerial coupler condenser (series aerial condenser), tune to a wavelength at the top end of the medium waveband, although the first real tuned circuit (the grid circuit) is on the long waves.

The result will be a great strengthening of the interfering signal and subsequent selectivity may not cut it out entirely. The remedy in this case is to avoid this accidental tuning to the undesired station. A change of aerial coupler capacity will often solve the difficulty. A very definite improvement will always be obtained by connecting



The questions dealt with on this page are from those raised by readers, the queries published being chosen for their general interest. The answers are written in the easy-to-follow manner which has made our contributor so popular among home constructors.

a small condenser (say, .00005 mfd.) across the coupling coil of the input transformer. Unfortunately this usually also weakens the desired long-wave stations.

There is a very simple way of reducing or eliminating break-through, and that is to include an inductance coil in series with and next to the aerial. A reaction choke coil, or preferably a smaller inductance coil, may be used. It should be short-circuited when working on the medium waves. Such a coil will usually cause some weakening of the long-wave signals.

When there is only one tuned circuit in the receiver break-through is most likely to be troublesome. When two circuits are employed in a so-called band-pass arrangement, it may usually be cut out. When two circuits with a valve between are employed, it is also reduced, but the valve may tend to amplify the break-through potentials applied to the grid, the second tuned circuit acting as an impedance coupling to the detector valve.

The remedy for these troubles is always to seek to increase selectivity

so that the desired signal is made much stronger than the break-through. The whole level of signal strength of the receiver is reduced so that the break-through becomes inaudible.

On a very sensitive set with a high degree of low-frequency amplification, the break-through effect will be correspondingly greater, but much needless worry is experienced by amateurs on this score.

The remedy lies in reducing the input either by reducing an aerial coupler or reducing the amplification of an H.F. valve of the variable-mu type (or reduction of anode coupler). The next step is to apply reaction. It will be found that the break-through has been reduced to inaudibility, while the desired long-wave signal has been raised to loudspeaker strength. Where double reaction is used the effect is the same.

The presence of break-through in the absence of reaction is usually nothing to worry about. Incidentally, there are no good stations below Oslo to receive.

Q. 118. To what extent can the features of your S.T.600 receiver be used by others of your other sets? I cannot afford to scrap my whole S.T.400, but am intrigued by the Extractor and other features of your new set.

A. I do not favour using individual features of one set and applying them to another unless you are a technical experimenter or unless you are prepared to risk indifferent results. I have had at least a hundred letters asking for special forms of the S.T.600 or adaptations. In some cases I make suggestions, but I never give advice unless the matter is so obvious that there can be no doubt as to results, or unless I have actually tried the alteration.

It is always very risky altering a set. All kinds of unexpected results may be obtained.

My advice is definitely to build the S.T.600 exactly as it is. The Extractor cannot be applied to any of my previous sets. The whole theory of it and its practical application makes it work effectively only in combination with other features of the input circuit.

The Wireless Listeners' Circle



THERE are many sources of information to which the potential purchaser can refer when about to decide upon a new receiver, but speaking quite generally, few of them are likely to provide him with details presented in "man-in-the-street" parlance.

To the average non-technical listener, technicalities are frightening, and yet it is a fact that when an expert endeavours to describe in print the merits of some new set or other, his greatest difficulty lies in translating the technical advantages into language readily understandable by the non-technical listener.

The value of any such test obviously lies in its appeal to the reader, and when facts are presented impartially and, as far as is possible, non-technically, the reader is presented with authoritative guidance upon which, by virtue of the independent conditions upon which such tests are conducted, he can place the utmost reliability.

But the great difficulty—and we write this without intentional offence to anybody—is in knowing just to what extent the average listener is able to understand technicalities.

It is not much good talking about the merits of automatic volume control if the term itself is "Double-Dutch" to the reader. He must first be told what automatic volume control *does* before he can appreciate to the full extent its advantages.

A Monthly Feature

It was with all these considerations in mind that WIRELESS first hit upon the idea of running a monthly "Listeners' Circle," and judging by the success of the first one, the idea has certainly caught on.

What finer indication of the general public's idea of a technical test could be provided, we argued, than to conduct the test with certain ordinary listeners present, not only to hear the set under test, but to try it for themselves?

Suffice to say that Listeners' Circle number one was a great success. It couldn't help but be, for it is obviously the one and only way

of providing the reader with the sort of information that he really requires. Well, encouraged by the first effort and

Great fun! And yet by far the most convincing demonstration of the practical utility of the set "under test" that could possibly have been conceived.

Get a party of people together on a certain evening, decorate the room, for the occasion and provide the guests with paper hats. Then see if after an hour or two they lose that reserved manner so characteristic of our race, and become matter of fact, John Blunt citizens! They do. We can vouch for that, and isn't that just how you want them if their opinions are to be of value to others?

We are proud of our "party," and we shall remember it for some time to come. So, too, we imagine, will those guests who were present, judging by the way in which they entered into the spirit of it.

But we do not intend to labour you with details of the actual party itself. There were the usual preliminaries, and we first introduced the set to our guests by means of a "stunt" guessing competition.

Hidden away in a room in another part of the house was a microphone which was connected by concealed wiring to a pick-up adaptor-plug which we had previously fixed inside the "ADT/95." At a given moment when there was a lull in the proceedings, the microphone was "faded" into use, and the guests, to their extreme surprise, were informed that a series of familiar sounds were about to be "broadcast," and that a prize would be awarded to the "listener" identifying correctly the largest number.

A Great Success

Either our "sounds" were very easy ones (which was hardly the case) or else the reproduction from the "ADT/95" was absolutely true to life, for three of our guests succeeded in getting the lot right! And there was nothing faked about it.

We had to have a second spasm of "sounds." It was a great success. Surprising what fun can be obtained from a cheap microphone (ours cost 21s.) and a good set, isn't it? And what a striking testimony to the quality merits of the set!

CONTINUING OUR LISTENERS' CIRCLE WIRELESS HOLDS A CHRISTMAS PARTY!

TO TEST, UNDER SEASONAL CONDITIONS,
THE NEW EKCO MODEL "ADT/95"

ILLUMINATING DETAILS OF A UNIQUE EXPERIMENT



" . . . In a little more than half an hour they had tuned in over fifty stations . . . "

with the festive season in the offing, this month we have gone one better. We have actually held a Christmas party for the express purpose of testing under seasonal conditions the new Ekco model "ADT/95"!

A pity, perhaps, that there are not pick-up terminals on the set to obviate the use of a pick-up adaptor-plug. But quite a small point, anyway.

Next in the proceedings came a "conducted" tour of Europe. We refer to it as "conducted" because with the Ekco "ADT/95" that is just about what it amounts to. With the name of every worthwhile European station accurately marked on the dial, you need never be in doubt for an instant as to the identity of the station you are receiving, even if there are dozens and dozens of programmes from which to select your entertainment.

Well, in order to determine the appeal (and incidentally the simplicity) of the "ADT/95" from the point of view of the average non-technical listener, we left the operation of the set entirely to our guests, and with a few preliminary hints from us as to the purpose of each control, they fell to the task of testing it with great gusto.

In a little more than half-an-hour they had tuned in over fifty stations; practically all of them at excellent speaker strength and noticeably free from interference. And to think that not one of the "operators" had the slightest technical knowledge, and that all of them, without exception, had had little or no experience of set operating!

Six Valves—Nine Stages

Mr. Stewart Watkins, of Oakhill Road, Beckenham, and his sister Miss Joan Watkins, were quite new to set operation; they admitted it. But they obviously revelled in the experience of being able to try out one of radio's latest set wonders for themselves. So, also, did Miss Muriel Grieve, who accompanied their party, and the Misses Richardson.

Mr. Leslie Vaughan, of Coldershaw Road, West Ealing, who was accompanied by Miss Joan Wright, also of Ealing, got down to business with real intent, and fired questions at us one after another.

He wanted to know how many valves there were in the set. We told him that there were actually six, but that these days numbers of valves alone conveyed little or nothing, for it was the number of stages which counted. Whereupon he wanted to know how a set with six valves could have more than six stages, and we had to explain that certain valves these days had two or more sets of

was concerned only served to draw from him another question as to why so many stages should be necessary, when modern stations were so very powerful?

What a question to answer in absolutely non-technical language and with a dozen interested listeners all waiting for the explanation!

However, this was the answer we gave them, and because it seemed so aptly to

In addition to the six stages included in all modern superhets, this particular Ekco model has three extra stages for what the makers describe as "pasteurization" purposes.

The first of those is to reduce the hissing noises which, with any really sensitive set, that is to say, a set that will pick up a lot of distant stations, are apt to mar the programme value of the station being received.

The second acts as a sort of buffer to the crackles and noises which ordinarily tend to "split the ear-drums" between stations, while the third is for levelling out variations in volume due to what is known as fading and various other circumstances. In other words, all stations received remain dead constant.

No sooner had our explanation finished than our guests assembled made straight for the set. They apparently intended to test the truth of our explanation forthwith. And they did—to their amazement and surprise, for we had rather conjured up visions of a sort of dream set even though our explanation was based upon fact.

But they were soon able to substantiate it for themselves.

Point number one, the "hiss" question; yes, the set was certainly remarkably free from it. Point number two, "between-station bombardment," no, the set could be made dead silent in between station settings. And then the "volume variation leveller"—we call it automatic volume control—yes, it was completely effective, and after twenty minutes on Athlone, a notoriously bad station for fading, our guests pronounced that there had not been the slightest audible change in volume.

A Remarkable Design

We can state, with the hearty endorsement of all those who were present for this unique test, that the Ekco model "ADT/95" is one of the most remarkable designs of the season. It is an easy matter to find a set that will tune in a whole gamut of stations, but few, if any, sets can provide so many alternative programmes at what we choose to term real programme value, as this fine instrument. The Ekco schemes for the suppression of hiss and crackles make all the difference between mediocrity and perfection. And these are not our views alone. They are statements based upon the views expressed by our chance-chosen critics.

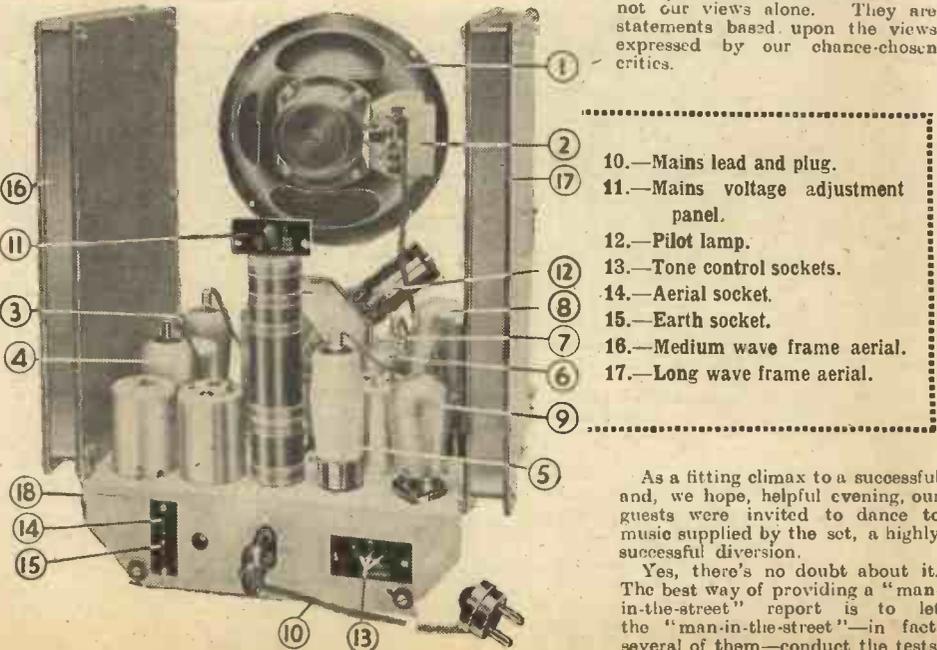


"ER JUST A MINUTE, PLEASE!"

Dwyer: Ladies and gentlemen. What better gift than the EKCO transportable! The performance—
 Clapham: Yes, what? That's got you guessing, eh? Great lad at caddies—conundrums. Told me a beauty about—
 Dwyer: Just a moment—"Wireless" readers are awaiting my verdict on this set. Your riddles are irrelevant.
 Clapham: Oh no, old boy! I object. This one was perfectly clean. Specially designed for the B.B.C. and the parlour. About the vicar's false teeth—
 Dwyer: The performance of this set is remarkable.
 Clapham: Rather! Not a whistle in a week.
 Dwyer: It can be carried from room to room and taken out in the garden.
 Clapham: I say, old chap, isn't that rather—I mean to say, garden pretty public place; shouldn't take out teeth in the garden, old boy. It's not done.
 Dwyer: I am not talking about teeth. I refer to this EKCO model "95," a splendid example of British radio craftsmanship.
 Clapham: Oh, yesh, wonderful set. Marvellous. Turn a knob and you get Konigswush—Konigspipp—you get Rome as easy as say the word. Bally oceans of music at all hours of the day and night. Jolly thing simply oozes with entertainment.

describe the advantages of the "ADT/95" in language which was apparently understood—even by the ladies present (no offence intended!)—we report it verbatim.

- 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 AVC 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.

electrodes in the one glass envelope, and that in consequence they were two- and three-in-one valves.

But even that didn't satisfy him, which rather pleased us, for it showed that he was taking a very keen interest. Our intimation that the Ekco "ADT/95" was a nine-stage receiver although it only used six valves so far as physical appearance

As a fitting climax to a successful and, we hope, helpful evening, our guests were invited to dance to music supplied by the set, a highly successful diversion.

Yes, there's no doubt about it. The best way of providing a "man-in-the-street" report is to let the "man-in-the-street"—in fact, several of them—conduct the tests.



Away from the glare of studio lights, Miss Fay Carroll, whose name will be familiar to all film fans, is an ardent radio enthusiast. Her choice of the Philco set seen above on which to receive her broadcast entertainment is indeed a wise one. As for "Stainless" the inimitable, with hat (exclamation mark), he believes in Portadyne for "perfect punctuation."



Jack Hylton, the popular dance orchestra leader, is highly delighted with the Ferranti "Arcadia" which he recently bought. Here he is seen explaining the merits of this fine set to Miss Eve Becke, another star of the radio firmament.



C. W. A. Scott, the famous airman, who is here seen with his colleague, T. Campbell Black (left above), relied upon K.B. radio to keep his family informed of their progress in the record-breaking Mildenhall to Melbourne air race. But no prizes will be awarded for indentifying the popular celebrity in the right-hand picture. Henry Hall is the owner of a Marconiphone model "Q286" radiogramophone, and he, of all people, should know what constitutes good radio.





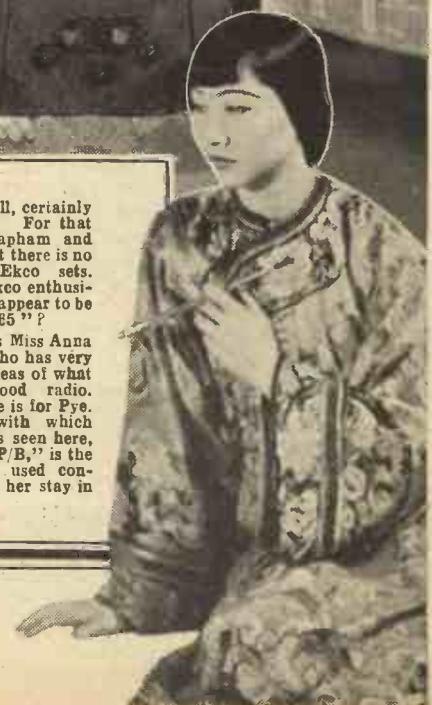
Do you remember that popular musical show, "Mr. Whittington"? If you do, you will easily recognise these two theatrical celebrities who starred in it. Miss Lala Collins (left) spends her leisure moments with a Burgoyne receiver, but inimitable Jack Buchanan has a preference for the radiogram type of instrument. His choice of the Marconiphone model, "Q.286" is one that will be endorsed by all who have heard it.



And the sets they use



"A spot of—," well, certainly not bother this time! For that ever popular pair, Clapham and Dwyer, are agreed that there is no conundrum about Ekco sets. They are both firm Ekco enthusiasts. And don't they appear to be enjoying the Model "65"?



On the right is Miss Anna May Wong, who has very westernised ideas of what constitutes good radio. Her preference is for Eyc. This model is seen here, the famous "F/B," is the one that she used constantly during her stay in England.



Was this the "sweet music" inspiration for "soft lights and sweet music"? Austen Croom-Johnson, the creator of this B.B.C. programme highlight, uses an H.M.V. model "440" on which to receive his broadcast entertainment.



*A Week-end
with the*

H.M.V. "Portable Fluid Light Six"

THE remarks of Miss Florence Desmond which are published on this page concerning her H.M.V. "Superhet Portable Fluid-Light Six" are sentiments which we are confident will be endorsed by a large number of WIRELESS readers.

"It is essential for me to have a portable receiver," says Miss Desmond, "because in the course of a week I require it in three places." How many readers of WIRELESS, we wonder, are placed in the similar position of requiring their radio programmes in more places than one? And how many find such a satisfactory solution?

There will be people who disagree with what we are about to say, but portables generally do not rank high in the public estimation. Alas, such unwarranted condemnation can only be a relic of the old days when the word portable as applied to radio stood for anything from a squeaky cigar-box affair to a cumbersome, more often than not instable, collection of apparatus which was the very last word in inefficiency!

Very Different Conditions

Perhaps we should apologise for being so wholesale about it, for, of course, there were exceptions. But they were few and far between, and in any case, it is one of those rules of life that the success of any new scheme is never likely to be pronounced on the strength of the exceptions.

No, in general, it must be admitted that the portables of the old days were most unsatisfactory affairs. And to-day, with all the development going on around us, we can afford to look back on those old so-called portables with not a little amusement.

But let us seek once and for all to dispel the bogey that those old-stagers have any relation with modern types of portables or that the word portable as applied to modern apparatus has any bearing upon the make-shift idea.

Perhaps that can best be done by a brief comparison of the conditions prevailing in the old days with those which hold good to-day.

Well, that is easily done. In the first case, the number of stations in Europe at the time to which we refer was so small that knife-edge selectivity was not a paramount consideration, and in consequence the only limits with regard to the size of the aerial were those imposed by the Postmaster General.

The comparatively small powers of the stations concerned, coupled with the poor amplification factors of the valves then in vogue, rendered a large aerial a very valuable asset. But if you took away that aerial, called the set a "portable," and relied upon the inefficient valves to pick up the stations,

well, is it surprising that portables rapidly fell into disrepute?

What invariably happened, of course, was that the then so-called portable was worked as near as possible to the point of instability to try and obtain the maximum efficiency, and in these enlightened days we shudder to think of the effect of such a practice upon quality of reproduction! It was nothing short of atrocious.

But what a very different story can be told to-day! Not only has the portable come into its own, but it stands out as a welcome solution to many vexed problems.

The old-time advantage of a large aerial has been completely nullified by the

But if you are after real radio portability, you must use a set that has been specially designed for the purpose. It will probably have occurred to you that there would not appear to be any real need for specially designed portables when modern sets generally are so sensitive that they will pick up a large number of stations without any aerial at all.

Quite so, but what about the "hiss" and general background noise? Oh yes, it's there right enough, it is bound to be if you try working an average super without an aerial unless—well, unless, like the H.M.V. "Superhet Portable Fluid-Light Six," it has been specially designed for the purpose.

There is an important distinction; a distinction which in this case, and without entering too much into technicalities, is achieved by virtue of the fact that the set in question has been designed by men eminently qualified to tackle the problem; by the engineers connected with what must surely be one of the largest, if not the largest, radio laboratory in the country.

