

# JOHN WATT ON AMERICAN BROADCASTING

# Popular Wireless & TELEVISION TIMES

HOW TO MAKE  
A SELECTIVE CRYSTAL SET  
★ ★ ★  
THE SCOTTISH EXHIBITION  
Etc., Etc.

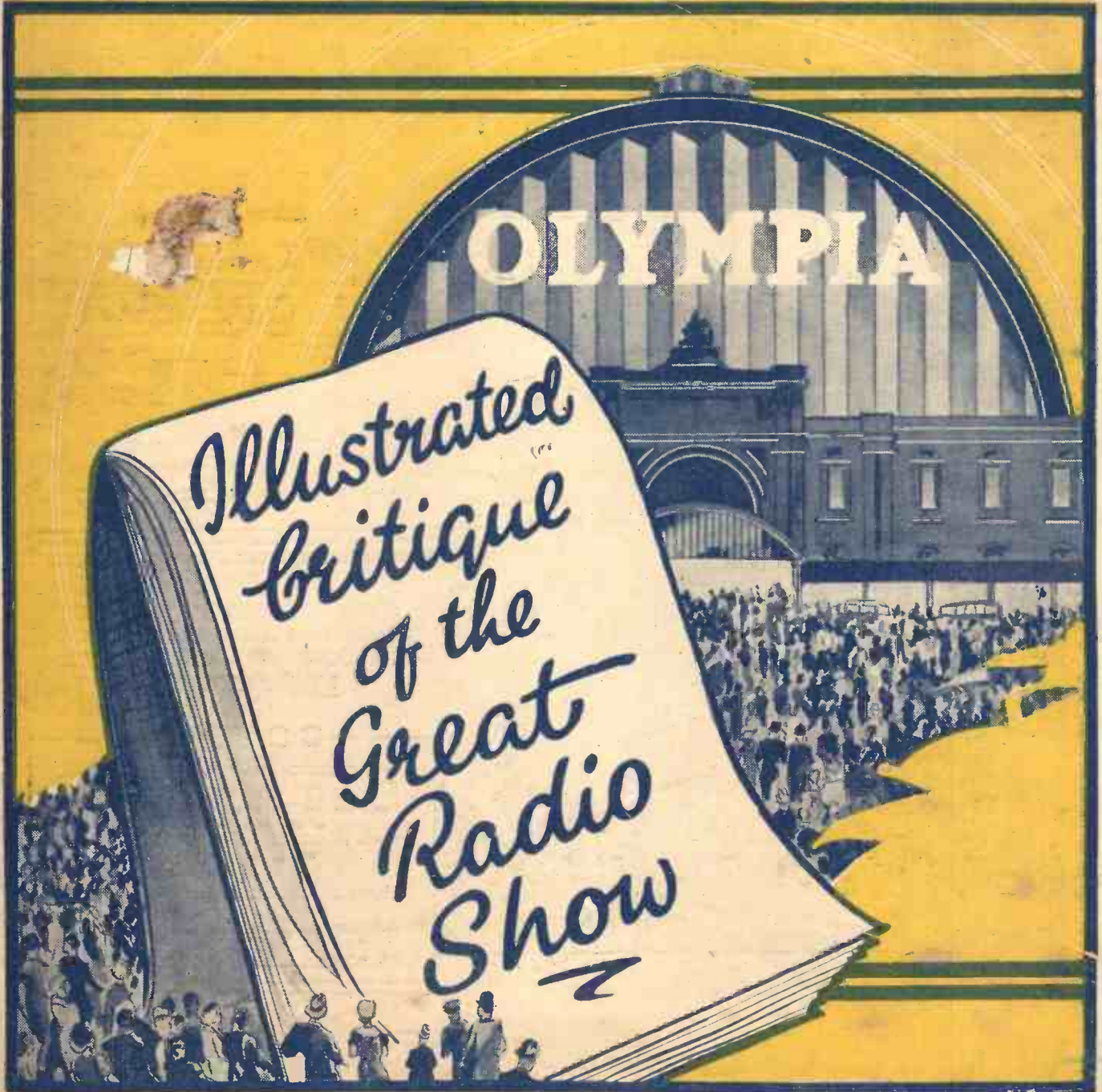
EVERY  
WEDNESDAY  
PRICE

# 3<sup>D</sup>

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# OLYMPIA

*Illustrated  
critique  
of the  
Great  
Radio  
Show*





HANDSOME

RELIABLE

OUTSTANDING  
PERFORMANCE

'THERMOMETER'  
TUNING



# COSSOR

## SUPERHET RADIO

### for Battery and A.C. Mains users

THESE two new Receivers incorporate the most up-to-date superhet practice. Employing a Pentagrid Frequency Changer in conjunction with specially designed coils, they possess an exceptionally high degree of selectivity. Backed by a wealth of experience in manufacturing hundreds of thousands of receivers they are, above all, reliable.

#### BATTERY MODEL 366A

As illustrated. With Pentagrid Frequency Changer, H.F. Screened Pentode I.F. Amplifier, Double Diode Detector and Economy Pentode Output. 8 in. Moving Coil Speaker. Cabinet with accommodation for suitable Accumulator and Battery. Price

H.P. Terms: 17/6 deposit and 11 monthly payments of 17/6.

**9 GNS**

(Exclusive of Batteries).

#### ALL-ELECTRIC MODEL 364

(Similar to illustration)

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ASK YOUR USUAL WIRELESS SHOP FOR A DEMONSTRATION, OR POST THIS COUPON FOR FULL PARTICULARS.

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To A. C. COSSOR LTD., Melody Dept.,  
Highbury Grove, London, N.5.

Please send me free of charge, literature giving full particulars of the new Cossor Superhet Receiver  
\*Model No. ....

\*Please state Model required.

Name .....

Address .....

P.W. 31/8/35



MANAGING EDITOR: N. F. EDWARDS.

TECHNICAL EDITOR: G. V. DOWDING, Associate I.E.E.

FLOOD WARNINGS  
KENNEL CRAFT  
REAL DRAMA  
BLIND LANDINGS

## RADIO NOTES & NEWS

AN OLD HAND  
HEARING U.S.A.  
PLAYS BY BLIND  
STATION NEWS

### The Show.

WELL, did you manage to get along to see Olympia? It was certainly a Jubilee year Show, but my own first impressions were sadly marred by the Fattest Man There. I was standing by the entrance, buying my catalogue, when that sheer hulk of a man-mountain stepped right on my corn.

The floor came up, the ceiling came down, the walls fell in, and that coloured screen was outcoloured by the blinding agony of such a weight on such a corn.

To my eternal regret it was so painful that I was speechless—and the man-mountain will never, never know exactly what I thought of him. But it was a great Show, wasn't it?

After waiting my turn at the "P.W." stand I raised an interrogative eyebrow at the Technical Hound who was answering questions. He leaned forward and whispered impressively, "They've gone crackers on short waves this year. Ab-so-loot-ly crackers!"

### Ole Man River.

STUDENTS of Negro melody will know that the flooding of a river in America is regarded seriously—"He Jest Keeps Rollin' Along," "Keep Away From My Door," and so forth.

The sting is now to be taken out of these watery lamentations by radio. On the surface of Ole Man Mississip' and other liquid highways, down by the levee, is placed a float, attached to a clockwork-controlled wireless transmitter.

When the water rises beyond a certain level a warning signal is sent out automatically, in time to enable flood precautions to be taken.

Mournful darkies (wid deir banjos ringin') will doubtless bemoan this retrograde step, but it will save a lot of unnecessary liquidation.

### "Lie Down, Rover!"

THE owner of a Hertfordshire kennels has hit upon a bright idea for keeping his canine charges quiet at night.

In each kennel there is a loudspeaker normally wired up to act as a microphone. If one of the hounds "creates" during the night the fact is indicated to the keeper's room, and by operating a switch he can speak direct to the culprit, who gets a sort of Love-in-Bloom effect—"Right into his room."

### A Tragic Broadcast.

I HAVE just been looking at the report of the remarkable tragedy staged by the Soviet writer, Alexander Virkin.

A popular figure, he had been invited to broadcast at an hour when a large audience could listen to his words. They heard more than that.

At the close of his talk, in a troubled voice he referred to having been betrayed. There was a pause, and then the crash of a revolver shot. When the radio officials rushed to his side they found he was dead.

### More Mystery Transmissions.

A LONDON clergyman, who was concerned by the fact that the B.B.C. services appeared to reduce his Sunday evening congregation, wondered if a similar effect was noticeable in the country. So he inquired of an old sexton in a village he was visiting.

The sexton was very glum. "Scarce

nobody comes to church a-Sunday nights," he said. "They stays at home and listens to their radiators nowadays."

### Air Radio.

THE Civil Aviation Department of the Air Ministry has called upon the National Physical Laboratory—familiarily known as the N.P.L.—for some advice on its wireless problems. These are (a) to make blind landings safely; (b) to use short-wave direction finders over long distances; and (c) radio warnings, for pilots flying near high obstructions such as wireless masts, in bad visibility.

The Prince of Wales' Vickers' "Viasta" monoplane, taken over by the Air Ministry some time ago, will be flown by Imperial Airways' pilots, when fitted with the necessary new test apparatus.

The Air Ministry has already ordered one approach beacon with a range of twenty or twenty-five miles. Further experiments will probably be carried out from the aerodromes at Croydon, Gravesend and Gatwick.

### Norway's New Ways.

SEVEN years' hard labour lies in front of the Norwegian radio engineers who have an important reorganisation plan to carry out in that period. Nearly all the existing Norwegian transmitters—and there are fourteen or fifteen of them—are to be gingered up to produce more kilowatts, and there is to be a big scale reshuffle of the wavelengths.

In addition, a new short-wave transmitter of 25 kilowatts is to be erected at Lamberstet, near Oslo.

### Those Crackles.

FIRE by the Limerick habit, a correspondent asks me what is the best verse that brings in the name of a modern broadcasting station. His own contribution is original and stimulating:

A set-building fan of Madona  
Said, "Oh, if I'd only known a  
Wealthy Erratic  
Who'd buy up this static  
I'd be smoking Corona Corona."

### Kalundborg of the East.

CHINA is to have an up-to-date high powered broadcasting transmitter working by next year. Standard Telephones and Cables, Ltd., have received an order from the Kwantung Government  
(Continued on next page.)

### LESLIE BAILY



The well-known author of radio plays and the popular B.B.C. "Scrapbook" programmes. He is now busily engaged in preparing another of the "Scrapbook" series.



## A HUNDRED-THOUSAND-POUND LOUDSPEAKER SCHEME

for an installation similar in design to Kalundborg, and having a power of 50 kilowatts.

The new station is to be erected at Canton. The wavelength is not yet fixed, but the date is June, 1936.

### By-Gone Stars.

**S**IGNING himself "Old Timer," and with unquestionable right to that title, a Warwickshire reader of "P.W." has gracefully enrolled himself high in my good books. He has read "P.W." from Number 1. This is his first letter to me, and he wrote in pure chivalry because, he says, "Those prizes of a guinea offered for the best letter to the Editor will probably cause the



'Ariel' post to fall off!" (As a matter of fact, touching wood, those prizes have not done anything of the kind! Which just shows what a lot of radio interest there is lying dormant.)

Of all the interesting subjects touched on by this veteran reader, I choose for honourable mention the stations of long ago. He reminds me of how the low-powered pioneers used to thump in—of how Madrid could be heard in London on a crystal, when Madrid was a youngster! And he recalls how little old Nurnberg used to come over in the early evenings "like a ton of bricks" till your ears got accustomed to him. What modern stations can compare with those Old Contemptibles?

### Television, Too.

**G**ERMAN television, the latest fair flower of their technique, has been plucked and placed in a military buttonhole.

Herr Hitler has issued a decree stating briefly that, in view of the importance of television for the security of aircraft, it has now been placed under the jurisdiction of the Air Ministry, with which the Ministry of Posts will co-operate.

### Strangers to Beds.

**T**O fall asleep in October and wake again the next April is the habit—so they tell me—of the dormouse.

I am reminded of this by some of my readers who seem to be inverted dormice, or "Dormouse Non-shut-s" to use the "Latin" name. These fellows never sleep or doze, but sit instead beside a wireless set and tune in the U.S.A.



Their temperament is gentle. The only way to rile them is to refer to mid-summer transatlantic reception as "freakish"—that will stir them up like hornets! I committed this crime in our August 3rd

issue, and I have been receiving stinging letters ever since.

C. E. P., of Brackley Street, E.C.1, offers to send me a record of such transatlantic triumphs—O.K. by me, with war-whoop accompaniment.

W. C. W., of Preston Street, Shrewsbury, is so ashamed of his disbelieving townsman (see page 537, Aug. 3rd.) that he offers to spend any Saturday night and Sunday morning tuning in the States, just to prove how it's done. Many thanks, Old Vigilante. I'll pass on the offer.

### Short-Wave Fashion Note.

**H**ABITUES of the short waves will rejoice to know that Podebrady, the sulky Czechoslovak who drifts into their ken, and drifts out again just when they want him most, is turning over a new leaf. He is to be entirely refitted—not merely with a new top coat of paint, but with a brand-new made-to-measure transmitter, and three uniform aerials of the omnidirectional type.

### RADIO TOPICALITIES

On September 2nd and 4th, what promises to be a riotously funny musical farce entitled "A Marriage Has Been Arranged" will be heard by listeners to the National programme. The plot has been prepared by John Dighton from a story by Valentine Dunn.

Several new and tuneful numbers have been written for the show by Peter Mendoza, and will be played by the B.B.C. Variety Orchestra, conducted by Kneale Kelley. The cast will include Doris Nichols, Valentine Dunn, Max Kirby, Bobbie Comber, Gordon McLeod, Clifford Bean and Robert Gordon. The producer will be Max Kester.

The last of the current series of "Transatlantic Bulletins" will be broadcast in the National programme on September 11th. The unqualified success of these broadcasts and the interest they have aroused among a wide variety of listeners will result in their early continuance. The method of presentation may be varied both in form and arrangement, but it is intended to extend the process to the British Dominions on appropriate occasions.

Birmingham Citizens' Orchestra has its first broadcast for Midland listeners on September 5th. It owes its name to the fact that it was formed under the aegis of the Birmingham Citizens' Society; indeed, it was Mr. Richard Clements, then Secretary of that society and now well known as a broadcaster, who asked Percy G. Sharpe to become its conductor. The normal strength of the orchestra is sixteen, but it can be augmented to thirty players.

Podebrady will also be sporting a smart change of wavelength when the season demands, for he will be fitted with a wave-range of anything between 14 and 100 metres. The new outfit is now being "tailored" at the Marconi works at Chelmsford.

### Not So Bad.

**O**NE of London's latest visitors, Mr. M. S. Shareef, has come here in connection with what is probably the most remarkable radio scheme ever conceived. It is a project to bring broadcast programmes to thousands of villages in Hyderabad by installing loudspeakers and a community-listening set in each.

An expenditure of £100,000 is said to be involved; but the founder of the scheme, the Nizam of Hyderabad, is one of the richest men in the world.

### Hem-Hom Reaction.

**V**ARIETY being the condiment of existence, it is pleasing to open letters expecting them to be about W 2 X A D, and to discover they are instead, concerned with Hemiptera-Homoptera!

For the benefit of the uninitiated I must explain that Hem-Hom, etc., is not the latest form of reaction, but is the scientific term for what the gardener calls "them green fly." Stung beyond endurance by their deprivations, I recently cried aloud for a remedy, and right nobly have you lads responded. Thanks, one and all.

Of special interest is the cure recommended by G. H. D., of Newport, I. of W. Instead of waging chemical warfare, G. H. D. treats the Hem-Homs like Christians, and anointeth their heads with oil—not sacrificial oil either, but good old paraffin!

I am going to try G. H. D.'s cure, and if successful I will not fail to record the Hem-Hom's reactions.

### For the Blind.

**T**HE National Institute for the Blind is organising a competition to encourage writers who are blind to write radio plays—a literary form in which they should excel, since the broadcast play is completely dependent on sound.

Val Gielgud, the B.B.C.'s Director of Drama, will be the judge, and cash prizes of £25 and £15 will be awarded for the best two plays sent in.

The plays must be in Braille, and though the blind of all nationalities may compete, the language must be English.

### Scotland's Newest Station.

**H**AVING bought himself a new motor-bike, K. M.—a Scottish reader of "P.W."—has been over to Burghead, Morayshire, to look over the new B.B.C. station.

He tells me that the mast foundation-work has begun, and the stone buildings are taking shape rapidly. The mast is to be 500 ft. high.

K. M. says also that the necessary land-lines have already been laid, and that opinion on the spot gives February as the likely opening date.

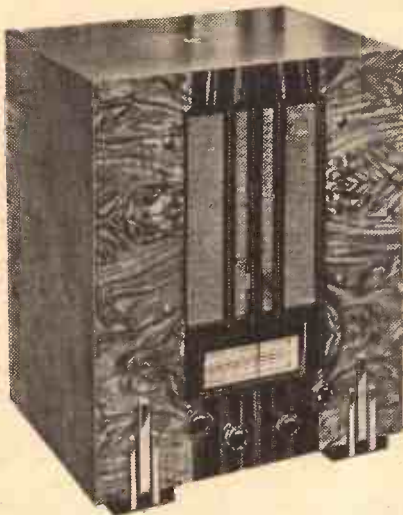
These items of information, however, are but floating scraps in K.M.'s letter, the full stream of which is devoted to praise of his new motor-bike. It sails up hills like a bird, and it runs as sweetly as a Chopin Prelude. Its petrol consumption, I gather, is only about equal to a cigarette lighter's—which maketh glad the Scottish heart, and stirs me to envy.

