

GREATLY ENLARGED NUMBER: COMPLETE GUIDE TO THE SHOW

# Practical <sup>3<sup>D</sup></sup> and Amateur Wireless

EVERY  
WEDNESDAY

Edited by F.J. CAMM

A GEORGE  
NEWNES  
Publication

Vol. 12. No. 310.  
August 27th, 1938.

AND PRACTICAL TELEVISION

## PRIZES!

### 25 W.B. SPEAKERS

#### Constructional Articles:

F. J. Camm's  
Push-button 3,  
Admiral 4-valver,  
Pyramid 1-valver,  
Short-wave 2-valver,  
Crystal Set,  
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interesting features

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# The set for YOU

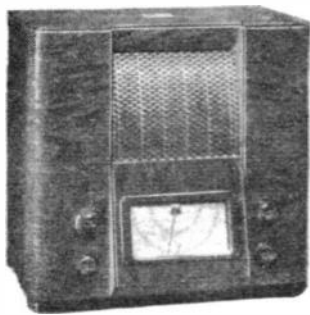


IS IN THE NEW RANGE OF

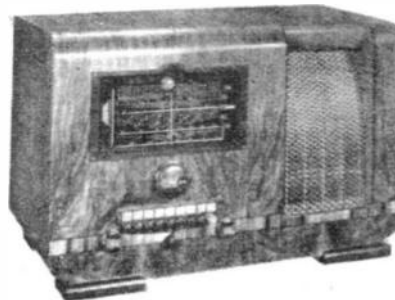
## "HIS MASTER'S VOICE"

# Radio

### RECEIVERS AND RADIOGRAMS



"HIS MASTER'S VOICE" 5-valve superhet table model 653 for AC mains. Three wavebands. Vernier scale. Separate controls for tuning, tone, volume, waverange. Pick-up sockets provided. CASH PRICE **10<sup>1</sup>/<sub>2</sub>** GNS. or by hire purchase. Also available with trowler waveband (70-200 metres) instead of 13.5-50 metres band. Model 653C at 11 Gns.

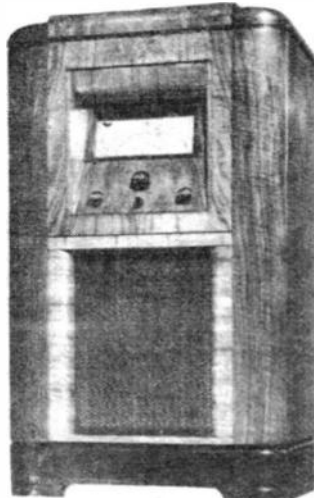


PUSH BUTTON 6-valve superhet receiver, model 657 for AC mains. Four wavebands. Eight push buttons for automatic tuning of principal stations, together with one enabling the set to be operated manually. Handsome **17<sup>1</sup>/<sub>2</sub>** GNS. walnut cabinet. CASH PRICE or by hire purchase.

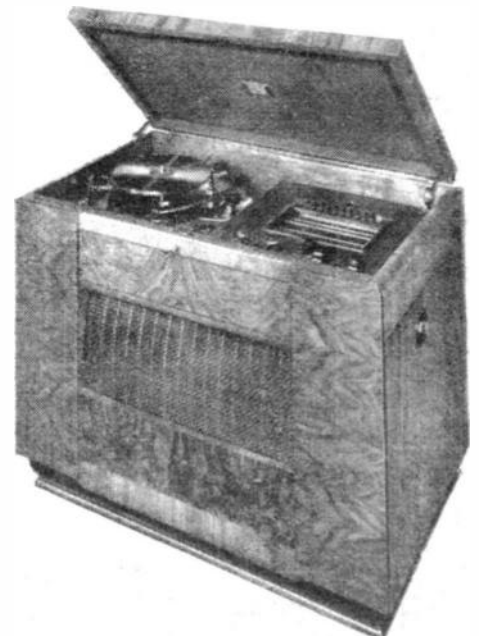
A GENERAL advance along the entire front is sounded in the new season's range of "H.M.V." Radio to be exhibited at Radiolympia, and presently to be seen, heard, and admired at your "H.M.V." dealers. Yet wider station-range . . . yet clearer reproduction . . . automatic and finger-spin tuning . . . modernity and dignity in cabinet design . . . irresistible price appeal, coupled with really easy hire purchase terms. Buy "H.M.V."—for home and beauty.

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- and
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40 YEARS' 'SOUND' EXPERIENCE

# NEXT WEEK: COMPLETE SHOW REPORT

**Practical and Amateur Wireless**

*First Souvenir Number*

**OLYMPIA**  
NATIONAL RADIO EXHIBITION

*Edited by F.J.C.A.M.M.*

*Technical Staff:*  
W. J. Delaney, H. J. Barton Chapple, Wh. Sch.,  
B.Sc., A.M.I.E.E., Frank Preston.

**VOL. XII. No. 310. August 27th, 1938.**

### Twenty-five Loudspeakers as Prizes

IN accordance with our usual policy, we are celebrating the Radio Exhibition by making a presentation of twenty-five of the latest W.B. Midget Loudspeakers. The speakers are to be awarded as prizes in a simple free-for-all competition, full details of which will be found on page 591. Remember there is nothing to pay and no irksome restrictions. Fill up the form on page 591 when you have found the mistakes in the circuit and send it as directed. The Editor of this journal will act as judge, in conjunction with the W.B. Engineers, and the result of the competition will be published shortly after the closing date.

### Broadcast Efficiency

FOR a recent broadcast it was necessary to have a background sound effect of a train journey. In order that realism could be imparted to this broadcast the B.B.C. fitted a microphone to the top of the Coronation Scot boiler front and a special recording van was coupled to the train. Records were then taken of the train starting, climbing Shap, arriving at and departing from Carlisle, climbing Beattock and arriving at Glasgow. A number of

further records were taken of the rhythms of the wheels and so on.

### B.B.C. Theatre Organ

FOR those listeners who are interested in the B.B.C. organ we can recommend the interesting handbook which has just been issued by the B.B.C., price 1s. (by post 1s. 1d.). With fine illustrations, this

a theatre of the intimate type, and a large area in Gloucestershire is served by it.

### "Brigade Exchange"

A REPEAT performance of this highly dramatic War story is to be given in the Regional programme on September 7th. Listeners who heard the original performance in 1930 will remember that this broadcast provides a sound picture of the activities in a dug-out on the Western Front in 1918, and the effect is vivid and ideal for a broadcast play.

## ROUND the WORLD of WIRELESS

explains many of the hidden mysteries of this interesting organ, and it is claimed that it is "one of the grandest and most versatile and satisfying theatre organs in the world."

### Orchestral Concert

THE B.B.C. Midland Orchestra will be conducted by Dr. W. K. Stanton, Midland Region's Musical Director, in a programme of classical music on August 29th. The chief work in this concert will be Mozart's Symphony in C.

### Variety Programme from Cheltenham

THEATRE variety on August 30th will be broadcast from the Opera House, Cheltenham, which has provided a number of broadcasts in the last three years. It is

### Sheep Fair

A RECORDED impression of one of the great sheep sales on the Welsh Border will be given for Regional listeners on September 2nd. The B.B.C. mobile unit will be at Kington overnight, and make the necessary arrangements to provide the sound effects of the arrival of over 20,000 ewes for the big auction sales in the morning.

### Halifax Organ Broadcast

NORMAN BRIGGS will broadcast on September 1st (Northern) for the first time at the organ of the Theatre Royal, Halifax. He will present a programme of popular music.



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# ROUND the WORLD of WIRELESS (Continued)

## Radio Amateur's Work Appreciated

IN a résumé of the decisions made at the International Telecommunication Conferences at Cairo, the current issue of *Electrical Communication* points out that, notwithstanding the increasing pressure of national and international requirements, the frequency bands allocated to amateurs and experimenters remain substantially those originally allocated at Washington in 1927. This is regarded as an appreciative recognition of the value of their work in the radio field. It is stated that there are approximately 70,000 amateur and experimental radio stations in the world, 50,000 of which are located in the United States of America.

## Electrical Recording at Berlin P.O.

A BERLIN post office has been equipped with electrical recording apparatus whereby the general public may "speak" letters instead of writing them. If the idea is well received the scheme will be extended to other centres in the Reich. The instrument is installed in a sound-proof telephone cabin which ensures privacy and secrecy. The cost of a five-inch gramophone record made in this manner is roughly 2s. 6d. for one side with an extra charge of half that amount if the reverse side is also used. Each record is supplied with a few needles for replaying, and is packed in a strong envelope for posting purposes. It is considered that many uses will be found for the record, but that in the first rush of the innovation it will make a special appeal to those ardent lovers, Hans and Gretchen!



The new "His Master's Voice" Table Television and All-World Radio Receiver (Model 904), costing only 29 gns. and giving a picture size 4½ ins. by 4 ins. It has wave ranges of 16.5-50, 200-570, and 725-2,000 metres. The instrument is here seen standing on the H.M.V. Instrument Table, which can be obtained for an extra 3 guineas.

## For Philatelists

THE Netherlands Post Office authorities have now issued a special postage stamp bearing a design including a view of Hilversum as the centre of Dutch radio activity.

## INTERESTING and TOPICAL NEWS and NOTES

### Italy's New Radio Network

FURTHER to our note on the subject in the August 13th issue, in addition to the Italian stations already in operation, Rome (100 and 50 kilowatts), Naples (10 kW), Catania (3 kW), Ancona (1 kW), Milan III (1 kW); Florence II (1 kW),

since 1931 when he left the Nation's Station for the East. He now broadcasts from WSAI from 11.15 to 11.30 a.m., E.S.T., Mondays to Fridays. WLW's "Top o' the Morning" programme will feature his hill-billy songs and guitar playing daily, except Sunday, from 6.00 to 7.00 a.m., E.S.T.

Jack's first occupation was punching mules on the Dukedom, Tenn., farm where he was born, but he gave that up when he punched one mule, fourteen chickens, four cows, and blew up one barn while dynamiting a mule into action.



An informal picture of Jack Doyle (famous boxer), Horatio Nicholls (world famous composer, otherwise known as Lawrence Wright, the music publisher), Jack Hylton (the well-known band leader), and Leslie Holmes (popular radio and stage artist), all discussing Horatio Nicholls' latest sensation, "The Blackpool Walk."

Genoa II (1 kW), as well as the short and ultra-short wave stations at Addis Ababa (Ethiopia) and at Monte Mario (Rome) have been lately brought into action. Turin II (5 kW) and Genoa II (5 kW) are almost ready for tests, and will be shortly officially inaugurated. Work is now being hurried on the construction of the 50 kW transmitter at Tripoli which is to be opened in October, and on the 10 kW Addis Ababa station, as well as on the building of the two 100 kilowatt and 50 kilowatt short-wave transmitters destined to the Rome (Prato-Smeraldo) centre.

### Light Entertainment from Bellahouston Park

THERE have been so many serious and straightforward broadcasts from the Exhibition that many listeners welcome the humorous revue, "Exhibition on Parade," the third edition of which will be presented on September 3rd. Jack House, the Glasgow journalist, who is well-known as a writer for the radio, has again been spending a good deal of time at Bellahouston Park in quest of the lighter side of showmanship. He has written the book and lyrics for which Douglas Steen has provided music. The producer will be Robin Russell.

### Jack Foy Returns to WLW

A NOTE from America informs us that Hill-Billy Jack Foy, one of the early-day WLW entertainers, is back in the fold again after some years of travelling about

## SOLVE THIS!

### PROBLEM No. 310

Atkinson had a three-valve receiver of the H.F., Detector and Pentode type which gave very good results on radio. He decided to use a pick-up, and connected this in the usual way to the grid circuit of the detector stage. He used the correct 1.5 volt grid-bias for this valve, but results were very disappointing, signals from standard records being harsh and of very poor quality. He had the pick-up tested by the makers, and it proved to be in order. He fitted the correct type of change-over switch in the grid circuit and correctly wired this. What was wrong? Three books will be awarded for the first three correct solutions opened. Address your envelopes to The Editor, PRACTICAL AND AMATEUR WIRELESS, Geo. Newnes, Ltd., Tower House, Southampton Street, Strand, London, W.C.2. Envelopes must be marked Problem No. 310 in the top left-hand corner, and must be posted to reach this office not later than the first post on Monday, August 29th, 1938.

### Solution to Problem No. 309

The grid battery which Mackay had was obviously of high resistance due to its condition, and when connected in the grid circuit it would prevent the output valve from operating properly. He could have connected it in the cathode lead in place of the bias resistor, but in any case a run-down battery of this type should be discarded.

The following two readers successfully solved Problem No. 308, and books have accordingly been forwarded to them: J. Robertson, Aukengill, Wick, Caithness, Scotland; W. Stonier, 36, Lynthorpe Road, New Moston, Manchester.