PRAISE FROM A STAR



Miss Florence Desmond (above), the famous stage and film star who is at present appearing in "Streamline," is an enthusiastic H.M.V. Portable user, and Miss Desmond's opinion, which is given below, is one that will be endorsed by thousands of satisfied owners.

□ □ □ □ □

"I find the His Master's Voice 'Superhet Portable Fluid-Light Six' a really marvellous set.

"It is essential for me to have a portable receiver because in the course of a week I require it in three places. I use it in my flat during the day, take it along to the theatre with me for matinees and evening performances, and just plug it into the lighting socket in my dressing room, where I enjoy programmes when I am not on the stage. At week-ends it entertains me in my country cottage.

"I especially like this H.M.V. receiver because I am always in a hurry, and the fluid-light device makes it so easy for tuning.

"I am quite a radio fan, and listen to all the Continental stations which this set reproduces so magnificently. Sometimes when I hear my fellow artists broadcasting, I can scarcely believe they are not in the room with me, which is rather lucky, as I usually listen whilst changing my stage costumes.

"My radio is much admired by my friends, and I find that the beautiful walnut cabinet blends with every type of furniture. The best good turn I ever did myself was when I bought this H.M.V. portable receiver. It has given such good results that many of my stage colleagues have bought one of these models, and it seems to be quite the fashion amongst theatrical folk these days to own one of these H.M.V. sets."

Hall-Mark of Good Radio

The, in a sense unusual, circuit arrangement of the H.M.V. "Superhet Portable Fluid-Light Six" with its pre-first-detector H.F. stage and the numerous patented circuit refinements which serve to stamp it with the hall-mark of good radio—of H.M.V. radio—is no accident.

It has been evolved as a result of endless and untiring research. That is why the overall efficiency has not suffered one iota as a result of dispensing with the conventional aerial; that is why the automatic volume control does precisely what it is supposed to do; that is why the quality of reproduction is faultless; that is why the usual "hiss" and general background "dirtiness" so common to superhets when worked without an aerial is in this case a negligible consideration; that is why, by the inclusion of "Fluid-Light" tuning, the operation of the set is so remarkably simple.

You might be inclined to say of our remarks that we

phenomenal increase in the number and powers of European stations, and valve technique has so much improved that there is little or no difference between the portable and non-portable types of construction.



are obviously biased. Remember simply that our observations are written *after* and not before our week-end spent in testing this fine instrument, and you will at once appreciate the reason for our enthusiasm.

Here is a portable, an all-electric portable, which is the nearest approach to perfected "take-it-where-you-will" radio that we have yet tested. It is neat and compact—in itself an article of furniture,—and its general performance without an aerial compares very favourably with many modern superhets specifically designed for use *with* an aerial. In fact by comparison with some of the modern supers that we have tested, it shows up to advantage.

is useful, too, to find the provision for the connection of an external speaker, although the success of the set as a portable in the strict sense of the word makes it rather doubtful whether, in ordinary circumstances, at any rate, an external speaker would ever be required.

The set is capable of providing an undistorted output of 2 watts, which is another way of saying that its volume limits are considerably in excess of what is ordinarily required for domestic listening.

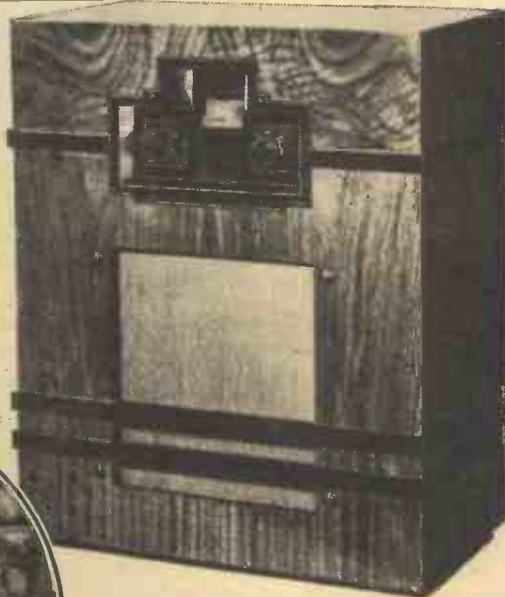
You are certain with this set of between 30 and 50 alternative programmes on any evening, and under, so it would seem, practically any conditions. Again we are quoting from our

windows, but at a spot in the same room not ten yards removed, and by the side of a large pillar, there was a noticeable decrease in signal strength from all stations. The reason became obvious when we learned that the building in question was heavily "metallised" in its construction. A perfect screening box, in fact, and most effectively earthed!

Although there are likely to be few, if any, domestic environments in which so much steel is used in the building construction as in the case mentioned above, we draw attention to the incident because in the attainment of maximum results it tends to show the advisability of trying the set in different positions even in the same room.

TECHNICAL SPECIFICATION

GENERAL DESCRIPTION.—Six-valve superhet portable receiver for A.C. mains operation, with automatic volume control and "Fluid-Light" tuning.
CIRCUIT ARRANGEMENT.—Variable- μ H.F. amplifier; cathode-coupled frequency-changer valve (combined first detector and oscillator); variable- μ intermediate-frequency amplifier; double-diode-triode (combining the functions of demodulation, A.V.C. rectification and L.F. amplification), and pentode output. L.F. amplifying stage is resistance-capacity coupled.
CONTROLS.—One main tuning (which drives illuminated wavelength scale), with concentric trimmer adjustment and one control for volume, with which is concentrically mounted the three-position switch which gives "medium waves," "long waves," or "gramophone." Main on-off switch is at the back. The fluid-light tuning indicator operates in the form of two arrows of light which are projected on to the wavelength scale. These are at maximum length when the station is accurately tuned in.
SPECIAL FEATURES.—(1) Complete portability; (2) effectiveness of A.V.C. scheme incorporated; (3) provision of built-in turntable; (4) total mains consumption of only 70 watts; (5) 2-watt maximum undistorted output; (6) provision for connection of pick-up and where desired, for external speaker; and (7) freedom from mains hum.
MAKERS.—The Gramophone Co., Ltd., 98/108, Clerkenwell Road, London, E.C.
CASH PRICE AND HIRE-PURCHASE TERMS.—16 guineas or first payment of £1 13s., followed by 12 monthly payments of £1 7s. 3d.



Cabinet craftsmanship—typical absolutely of the high standards for which H.M.V. are famed—is an appealing feature of the "Superhet Portable Fluid-Light Six."



"... We even walked into a butcher's shop on the Saturday evening, where among the lambs it behaved like one of them!"

own experiences, for during the week-end over which our tests of this set were conducted we took it to numerous different localities in and around London.

It Worked Perfectly

Without exception, it worked perfectly, and, when tested almost in the shadow of the Crystal Palace (a notoriously bad spot for reception), the results obtained provided adequate proof of the efficiency of the design.

We even walked into a butcher's shop with it on the Saturday evening, where among the lambs it behaved like one of them!

It was particularly interesting in the course of our "touring tests" to note the relative field strengths of stations in the different localities in which the set was tried.

On the west side of London, for instance (at Ealing) there was little to choose in strength between the London Regional and National transmitters, but at a spot almost due South from London Bridge, the National required a much greater advancement of the volume control to bring it into line with the strength of the Regional.

In one of our tests in a building in the heart of the city, the set worked perfectly near the

On the Saturday afternoon of our week-end with the "Portable Fluid-Light Six" we subjected the instrument to a test which will no doubt be of interest to all our readers who interest themselves in television.

With many of the cheaper types of television receivers at present available, the brush discharge from the motors is often a source of interference to the "sound" channel, which has, of course, to be received on a set separate from the one on which the "vision" signals are coming through.

It is possible to obviate the trouble by a system of "smoothing" on the motor brushes, but we were pleasantly surprised to find that not even this precaution was necessary when using the H.M.V. portable

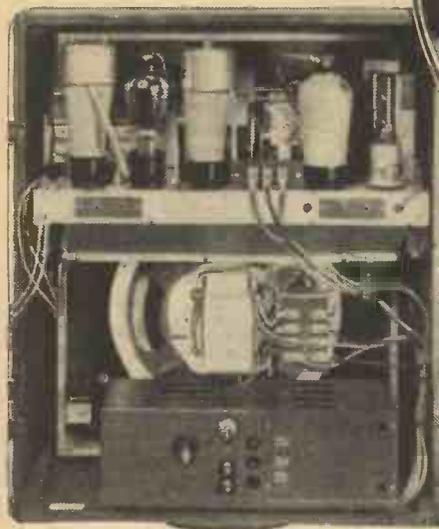
● ARE YOU INTERESTED IN TELEVISION RECEPTION ?

Do you experience any interference troubles with the "sound" reception due to brush discharge from the televiewer motor ?

● Read how this set enables you to overcome that difficulty with the minimum of trouble.

for the reception of the "sound" channel. By swivelling the set round on its turntable, a position could be found at which the interference was to all intents and purposes negligible.

As we have previously indicated, this set of H.M.V.'s is the nearest approach to perfected radio portability that we have yet tested, and we congratulate the designers. And to think that we used to turn up our noses at mention of the word portable!



To ensure absolute safety the mains are automatically switched off when the back of the receiver is opened.

to obtain effective control automatically. The fact that distant stations on this set can be relied upon in practically all cases to provide consistent programmes is indeed a feather in the caps of the designers, remembering the initial disadvantages with which they were faced.

Then there are the little refinements so typical of H.M.V.'s thoroughness, but not often encountered in strictly portable designs. We commend the provision of pick-up terminals, for instance, especially as no additional volume control is required when using a pick-up. It

THOUGH I am a mains user there are times when I am very envious of the man who is restricted to batteries. Mains are all very well when one has a definite receiver, well tried and tested, but when one has new designs to test the joy is often tempered by sorrow.

Ooh that hum! You battery kings do not know the torments some of us poor set-testers go through in the search for the source of an elusive hundred-cycle "note," or a ripple whose pitch is about an octave higher.

Hum-hunting is instructive, but not conducive to composure or friendliness, either to the set or the mains. If done at home this kind of research can also cause a rift in the family lute.

You may think I am making mountains out of the small peaks of A.C. ripple, but, believe me, about 95 per cent of listeners with mains sets put up with hum to a greater or lesser degree. A mains set—even one capable of giving 5 or 7 watts output—should be *completely free* from any background noise when no station is tuned in.

It is possible, and it should be the standard every mains receiver designer should set himself. Not that hum is always easy to cure. I well remember the struggles of our Chief of Research, with a radiogramophone he had built.

The hum was not loud—it was less than that normally pronounced as "free from hum" or "silent back-ground" by not-too-particular designers. But it could be heard "comfortably" a yard from the speaker—a low rumble that was drowned when music or even speech came on.

But he would not have it, and he tore away at the innards of that set for many weary hours before he silenced the hum altogether. Now you cannot hear any sign of life unless you place your ear up against the speaker.

A couple of good chokes and two or three large

electrolytic condensers went in the power pack, and several stages of decoupling (one of them containing a choke) were connected in the detector anode. It took a long time, for resistance coupling with 1-mfd. condensers was being used, and the set was really efficient down the bass end of the register. But, the fact that so much smoothing and decoupling was

Screened pick-up leads, an earthed pick-up frame, and screened motor-mains leads are often required to obtain trouble-free gramophone reproduction.

If the hum "appears" when the pick-up is approaching the centre of the turn-table it is a sign that the trouble is coming from the motor windings. These may have to be screened by a sheet of iron between the pick-up and the motor, or earthing the frame of the motor may help.

D.C. motors are sometimes guilty of noise induction into the set owing to sparking at the commutator. Condensers and cleanliness, plus perhaps a little screening, should

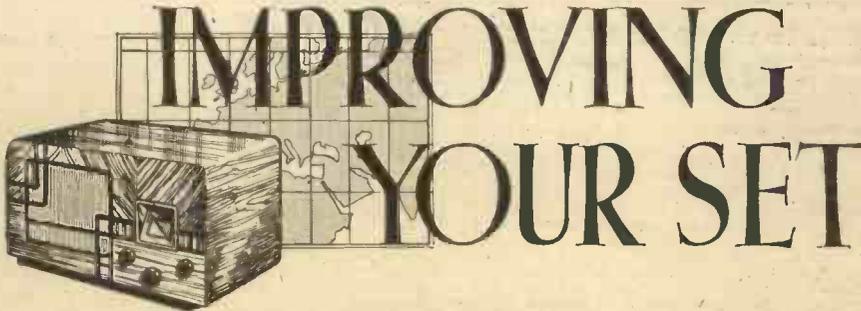
do the trick here. The *best* remedy is to use a really good motor.

One cause of bad hum with a pick-up is a break somewhere in the windings of the unit. This is easily checked by playing a record, or, if things have not reached that state of preparedness, by placing a needle in the chuck and "plucking" it. Absence of clicks in the speaker will denote a disconnection (or a short circuit) somewhere. The latter will not cause hum, but the former may give rise to a very bad attack.

I have had not a few cries for help from readers who are worried about the eventual closing down of the medium wave National transmitters in favour of Droitwich. The strength of the latter station is in many cases not quite good enough, and constructors in affected areas are afraid their sets will be useless when the change takes place.

They need not worry. To start with, the change will not be carried out for some considerable time, but when it is it is not a difficult matter to add a stage of untuned H.F. in front of any set that is not quite powerful enough on Droitwich.

Such a stage can be tucked away conveniently and costs very little. I am using an aperiodic stage myself and find it very useful indeed. But more of this later.



You must have a silent background for true radio enjoyment. Here are a few hints on hum tracing.

By **FREDERICK LEWIS**

necessary only shows how difficult it is to eradicate hum in powerful sets.

When finished all was clear and the set was tried on pick-up. Quite O.K., thank goodness!

Oh, yes, there was cause for a sigh of surprised relief, for not infrequently a set will be almost, if not completely, hum-free on radio, but will evince a terrible noise from the mains when a pick-up is to be used.

The Gramophone Side

Then some more searchings—apart from mains smoothing—have to be undertaken. If the set is O.K. with pick-up terminals shorted and the mains disconnected from any motor in the vicinity, you can rest assured the set is all right.



Noel Coward recording in the H.M.V. studios. Carroll Gibbons, the famous Savoy Hotel Orpheans leader, is conducting.



From My Armchair

by
S.T.

Our popular contributor here unfolds some radio secrets that have never before been revealed. They will come as complete surprises to our readers. Incidentally, S.T. has evidently been the victim of no uncertain horticultural propaganda which has inevitably affected the trend of his armchair thoughts.

RADIO SECRETS THAT HAVE NEVER BEEN TOLD BEFORE:

No. 1.

Two hours after reading in your notes about the ravages of the lamination louse in Ilford, where I live, I felt a violent tickling especially in the small of my back and other parts not readily accessible. Do you think this pest has attacked me?"

I can't say. There is no accounting for tastes.

It may be just a case of delayed irritation. Some readers complain that immediately after reading my armchair vapourings they experience a curious pain in the neck.

An Unbiased Opinion

A clear reference to the new parasite which has wrought such havoc (why is havoc always wrought?*) amongst L.F. transformers, was made recently by an anonymous competitor in a recent air race. On being asked his opinion of an anonymous transformer made abroad by an anonymous firm and sold in an anonymous cut-price shop, he remarked promptly: "It's lousy, and that's praising it."

* * *

Those who squeal about my photographs should read the leaflet that has just been pushed under the door of my lab.:

"The mother who says she sees no need to start putting powder on a fresh young skin like yours is not being old-fashioned so much as over-cautious. To you, your pretty skin is something that has happened—like the colour of your eyes or the shape of your nose. To her, it is a flower that she has tended and lovingly guarded since the days when you were dried on her lap after your bath."

This ought, at any rate, to silence the Altrincham comrade who said I looked as though I had never had a bath.

* I suppose because revenge is always wreak-ed.

I suppose everyone knows that valveholders are standardised as regards the positions of the sockets. But how many people know these sizes and dimensions?

Well, here are some standardised by the valve manufacturers. 9-pin base sockets: distance between socket

ALL "SHIP-SHAPE"



Mrs. Sheila Borrett, the only officially appointed woman announcer Britain has had, has recently opened a cleaning business in New Malden, with her husband, Commander Borrett. The premises are called "The Ship-Shape Shop" and the interior has been decorated to resemble a ship, while all the staff wear nautical dress. Here is Mrs. Borrett behind the counter receiving hats for cleaning.

2 and the vertical line through centre is 12.97 millimetres; between 7 and centre is also 12.97 millimetres; between 9 and the line between 5 and 4 is 25.43 millimetres.

This is really all very reasonable, but I like to picture a sub-committee meeting of the Imperial Thermionic Valve Manufacturers' Association to discuss this matter. Members of the

committee (representatives of different firms) are designated V.1, V.2, V.3, etc., for brevity.

A Question of Dimensions

Chairman: Well, gentlemen, we have been discussing this matter for five hours. We cannot allow a matter of .03 of a millimetre to hold up business.

V.1: It's ridiculous to dimension anything to 12.97. The public will say

V.3 (yawning): What does the great cow-faced public know about it? They'll never know.

V.5 (darkly): Unless "S.T." tells them.

V.7: Oh, to h— with "S.T."

V.4: The public, if there is a leakage of confidential information, will admire us for the careful calculation of our 12.97. If it had been 13

V.1: Which it ought to be. I feel we owe a duty to the great public that buys our valves

V.2 (sneeringly): You mean you've got a big stock of valve bases already made to 13 millimetres!

V.1 (defiantly, biting nails): Well, what if we have?

V.2: Tchah!

V.3: Tchh!

V.4: Tch!

V.5: Tch!

V.6: Pouf!

V.7: I don't mind admitting that my firm also expected this committee to agree to 13 millimetres—the sensible figure. We thought we'd steal a march on you

"All a Bit Undersized"

V.3 (under breath): Yes, you dirty dogs.

V.7: . . . and the only reason you fellows want 12.97 is to queer our pitch.

V.5: I take exception to that remark, Mr. Chairman. That was not our motive at all in insisting on 12.97 millimetres.

Chairman (sighing): I know, I know. My firm's valve bases are also

all a bit undersized. It was only after moulding a quarter of a million that the error was discovered.

V.1 (generously) : Let's compromise. Call it 12.99 millimetres.

V.5 : What ! And make the great British public struggle to squeeze their valves into the holders ?

V.3 (callously) : What of it ?

V.5 : They'll break half the valves.

V.7 : That would not adversely affect trade.

The Discussion Continues

V.1 : The valves will fit all the better. No loose contacts. We'd just print a warning ; that would clear us.

V.4 : I insist on 12.97 millimetres.

V.1 : Make it 12.975.

V.4 : No, 12.97 or nothing.

V.7 : If it were nothing we wouldn't have a socket for the fifth grid of our double-diode-triode-heptode.

V.3 (under breath) : That wouldn't affect its working.

V.7 (angrily) : What's that you said ?

V.3 : I said that it was a darned good valve and that to deprive it of its fifth grid socket would alter its whole load

THE RESULT OF THE MEETING

characteristic and increase the percentage of third harmonic content in the second screen current beyond the permissible limit.

V.7 : Oh.

V.3 : Yes.

Chairman : Come, come, gentlemen, we must try and settle this matter before Radiolympia.

V.1 : Well, I'm not unreasonable. If my offer of 12.975 is not acceptable, I'll consider 12.9749.

Chairman : Any more offers ?

V.4 : 12.97485.

V.1 : Impossible.

V.7 : Make it 12.974852.

V.3 (yawning) : Make it inches.