I hope K. M. will write again, for his enthusiastic descriptions are as bracing as a Highlands holiday.





# The SCOTTISH Radio Exhibition



One of the already famous Jubilee model Marconiphone receivers. It employs a superhet circuit.

IN round figures there is a distance of something like 400 miles separating London from the important centres north of the Tweed, and a line drawn on a map through Glasgow, London and southern Europe reveals that, as far as a great number of Scottish listeners are concerned, those 400 miles travelling northwards from London are entirely over land, and undulating land at that.

There is perhaps nothing that could illustrate in more striking fashion the importance to Scottish listeners of the Radio Exhibition which opens at the Kelvin Hall, Glasgow, on Friday, for since the developments of the new season were hailed on all sides at the London Show as of such momentous importance to southern listeners, how much more are they of interest to listeners over the Border with this 400-mile geographical disadvantage?

### A Stronghold of Radio.

Scotland is, and has been right from the early days, a stronghold not only of home-construction but of radio generally, for to its scattered population in the villages and hamlets of the Highlands, where the "competition" of the talkies and other such diversions just does not exist, broadcast entertainment means everything. If we in London were forced for a couple of months or so to rely upon radio not only for our entertainment, but as an important means of keeping in touch with the daily happenings of the outside world, we should probably be better able to appreciate the importance which is attached to radio by many a Scotsman.

We should probably know, too, the reason which prompts our fraternity over the Border to turn out in such large and enthusiastic numbers for the annual Show at the Kelvin

Hall. To a more marked extent perhaps than in London or Manchester, they besiege the building from the moment the Show is declared open, anxious to learn of anything and everything that may enable them to enjoy better radio.

It is, therefore, a source of great pleasure to us who have witnessed the London Show in all its glory to be able with such optimism to provide for our Scottish readers a forecast of their very own Show, for this year, without any question of doubt, is a vintage year for radio. And in this Show there are more genuine developments, as distinct from just refinements, than in any exhibition which has yet been held.

It is, we feel, to be regretted that not more component manufacturers have deemed it necessary to display their latest products in Scotland, for in the list of exhibitors which is given in this article it would appear to be almost entirely a commercial set Show. But perhaps we should hasten to add that that is merely an apparent effect.

### FOR A.C. USERS



An example of the multi-output Ferranti mains transformers.

Actually, the absence from the Show of component manufacturers is accounted for by the fact that in Scotland the various wholesalers and retailers make very much more of the exhibition than is perhaps the case in London, and it is upon their stands that the home constructors will be able to keep in touch with all the latest developments. Thus, although we may have very strong feelings regarding the desirability of component manufacturers themselves exhibiting, we must in fairness admit that the commendable activities of the wholesalers and retailers in Scotland do put rather a different complexion on the matter.

But from our point of view it tends to preclude any sort of detailed review of the new components in so far as the Scottish Show

Scottish readers in particular will be interested in these details of their own Radio Show which is being held in the Kelvin Hall, Glasgow, between August 30th and September 7th. Price of admission, 1s.; hours, 2 p.m. till 10 p.m.; Saturday and Wednesday, 11.30 a.m. till 10 p.m.

is concerned, because the wholesaler and retailer exhibits are devoted not to just one particular make of components but to all of them, and our difficulty will be apparent. But we can and do suggest that those of our readers in Scotland who belong

to the great home-constructing fraternity would be well advised before going to the exhibition to study in detail "P.W.'s" complete review of the London Show.

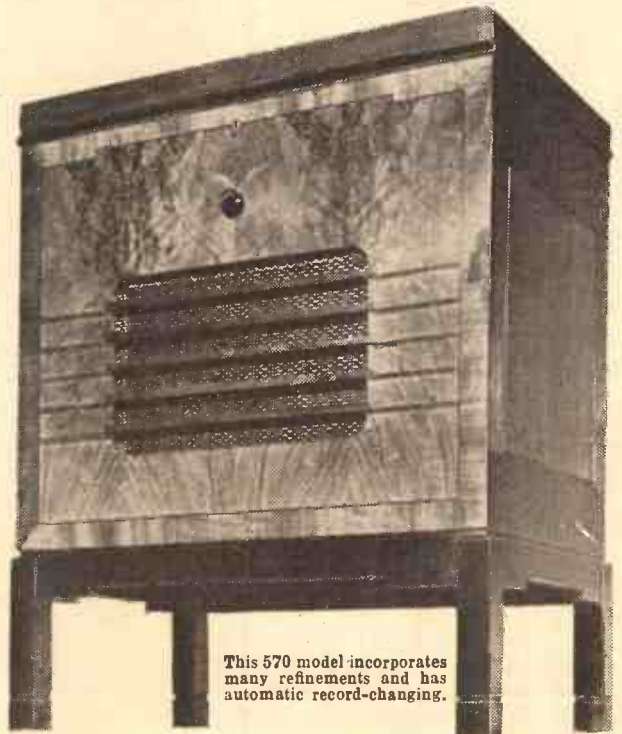
They will then have a clear idea of the progress that has been made in the design of components, and will know what to look out for on the stands of the Scottish wholesalers and retailers. But it isn't only in the matter of components that this Show is of interest to constructors. In Scotland where, in general, the electrification of the countryside is, to a great extent, limited by the vast areas to be covered, and in the remoter districts by the comparatively few residents to the square mile, the whole question of valves and batteries is one of first-rate importance.

And in this connection, visitors to the exhibition will find much to interest them, for practically all of the leading valve and battery manufacturers are exhibiting.

Britannia Batteries, for instance, whose exhibit you will find on Stand No. 11, have

(Continued on next page.)

### AN H.M.V. RADIOGRAM



This 570 model incorporates many refinements and has automatic record-changing.



## The Scottish Radio Exhibition

(Continued from previous page.)

given particular attention to comparatively inexpensive super-capacity batteries, and three new batteries of this type are now available. There is a 120-volt "Special Power" Pertrix battery at 15s., a "Bulldog Giant Power" battery of 120-volts at 16s., and a 120-volt Pertrix "Giant Power" battery at 22s. 6d.

These prices may seem expensive by comparison with the types of batteries that can be obtained for seven or eight shillings, but if your set is fairly heavy on H.T. current they are most economical to buy, because of the substantially increased length of life that they give. To buy the smaller types of batteries for big sets is like throwing money down a drain.

Another exhibit on Stand No. 11 which you should make a point of examining is the new P 162 accumulator. It has an ampere-hour capacity of 62, and at 9s. 6d. is claimed to be the cheapest cell of its size available.

Ever Ready, who, to quote their own slogan, are "the Firm that put Power into a Packet," are exhibiting their battery products on Stand No. 35, and several new additions have recently been made to their various ranges. A downwards price tendency seems to be reflected in the products of all the battery makers this year, and Ever Ready are no exception.

What is probably one of the most comprehensive of all the battery exhibits in the Kelvin Hall is that of the Chloride Electrical Storage Co., Ltd., on Stand No. 47. With the additions recently made to their Drydex battery ranges, there are now getting on for 150 different types of batteries available catering for all sets and pockets. Here again the level of prices generally is low, compared with what it was twelve months ago.

### Special L.T. Batteries.

One notable feature of Exide activities this year is the length in which they have catered for modern sets. These days sets employ more valves than was the fashion a year or so ago, and there has arisen, in consequence, a demand for accumulators with higher discharge rates to minimise the number of visits to the charging station.

The new Exide accumulators which have been designed with this object in view are the OCG 3 at 8s., the OCG 3C—which provides a visual indication of its condition—at 8s. 6d., and the GFG 4C, also with indicator, at 10s. 6d. All of these models are in glass containers.

The increasing popularity of midget radio is also reflected in the products on the Chloride stand, where several midget H.T. batteries and accumulators specially designed for these types of sets are exhibited.

The makers of the renowned Hellesens batteries are showing as usual a very full range of batteries at prices to suit all pockets (Stand No. 5), and it is of interest to mention that this firm specialises in replacement batteries for practically every type of commercial set in the battery-operated class. This includes portables and ordinary sets.

Other battery exhibits which provide first-class examples of the progress that has been made during the past twelve months are those of Siemens (Stand No. 78), Lissen (Stand No. 33) and G.E.C. (Stand No. 28).

### Improved Valves.

The tendency in valve design during the last

## A MULLARD MASTERPIECE



Outstanding appearance is one of the features of this new Mullard four-valve battery receiver. It employs Class B output and costs £9 12s. 6d. complete with all batteries.

few months has been to improve existing types rather than to bring out any new and revolutionary models. That is all to the good, for these unorthodox innovations are all very well, but they do tend in many cases to introduce circuit elaborations or alterations which are not always what the listener, or perhaps we should say the constructor, is after.

There are new valves, of course, and many arrived since this time last year, and the general standard of efficiency is considerably up. But there does not seem to be any appreciable extension of the scheme for combining in the one envelope the electrodes for several different

functions. If a halt has been called in the activities in this direction, it may be hailed as a wise move on the part of the manufacturers, for the two- and three-in-one idea does tend to hamper circuit flexibility.

Not that we have anything to say against the multi-purpose valves which are at present available. In practically every case they serve very useful functions indeed, but it is doubtful whether any great advantage would ensue from further extensions of the idea. After all, when two or three sets of electrodes are included in the one envelope, the filament is usually common to them all, and if that goes, then two or three valves are rendered useless—not one.

But progress has been made in practically all directions, and visitors to the Kelvin Hall would be well advised not only to examine the various valve exhibits, but more particularly to collect the various free booklets which are available and in which the ranges are described in detail. These can be obtained from the stands of Cossor (No. 31), Ediswan (No. 52), Ferranti (No. 60), Oram (No. 28), Lissen (No. 33) and Marconi (No. 30).

### Special S-W Types.

Considerations of space unfortunately preclude a reference to the numerous valves which are of particular interest to constructors—there are far too many of them for that—but in view of the rapidly increasing number of adherents to short waves, mention should perhaps be made of a special type of frequency changer which has recently been introduced for this purpose.

It is known as the X 41, and it will oscillate satisfactorily to well below 5 metres—15 metres below the wavelength at which most ordinary heptodes and frequency changers cease to function. The

valve is available in Marconi and Oram ranges. So remarkable was the progress made last year in the design of loudspeakers, and of W.B. loudspeakers in particular, that few people expected any developments of a major character at the present Show. Which just goes to show that it doesn't do to take anything for granted in radio, for when you examine the exhibits of the Whiteley Electrical Radio Co., Ltd. on Stand No. 10 (and examine them you must) you will be amazed—literally amazed—at the progress that this enterprising firm has made.

(Continued on next page.)

## THE FIRMS EXHIBITING AND THEIR STAND NUMBERS

Firm	Stand No.	Firm	Stand No.	Firm	Stand No.
Aerodyne Radio, Ltd.	27	David Elder, Ltd.	26	Munn's Radio Service	57
Allied Music Traders, Ltd.	34 and 68	Ensign, Ltd.	58	North British Machine Co., Ltd.	56
A. J. Balcome, Ltd.	44	Ever Ready Co. (G.B.), Ltd.	35	Oldham & Son, Ltd.	76
Robert Ballantine	7	Ewing & McIntosh, Ltd.	42	Philips Lamps, Ltd.	53
Beethoven Radio, Ltd.	50	Ferranti, Ltd.	60	Pye Radio, Ltd.	32
Belling & Lee, Ltd.	13	General Electric Co., Ltd.	28	Radio Gramophone Development Co., Ltd.	2
Alex. Biggar, Ltd.	25	J. Gow & Sons	66	James Robertson	46
Michael Black, Ltd.	37	Gramophone Co., Ltd.	51	Ross & Adam	74
William Blackadder	71	Wm. Harper & Co.	18	Scottish Radio Retailers' Association	70
Britannia Batteries, Ltd.	11	Hartley Turner Radio, Ltd.	48	Siemens Electric Lamps & Supplies, Ltd.	78
The "Broadcaster"	77	Hellesens, Ltd.	5	W. S. Steele, Ltd.	21
Garnet R. Buchanan	20	James R. Hunter	6	Stirling Hunter, Ltd.	75
Burndept, Ltd.	38	Itonia, Ltd.	55	Stratton & Co., Ltd.	69
Chloride Electrical Storage Co., Ltd.	47	Johnson Talking Machine Co., Ltd.	8	Thompson, Diamond & Butcher	15
City Accumulator Co., Ltd.	1	Kolster Brandes, Ltd.	67	Thomson & Brown Bros., Ltd.	17
H. Clarke & Co. (M/c), Ltd.	45	Lampex Radio & Electric Co.	54	Ultra Electric, Ltd.	43
E. K. Cole, Ltd.	29	Lissen, Ltd.	33	Frederick Waterhouse, Ltd.	72
A. C. Cossor, Ltd.	31	McMichael Radio, Ltd.	61	Westinghouse Brake & Signal Co., Ltd.	9
Cuthbertson & Co., Ltd.	73	Thomas Machell & Sons	16	James Whiteford & Co.	12
Decca Gramophone Co., Ltd.	23	Marconiphone Co., Ltd.	30	Whiteley Electrical Radio Co., Ltd.	10
J. Stuart Denholm	39	Muir & Bryden	38	The "Wireless Trader"	22
Dulcetto-Polyphon, Ltd.	3	Mullard Radio Valve Co., Ltd.	59	Philip Woolfson, Ltd.	19
The Econasign Co., Ltd.	14			Young's (Glasgow), Ltd.	4
The Edison Swan Electric Co., Ltd.	52				



## The Scottish Radio Exhibition

(Continued from previous page.)

The 1936 "Stentorians," of which—counting only the P.M. models—there are four altogether are remarkable reproducers, and to attach one of these to your set seems like turning up the volume control, such is their great sensitivity.

The W.B. permanent magnet moving coil range includes the "36 S" at 42s., the "36 J" at 32s. 6d., the "36 B" at 23s. 6d., and a midget model with a four-inch cone at 17s. 6d.

A distinct improvement has been effected in the design of practically every part of these new speakers, of which, perhaps, the most notable points are the new method of centring—which has an important bearing upon the sensitivity and power-handling capacity—the new baked speech coil former and a larger and more powerful magnet system.

### Suppressing Static.

Incidentally, the "36 S," the "36 J," and the "36 B" are all fitted with an improved version of the famous W.B. "Microlode" matching system which enables them to be used entirely satisfactorily with any type of set output.

There is one other exhibit in the Kelvin Hall to which all constructors are recommended to make a visit, and that is to the stand of Belling & Lee (No. 13). In addition to their usual range of accessories to which, this year, there are

MUNICH	440
SOTTENS	
STOCKHOLM	
ROME	420
MUNICH	400
SCOTTISH	
LEIPZIG	380
WEST	
MILAN	
BERLIN	360
LONDON	
HAMBURG	340
TOULOUSE	
POSTE PARISIEN	320
HILVERSUM	
MIDLAND	300
SCOTTISH NAT	280
NATIONALS	
COPENHAGEN	260
TRIESTE	
ABERDEEN	240

several newcomers, the Belling-Lee exhibit is centred around the various devices that they have produced for the suppression of man-made static.

It is probably true to say of this enterprising firm that no organisation in the industry has devoted more time than they to the vitally important question of the elimination of electrical interference, and the results of their researches are now available to the listening public in the form of numerous inexpensive units which really are effective. Make a point of seeing them.

### Plenty of Superhets.

We have referred to this year as a vintage year for radio. Such it most certainly is, and after a careful survey of the many commercial sets which are now available, one cannot but marvel at the ingenuity of the various manufacturers. Last year the design of sets improved to such a remarkable degree that it was not anticipated that this new season would be heralded in with anything but minor refinements.

But as you will see when your turn comes to visit the Kelvin Hall, the new sets, almost without exception, are considerably in advance of those of last year, and moreover prices are even lower!

Of the sets exhibited, the superhet type easily

heads the bill and is, in fact, almost universally employed. There are very few straight sets indeed of the all-electric variety, and even in the battery-operated class straight sets are not exactly prolific.

Such refinements as A.V.C., automatic noise suppression and station naming seem to be almost standard practice, but there are perhaps not so many sets of the all-wave type as might have been expected in view of the rapidly increasing interest in short waves. It is true that there are many more than last year, but several of the biggest firms seem to have given short waves the go-by altogether.

One particularly welcome feature of the new season's models, taking them as a whole, is the tremendous improvement that has been effected in the design of tuning dials. There seems to be a definite vogue at the moment for large, opened-out scales on which the station names can easily be read without a magnifying glass and the risk of a twisted neck, and this public demand is well catered for in the models which



AN ATLAS MAINS UNIT

The photo above shows one of the latest Atlas mains units. It is the D.C.20 model and has three H.T. positive tapings.

To the left is a close-up view of the thermometer tuning indicator, which is a feature of the new Cossor receivers.

One of the attractive bakelite case Ekco receivers. A nine-stage superhet circuit is used in this transportable model.



This Westinghouse metal rectifier takes the place of a diode valve for H.F. rectification. It is known as the "Westector."

are now available. Let us make it quite plain that in our estimation there is nothing stultish about these outside dials. They are a boon to the ordinary listener in that they do greatly simplify station selection, and the old snag of the pointer pointing, through the overcrowding of names, to more than one station at a time is obviated. There are several notable examples of these new-type dials on show at the Kelvin Hall.

The fact that there are something like 5,000 sets from which to choose these days renders it quite impossible to describe each and every one, but to provide a general idea of the trend of development we propose just to single out some of the most outstanding models that you will be able to examine in your tour of the Show.

Aerodyne "Aeromag," which you may already have read about, is the latest innovation of Aerodyne Radio, Ltd., and since it is the only feature of its kind in the Show, it warrants mention right at the head of the list.