# An Open Letter to Our Readers and the Trade

By THE EDITOR



**G**ENTLEMEN,  
Many changes have occurred in our industry since my last Open Letter to you. If some of those changes have been for the time being negative in character, in my view they will eventually be to our benefit. In the first place, although the number of licences has increased, the sales of sets have declined, which indicates in a very certain fashion that the public cannot be lulled into a purchasing mood by flashing knobs of fancy tuning dials and other "selling points" which enable the high-pressure salesmen to break down what they like to consider as "sales resistance." The public is a good deal wiser than it was five years ago, and it is seeking not so much mechanical improvement as advances in efficiency. It does not want a dial engraved with hundreds of stations when the set only functions satisfactorily on half a dozen. Such a dial merely invites the aggravation of the customer and certainly adds to the discomfiture of the service engineers, who are left to answer the inevitable questions as to why the set will not receive all of the stations on the dial.

The public is also tired of the policy of the too-frequent production of new designs rendering previous models obsolete. You cannot deny that many members of the public have become annoyed with you when you have over-night converted their latest twenty-guinea model into one which is obsolete and which cannot be unloaded as a second-hand receiver except for a few shillings. That is bad marketing policy which may give you only a temporary advantage. I offer you the advice that you should stabilise your models and concentrate on improving the radio side of the set before you settle down to tinkering with the purely mechanical side.

Push-button tuning is being fostered by many firms this year and it is the hope of the trade that this innovation may help to elevate sales to their 1935 level. I sincerely hope that it does so, and that you are right in your belief that there are many thousands of people to whom the small task of selecting a station by normal tuning methods is an operation they ought not to be called upon to perform. I can readily believe that this is a feature of sets which will be welcomed by females. It may also prevent a great deal of ham-handed station searching and the resultant re-radiation to the annoyance of the neighbours.

Since the last Exhibition Sir John Reith has left the B.B.C. and his successor has not yet taken over his duties. It is my opinion that the change will not be for the better nor for the worse, for the B.B.C. is now running on lines where the duties of a Director-General (the military title seems most apt) have become merely routine. The B.B.C. methods have become so well established and deep rooted that it would be impossible to change them.

I would remind you that many manufacturers thought that all-wave receivers would encourage sales, but they have not done so. I think this is largely due to the fact that many of the short-wave programmes are not worth listening to, and, even when they are, they are accompanied even on the best of receivers by a mushy background which renders them comparatively unintelligible. The all-wave receiver in my view has a long way to go before it can claim to be anything more than a qualified success.

I note with pleasure that you have stabilised prices. This is good business policy in view of the number of firms who have failed and fallen in endeavouring to maintain an uneconomic price war.

The main motif of Olympia this year is to be television. It seems a pity that your posters are so futuristic in design that their purport and meaning do not reflect the clarity of radio reception and vision which you should instil in the minds of the public. The poster is a jumble, which even a surrealist would condemn. Many of you fear the competition of television, apparently forgetful of the fact that it may be some time before the provinces have television, especially in view of the failure of the coaxial cable scheme between London and Birmingham which was to be the first provincial district to have a television service. You are guilty of making the mistake of thinking that London's problem is the problem of the rest of the country. Television may compete against ordinary sound receivers in London, but not to any marked extent. It will, in my view, enlarge the market, not compete with an existing one.

Once again it is my duty to report that manufacturers have not given the attention to the home-constructor market which that market warrants. The market is still a large one, and in spite of the decline in the number of journals, the net sales of this journal are in just as healthy a position as they were last year. Fortunately, a number of firms have retained a sense of proportion and still cater for the home-constructor. Only a few firms have produced components for the home-constructor interested in television, and, as I reminded you last year, it is to the home-constructor that you will turn when you desire to know the results of your experiments. They are not problems which you can solve in your technical department.

I congratulate you in abolishing the cabaret at Radiolympia. This attracted the wrong type of public, and although it is my opinion that the gate this year will be less, I think the volume of business done will be greater. If you disagree with my views I shall be pleased to discuss them with you on Stand No. 9—Ground Floor.

Yours faithfully,  
F. J. CAMM.

# F. J. CAMM'S PUSH-BUTTON RECEIVER

## THREE

The First Home-constructor Push-button Receiver built round one of the New Automatic Units

ONE of the main features of this year's Radio Show is push-button tuning. This is familiarly referred to as "Push," "Press" or some other term, but in every case the arrangement indicates that a series of buttons are provided on the panel and when operated these tune to the various stations indicated. This process is carried out in two different manners. In one type of set the push-buttons automatically bring into circuit pre-set condensers ready tuned to the desired capacity, and in others a motor is brought into circuit and drives the tuning condenser. One special arrangement, however, causes a special type of condenser to be moved over a small angle and acts in a similar manner to normal tuning, except that pre-set stops are provided. In order that our readers may be fully up-to-date we are presenting here full constructional details of a standard broadcast receiver, in which the push-button feature is incorporated, and the accompanying illustrations show that this is both neat and simple to build.

The basis of the design is a standard three-valve circuit, in which a variable-mu H.F. pentode acts as an H.F. amplifier and is followed by a pentode acting as a grid rectifier. This is resistance-capacity coupled to a tetrode which feeds the speaker.

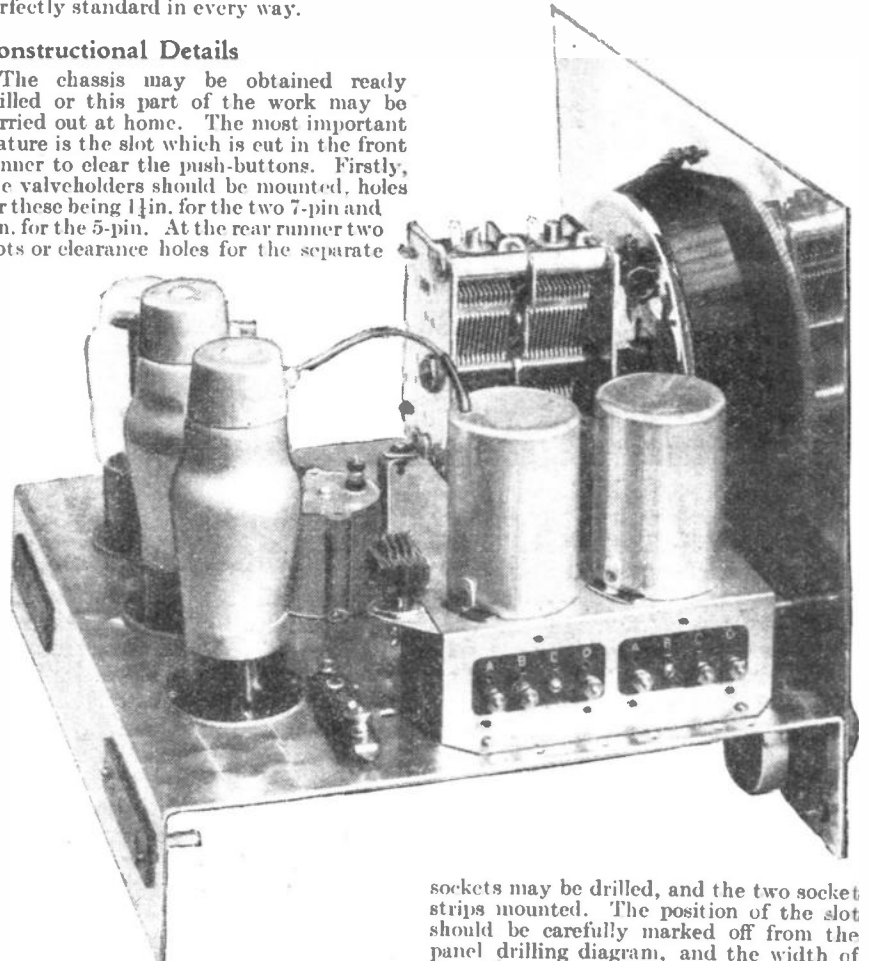
### Mechanical Details

A metal chassis and panel is employed for the receiver, as for the other models described in this issue. A standard two-gang condenser is employed for manual tuning, and is operated by a wavelength-calibrated dial and slow-motion drive mechanism. The two coils are of the screened type, and the on/off switch is operated by the wave-change switch which is fitted to the coils. The automatic tuning is carried out by means of a Bulgin 6-way push-button unit in conjunction with a set of ten pre-set condensers. One of the buttons, which is coloured white for identification purposes, brings into circuit the normal two-gang condensers for manual tuning. This is trimmed in the normal

manner, and when in operation the set is perfectly standard in every way.

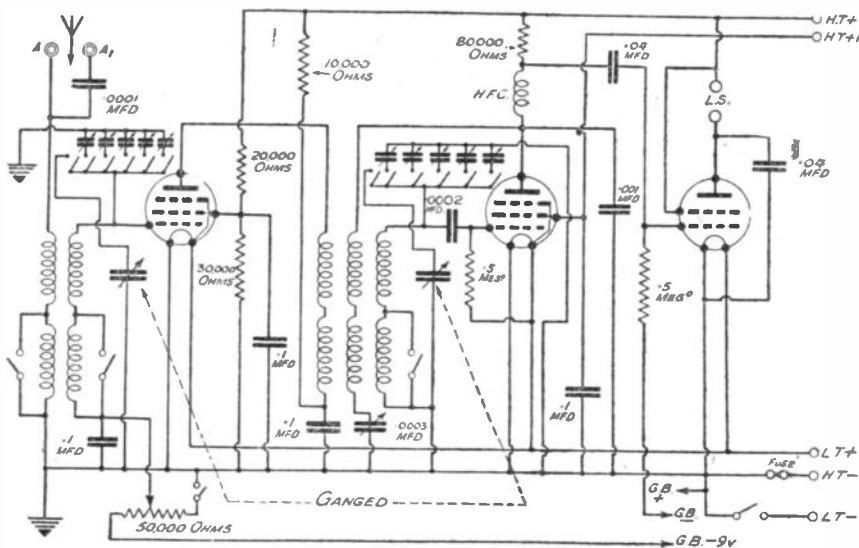
### Constructional Details

The chassis may be obtained ready drilled or this part of the work may be carried out at home. The most important feature is the slot which is cut in the front runner to clear the push-buttons. Firstly, the valveholders should be mounted, holes for these being 1 1/4 in. for the two 7-pin and 1 in. for the 5-pin. At the rear runner two slots or clearance holes for the separate



A side view of the receiver, fully assembled and ready for wiring. Note the clean layout and arrangement of the components.

sockets may be drilled, and the two socket strips mounted. The position of the slot should be carefully marked off from the panel drilling diagram, and the width of the slot should be 3/4 in., or just to clear the base of the buttons. The unit should then be carefully positioned and the two end fixing holes accurately marked off. Bolt the unit in position temporarily and place the escutcheon plate over the knobs so that the end fixing holes for this may be placed. It will be noted that the operating rods for the unit are supplied longer than are required for this particular set, and therefore two courses are open to the constructor. In our case, we cut off a short portion of each rod and mounted the push-button unit back from the chassis runner with 1 in. distance pieces. Longer pieces could be employed to avoid cutting the rods, but this would entail moving back the condenser unit, and the valveholders, and thus it is desirable to follow the procedure which was adopted in the original model. When the fixing holes are placed, the escutcheon should be removed, and the panel drilled from the panel drilling diagram.



Theoretical circuit of the push-button set.

### Wiring Details

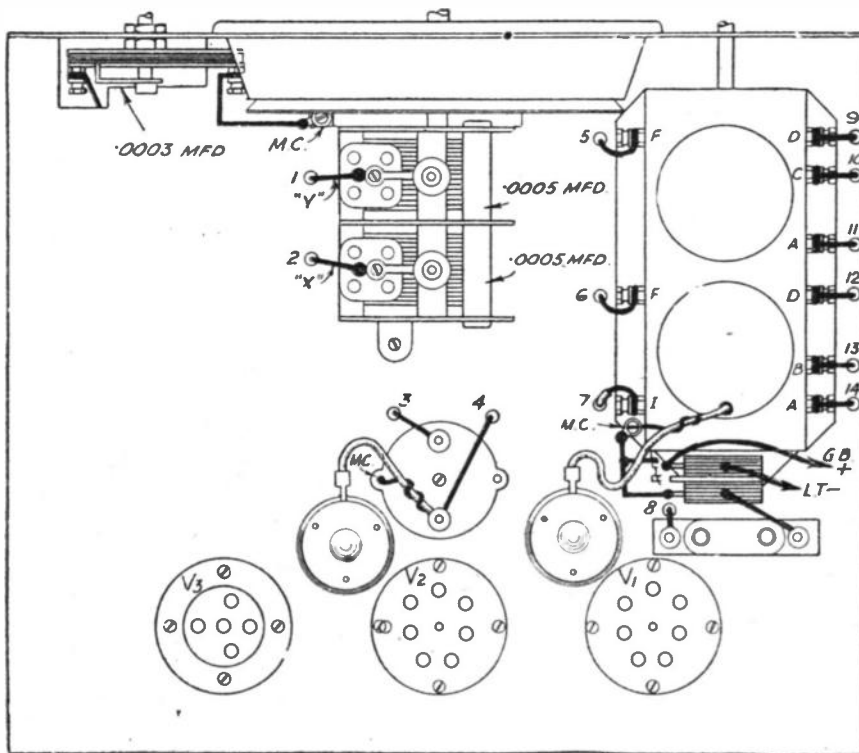
The panel may be bolted to the chassis before wiring is commenced, and before locking the nuts of the retaining bolts care should be taken that the push-buttons all operate cleanly in the holes and slot, and each one should return immediately a



second one is pressed in. Small mounting brackets will be needed for the gang condenser, and these may be made or obtained from the suppliers of the kit. The wiring will have to be carried out very carefully in order to ensure that the push-button mechanism will operate in the correct manner. The wiring diagram shows the switch with the two plates separated and identified, and it will be found desirable to make connection to the switch before assembling it. Lengths of tinned copper wire should therefore be joined to the points indicated, and the pairs of contacts shown bridged should be joined with a short length of the wire. When mounted, the leads may then be joined to the appropriate points and insulated with standard insulated sleeving. The remaining wiring may be completed from the wiring diagram or the theoretical circuit on page 572, and the receiver is then ready for testing.