Putting It To a Vote

Chairman : I propose to put this matter to the vote. It has been proposed and seconded that the distance between socket 2 and the vertical line through the centre be 12.97 millimetres. Those in favour ? Those against ? Carried with one dissentient.

V.1 (rising) : Very well, gentlemen. My firm will resign from the Association. We shall make our valves in China and flood the British market with valves at tenpence each. We'll....

Chairman : I think we

ought now to adjourn for lunch. After the lunch interval, an unanimous vote on 12.97 millimetres was taken.

Little does the great wet-nosed British public know what a near thing it was.

INTERLUDE FROM HILLEGOM

500 GLADIOLI, 3½-4 circ., in 10 named vars. 100 Anemones, 100 Ranunculus and 10 beautiful Lilies for only 10s. (C.O.D.) ; 10s. 6d. carriage and duty free.—HILLEGOM.

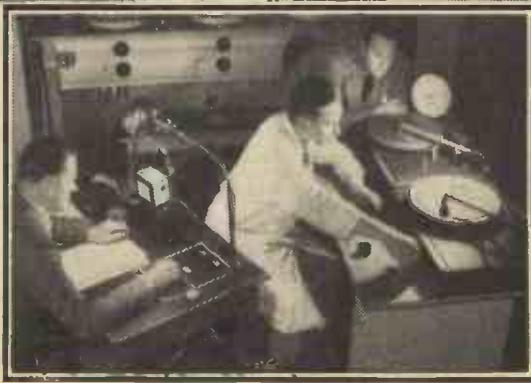
Things have been progressing rapidly with the Wireless Designers' Sanctuary on the slopes of Snowdon. The concrete pit reserved for a few designers who think for themselves and thus need special protection from a certain violent section of the public, has proved inadequate.

A visitor from Chorlton-cum-Hardy was teasing the designers by throwing bricks through the railings when he overbalanced and fell on to the wire-netting which is intended to catch light articles such as orange peel, silver paper and the like.

One of the designers who had been resting in the sun on one of the terraces—having recently produced a very popular set and having retired to the Sanctuary to escape the consequences—suddenly awoke and seeing the reader at his mercy, sprang forward and licked his face.

* * *

GERMANY'S "RED-HOT" NEWS



Recent developments in German broadcasting programmes have put wonderful life into the news bulletins. Huge crowds of listeners have been hearing daily transmissions under the title of "Echo of the Day." Within a few minutes of their taking place listeners are accurately informed of the day's happenings—in short reports recorded on the spot of the occurrence. Thus they get a plastic and lifelike picture of the event. For this purpose expert wireless reporters are engaged and they make use of a so-called "echo-car." Wherever anything is going on they are to be seen. They make a report that is not transmitted at once but is taken down on wax records for transmission later.

On the left, above, we see the special "echo car" used for the German "red-hot" news bulletins, while above is a glimpse of the interior of the car, with the recording apparatus taking down the eye witness account from the reporter on the roof of the car. The third picture shows the "Echo of the Day" programme being broadcast, the news Editor is reading the bulletin and the operators are awaiting his signal to switch on the record made earlier in the day.

CLEAN FUN WITH THE S.T.600.

My tour of Britain has been concluded but it will have happy memories for me. The S.T.600 has been the easiest of all my sets to demonstrate.

The calibrated dial with station names all there just waiting for the pointer was a godsend. It was a simple matter to get 50 stations in an hour.

The Demonstrations—and Demonstratees

To avoid errors in identification when I toured the S.T.400 two years ago I needed technical assistance with a wavemeter of the heterodyne type. This time I went naked and alone (I am speaking in a technical sense) into each lion's den.

The lions were, for the most part, hungry for information and some had sharpened their fangs for the occasion. Mind you, I didn't know these people from Adam although I soon recognised the old Adam in some of them.

1,000 GLADIOLI, first size, 4-5 inch circ., in 10 named vars., for only 22s., half lot, 12s., carriage and duty free to destination (C.O.D. 6d. extra).—HILLEGOM, Holland.

Yes, yes. To-morrow, perhaps.

Well, to continue. These gentlefolk who came to my demonstrations were kittle-cattle. One man at a Brookmans Park was peculiarly kittle. In fact, I gravely suspected him of having had five gins, twelve whiskeys and about fifteen ports, and then, fortified for the occasion, met me and the others outside Broadcasting House.

To digress, this was a bad idea for a meeting place. I kept getting mixed up with the variety star fans and lunces* who clutter up the pavement below Ariel's modest little figure.

Nobody knew who I was and I knew nobody who was coming to the demonstration, so all I could do was to look for somebody who was looking as though they were looking for somebody who was looking for them.

Having made the sign manual of the true radio experimenter† without avail, I would mutter something about, "Are you expecting a demonstration

Several men standing alone or in twos and staring at the arriving limousines which disgorged the various stars of the ether, were thus approached and their replies were richly variegated.

* Brit. Pat. 2,473,526, Nov. 20, 1934.

† The neck is twisted into the shape of the letter S while the little finger of the right hand is bent into the letter T.

750 GLADIOLI, first size, 3½-4 inch circ., in 8 vars., for only 16s.; half-lot, 10s.; carriage and

No. Please come back in a week. Go and look at p. 173.

Well, here are some of the replies:

- (a) "Demonstration? No, I think it will pass off quietly."
- (b) "What? The 600? Are you S.T.? Really? I've brought my young lady, d'you mind? She's in the Langham Hotel."
- (c) "A what?"
- (d) "I'm waiting for Henry Hall."
- (e) "What is it?"
- (f) "What? Can I go in? Free?"
- (g) "What is it? Television?"
- (h) "What the 'eck's 'e talkin' about?"

However, I soon learnt to distin-

of evidence that they sum me up. Some of the P.S.'s to their subsequent letters show that. I am "more genial than you look in your photos, and stouter." I am "not quite as impressive in the flesh as I had thought." I am "taller than your photos, which usually only portray your head."

Summing Them Up

I have also caught demonstratees looking critically at my shoes, my shirt, socks and even at a button left conspicuously undone.

It is not surprising that I sum-up some of the crowd clustering round me. No first-night actor looks at the first few rows of the stalls with more speculation.

Here are a few labels I have mentally pinned to demonstratees:

RELAYING THE PROGRAMMES TO THANET



The mayors of Ramsgate and Margate and the senior councillor of Broadstairs recently jointly declared open the first building erected for the sole purpose of housing the complete equipment for the reception and redistribution of broadcast programmes under the popular relay system. The relay in question is that in operation in Thanet and the building is conveniently placed for serving the three adjacent towns.

guish the common or garden rubber-neck from the keen would-be demonstratee. The latter had a radiant glow of expectation on his face. He would turn hither and thither, especially thither, his nose twitching with suppressed excitement and almost sniffing round for Britain's leading radio designer.

"Poznan"

I had only to say: "The car's on the other side of the road," and he would understand.

But that was all a digression. I was talking about "Poznan"—that is how I catalogued him after the demonstration.

By the way, I do catalogue demonstratees in this way. There is plenty

- (1) Decent sort. Elderly. Probably the fellow who said he got twenty stations but felt he ought to get more. Didn't blame me, probably his own lack of skill. Good sort.
- (2) The red-haired fellow with a sneer who stayed on the edge of the crowd and never said a word and left early.
- (3) The City and Guilds first year student who asked what the response was like at twelve kilocycles and did I think Barkhausen was right.*
- (4) The fellow who kept muttering something about Class B.

(Please turn to page 96)

* I quite agree with Barkhausen within the limits of his premises, but not beyond his first hypothesis.—J. S.T.

Practical HINTS FOR ALL



Some Topical Tips

By A. S. CLARK

BY the time this number of WIRELESS is in the hands of readers we shall all be looking forward to the Christmas celebrations. So a few tips in connection with the use of the radio at the Christmas party will not be amiss.

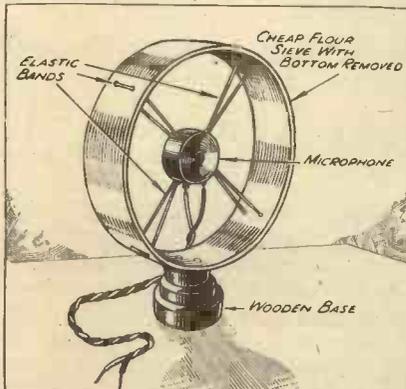
Time and again it has been explained how a microphone can be attached to the pick-up terminals of a set, so I don't propose to bring that up. But very often difficulty is found in solving the problem of how to fix the microphone.

Must Be Shock-Proof

Unless it is placed so as to be quite free from shocks, your home "broadcasting" may be spoiled by numerous loud bangs and splutters. To avoid this some form of sprung mounting is desirable.

This can be obtained in a really simple manner if you work on the lines suggested in one of my sketches this month. As the diagram shows, no expensive or elaborate equipment is needed; in fact, the only point

MOUNTING THE "MIKE"



Although looking very professional, this microphone mount is extremely simple and inexpensive to make up.

requiring mention is the method of attaching the rubber bands to the microphone.

Occasionally a microphone is carried in a wooden outer casing, and when

that is the case, it is simply necessary to screw small hooks into the wood. In other cases some method will have to be devised to suit the particular microphone employed.

This should not be difficult. In some cases, for instance, you may be able to fit metal clips under nuts or bolt-heads. But, in any case, some way out should be obtainable with the aid of twisted, tinned copper wire of about 18 gauge.

While on the subject of microphones there is a fact which is not generally known, but which is often quite useful. When a fairly sensitive receiver is available an ordinary earpiece off a radio telephone head-set will often prove quite efficient as a microphone.

No input transformer or battery is needed with it. Just connect the two wires from the earpiece direct to the pick-up terminals or sockets. You will probably find that you have to speak very close to the "microphone," but that is not really a handicap.

Sometimes the sensitivity of the earpiece as a microphone can be increased by unscrewing the cap about one turn.

Shielding the Leads

And now a word about hum. If you run long leads to the set from the microphone in another room, and there are mains in the house, you may find that a certain amount of hum is picked up.

There is only one way to avoid this, and that is to use screened wire for the "mike" leads. As the normal type of screened wire used in radio is rather expensive, it is out of the question for such a long run.

But, luckily, there is a good alternative available fairly cheaply. It is

lead-covered twin-bell wire. Although not very flexible, it serves the purpose admirably, and the lead casing is easy to earth.

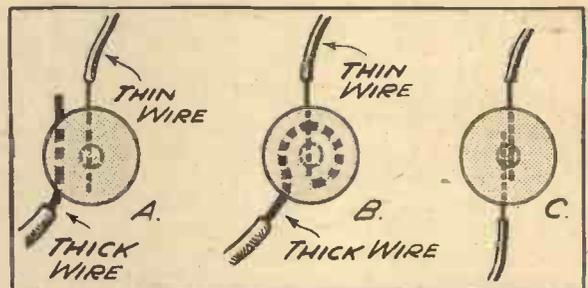
It might at first be thought that the capacity of such wire would be too high, but I have used it for the purpose without being able to notice any loss in high note response.

How Is Your Motor?

And now a little "spot" of advice. If you have not oiled or greased your turntable motor for a long time, it's worth doing, or having done.

Although turntable motors will run for a long time without attention, they need a little occasionally. Very often such need shows up in the motor producing slurring on heavy passages of a record; it hasn't got enough power because so much is being lost in the dry bearing.

ENSURING FIRM CONNECTIONS



Often with a terminal provided with a hole in the shank for use as telephone-type terminal as well as an ordinary one, two wires are used. A shows the incorrect way of attaching a thick and a thin wire, B is the correct way, and C shows how two thin wires can be used.

Sometimes an oiling chart is provided inside the cabinet. But in any case it is an easy matter to find the oil holes, or grease caps.

Dual-type terminals are getting quite common. You know the sort I mean, you can either twist the wire round the shank before clamping in place, or you can pass it through a hole in the shank and then turn the terminal screw down, holding the wire as in the so-called "telephone-type" terminal.

When the wire is held in the latter way, and it is desired to attach another lead to the same terminal, the mistake is often made of just laying the second wire under one side of the terminal screw and tightening up. If this is done, and the second wire is thick, the terminal screw may not go down far enough to clamp the first wire. See A in the diagram.

Twisting the wire round as at B ensures that both wires are held firmly. And at C a convenient way for holding two thin wires is shown.

WIRELESS *in the* GREAT WAR



EXPLOSIONS are tearing up the pale green waters of the North Sea, rearing up gigantic columns of spray and foam; destroyers are dashing across the horizon dropping depth charges, while over to the westward the bows of a torpedoed steamer are rising into the air as the vessel takes the final plunge.

Somewhere deep below the surface of the sea, the cause of all this turmoil and disturbance is hiding, the German submarine, or U boat as it was familiarly called.

Hunted By Depth Charges

The rumble of the depth charges, dropped by the destroyers, as they explode under the water, is like the sound of distant thunder; the hunter is now the hunted, for the avengers are leaping over the water burrowing with their depth charges to drive the fox from its lair.

Let us take a peep at the other side of the picture, the U boat side, for whatever might be the right or wrong of the affair, whether the submarine is pirate or hero, that side is certainly interesting, especially from our point of view for wireless was prominent in all U boat activities.

The long grey shape of the submarine is lying motionless on the sea bed not so far away from the sinking steamer which it has just torpedoed. Every man is standing at his post and remains absolutely silent; the engines are stilled and the only

Creeping along the surface in the dead of night, or lying doggo on the floor of the ocean, such was the nerve-racking lot of the crews of the German U boats, who often relied solely on wireless for news and instructions. A vivid pen-picture.

By "Radiat"

sound which disturbs the silence is the intermittent rumbling of the depth charges as they explode, now far, now near.

A Narrow Escape

Suddenly a depth charge explodes immediately above the submarine and all the lights go out. Still no man moves or utters a word, they wait for the order from the commander. The men bite their lips, in the darkness their faces become grim and grey. Will the next depth charge get them? The suspense is almost unbearable.

Another explosion rocks the boat and some crockery crashes to the deck, but there is a sigh of relief, that depth charge was a little farther off.

Presently the noise of the explosions become more distant and dies away. Tension relaxes and the commander whispers an order. The lights come on again and the whir of the electric motors is heard as the submarine moves cautiously towards the sur-

face. Another narrow escape, but how long will the good luck hold?

The wireless cabin on the U boat was naturally a very minute affair, and was usually situated between the commander's cabin and the control room. It consisted of a tiny silence cabinet just large enough for the operator to squeeze in amongst his instruments.

It is the usual style of wireless silence cabinet, resembling an enlarged coffin, and standardised more or less in both British and German navies.

Holding Two Jobs

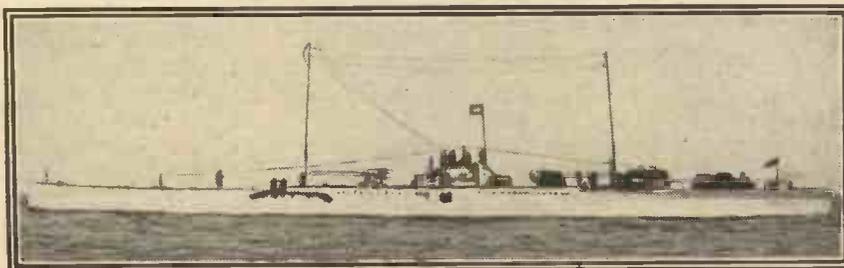
In the early days of the U boat campaign the wireless operator was only a wireless man in his spare time. That is to say he was also an expert on some other job, combining his duties with that of an electrician, torpedo man or even gunner. He was, of course, expert in all styles of signalling such as flags and semaphore.

Wireless from a submarine was only

possible if the submarine was on the surface, when the submarine was submerged the aerials were of course under water, and useless from a wireless point of view.

Two aerials were employed, known respectively as short and long distance

ONE OF THE GERMAN GIANT SUBMARINES



(Imperial War Museum Photo)
One of the Deutschland type of ocean-going submarines which were originally intended for mercantile purposes. The Deutschland herself made two voyages to the United States but upon that country's entry into the war she was converted for offensive purposes.

aerials. The short range aerials were slung permanently from the bows to the stern and supported on two short masts erected on either side of the conning tower. It was necessary to keep these masts as low as possible so that they would not be obvious when the submarine was riding just below the water.

The Second Aerial

Naturally the highest object on a submarine must be the periscope; these were of the telescope variety and could be raised or lowered as desired. In passing, it may be mentioned that these telescope periscopes were never absolutely waterproof, and anyone gazing through the instrument invariably suffered the discomfort of water dripping down the back of his neck.

With this small aerial and due to the slowness of the submarine on the surface of the water, the range was limited to a few miles.

In safe waters, however, or on dark nights, it was possible to use the long-distance aerial which was slung on high portable masts. These masts were only erected as required and were stored in the diving tanks, and consequently were very rusty.

Due to the rusty state of these masts the subsequent difficulty of erecting them, i.e., fitting one section into another, can be imagined, especially on a very dark night in heavy weather. The upper deck of a submarine being almost on the water line is always awash, and there is no protection whatever.

Interception Stations

With the long-range masts communication over some hundreds of miles was possible; in fact, the record was in the vicinity of seven hundred and seventy miles.

The standard 5-kw. Telefunken set, so popular with the Central Powers, was generally used, although in submarines such as those which were designed for crossing the Atlantic, more powerful apparatus was installed.

To the Germans, wireless was, on occasions, a dangerous friend, for we had special wireless stations dotted at various points along the coast, called "Enemy Interception" stations, which spent their whole time listening in for enemy submarine wireless.

On hearing a U boat's wireless, these stations would inform the nearest

WIRELESS BETRAYS THE MERCHANTMAN

direction-finding station, and a bearing or position would be obtained on the unsuspecting submarine.

This would result in a decidedly unfriendly visit to the spot where the signals were last heard by destroyers, armed trawlers and aircraft, with perhaps a mystery ship thrown in.

On first sight of the enemy the submarine would do a "crash" dive, and, if possible, lie silently on the sea floor until the danger had passed.

Visible to Aircraft

This was well enough in our Northern waters where the sea is not very clear, but in the Mediterranean or Adriatic the water was so clear that aircraft could often see the submarine lying on the bottom. That, of course, meant numerous depth charges, and later an oily patch on the water where the U boat had been lying.

THE U BOAT'S DREAD FOE



(Imperial War Museum Photo)
The deadliest enemy and everlasting fear of the German submarine crews was the depth charge, one of which is here seen exploding under the surface, as the destroyer from which it has been dropped races madly round in ever-narrowing circles.

Later in the war submarines themselves used direction-finding wireless to catch their prey, and woe betide the Allied steamer which used wireless too much. In one particular instance an Austrian submarine, on picking up wireless signals, followed them up and found that they came from a ship in an Italian harbour. Nothing daunted, the submarine entered the harbour and not only sunk the ship, but bombarded the town.

Life on a U boat in the latter part of the war was one of the most nerve-wrecking experiences which it was possible to undergo, for by this time our defence against submarines was reaching the peak of its perfection. The submarine was hunted and harrassed, day in and day out, by one type of destruction after another, from depth charges to suffocation.

When the Alarm Sounded

A submarine would be sailing along on the surface, the crew taking a much-needed breath of fresh air. The alarm would sound, the black smoke and sinister mast of a destroyer had appeared on the horizon. Down through the hatchway the men would tumble, and the man who did not get his fingers stamped on on the iron ladder, or his head kicked as they literally fell through the hatch, was lucky.

Diving stations would be ordered and the sharp order to dive given by the commander. Levers are pulled, controls quickly adjusted, and everyone

balances himself for the dive—but nothing happens. Something has gone wrong, and the submarine is an easy prey to the destroyer.

Or again, and owing to the hasty preparation with which everything is done, the submarine may refuse to stop diving, a very common fault in those days. Another favourite idiosyncrasy of the submarine was to sink on an uneven keel.