There have been several attempts hitherto at automatic tuning devices, but it has been left to Aerodyne to produce the first really

practical design. And "Aeromag" just about describes it. With this set it is possible quite automatically to tune-in any station you want from any position in the house and, moreover, this remotely controlled robot invention entirely removes the possibility of poor quality through mistuning. The human element is, in fact, entirely eliminated, since stations tune themselves in, and all that the listener has to do is to press a button on the remote control panel.

You will be able to see a practical demonstration of the way in which this ingenious robot device works if you make a point of visiting Stand No. 27.

### Two Fine Ranges.

Because of the tremendous success which resulted from the introduction last year of their "tilting dial and spectrum tuning" device, H. Clarke & Co. (M/C), Ltd., have wisely decided to retain it in their current models. These include, among other notable designs, the A18, the A17C and the A24RG—a table model, a console, and a radiogram at 13 guineas, 17 guineas, and 24 guineas respectively. The same chassis is employed in these three models, and it consists of a five-valve (including rectifier) superhet with A.V.C., second channel suppressor and a 2.5-watt output.

A particularly notable feature of these new Atlas instruments is that the cabinet in each case is lined with Celotex non-resonant material to eliminate box-resonance.

From their noteworthy efforts during the last two or three seasons, one rather expected that E. K. Cole would produce another series of wonder sets with which to herald in 1936, but few people, we imagine, visualised that they would be able to leap quite so far ahead as has turned out to be the case. The 1936 range of Ekco sets constitutes a striking tribute to the

resourcefulness and ingenuity of the energetic research staff at Southend, and they undoubtedly contribute one of the finest exhibits in the whole Show.

Listeners have indeed cause to be thankful that such fine sets are available for prices ranging from as low as 8 guineas up to 22 guineas, and that in consequence there is an Ekco set to suit every pocket.

It is difficult, to say the least of it, to single out from such a first-class collection of sets any particular one for mention, but perhaps the most noteworthy is the AC76, a magnificent 7-stage superhet at the very modest price of 11 guineas. You should make a special point of seeing the Ekco stand, and this set in particular, for it provides a convincing object lesson in the advantages of a big dial.

The Ekco slogan for this year is "Clear-Cut Reality," a slogan that was never more appropriately applied.

### Of World-Wide Repute.

Another brilliant high-light among the commercial set exhibitors at the Show is the stand of A. C. Cossor, Ltd. As most of you will know, the history of Cossor goes back many years, and there is something very significant about a range of sets produced by a firm that has been responsible for a range of valves which has earned for it a world-wide reputation.

(Continued on page 704.)



# BARRY KENT CALLING

*News and Views from the "Big House"*

## A Minor Crisis.

THERE has been a minor crisis at Broadcasting House because of the discovery that some artists have been working for different purposes under different names. The Variety Department has found occasions on which artists of the Music Department's list were needed; and it wished them to appear differently in Variety Programmes.

The matter has been fully discussed, and the decision is to ban the practice in future. If artists wish to change the nature of their work they will have to seek transfer to the list desired. The B.B.C. will not stand for duplication of artistic personality. Which is as it should be for all artists, in these hard times.

## Sir Stephen Tallents Begins.

I hear that Sir Stephen Tallents has begun to take over his new work at the B.B.C. He is seen a good deal round the building, meeting those with whom he will be expected to collaborate. It is likely that Sir Stephen will be very much in the public eye, and probably will broadcast a good deal.

As a fully-fledged Controller, he will be practically independent of the normal discipline and system of control cultivated in the B.B.C. This will make it possible for him to come and go pretty much as he likes: obviously a great advantage for one with his special responsibilities.

## An Affair of a Carpet.

The carpet on the floor of St. George's Hall has been the subject of anxious discussion in the B.B.C. The truth is that it has become so tattered and dirty as to be regarded as dangerous for those who have to work in the Hall. The Variety Department has asked for the carpet to be removed, and numbers painted on the floor instead.

## Accident Jokes.

The B.B.C. has had some trouble recently about jokes of accidents in variety programmes. A new rule has been issued putting a stop to all this. The difficulty became acute as the result of an item included in a relay from an entertainment at a popular seaside resort. Some fun was made of railway accidents.

Here is probably another example of the pitfalls of putting on the air something that was built for visual entertainment only. There are usually special circumstances helping the eye to avoid the shock that the ear alone would experience.

## News of Artists:

Leo Fuld, who has finished his contract with Jack Hylton, will be accepted for

broadcasting in October, sharing a feature with Larry Adler. Ronald Frankau, Laddie Cliff and Renee Houston are also returning to the microphone before long.

## Variety Programmes for Empire Transmissions.

The B.B.C. has decided to institute a new feature in the Empire programmes. There is to be a series of variety programmes at weekly intervals in the appropriate transmissions, the artists being either from or well-known to those parts of the Empire to which the transmissions concerned are directed.

One important result of this innovation will be the encouragement of Empire artists to visit England more readily than in the past. A fair proportion of Canadians has been coming over since the success of Bill Campbell and Gerry Fitzgerald; but

## HEARD FROM RADIO BARI



Mr. and Mrs. Scaturchio, the two announcers at the Italian broadcasting station at Bari. Mrs. Scaturchio was before her marriage announcer at Naples, and her husband was dramatic producer at that station. Radio Bari is a 20 k.w. station and works on a wavelength of 283.3 metres.

the other Dominions are not yet sending their quotas. This move is also a tangible sign of the expansion of the B.B.C. Empire service.

## Margery Booth.

In the Orchestral Concert on the Regional at 9.20 on Sunday, September 29th (John Barbirolli conducting), the B.B.C. will be responsible for acknowledging in this country Margery Booth, an English singer with a distinguished reputation in Vienna and on the Continent generally. Apparently, Broadcasting House is making a special effort to discover British artistes well known abroad who have not had adequate opportunities at home.

## ON THE AIR

Candid comments by our broadcasting critic on recent programmes.

I WISH I had listened to the Friday's broadcast of "Pleasant Portion" instead of Wednesday's. All the good the Radiolympia Variety bill—and by this I mean chiefly Leonard Henry—did me was set at naught by that desolate wilderness which became the portion of the Misses Craik. Barbara Couper chose an unfortunate subject for her play—the drawing of a character that was the very antithesis of the best conception of motherhood.

Mrs. Craik (admirably portrayed by Gladys Young) was a nasty, selfish woman who let her own self-pity dominate her life, making her blind to the sacrifices her two daughters were ever making on her behalf. She would not tolerate their using the word "sacrifice." She alone should speak of sacrifice.

## An Unpleasant Character.

Despite the unpleasantness of the character, the fact remains that here was a masterly piece of character-drawing. The likes of Mrs. Craik do not exist to-day. Their daughters would see to that. But they have existed, as other bad types of humanity have existed. Shakespeare has his gallery of bad kings, etc. Literature has immortalised the vicious as well as the virtuous. This alone justifies Barbara Couper's creation of Mrs. Craik.

Equally well drawn were the virtuous and self-sacrificing daughters, Carrie and Doris (Beatrice Lehmann and Joyce Bland). But in their anguish they moved us to pity, almost to tears. Listeners either like to hear this cry of the soul or they don't. Those who do listened the play through. The rest switched off. I listened throughout, but I was saddened. I was made to forget Leonard Henry.

The first Variety bill from Radiolympia did not open to the customary fanfare of trumpets, or the effusions of a compère unable to conceal his bewilderment over the amazing spectacle before him—a theatre of colossal dimensions packed from the floor to the roof, etc., etc. On the contrary, the compère was unaccountably modest all through.

At the outset everything seemed quiet and everybody too well behaved for words. And, as if it were intended that listeners should be the same, they were made to wait what seemed an eternity after the announcement from the Studio for the rise of the curtain at Olympia.

## The Second Relay.

The second relay (on the Saturday) was altogether different in this respect. Whereas I had been more or less satisfied with the bill on the first occasion and dissatisfied with the compère, the reverse was the case with the second. Frankly, I thought Saturday night's bill was poor, considering the occasion. Apart from Elsie and Doris Waters, and Harold Ramsay on the new organ, there wasn't anything new in the bill at all. This criticism applies equally well to the first broadcast, too. Elsie Carlisle and Sam Browne were first-rate in the first broadcast. But why, with

such an array of talent to select from, should they be included in the second to do practically the same act?

The best acts of the two performances were, undoubtedly, Elsie and Doris Waters and Leonard Henry. And of these two the one I enjoyed most was Leonard Henry. He was at his very best. How the audience reacted to him! How he reacted to the audience!

It is unusual to hear a show commère. What a delightful commère Yvette Darnach is! She was quite the best feature of "Sourires and Chansons." Besides singing two pretty little songs, "Le Piano Mécanique" and "There's a Bit of Paris in Your Smile, Madame," she introduced every artiste in the daintiest manner possible. Edwin Lawrence—the genial raconteur—was the best of these. I shall look for him again. He makes you laugh.

What a beautiful voice John Drinkwater has! It was heard to advantage in his appreciation of the late Sir William Watson.

(Continued on page 704.)



# Our Readers' Opinions

## A KEEN ENTHUSIAST.

Sir,—My experiences date back some eight years, when my active life was nipped in the bud and I was rushed to hospital with hip trouble.

Imagine my disgust when the doctors told me that I would never be able to play football or cricket again.

Then came the time when I was sent home, and I began to look round for a worth-while hobby. I tried one thing after another, but I got fed-up with them all.

Then a friend suggested wireless and I have blessed his name ever since, for since that day I have not had a dull moment.

I bought the necessary parts, etc., and made a crystal set, and from the first note of music that came through I caught the radio disease and I don't think I will ever be cured of it.

### That First Foreigner.

Then another good friend gave me a lot of junk from which I made a single-valver and heard my first foreigner. That whetted my appetite for D.X., and I followed it up with a two-valver with swinging coil reaction and loudspeaker, and I thought that was perfection; but no, I changed the old horn speaker for a new cone speaker and that was a hundred per cent improvement.

Then once more I was taken into hospital, where I remained for sixteen months.

When I came out, alas, my poor old two-valver could not stand up to the changed conditions; I was face to face for the first time with the problem of selectivity.

So I decided that the old set had to go, and believe me it was like parting with an old friend. Then my good friend No. 1 (further blessings on his name), introduced me to "P.W.," and it was as if I had been groping in the dark and suddenly the light was switched on. What a wealth of knowledge and information, no more haphazard and slapdash methods—and all for the insignificant sum of three pence per week.

Then out of the blue flashed the "Comet" and Oh Boy what a set; all Europe was at my feet, I felt like Napoleon must have felt when he was at the height of his triumphs.

### Trying the Short Waves.

I next decided to sample the short waves, so I built an all-wave set. It was a det., L.F. and Power and on the long and medium waves it was excellent, but on the short—well the least said the better, because I'm afraid the fault was all mine, so I gave the shorts a miss for a time.

After my first failure on short waves, I began to read the wisdom of W.L.S., and I decided to build a single-valver like he advised, but I'm afraid good old W.L.S. would have expired if he had seen my set. Owing to the lack of Jimmy Goblins, I had to go to the junk box for most of the necessary components.

I stripped down an old '0005 condenser

of half its plates for tuning and I did likewise for reaction. The H.F. choke I wound on a half-inch glass tube, fixed condensers I made from tinfoil and mica, two pieces of flex twisted together, and I had an aerial condenser, home-made coils completed my ensemble. The great moment came when I switched on and the first thing I heard was that good old-timer W 2 X A D. Since then I'm a confirmed short-wave fan.

If I had all the money in the world, I would still make as much of my short-wave gear as I possibly could.

## ONE GUINEA FOR A LETTER!

AN INVITATION FROM THE EDITOR TO "P.W." READERS

I WANT readers of "P.W." to help each other. I want them to use the columns of this paper to express their views on all and every aspect of the great hobby of radio; I want them to "swap" experiences; I want them to tell about their triumphs—and their failures—with the various sets they have built. I want, in short, to encourage an exchange of views, opinions, likes and dislikes.

Send me letters for publication, in order that "P.W." can become, more than ever, the best medium for imparting all kinds of knowledge about radio.

YOU must have had, many and many a time, interesting experiences when building or operating your set. Tell other readers about your radio experiences. And, incidentally, get to know each other through the medium of "P.W."

For the best letter out of each batch published I am offering a prize of one guinea. Send your letters to the Editor, "Popular Wireless," Tallis House, Tallis Street, London, E.C.4.

Wishing "P.W." all the best, and long may you reign supreme as the king of radio journals.

Yours truly,  
P. B. Creegan,

67, Powys Avenue, Town Hill, Swansea S. Wales.

(This letter wins the guinea prize offered by the Editor in accordance with the details on this page.)

## AN EARLY START.

Sir,—Having been a constant "P.W." reader since its inception, and having built practically every type of set since the advent of home-constructed broadcast receivers, perhaps a brief outline of my early experiences may be of interest to some of your later readers.

I took the plunge in 1922, when, having read an article on the specific R of conductors, I sallied forth and bought a large quantity of 15 s.w.g. D.C.C. copper wire. With this, after many failures, I constructed a variometer of impressive proportions, the stator being of 10 inches diameter. Then, having procured a crystal detector (open type) and a single headphone, I assembled

same on a piece of plywood which literally dripped paraffin wax.

Upon hitching up I was rewarded with gramophone records from 6 FL and also a faint noise which proved to be 5 NG. For several weeks I was content to sit clasping my single earpiece to one ear, and plugging the other with a finger.

I say I was content, but my parents weren't—they wanted to be hearing something as well; so, having arranged a parental loan I embarked on a one-valve receiver.

### Using a Soft Valve.

I bought a mysterious apparatus for winding basket coils, two solid dielectric oil-immersed variables, and a Dutch valve, together with valve holder sockets, a few fixed condensers at anything from 2s. 6d. to 4s. 6d., a variable grid leak, and far too much square tinned copper wire.

To my great disappointment the resulting contraction produced only signals from Nottingham and Sheffield very little louder than the crystal set. Quite by accident I discovered that the valve only worked efficiently with 20 v. on the plate, and thereafter followed a period of resting on my laurels, as it were. In the morning I could tour the 11 o'clock programmes from 6 KH, 2 LS, 6 FL, 5 NG, 2 ZY, and when conditions were good I heard Aberdeen, Glasgow, London, Bournemouth and Liverpool.

Later I erected an aerial which was the envy and despair of the locals, being 120 ft. high at the free end, and of excellent length. This was achieved by using the chimney of an adjacent works.

I used a variety of earths, including waterpipe, earth-tube, and galvanised iron bucket filled with cinders, and placed the set actually on the kitchen sink to get the requisite short aerial and earth leads. The aerial being so large collected considerable static charges which generally went to earth via the hands or arms of anyone who was working at the sink.

### Could Receive Practically Everything.

By this time I was using detector and 1 L.F., having a loose coupled aperiodic aerial (honeycomb plug-ins) and Marconi 6-v. bright emitters taking '75 A. With this outfit I could receive practically everything going at the time and twice spanned the Atlantic, once receiving a station on the Pacific coast (K G O, Oakland, Cal.)!

Next Thorpe K4 valves attracted me, and I went in for a variety of Unidyne sets, which were delightful to handle and ideal headphone sets. At the same time I built S.T.'s "Twin Valve Receiver," a 2-valve reflex without a crystal, and a very fine set. I built the S.T.100 for a friend and had many sleepless nights before I discovered a dud detector—after which it was grand.

Later I was hanging my nose over some

(Continued on page 702.)



# AMERICAN BROADCASTING

By JOHN WATT

This popular B.B.C. Variety Producer has just returned from the U.S.A., and in an interview with our special correspondent gives a first-hand impression of what goes on in the American broadcast studios.

YOU are all familiar, no doubt, with those extravagant American pictures that leave you in a slightly dazed condition at the end; those typical "mammoth" productions full of blare and bluster, with legions of glamorous girls in spangles and cellophane eagerly disporting themselves on some fantastic miracle of Hollywood stagecraft. And it is possible that you have been misled by these terrifying spectacles to suppose that the broadcasting methods of the U.S.A. are equally elaborate.

## Simplicity.

Nothing, however, could be farther from the truth. The most characteristic feature of American broadcasting is its tremendous simplicity—a simplicity which other countries might do well to imitate.

At least, so I gathered from John Watt, the popular B.B.C. variety producer who has just returned from the States, where he has made a close study of American broadcasting methods.

"All the acts," he told me during a chat in St. George's Hall, "are put over in one single studio; Radio City and the N.B.C. studios are not equipped to take more than one broadcast each. This eliminates the danger of overlapping transmissions and complications in the timing of items."

"What was your salient impression of American broadcasting when you left the studios there?" I asked.

## Very Accurate Timing.

"The timing system," he replied without a moment's hesitation. "Now I want to tell you how the American broadcast people time their acts with such remarkable precision. There, if anywhere at all, time is most certainly money; for you must remember that the time element is strictly observed, not so much for the common convenience of artistes and listeners, but because the programmes, being commercially sponsored, have to be run on a strict time basis."

"No advertising manager on a newspaper will give his 'space' away for nothing; and it is the same consideration which makes the directors of a commercial broadcast organisation guard their time with equal jealousy



John Watt, who was associated with three radio productions while in America.

"How then, you may ask, has American broadcasting ensured that these time limits shall be respected and watched? This end has been achieved by an interesting psychological method.

"Here we have the ordinary electric clocks that tick over each half minute, so that when the correct time is registered only at thirty-second intervals, the artiste is able to gauge the actual time at any given moment between the half minutes.

"An ordinary clockwork time-piece, although more sensitive in this respect, would be equally useless in the studio since the large hand, moving imperceptibly, would fail to give any real sense of the progress, the motion of time.

"That is what is needed to keep the artist permanently conscious of the time element, to make him regulate his broadcast—speed it up or slow it down—accordingly; and this is what America has successfully provided for.