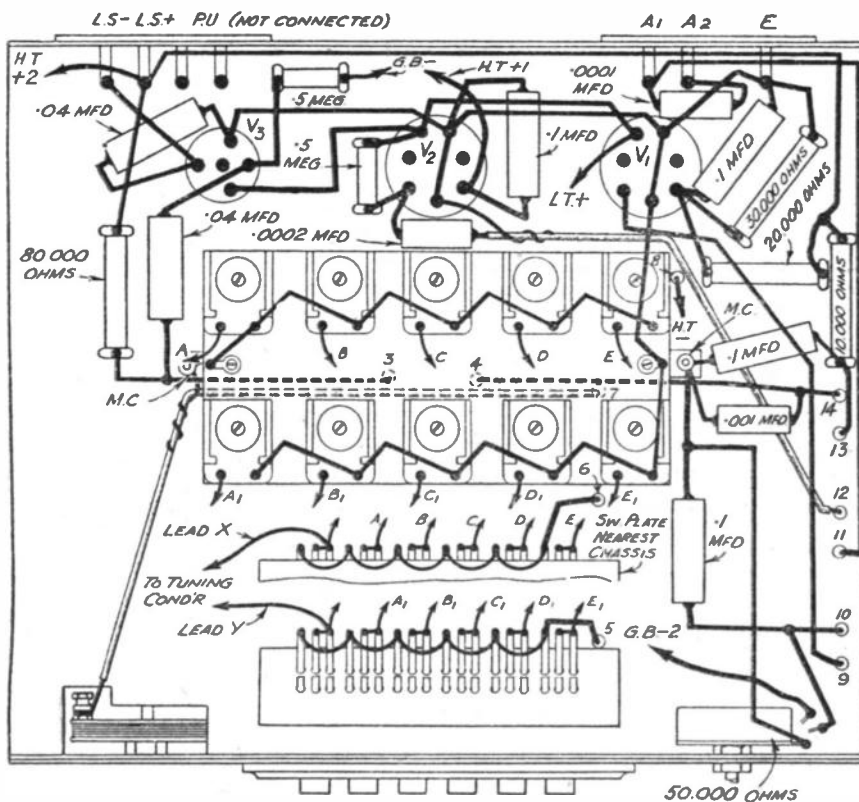
Notes on this, together with trimming details for the pre-set condensers will be given in next week's issue.

# Wiring Diagram of the Push-button 3



## LIST OF COMPONENTS FOR THE PUSH-BUTTON THREE-VALVE RECEIVER

- One semi-circular dial (Polar).
- One B.P.114 coil (Varley).
- One tuning condenser, 2-gang, .0005 bar type (Polar).
- One reaction condenser, .0003 mfd. Compax (Polar).
- One push-button switch, S.221, with knobs and escutcheon (E10) (Bulgin).
- Ten pre-set condenser (for values, see Editorial) (Bulgin).
- One series condenser, type 451, .0001 mfd. (T.C.C.).
- One grid condenser, type 451, .0002 mfd. (T.C.C.).
- One bias condenser, type 341, .1 mfd. (T.C.C.).
- One anode by-pass condenser, type 451, .001 mfd. (T.C.C.).
- Two screen condensers, type 341, .1 mfd. (T.C.C.).
- One coupling condenser L.F., type 451, .04 mfd. (T.C.C.).
- One tone condenser, type 451, .04 mfd. (T.C.C.).
- One H.F.C. H.F.9 (Bulgin).
- Three valveholders—two 7-pin, one 5-pin (Clix).
- Two grid-leaks, .5 meg. 1/2 watt (Erie).
- Two screen resistances—one 30,000, one 20,000 1 watt (Erie).
- One anode resistance, 80,000 1/2 watt (Erie).
- One anode resistance, 10,000 1 watt (Erie).
- One on-off switch, S.132 (Bulgin).
- Two terminal strips—A., A.1, and E., L.S. (Clix).
- One panel, 11in. x 9in. alu. (Peto-Scott).
- One chassis, 11in. x 2in. x 9in. alu. (Peto-Scott).
- One bias pot., 50,000 without switch (Erie).
- Fuse, 100 mA (Microfuse).
- Fuseholder (Microfuse).
- One valve, 210VPT, 7-pin metallised (Cossor).
- One valve, 210 SPT, 7-pin metallised (Cossor).
- One valve, O.T.220, 5-pin (Cossor).
- One 120-volt H.T. battery and one 2-volt 40 A.H. accumulator (Exide).
- One Stentorian loudspeaker (W.B.).



It will be noted that three connections are omitted in the above plan. The centre terminal on valveholder V3 should be joined to the L.S.+ terminal, and the two left-hand blank sockets of V1 and V2 should be joined to the L.T.— filament line.

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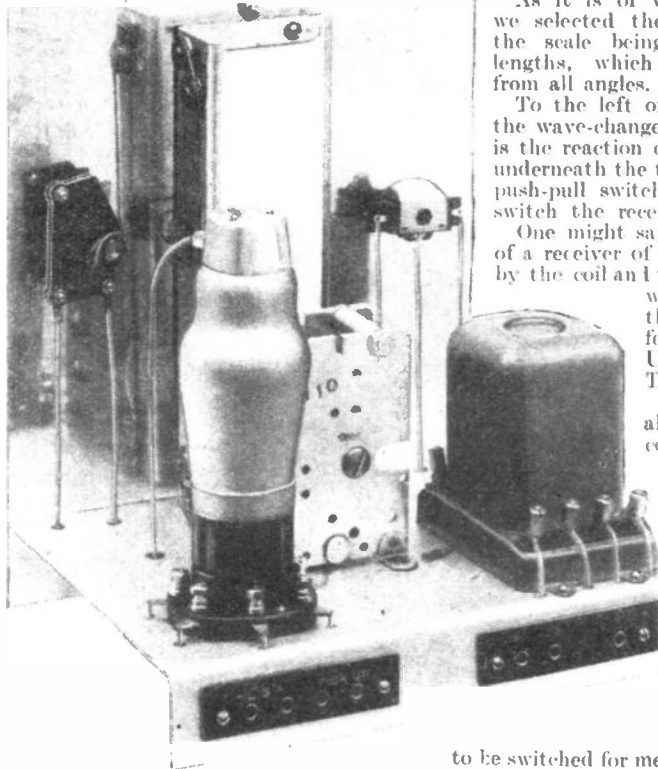
2d.—Every Wednesday.

# The "PYRAMID" ONE-VALVER

## Preliminary Details of a Modern One-valve Set

ONE of the most useful receivers for a beginner or anyone requiring individual reception is that employing a single valve in conjunction with an efficient circuit.

To provide a design of this type we have



apparatus combined with the highest degree of efficiency, and so arranged that the veriest beginner will experience no trouble with the constructional work.

From the appearance point of view, the panel, which is formed from machine-finished aluminium, and which supports the three controls, makes the receiver distinctive and quite professional.

As it is of vertical oblong shape we selected the Polar vertical dial, the scale being marked in wavelengths, which are clearly visible from all angles.

To the left of the dial is situated the wave-change switch, to the right is the reaction control, while directly underneath the tuning-knob is a small push-pull switch which is used to switch the receiver on and off.

One might say that the efficiency of a receiver of this type is governed by the coil and the valve: therefore, we have selected for these two essential features the Wearite Unigen coil and the Tungram H.P.210.

The coil windings allow the aerial coupling coil and the grid coil

to be switched for medium and long waves, and advantage is taken of this to secure the maximum selectivity. In this direction alternative aerial connections are also provided, so whatever type of aerial is used,

it should be possible to secure the most satisfactory operating conditions.

The tuning and reaction are controlled by Polar variable condensers, which allow a very smooth action to be obtained. The advantages and disadvantages of triode versus pentode valves were explored to the fullest extent, and it was finally decided to use a straight H.F. pentode as a leaky grid detector, as the gain obtainable more than repaid for the slight addition of cost and wiring.

With correct screen voltage, this type of valve forms one of the most efficient detectors, and as the headphones are connected to the anode circuit of the valve via a resistance-capacity coupling, the maximum output is secured with the minimum of distortion.

This arrangement also serves another purpose. In many cases, it will be desired to use a battery eliminator which, if of the D.C. type, is in direct contact with the mains supply, and this might raise some doubts regarding the advisability of using headphones. The resistance-capacity output, however, removes any fears that one might have in this direction, as the headphones are isolated from any direct current voltage.

Again, it may be necessary at some future date to add an L.F. amplifier to the "Pyramid." Through embodying the output circuit mentioned above, such additions will be rendered quite simple.

To simplify the wiring a small metal chassis has been used, and it also allows the panel to be securely fastened by two bolts.

This three-quarter rear view of the "Pyramid" One-valver shows the business-like layout which is adopted.

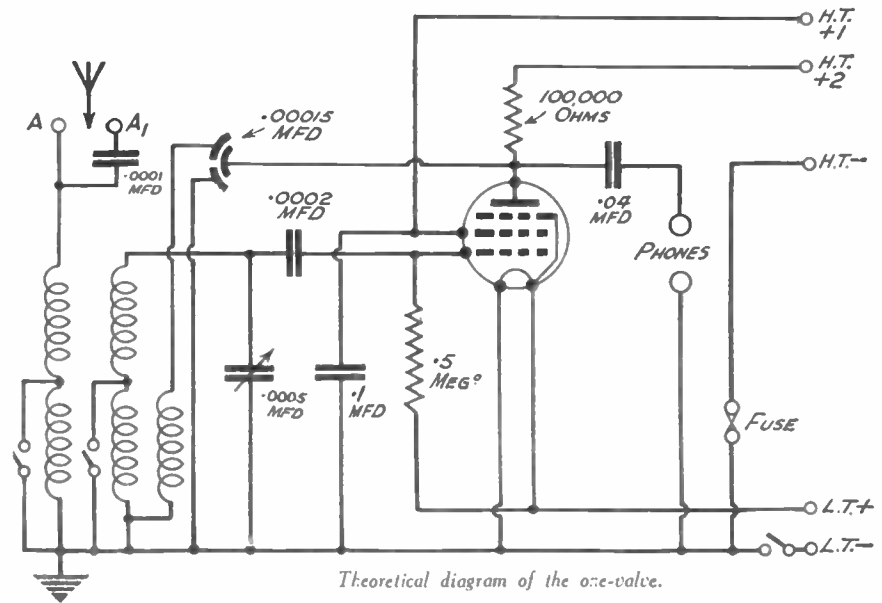
produced the "Pyramid" receiver and, as with all our designs, we have spared no trouble to produce a simple piece of

to be switched for medium and long waves, and advantage is taken of this to secure the maximum selectivity. In this direction alternative aerial connections are also provided, so whatever type of aerial is used,

### NEXT WEEK!

Wiring Diagrams and Further Details of the Receivers described in this Issue.