"Trimming Duty"

In this case a member of the crew would run to the higher part of the vessel in order to restore the balance. In every submarine some of the crew were specially allocated for this "trimming" duty, and it was their exciting if awkward job to run about the rapidly diving submarine in an effort to prevent it sinking

stern or bows first, or even capsizing altogether. Frequently, of course, their efforts were fruitless, as witness the fact that Germany lost one out of every two submarines which she sent against the British.

Even if it was possible to stop a submarine descending out of control, there was always the thought in the back of everyone's mind, "Could they get back to the surface again?"

(Please turn to page 94.)

That's What I Think...

A seasonal symposium of gift suggestions based on the views of some world-famous celebrities.

As a race we are not the type to take chances with that of which we know nothing. Enterprising, perhaps, but, taking the case of the average level-headed Englishman, it is usually his inborn characteristic of reserve which predominates when any impulse arises to jump into something unwarily.

That is why, when it comes to buying a wireless set, or for that matter anything else of which the layman's knowledge is limited, there is a certain amount of comfort in knowing what the other fellow thinks.

For instance, if you contemplate purchasing a car, it is interesting and no doubt to an extent helpful to hear what the engineer in the showroom has to say about it. But there is always that feeling—however sincere the salesman may be—that he is trying to sell you something, which, of course, is precisely what he IS doing.

Very Sane Psychology

But if you can hear something of the performance of the model from Mr. Jones down the road, who happens to own one, then at once you feel happier about it, first because Mr. Jones has nothing to gain by hiding anything from you, and secondly because if Mr. Jones, whose knowledge of such matters, like your own, is limited, can obtain such an excellent performance, then so can you!

It is the same sane psychology that has to be reckoned with when it comes to the choice of a wireless receiver. The makers, quite justifiably, may assure you that their particular model is good; you may even hear it in a shop and think yourself that it is good, but if your next-door neighbour can give you a matter-of-fact account of his actual experiences with the particular model, then your enthusiasm is at once in the ascendant.

We seek to serve our readers by providing from time to time concise technical details of the outstanding sets of the season, and we like to believe that those details are helpful. But at least we do not harbour any

misguided belief as to the limitations of a strictly technical report when it comes to the average listener.

That was one of the reasons for the introduction of the WIRELESS Listeners' Circle, for if, in addition to our own technical opinion, we can provide you with the faithfully-recorded experiences of chance-chosen critics—listeners who, perhaps like yourself, have little or no knowledge of technicalities—then their views obviously constitute a valuable guide as to what sort of results you can expect to get yourself.

Contributors

Sir Dan Godfrey
The Master of Falkland
Edward Chapman
Max Miller
Sir Ambrose Fleming
Miss Mary Lawson
Miss Elsie Carlisle
Reginald Dixon

But at this season of the year—the “present” season—the Listeners' Circle in itself is not entirely adequate on account of the fact that for practical considerations its scope is necessarily limited. If a job is worth doing, it is worth doing well, and were we to hold a Listeners' Circle on every one of a representative range of sets—a range sufficiently comprehensive to cater for all shades of opinion—then there would certainly not be room for anything else in the issue.

Instead, then, we have gone one better this month by collecting the opinions of notabilities in all walks of life on the sets that THEY use.

Under the appropriate heading of “That's What I Think,” it is an eminently suitable way of supplement-

ing our Listeners' Circle which appears elsewhere in this issue, and apart from the intrinsic interest of knowing the types of sets that are used by these world-famous celebrities, their opinions are of value to you as a guide, for as far as technical knowledge is concerned they, too, with one exception, are ordinary listeners.

But they are ordinary listeners with a distinction—a distinction which places them in an unassailable position to pass judgment on the instruments that they use.

For instance, the opinion of one so famous in the world of music as Sir Dan Godfrey is of inestimable value to the ordinary listener, for nobody could be more eminently qualified to judge than he. It is at once apparent that after such a long and distinguished association with music he would be able to detect the slightest flaw in the reproduction of any musical rendering with which he is familiar.

And is it likely that there is any composition with which he is not familiar?

Unbiased Verdicts

The same thing may be said of all our other celebrity-critics, for each in his or her own sphere is in an unrivalled position when it comes to giving a verdict as to what constitutes a good set.

It is with considerable pleasure on our part that these distinguished personages should reveal their views for the first time through the medium of WIRELESS, and we are confident that our readers will welcome them. A survey of present market conditions and raw material prices makes it apparent that prices have reached rock-bottom, and that if anything prices in the future are likely to rise.

Now, then, is the time to buy. Study the opinions given on the following pages, choose the set most suited to your requirements, and then give yourself a real present! After all, it isn't everybody that can say that they bought their set on the advice of such famous people, is it?

SIR DAN GODFREY'S choice of a Marconiphone model "296" to receive broadcast entertainment, in his retirement, was indeed a wise one—consistent, in fact, with what one might have expected from one famed for so long in the musical world.

For the Marconiphone model "296," like all the sets which bear this famous trade mark, is above all else a quality receiver. It is the product of an organisation which carries with it the traditions of the most famous name in radio, and it is one of those sets that can confidently be recommended for use even by the most fastidious listener.

That such an outstanding instrument should be available for so little as 13½ guineas should alone be the deciding factor for all those who are hovering on the brink wondering whether to buy now or to wait in the vain hope that prices may go still lower.

It is certain that prices can never be lower while such high standards of



Sir DAN GODFREY
(Columbia photo)

WHAT SIR DAN GODFREY THINKS OF

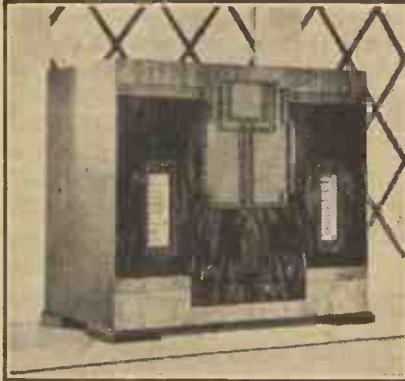
MARCONIPHONE

Shortly after his retirement from the leadership of the Bournemouth Municipal Orchestra, Sir Dan Godfrey, the eminent musician, purchased a Marconiphone model "296." In a letter to the local Marconi-man from whom the set was obtained, Sir Dan wrote:

"I would like to express my appreciation of the service you extended to me when purchasing my Marconiphone '296.'

"I know that I am critical and perhaps hard to please, but naturally, when buying a set, performance and tonal quality stand more important to me perhaps than with most people, as you no doubt realised during the many demonstrations you gave me with various types of sets.

"However, I am delighted with my choice and hope I was not too difficult."



workmanship are apparent in the design, and it would seem that still further reductions in prices can only be achieved by a sacrifice in the quality of the article. One can hardly visualise a company with the prestige of Marconiphone contemplating for one moment the sacrifice of quality on the altar of low prices!

The Marconiphone model "296" is a 5-valve (including rectifier), 7-stage superhet with such modern refinements as full delayed automatic volume control and visual tuning indication.

The controls are few and simple to handle. In addition to the main tuning knob, there is a volume control, a tone control and a master switch.

There is in the design the usual provision for the connection of pick-up and external speaker. The set is for A.C. mains only.

The set can be obtained for a first payment of 30s., followed by 12 monthly payments of 22s. 9d.

KOLSTER BRANDES almost made radio history when they introduced their now famous model "381" receiver, for despite the fact that many previous attempts had been made in other quarters to produce receivers for universal mains operation, this was one of the first low-priced high-performance universal supers which really succeeded.

Most Successful

And it *did* succeed. No sooner was it introduced than orders literally began to pour in, and it has now established itself as one of the most successful designs of the season.

That is because the listening public is quick to realise that it is getting, not exactly something for nothing, but at least remarkable value for money. And the K.B. model "381" certainly is remarkable value for money.

Ten guineas. And for your money you get a fully-fledged superhet for universal mains operation with automatic volume control and all the

KOLSTER BRANDES

THE MASTER OF FALKLAND SUMS UP THE MODEL "381" IN THESE WORDS:

"Here, for the price of a suit of clothes, is a wireless set that seems to meet every need of the average listener. This K.B. '381' is a five-valve superhet, for A.C. and D.C. mains, easy to manage, good to look upon, and delightful to hear. The range is remarkable; you find the name of every worth-while station on the tuning-scale. And such quietness of background and tonal purity you don't always find in sets four times the price."



The Master of Falkland with the K.B. model "381," of which he speaks so highly.

modern refinements which make for better broadcast reception.

The set is both sensitive and selective, and the calibration of the dial in station names and wavelengths facilitates the identification of distant stations. The dial, incidentally, is illuminated in use.

Stopping Static

A particularly commendable feature of this design in view of the increasing menace of "man-made" static interference is the provision of a built-in mains filter. It prevents the noise arriving via the mains, which is perhaps the most prolific source of "man-made" static interference troubles.

Users of this set can be assured of a large selection of alternative programmes, and as is fitting with such a meritorious design in other respects, the quality of reproduction is very pleasing.

The set is available for a first payment of 28s. (which includes 3s. insurance), followed by 12 monthly payments of 18s.

EDWARD CHAPMAN, whose name will at once be familiar to all who patronise the talkies, is a Philco "fan." That much may be gauged from the fact that he owns not just one, but three sets of this famous make.

Obviously, there must be a reason for that, for Edward Chapman's close contact with the science of sound reproduction makes it apparent that he would not be content with anything but the best.

It is our opinion that Philco sets

PHILCO

READ WHAT EDWARD CHAPMAN SAYS

"Philco sets certainly rank amongst the best receivers, in my opinion. I have never possessed any other makes, and I now own a Philco Radiogram, a Midget set, and a Philco Car set. I am using these three sets all the time. I listen-in in my dressing-room, and also when I am at the studio.

"Striking features of all Philco sets, in my opinion, are the amazing range, the true-to-life tone and the knife-edge 9-kilocycle selectivity.

"My wife appreciates all these points, and also likes the sets because they are such handsome pieces of furniture.

"Whenever I broadcast, my wife and friends listen-in to me on the Radiogram

"Thanks to Philco, I keep very regular hours. Instead of going out to places of entertainment, my wife and I usually prefer to stay at home with our Philco sets."



Edward Chapman, who is starring in the new B.I.P. film, "Mr. Cinders," is a firm Philco "fan." He owns a Philco Radiogram, a Philco Midget set and a Philco Car installation!

Selectivity, because it is not much good being able to receive all the stations in Europe if more than one of them comes in at once, and quality of reproduction because in these enlightened days it is the most telling argument in favour of any receiver.

Modern Philco sets range in price from 8 gns. to 35 gns.

Full details of this popular range will gladly be forwarded to all WIRELESS readers who apply direct to Philco at Aintree Road, Perivale, Middlesex.



The Philco model "16B" is an 11-valve "balanced" superhet for world-wide reception. It tunes from 13 to 575 metres and it costs 35 guineas.

appeal particularly to this well-known personality, in the same way that they appeal to many thousands of ordinary listeners, because the makers, in the design of their various models, have given proper attention to what are, in our opinion, the two most vital points; selectivity and quality of reproduction.

THE fact that inimitable Max Miller uses an Amplion Radiolux Superhet to test the fidelity of his own gramophone recordings, speaks volumes for the quality merits of what is undoubtedly a very attractive design.

The Amplion Radiolux Superhet, at only 12 guineas, is still further striking proof of our contention that now, very definitely, is the time to buy, for with this set, as with so many other present-day designs, it is difficult to visualise that prices will ever be lower—at least, not while the quality of the article offered remains so high.

Although this attractive set of Amplion falls into the superhet class, it is in a sense unique in that the design does not include a separate intermediate-frequency amplifying valve.

The trouble with all really sensitive receivers, with which, of course, we include superhets, is that the radio of noise to signal strength is in certain circumstances apt to be unbearable. In the case of superhets, experiment tends to show that the I.F. amplifying valve is responsible to a large extent

AMPLION

MAX MILLER'S CANDID OPINION.

"My 'Amplion' RADIOLUX SUPERHET made a special appeal to me in the first instance on account of the neatness, artistic design, and pleasing appearance of the cabinet. The 'works' amazed me by the wonderful efficiency which enabled me at once to listen to various English radio programmes which were clearly and faithfully received whilst, when wanting entire change of entertainment, I quickly found that the foreigners were received by the score without what my friends call "interference" from one another.

"When reproducing gramophone records to test the style and quality of my own recordings the true reproduction, the accuracy of expression, the tone and quality, which is so necessary for one to be able to criticise, impressed me considerably—in fact, it was an education to me. Your instrument and the excellent entertainment it provides has been greatly appreciated by visitors to my home."



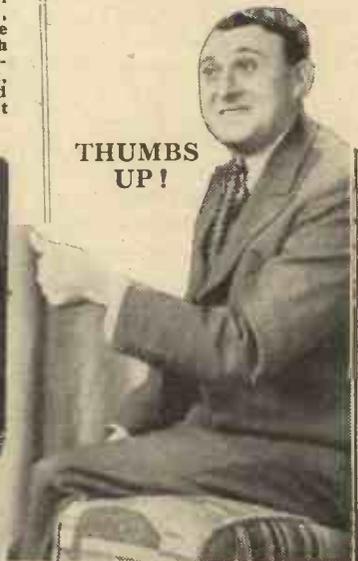
The famous radio, film and vaudeville star, Max Miller (the "Cheeky Chappie") believes the Amplion Radiolux to be "the goods."

pensed with no doubt accounts for the fact that the performance of the set on distant stations is so clean.

The Amplion Radiolux has a visual tuning indicator, and is for A.C. mains.

On hire-purchase, a first payment of £1 6s. 6d. secures delivery; the balance is payable in 12 month's instalments of £1 1s.

THUMBS UP!



SIR AMBROSE FLEMING'S PREFERENCE IS FOR with Class B output, and although it is

undoubtedly one of the greatest radio technicians of to-day. In fact, it was largely due to his discovery of the original two-electrode thermionic valve that modern radio owes its existence.

That such a distinguished scientist should have expressed himself as so satisfied with his new Pye receiver, a model "SP/B," is a tribute from which we are content to let you draw your own conclusions.



Sir Ambrose Fleming.

Significant

Although Sir Ambrose has only recently purchased his "SP/B" model, it is significant that during the last four years he has been using another set of Pye make, the famous "Twin-Triple."

The model with which Sir Ambrose is now receiving his broadcast entertainment is perhaps one of the most outstanding achievements of a firm



During his tour of the recent Bristol Radio Exhibition Sir Ambrose Fleming paid a visit to the Stand of the Broadmead Wireless Company, where he bought a Pye model "SP/B" portable receiver. Severe critic of wireless apparatus though he is, Sir Ambrose said that he was very satisfied with the performance of the receiver, the tone quality of which he stated was exceptionally good. He was amazed at the improvement which had been made since he bought his last Pye receiver, a "Twin-Triple" Model, four years ago.

which has specialised in receivers of the portable type for a considerable number of years. It is a five-valve battery receiver

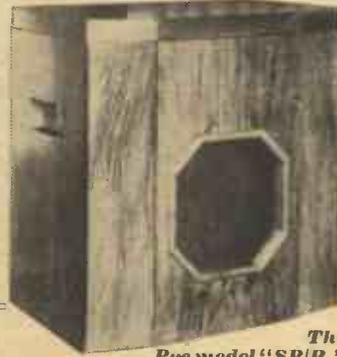
capable of providing an undistorted output of 1½ watts through the permanent-magnet moving-coil speaker incorporated, it is remarkably economical in use.

A Very Handsome Set

Like all Pye receivers, the set is housed in a particularly handsome cabinet, the sort of thing that looks equally at home in a modern or period setting. It is made from beautifully figured walnut, and the provision of side handles and a turntable facilitates its use.

The station indicator is of the full-vision type, and it is calibrated both in names and wavelengths, incidentally, when the set is in use the station indicator is illuminated.

The price of the Pye model "SP/B" is 15 guineas. Alternatively, you can obtain the set on payment of 3ls. 6d., followed by twelve monthly payments of 26s.



The Pye model "SP/B."

If the Aerodyne "Curlew" receiver had little in its favour technically, it is easy to see why Miss Mary Lawson, the film star fiancée of Fred Perry, is so enraptured with the one in her possession. Who wouldn't be with a set so attractive in appearance as this one?

But apart from its extremely pleasing appearance, the Aerodyne "Curlew" excels in other ways, for, based on modern standards, it is in every respect a first-class design.

Three Pentodes

It is a welcome relief from what appears to be developing into standard practice these days in that it is not a superhet. It is an all-pentode combination of three valves for universal mains operation, and as such it is a design that will make an instant appeal to all those who fight shy of superhet "noisiness."

The fact that three pentodes are employed in the circuit may be taken as an indication that this set does not lose much in distant reception capabilities by



comparison with receivers of the superhet class, and the provision of band-pass input ensures adequate

selectivity for all normal requirements. Superhets are all right provided that they have been properly designed, but otherwise there is a lot to be said in favour of sets such as the Aerodyne "Curlew."

It is fitted with an energised moving-coil speaker through which the output valve is capable of providing a maximum undistorted output of 2 watts, and the usual provision for the use of a gramophone pick-up is included in the design.

Excellent Choice

If you prefer to think of the purchase price in terms of cost per week, the Aerodyne "Curlew" on hire purchase works out at approximately 5s. The hire-purchase terms are £1 down and 11 monthly payments of £1. The cash price of the set is £10 19s. 6d., from which it will be seen that the hire-purchase terms are particularly generous.

At the price the Aerodyne "Curlew" is certainly excellent value for money, and we are not surprised Miss Lawson made it her choice.

"COMPLETELY OUTSTANDING," SAYS MISS LAWSON



Miss Mary Lawson, the charming British film star, who plays lead with Charles Farrell in the new picture, "Falling in Love," is, amongst her many activities, a great Wireless "fan." Her latest acquisition is an Aerodyne "Curlew" universal receiver, concerning which Miss Lawson says: "I find the Aerodyne sets completely outstanding. The reception that I get in my London home with the 'Curlew' exceeds anything which I have ever heard even on sets costing double the price. I have some experience of broadcasting myself, and my only regret is that I cannot hear my own voice coming through to me on my 'Curlew' receiver."

THE set which is MISS ELSIE CARLISLE TELLS YOU ALL ABOUT HER others, but it is the G.E.C.

used by Miss Elsie Carlisle—the G.E.C. “Superhet A.V.C.5”—and with which, apparently, she is so very delighted, is an outstanding example of up-to-date radio technique.

Naturally, as the product of such a world-famous organisation as the General Electric Company, that is rather what one would expect, but that it should be available for a price as low as 14 guineas seems almost too good to be true.

Like the popular star whose views are recorded on this page, we, too, can speak from experience of this set, and we find it easy to appreciate the reason for her enthusiasm. It is a fine set, and no wonder Miss Elsie Carlisle marvels at its performance.

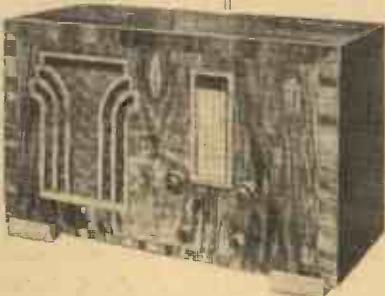
So far as the basic circuit of this instrument is concerned, there is not such a great deal to distinguish it from any other 5-valve superhet of recent design. And yet in performance there are few to touch it near the price.