"In the studio there is a large clock with a great red hand moving visibly round the dial. You stand in front of that clock. And you have to watch it; you see this big red hand moving—moving, and you know exactly how you are placed. Its effect is almost hypnotic."

## TELEVISION JOTTINGS

Some notes on recent developments in this science.

ONE of the most amazing features of television development this year is the tremendous profusion of new systems, chiefly hailing from the Continent. Every day almost one hears of something new (generally said to be "revolutionary"), but never with full details.

The fact of the matter is that in its transit from the fountain-head to the technical Press, thence to the foreign daily Press, and thence to this country, a certain amount of distortion takes place. Several of these "new" systems have been tracked to their respective lairs, and each of them

"But what about the high spots of American radio?" I queried.

"The high spots," he replied, "are no higher than our high spots, though they are certainly more frequent. The sort of show we gave in our Jubilee Gala Programme is done every week from New York in the Rudy Vallee guest hour; a great number of stars comprise the programmes and any Hollywood luminary who may be in New York at the time is brought to the microphone.

## Public Voting by Telephone.

"In America I was associated with three radio productions; Kate Smith introduced me over the air in one; I produced a show, 'It Seems Only Yesterday,' and compered—or as the Americans have it M.C.'d—a Variety Hour.

"The shows were appreciatively received and I got a hundred per cent Press. But what impressed me greatly was the extraordinary speed with which most acts went to the microphone. Everything is done at top speed. There is so much time to fill that the slow and laborious process of knocking a show into shape 'on the floor' as we do here is neglected."

"What is the most popular broadcast there?"

"That's a difficult question. But one of the most popular broadcasts is the Major Bowes' Hour, in which amateur talent is recruited from all over the district. Millions of would-be broadcasters apply for auditions, and the chief virtue of introducing these amateur performers to the public is the intimate, domestic atmosphere they create.

"At the end of each broadcast a hundred telephone girls are busily receiving calls from listeners who record their votes on the best turn. These votes are quickly counted and checked and the winning contestant's name is subsequently announced. I think it might be amusing to try something like this at the B.B.C."

"One more question," I pleaded. "Did any amusing things happen to you in the States?"

He was not allowed to answer, for the irrepressible Harry Pepper, who had been standing close to us on the stage, butted in.

"Yes, you bet it did. They let him land!"

And he dragged John Watt off to listen to a new tune.

has turned out to be some small, but important, development or refinement of an existing system.

Actually, to the technically-minded person, such developments are just as interesting and important as any freakish new system. It just happens that the daily Press does not realise that, and has to make something sensational in the way of headlines.

## Amazing Improvements.

Since the terrific burst of television publicity that was loosed early this year has died down there has probably been more quiet development carried on behind the scenes than ever. I have just been privileged to see a demonstration by a well-known company, whose system I also inspected earlier in the year, and the improvement is perfectly amazing—quite

(Continued on page 701.)



# How to Make A Selective CRYSTAL SET

A HIGHLY-EFFICIENT DOUBLE-TUNED RECEIVER SPECIALLY DESIGNED FOR MODERN CONDITIONS.

**T**HERE are probably millions of listeners who have never used a crystal set and do not realise the advantages and effectiveness of this method of reception.

A crystal set is practically everlasting, and its first cost is its only cost except for the annual licence fee, which must, of

cannily clean. The term "crystal clear" is most apt.

Naturally, in the absence of amplification such as is provided by thermionic valves there can be no great volume or extensive range. However, on an outdoor aerial an efficient crystal set will give a good performance up to a distance of twenty-five miles or so from a medium-wave station, and up to fifty or more miles from the Droitwich station.

Considerably greater ranges have been achieved, but it is not safe to reckon on much more than the above.

### Cheap to Build.

The very simple crystal set of a few years ago, which consisted of little else but a coil of wire and a crystal detector, is not suitable for all modern conditions. A fair degree of selectivity is needed to separate a pair of locals like, for example, the two London stations.

Fortunately, it is possible to obtain the necessary station-separating powers without sacrificing sensitivity. Indeed, the circuit of the crystal set we are about to describe gives an improved signal strength, and so those who live in the North and West Country should find it as effective as Londoners.

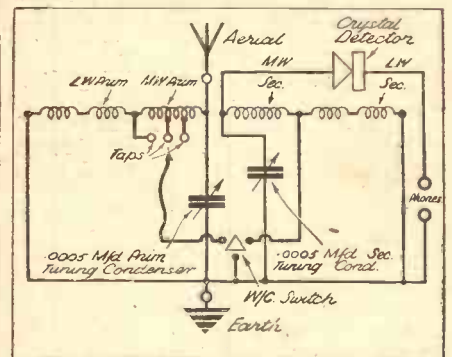
We have adopted the coupled-

bakelised material is readily available for a few pence.

The spacers are necessary to divide the windings, for the long wave ones will run to more than single layers. You can use cord or string for the spacers, holding these in position with Seccotine or glue, holes being pierced in the former through which neatly to pass their ends.

All the windings should be wound in the

### TWO TUNED CIRCUITS

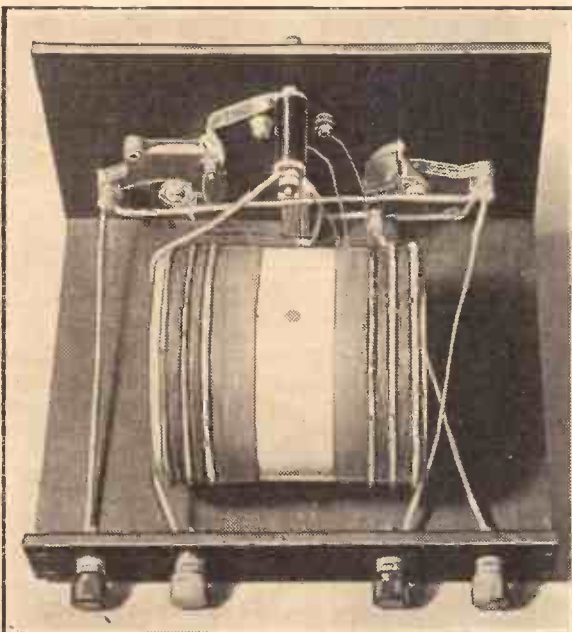


A coupled aerial circuit, combined with tappings on the primary winding, gives a high degree of selectivity. Note that both the primary and secondary coils are fully tuned.

same direction, but it doesn't matter a scrap which direction. As we have said, the long-wave windings will demand more than one layer each. You do not have to worry much over how these fall. Wound in a

(Continued on next page.)

### INCORPORATES A HOME-WOUND COIL



One former is used for all the coil windings, and particulars of the windings are given in the sketch on the next page.

course, be paid whatever the type of instrument employed.

There are no H.T. batteries to wear out and require renewing, and no accumulator needing periodic charging and replacement. It is true that it isn't possible to operate a loudspeaker satisfactorily with a crystal set, but generally two or three pairs of headphones can be worked.

### Completely Silent Background.

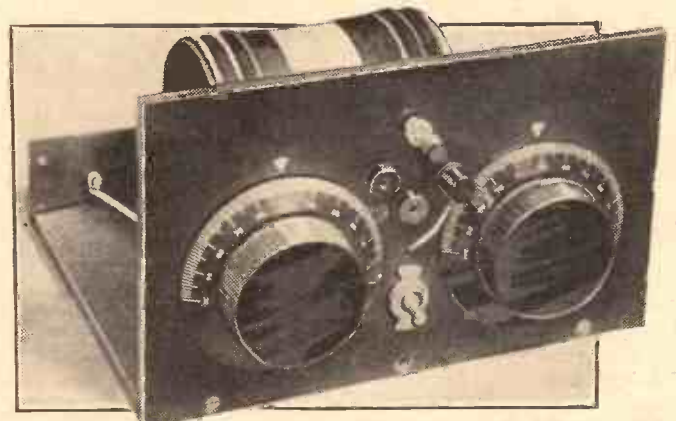
For solitary listeners the crystal set is ideal. The headphones cut out extraneous noises, and it is like poking one's head into the quiet precincts of the very broadcasting studio. There is a sense of intimacy with the radio artists and announcers which the loudspeaker can never quite convey, for they seem to speak right into one's ears.

And there is an entire absence of those whispering, rustling little background noises which are developed by the best of valve sets that makes the reception almost un-

principle. There are, as will be seen in the theoretical diagram, two tuned circuits inductively linked.

The little set is very easy to build and does not cost much. The main item is, of course, the coil. All the windings are accommodated on the one former which, as the diagram shows, is three and a half inches in diameter and four inches in length. You could use cardboard for this, but the proper

### ALL COMPLETE AND READY FOR USE



The dial on the left tunes the primary circuit, and that on the right the secondary. Between the two dials can be seen the tapping plug and sockets, together with the crystal detector and wavechange switch.



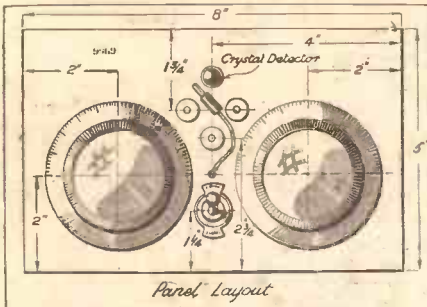
## A SELECTIVE CRYSTAL SET

(Continued from previous page.)

more or less rough bunch the set will work all right, but obviously it won't look quite so neat.

The medium-wave windings are in single layers, and here a little extra care is distinctly advisable. Keep the turns closely together. The tappings which are indicated can be made merely by taking out

### QUITE SYMMETRICAL



Owing to the symmetrical panel layout adopted, the actual drilling operation is extremely simple.

long loops of the wire and twisting them neatly.

The ends of the windings can be secured in each case by threading them through small holes pierced in the former with a fine bradawl or thick needle. Two holes for each end and the wire stitched through them will make a sound and secure fixing.

The coil can be mounted direct on the baseboard by means of one small screw passed through the former, the screw being in the centre at the bottom. So that it can be reached easily with a screwdriver, a quarter-inch or so hole can be bored

through the former at the opposite (top) side.

The panel drilling and the mounting of components are perfectly straightforward, although we may mention in passing that there is no reason why you should not use a wooden panel if you so desire, though its appearance will not equal that of polished ebonite in our opinion. You could also use wood for the terminal strip if you feel economically minded.

### The Foil Strip.

The one connection to the crystal detector is made, as you will observe, by means of a small copper foil strip, as this is rather easier to tuck under the securing nut of the detector than a wire lead.

A small flexible lead passes through the panel from the wavechange switch and terminates in a wander-plug. Use rubber-covered flex for this lead and tie a knot in it just behind the panel so that there will be no pull on its connection to the switch.

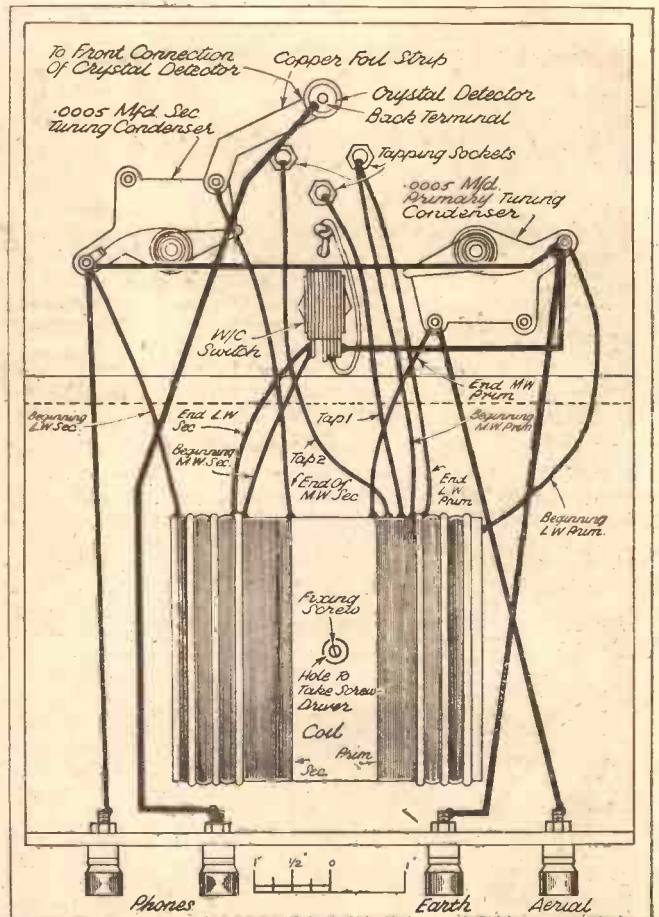
This plug and the tapping sockets are, of course, used in connection with the medium wavelengths. With an average aerial you will find them give suitable results for the following wavelengths.

Looking at the front of the set, the right-hand socket for 190 to 300 metres, the middle one for 280 to 430 metres, and the left-hand one for 400 to 600 metres. This is, we repeat, with an average aerial; there may be slight differences for aerials that are rather shorter or longer than the average.

### The 'Phones.

High resistance telephones are needed, those marked 1,000 ohms or more on each earpiece. To use two pairs of 'phones connect one tag of each pair to the terminals on the set and connect the remaining tags together. This is a series arrangement and is always preferable to a parallel arrangement for a crystal set.

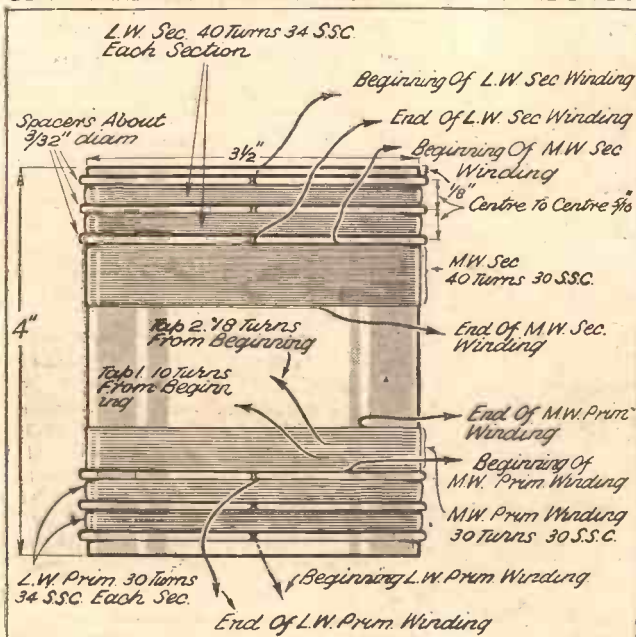
The tuning of the set is not critical, but you will have to adjust the crystal detector



The coil former is held in position on the baseboard by a single screw, and a hole is cut in the top of the former to permit the blade of the screwdriver to be passed through.

in order to discover its most sensitive setting. Once this has been found the set will work consistently for long periods, unless it is subjected to mechanical vibration or is accidentally rather heavily knocked.

## THE ARRANGEMENT OF THE WINDINGS



Each winding is separated from the next by a spacer, which can be a length of thick string or cord. The former itself is a piece of "Paxolin" tubing.

## THE PARTS REQUIRED

- 2 Polar "Compax" .0005-mfd. tuning condensers.
- 2 Polar 3-in. knob dials.
- 1 Bulgin 3-pt. W/C toggle switch, type S87.
- 1 "Sylverex" Permanent detector.
- 4 Bulgin indicating terminals.
- 3 Clix parallel sockets, with plain shoulders.
- 1 Clix wander-plug for above.
- 1 Peto-Scott ebonite panel 8 in. x 5 in. x 1/8 in.
- 1 Peto-Scott wood baseboard, 8 in. x 6 in. x 1/8 in.
- 1 Peto-Scott terminal strip, 8 in. x 1 1/2 in. x 1/8 in.
- 1 3/4-in. Paxolin tube, 4 in. long.
- 1 oz. 30 S.W.G. S.S.C. wire.
- 1 oz. 34 S.W.G. S.S.C. wire.
- 1 pair 'phones, Ericson.
- 1 coil B.R.G. "Quikon" connecting wire.
- Copper foil, cord, screws, etc.

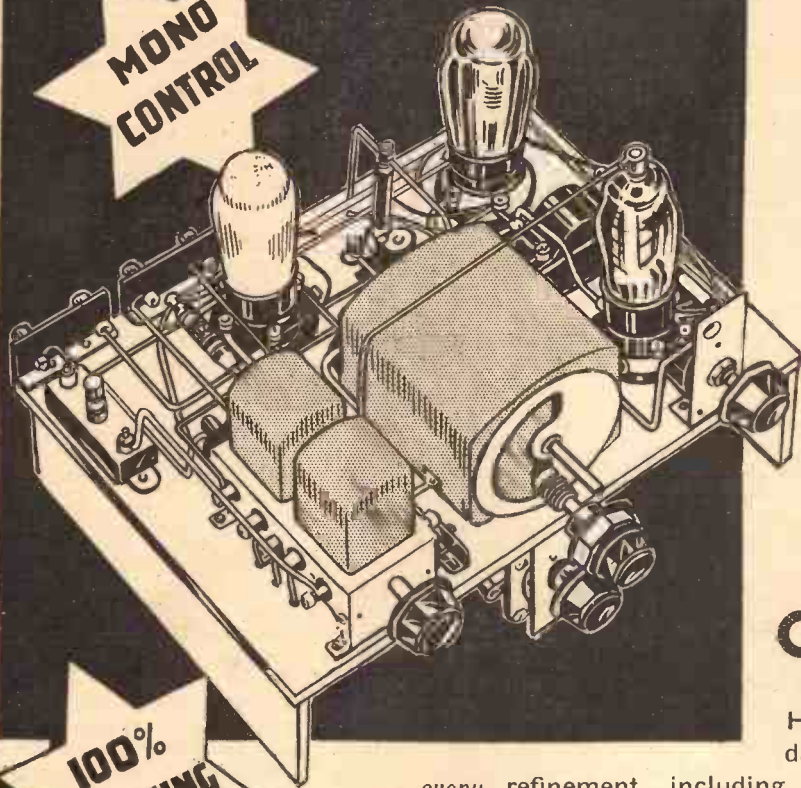
The detector should be handled with care, for rough usage is liable to damage the crystals. The adjustment for sensitivity is made merely by pulling out the little knob, moving it round a portion and then gently releasing it.