- LIST OF COMPONENTS FOR THE "PYRAMID" ONE-VALVE RECEIVER**
- One vertical C.K. dial (Polar).
  - One No. 5 tuning condenser, No. 5 .0005 (Polar).
  - One reaction condenser—Compax differential, .00015 (Polar).
  - One Unigen coil (Wearite).
  - One valveholder—V.H.22 (Bulgin).
  - One grid condenser—type 451, .0002 mfd. (T.C.C.).
  - One anode condenser—type 451, .0003 mfd. (T.C.C.).
  - One coupling condenser—type 451, .04 mfd. (T.C.C.).
  - One series condenser—type 451, .0001 mfd. (T.C.C.).
  - One screen condenser—type 341, .1 mfd. (T.C.C.).
  - One grid leak—.5, 1-watt (Erie).
  - One anode resistance—.1 meg., 1-watt (Erie).
  - One switch—S.114 (Bulgin).
  - One switch—S.22 (Bulgin).
  - Two terminal strips—1.3 sockets—A., A.1, and E., 1.2 sockets, L.S. (Clix).
  - One panel—9½ in. x 7½ in.—Alu. (Peto-Scott).
  - One chassis—7½ in. x 6 in. x 1½ in.—Alu. (Peto-Scott).
  - Fuse—100 mA. (Microfuse).
  - Fuseholder (Microfuse).
  - One H.P.210 metallised valve (Tungram).
  - One pair earphones (Ericsson).
  - One 120-volt H.T. battery (Exide).
  - One 2-volt 40 A.H. accumulator (Exide).
  - One Stentorian loudspeaker (W.B.).



Theoretical diagram of the one-valve.



# ON YOUR WAVELENGTH



## Welcome!

A HEARTY welcome to every reader on the occasion of the 17th Radiolympia, and a particular welcome to Stand No. 9—Ground Floor. It was not so long ago that the wall stands at Radiolympia were somewhat crowded with various periodicals. To-day, only two of them remain. I take pride in the fact that this journal is one of those two—the oldest and the youngest side by side. The others for one reason or another have fallen by the wayside. It could not have been for want of interest in home construction, for the net sales of this journal are healthier to-day than they were a year ago. This journal immediately took the lead in editorial policy and in net sales. It has been present at 7 exhibitions, and the portents are that it will be present for many more. We are on the eve of great developments in home construction, for it is my belief that television will create a vast new army of home-constructors. Just as soon as the moment is ripe this journal will describe practical television receivers as it has done in broadcast receivers.

It has been my privilege to examine the Exhibition before it is opened to the public. You will not have had time if you are in the provinces to have visited it at the moment you receive this issue. You owe it to yourself, however, to go, for design has taken a marked step forward since last year, and the television demonstrations alone will make it worth while. When you call do please look me up!

## Two New Handbooks

SPECIALLY produced in time for Radiolympia are the two new PRACTICAL AND AMATEUR WIRELESS Handbooks—the first is entitled “The Practical Wireless Service Manual,” and the second, “Wireless Transmission for Amateurs.” Both may be inspected on our Stand. The first volume is opportunely produced in view of the fact that there are 50,000 people in this country engaged in the profession of wireless servicing. This is now a definite profession with attractive prospects, for good salaries are paid to people who rapidly diagnose the faults and apply the necessary remedies. The book will be found a

## By Thermion

useful tool to amateurs and professionals. The contents include:

Choice and Types of Instruments, Fault Tracing without Instruments, D.C. Multi-range Milliammeter, Measuring Resistance, Measuring A.C. Voltages, Measuring Capacity, Using the Universal Meter, A Valve Voltmeter, An L.F. Oscillator, Calibrating and Using the Valve Voltmeter, Calibrating and Using an L.F. Oscillator, A Signal Generator, Tracing Faults in a Superhet, Trimming and Aligning Receivers, Testing Valves, Valve Replacement, Reaction Faults.

Improving Old Sets, Universal (A.C.-D.C.) Receiver Faults, Checking Receiver Performance, Distortion—Causes and Cure, Tracing Sources of Interference, Temporary Repairs and Substitution, Adapting Milliammeters, Renovating Cabinets, Servicing with the Cathode-Ray Tube, Tracing and Eliminating Hum, Simple Tests for Components, Adjusting and Testing Coils, Servicing Commercial Receivers, Second-channel Interference, Checking Performance, Background Noises, Loudspeaker Faults and Remedies, Equipping a Service Workshop, Wireless Calculations, Colour Codes.

It costs 5s., or by post 5s. 6d.

The second book is an ideal introduction to the fascinating field of amateur transmission.

It deals with every aspect of the subject from the obtaining of the licence to fundamental principles, erection of aerials, the various transmitting circuits, equipping a station, building transmitters, modulation systems, tables and formulæ. Each volume is neatly bound in cloth, printed on good paper, and fully illustrated; the Transmitting Book costing 2s. 6d., or 2s. 10d. by post.

## Funny Story

THE following story sent to me by V. R. S., of Cambridge, was written in the hope that I would believe it not. I invite you to do the same, and for that purpose I print it: “A dear old lady possessed a beautiful radio costing at least 35 guineas. She rang up the suppliers to say that it had failed. A service man arrived with the test gear and valves for replacement. He switched on, tuned in the National, and there it was. Being a salesman, too, he fitted new valves and convinced her that it was now much better—almost as good as new! Just as he returned to his place of employment, the 'phone rang again. The dear old lady wished to speak to the Manager as the set still did not work. The Director, himself a capable engineer, paid a visit. After apologising he switched on, waited a second or two for warming-up, twiddled the tuning-knob, and there was the station again. ‘But,’ said the dear old lady, ‘you turned that knob.’ ‘Certainly, madam.’ ‘Oh, but I have not altered it since you installed it two years ago.’” Those press-button salesmen will find this lady an easy customer.

## Press-button Tuning

I WAS taken to task some weeks ago by a manufacturer interested in supplying parts for press-button tuning sets because I had dared to say that I thought that press-button tuning was a mechanical improvement, and that manufacturers should have remedied other parts of their sets first. Herewith quotation from one of our trade papers: “It is childish to talk of press-button tuning as being capable of stopping that stampede (dealers deserting the trade owing to the competition of television). There is nothing new in automatic tuning; certainly not enough to make the man who owns a set without it buy one when he is being told by Radiolympia of the imminence of television.”

Whilst television will certainly become popular, I think most of these critics overlook the fact that the television service area is confined to London. It cannot, therefore, affect the sales of receivers in the provinces.

### That Cheap German Receiver

THE Nazi Government proposes to back the marketing of 700,000 35s. two-valve mains receivers to implement its four-year plan for saving metals such as copper, zinc and tin. These sets were seen at the Berlin Fifteenth Radio Exhibition, and one of the manufacturers has dispensed with the metal chassis altogether and uses pressed board. The set receives the local station and the long-wave National, which is another way of ensuring that the German nation is even more closely muzzled and listens only to Hitler's views as spread through his official mouthpieces. It is evident that the German Government does not wish German citizens to listen to the broadcasts from other countries. It is with some concern that I note that methods are being adopted over here to muzzle the British Press, the chief weapon being the Official Secrets Act. At the Berlin Show a number of very short cathode-ray tubes were shown, although the size of the screen is normal. Germany proposes to continue the provision of free viewing facilities. Automatic tuning is not popular in Germany.

### The Etheric Aerial

MR. T. McC., of Kingston-on-Thames, *apropos* my recent paragraph, sends me the following details of his aerial:

"The fundamental basis of my invention consists in providing lengths of intensely-strained wire or the like, the strain being imparted through the medium of springs, coiled, spiral or otherwise tensioned, so as to render them more susceptible to radio or electrical impulses.

"In carrying out my invention, I provide a wooden or other frame, whereon I stretch wires from end to end having springs at each end so as to render the tension of an elastic or resilient nature; two connections from the wires are made—one to the wireless set, and the other to earth.

"During the past three years I have experimented with all kinds of straining devices, also different metal wires (paramagnetic and diamagnetic) of all degrees of thickness, etc. etc., and have now got the device boiled down to a commercial basis, and intend putting it on the market at a price of 3s. 6d. or 4s. Besides acting as a handy indoor aerial (3ft. long) it is also of great utility if used in the audio frequency circuit, where it must be inserted in both leads—otherwise there is trouble.

"It is hardly possible to explain the *modus operandi* of my invention in this letter, but—as I said before—I will be glad to demonstrate it working



### Meter Readings

A PROBLEM was recently put forward by a reader who was testing a receiver with a multi-purpose meter and who could not decide upon the reading obtained. It appeared that the meter had a series of voltage ranges, obtained with a selector switch, and when on a high voltage range he obtained a reading of just over 100 volts. To make quite certain what the reading was, he used the next lower range which read slightly more than 100 volts, and he then found that the reading was only slightly above 60 volts. He thought the meter was out of order, but this was not so. On the high voltage range the total current flowing through the meter would be less than on the lower range, owing to the higher resistance of the meter, and thus this would be the more accurate reading. The voltage being tested was probably the screen voltage, where the additional drain of the low resistance meter would considerably modify the voltage actually applied to the circuit.

### Oscillator Adjustments

A PROBLEM which often besets the beginner when using a simple superhet converter is the fact that stations are received at two separate settings. This problem will also arise if a superhet is employed in which the oscillator is separately tuned. The reason is that the intermediate frequency is obtained when the oscillator is tuned both above and below the signal frequency. The correct setting to employ cannot be stated definitely, although in most cases the best results will be obtained when the oscillator is tuned to the lower frequency.

### Ineffective Screening

WHEN metal screens are employed between stages in a receiver it may be found that the screening appears to be ineffective. This may be due to several reasons, but it is important to bear in mind that the screening will not act in the desired manner unless it is complete. This means that the separate pieces of a complete screen must be bolted together so that no gaps or air spaces are left, and it may also be found that it must be made in such a manner that it forms a complete box—with top and bottom. An obstinate superhet was recently tested where oscillation could not be avoided until the chassis (which was of metal) was placed upon a sheet of metal so that it was closed in entirely. The underside screens had been made exactly to the depth of the chassis and this enabled each section to be enclosed by the bottom plate.

at your office or elsewhere, or perhaps you might be in this vicinity."

### Back Numbers

D. WAREHAM, Ashford, Middx., says that he has a limited number of PRACTICAL AND AMATEUR WIRELESS which he would like to dispose of. He will supply these free to the first person who applies for them, and who is agreeable to paying the carriage. Letters should be sent to me marked "Ashford."

### Trade Union for Service Men

I LEARN that during Radiolympia efforts will be made to form a Trade Union for Radio Service Engineers. It is said that there are no fewer than 10,000 such engineers in London alone. As it is a comparatively new profession they have not yet been organised. The task of organising them would be left to the Electrical Trades Union. In view of the fact that service men are called out at all hours of the day and night, I am wondering how the Trade Union will go on about the eight-hour day?

### Autumn Plans for Outdoor Television

I AM informed that Euston Station will be visited by the B.B.C. mobile television unit on September 18th and 19th to show viewers the exhibition and celebrations with which the L.M.S. is commemorating the Centenary of the opening throughout of the London to Birmingham Railway, the first main-line to London. On September 18th the cameras will be taken along the platforms to show the exhibition of rolling stock and engines from the earliest days to the present time—passenger coaches more than a century old and saloons used by Queen Adelaide and Queen Victoria, and the latest types of rolling stock including a three-car Diesel train. On September 19th viewers will see the start of the "Coronation Scot" and some of the commemoration ceremonies in Euston Station.

The first outdoor event after Radiolympia will be the televising of the British Empire Cup Pony Race at Northolt on September 5th. Five days later one of the mobile television units will be installed at Wapping, to give a pictorial survey of the work of the river police. During the autumn it is hoped to pay a return visit to the Pinewood Film Studios, where "shooting" will be in progress of scenes from "The Mikado." At the end of September it is hoped to show viewers how police horses are trained at Imber Court.

# The "Fleet" S.W. Two

A Simple 2-valver for the Short Waves—Designed for the Beginner and Expert

**N**O programme would be complete without a short-waver, so we have designed the "Fleet" receiver to cater for those who are interested in short-wave reception.

While there are many opinions as to the most suitable circuit arrangements, it was decided to combine constructional simplicity with maximum efficiency and use, therefore, the reliable detector-L.F. combination.

With only two valves in use it was

gives an amazing over-all amplification. Particular attention has been paid, however, to the signal/noise ratio.

In the aerial circuit a plug-in coil is used which enables the correct degree of

socket is provided which has in series with it an air-spaced variable condenser of the pre-set type.

Band-spread tuning is used, the tone condenser being mounted on the left of the panel, while the band-spreader is mounted in the centre and controlled by a dual-ratio slow-motion drive.

In the anode circuit of the detector valve is a short-wave H.F. choke, which not only effectively prevents undesirable H.F. currents from passing through into the L.F. stage, but also guarantees a smooth and progressive reaction control.

The coupling between the detector and output pentode is by means of a parallel-fed transformer, this method being used to safeguard against transformer breakdown and to provide sufficient decoupling of the detector anode circuit to reduce the possibility of instability through feed-back.