“When ‘The Show is Over,’” says Miss Carlisle, “you’ll usually find me at home ‘With My Eyes Wide Open,’ marvelling at the wonderful performance of my new G.E.C. ‘Superhet A.V.C.5’ set. “Distance doesn’t seem to worry it a bit. I can get the most thrilling foreign programmes just as easily and with the same perfect tone as the B.B.C. stations. “I should know something about making records, but believe me, when it comes to entertainment value, my set knows something about breaking them. “I don’t know ‘Who Made Little Boy Blue,’ but I do know that ‘If There Were More Than Twenty-four Hours a Day’ I should still be getting entertainment from my G.E.C. radio, and there’s ‘No More you Can Say’ about any set.”



MISS ELSIE CARLISLE



That is one of the advantages of buying from a firm to which

the maintenance of traditional ideals is of infinitely greater importance than merely mercenary considerations. The circuit may be the same basically as

attention to detail—the hundred and one little refinements—that make all the difference between mediocrity and perfection.

As its name implies, the “Superhet A.V.C.5” is a five-valve superhet with automatic volume control. It is housed in a beautifully finished in-laid walnut cabinet of artistic design, and the controls, which are particularly simple in operation, include one for tuning,

one for volume control, one for tone adjustment and one for wave-change switching.

The tuning dial, which is cleverly illuminated in colours, is calibrated in both station names and wavelengths.

Fourteen guineas is the price of this set, but it can be yours for 25s., followed by twelve similar monthly payments.

IN the days when a wireless receiver was little more than a fascinating toy, Ferranti, an organisation then over forty years old, had the foresight to see that the ultimate success of transmitting programmes through space could only lie in the attainment of fidelity of reproduction.

And right back in those early days when the future of broadcasting in this country was a matter for conjecture, Ferranti’s had the courage of their own convictions. They adopted, and rigidly adhered to a policy of “quality first,” and while most others sought to make a name on the strength of revolutionary (and often unsatisfactory) circuit developments, Ferranti’s were content to delve into response characteristics in anticipation of the future.

Quality Products

To what extent that policy has paid them may be gauged from the fact that there is not a firm in the country to-day with a more universally accepted reputation for quality-of-reproduction pro-



ducts. Little wonder, therefore, that their attractive range of superhet receivers should be so outstandingly

good from the point of view of quality of reproduction.

There is a Ferranti set to suit all pockets. You can pay as little as twelve guineas for the table model “Lancastria” or as much as 30 guineas for the “Arcadiagram” radio-gramophone, but whatever you pay, you can be sure that your set will be first and foremost a quality receiver.

What is perhaps one of the most popular of all the sets in the Ferranti range is the famous “Arcadia” table model, an all-electric 5-valve superhet with every possible modern refinement. At 15 guineas, it is a masterpiece, and it excels both from the point of view of performance and appearance.

“All-In” Dial

This popular A.C. mains instrument is provided with automatic volume control, and it is fitted with the ingenious Ferranti “All-in” dial.

For those who prefer, the “Arcadia” is available for a first payment of 35s., followed by twelve monthly payments of 25s. 8d.

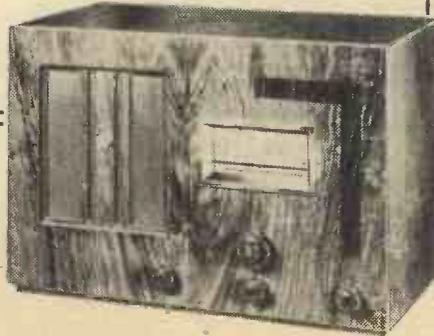
REGINALD DIXON ON FERRANTI



“I have held Ferranti radio apparatus in high esteem for as long as I can remember, and since they have been making complete wireless sets I have invariably purchased a Ferranti receiver. “My musical performances are known to almost all listeners, and it will be obvious to anyone that in choosing my wireless, I must have a set which gives me good reproduction. I find my present Ferranti receiver one of the most satisfactory and simple sets I have ever had the opportunity of using.”—Reginald Dixon.

FOR THE BATTERY USER

A FINE GIFT SUGGESTION
FROM THE FAMOUS
COSSOR RANGE



The Cossor models "350" and "353" are identical in appearance externally.

It can truthfully be said that not until this present season have manufacturers generally realised the importance to their trade of catering adequately for the battery user—an army still representing the majority of listeners in this country.

THE MODEL "350"

A 3-valve battery operated receiver, consisting of: screened grid variable- μ H.F., detector and power output. Single-knob dual-pointer tuning with horizontal full-vision scale calibrated in wavelengths. Remaining controls consist of one for selectivity, one for volume and master switch. Speaker incorporated is of the moving-iron type.
Cash price (which includes the three specified Cossor valves, but which is exclusive of batteries) £5 12s. 6d.
Hire purchase terms: 10s. deposit and twelve monthly payments of 10s.

But that is hardly true concerning the activities of Messrs. A. C. Cossor, who, with characteristic foresight, have always made a strong feature of battery designs. Little wonder, there-

fore, that their business has gone from strength to strength until now it represents one of the largest manufacturing concerns in the country.

Two Different Types

With so much start on others who, until now, have tended to neglect battery designs, it is only to be expected that the battery models in the current Cossor range are among the most outstanding instruments of the season.

The Cossor Screened-Grid Battery

three, which is illustrated here, is a particularly fine example. It is available in two different types—one with power output and moving-iron speaker (Model 350), and one with pentode output and moving-coil speaker (Model 353).

Wide Choice of Programmes

Externally, the two sets are identical, and the chassis and general construction inside differ only in minor respects.

The chassis which is common to both these models is arranged on the circuit sequence of variable- μ H.F., detector and output. Fully screened super-selective low-loss coils are incorporated,

THE MODEL "353"

In general design, the model "353" is similar to the model "350," but the circuit sequence in this case consists of screened H.F. pentode, detector and pentode output, and a sensitive moving-coil speaker of the permanent magnet type takes the place of the moving-iron instrument which is in the "350." The controls are identical, and the cabinet work is the same in each case.
Cash price (which includes the three specified Cossor valves, but which is exclusive of batteries) £6 17s. 6d.
Hire purchase terms: 15s. deposit and ten monthly payments of 15s.

and these, in conjunction with the variable- μ S.G. valve, ensure a wide choice of programmes.

What finer gift suggestion for the battery user than one of these?

It is hard to judge the speed of a car without being able to see the speedometer reading. It is almost equally difficult to identify distant stations on a set which provides no dial indication of wavelength or name.

Perhaps that accounts for the fact that this present season has seen the introduction of more revolutionary tuning ideas than at any time since broadcasting first commenced. All manner of different ideas have been evolved to simplify the listener's task, and it is hard to say which of these can be rated as the most important.

A Clever Idea

But for sheer originality of idea, there must surely be few to compare with the "Spectrum Tuning" device which is an exclusive feature of the Clarke's "Atlas 7-5-8" receiver. In the few months that this set has been on the market, it has broken sales records over and over again, which is adequate testimony of the listening public's appreciation of a clever idea.

"Spectrum Tuning" makes distant station reception

A GREAT TUNING INNOVATION

Advantages of Clarke's "Atlas 7-5-8" Spectrum Tuning Feature.

child's play, for the simple reason that not only are the various tuning positions for stations shown on the dial by name, but in addition differ-

entiation between the two wavebands is achieved by the use of clever contrasting colour illumination for the respective ranges.

For instance, until the set is actually switched on, the dial is free from markings. But the moment the set is switched on by turning the master switch to the medium-wave position, the names of all the important stations in Europe, and the settings at which they are received, appear in green on the tuning dial.

If the master switch is turned to the long-wave position, the names and settings of the medium-wave stations disappear, and instead the names and settings of the long-wave stations are visible, this time in red.

As a finishing touch to a clever idea, the whole dial is arranged to swivel so that it can be adjusted for easy reading irrespective of the angle at which the operator is viewing the set. That obviates a lot of unpleasant "neck twisting."

The Atlas model "7-5-8" to which this clever device is exclusively fitted costs 14 guineas.

PRAISE FROM A WAR-TIME EXPERT



Mr. E. J. Elphick, of West Wickham, who during the war was in charge of the high-power Atlantic Wireless Service, considers that "Spectrum Tuning" is extremely clever and effective.

AND NOW

What does this issue of "WIRELESS" say?

See test report on Page 93
Also read about the Amplion Radiolux Superhet on Page 77.

By quoting extracts from the unbiased opinions of the technical press who have put the Amplion "Lion" speakers through severe tests, we give you valuable proof of their outstanding qualities.



"Popular Wireless" said—
The whole design of the Amplion "Lion" is on advanced lines and is characteristically different from the general run. There are terminals for connecting an extension speaker, and terminals for tone or volume control, if such are desired. A plug and numerous sockets enable accurate matching to be made with any output.

This really is a fine production, and one which we have no hesitation in recommending to the attention of all readers who desire quality results without undue cost.

"Practical Wireless" said—

The sensitivity is of a very high order... high notes are reproduced with all their brilliancy, whilst the low notes are nice and full-bodied without being boomy.

47/6
(7" CONE)

AMPLION

AMPLION (1932) LTD.
82-84, Rosoman Street, London, E.C.1.

"Lion" Super 10 in. cone - - - - 55/-

DUO-NICORE TUNING COIL

Varley have produced a range of "Duo-Nicore" tuning coils to meet the demand for coils without switches. The Intermediate Frequency Transformer illustrated has special features which greatly simplify the adjustment of superheterodyne receivers by home constructors. Write for full information and a free illustrated catalogue.

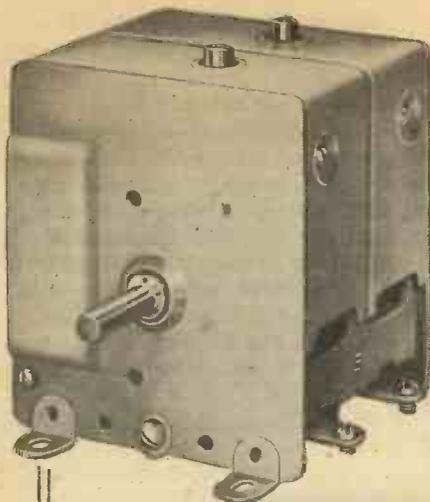


I.F. TRANSFORMER

List No. BP84 **8/6**

Varley

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**ROBERTS
THREE**

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SPECIFIED SOLUS

POLAR SEMI-CIRCULAR DRIVE

Slow motion. Bevelled scale in wavelength. Moulded escutcheon.

Lamp-holder provided. **5/9**

Write for illustrated Catalogue.

POLAR MIDGET TWO-GANG CONDENSER (as illustrated above)

Steel frame and cover. Ball-bearing shaft. Trimmers operated from top. Matched within 1/2 per cent. or 1 mmfd. whichever is the greater.

2x'0005 **11/-**
Also made in Three-Gang and Three-Gang Superhet, price 16/6

WINGROVE & ROGERS, LTD.,
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'Phone: Polar Works: Old Swan, Liverpool.

Your Volume of
THE BOOK OF PRACTICAL RADIO
is Now Ready



This is the De-Luxe Edition—reduced.

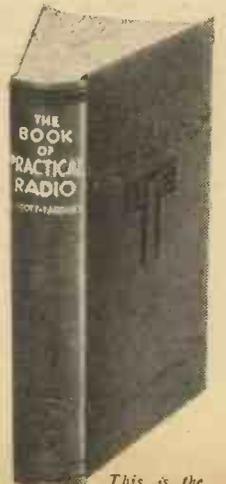
Send in Completed Gift Voucher and remittance at once.

Your volume is waiting. This month gift token No. 2 appears, and readers who have started with gift token No. 1 will be able to complete their Gift Vouchers, which, together with cash remittance, should be sent in immediately.

If you did not start with No. 1, there is still time to qualify for this invaluable book by starting with token No. 2. You must then wait one more month until you have collected two consecutive tokens.

Do not delay! Volumes will be sent out in strict rotation, and if you want yours quickly, you must send in that completed Gift Voucher the moment it is ready.

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This is the Standard Edition—reduced.

As We Find Them

NEW APPARATUS TESTED

Interesting reviews of the latest products submitted by radio manufacturers and traders for examination and test in our laboratories.



The Pifco Rotameter

A REALLY high-grade universal measuring instrument is one of the most valuable pieces of apparatus that a constructor can possess. Every radio enthusiast must at some time or another feel the urgent need for the wherewithal to measure either voltage or current, or both.

The constructor who comes up against a spot of trouble and hasn't the necessary meters for checking purposes finds himself at a very serious disadvantage, because he is completely in the dark as regards his battery voltages, anode current consumption, and so forth.

What service-engineer is there who would tackle a fault-finding job without the proper equipment in the form of measuring instruments? None, if he is worthy of the title.

A Valuable Instrument

But to buy several separate meters is a costly business, especially if they are of the high-resistance moving-coil or condenser types—the only types from the standpoint of real accuracy where radio work is concerned. There is no need, however, to spend a lot of money on separate instruments, because there is a combined instrument which covers four voltage and three current ranges at the simple turn of a switch knob. And that is not all. This particular piece of apparatus gives direct readings of resistance values up to 50,000 ohms, and will tell you immediately whether a valve filament is intact or broken.

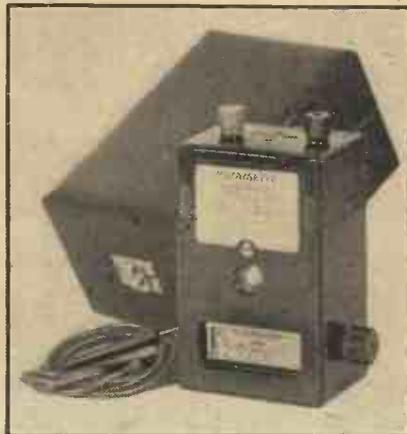
The instrument in question is the Pifco Rotameter-de-Luxe, and is illustrated on this page.

It has a resistance of 500 ohms per volt, a factor that enables accurate readings of voltage to be obtained with small capacity dry cell batteries, etc.

A slight turn of the knob on the side

of the bakelite case immediately brings a new scale into position, and there are eight of these, all told. They are as follow: 0-5 volts; 0-20 volts; 0-100 volts; 0-400 volts; 0-10 m.a., 0-50 m.a., 0-250 m.a., and 0-50,000 ohms.

A pair of substantial flexible leads, which plug into the two terminals on the top of the case are provided with each instrument, while between these terminals are valve sockets into which a valve whose filament is under suspicion is inserted.



The Pifco Rotameter-de-Luxe gives voltage readings from 0-400 and measures currents up to 250 m.a.

It is an ingenious piece of apparatus and one that we can commend to the attention of every discriminating radio enthusiast. The price is two guineas, and it is worth every penny of this. Those who want further details should write to the makers, Messrs. Pifco, Ltd., of Shudehill, Manchester.

Ferrocart Coils

No component can do more to make or mar one's reception than the

tuning-coil. A badly-designed tuning unit invariably produces poor selectivity and sensitivity. From this you will gather that tuning-coil design is essentially a job for specialists, and you'll be right.

A good coil is not just a number of turns of wire wound round an insulating former. It is much more than that. Coil design involves careful mathematical calculations, a great deal of experimental work, loads of practical experience coupled with the ability to turn out the finished article at a competitive price. And it is no easy matter to produce a one hundred-per-cent efficient job at a price that meets the pocket of the average man.

Probably no firm has done more for the constructor than Colvern, a name indelibly linked with all that is good in coil design.

Full Range Available

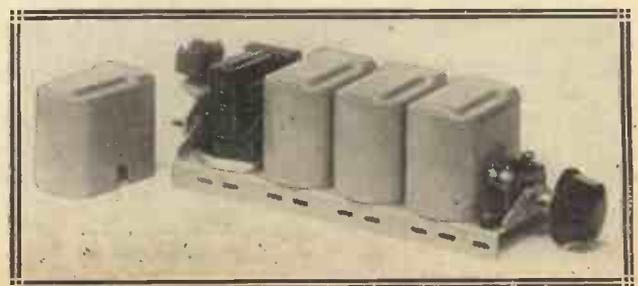
When the air-cored coil was considered to be the last word there was always a suitable Colvern coil for every conceivable type of circuit. Later, with the introduction of the Ferrocart principle of core construction it was Colvern who quickly realised its potentialities and secured the sole manufacturing rights in this country.

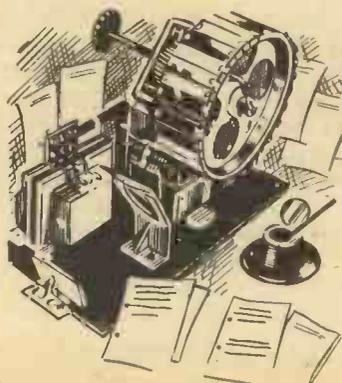
There is no need to discuss the merits of Ferrocart cores here—these are already well known to readers. Suffice it to say that Colvern have a complete range of these coils in single and ganged types, and for superheterodyne and "straight" circuits.

The latest model we have had the opportunity of testing is the four-gang assembly, which comprises four Ferrocart screened coils mounted upon a

(Continued on page 93.)

This fine Colvern ganged coil assembly comprises four "Ferrocart" coils. The switch knob provides on-off and radiogram switching in addition to wave-changing.





Notes on Television

by DR. J. H. T. ROBERTS F. Inst. P.

Our Scientific Adviser here discusses the future of television, and reviews the progress so far made.

As announced in the first issue of WIRELESS last month, I have been asked to keep you up-to-date month by month with all the latest happenings in Television in all parts of the world. This is very interesting for me—I hope you will find it so, too—but it is not quite so easy as it sounds.

Developments in television take place weekly, almost daily, and moreover, it is difficult to assess the value of the reports of television discoveries.

Too Much Prophecy

I suppose there is scarcely anything of recent years which has been subject

to so much exaggeration and fantastic prophecy—"ballyhoo" as our American friends aptly call it. Without going into the causes of all this—and it has been mainly the fault of the newspapers—it is important to remember that, so far from helping the progress of television it has done it serious harm. The public, after all, still believe a great deal of what they read in the newspapers (I am talking about the newspapers, mark you,

not the technical radio journals!) and when they are filled up with extravagant promises of "seeing the Test Match from Australia" (the classic example) they naturally think, poor souls, that it is nothing, by comparison, to ask for a set that will see the length and breadth of their native land.

Now, the fault, as I say, is not with the science of Television, but with those

who put about irresponsible statements, without any regard to the very great difficulties which have still to be overcome.

Pioneering is Hard

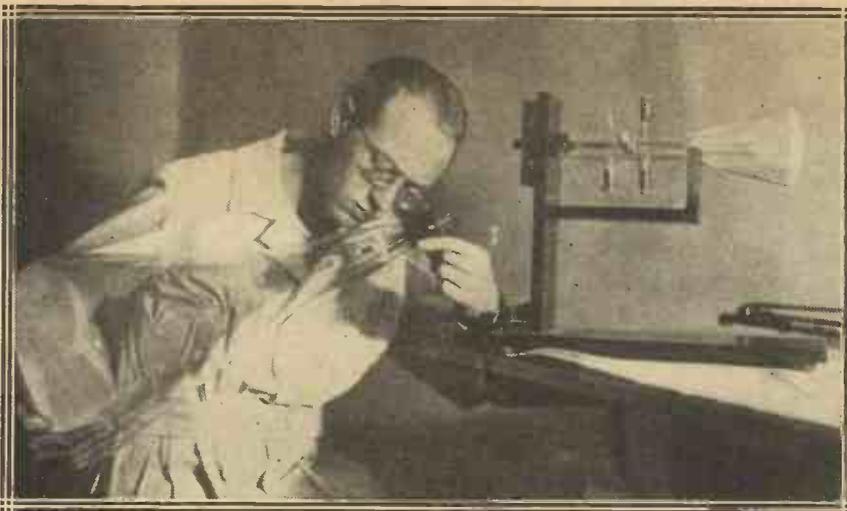
The Baird Company has done yeoman service in pioneering television, and deserve credit for the way in which they have surmounted difficulties (political as well as technical) and given the public a television service which, having regard to all the conditions, is no mean achievement.