You will probably find a sensitive spot right away. Do not be tempted to keep adjusting the device in an endeavour to discover better and better spots. This particular detector is of the "permanent" variety; that is, its sensitivity is consistent. Handle it as little as possible consistent with good results.



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..... OPERATING THE KELSEY.....

# "PORTADAPTOR"

Full details for operating this remarkable portable short-wave unit, constructional details of which were given last week.

..... By THE DESIGNER .....

THOSE of you who are building, or who have built, my new "Portadaptor" short-wave unit will no doubt be anxiously waiting to learn more of the various uses to which it can be put.

In these final notes, therefore, I intend to confine myself entirely to installation and operation, for although the "Portadaptor" is perhaps the most simple of all short-wavers from the point of view of operation, short-wave reception with any type of receiver is very different from logging stations on the ordinary broadcast bands.

I do not intend to discourage you by saying that it is difficult. It isn't. But success on short waves is dependent to a very much larger degree upon the way in which you set about it, and if, therefore, in the following observations I do not appear to give you credit for having much intelligence, you must put it down solely to my desire to ensure for you satisfactory results.

## The Threefold Purpose.

You will know from my previous articles on the "Portadaptor" that its purpose is threefold. It can be used as a single-valve short-waver, as a straightforward detector type adaptor, or as an autodyne superhet adaptor, and, as I have previously explained, it will work entirely successfully with any type of battery set.

But I do not want you to be misled by that last statement. In other words, because I say that it will work entirely satisfactorily in conjunction with any type of battery set, I do not want you to imagine that results will be the same with any set.

That will depend entirely upon the degree of amplification that is available in your existing set, and if you use the "Portadaptor" with a simple little two-valver you must not expect it to produce results comparable with those obtainable when it is being used in conjunction with a much more elaborate set. The "Portadaptor" will do a lot, but I am afraid that it will not work magic.

However, on the adaptor applications of this little unit I shall have more to say later. In the meantime I want to elaborate upon the details I gave in the last issue concerning the operation of the "Portadaptor" as a single-valve receiver.

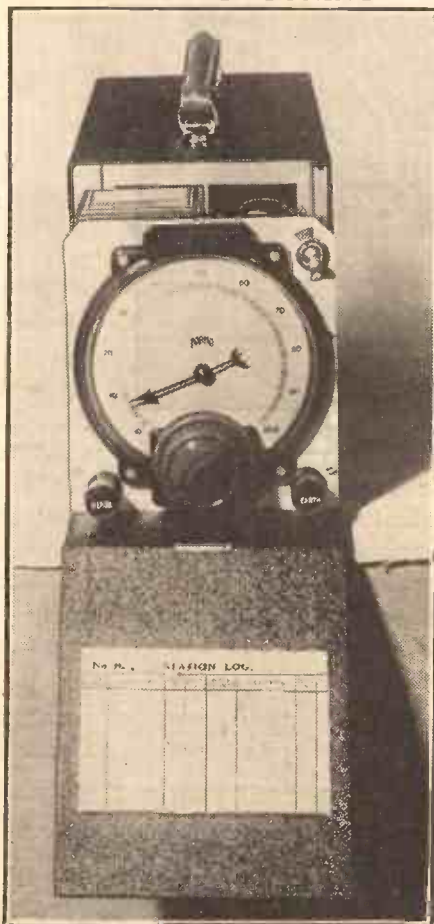
## Using the Reaction Control.

Under these circumstances, where results are entirely dependent upon the amplification given by just the single valve, you cannot hope for much success unless full and proper use is made of the reaction control. It is, for instance, of vital importance that the change to the oscillating condition to which I referred last week should take place very smoothly, and if there is the slightest tendency to "ploppiness" when this change takes place, your chances of success are remote.

Actually, if you have built the unit exactly in accordance with my specification, I do not imagine that you will have any trouble at all, although one always has to

make allowances for the fact that individual valves are bound to vary slightly. Let me make it quite plain that I am not attaching any blame to the manufacturers for this state of affairs. Valve manufacture is a very tricky business, and to turn out valves of a type with identical characteristics throughout would be a prohibitively costly business, anyway. The tolerances imposed are stringent enough for all practical purposes, and my only object in calling attention to the slight variations which exist is with a view to short-circuiting any troubles which may arise.

## TWO-SPEED TUNING



The two concentric knobs on the tuning condenser provide different ratios of drive, making tuning comfortable and yet highly accurate.

Frankly, I doubt whether any of you will encounter "ploppy" reaction troubles, even allowing for slight variations in individual valves, but if you do, then an almost certain cure is to use a larger aerial, and this, incidentally, will be a definite advantage when receiving distant stations. There are, of course, other and perhaps more usual ways of doing it, but the design of this unit is not entirely suitable for poking about inside, and in any case it should not be necessary.

Since so very much depends upon smooth reaction control, may I just give you some indication of what I mean. The ideal to be aimed at is when the change from the non-oscillating to the oscillating condition takes place with something akin to a heavy breathing sound. No plop, no suddenness, but just a gradual change.

If you search for stations with the unit just in this "breathing" condition, you will find it a very simple matter to resolve them. Incidentally, as I mentioned last week, the setting of the reaction condenser to maintain the unit just (but only just) in the oscillating or, if you like, the "heavy breathing" condition will not remain constant throughout the range of the tuning condenser, and periodical readjustment will in consequence be necessary. It is best to try to work the tuning and reaction controls together.

## The First Method.

Now about the adaptor applications of the "Portadaptor." The logical stepping-stone from using the unit as a single-valver to using it in conjunction with an existing set is first to try it as a perfectly straightforward adaptor. In other words, you use the "Portadaptor" exactly as if you were using it as a single valve receiver, but you make use of the L.F. stages in your existing set to amplify the stations received on the unit.

To join it up in your set first disconnect the phones from the unit, and short-circuit the two terminals with a piece of wire. This is most important, for the adaptor will not work unless this is done.

Next join the adaptor terminal marked "to set" to the anode terminal of the detector valve holder in your existing set. Incidentally, the detector valve, that is to say the one in this holder, should be removed. Join a wire from the L.T. negative terminal on your set to the earth terminal on the "Portadaptor," and leave the aerial and earth leads connected to the appropriate terminals on the adaptor.

Switch on the adaptor and your existing set, and by operating the adaptor as I have already explained you should now be able to hear short-wave stations on the loud-speaker attached to your existing set.

## As a Superhet.

That is one way of using the "Portadaptor" in conjunction with an existing set. The other, and infinitely more efficient way, is to use it as an autodyne superhet adaptor. But to be able to do this it is essential that your set should have one or more H.F. stages or should be of the superhet type. I mention this fact because it is not an atom of good trying to use the "Portadaptor" as a superhet adaptor in conjunction with a straightforward "det.-L.F." type of set, not that I imagine that there are very many of these sets in existence to-day.

For this application of the "Portadaptor" you must still leave the phone terminals short-circuited, but the adaptor terminal marked "to set" must in this case be connected to the aerial terminal of your existing set, and your set earth terminal should be joined to the adaptor earth terminal.

As before, the aerial and earth leads should be left connected to the "Portadaptor" terminals and not to the set.

(Continued on page 702.)



# OLYMPIAN IMPRESSIONS

## A Critique of the Great Radio Show

I WANT you to come with me in imagination on a visit to the great Radio Show at Olympia. No doubt many of you did go in actual fact. Well, I hope you will enjoy a mental re-visit and see the giant display of radio ingenuity and novelty through someone else's eyes. Of course the exhibition has now closed, but I will wager there are two or three hundred thousand who will not forget it for a long time.

I do not think there was so much to be seen outside the vast exhibition buildings this year as on previous occasions. Last year, for example, as you came up the Hammersmith Road it looked almost as if the Show had boiled over and thrown a considerable proportion of its contents into the surrounding streets.

Streamers, banners and flags, distributors of literature, posters hastily converted and bill-plastered shops, and so on. But this time there was not quite so much of that kind of thing. So one's first impressions were, perhaps, a trifle disappointing. But first impressions are traditionally misleading and they were in this case.

As soon as the turnstiles had been negotiated and a glimpse of the interior of the building obtained, it was at once quite obvious that the Show was by no means "thinner." Rather the contrary if anything.

### A New Arrangement.

It seemed to me that a new arrangement of the stands had been made and one that was a considerable improvement. They seemed more orderly with more regularly marked and wider gangways. Although it was early in the evening there were thousands of visitors, but even so none of the crowding, jostling and congestion that used to make going to Radiolympia a tiring, if pleasant, adventure.

No doubt experience has shown the organisers where to expect the throng to be thickest and they had cleverly planned accordingly.

As against this improved stand layout, I will venture it as my opinion that the decorations and lighting were rather less orderly. The rigid uniformity of former years gave way to an extremely free and easy treatment which was just as pleasing in its way.

★.....★

Jubilee year has included many notable events, but surely none which so adequately demonstrated the enterprise and ingenuity of British industry and the sterling qualities of British engineers and craftsmen as the National Radio Exhibition.

You have already read in "P.W." full details of all the outstanding developments revealed at the Show and many of you, no doubt, paid personal visits to it. Nevertheless, we believe all readers will enjoy this description of our special representative's tour round the stands.

He concludes his entertaining article with some very pointed observations, but his criticisms, if somewhat outspoken, are definitely constructive in character.

★.....★

At the one end of the Grand Hall was the big illuminated design that so much has been written about in the newspapers.

This was not a showy piece but a quite artistic lighting effect of huge dimensions. A colossal sweep of softly illuminated colouring spread around and above the arms of the R.M.A. Under these was the figure "1935" and a silhouette of the domes, spires and roofs of the city.

At the very bottom appeared the statement: "7,000,000 Homes Use Radio."

Towards the centre was something quite new. Underneath a fountain of neon lights was a large booth containing an interpreter and a gentleman whose job it was to give information to all who requested it. I asked him where I could find some television. "Not anywhere," he said shortly, in a manner which seemed to indicate that I was not the first by a long way to ask that question!

Another new item was a complete post office placed right in the Grand Hall. And when I say "complete" I mean a fully-fledged P.O., where you could send telegrams and post air mail letters, and so forth, and not merely a poky little bureau where all you could do was to buy three-half-penny stamps.

### The B.B.C. Theatre.

And just round the corner from this useful Government shop was the vast B.B.C. theatre with its box offices and everything else to make it a perfect replica of the real thing. But that's wrong; it *was* the real thing even though it had all been built in only a few days. How they managed to rivet together the hundreds of tons of steel girders necessary to the imposing structure, lay the miles of wooden planks for the flooring, build boxes and fix hundreds of tip-up chairs in so short a time completely baffles me. A prodigious task!

With its stage proscenium arch of double the width of the majority of London stages and its half a million candle power of stage lighting, the Broadcasting Theatre was certainly a magnificent affair. The seating capacity was 4,000! But you had to pay more or less normal prices for those seats. The cheapest were only sixpence, it is true, but there were only five-and-nine-pennies available when I lined up, and that faintly annoyed me.

(Continued on next page.)

### THE "TELEPATHOVOX"



Visitors to the Show were intrigued by the wonderful robot on the Marconi-phone stand. This remarkable device, called the "Telepathovox," automatically answered any questions put to it, and was one of the outstanding features of the exhibition.



## OLYMPIAN IMPRESSIONS

(Continued from previous page.)

If I could have got in for sixpence perhaps I should not be now saying that I consider the B.B.C. ought to be able to weigh in with some good free sideshows at these Radio Exhibitions. Their other exhibits were pretty thin. There was, for example, a whole good stand somewhat wasted by being devoted to a giant example of what is technically known as photomontage; that is, a scramble of photos—such a scramble that only a few appeared to want to look at them and they did not tarry for long!

As a complete contrast the Post Office provided a really first-class free show. It was as good as an exhibition in itself and I should not have felt that the evening had been wasted if I had seen nothing else.

### A Very Fine Exhibit.

There was first of all a quite free cinema in which there were some hundreds of seats you did not have to pay to sit on. The entertainment was, however, rather brief, although one could hardly criticise it on that account for it was most interesting. There was a talkie depicting the working of the air mail service and the commentator described clearly all the adventures, to accompanying sound pictures, of the letters from the time they were posted until they were loaded on to the giant air liner.

Another film depicted a listener and his wife and a radio set which suddenly developed noises. The listener wrote to the Post Office about it, and then we saw the Post Office track down the interference to a refrigerator in a neighbouring shop. An amusing and instructive film somewhat "loosely" produced and acted, but decidedly worth seeing—especially as one did not have to pay to see it!

That by no means exhausted the P.O. display. In a large annexe there were dozens of intriguing pieces of apparatus, most of them actually working.

There was a micro-wave transmitting and receiving apparatus. Its directional qualities were strikingly demonstrated by the engineer in charge for, as he swung the small transmitter round, so a large lamp operated by the receiving equipment dimmed and brightened.

A working model of an automatic telephone exchange attracted considerable attention, particularly as an engineer interestingly described how it worked. And then we had a voice frequency outfit to show visually the frequencies of human speech. Visitors were invited to try their own voices on it.

Various forms of interference were demonstrated and there was a fine model of the Rugby radio station. A full-size cable manhole with linemen working in it was among the several other interesting P.O. exhibits, and at large counters visitors were invited to hand in telegrams for free transmission to friends on board ships at sea.

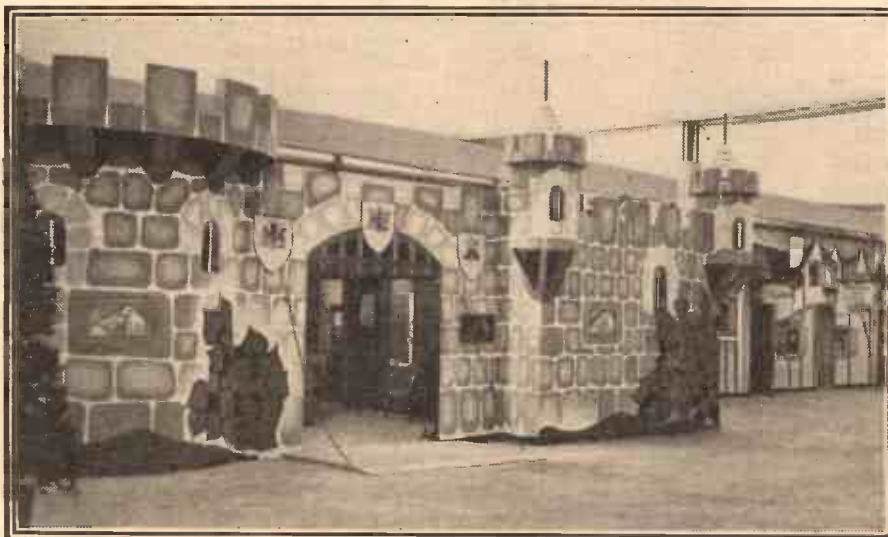
Yes, once again the Post Office must be congratulated for providing a really first-class show, and it is to be hoped that one of these days the B.B.C. will be fired with a competitive spirit and try to equal or beat



★ ★  
A notable feature of the new season's models is the improvement that has been effected in the design of tuning dials. The fine instrument shown above, which was exhibited on the G.E.C. stand, is but one of many examples.

★ ★

## BEHIND THE SCENES AT RADIOLYMPIA



This behind-the-scenes view of Radiolympia shows the ingenious way in which The Gramophone Company disguised their offices.

that department in its Radiolympian efforts. The effect that it has had on me, at least, is that I shall never again tend to think of red tape and the Post Office at the same time.

But I must take you along to the stands of the set and component makers, though I do not propose to describe individual items at length. You have already had very complete reviews of the new receivers displayed. However, I shall conclude this article with a summary of my impressions of the technical aspects of the exhibition.

### Goldfish and Curves.

Many and varied were the methods of attracting the attention of visitors to particular stands. On one stand there were glass tanks of goldfish and on another rotating globes about six feet in diameter.

But more appropriate and certainly much more to the point was the loudspeaker Curve Recorder, on view at the Benjamin stand. This entirely scientific and intriguing outfit was one of the most satisfying of all the exhibits apart from the actual sets, especially to one like myself who, while able to derive entertainment from irrelevant sideshows, prefer exhibitors to—well, stick to the point.

Goldfish, for example, are pretty creatures, but one expects to see them at aquaria; they seem a bit out of place in a radio show.

Now one knows that small accumulators are made, and one has also seen very large accumulators, but I found that the close juxtaposition of the extremes at the Exida stand rather startling.

(Continued on next page.)



## OLYMPIAN IMPRESSIONS

(Continued from previous page.)

There were some tiny Exide cells not much larger than matchboxes. These are mainly used in pocket wireless sets such as the police of certain counties carry. (One also figures in the Kelsey "Portadaptor.") And within a foot or two were great, powerful-looking cells obviously capable of turning the starting motor of a Jorry.

Nevertheless, these are not the largest accumulators made by the Chloride Storage Battery Co.; I have seen even larger ones actually being manufactured at Clifton Junction. Cells so big that you could take a bath in one of their cases and find plenty of room to kick your legs about.

I noticed that the Exide Indicating device which figures on many of the Exide radio batteries was attracting attention.