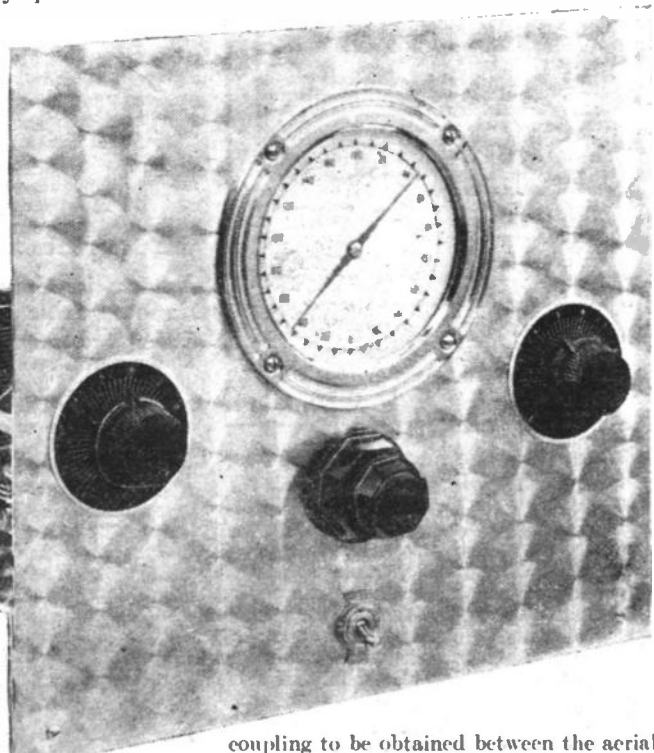
As additional precautions, however, the H.T. supply is by-passed to earth through a .5 mfd. condenser; an H.F. stopper is fitted in series with the grid of the pentode, and a by-pass condenser joined between the output anode and earth.

### Constructional Details

With a receiver of this type it is essential to provide adequate screening to prevent undesirable hand-capacity effects, and in this direction metal has been used for both panel and chassis.

As regards the chassis, the chief work will be drilling 1 1/2 in. holes for the two 7-pin valveholders and a 6-pin coil holder, and the necessary clearance holes for the location of the two Clix sockets strips which are fitted to the rear runner.

All the components can be mounted on the panel with the exception of the band-spread variable condenser and its associated drive, and the panel then bolted to the chassis.

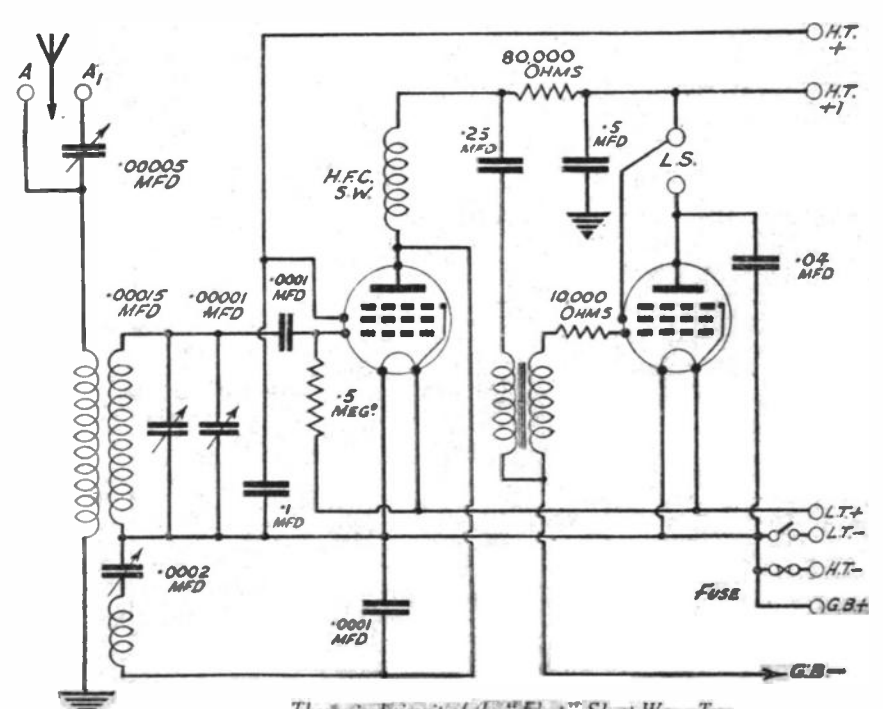


A general view of the two-valver.

essential for the design to be such that they would give their maximum gain; for the detector valve, therefore, a straight H.F. pentode is used as this enables a very high magnification to be secured which, when fed into a high-gain output pentode,

coupling to be obtained between the aerial and grid circuits on all wavebands. To allow the utmost efficiency to be obtained on various types of aerials, an alternative aerial

- LIST OF COMPONENTS FOR THE "FLEET" S.W. TWO-VALVE RECEIVER.**
- One Airplane degree marking dial—dual ratio (Jackson).
  - Two tuning condensers—.00015 S.W. Special, and .00015, Midget U.S.W. (Jackson).
  - One .0002 Diacon reaction condenser (Jackson).
  - One .00005 aerial series condenser (Jackson).
  - One S.P.3 coil and holder (B.T.S.).
  - One .0001 type 4601/S grid condenser (Dubilier).
  - One .5 type 4608/S H.T. condenser (Dubilier).
  - One .0001 type 4601/S anode by-pass condenser (Dubilier).
  - One .25 type 4606/S coupling condenser (Dubilier).
  - One .04 type 4601/S tone condenser (Dubilier).
  - One .1 type 4603/S screen condenser (Dubilier).
  - One .5 type 1-watt grid leak (Erie).
  - One 80,000 ohms 1-watt anode resistance (Erie).
  - One S.K.T. L.F. transformer (B.T.S.).
  - Two valveholders—one 7-pin V2, one 5-pin V1. Chassis type (Clix).
  - One switch, S.102 (Bulgin).
  - Two scales, I.P.7 (Bulgin).
  - Two terminals trips—A, A1—and E, L.S. (Clix).
  - H.F.C., S.W., (B.T.S.).
  - Panel: 10 in. x 9 in. alu. (Peto-Scott).
  - Chassis: 10 in. x 2 in. x 7 in. alu. (Peto-Scott).
  - Fuse: 100 mA (Microfuse).
  - Fuseholder (Microfuse).
  - Two valves, H.P.210 and P.P.225 (Tongsram).
  - One pair earphones (Ericsson).
  - One 120-volt H.T. battery and one 2-volt 40 A.H. accumulator (Exide).
  - One Stentorian loudspeaker (W.B.).



Technical circuit of the "Fleet" Short-Wave Two.



A PAGE OF PRACTICAL HINTS

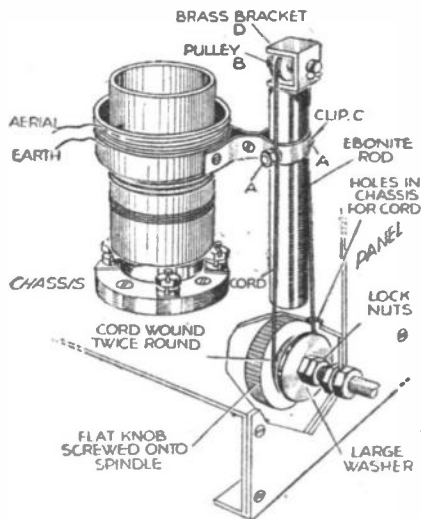
SUBMIT YOUR IDEA

READERS WRINKLES

THE HALF-GUINEA PAGE

An Adjustable Coupling Device

THE sketch shows a variable coupling coil I have made for my S.W. receiver. The pulley B is a large terminal mounted on bracket D which is screwed to the top of the ebonite rod, the lower end of which is, of course, screwed to the chassis. Clip



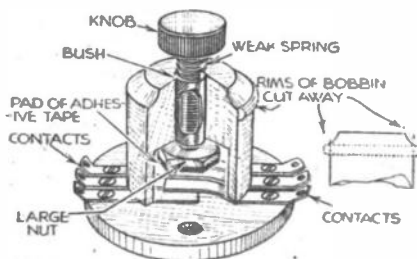
A simple adjustable coupling device.

C is a piece of thin brass made to the shape shown, and A is a small bolt soldered to C, for anchoring the cord.

If clip C is carefully made it will move smoothly up and down the ebonite rod allowing the most minute adjustment of the coils, and in conjunction with a dial and pointed knob will be found extremely useful.—R. PHILPOTTS (West Cramlington, Northumberland).

A Simple Screw-down Switch

WHEN trying out some remote control circuits I needed three press-buttons to be controlled by one knob. I could not



An easily-made screw-down switch for experimental purposes.

obtain apparatus of this kind anywhere, so I adopted the simple dodge illustrated. The hole in the bobbin is widened to 3/16 in. for about half-way up. The insulator (which is the sleeve of a disused plug) is not needed if the screw already fits the hole in the bobbin neatly.—H. NEWTON (Murton, Co. Durham).

THAT DODGE OF YOURS!

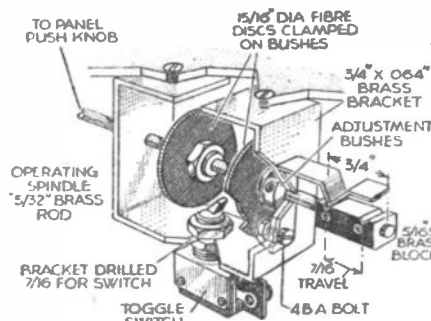
Every Reader of "PRACTICAL AND AMATEUR WIRELESS" must have originated some little dodge which would interest other readers. Why not pass it on to us? We pay £1-10-0 for the best wrinkle submitted, and for every other item published on this page we will pay half-a-guinea. Turn that idea of yours to account by sending it in to us addressed to the Editor, "PRACTICAL AND AMATEUR WIRELESS," George Newnes, Ltd., Tower House, Southampton Street, Strand, W.C.2. Put your name and address on every item. Please note that every notion sent in must be original. Mark envelopes "Radio Wrinkles." DO NOT enclose Queries with your wrinkles.

SPECIAL NOTICE

All wrinkles in future must be accompanied by the coupon cut from page iii of cover.

Operating Mechanism for Sub-chassis Toggle Switches

TOGGLE switches mounted below the chassis (to suit short wiring and layout) are difficult to adopt for panel operation. The simple yet robust mechanism illustrated which has given every satisfaction, possesses a locking action to prevent spindle backlash and is easily constructed. Two bushes, holding operating discs, are fixed to a 5/32 in. dia. brass



A method of operating chassis toggle switches.

rod by means of set screws. The vertical faces of the brass mounting bracket are drilled to allow easy spindle movement parallel to the chassis. The upper bracket faces are tapped for fixing the mechanism, whilst the

NOW READY!

WIRELESS COILS, CHOKES AND TRANSFORMERS, AND HOW TO MAKE THEM.

2/6, or 2/10 by post from Geo. Newnes, Ltd., Tower House, Southampton Street, Strand, London, W.C.2.

lower face is drilled 3/8 in. dia. to receive the toggle switch. Secured to the extreme end of the spindle is a 3/8 in. square brass block (3/4 in. long): V-shaped grooves upon the sides of the latter engage with the locking spring at the "on" and "off" positions of the spindle, the travel of which is approximately 3/8 in. The mechanism has a definite "snap" action, and its simple adjustments are effected entirely by the two bush set screws.—WM. A. HARRISON (Aintree).

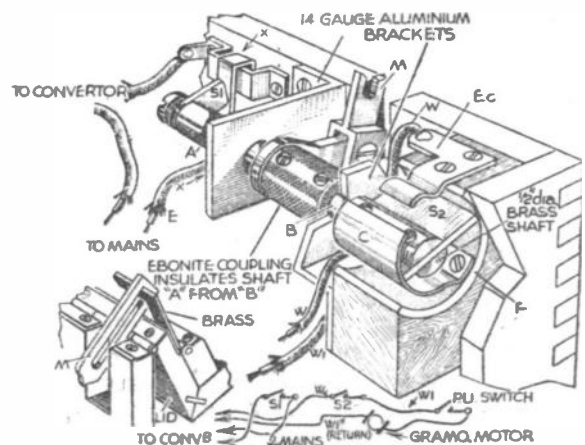
Automatic Converter and Gramo-motor Switching

I HAVE recently constructed a radiogram for operation from a converter, and as will be seen from the illustrations, the method of switching is rather out of the ordinary. The operation is quite simple, being effected through the medium of the gramolid, and the movement is as follows. A strong brass control arm "M" activates in cam fashion the double shaft "A-B," this shaft causing "S1" to release a strong brass contact-arm which in turn contacts with the back contact, thus completing the necessary converter circuit.

"S2" functions in rather a novel way, inasmuch as the rotation of a flat piece of brass, previously let into the "B" shaft, engages smartly with a well-tempered contact piece "EC"; this contact is also made of brass, and completes the circuit for the gramo motor, but it will be seen that completion of the motor circuit can only take place on lifting the P.U. arm.

"F" is a section of a bakelite former, and as the wood cut-out was not sufficiently smooth, this is glued to the cut-out. The inset illustration shows the way in which the lid controls the arm "M," whilst the circuit diagram shows the simple wiring.

The only important point which had to be watched was to see that the framework side of the contact switch "S1" went to earth potential, and in my case I was able separately to earth the whole assembly.—R. C. COLPIT (Croydon).