I know something of pioneering myself, and I know how much hard and uphill work goes to it and how the

work of those who came first and who valiantly wrestled with the difficulties, and at a time when public interest was not nearly so great as it is to-day. I hold no brief for the Baird Company (or any other), but I think it is only right to point out the great service they have rendered and to give them full marks for it.

Now as to the future development of television, I shall have more to say about this from month to month as we go along. There are several major problems which will have to be settled pretty soon, however, before we can expect any really substantial ground to be gained.

AN ADVANCE IN CATHODE-RAY TELEVISION TUBES



Many scientific men consider that mechanical systems of scanning are destined to give way entirely to the cathode-ray tube. Here we see Manfred von Ardenne, the famous television worker with one of the latest tubes. On the bench is an early tube made in 1930.

One of the leading matters that requires discussion is the question whether low-definition or high-definition systems should be used.

Pros and Cons

It is obvious that a high-definition system employing, say, 180 lines to the inch, should give better pictures than one employing only 30 lines to the inch, other things being equal.

The matter does not end there, however, and there are various

kicks far outnumber the ha'pence, as they say in Lancashire.

Low or High Definition?

So, although we are all anxious to see television develop as soon as possible into something comparable to broadcasting in the remarkably perfect form in which we have it to-day, don't let us overlook all the foundation

other points, for and against, to be considered when reviewing this question of high definition transmission and reception.

The question of the wavelength to be used for television transmissions is a matter which is exercising some of the best brains in the industry. It is evident that if television is to monopolise a relatively wide band of

frequencies—as it does—it is going to cause complications if located in the broadcast region. Already the broadcast band is overcrowded, and one of the principal anxieties of broadcasting authorities throughout Europe, and the world, is to find sufficient wavelengths to go round, and to allocate them so as to avoid interference. What is it going to be like if television frequencies—not a single wavelength, but a band—are to be superimposed upon an already over-congested ether?

The "Spread" Problem

This question, as I have said, has given cause for deep concern ever since television was seriously considered, and as time goes on, the overloading of broadcast channels becomes ever greater instead of less. Therefore, we are bound to look, it seems to me, for some channels outside the broadcast region, if we are to have any chance of a successful television service.

It is for reasons of this kind that it has so often been suggested that television should be assigned to the very short wavelength region. These ultra-short waves have many advantageous properties, quite apart from their distance from the broadcast band. It is largely in connection with short-wave transmission that the high-definition systems of television are now being considered.

As to the scanning systems, you know that an old-age controversy has been going (age-old in the television era, that is), as to whether the mechanical scanning-disc system has any hope of reaching perfection, or whether some "weightless" arrangement, like the cathode beam, will be necessary in order to get sufficiently rapid "response."

That Promised "Discovery"

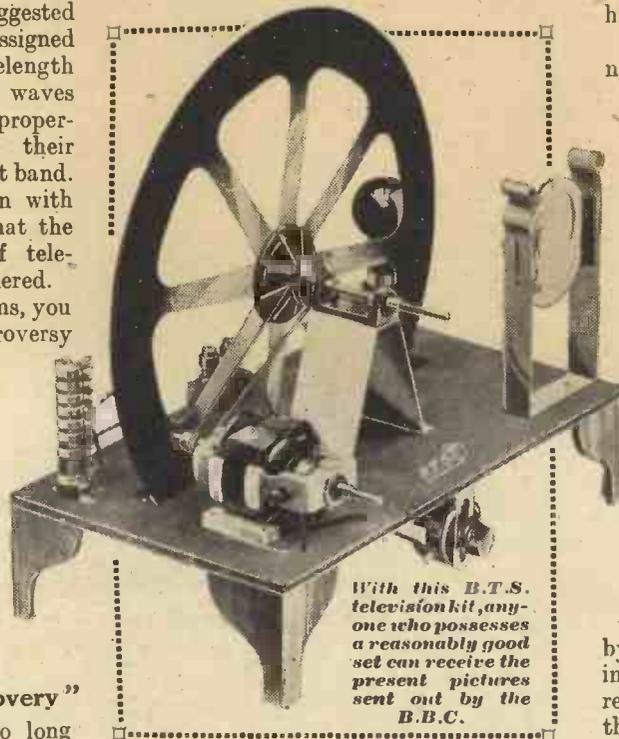
It would take much too long to go into this question at the moment, although in future articles we will consider these alternative schemes in more detail. Suffice it to say, for the moment, that there are many people, and they include some of the most eminent scientific men associated with television development, who believe that the scanning disc, or mechanical system is destined to give way completely to the cathode-ray or "instantaneous" system.

For many years now people have been saying that television has got as far as it can unless "some new

THE QUESTION OF SHORT WAVES

principle" could be discovered which would get it out of the morass, as it were, into which it seemed, not so long back, to have become entangled. What that "new principle" was to be no one knew, but many thought it would be some form of cathode-ray principle.

Personally, I do not think for a moment that some epoch-making discovery is going to be made suddenly, which will revolutionise television and put it into the front of the picture. I believe that the development of television will proceed along lines of slow—and perhaps painful—progress, just as was the case with radio telephony (broadcasting) and many other sciences. Why should we assume



With this B.T.S. television kit, anyone who possesses a reasonably good set can receive the present pictures sent out by the B.B.C.

that by the waving of a wand, some sudden *coup d'état* is going to happen in television, which has never happened in other departments of knowledge or research?

Wild Statements

No, I am convinced that television will be improved bit by bit, getting gradually better (as it has been doing for some two or three years past) and that in the fullness of time it will become a real public service, fit to rank, in technical excellence, with the talking

pictures, the radio, and the telephone. But I think that time is a long way off yet and I particularly deplore, as I said at the beginning of this article, the unauthorised and wild and almost misleading statements that are so often published in the Press. Such statements do untold harm and only embarrass those who are seeking to develop television on sound and sensible lines, and make their task more difficult than it is already.

The Opinion of Marconi

As to the future of television it is very interesting to have the opinion of such an eminent radio pioneer as Marchese Marconi, who said recently, "Television can never completely supplant broadcasting as we know it to-day. It is my view that sound is more important than vision. Television is a very useful adjunct to broadcasting, but I do not think it is likely to fill the same need as wireless transmission in the form in which we have it to-day.

"One of the important technical disadvantages of television is that it monopolises a relatively broad band of waves in the ether; also it is more subject to outside interference."

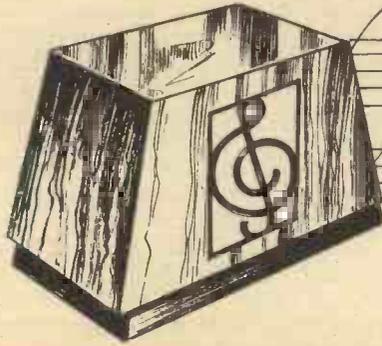
On the great question of "television across the Atlantic" (which always seems to intrigue televisionaries so much) Marconi said, "I think that television across the Atlantic will be very simple, in course of time." He added that he did not think it would be so very long before events would be thrown upon the screen in cinemas and theatres at the time they were actually happening.

"One Link Missing"

Another significant statement made by Marconi recently was to the following effect: "Television has now reached a stage when it can be said that there is only one link missing from the chain necessary to make it suitable for an everyday public service and entertainment. The missing link cannot be very far from our grasp."

What the missing link referred to by Marchese Marconi will prove to be we can only guess, but possibly he refers to some more convenient method of scanning and reconstituting the picture. Great hopes are entertained for the cathode-ray system and many people consider this to be immensely superior to the mechanical scanning disc system, but it is quite certain that

(Please turn to page 95.)



How Loud is your Loudspeaker?

by Victor King

EVERY listener knows whether or not his set is selective, for good selectivity is plainly evinced by a clean separation of programmes, while bad selectivity results in the overlap of stations.

Also the sensitivity of a set is quickly apparent by the number of different programmes that can be made easily audible. But the majority of listeners are rather at sea regarding the quality of the sounds made by their sets.

People seem to place their own interpretation of quality before the opinions of skilled acoustic engineers. I expect you have all encountered that type of set-owner who possesses a real old-stager of a wireless set which distorts terribly, though its owner is absolutely convinced that the quality is above reproach.

The Tolerant Ear

"Marvellous tone; can't bear to listen to So-and-So's new receiver. Don't hear anything as good among all these new-fangled outfits," is the sort of thing he says.

We know why this is; the human ear is a tolerant organ and quickly adapts itself to conditions. It resents subsequent variations from those conditions.

But it can be made to get used to new conditions, it can be cultivated to its greatest appreciation of musical and other sounds when these are natural and free from distortion.

A distorting wireless set destroys the tonal balance of, for example, an orchestra. If it can improve it, then it is doing something that the great musicians who wrote the music, and the

Plenty of food for thought is provided by this interesting article on the psychology of listening.

great conductors who interpret that music, cannot do!

The sounds made by a band or orchestra are the result of extremely careful construction by master musicians, so any variation away from them through a faulty radio outfit is obvious vandalism.

Measuring Loudness

So much for quality. But what about loudness? Quality is straightforward; either the set distorts or it does not, but how can we appraise the volume of sound that issues from a loudspeaker?

It cannot be done by using the power output figure of a receiver, for this can give only a rough estimate of the maximum loudness that might be possible given certain well-defined conditions.

The power output of a set is really the power output of its last (output) valve. Supposing a power valve rated for a maximum output of 3 watts is used.

This power can be realised only if that valve can be loaded to its full

capacity by the previous valves and without these themselves being overloaded in

the process, for valve overloading is one of the commonest causes of distortion.

Even if this can be done it does not follow that the full three watts can be used for developing air vibrations. Far from it. There will be losses, very serious losses, particularly in the loudspeaker.

The extent of the loss will vary as with different instruments, so it can be said that one man's three watts are not necessarily those of his neighbour!

Engineers have a method of cataloguing degrees of loudness. It involves the use of what are known as decibels. But decibels cannot be made to convey much to the average man.

Difference of Opinion

I feel we need some very simple method of expressing loudness. It need not be extremely exact, but it ought to provide a constancy.

At present it is left to individuals to fake their own tabulations.

Thus you get this sort of thing.

"The Wireless Military Band came through with enough volume to fill a hall."

"I heard Milan at quiet-room strength."

People's ideas as to loudness vary most widely. You may think that a certain programme level is rather "soft pedal," while another might consider identically the same volume to be "loud."

We haven't to look far for an explanation. People's hearings differ, some have very sharp hearing, and others verge on



It needs a good set to reproduce the full effect obtained from such an unusual orchestra as this one which Stanford Robinson is conducting.

deafness. Also, the nerves play their part.

A man with a keyed-up nervous system will jump at the pop of a Christmas cracker, another will hear a loud explosion with apparent unconcern. Clearly the ones "fairly loud" could well be the other's "deafening"!

In any attempt to define degrees of loudness in so far as the radio loud-speaker is concerned, the varying nature of transmissions have to be taken into consideration.

Power Output Misleading

It is true that the B.B.C. control engineers narrow the range of loudness differences at their end, but all the same supposing this happened. Two sets of similar rating were being tested by two different listeners on the same distant station. The one heard nothing but a quiet-spoken announcer during his test, and the other a crashing brass band.

The latter might well have much more to say about the volume obtainable on the set than his fellow experimenter!

Perhaps you think this volume business must always be a matter of opinion. Well, maybe, but my point is this. Power outputs, with so much variation in the efficiencies of loud-speakers, are rather meaningless, and if there were some simple means of measuring the extent of the air vibration at, say, six feet from the speaker on a standardised kind of programme item (such as Henry Hall's band), then we should have a much better check

THE HUMAN FACTOR UPSETS JUDGMENT

on the individual performances of sets.

Which reminds me, I have had a nice long letter from a Mr. Patrick, of Hull. He starts by saying that while he finds my articles interesting (which is good), he does not always agree with me (which is better still), though he always finds food for thought in what I have to say (which means with at least one reader I achieve my ambition).

Mr. Patrick goes on to say:

"But what is really prompting me to write you is to thank you for an article you wrote some time ago, re the advantages of hotting a set up rather than constantly changing from one circuit to another.

"In the article you drew an analogy of a friend of your's who was always sticking the latest gadgets into his set and yet never seemed to get the results he aimed at, and if you remember, you described how you had a little two-valve set for home use which you had spent a considerable time on hotting up and getting everything just so, and the same little set giving better results than the friends umpteen valver.

The Hum Vanished

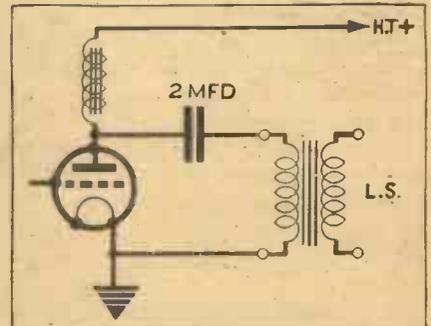
"Well, I wish to thank you personally for the advice contained in that article, as I have tried to follow out the advice contained in it and, I think (in fact, I am sure) I have done the right thing.

"I have an "S.G.4" based on S.T.'s great 500, and I have spent hours and hours hotting it up.

"I have only a very limited amount of cash to play with, and I think this is what made me take your advice to heart, but, believe me, the advice is sound.

"I will give you an illustration of what I mean. To begin with, I run the set off the mains, with an eliminator. I have been doing so for the past two years, and all this time there has been

a nasty hum coming from the L.S. I have been trying all the little dodges published in the radio press, but none of them seemed to have any effect. I was using the usual choke and condenser output filter, and changed this for a transformer, but the results seemed to be worse, if anything. So following up your advice, I kept on trying, and as a last resort I put back the choke output and then fed this into the transformer and then to the L.S., and believe me, there is no comparison with the previous results. This is as good as another valve in volume, without distortion and no hum!



How Mr. Patrick connected his choke output and L.S. transformer.

"I am listening to a 'Prom.' concert whilst I am writing this, and believe me it is wonderful, and this on a Blue Spot 66R. unit and chassis. It is certainly better than a lot of the cheap moving-coils I have heard. I have connected the rig as in the figure. A little unusual, but marvellous. I should like to mention that rather than buy a lot of cheap tack I have scratched and scraped and got each article in the set of the best that can be bought, so you will see I have been a successful pupil of your advice re hotting up and experimenting."

May Be Worth Trying

The moral seems to be, "If at first you don't succeed—" But radio always has been and, I hope, always will be a very personal kind of hobby. Mr. Patrick has taken steps to get his set hotted up to the extent of giving him all he wants free from hum. His methods, though perfectly successful in his own case, might not apply to all others, but I have passed on his tip re hum for others to try.

I'd like to hear from many more readers who have interesting experiences or useful tips to pass on. Lots of amateurs achieve outstanding results by methods which might not always be strictly conventional. Postcards and letters addressed to Tallis House, London, E.C.4, will find me quickly enough.

FOR HOME CINEMAS



A special amplifier and microphone equipment that has been produced for the benefit of home cinematograph users. It is intended for those who wish to introduce music or a running commentary as accompaniment to the silent films that are used in home projectors.



A Big Christmas Programme—Dr. Adrian Boulton's Tour—India and the B.B.C.—Further News Bulletin Revision.

By Our Special Correspondent

"The Messiah"

Next year is "Handel Year," in which will be celebrated the centenary of the great Oratorio composer. The B.B.C. will begin its contribution in the

Christmas programmes at 9.30 p.m. on Sunday, December 23rd (National transmission) with Part 1 of "The Messiah," conducted by Adrian Boulton, and including Stiles Allen, Margaret Balfour, Tom Pickering, and Keith Faulkner. The second part of "The Messiah" will be given at Easter and the third part at Whitsuntide. Thus will be arranged the first broadcast transmission of the whole of this oratorio.

"GROWING WINGS"



Mr. Filson Young is planning to resume his series of "Growing Wings" talks in the New Year. Here he is climbing into his plane during flying instruction.

The End of a Series

This Christmas season will see the last production by Father Bernard Walke and Mr. Filson Young of their Nativity Play in Father Walke's little

church, St. Hilary, Marazion, Cornwall. The play is acted by local people and arranged in the traditional mediaeval manner. It has established a big following throughout the country and will not be easy to replace. But it is the right policy to give other people a chance.

Goodbye to "The Central Elephant"

On Tuesday, December 18th, the B.B.C. will give a farewell dinner to the Executive Committee of the Central Council for Broadcast Adult Education, known shortly as "The Central Elephant." It was this august body which has presided over the fortunes and misfortunes of the B.B.C. high-brow activity during the past seven years. Now they have been disbanded as a first step to reducing the serious part of programme work. But apparently they are to be feted in right royal fashion.

India and the B.B.C.

Much surprise has been expressed in India at the report published in a London newspaper that Sir John Reith had accepted an invitation to undertake a special mission to that country in order to frame its broadcasting. It was stated that Sir John would go out to India next year, and it was added that in the new constitution of the B.B.C. provision would be made for the supervision of all the rest of the broadcasting in the British Empire.

There is, of course, no such intention. While the B.B.C. remains ready to give advice when asked, it clearly has no right to insist upon any measure of control or supervision outside the area of the United Kingdom and Northern Ireland.

And the next thing is that Sir John Reith will certainly not set out on any

(Please turn to page 93.)

ALTHOUGH the B.B.C. excelled itself last year in the elaborate and careful plans for the Empire Broadcast on Christmas Day, I gather that this year a still more ambitious attempt is to be made. An idea of the complexity can be gained from consideration of the fact that a special D.C. panel has had to be built possessing twenty-two points of assembly.

There will be unusual features, including the singing of the National Anthem by choirs co-operating thousands of miles away from each other. There will be a gathering of Christmas impressions from all over the Dominions. These will lead up to a festival in England presided over by the redoubtable Freddie Grisewood—all of this as a preamble to the great event of the day, the King's third Christmas message to all his peoples at three o'clock sharp.

Dr. Boulton in America

In addition to conducting several concerts in Boston and in Cambridge, Massachusetts, Dr. Boulton has also accepted an invitation to be guest conductor of Dr. Ernest MacMillan's Symphony Orchestra in Toronto. But his most important engagement in America will be from New York on the main networks of the National Broadcasting Company which will take a special concert of the New York Philharmonic under Dr. Boulton's baton. It looks as though he will have a busy fortnight. The importance of his engagements indicates not only his high standing in America, but also the prestige there of the B.B.C.

PERSONALITIES IN WAX

Pen pictures of some of our outstanding recording artists.

It is not given to everyone to have that elusive something we call personality. Some have it to a marked degree, while others seem to have no outstanding feature, no individuality.

In the musical and entertainment world, as in everyday life, one meets many variations in people. But real success on the stage, before the radio microphone, or on record largely depends on that mysterious power to get personality "over."

Especially is the need for this quality felt in radio or gramophone work, the latter, indeed, being even more dependent on personality than the younger science of radio.

And yet these plain black discs can be packed with the artistic essence of the performer. One has only to hear a few records of Elsie Carlisle, Bing Crosby, Greta Keller, Sandler, of the modern school, or of Caruso, Kreisler, Chaliapin of the earlier recording artists, to realise how very strongly the individuality can be transmitted to the listener on the stylos and wax.

A Definite Personality

Those who have met and heard Elsie Carlisle in the flesh as well as on record will know what I mean. Elsie is not a physically big person, but she has a very definite personality, on or off the stage. That is the secret of her success—aided, of course, by her voice.

Her latest Decca record "Who Made Little Boy Blue?" is a good example of the transference of individuality on to wax.