### A Real Work of Art.

At the POPULAR WIRELESS stand the Kelsey "Portadaptor," which I have just mentioned, appeared to be collecting the largest crowd. I am not surprised, for it is an amazingly neat piece of work. Mr. Kelsey is an extremely clever craftsman, and although he does all his work with the simple tools such as are used by the ordinary constructor, he always manages to obtain that subtle professional finish. His productions are object lessons for the amateur and clearly show what can be achieved by care and patience.

Naturally, the fine model of Marconi's yacht proved a great draw at the "P.W." stand, and once the crowds were made to tarry by this outstanding exhibit they found plenty else to keep them tarrying.

The original model of the S.T.600, for example, and John Scott-Taggart's new set, the S.T.600 Radiogram.

Not so very far away from our stand a number of people were absorbed in a demonstration of the Aerodyne Aeromag scheme. It could not be shown working properly

because only loudspeakers fed from the central amplifier were allowed in Olympia. Instead, there was a large dial functioning in conjunction with the control.

Aeromag is a particularly effective form of remote control, and with it you can tune in any of the stations from a distant room. And you get a dead tuning, too, none of that moving from a predetermined setting to another. The set itself pulls each station into exact tuning for any particular station. And at the control end you have a small dial on which you can watch the tuning variations.

I must admit that it is quite a mystery to me how this ingenious device functions, for remember it is all purely electrical, there are no mechanical links between the control point and the set, and the connecting lead can be as long as you like.

Another example of extremes in sizes could be seen at the T.C.C. stand. Here there were condensers no larger than grid leaks and big ones you could hardly accommodate in a large portmanteau. But what impressed me most was a condenser about the size of a hand box camera which is able to withstand a voltage of 25,000.

A working voltage, mind you, and not just a momentary surge. The component was tested up to as much as fifty thousand volts. Now fifty thousand volts is a hefty pressure, and it beats me how T.C.C. managed to obtain such a compact construction in a condenser designed for such terrific potentials. If it were left to me I fear fifty thousand volts would be as large as pianos!

The Hivac stand was one which created

great interest, for here were to be seen what were, I think, the smallest sets in Olympia. Using the new Hivac midget valves one of these sets was little larger than a cigarette case. And another, complete with an earphone, was built into a box which would surely not have taken more than four or five small cigars. This, by the way, was

## ON THE COSSOR STAND



Here you see Mantovani, leader of the well-known Tipica orchestra, showing great interest in the wire-joining machine on the Cossor stand at Radiolympia.

constructed by an amateur, and I thought it a mighty fine piece of work.

You have all heard no doubt about the other new Hivac valves, the revolutionary Harries L.F. amplifier, the intensity compensator, etc. These were all present, and I give Hivac full marks for the neat, enthusiastic presentation they gave to their products.

Another stand of particular interest to the home constructor was that on which the Eddystone apparatus figured. Here you were greeted by no mere counter spread of components, although intriguing components were to be seen, but many short wave wavemeters, receivers and transmitters interesting in both their appearance and their potentialities.

### A Transmitter, Not Receiver.

Particularly did this last apply to a tiny five-metre outfit, and I am sure quite a number thought that there had been some mistake and that it was really a receiver!

One expected to find condensers on the Dubilier stand, and condensers there were in plenty as well as resistances, interference devices and other such things. But personally I found myself spending the most time examining some fascinating relays. For example, the Dubilier Time Relay. I think this kind of thing is a new departure for that great Dubilier concern. Mind you, that is only my opinion based upon the fact that I have not hitherto encountered any Dubilier gear of this nature.

However, if it is a new line for the firm, then all I can say is that they appear to be pursuing it with great skill, for the relays were obviously most soundly designed.

In order to display their famous No Mast  
(Continued on page 703)

## WAITING FOR THE DOORS TO OPEN



This photograph of the main hall was taken just as the doors of the Show were about to be opened to the general public. Unfortunately it does not do justice to the impressive effect of the Neon signs and bright colouring.



# ON THE SHORT WAVES



**DIVIDING THE SPECTRUM.**  
 An explanation of band-spreading and its various advantages  
 by W. L. S.

SEVERAL recent queries from readers have made it clear that it is time for me to deal once more with this vital question of band-spreading, but from rather a different angle from last time when we discussed the best methods of doing it.

Just now the question is, "Why this band-spreading, how, and how much?" And we had better start right away by deserting the sphere of short waves and talking about a broadcast receiver.

### Narrow "Slices" of Wavelengths.

Just imagine a standard broadcast set that had such values of inductance and capacity in its tuning circuits that it went from 200 to 10,000 metres in one sweep. The whole medium-wave broadcast band would probably be crowded in between 0 and 30 divisions on the dial; the long-wave band would come, perhaps, between 50 and 55; and the rest would be populated only by aeroplanes, ships and various Morse stations.

Well, a set of that type would be covering a range of roughly 1,500 kilocycles on its tuning scale—and that is about one-third of the range covered by a single short-wave coil that tunes from 30 to 55 metres, which represents roughly 4,500 kc.

On each coil of your short-waver (and you probably have three) the chances are that you are covering a range of between 4,000 and 10,000 kc. The coil that tunes from 15 to 30 metres gives the latter figure.

Now the short waves are less thickly populated by interesting transmissions than are those above 200 metres—that is to say, the bands you will want to listen on, regularly, are even narrower by comparison than the medium-wave and long-wave broadcast bands that occupy those narrow slices on our imaginary broadcast receiver.

### How the Stations Are Grouped.

This is precisely why the short waves strike the newcomer as a vast expanse of morse, with an interesting transmission sprinkled in just here and there. Fig. 1 shows you how the interesting bands are spaced, with some idea of their actual width. I have shown the scale both in megacycles and metres, but the megacycles, of course, are the only criterion of actual width.

Fortunately for all of us the modern short-wave tuning condenser, equipped

with a good slow-motion device, makes things pretty easy to handle. I have before me, as I write, two separate sets of commercial short-wave coils.

One set covers the range in the three bands of 13-26, 24-52, and 46-96 metres. The other is calibrated as taking in 13-26, 22-47 and 41-94 metres. Most of the commercial coils are somewhat similar in the ranges covered.

You will see, by comparing these figures with the diagram, that your smallest coil will bring in the 16-, 19-, and 25-metre broadcast bands and the 20-metre amateur band; the next will bring in the 31-metre broadcast, the 40-metre amateur band, and the 49-metre broadcast band will be right at the top end, and may or may not be completely covered.

60 or 70 divisions on the little chap, as against 5 or 10 on the big one, and that will mean, quite literally, that you will be able to stop and examine transmissions that you would probably have shot right through otherwise without even noticing them.

### Almost A Necessity.

Some folks seem to think that band-spreading is only desirable from the amateur transmitter's point of view. He has to look over the amateur bands really thoroughly, and the rest of the spectrum just doesn't matter to him at all. That means, of course, that a good spread is an absolute necessity, and not just a luxury.

I suppose I must admit that it is a luxury for the short-wave broadcast listener (in the sense that he can get along without it); but when a luxury is so readily and cheaply available it's a crime not to make use of it.

It is hardly worth while going to the extreme of making a large set of coils, all very carefully cut to size, so that one band is covered by each. I have done this, but it's very hard work. Using a tuning condenser of .000015 (the size of the normal band-spreading condenser), each coil would just give full coverage of one particular band.

Seven coils is a bit of a handful, and one is prevented from looking round the rest of the dial for "stray" transmissions, which, by the way, are quite numerous. In fact, their mere existence is a powerful argument in favour of a band-spreading scheme which allows one, so to speak, to "turn the microscope" on any part of the spectrum that one wants to scrutinise.

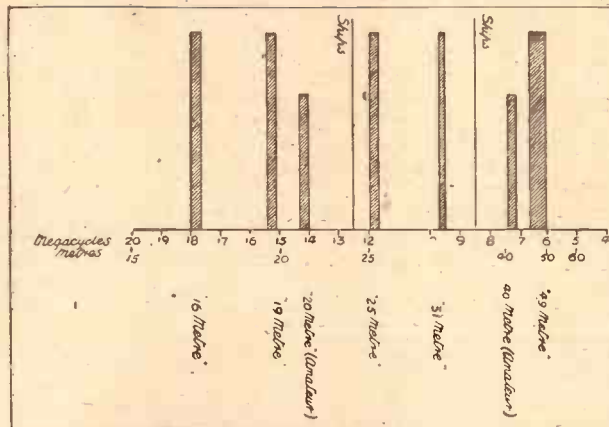
### On the Detector Only.

Band-spreading in any shape or form is apt to be a bit of a nuisance when we are dealing with sets that use tuned H.F. stages. I usually solve the problem by using it on the detector only. The small coverage on the band-spread condenser is equivalent only to a minute movement on the H.F. tuning control, and the off-setting effect is hardly noticeable.

In any case the H.F. control should be flat, in my opinion, although I know lots of people disagree violently on that point.

Try band-spread tuning for yourselves, and you won't go back to "wide tuning" again.

## WHERE TO FIND THE BEST BANDS



A diagram which shows the widths and locations of the short-wave bands of real interest to listeners.

The largest coil will bring in this band at the bottom end, with the 80-metre amateur band coming higher up the scale. On each coil, comparatively speaking, you will find large "bare patches" on your tuning scale. In them you will hear either lots of unintelligible high-speed morse or nothing at all.

The simplest method of band-spreading is, of course, the provision of a much smaller tuning condenser connected in parallel with the main one. Then, as you arrive at the bottom end of each of the interesting bands, instead of having to be whizzed through it at high speed on the main dial, you can take things easy on the small condenser.

With correct choice of capacities you will be able to arrange so that each band covers



ON THE SHORT WAVES.—Page 2.

## WHAT READERS ARE SAYING

**H**AVING just returned from a short holiday, I find the post-bag overflowing in all directions. Comments this week must therefore be short and, if possible, sweet.

J. M. (Glasgow) wants to build a short-wave single-valver, and wants to know if the layout of the "Simplex" Two minus the L.F. stage would be suitable. Yes, certainly, J. M., it should be almost ideal for a small one-valver.

### An Amateur Programme.

R. D. E. (Standon) tells me of some of his latest "bags," including VP 3 MR, an amateur in British Guiana, putting out a "programme" on the 40-metre band. He also mentions COCD, Havana, Cuba, a new station working on 48.9 metres, who is well received up to 6 a.m. B.S.T. Among other points of interest are the fact that he has received a harmonic of one of the Colombian stations (on 21 metres), together with such stations as ZLR (Wellington), VP 6 NW, VP 5 PA and several others that one doesn't often hear of.

### I.S.W.C. Contest.

Mr. Arthur Bear, of the International Short-Wave Club, asks me to announce that the club is running a listening contest open to every short-wave listener in this country. It opens on September 1st and closes on November 30th, during which period all contestants are asked to log as many short-wave stations as possible and to write to them asking for verifications.

Only verifications from short-wave broadcasting stations will be accepted. No commercials will be allowed unless the "veri" states that the programme received was definitely of a broadcast nature.

First prize is a 7-valve all-wave receiver. Full particulars and entry form may be obtained by forwarding a ½d. stamp to I.S.W.C., D X Contest, 82, High Street, Clapham, London, S.W.4.

E. W. (Guernsey), referring to my article on aerial coupling, points out that my alternative schemes are hardly available to readers who are using commercial wave-change coils. Some models have a fixed aerial winding, and others rely upon capacity-coupling for all bands.

### Foot-Capacity Troubles.

Generally speaking, such coils will be found to give satisfactory results on all ranges; but in some cases those with separate aerial windings may be improved still further by the addition of a preset or variable condenser in the aerial lead.

E. W. also comments upon the shifting of the Portuguese station CT1AA from 31.25 metres to 25.36.

C. R. H. (W.7) comments upon the de-

terior circuit shown on page 475 of the July 13th issue, and wants to use it as an adaptor. He is hazy about the best way of connecting the aerial and earth to it. I suggest the good old expedient of capacity-coupling. Hitch the aerial, via a neutralising condenser, on to the live end of the grid coil. Don't worry about an earth at first, but earth L.T. later if you think the set needs it.

F. C. W. (Wisbech), a "B.C.L." Two user, suffers from the unusual malady of foot-capacity. By this I don't mean that he tunes-in with his feet, but that the set is perfectly stable as long as the operator keeps his feet on the floor! When he lifts them the set goes mad. Sounds to me like long battery-leads, F. C. W., and I suggest that you stand your batteries on a metal plate and earth it. If this doesn't improve things, try standing them on the table immediately behind the set with leads as short as possible.

J. H. W. wants to know where he can obtain "Metaplex." The Peto-Scott Company are the makers, J. H. W., and you can obtain single or double-sided panels and baseboards of any size from them.

Regarding your other query about the best time to hear Africa, I think you should manage to pull in Nairobi and/or Johannesburg on the 49-metre band

## KEEN ENTHUSIASTS



A group of 5-metre enthusiasts gathered together at Miss Corry's station (G2YL) during last season's R.S.G.B. convention.

between 6 and 8 p.m. almost any evening.

J. E. (Leeds) tells me that he has cured hand-capacity in his particular set by the simple expedient of altering the coils, which were home-made. Instead of leaving the grid-coil with the turns spaced about ⅜ of an inch, he closed the winding up, and the hand-capacity vanished at once. I can't attempt to explain it, but pass the tip on for what its worth.

He has received a verification from the operator of the "Discovery II" (VPSJ), which reveals that when he logged him he was near Madagascar.

G. A. R. (Huddersfield) writes to thank me for recommending valve-base coils. He has made himself a set, actually on old valve bases, and finds them better than anything he has yet struck. He also encloses a "world map" printed in America showing our old friend VK3LR (Melbourne), shown somewhere up in North Queensland. Funny how some of these stations will run about!

## SHORT-WAVE NEWS

**T**HE secretary of the Tottenham Short-Wave Club tells me that the club has now grown to quite a healthy size, and that several interesting meetings have been held recently.

These meetings are at 57, Pembury Road, Bruce Grove, Tottenham, N.17, and anyone wishing to attend one or to join the club should write to that address for particulars. Lectures, informal discussions and Morse practice form the major part of the activities.

### An Interesting Month.

September is to be an interesting month for Empire listeners. Among the outstanding broadcasts will be the R.A.C. Ulster T.T. (Sept. 7th and 8th), the St. Leger (Sept. 11th and 12th) and, of course, the "Proms."

A rapid and noteworthy rise in the number of radio receiving licences in New Zealand is attributed partly to the popularity of the Empire programmes. N.Z. now boasts 145,231 licences, against 111,000 at the same time last year.

In addition to the usual "standing schedule" at the Empire Station, it is announced that GSI (19.66 metres) and GSL (49.1 metres) are now putting out experimental transmissions. The former works from 5.15 to 7.15 p.m. (G.M.T.), and the latter takes over at 7.30 and continues till 9 p.m. The only substantial break during the whole of the twenty-four hours now occurs between 6.30 a.m. and 11 a.m.

### Some New Arrivals.

New stations reported by readers just recently include the following: FZS (Saigon,

Indo-China), heard with an experimental transmission on 16.35 metres; the new "Jap" transmission in English from J V H, Nazaki, on 20.55 metres; K K Z at Bolinas, California, on 21.91 metres; H H 2 T, Port-au-Prince, Haiti, apparently broadcasting regularly on 25.93 metres, just outside the official 25-metre band; and a host of unidentified or irregular transmissions.

Conditions at the time of writing are still extremely good, but the 49-metre band seems to be slow in picking up. The locals are still very strong, but the North and South Americans do not seem to reach a reasonable strength until a rather later hour than was the case last year.

Readers whose sets will tune up to 70 metres are advised to listen for the transmissions from HC2ET (Guayaquil, Ecuador) on 65.22 metres, which can be heard early in the morning (3 till 5 a.m.) on Thursdays and Sundays.

W. L. S.



# RULE OF THREE

UNDER the shadow of the Ullswater Committee, which will finally decide the future of the B.B.C.'s constitution, considerable internal re-alignment of forces is going on inside the "Big House."

When Colonel Alan Dawnay's health broke down under the strain of a conscientious attempt to live up to his office of Programme Controller it was obvious that a fresh form of control would be necessary. It was obvious that the task was beyond the powers of any one man. Some kind of devolution of duties seemed inevitable.

And now that the devolution has come to pass everyone is calling it a revolution. It is nothing of the kind. On October 1st, it is true, many new directors come into action. Their coming represents much less in terms of programme change than might be expected.

### A Very Free Hand.

When one examines the changes in full it becomes clear that only the Higher Command is vitally affected, and even here the changes are more of office than of personnel. The departmental chiefs who do all the donkey work of programme building remain strangely the same as before.

Listeners are apt to imagine that the bulk of the programmes come about as the result of somewhat sinister promptings from the Higher Ups at the Big House. Actually the programme men have a very free hand.

Before we analyse the possible benefits from the new programme control it might be as well to get the complete broadcasting hierarchy into some kind of perspective. True we are mainly concerned with the grades handling programmes; but in so far as these programmes may be influenced by the Hidden Hands we may as well know whom they are.

### At the Head.

Sir John Reith is the Director-General. Seated, as before, on Olympus, he virtually controls broadcasting—being responsible, in a way I have never entirely understood, to the board of governors.

Right under him come three controllers or directors. I prefer the latter term myself. We will call them parallel in status, although it is obvious that they

are not, because their responsibilities are so utterly different.

Anyway there are three directors under the Director-General (1) Director of Public Relations—a new post this, being taken up by Sir Stephen Tallents, whose publicity work for the Post Office needs no further

★.....★

### ALAN HUNTER REVIEWS THE RECENT CHANGES IN THE B.B.C. HIGHER COMMAND AND IN DEPARTMENTAL CONTROL GENERALLY.

★.....★

emphasis. (2) Director of Internal Administration, B. E. Nicolls, recently promoted to this post. (3) Director of Programmes—another new post, at least in definition—taken over by Cecil Graves, whose great work for the Empire service is still all too little recognised.