Automatic switching device for a converter and gramo-motor.

# Be guided by the expert use

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REGD. TRADE MARK BRITISH MADE

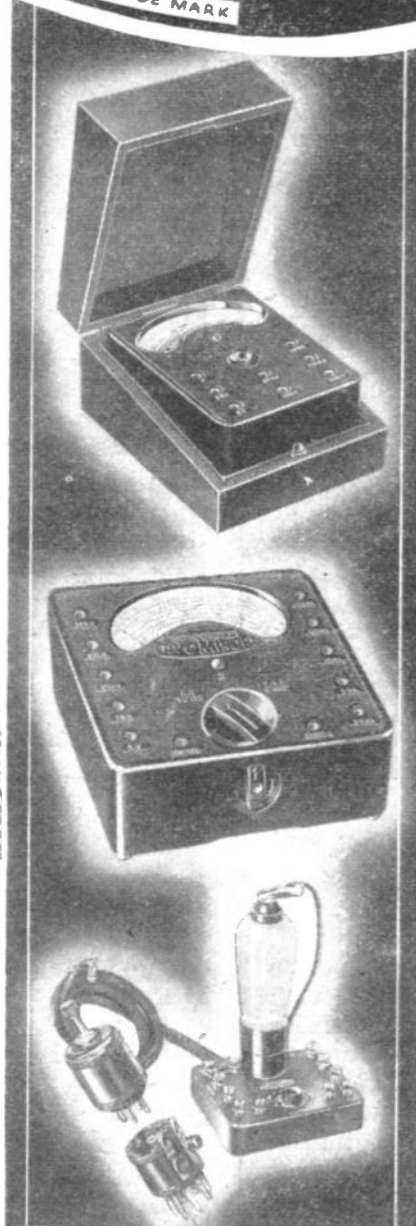
THESE instruments put into the hands of every radio experimenter and keen amateur the same precision-testing facilities which the radio engineer has learned to expect of 'AVO' instruments. The outcome of many years' experience in the manufacture and design of electrical test apparatus, they combine high accuracy with maximum utility and are available at a truly moderate cost.



### A VALUABLE BOOK

A new and enlarged edition, entirely re-written in the light of present-day knowledge. It takes the reader in easy stages through the whole routine of testing modern receivers, and clearly explains the causes of faults in receiving and amplifying apparatus. It also shows how to use effectively all radio instruments. 150 pages with numerous diagrams and graphs.

Price 2/6 (Post Free 2/10)



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#### Electrical Measuring Instrument

An accurate 13-range moving-coil instrument for all normal radio tests, including H.T., L.T. and G.B. Batteries, D.C. Mains and Eliminator Voltages; Valves and valve circuits, etc.

| CURRENT   | VOLTAGE           |
|-----------|-------------------|
| 0-100 mA. | 0-6 .. 0-240 V    |
| 0-20 ..   | 0-12 .. 0-30 ..   |
| 0-12 ..   | 0-120 .. 0-600 .. |

| RESISTANCE  |
|-------------|
| 0-1000 ohms |
| 0-5000 ..   |
| 0-12000 ..  |
| 0-50000 ..  |

Complete in case with instruction booklet, leads, and interchangeable testing prods and crocodile clips. **45/-**

### The UNIVERSAL AVOMINOR

#### Electrical Measuring Instrument

A 22-range precision moving-coil instrument for all A.C. and D.C. testing. All readings direct. Total resistance of meter 200,000 ohms.

| D.C. VOLTS      | MILLIAMPS       |
|-----------------|-----------------|
| 0-75 millivolts | 0-2.5 milliamps |
| 0-5 volts       | 0-5 ..          |
| 0-25 ..         | 0-25 ..         |
| 0-100 ..        | 0-100 ..        |
| 0-250 ..        | 0-500 ..        |
| 0-500 ..        |                 |

| A.C. VOLTS | RESISTANCE    |
|------------|---------------|
| 0-5 volts  | 0-20,000 ohms |
| 0-2 ..     | 0-100,000 ..  |
| 0-100 ..   | 0-500,000 ..  |
| 0-250 ..   | 0-2 megohms   |
| 0-500 ..   | 0-5 ..        |
|            | 0-10 ..       |

Complete with instruction booklet, leads, interchangeable testing prods and crocodile clips. **£5.10s.**  
(Leather case, 10 -

### The AVODAPTER

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OUR SIGNATURE TUNE. WE ARE  
NOW GOING TO PLAY FOR THE FIRST TIME  
IN ENGLAND A SPECIAL SWING NUMBER**

ENTITLED "HOT SWING NUMBER"



**... and then  
the set goes DEAD  
and you say**

**'NEXT TIME I'LL FIT**

**Exide AND Drydex**

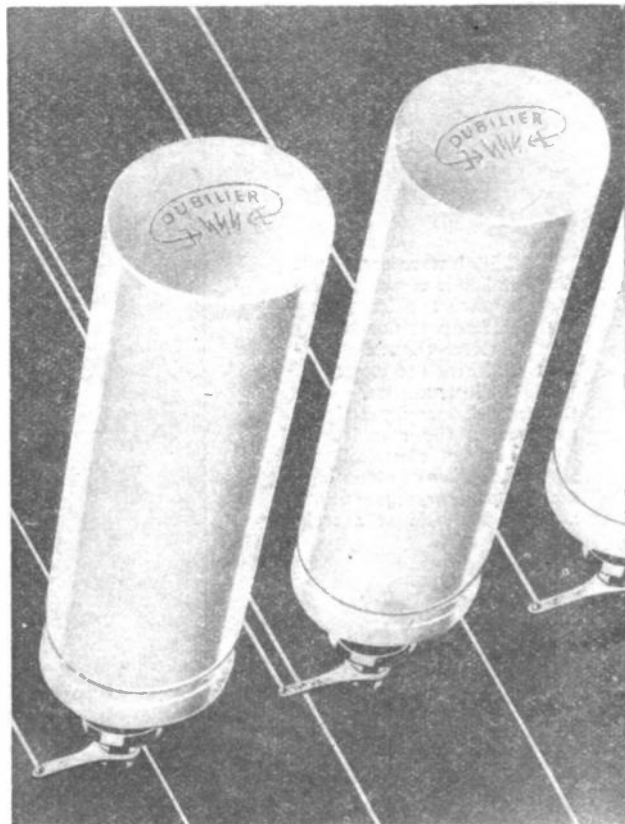
R42A

**RADIO ACCUMULATORS AND  
DRY BATTERIES'**

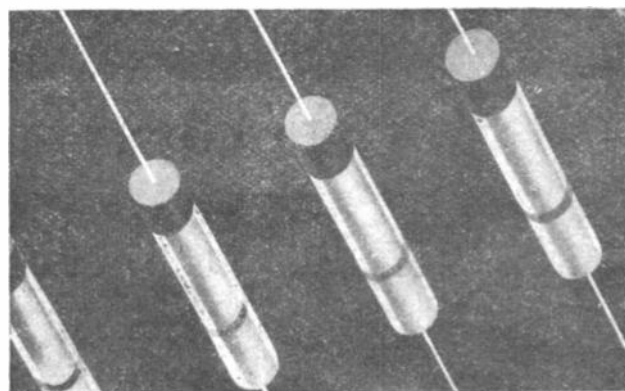
How like a battery, to run down at such a moment! And how like Exide to make such disappointments a thing of the past! For Exide has the Charge Indicator to tell you *before* a re-charge is necessary. And what about H.T. batteries? The name to remember is Drydex. The battery that lasts longer and grows old gracefully, without fear of a quick collapse. Exide and Drydex—they **still keep going when the rest have stopped**

*From reputable dealers and Exide Service Stations. Exide Service Stations give service on every make of battery. The Chloride Electrical Storage Company Ltd. (Exide and Drydex Batteries), Exide Works, Clifton Junction, near Manchester. Also at London, Manchester, Birmingham, Bristol, Glasgow, and Belfast.*

# DUBILIER



## STAND 69



If, by any misfortune, you should not reach our stand, please write for a copy of our new Catalogue. It contains details of all our latest patterns of condensers and resistances which we think will be of most interest to Radio Manufacturers, Traders, Service Engineers and Constructors.

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DUGON WORKS, VICTORIA ROAD, NORTH ACTON, W.3**



# The "JUNIOR" CRYSTAL SET

The Ideal Set for the Beginner

**K**NOWING that a very large demand exists for an efficient crystal receiver, we have given the design of the Junior as much consideration as the other models mentioned in these pages. We set

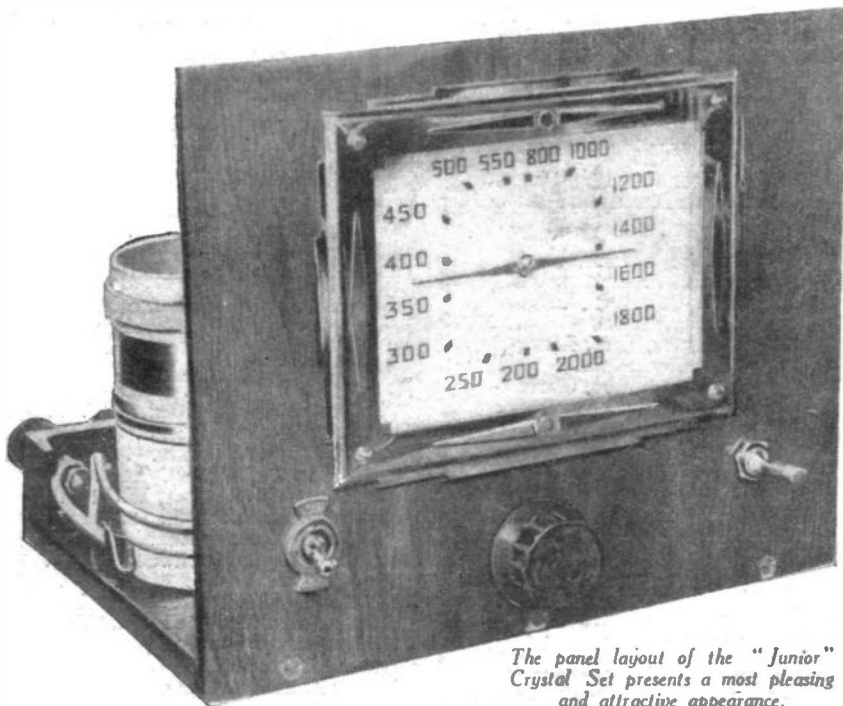
valve receiver, all conditions being equal, it is usual to employ headphones for reception and two terminals are provided for this purpose.

Many people object to using headphones,

especially the modern type, have many advantages.

For the aerial coil we have selected a most efficient dual-range air-cored coil, produced by Messrs. Bulgin, the normal reaction winding being utilised for the aerial coupling, thus allowing a very satisfactory degree of selectivity to be obtained, together with efficient transference of the signal in the aerial circuit to the tuned circuit across the crystal.

It will be noted that this coupling coil is also connected to the switch so that the



The panel layout of the "Junior" Crystal Set presents a most pleasing and attractive appearance.

about to produce a compact receiver whose appearance would be not only pleasing to the eye but also render it worthy of being placed in any room without becoming a blot on the general furnishing scheme.

For simplicity's sake we have used a wooden baseboard of a size sufficient to hold the essential components, and a panel of a piece of polished walnut-finished ply.

The controls are only three in number; on the left of the dial is a neat toggle-switch, which is used for changing from the medium to the long waves, and to the right of the dial projects a small knob which enables one to select the most sensitive spot on the crystal combination.

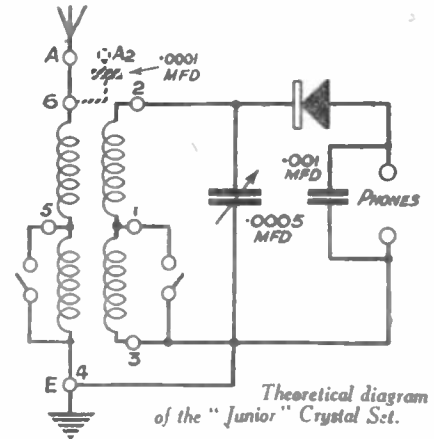
The crystal detector itself is of the semi-permanent type, and this was selected because it removes all the trouble usually associated with the old cat's-whisker arrangement.