Elsie Carlisle is friendly, energetic, and vivacious. She hates pretence and is always direct in her views and attitude to life. Born in Manchester she has the pertinacity of her countrymen and women.

She has had many imitators in her art—but there is only one Elsie Carlisle. That is personality.

Another personality of the air and record of whom we have been hearing a lot lately—with Jack Jackson and his Band—is Peggy Cochrane. Here is a lady who, apart from anything else, is amazing for her sheer versatility.

Starting her artistic life as a most proficient classical violinist (and she still gives "serious" recitals), Peggy Cochrane studied at the Royal Academy of Music and was already known as a soloist at the age of seventeen. Meanwhile—she had had singing lessons and learnt the piano also.

Later, syncopated piano music took up Miss Cochrane's attention, to the benefit of thousands of gramophone

THE CHILDREN'S HOUR



Henry Hall, who is particularly popular with the kiddies, and who has just made an excellent children's record "Noah's Ark," is here seen with his own children during a rare interlude from work.

users, and following that she also took up dance-band vocalism. It is not crooning; and Peggy Cochrane could not be called a crooner—she is a more descriptive singer.

Incidentally she arranges her own pianoforte solos and interludes, which she plays at the Dorchester with Jack Jackson. But more than that, Peggy Cochrane is a dance number composer—hers is the recent success "Ache in My Heart" (under a nom-de-plume), and she has also appeared in a film and written music for several others.

On top of all this Peggy Cochrane has time and the ability to direct a home as the wife of a London doctor. Amazing, isn't it?

Who started crooning? Not Bing Crosby, although he is recognised as the King of Crooners. Nor was it Val Rosing or Les Allen, so they say, but the present deputy leader of Jack Jackson's Band, "Chappie" D'Amato.

It may not be true, but rumour has it that the first "croon" took place on impulse during 1922 when "Chappie" stood up and sang the chorus of "Evergreen Eve" in the orchestra pit of the Shaftesbury Theatre. He started something!

And now hats off to a young lady artist who has not recorded nearly enough, though she has recently broadcast a fair amount, Beryl Orde. She is only twenty years of age, but she has packed an amazing amount of stage experience into her life. Her mimicry powers are beyond question, for she is a born mimic, and got into trouble at school for imitating various mistresses when singing at the school concert in Liverpool. (Beryl is another Northerner!) At the age of ten she gave a concert in which every artist was—Beryl Orde. Later she toured as a child mimic. Her first broadcast was with Eddie Pola in "Jazz Justice." (She has recorded a record under that name for H.M.V.).

LISTEN TO THESE

Some outstanding records from the latest lists.

Two Cigarettes in the Dark. Bing Crosby—no more need be said. (Brunswick O1874.)

America Calling. Carlisle Cousins medley. As trim as ever. (Decca F5276.)

Who Made Little Boy Blue. Elsie Carlisle. A typical, enjoyable, intimate record. At her best. (Decca F5288.)

John Peel. Harold Williams and the B.B.C. Male Chorus. Very fine recording. (Col. DB1455.)

MISCELLANEOUS.

Play the Game You Cads. Kenneth and George Western make a record "stunner." Oh, very well done! (Col. DB1450.)

Noah's Ark. A good Christmas record by Henry Hall—for the kiddies. It is a double-sided arrangement of nursery rhymes and zoological tunes. (Col. DB1441.)

Music Hall. Original B.B.C. stars do a miniature music hall programme on Regal Zono. MR1435.

Curly Wig. Harry Hemsley does two excellent child impersonations. (Regal Zono MR1438.)

CHRISTMAS ITEMS.

Carols. The B.B.C. Wireless Chorus and Organ. Recorded in the Kingsway Hall. (Col. DB1451-4.) Also Church Choir singing Vocal Gems (Col. DX643.)

An Old Bachelor. Bransby Williams returns to the recording microphone to add another of his inimitable monologues. (Col. DX642.)

Peter Pan. Selection by the London Palladium Orchestra from the famous show. (H.M.V. C2693.)

DANCE NUMBERS.

Have a Little Dream. Henry Hall and B.B.C. Dance Orchestra. (Col. CB791.)

Yes, Madam? The Masqueraders playing two numbers from the popular show. Very well played and recorded. (Col. CB789.)

Noon Glow. Duke Ellington and his

(Please turn to page 89.)

LISTEN TO THESE

—Continued from previous page

Orchestra. Usual "hot" arrangement. (Brunswick O1901.)

Keep Me in Your Arms. Ambrose and his Orchestra. Now recording exclusively for Decca. (Decca F5284.)

I Love You Truly. Jesse Crawford, the famous American organist. A typical "sugary" rendering. (Decca F5221.)

A SPECIAL RECORD.

Alleluia. In honour of the wedding of their Royal Highnesses the Duke of Kent and the Princess Marina of Greece, Decca have issued a double-sided record of the specially composed anthem sung during the ceremony in Westminster Abbey.

The record was actually made in the Abbey itself by the Abbey choir under the conductorship of Dr. Ernest Bullock, who composed the anthem.

Priced at 2s. 6d., there has been an enormous sale for this record, Decca R.001, and the proceeds are being devoted to a philanthropic cause which is of absorbing interest to their Royal Highnesses—social relief work in connection with men and women who are unemployed.

One side of the disc bears a facsimile of the signature of the Duke of Kent, while on the other is printed that of his bride, Princess Marina. This record is an historical one, and whether or not you like church music, exquisitely sung, you should get it as a memento of an occasion that can never occur again.

VARLEY COMPONENTS

Compact Coils of High-efficiency

THE introduction of the iron-cored tuning coil has done a lot towards the achievement of greater compactness in receiver design.

This is largely due to the special high-permeability material used in the core and to the fact that fewer turns are required to produce a given inductance.

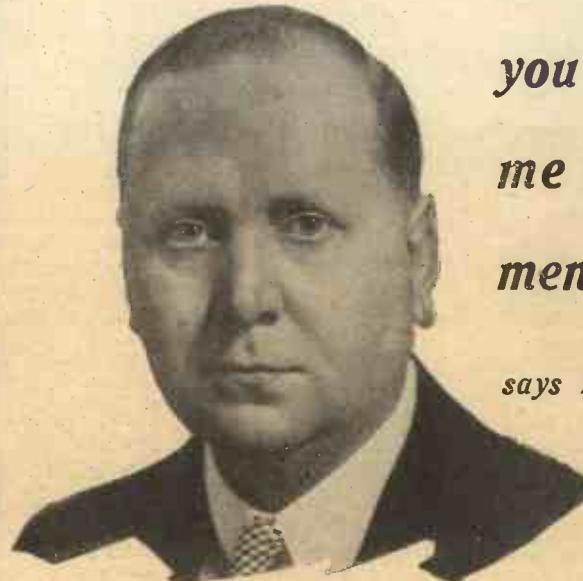
Varley's have recently brought out an extremely compact range of coils known as the "Duo-Nicore." They are little larger than H.F. chokes of normal dimensions yet they are very efficient indeed.

With standard variable condensers these coils cover from 200-550 and 900-1,900 metres. In addition to the usual aerial and H.F. transformer types there are "Duo-Nicores" suitable for all kinds of superheterodyne circuits. The intermediate transformers (110 kc. and 450 kc.) are similar in appearance to the tuning coils, but are provided with a coupling adjustment-screw which projects through the side.

The trimming is carried out by means of two concentric controls on top of the component, and it is of interest that the coupling can be adjusted after trimming with negligible effect on this.

The high standard of quality and efficiency associated with Varley products has been fully maintained in these "Duo-Nicore" coils, which are in every way excellent.

"MOST REMARKABLE REPRODUCTION



you will thank me for recommending it...

says **Dr. J. H. T. Roberts,**
D.Sc., F.Inst.P.

in **"WIRELESS"**

WHAT OTHER EXPERTS SAY:—

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."

"WIRELESS WORLD":—"A considerable increase in efficiency."

"POPULAR WIRELESS":—"Eclipses previous standards" and "A valuable contribution to better broadcasting."

Mr. A. K. JOWERS, "AMATEUR WIRELESS":—"A definite advance in design."

WHAT PRIVATE USERS SAY:—

"It has given my set a new lease of life. I could not have believed my set (a home-constructed 3-valve) capable of such vivid realism. I am proud of it now, thanks to your great achievement."—A. S., Berkhamsted.

"... in fact, no words of mine can express my feelings about this masterpiece of loudspeaker art and I can only say that from henceforth W.B. Stentorian is my motto, and I am proud of it."—A. H. N., Brierley Hill.

"I cannot speak too highly of this marvellous instrument."—G. H. N., Altrincham.

"Thank you for the opportunity to hear radio so perfectly."—R. C., Swindon.

"The difference was beyond my expectations... performance is too good for words—it must be heard to be appreciated."—H. W., Rhyd.

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

Write for the new W.B. Stentorian leaflet

STENTORIAN

PERMANENT MAGNET MOVING-COIL SPEAKERS.

Whiteley Electrical Radio Co., Ltd.
(Dept. C), Radio Works, Mansfield, Notts.

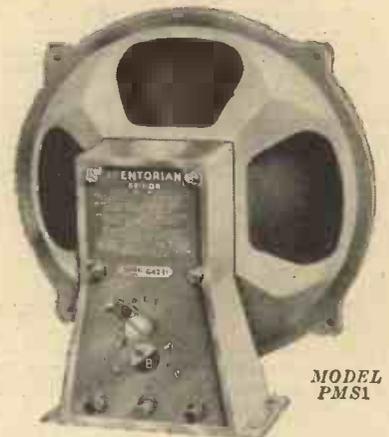
Sole Agents in Scotland: Radiovision, Ltd., 233, Vincent Street, Glasgow, C.2.

Sole Agents in I.F.S.: Kelly & Shiel, Ltd., 47, Fleet Street, Dublin.

Make no mistake—this revolutionary speaker, almost conventional in appearance, embodies these distinct and exclusive improvements in design. Its startling performance has amazed experts everywhere.

The unique Whiteley Speech Coil is bringing to thousands a new conception of realism in radio. The exclusive new magnet (prov. pat.) is giving to users a majestic volume of which they never thought their sets capable.

Whatever your set, a W.B. "Stentorian" will match it accurately as principal or extension speaker. Hear one to-day, and marvel at the astonishing difference it makes.



MODEL PMS1



In last month's article I promised that I would deal this time with rather more advanced short-wave circuits, still from the practical point of view. In case one or two readers are a little worried about that "more advanced" business, I must make one point clear at the outset.

The portion of any short-wave set which decides between success and failure is the detector. You may operate a short-wave set with a thoroughly inefficient H.F. stage and a perfectly useless L.F. stage, but if your detector is working well you will get results. On the other hand, if it isn't, the best H.F. and L.F. sides in the world won't help you.

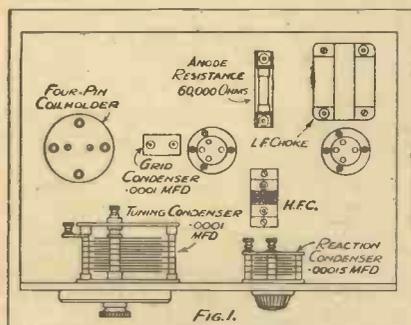
That is the main reason why I have always staunchly supported the single-valve short-wave set; when one has only a detector to worry about, one generally succeeds in getting it just right. And then, when one starts adding L.F. stages, one is surprised at the results.

Single-Valve Efficiency

Make no mistake about it—a short-wave single-valve set should get everything that is going. I have done all my best reception on one, in spite of the assurance of well-meaning friends that I was "just being cranky."

For one thing, a single-valver gives one just about the most favourable

A CONVENIENT LAYOUT



This is the layout suggested by W. L. S. for an ordinary two-valve detector and L.F. receiver.

ratio of signal to background that it is possible to obtain, and it is precisely this signal-to-background ratio that counts in short-wave work.

So when you study the layouts of "more advanced" receivers, please remember that you ought first of all to drill yourself in the gentle art of making a detector work better than

it has ever worked before. Then you can start piling on the amplification, so long as you don't introduce a lot of extraneous noises and spoil the whole thing.

Fig. 1 shows, without wiring, a convenient chassis layout for an ordinary two-valve (detector-and-L.F.) receiver. Fig. 2 shows a similar arrangement for a three-valver using a stage of H.F. I don't propose to give



SHORT WAVE NOTES

In dealing with two- and three-valve layouts this month, our short wave expert, W. L. S., has some good advice to offer on detector circuits.

the wiring details, because then people will write and ask what components to use, and what length such-and-such a wire must be, and so on.

Work out your own wiring scheme from the circuits that you know. If you aren't sufficiently experienced to do this, you had better keep to a complete "cut-and-dried" design.

In the "layout" diagram of the three-valver I have shown a drum-drive with a condenser mounted on either side of it. There is no trouble about ganging in this way, and it certainly simplifies tuning considerably.

Winding the Coils

Those who prefer to manipulate two separate controls, however, have only to mount a condenser on the front panel on either side of the H.F. screen, and equip each with an ordinary slow-motion dial.

Two-pin plug-in coils don't appear to be available these days. If you happen to have some of them, by all means use them. If not, I strongly recommend you to wind your own coils on some sort of compact four-pin former. Space doesn't permit me to give full details for doing this; sufficient to say that you will need three coils, or, in the case of the three-valve set, two sets of three coils.

Wind them roughly as follows: "A" coil, 10 turns grid, 6 turns reaction. "B" coil, 6 turns grid, 4 turns reaction. "C" coil, 4 turns grid, 4 turns reaction.

Avoiding Threshold Howl

Bear in mind all that I said last month about the necessity for short wiring. Most of it can be carried out underneath the chassis, which may be made of aluminium or of "Metaplex."

I don't anticipate that anyone will have any difficulty with a two-valve receiver built on the lines of Fig. 1. There is, indeed, nothing to go wrong.

I have suggested the use of resistance-capacity coupling, because direct transformer coupling is apt to lead to an annoying trouble known as "threshold howl."

The three-valver, as far as the last two valves are concerned, may be built on exactly the same lines. The H.F. compartment needs no special treatment if the suggested layout is adhered to, and if one uses a metal-

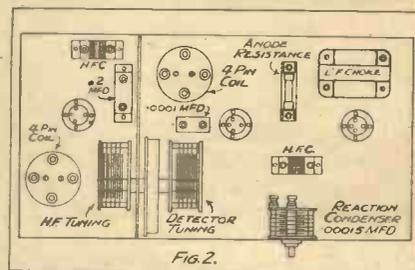
lised valve there is not the slightest need to worry about mounting it horizontally through the screen as we used to do.

Test the Detector

After all, this month's page is rather devoted to the needs of the man who has had a little short-wave experience and won't fall into the simple traps. He can probably be trusted to make a very good set once he has been given a little guidance with the layout of parts.

The novice will have his turn later, and I hope to describe a complete short-wave set suitable for starting him off. The "intermediate grade" will be served occasionally by circuit diagrams of sets to try out.

WITH GANGED TUNING



In this three-valve scheme the H.F. and detector tuning condensers are controlled by a one drum drive.

But in every case of the construction of a new short-wave design I would stress the importance of getting the detector part exactly right. It is a good plan, after construction of the whole set, to test the detector circuit free from the rest and concentrate on that to make sure it is in first class working order. Then the other stages of the set can be connected again.

THE Professor and I were sitting in his den at the "Microfarads" busily engaged upon the mass of research work that always precedes the launching of one of those startling new circuits of ours. We had reached a point where concentrated thought was required and were fully occupied in the generation of brain waves.

my train. In some extraordinary way I had put my boots on backwards and the faster I ran the further I got from the train.

Seeing my plight, the guard obligingly brought it along to the taxi rank outside and ushered me into a compartment. I had no ticket, but he produced a selection from the golf bag

"Number engaged," roared the Professor into the microphone.

I relieved him of the instrument and spoke myself to the dear lady. It might, I suggested, be better if she would give me a message that I could pass on, for I doubted whether she would have much success with the Professor direct in his



Like myself, the Professor always thinks best when he is lying back in a comfy chair with his feet on the mantelpiece and closed eyes. The uninitiated might completely misinterpret the wood-sawing noises that both of us are apt to produce when thus immersed in work. Though they may sound like snores, they are actual indications of violent cerebral activity.

Just to show you how much a keen brain can get through in a matter of a second or so let me recount an experience of my own on this particular evening.

A Strange Adventure

For some reason I was, except for the Prime Minister, practically the only person in Paddington station. He had just remarked that he was a great admirer of Edgar Wallace, so of course I tried to go and buy a towel at the bookstall. The difficulty there was that the chappie behind the counter had nothing in stock but wireless valves and tintacks, and it was most difficult to explain to him that I must



THE FASTER I RAN THE FURTHER I GOT

have the towel and had only two minutes in which to catch my train at the far end of the longest platform, for he insisted on conducting the conversation in Morse.

The only thing to do was to grab a tablecloth from the refreshment room and, waving this, I started towards

that was slung over his shoulder, placed one in his punch and pressed the trigger thing. Instead of just a single ting the bell went on ringing and ringing and ringing.

Then I realised that it was the Professor's telephone bell going. The

TO THE RESCUE

How Professor Goop and Wireless Wayfarer answer Miss Worples's SOS for someone to put her set right—and how they don't.

ring couldn't have lasted more than a second or so, and you needn't tell me that the brain that can think of all those things in a single second isn't pretty actively at work.

You see what I mean? I answered the 'phone because the Professor's concentration, even deeper than my own, was such that even the 'phone bell couldn't disturb him.

"Hullo!" said a feminine voice from the other end of the line. "Is that you, dear Professor?"

"No," I replied. "This is Mr. Wayfarer. The Professor is very busy at the moment."

In a Terrible Mess

"It's rather important," cooed the voice. "This is Miss Worples speaking. I wonder if you would mind waking him—or rather, I should say, I wonder if you would be kind enough to interrupt his deliberations?"

So deeply immersed was the Professor in his subject that I had to boot him quite hard and shake him several times before he returned to earth. I placed the 'phone in his hands.

"Miss Worples wants to speak to you," I said.

present condition of concentration. "Dear Mr. Wayfarer," cried Miss Worples, "do help me. I'm in a terrible mess."

"Then what you want," I said, "is the Mudbury Wallow Valet Service. Willing as we always are to help, the Professor and I cannot undertake dry cleaning."

The Professor Moves

"No, no! What I mean is that this is Christmas Eve, and my wireless set has broken down and I can't find out what's wrong with it, and Mr. Spoofer of the wireless shop can't possibly come round because he is so busy, and I simply must have it working tomorrow and I'm sure that you and the Professor will come and put it right for me."

"Why, of course," I cried. "That's just the kind of job that we love. Dear lady, we'll be with you in a shace of brakes."

"A what?"

"A brace of shakes, and will put



PICKING UP THE BITS THAT DROPPED OUT

that jolly old set of yours right in no time at all."

By this time the Professor was sitting up and taking notice. I told him what was afoot and straightway he began to collect the gear that we should require.

We couldn't find his attaché case anywhere, and anyhow it wouldn't

have been big enough. So we bunged milliammeters and voltmeters and valve testers and all the rest of the doings partly into Mrs. Goop's string shopping bag and partly into a cover removed from one of the drawing-room cushions.

The Professor ran on ahead with the string bag, and I followed behind with the cushion cover, retrieving the things that fell out through the network as he ran.

Arrived at Miss Worple's, we found that she had apparently sent out something like a broadcast SOS, for Pimpleson, Tootle and Captain Buckettt were waiting there, doing their feeble best.