Sir Stephen Tallents will help to make broadcasting still more popular than it is, and I suspect part of his work will be to make Sir John Reith more personally popular than he is. Whether he will succeed I should not like to say, knowing how much Sir John sincerely loathes personal publicity—to such an extent that we did not have a chance to see him in the recently released B.B.C. film.

the present as Deputy Director-General, a post his long experience with the machine of broadcasting enables him admirably to fulfil.

And so we come to the creative director, the programme director. Cecil Graves will not suffer from the same disadvantage of Splendid Isolation characterising the Dawnay régime. He will assume a sort of triangular control, with Major Gladstone Murray and Roger Eckersley completing the geometrical figure.

It is perhaps of some importance to point out that Mr. Graves' two assistant-directors are not intended to be "buffers" between the programme director and the various departmental chiefs. All of these people will be able to make direct contact with Mr. Graves, for that is part of the essence of the re-alignment.

### The Three Programme Chiefs.

Between this programme triumvirate or rule of three the real control of our daily—and nightly—broadcasting fare will shortly be vested. All three are men of tested ability, integrity and drive.

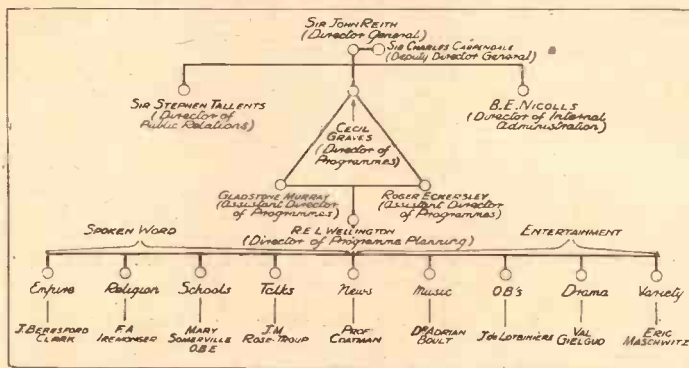
They will make direct contact with nine distinct departments, in which are included practically every conceivable phase of the broadcast service. Co-ordinating the output of these departments will be a Director of Programme Planning—R. E. L. Wellington—in a job he has been doing without acknowledgment for years.

And now, just to complete the picture of the hierarchy as I see it, let us go through the nine departments, noting the personalities whom we shall look to for our programmes this winter.

### Speech and Entertainment.

For a very good reason I will divide these nine departments into two groups, one of five and the other of four. Coming under what can very loosely be called the Spoken Word are the five—Empire, Religion, Schools, Talks and News. Under an equally loose—and equally inaccurate—head of Entertainment come the Music, O.B., Drama and Variety de-

### THE B.B.C. ADMINISTRATION



This diagram of the B.B.C. "family tree" shows how the various administrative and executive positions are arranged. The nine programme departments are divided into two main groups comprising the Spoken Word, under Major Gladstone Murray, and Entertainment, under Mr. Roger Eckersley.

Under Sir Stephen will come also the whole of the B.B.C. publications, not forgetting the Press section, whose "waffles" pour out from the duplicating machines in an ever-growing flow for the benefit of radio correspondents!

Sir Charles Carpendale will stay on for

partments.

At the moment it is not clear whether this broad divisioning will actually apply. If it does—and there seems good reason to suppose something of the kind will happen—Major Murray will concentrate his

(Continued on next page.)



## RULE OF THREE

(Continued from previous page.)

energies on the Spoken Word group, while Roger Eckersley will deal with the Entertainment side he is so very well acquainted with.

The Empire service passes to the control of J. Beresford Clark, who for the past year or two has been Director of Programmes. He will now assume the title of Empire Director.

Religion remains under the control of F. A. Iremonger, whose work has put broadcast religion on a plane of its own, as many leading church dignitaries have readily admitted.

Schools broadcasting continues under the admirable control of Miss Mary Somerville, O.B.E. Her recent honour marked ten years of unceasingly fine work in this pioneer field of education. She will in future be aided by A. C. Cameron, a distinguished educational personality who will act as Secretary of the Central Council for School Broadcasting, thereby releasing Miss Somerville for the work where she is most needed—the preparation of the actual broadcasts to schools.

### Regional Liaison Work.

Talks pass from the control of Charles Siepmann to his assistant, J. M. Rose-Troup, an executive with a wide experience of the spoken word and a man of infinite tact. Mr. Siepmann, by the way, takes on a job that may or may not have a great significance—Director of Regional Relations. His job will be to act as liaison between the London programme board and the programme directors of the various Regional centres.

News, the last of the Spoken Word group, remains under the control of Professor Coatman. No real development in this service can be expected until the Ullswater Committee's report comes out, defining afresh the attitude towards the established Press agencies of news. But subject to present limitations—which are considerable—Professor Coatman can be relied upon to deliver the goods.

In the Entertainment group very little change has to be recorded, and that is why, from the low-brow listener's point of view, all this ballyhoo about changes at the Big House has very little meaning.

Music continues under Dr. Adrian Boult, Drama under Val Gielgud, and Variety—the spice of radio, as well as of life!—under Eric Maschwitz.

### Television Not Yet Included.

There is only one change—in the O.B. department. J. de Lotbinière, a big man in more senses than one, takes over the onerous work bequeathed by Gerald Cock on his promotion to the post of Director of Television. Mr. Lotbinière has had a rapid rise through the "Big House," and no one grudges him his new step up.

It is interesting to note that the B.B.C. is leaving television right out of its present hierarchy, preferring to let Gerald Cock push ahead without let or hindrance at the Alexandra Palace until such time as the new science takes on something like a service aspect.

I am afraid all this must have read a trifle dully, mainly because we are dealing with many names by no means familiar to listeners. But in the course of the next few

months these names I have mentioned will make news almost every day. It is just as well, therefore, to keep in mind their relative positions in the "Big House" scheme of things.

## AMATEUR RADIO

NO newcomer to the short waves can listen for long without coming into contact with amateur transmitters. And usually this contact is followed by a desire to know more about these stations, Q.S.L. cards, code abbreviations, the special licences, how to make suitable transmitters, and so on.

Those who want to know all about the amateur movement, or, indeed, anyone inter-

ested in short-wave reception or transmission, can do themselves a real good turn by purchasing a copy of "The Guide to Amateur Radio," which can be obtained for 6d., plus postage, from The Radio Society of Great Britain, 53, Victoria Street, London, S.W.1.

There are long articles dealing most elaborately with circuits, valves, and aerials in connection with their special application to short-wave radio.

For those just taking up an interest in short-wave transmission, the contributions on artificial aerials, transmitter power supplies, and transmitter designs, will prove almost invaluable. At the same time, practical articles on receiver construction and designs are amply represented. The whole tone of the publication is essentially practical, and contains information which is really unobtainable elsewhere; and amongst the valuable sections is a list of selected text books for those who desire to go further into the various branches of the subject.

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# RADIOTORIAL

The Editor will be pleased to consider articles and photographs dealing with all radio subjects, but cannot accept responsibility for manuscripts or photos. Every care will be taken to return M.S.S. not accepted for publication. A stamped, addressed envelope must be sent with every article.

All Editorial communications should be addressed to the Editor, POPULAR WIRELESS, Tallis House, Tallis Street, London, E.C.4.

All inquiries concerning advertising rates, etc., to be addressed to the Advertisement Offices, John Carpenter House, John Carpenter Street, London, E.C.4.

The constructional articles which appear from time to time in this journal are the outcome of research and experimental work carried out with a view to improving the technique of wireless reception. As much of the information given in the columns of this paper concerns the most recent developments in the radio world, some of the arrangements and specialties described may be the subjects of Letters Patent, and the amateur and the trader would be well advised to obtain permission of the patentees to use the patents before doing so.

## QUESTIONS AND ANSWERS

### FILTER FOR BACKGROUND NOISES.

A. S. P. (Workshop).—"The set is a last year's 'Universal' for A.C. or D.C. mains, and the only trouble is that it is a bit noisy. A business friend of mine who had the same trouble with a set of this kind got over it by using a mains filter, consisting of two .01 mfd. condensers, and two long-wave coils.

"The diagram to which he wired up shows one coil connected to each of the main fuses. The other side of each coil then goes to its respective mains terminal on the set, and also to one of the condensers. Finally, the other sides of these condensers are joined together, and taken to earth.

"I have tried the same stunt, but it reduces strength and gives a distorted output. The condensers are the same as he used, but they are different coils, and I think these are the trouble.

"Is there any special make or size of long-wave coil which should be used for this purpose?"

The chief requirement is that the coils should be of low resistance—if they are not they will "starve" the set, with the result of which you complain.

Instead of using tuning coils, which may or may not be good enough for the purpose, you should employ H.F. chokes of the type specially designed for mains work. (Ordinary H.F. chokes are worse than useless for such a filter.)

Long-wave coils, of 200 turns or so, may prove to be O.K. from the choking (impedance) point of view, but they must be of low D.C. resistance.

### VERY ACCURATE GANGING.

J. E. (Burslem, Staffs).—"I want to be quite ready for the autumn come-back of the distant stations, and I have been experimenting with finely-adjusted ganging. Wide-angled, slow-motion handles, and all that.

"By using a sensitive milliammeter in the detectors' plate circuit, I have got remarkably accurate settings for the trimmers. And the difficulty I find is not so much the keeping of the ganging in step throughout the waveband, as that of keeping the detector circuit constant with the two H.F. pentode's circuits preceding the detector.

"I have, in fact, had well-nigh perfect ganging, from below 200 to over 600 metres, and with first-class results on the long waves as well. But the best detector-circuit trimming depends on whether or not there is reaction. I am told reaction always makes a difference—normally slight, but noticeable if as closely investigated as I have managed to get it.

"My aim is to get the set as sensitive as possible. Would it be best to make the detector ganging coincide with the H.F.'s when reaction is full on, or when it is right off, or at the intermediate position?"

You are certainly doing the job thoroughly, and we congratulate you on the accuracy already achieved.

Since it is the distant stations you want, and full sensitivity, it will be best to give the final touches to the detector's ganging when reaction is fully applied, and the set is almost oscillating.

### EFFEL TOWER ON MEDIUM WAVES.

W. S. (Southampton).—"The set had been tuned to Bournemouth's wavelength, and I had turned the dial about two degrees above this when I heard a Frenchman announce 'Tour Eiffel.'

"It was quite clear, and though I tuned to long waves, I could not hear the same programme up there. Did I hear a harmonic, or has this station altered its wavelength to the medium waveband?"

It would have been the direct transmission you heard, and not a harmonic. Eiffel Tower's wavelength has, for some months, been lowered from the long waveband, and the station now works on 206 metres.

### POOR RESULTS FROM VARIABLE-MU CONTROL.

"VARIMU" (Hornsey).—"I do not get the proper results from the H.F. volume control. There is a separate grid bias battery for this, and although it is the right voltage, it does not make any difference when I turn the knob, except the last quarter turn, which acts very suddenly, and puts the programme down suddenly from full strength to weak.

"The valve is a new one, and works all right on another set which I have tried it on. What can I do to make it give smooth volume control?"

Since you are using the correct voltage grid bias battery and your valve is a new one which works satisfactorily when tried in another set, it would seem that the cause of the trouble lies in the potentiometer itself. We would suggest that you remove the potentiometer from the set and get it tested. Probably you will find that the resistance element has developed a break near one end. If you cannot test it yourself your best plan is to send it back to the makers.

### FITTING A "LOCAL STATION" SWITCH.

E. G. M. (Newcastle).—"The set is so good that it is too strong for comfort when tuned-in to the local station. Could I fit it with a local station switch, such as is supplied with some of the newer types of commercial sets?"

"I understand that these switches are based on the principle of putting in resistance to tone down the volume. How much resistance is required? And what are the connections?"

There are several ways of using such an arrangement, according to the various types of aerial coupling, etc. But the basic principle is, as you say, merely that of adding resistance, so the method is easily tried on any set.

Frequently all that is necessary is an ordinary on-off switch and a 100-ohms resistance, connected in series across the set's A and E terminals. But sometimes a different value of resistance is necessary; and sometimes the simple connection across the two terminals named is not so good as connections across other points governing the set's input.

(Continued on next page.)



## RADIOTORIAL QUESTIONS & ANSWERS

(Continued from previous page.)

In general, however, the simple arrangement outlined above is satisfactory, especially if two or three values of resistance are available to choose from.

The full connections are "A" terminal to one side of the resistance; other side of the resistance to the new switch; other side of the switch to the earth terminal.

The "local station" position is that in which the switch is "on."

### MEASURING RESISTANCE WITH A MULTI-RANGE METER.

E. T. (Charnmouth).—"I have a multi-range milliammeter, which the advertisement said could be used for measuring resistances, among other things. I am disappointed to find, however, that there are no instructions with it for doing this.

"As it is of foreign manufacture, I do not think it is any use writing to the makers. Can you tell me how it is done?"

It is quite easy to measure resistances with a milliammeter, but a working knowledge of Ohm's Law is necessary. Another essential requirement is a steady voltage, but this generally provides no difficulty, since a 2-volt accumulator will do, if it is not too newly charged, or nearing the run-down condition.

With such an accumulator, and a knowledge of Ohm's Law, the measurement could be effected as follows:

The resistance under test would be wired in series with another resistance that is variable and capable of limiting the current supplied by the accumulator to the maximum that can be read on the milliammeter's scale.

For example, if the instrument, with shunt, will measure up to 1 amp., the variable resistance must be capable of restricting a 2-volt supply to a current of 1 amp.—a condition that Ohm's Law says will be met by a resistance of 2 ohms; say 3 ohms in practice to give a safety margin.

At first the resistance to be tested is shorted, and the variable resistance is used "all in," to restrict the current as much as possible. This will give a reading on the milliammeter below its maximum.

The variable resistance is then carefully decreased, until the full-scale reading is obtained—in the case cited it will be 1 amp., and the resistance then in circuit will be exactly 2 ohms.

Then the resistance to be tested is "unshorted," to see how much this scale reading is reduced. The extent of the reduction will indicate the extra resistance that has been added—that is to say, it will tell how many ohms there are in the resistance under test.

A drop from 1 amp. to  $\frac{1}{2}$  an amp., for example, would indicate that the test resistance was exactly 2 ohms; this figure being arrived at by the application of Ohm's Law, as set out below:

The equation for Resistance is:—

$$R = \frac{V}{I}, \text{ where } R = \text{Ohms}; V = \text{Volts, and } I = \text{Amps.}$$

In this instance  $V = 2$ .  $I = \frac{1}{2}$ ; so the total resistance is  $\frac{2}{\frac{1}{2}} = 4$ .

This is the total resistance, from which the limiting resistance (2 ohms) must be deducted, thus leaving 2 ohms in the resistance under test. (The other resistances in circuit, short test wires and the milliammeter itself, are so low that they can be ignored.)

Smaller readings of milliamps, and so forth, can be used to test higher resistances of the value of thousands of ohms. But in such cases the value of the limiting resistance must be correspondingly high or the milliammeter will be burnt out.

You will note that the correct value of the limiting resistance for every change and the correct interpretation of the final reading depend upon the application of Ohm's Law.

## TELEVISION JOTTINGS

(Continued from page 688.)

comparable with the difference between a 1936 and a 1932 radio receiver.

I am not allowed to say any more than that in this particular case; but readers can take it for granted that, technically, there will not be much to find fault with in television when it is finally loosed upon them.

It's a curious thing, but I have had several letters recently from keen followers of the 30-line transmissions, upbraiding me for dropping my notes about them and ask-

ing why. Well the reason must be pretty obvious; I covered practically every point concerning them during last winter and the spring of this year and, presumably, there have not been many newcomers since then who have bought gear for receiving the low-def. transmissions.

Italy is now in the news in connection with television, although they were not believed to have progressed further than the stage at which all documentary evidence of interest was being collected and collated, and a laboratory equipped. The latest news is that high-definition broadcasts are to start almost at once, using a patented system about which no details are disclosed.

The new concentric cables are already being installed in the U.S.A., although that does not necessarily imply that they are

to be used for television at once. The beauty of a cable which has suitable characteristics for carrying a very wide range of frequencies is, of course, that hundreds of private telegraphic messages may be carried simultaneously or, as an alternative, a few dozen telephonic conversations.

One television transmission, however, occupies the whole available "space" in one go. I have seen demonstrations, in this country, of a "tone-frequency" system of telegraphy, whereby forty or fifty telegraphic messages could be handled on a perfectly ordinary cable. I wonder whether we shall see this applied to television?

From Germany again comes a rumour that television will be available to ordinary telephone subscribers very shortly. I am not sure that that is always an advantage. L. H. T.

# "I FIND IT AMAZING"



says Mr. G. V. Dowding, Associate I.E.E.,  
(Technical Editor of "Popular Wireless.")

Mr. Dowding's message, reproduced below, gives striking evidence of the startling improvement in reproduction and volume which the new 1936 Stentorian provides. Whatever your receiver, this new speaker cannot fail to bring you greater clarity, a new "forwardness" and realism, and a surprising extra volume. 1936 Stentorians have been specified exclusively for every important "constructor" receiver published during the "Exhibition period." Truly, in the words of one great journal, this new standard of performance is an "historic achievement"! Hear one of these remarkable speakers on your set to-day. The difference will amaze you!