As the output of a crystal receiver is naturally much lower than that of a one-

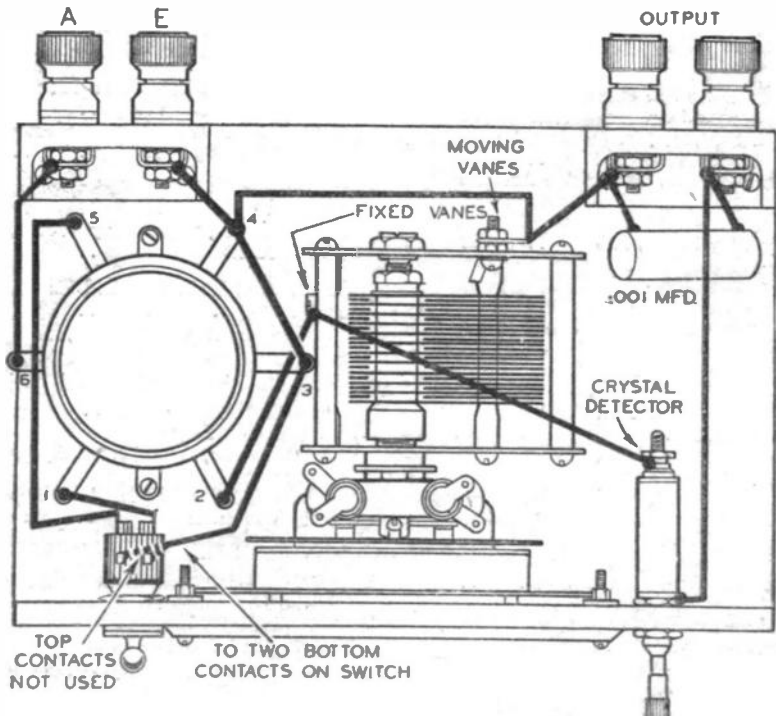
but if one is interested in perfect quality of reproduction, and if one wishes to hear some particular item which does not interest the occupants of the room, then headphones,

correct coupling ratios are maintained on both medium and long waves.

The large rectangular dial clearly marked in wavelengths enables the tuning point to be readily identified and provides a pleasing finish to the panel.



Theoretical diagram of the "Junior" Crystal Set.



Wiring diagram of the "Junior" Crystal Set.

### LIST OF COMPONENTS FOR THE "JUNIOR" CRYSTAL SET

- One tuning condenser, without dial or slow motion. Popular log. .0005 (Jackson).
- One tuning dial, square plane, degree and scale (Jackson).
- One coil, C.69 (Bulgin).
- One crystal detector, R.D.40 (Jewel Pen).
- One switch, S.98 (Bulgin).
- Two terminal blocks, A.E. output (with terminals) (Belling and Lee).
- One panel, 8in. x 6 1/2 in. walnut (Peto-Scott).
- One baseboard, 8in. x 3in. (Peto-Scott).
- One fixed condenser, .001 mfd., type 4601/S. (Dubilier).
- One fixed condenser, .0001 mfd., type 4601'S. (Dubilier).
- One pair earphones (Ericsson).

# Guide to the Exhibitors

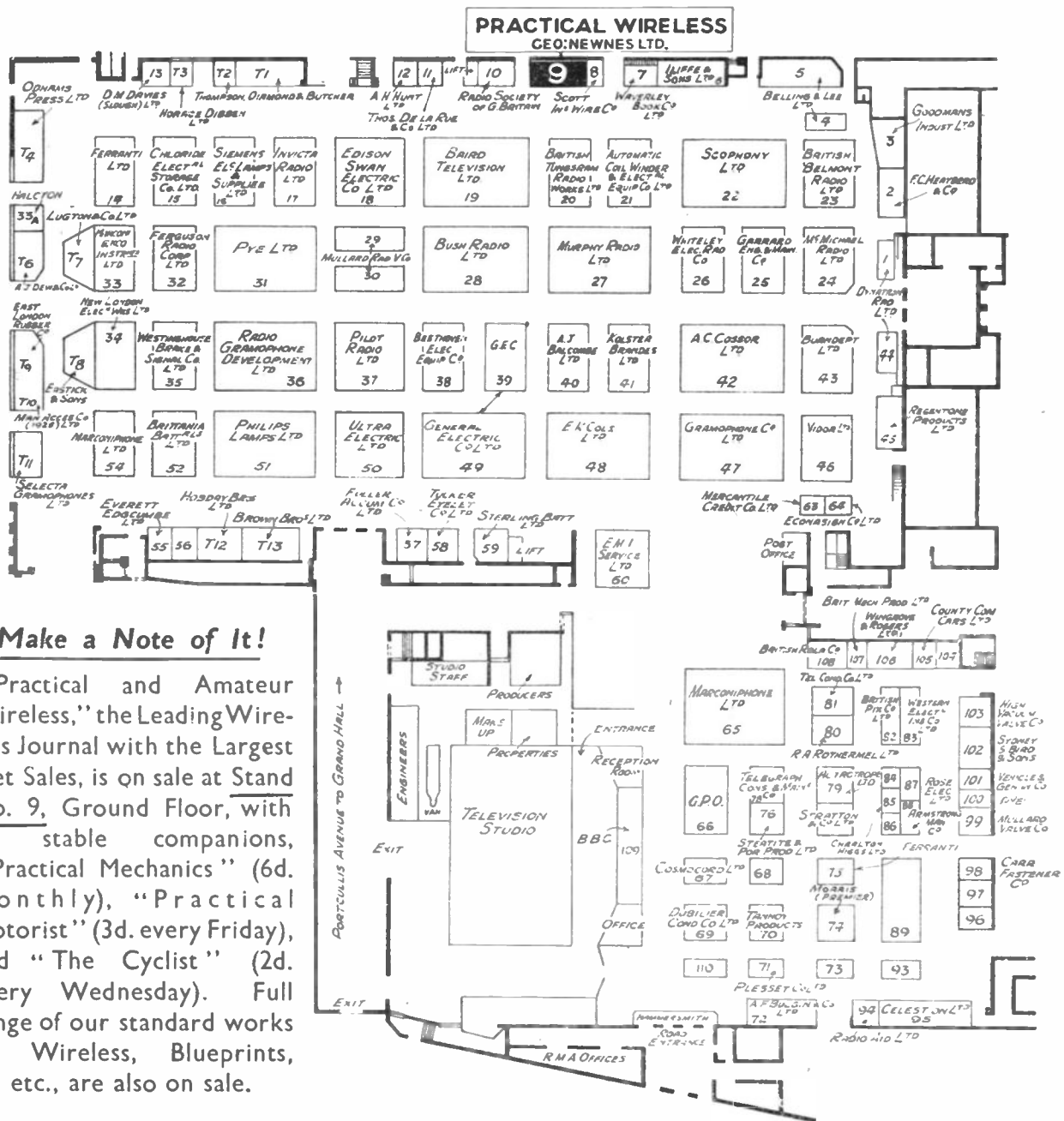
Full List of Exhibitors arranged in  
Alphabetical Order, with Addresses  
and Stand Numbers

| NAME AND ADDRESS  | STAND | NAME AND ADDRESS  | STAND      | NAME AND ADDRESS  | STAND   |     |
|---|-------|---|------------|---|---|-----|
| Armstrong Manufacturing Co., 100, King's Road, Camden Town, N.W.1                       | 88    | E. M. I. Service, Ltd., Sheraton Works, Hayes, Middlesex  | 60         | <b>NEWNES, GEORGE, LTD., TOW R HOUSE, SOUTHAMPTON ST., STRAND, W.C.2</b>    | 9   |     |
| Automatic Coil Winder and Elec. Equipment Co., Ltd., Winder House, Douglas Street, S.W. | 21    | Everett Edgcombe, Ltd., Colindale Works, Hendon, N.W.   | 55         | Odhams Press, Ltd., Long Acre, W.C.2  | T4  |     |
| Baird Television, Ltd., Worsley Bridge Road, S.E.26                                     | 19    | Ferguson Radio Corporation, Ltd., 105/109, Judd Street, W.C.1   | 32         | Philips Lamps, Ltd., 145, Charing Cross Road, W.C.2                         | 51  |     |
| Balcombe, Ltd., A. J., 52, Tabernacle Street, E.C.                                      | 40    | Ferranti, Ltd., Radio Works, Moston, Manchester   | 14, 75     | Pilot Radio, Ltd., 87, Park Royal Road, N.W.10                              | 37  |     |
| Beethoven Electric Equipment, Ltd., Chase Road, North Acton, N.W.10                     | 38    | Fuller Accumulator Co. (1926), Ltd., Woodland Works, Chadwell Heath, Essex  | 57         | Plessey Co., Ltd., Vicarage Lane, Ilford, Essex                             | 71  |     |
| Belling & Lee, Ltd., Cambridge Arterial Road, Enfield, Middlesex                        | 4, 5  | Garrard Engineering & Manufacturing Co., Newcastle St., Swindon, Wilts  | 25         | " Practical Wireless "  | 9   |     |
| Bird & Sons, Sydney S., Cambridge Arterial Road, Enfield, Middlesex                     | 102   | General Electric Co., Ltd., Magnet House, Kingsway, W.C.2   | 39, 49     | Pye, Ltd., Radio Works, Cambridge   | 31, 100   |     |
| Britannia Batteries, Ltd., Union Street, Redditch, Worcs                                | 52    | Goldmans Industries, Ltd., Lance-lot Road, Wembley, Middx.  | 3          | Radio-Aid, Ltd., 45, Duke Street, W.1                                       | 94  |     |
| British Belmont Radio, Ltd., 4-5, Ridgmount Street, W.C.1                               | 23    | Gramophone Co., Ltd., 108, Clerkenwell Road, E.C.   | 47         | Radio Gramophone Development, Ltd., Globe Works, Newtown Row, Birmingham, 6 | 36  |     |
| British Broadcasting Corporation, Broadcasting House, London, W.1                       | 109   |   |            | Radio Society of Gt. Britain, 53, Victoria Street, London, S.W.             | 10  |     |
| British Mechanical Productions, Ltd., 79a, Rochester Row, London, S.W.1                 | 107   | <p><i>For the Best Books, Blue-prints, Periodicals, and Reader Service, visit our Stand No. 9, Ground Floor</i></p> |            |   | Regentone Products, Ltd., Worton Road, Isleworth, Middx.                  | 45  |
| British Pix Co., Ltd., Pix Works, Lillieshall Road, S.W.4                               | 82    |   |            |   | Rose, Norman (Elec.), Ltd., 43, Lamb's Conduit Street, W.C.1              | 87  |
| British Rola Co., Minerva Road, Park Royal, N.W.  | 108   |   |            |   | Rothermel, R. A., Ltd., Rothermel House, Canterbury Road, N.W.6           | 80  |
| British Tungram Radio Works, Ltd., West Road, Tottenham, N.17                           | 20    |   |            |   | Scophony, Ltd., Thornwood Lodge, Campden Hill, W.8                        | 22  |
| Brown Bros., Ltd., Great Eastern Street, E.C.2  | T13   |   |            |   | Scott Insulated Wire Co., Queensland Works, Westmoreland Road, N.W.9      | 8   |
| Bulgin, A. F., & Co., Ltd., Abbey Road, Barking, Essex                                  | 72    |   |            |   | Selecta Gramophones, Ltd., 81, South-wark Street, S.E.1                   | T11 |
| Burdett, Ltd., Light Gun Factory, Erith, Kent   | 46    |   |            |   | Siemens Electric Lamps and Supplies, Ltd., 39, Upper Thames Street, E.C.4 | 16  |
| Bush Radio, Ltd., Power Road, Chiswick, W.4   | 28    |   |            |   | Steatite and Porcelain Products, Ltd., Stourport-on-Severn                | 76  |
| Carr Fastener Co., Ltd., Finsbury Court, Finsbury Pavement, E.C.2                       | 98    |   |            |   | Sterling Batteries, Ltd., Sterling Works, Dagenham, Essex                 | 59  |
| Celestion, Ltd., London Road, King-ston-on-Thames                                       | 95    |   |            |   | Stratton & Co., Ltd., Eddystone Works, Bromsgrove Street, Birmingham      | 77  |
| Charlton Higgs (Radio), Ltd., Edward St., Dudley Hill, Bradford                         | 85    | Tannoy Products, Canterbury Grove, S.E.27   | 70         |   |   |     |
| Chloride Electrical Storage, Co., Ltd., 231, Shaftesbury Avenue, W.C.2                  | 15    | Telegraph Condenser Co., Ltd., Wales Farm Road, Acton, W.3  | 81         |   |   |     |
| Cole, E. K., Ltd., Ekco Works, South-end-on-Sea, Essex                                  | 48    | Telegraph Construction and Main-tenance Co., Ltd., 22, Old Broad Street, E.C.2                                      | 78         |   |   |     |
| Cosmocord, Ltd., Cambridge Arterial Road, Enfield, Middlesex                            | 67    | Thompson Diamond & Butcher, 34, Farringdon Road, E.C.   | T1, T2     |   |   |     |
| Cossor, A. C., Ltd., Cossor House, Highbury Grove, N.5                                  | 42    | Tucker, George, Eyelet Co., Ltd., Cuckoo Road, Birmingham 7   | 58         |   |   |     |
| Davies, D. M. (Slough), Ltd., Trading Estate, Slough, Bucks                             | 13    | Ultra Electric, Ltd., Western Avenue, Acton, W.3  | 50         |   |   |     |
| Davis & Timmins, Ltd., Brook Road, Wood, Green, N.22                                    | 96    | Vacuum-Science Products, Ltd., 166, Weir Road, S.W.12   | 105        |   |   |     |
| De La Rue, Thos., & Co., Ltd., 90, Shernhall Street, E.17                               | 11    | Vehicle and General Insurance Co., Ltd., Royal Liver Building, Liver-pool, 3  | 101        |   |   |     |
| Dew, A. J., & Co., Ltd., 33, Rathbone Place, W.1  | T6    | Vidor, Ltd., West Street, Erith, Kent   | 43         |   |   |     |
| Dibben, Horace, Ltd., 34, Carlton Crescent, Southampton                                 | T3    | Waverley Book Co., Ltd., 96, Farring-don Street, E.C.4  | 7          |   |   |     |
| Dubilier Condenser Co. (1925), Ltd., Ducon Works, Victoria Road, North Acton, W.3       | 69    | Westinghouse Brake and Signal Co., Ltd., 82, York Rd., King's Cross, N.1  | 35         |   |   |     |
| Dynatron Radio, Ltd., Perfecta Works, Ray Lea Road, Maidenhead                          | 44    | Weston Electrical Instrument Co., Ltd., Cambridge Arterial Road, Enfield, Middlesex                                 | 83         |   |   |     |
| East London Rubber Co., Ltd., 29, Great Eastern Street, E.C.                            | T9    | Whitcley Electrical Radio Co., Vic-toria Street, Mansfield, Notts   | 26         |   |   |     |
| Eastick, J. J. & Sons, 118, Bunhill Row, E.C.   | T8    | Wingrove & Rogers, Ltd., Mill Lane, Old Swan, Liverpool   | 106        |   |   |     |
| Econasign Co., Ltd., 92, Victoria Street, S.W.1   | 64    | Wireless and Electrical Trader, Dorset House, Stamford St., S.E.  | 89         |   |   |     |
| Edison Swan Electric Co., Ltd., 155, Charing Cross Road, W.C.2                          | 18    |   |            |   |   |     |
|   |       | Haleyon Radio, Ltd., Sterling Works, Dagenham   | 33A        |   |   |     |
|   |       | Hayberd, F. C., & Co., 10, Finsbury Street, E.C.2   | 2          |   |   |     |
|   |       | High Vacuum Valve Co., Ltd., 111, Farringdon Road, E.C.   | 103        |   |   |     |
|   |       | Hobday Bros., Ltd., 21, Gt. Eastern Street, E.C.  | T12        |   |   |     |
|   |       | Hunt, A. H., Ltd., Bendon Valley, Garratt Lane, Wandsworth, S.W.18  | 12         |   |   |     |
|   |       | Iliffe & Sons, Ltd., Dorset House, Stamford St., S.E.   | 6          |   |   |     |
|   |       | Invieta Radio, Ltd., St. Andrews Road, Cambridge  | 17         |   |   |     |
|   |       | Keats-Hacker, 91-93, Bishopsgate, E.C.2   | 1          |   |   |     |
|   |       | Kolster Brandes, Ltd., Cray Works, Sidecup, Kent  | 41         |   |   |     |
|   |       | Lington & Co., Ltd., 203, Old Street, E.C.  | T7         |   |   |     |
|   |       | Manufacturers' Accessories Co. (1925), Ltd., 85, Gt. Eastern Street, E.C.   | T10        |   |   |     |
|   |       | Marconiphone Co., Ltd., 210, Totten-ham Court Road, W.1   | 54, 65     |   |   |     |
|   |       | Marconi-Ekco Instruments, Ltd., Electra House, Victoria Embankment, W.C.2   | 33         |   |   |     |
|   |       | McMichael Radio, Ltd., Wexham Road, Slough, Bucks   | 24         |   |   |     |
|   |       | Mercantile Credit Co., Ltd., 39-45, Finsbury Square, E.C.2  | 63         |   |   |     |
|   |       | Morris & Co. (Radio), Ltd., 167, Lower Clapton Road, E.5  | 74         |   |   |     |
|   |       | Mullard Radio Valve Co., Ltd., 225, Tottenham Court Road, W.1   | 29, 30, 99 |   |   |     |
|   |       | Murphy Radio, Ltd., Broadwater Road, Welwyn Garden City, Herts  | 27         |   |   |     |
|   |       | New London Electron Works, Ltd., East Ham, E.6  | 34         |   |   |     |