Must Use System

Brushing them aside, the Professor and I took entire charge of the proceedings. You may or may not have realised that the whole secret of successful trouble hunting is system. The idea is that you begin at one end of the set and work right through it to the other. Thus by a process of



HIS LEAP WAS A PRETTY THING TO SEE

elimination you arrive at the only possible cause of the trouble.

In the case of Miss Worple's set matters were very difficult, for to begin with the combined milliammeter and ammeter multi-range instrument showed that no current was flowing in any circuit. To our surprise we found that even direct connection to the mains gave a zero reading.

"Simple," smiled the Professor; "the fuse has gone. This plug point, as you will observe, is absolutely dead." To demonstrate the point still more convincingly he licked the forefinger of each hand and placed them on the contacts.

A Sure Indication

His leap into the air was one of the prettiest things that I have seen for a long time. Luckily Miss Worple had laid in some good cheer for Christmas, so plenty of first-aid material was at hand. Brandy left him still motionless, and it was not until we had trickled most of Miss Worple's one bottle of champagne down his throat



I'M GLAD THAT IT WAS EMPTY

that signs of returning animation manifested themselves.

Captain Buckettt and Tootle meantime had been looking over our multi-range instrument and discovered within it a joint that had come adrift. A simple soldering job was clearly called for and at this kind of thing I luckily excel.

We plugged the electric soldering iron into the socket by the fireplace and left it propped up against the fender to heat up whilst we took another look at the set. Presently we became aware that the atmosphere was somewhat stuffy. Glancing round we saw that some clumsy ass had upset the soldering iron, and that the hearthrug was well alight. Some good work with a bucket of water and all the available siphons soon had the conflagration under control, as the best firemen always say.

Still No Results

We quickly had the testing instrument in good working order again, though of course that ass Tootle must needs put his heel in the tin of flux, and then tread it about all over the room. The tests began again and the mystery deepened.

So far as we could see, everything appeared to be in working order, but just to make sure, we renewed all flex leads and remade every soldered joint. Still there were no results. It was now nearly midnight and our labours had exhausted both us and Miss Worple's Christmas stock of liquid good cheer.

More Spares Requisitioned

The Professor and I never leave a job once we have undertaken to see it through. Though tests could disclose no defects in the valves, it might be that one of them had developed some obscure fault. Tootle and Pimpleson were sent scurrying home to fetch other valves from their store, or if necessary to knock up Sir K. N. Pepper and others who might have gone to bed in order to obtain replacements from them.

Captain Buckettt volunteered to fetch a spare loudspeaker of his, and Pottleson, who had blown in in the

meantime, went off for an output transformer.

On the return of the emissaries we tried the new valves, but still the set was dead. We were just going to tackle the business of removing the output transformer and substituting Pottleson's when Gubbworthy floated in, saying that he had heard on the 'phone from Sir K. N. Pepper that Miss Worple was in trouble. We told him in faint voices all that we had done during those hours of strenuous work.

Really Quite Simple

Gubbworthy strolled to the French window, opened it, and without a word passed out into the night.

"And now," said Miss Worple, "you see just how useful some of your friends are. Mr. Gubbworthy comes in, hears what we've done, and then just walks out on you like that."

"Our next little number," remarked the loudspeaker, "will be 'Thinking of You in My Bath.'"

We looked at one another, we looked at Gubbworthy, who stepped back through the window delicately wiping his hands on his handkerchief.

"Pretty good earthing switch that of yours, I should say, Miss Worple," he remarked, casting a melancholy eye on the empty decanter.

I'm glad that it was empty.

COMPLETING THE CIRCUIT

It's amazing how many people do not realise that for anyone to receive an electric shock, he must complete a circuit with his body, or part of it.

I recently saw a cartoon of a tight-rope walker making his precarious way across a circus tent, and at the same time shuddering with the violent shocks he was supposed to be getting. Down on the ground the electrician is calling out. "I told you that was an electric cable and not a tight-rope."

Of course, so long as a cartoon raises smiles it need not be technically accurate, but I mention this one because it so ably illustrates the point in question. If the tight-rope walker could get on to the cable without a shock, once there he would be immune.

The time when he would get a shock would be when he had one foot on the cable and one on some earthed object. The circuit would then be made via him to earth, and via earth back to the generator and so to the cable again.

Similarly in the case of a live rail on the Underground or elevated electric line, if you could take a jump and land securely balanced on the live rail you would feel nothing. But as soon as you lost your balance and put one foot to the ground or on one of the wheel rails you would complete the circuit and get a shock.

And so with a radio set, the hand (or hands) must touch two points of different potential before there is any possibility of even a tingling sensation.

A. S. C.

BROADCASTING IN SPAIN

—continued from page 56

The political aspect of broadcasting in Catalonia, I found, somewhat intriguing. Under the autonomy statute the Catalan Government (Generalitat) may possibly decide to conduct its own broadcasting service, subject to certain jurisdiction from Madrid, the seat of the Cortes (Parliament) of the Central State. There is another Barcelona station, EAJ 15 (National Association), and one or other of the stations may be given official recognition, or a new government station constructed.

All English listeners to foreign stations will hope that the recent political unrest in Spain will not unduly retard the reorganisation of broadcasting in that country—a scheme, somewhat akin to the General Ferrie plan in France, that provides for an extensive network of high-powered stations.

AS WE FIND THEM

—continued from page 82

metal chassis. In addition to the wave-change switch the assembly also includes a radiogram change-over, and on-off switch.

Thus there are three separate controls operated by the one knob, which is marked: Off, Medium wave (M), Long wave (L), and Gramophone (G). Accuracy of matching is an outstanding feature of these ganged units, which are also of robust construction and unaffected by temperature changes.

Our tests with this four-ganged unit proved it to possess a very high efficiency factor, as was expected, and we have no hesitation in recommending it to constructors.

The makers are Colvern Ltd., Maw-nay's Road, Romford, Essex.

The "Amplion" Lion

The Amplion "Lion" moving-coil speaker—a sample of which we have recently had on test—is a most efficient example of its type.

It is a particularly well-built chassis permanent-magnet instrument incorporating a universal transformer for



The Amplion "Lion" Moving-Coil loud-speaker is remarkably good value at £7/6

providing accurate matching with all types of modern output valves. This includes the new Economy Double Pentode for battery sets which, of course, requires a transformer of very high inductance. The clearly engraved terminal strip has, in addition to the transformer matching, sockets and terminals for connecting an extension speaker and for volume or tone control leads.

A completely sealed magnetic gap is another feature of the "Lion."

On test we found the sensitivity to be of a high order, and the response well balanced, giving very good and pleasing reproduction. The "Lion" is quite definitely a quality job.

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FOR the small sum of 2s. 10d. you can give yourself a £1 1s. present! A bald statement, perhaps, but if you turn to page 81 and to cover it you will understand how this unique present can be obtained.

For it is an unique present, well worth a guinea, and every reader of "Wireless" should take advantage of it. It is no more nor less than John Scott-Taggart's latest and greatest radio work, "The Book of Practical Radio," containing a wealth of practical information



of vital value to every home-constructor.

From the first paragraph of the book you will be lured on from chapter to chapter by the fascination of the author's style, and the very valuable information given. There will be scores of occasions when you will take 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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A VERY ACCEPTABLE PRESENT

CHRISTMAS is here once again, and with it the old problem of choosing suitable gifts for one's relatives and friends. Truly the problem presents many difficulties, but fortunately there is unlimited scope if the said relative or friend happens to be an enthusiastic constructor or listener—and most people are one or the other these days.

Perhaps one of the most acceptable gifts of all is a good moving-coil speaker, and there are a variety of reasons why this should be so.

Ideal Extension Speaker

If, for example, the potential recipient is a constructor, then by giving him a loudspeaker you are providing him with something that is essential, and which moreover is not tied down to one particular receiver. If you are wise in your choice you will pick a model that can be used with any type of set, and which will give equally good results with every conceivable type of output valve.

On the other hand, should the rela-

tive or friend already possess a built-in design (i.e., with speaker incorporated) he will be the first to appreciate the advantages of having an extension speaker "on tap," again assuming that your choice is suitable.

This brings us to the well-known W.B. "Stentorian," with its "Micro-lode" method of instantaneous matching to any output.

These speakers, which, incidentally,



The "W.B." P.M.S.1 permanent-magnet moving-coil speaker.

we can thoroughly recommend from our own practical tests, embody several distinctive features.

For example, the magnets (the "Stentorian" is, of course, a permanent-magnet instrument) employ a new and exclusive magnetic material which enables remarkably high sensitivity to be achieved. This means that excellent volume is obtainable with small inputs.

Special Speech Coils

Additionally, these latest models incorporate the "Whiteley" speech coil, previously used only on the very large W.B. public address speakers, as well as absolute protection of the moving parts from dust and dirt.

On the back of the instrument is a switch—quite a simple looking affair—which provides accurate matching to any output or to any receiver when the "Stentorian" is used as an extension speaker.

In the case of the P.M.S.1, otherwise known as the "Stentorian" Senior, an oversize cone is fitted, and the power handling capacity is 5 watts (undistorted). This model is the largest one in the W.B. domestic range.

WIRELESS IN THE GREAT WAR

—continued from page 74.

Depth charges would be exploding all around, and these explosions, although some distance away, frequently put the lights out and broke vital gauges, so that it was impossible to see or tell just what damage had been done in this darkened vessel. Only the faint light from the dark green sea would filter into the vessel, and maybe some fish would press its snout against the glass, a mockery in its freedom to the entombed and wretched crew.

Then there was the air. The submarine, owing to the alertness of the English vessels might not have had time to ventilate itself properly for many days, and the air would be foul. She might be compelled to stay under for a still longer period if the tenacious enemy on the surface suspected her presence beneath them.

Movement was Dangerous

The submarine might attempt to escape by travelling underneath the surface, but then again her electric batteries which supplied the power for the electric engines might be run down, and it was necessary for the submarine to get to the surface to

charge them. This could only be done by the oil engines when the vessel was on the surface, and even if the submarine used her engines at all, those on the surface could, if they were sufficiently near, follow her movements by means of hydrophones.

The submarine's only hope of escape, more often than not, would be to lie absolutely silent under the surface. No man would be allowed to speak, each would stand silently at his post waiting for that horrible thud which preceded the explosion of a depth charge against the hull.

The Dreaded Chlorine

The terrifying explosions might draw nearer and nearer, and even if they missed the vessel one might come sufficiently near enough to damage a plate in the ship's side. And then perhaps traces of pale green vapour would appear, followed by someone coughing—water was shorting some of the electrical connections, giving rise to the dreadful chlorine gas.

In this terrible form of going down to the sea in ships, wireless and wireless men played their part, and many lie in their steel coffins beneath the seas, far from the pleasant ether waves which now fill the world with music and song.

They have added radio history to the vast tradition of the sea.

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ROBERTS-3

The designer specifies ALL these

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There are over 30 Clix perfect contact components described in Folder "O" free.



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NOTES ON TELEVISION

—continued from page 84.

we have not yet reached finality and it may be that something will be discovered in the future which will supersede even the cathode-ray system.

“Facsimile Radio”

Although not actually television in the ordinary sense, a kind of adaptation of television is now being developed by the Radio Corporation of America, in the shape of a system for flashing printed pages at high speed through the air.

Micro-waves, tiny impulses measured in centimetres, form the key used in this new system of television. The Radio Corporation state that apparatus will soon be installed for inter-city communication by means of which letters and pictures will be transmitted at many times the speed possible at present. To-day it takes 40 minutes to send a picture between New York and Chicago by normal radio short waves, but in recent experiments with this new system a picture was sent from the Empire State Building to Camden in less than five minutes.

Tests are being made almost daily at the laboratories of the Radio Corporation of America, at Broad Street, New York, and officials of the company declare that this new *facsimile radio*, as they call it, is “the gateway to television.”

Short-Wave Experiments

The arrangements with Baird Television, Limited, for regular television programmes on the 30-line system has been the subject of a good deal of reconsideration. At the same time, experimental work has been going on in many different quarters on high-definition systems, employing ultra-short wavelengths. Many people believe that there is a much bigger future and greater possibilities for the high-definition system than for the low-definition, notwithstanding the fact that the latter is specially adapted for transmission on medium wavelengths.

But you must bear in mind that whereas the low-definition system has been in use for some time past and is evidently capable of giving a reasonable service, the high-definition system,

notwithstanding its great potentialities, is by way of being in the experimental stages. So that we must not jump to the conclusion that the low-definition system is all knocked on the head and that the high-definition has all the advantages and none of the drawbacks.

Personally, I think that the high-definition system will win the day, and I believe as I have already said before, that very short wavelengths will ultimately provide the real solution to television services.

B.B.C. NEWS

—continued from page 87

more missions overseas during the next two years, during which the constitution of the B.B.C. is to be revised. If anybody goes to India it will be either Admiral Sir Charles Carpendale on his retirement at the end of 1936, or Mr. Graves, head of the Empire Department.

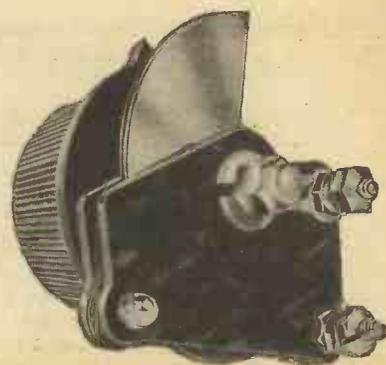
The Bulletins

The experiment of lengthening and “illustrating” the main news bulletin is not meeting with public approval. There have been hardly any letters in favour of the experiment, and although the post against it has not been considerable it has been emphatic. Nor have I met in my personal experience anyone who does not prefer the old system of compact straightforward summaries without ornament.

This does not mean that the embellishments of the news are uniformly unpalatable. Many of the little talks are interesting, but they should be put at the end of the bulletin and not mixed up in its body. This reform will be made about the end of the year.

Religious Changes

Mr. Iremonger, the new Religious Director of the B.B.C., continues to apply his new policy. The withdrawal of the Silent Fellowship will be followed in the New Year by his taking over of the Daily Morning weekday services, formerly handled by the Rev. Hugh Johnston, now Rector of Cranleigh. Later in the year the process of sorting out broadcast preachers will be intensified considerably to the advantage of the quality of the services. On the other hand, many listeners may note and regret the disappearance of the personal “human” factor in the broadcast religion offered under the new régime. Assuredly all old listeners will miss Mr. Stobart’s Grand Good-night on New Year’s Eve—the message which struck the characteristic note of the first era of B.B.C. religion.



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Grand Piano
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FROM MY ARMCHAIR

—continued from page 71.

- (5) The bald chap in the corner who never blew his nose but very efficiently managed not to miss his handkerchief—probably the man who wrote that really unpleasant letter.
- (6) That very decent young chap who said loudly and twice: "It's certainly the best set I've ever heard."

Why Not a Label

I think, in future, I shall ask each visitor to bear a large label on which is written his name and extracts from his letter. Some of the best appreciations of the S.T.600 have come from demonstratees who in their previous letters would have made a Billingsgate fish-porter sob.

I usually made a point of including some of these people, although I never knew who was who. I should have been readier for a heckler if I had been able to read his label!

WALKER.

Can't get locals—all a pack of lies—same old ramp—more description and less photographs of yourself—swindle—my eye and Betty Martin.

However, to get back to my friend "Poznan."

1,500 GLADIOLI, first size, 3½-5 inch circ. in 12 vars., for—

J.S.-T.: Look here, I can't have these continual interruptions. What is it all about?

Hillegom: Hier Hillegom. It is the bulb season and all the wireless papers have bulb advertisements from Holland.

J.S.-T.: But wireless men don't want bulbs. What do you mean by

"first size," what's the difference between a Ranunculus and an Anemone? And who wants 8 vars.?

Hillegom: Your readers. It is the annual custom. Every good wireless paper has the small bulb advertisement. We get the good bulb orders.

J.S.-T.: Well, I suppose it's all right, especially if you can tell me whether Huizen uses Hilversum's aerial or whether it's just the programme that's called Huizen when it comes from Hilversum's studio, or whether they really change over . . .

2,000 GLADIOLI, first size, 4½-5 inch circ. in 15 vars., . . .

Well, anyway, "Poznan" was quiet all the way to Shadbolt and Nash's

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The February Number of "Wireless" will include another Special

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joinery where I gave the demonstrations at 1 mile from the London twin stations.

The demonstration began by getting London Regional. I made some suitable jocular remark to show them I was a decent sort of fellow.

But our friend suddenly seemed galvanised. In fact Galvani himself would have abandoned frog's legs as a hobby had he ever met this peculiar pest—if I may be forgiven for ever calling a reader a pest.

In a vicious snarl he said: "But you can't get Poznan."

As Poznan is difficult to get anywhere, is a weak-powered Polish

station and is only 9 kilocycles from London Regional, I felt this challenge a bit thick. I affected not to hear it.

I explained the set and the pest went to sleep. His jaw hung loosely and his eyes were closed.

In a low voice I told the eagerly listening crowd: "That's Hamburg." Mind you I am intensely proud of this at 1 mile from L.R. Look up your list of stations and you'll see why.

But a sudden monotone said: "Hamburg but not Poznan." I smiled gently and demonstrated Berlin on the other side of L.R., but again my friend woke up.

"It won't get Poznan." "Darned Good Set, But . . ."

I thought the best policy was to say "No, it won't get Poznan," but I felt he would switch over to Moravska Ostrava, although now I recount the event I doubt if he could have negotiated enough syllables to make the words recognisable.

Every now and again he would interject: "'Sno good if it won't get Poznan." We all got rather tired of this—even the demonstratees who love nothing better than to see me getting heckled—or rattled.

Feeling I had the meeting with me, I turned patiently to the interrupter and said:

"Poznan isn't working. They're whitewashing the masts."

He muttered something about nothing would get Poznan if the masts were being whitewashed. He went to sleep, then. I was able to demonstrate instead of remonstrate.

At the end of the evening I said: "Well, I think that's enough to be going on with, gentlemen."

Our friend woke up. "Best set I ever heard. Never heard a better set. Darned good set. But it won't get Poznan."

2,500 GLADIOLI, first size, 4½-5 inch circ. 20 named vars . . .

J.S.-T.

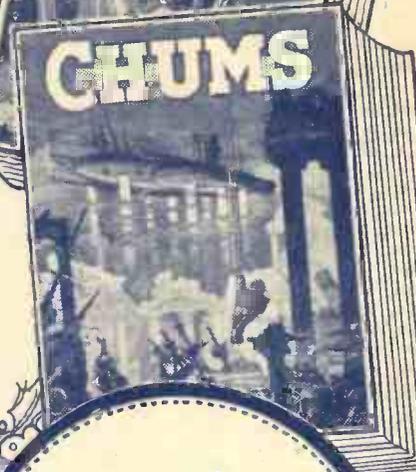
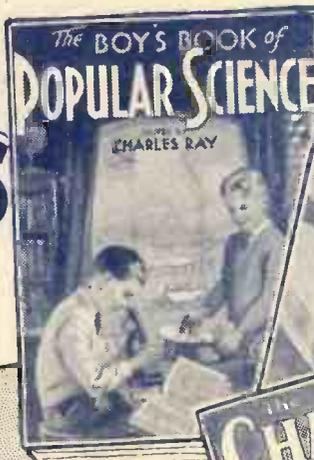
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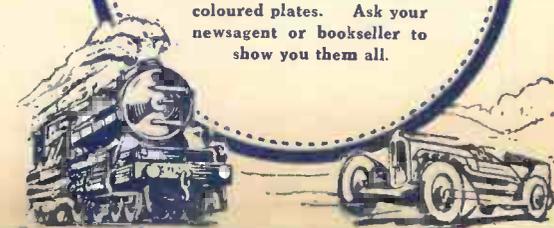
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