Mr. G. V. Dowding, Associate I.E.E., Technical Editor of "POPULAR WIRELESS":

"In my opinion your new 'Stentorian Senior' marks a very definite step forward in sound reproduction. Knowing something of the intricacies and problems involved in the technique of Loud Speakers design, I find it amazing that such sensitivity and balance of response have been achieved.

"You are to be congratulated on what is one of the most praiseworthy radio developments of the year, and the Public is indeed fortunate in having the opportunity to acquire this latest W. B. advance at a reasonable price.

"You are certainly setting a hot pace in Loud Speaker design!

"As a technician I have gained great pleasure in running up and down the frequency scale of this new 'Stentorian,' noting the width of the audio spectrum which it encompasses and the absence of interfering resonances; and as a listener to the Broadcast Programme I have appreciated its wonderfully 'naturalistic' rendition of speech and musical items."

G. V. Dowding



Write for new leaflet.



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# 1936

# STENTORIAN

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## OUR READERS' OPINIONS

(Continued from page 687.)

thing really big; I managed to scrape together enough money to build the "Anglo-American Six." I went nearly bald over this one—it being several weeks before I could get it neutralised. When I finally got it going, I sold it for a sum which would buy a good radiogram now. About that period people would pay anything for a wireless set, and I made good money turning out 3-valve sets for £12 apiece, this being about half the sum other constructors were asking.

I religiously pored over "P.W." every week, and I can truthfully say that I have built, either for myself or customers, practically every star set which has been described in your excellent paper. As a matter of fact "P.W." led me to take up wireless as a career, and I have had much valuable experience in the Marconi Company, both at sea and ashore.

In conclusion I must say that my present set is the A.C. S.T.600, which I regard as about the best combination of three valves I have yet run across. Viva "P.W."!

Yours truly,  
Robt. B. Webster,

County Hospital, Workshop.

### FAULT TRACED TO SHORTED CONNECTION.

Sir,—I have been a reader of "P.W." for many years, and one of my experiences during the absorbing pastime of home construction concerns that famous receiver, the "National Eckersley Three."

I originally made up this set in the chassis form in which it was illustrated, but as it did not fit my existing cabinet very well I decided to re-build it on a flat baseboard. Having done so I proceeded with the preliminary tests. To my disappointment there was not a sound, but after the set had been switched on for a few minutes there was an alarming smell of burning rubber.

I hurriedly switched off, and to my astonishment found that the "Ohmite" bias resistance was hot. I eventually traced the fault to a short to the coil can in the lead from the H.F. transformer coil to the anode of the S.G. valve. After this was rectified and the damaged resistance replaced, the set was O.K.

This experience cost me a new resistance and a lot of valuable power out of a new H.T. battery, but I learned that "coil cans cut connections" (to quote "P.W.") and that cheap H.T. fuses are not to be relied on.

With best wishes to "P.W."

Yours truly,  
Stanley R. Taylor,

45, Minster Moorgate, Beverley, Yorks.

### A POPULAR STATION.

Sir,—With reference to the letter from F. A. Beane, Ridgewell, Essex, published in "P.W." for July 20th, I should like to express my hearty agreement with his remarks re the popularity of the famous Dutch station, Hilversum. For many years I have enjoyed their programmes of light music, and have before me now a letter from the A.V.R.O. dated November 23rd, 1928, which I received in answer to a request report on the broadcast programmes from Hilversum.

In those days my receiver was a det. 2 L.F. driving a horn speaker, but there was probably more fun in receiving Hilversum then than there is to-day. Nevertheless, I often switch on at 7.40 a.m. and tune in my old friend, whose early morning programme can generally be relied upon to please.

Yours truly,  
Stanley R. Taylor,

45, Minster Moorgate, Beverley, Yorks.

## THE KELSEY "PORTADAPTOR"

(Continued from page 692.)

It is in connection with operation that this particular application of the unit is different, and the correct procedure is as follows:

First adjust the tuning dials on your existing set to a wavelength of somewhere round about 2,000 metres and leave them set there. Now put the reaction condenser on the "Portadaptor" at its maximum setting and slowly tune with the main adaptor tuning dial. You need not again touch the adaptor reaction condenser, and you will hear stations simply by operating the one main control of the unit.

If your existing set incorporates a reaction control you can simplify reception and incidentally improve results by making use of it. Use it exactly in the same way that you use it for ordinary broadcast reception, but you must use it in conjunction with the tuning dial on the adaptor, and you must not touch the tuning controls on your existing set unless, if there is more than one control, you adjust them when you are actually listening to a short-wave station to ensure that they are accurately in tune. This will not, of course, be necessary if your tuning condensers are ganged.

### Using an External H.T. Battery.

You may be a little puzzled as to the purpose of the terminal on the "Portadaptor" marked "X." This is to enable you, if you desire, to use an external H.T. battery. You join the positive side of the battery to "X" and negative to the adaptor earth terminal, but the battery in the unit must be removed before you use an external one. Incidentally, when you do use an external H.T. battery, you can use anything from 60 to 80 volts, and the higher the voltage, within reason, the better will be the results. But if you take it too high you will probably get "ploppy" reaction trouble.

I think now that I have told you all that is necessary to enable you to get really down to business. May I hope that the "Portadaptor" provides you with many hours of fascinating amusement, and I shall be interested to hear how you get on.

### NEXT WEEK

Of vital interest to all set owners

## "FIRST AID FOR RADIO SETS"

Don't miss this special practical article



# OLYMPIAN IMPRESSIONS

(Continued from page 695.)

Aerial Messrs. Central Equipment had huge models of houses. Very good exhibition pieces these, with their realistic imitation brickwork and cunning illumination.

A surprise to me was the Marconi car radio, very attractively displayed with a beautiful model car and a full-sized wheel to demonstrate the placing of the controls.

There were also two huge diagrams brilliantly illuminated showing the circuit of the Marconi 264 set, and above these were metres illustrating the quiescent and non-quiescent current conditions of the receiver. Just the kind of exhibition display to appeal to the technical man this, and one which would have the incidental effect of creating confidence in the inexpert.

"After all," one can visualise a listener thinking, "if they can reveal the circuits of their sets in such a free and open manner they clearly do not fear criticism from the engineering fraternity."

The one-hundred-and-ten-guineas radiogram at the H.M.V. stand was making the mouths of visitors water, and there were many looking longingly at it. But I noticed a distinct backwardness in regard to the H.M.V. invitation to place a hand in a dark aperture of a box-like affair on which rested a set "and see what happens."

### The Black Paint.

But I stuck my hand in and the set at once started to work. A photo-cell arrangement, of course. But after a few seconds the set stopped. I took my hand out and tried again. The set worked for a short period and then stopped again.

"Rather temperamental?" I observed to the smiling attendant. "Oh, it won't keep on working," he said. He meant the set, for, you see, the idea was that it would switch on just for a second or two when you inserted your hand. Which was all very cunning and very nice except that I found afterwards that my hand had picked up three or four square inches of black paint from the interior of that box!

A most effective stunt on the H.M.V. stand, by the way, were the perspective pictures showing fortunate listeners luxuriously listening to H.M.V. sets. I am not even now quite sure how the marvellous "solid" effect was obtained in these pictures. They looked like either cleverly arranged models behind glass (but there was not sufficient depth as far as I could see), or some new stereoscopic effect.

### "Sleek, Glossy Thoroughbreds."

Probably the truth is that they were each fashioned from several photos arranged to fall at slightly different distances.

A feature of the Graham Farish display was the lavish provision of literature. One huge bench running right down the side of the stand was covered with neat little piles of leaflets and brochures. There was no sign of any reluctance on the part of the passers-by to take advantage of the opportunity afforded them to acquire "G.F." catalogues!

I thought that the Ekco sets were particularly well displayed. Or is it that

they are sets which lend themselves unusually well to an exhibition setting? I believe that is what it is for they are so modernistically attractive in their forms and colouring. Sleek, glossy thoroughbreds. And the Ekco car radio; magnificent apparatus. I really do believe that if Ekco so willed they could produce a steam-roller which art connoisseurs would travel across the world to see and admire.

A large stand in the Grand Hall was this year devoted to the subject of electrical interference. This stand was organised by the Radio Manufacturers Association, with the help of the P.O. But I am wrong to call it a "stand" for it was known officially as the Interference Bureau at which listeners could obtain free advice regarding their interference problems. In regard to interference, I noticed that K.B. prominently displayed their Rejectostat system which has now stood the test of time and emerged as one of the most successful innovations of the past couple of years.

### The Atlas "Bobbies."

A rather humorous note was struck by Messrs. Clarke's Atlas with their policemen figures, fat, jolly "bobbies" who put one in a good humour on sight and made one the more ready to appreciate the fine "Atlas" gear shown.

Westinghouse had their life test on show, as reported in previous "P.W.s." Metal rectifiers which have been operating on load continuously for eight years! They were naturally rather rusty looking and had the appearance of historic relics as compared with the neat, shiny modern Westinghouse rectifiers. But the point is that they were still successfully doing their job after no fewer than 73,000 hours.

One of the busiest stands was that of Messrs. Bulgin. When I visited it, there was tremendous activity, and it appeared to me that there was considerable trade buying going on behind the masses of constructors and others who were there merely to examine the interesting components and gadgets.

### Personality Means Success.

Colverns were also busy, and I noted that their genial managing director was present. I may be wrong, but I fancy that every really successful concern owes its success to the fact that it has a Personality (note the capital) behind it.

The familiar polar bears were again present on the Wingrove and Rogers stand, at which there were to be seen some fine examples of modern condenser engineering.

Whiteley Electrical had some rather "robotish" little figures among their decorations which were decidedly effective. Considerable interest was evinced in the new W.B. loudspeakers, particularly in the "Duplex," which is fitted with a horn "tweeter."

### High Standard Everywhere.

And now for the very difficult task of summing up. One thing, however, is very clear and that is that the Show revealed a remarkable uniformity of quality. The general standard of the British radio industry is a high one. There are sets and components which stand out above the others on account of their exceptional technical efficiency, or because of their

(Continued on next page.)

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## OLYMPIAN IMPRESSIONS

(Continued from previous page.)

rather superior value for money, but—and this is my view—the peaks are comparatively less predominant, and this for the reason that the general standard is higher.

### Disappointing Loudspeakers.

But I did not think that the loudspeaker reproduction heard at Olympia, en masse as it were, showed quite the advancement one might reasonably have anticipated. There were several loudspeakers, some in sets and some displayed separately, which were noticeable and decidedly pleasing exceptions to this. But, on the other hand, there were others which can only be described as rather poor as judged by modern criteria. Many sets which were otherwise quite remarkable achievements, taking price and everything else into consideration, were, in my opinion, spoilt because of the somewhat thin ineffectiveness of their loudspeakers.

As against this it is only fair to say that there were other receivers which carried their attractiveness right through to the output in the fullest possible measure.

### Those Small Sets.

I view with some alarm the apparent tendency to make sets smaller and smaller. It is possibly due to this that some instruments are not so good as they might be, in so far as their loudspeakers are concerned. You simply cannot obtain full bass and freedom from resonances from a moving-coil speaker squashed into a tiny cabinet together with all the other bits and pieces of a fairly complicated hook-up.

Mind you, it is possible to achieve considerable compactness with very expert design, and I am not saying that any set which looks neatly small is a washout—far from it.

As in most things there is a happy mean, and there can be no doubt at all but that many firms have struck this. I am not going to particularise at this stage, but I will say that the handful of firms who constitute the "big five" or "big six or seven" of the radio industry seem to have every detail of producing the best sets at the lowest price and in the neatest forms completely weighed up, and that the majority of the remainder are not so very far behind.

### Short-wave Virility.

The home construction movement as judged by Radiolympia is still full of vitality. There were many new components on show, and the increasing popularity of the short waves was very evident; not only was there much short-wave gear displayed, but, more importantly, there were many visitors keenly interested in it.

Yes, it was a great exhibition, successful both in its appeal to the public (this is proved by the attendance figures) and in its revelation of the progress made by the British radio industry. There may not have been much, if anything, that was revolutionary to be seen, it was more a vast display of the consolidation of advanced apparatus for ordinary listeners.

## THE SCOTTISH RADIO EXHIBITION

(Continued from page 685.)

If the people who actually design and make the valves do not know how best to employ them—well, frankly, who does?

Cossor sets, no less than Cossor valves, have achieved a world-wide reputation for reliability coupled with efficiency, and this year there is a Cossor set for everybody.

Among the many notable additions to the range, mention should be made of an entirely new table model radio gramophone because, at 16 guineas, it is probably the cheapest radiogram on the market, and of the new Cossor "high fidelity" radiogram because it is one of the most superb instruments available. Each of these magnificent instruments is in a class of its own.

The "high fidelity" radiogram, which is known as Model 836, costs 55 guineas, and it is undoubtedly one of the most ambitious sets in the whole Show. It is an 11-valve (including rectifier) superhet, with two super-power valves in push-pull in the output, giving 6 watts undistorted output. The gramophone side is fitted with an improved form of automatic record changer.

### High Quality At Low Price.

The name of Ferranti is, and always has been, associated with quality of reproduction, and it is quite evident that they intend to safeguard that enviable reputation in the range of sets that they have produced this year. There are several new and interesting models which you will be able to examine on their stand (No. 60), but perhaps the most important pieces of news about this exhibit is that it is now possible to obtain Ferranti quality for as little as 8½ guineas. Ask to see the "Una" consolette when you pay their stand a visit, and when you have examined it you will appreciate what a remarkable 8½ guineas-worth it is. The "Nova" consolette at 11 guineas is another Ferranti winner which you should not miss.

## NEXT WEEK

Full Details of  
THE "TWO-PEN"  
A high efficiency economy  
receiver for loudspeaker work

Two notable features of the G.E.C. range of sets this year are—first, a very fine battery S.G. three which sells complete with batteries and valves for £7 19s. 6d.; and, secondly, a super-quality A.C. mains superhet model which, with every possible modern refinement, is remarkably cheap at 13½ guineas.

The battery set, which is justifiably described by the makers as being in the "luxury" class, is undoubtedly one of the most attractive battery models at the price in the Show. The circuit employs a variable-mu H.F. stage and is provided with an economy pentode output, and battery consumption is kept very low by the inclusion of an ingenious-automatic biasing circuit. Excellent quality of reproduction is ensured by the inclusion of a powerful 8-inch permanent magnet moving-coil speaker, and the cabinet is designed to house the necessary batteries. This is an instrument that should not be missed by anyone who is interested in battery sets.

The super-quality mains set, which is known as the "Fidelity A.C.5," is claimed to reproduce accurately all the essential harmonics of every note in the musical scale. The set is a superhet, but to ensure this high standard of quality the band-pass width of the I.F. filters has been broadened to increase the high-note response, and this feature, coupled with the 10-inch

auditorium type dynamic speaker which is incorporated, provide remarkable fidelity of reproduction.

Perhaps the most apt description that can be applied to the range of sets that you will be able to examine on the "His Master's Voice" stand this year is "radio for the connoisseur at everyman's prices."

There is certainly a model to suit every taste and pocket, and we need hardly dwell upon the excellence of the sets exhibited, for the reputation of all products bearing the H.M.V. trade mark is far too widely known to warrant iteration by us.

### Most Comprehensive Range.

We feel in the case of this exhibit that we cannot do better than urge you to make a personal visit to the stand because, without any doubt, the H.M.V. range is one of the most comprehensive of all. On the score of outstanding interest, it is probably true to say that every receiver and radiogram of this famous make warrants inclusion in this review, but on account of considerations of space that is unfortunately impossible.

Perhaps, therefore, we had better confine our remarks to the most recently introduced model. This is a four-valve superhet console receiver of the universal type—that is to say, it can be used on either A.C. or D.C. mains. As is the case with all the other H.M.V. receivers, this newcomer is the last word in up-to-date radio practice, and there is little doubt that at the most reasonable price of 15 guineas it will make a very wide appeal indeed.

Much as we should like to tell you more of the many new sets which will be available for your inspection at the Kelvin Hall, not by all the literary efforts in the world do we feel that it is possible adequately to do justice to the tremendous progress that has been made. This article is intended, therefore, to direct your attention to certain of the exhibits which will tell their own story. And as a particularly happy note on which to finish, mention should be made of the really commendable way in which that old-established organisation—Marconiphone—has once again stepped into the limelight with a range of receivers and radiograms which is indeed second to none.

There is much that could be said of a eulogistic nature concerning the instruments with which they are marking the opening of the new season, but a visit to their stand will impress you far more than we can by a mere written description.

And when you do pay your visit to the Marconiphone stand, make a special point of examining their new model 235 receiver.

## ON THE AIR

(Continued from page 686.)

Tuning-in at random one evening I thought I had come across A. J. Alan in a surprise item. After a moment or two I could see my surmise was wrong. Actually it was C. Stanley Eke in "On the Road."

Bobby Howell and his Band struck me as being typically British. Quiet, tuneful, and well-balanced, with plenty of good filling stuff in the middle. In his broadcast he played tunes that seemed to me to be all of one type. To some ears this might prove monotonous. But not so to mine. I like a tune and rational harmonies. Bobby Howell provides both.

He gave a very interesting arrangement for three violins of "Smooth Sailing." It is rare among dance bands to hear prominence given to violins. Earlier in the day we had heard Reginald New at the organ play "Smooth Sailing." The comparison was interesting. Bobby Howell has at least two excellent soloists in Percy Renault and Chick Henderson. Here again the style isn't exaggerated and should suit the majority of tastes.

I was sorry for the announcer who had to read out the list of entries for the Welsh Sheepdog Trials. Have a heart, Wales!

At a time when Talks are out of season, it is pleasant to hear such a talk as the one Neville Cardus gave us on the first day's play of the last Test match. Mr. Cardus talks on cricket as well as he writes. And that is saying a good deal.

C. B.

Book of  
Practical  
Radio

3

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