# FINDING YOUR WAY ROUND RADIOLYMPIA

Floor Plan Showing Positions, Names of Firms and Corresponding Numbers of Stands

**For Detailed Guide to Each Exhibit, See Pages 584 to 591**







**ARMSTRONG MANUFACTURING CO., 100, King's Road, Camden Town, N.W.1. Stand No. 58.**

ON this stand the receivers will all be in chassis form and will include, 6-, 7-, 8-, 9-, 10- and 12- valve units. These are all of the all-wave type, some having push-button tuning, and others being of the radiogram type. One of the most popular models is a 12-valve unit, with cathode-ray tuning indication, covers five wavebands, has two I.F. stages with variable selectivity on both stages and delivers an output of 10 watts. The price is 17 gns. complete with valves.

### Complete Guide to the Exhibits

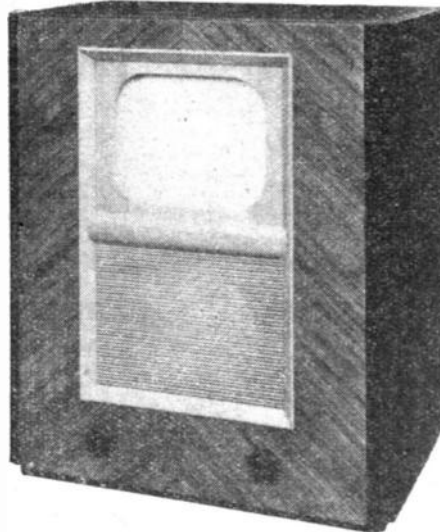
In a few cases details of exhibits have not been released at the moment of going to press.

**A. J. BALCOMBE, LTD., 52-58, Tabernacle Street, London, E.C.2. Stand No. 40.**

THE receivers on this stand are known as "Alba" models, and a feature of them will be the automatic push-button tuning. In these receivers it is known as the "Presto-tune," and will be found on the 10-guinea all-wave superhet. The remaining models will include table, floor and console cabinets and one of the most interesting will be a 4-valve three waveband superhet radiogram at 15 guineas.

**BEETHOVEN ELECTRIC EQUIPMENT, LTD., Chase Road, North Acton, N.W.10. Stand No. 38.**

THE receivers to be exhibited on this stand will include open aerial receivers for battery and mains use, transportables for both mains and batteries, portables in a similar selection, and a special radiogram. This will be fitted with a twin speaker unit and push-button tuning will be found on several of the models. A feature of the Beethoven receivers is the large rectangular tuning dial which is set at an angle into the cabinets.



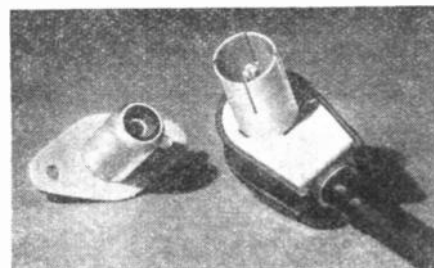
This Baird television, which may be seen on Stand No. 19, gives a black and white picture 7 1/2 in. by 6 1/2 in.

**THE AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO., LTD., Winder House, Douglas Street, S.W. Stand No. 21.**

THE exhibits here will consist in the main of test apparatus, amongst which are the popular Avometer, Avominor, Avodapter, etc. These appeal alike to the ordinary listener and the advanced experimenter or service man, and for the manufacturer the special coil-winding instruments will prove of great interest. In addition to the radio apparatus this company also produces a neat photo-electric photographic exposure meter.

**BAIRD TELEVISION, Ltd., Worsley Bridge Road, Lower Bydenham, S.E.26. Stand No. 19.**

ALL of the television receivers to be seen on this stand are of the type utilising the cathode-ray tube. The tubes in this case are all Baird products and give a very large image for the size of tube which is employed. There are models to suit all requirements, up to the super all-wave radiogram, and a feature of the picture on these receivers is the brilliant black and white image which is obtained.



A useful plug and socket for coaxial cables. A Belling-Lee product which may be seen on Stand Nos. 4 and 5.

**BELLING & LEE, LTD., Cambridge Arterial Road, Enfield, Middlesex. Stand Nos. 4 and 5.**

YOU will find on Stands 4 or 5 a Belling-Lee suppression engineer who knows your locality and his job, and who is there to help you to overcome the buzzes and crackles that spoil your radio programmes. The Belling-Lee vertical aerials will come as a welcome relief after the unsightly irregular array of poles and bent sticks which ruin the outlook for so many suburban householders. These aerials are supplied as complete anti-interference systems.

Floor plan appears on page 583.  
Complete Show Report next week.

The new "Elimin-o-e," although giving reception on all broadcast bands, makes use of switching between medium and short wavebands.

Suppression at the source will be demonstrated in a model kitchen very full of electrical appliances which visitors will be invited to put into operation by pressing a series of buttons. A very full range of industrial suppressors will be on view together with the latest interference measuring apparatus, noise locators, etc.

Television aerials will be shown *in situ* mounted on full-size brick chimneys. Other television accessories and components, flat pin-plugs and sockets to B.S.8.066 for extension loudspeaker points in the home or hospitals, and for radio relays; fuses and fuse-holders, terminals of all sizes and descriptions, including a new spade and a "B" type with top socket; plugs and sockets; rubber plugs (5 amp. mains) moulded on to leads, form some of the chief new lines.

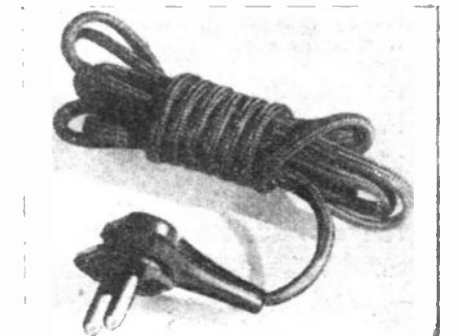
Considerable interest will be shown in appliances made for use in the Air Force and now exhibited with permission of the Air Ministry. This exhibit includes special suppressors, terminals, plugs and sockets, fuses and holders, etc.

**SYONEY S. BIRD & SONS, LTD., Cambridge Arterial Road, Enfield, Middlesex. Stand No. 102.**

AS specialists in the manufacture of condensers, this exhibit will consist of a display of every type of condenser that is met with in modern tuning circuits. These range from the small mica-dielectric pre-sets or trimmers up to the large transmitting models with high quality insulation suitable for use on high-voltage circuits. An interesting addition to the products of this firm is a tubular electric chime consisting of two tuned rods, operated from a special bell-mechanism. This is intended to replace the usual door bell used in the home and it may be made to operate in such a manner that an indication as to which door requires answering may be obtained.

**BRITANNIA BATTERIES, LTD., Union Street, Redditch, Worcs. Stand No. 52.**

THE exhibits on this stand will be very similar to those exhibited last year, except that there will be a new system of catalogue numbering of the Pertrix H.T. batteries. These are now designated "The New" Pertrix batteries. A new feature in the range of accessories and components is the Pertrix Gas Lighter, which, complete with battery and burner, costs 5s. Spare parts are available.



Another Belling-Lee product—a moulded rubber 5-amp. plug and cord.

**BRITISH BELMONT RADIO LTD., 4-5, Ridgmount Street, W.C.1. Stand No. 23.**

THE range of Belmont receivers which will be shown on Stand No. 23 will include some novel Midgets. These are finished in attractive coloured cabinets and range in price from £4 4s. Among the features incorporated in the Belmont receivers may be mentioned iron-core coils, silver-mica trimmers, isolating insulation for tuning condensers and negative-feedback circuits. Another novel feature is the volume control which automatically makes the change from radio to gram—being effective on radio for the first part of its travel and on gramophone for the remainder.

**BRITISH MECHANICAL PRODUCTIONS, LTD., 79a, Rochester Row, S.W.1. Stand No. 107.**

HERE will be seen the wide range of "Clix" components amongst which are valveholders, coil holders, switches, plugs, sockets, etc. The valveholders are designed for various types of receiver and valves, and include chassis or baseboard types for Octal, Acorn, standard or Continental types. Valve-cap connectors, fuses, frequentite trimmer condensers, and a new wall plug are among the remaining items which may be seen on this stand.

**BRITISH PIX CO., LTD., Pix Works, Lillieshall Road, S.W.4. Stand No. 82.**

HERE will be seen the well-known Pix Aerial and other interesting accessories produced by this firm. These will already be familiar to our readers, and in addition to the popular small aerial accessories, the well-known Pix valves will also be displayed.

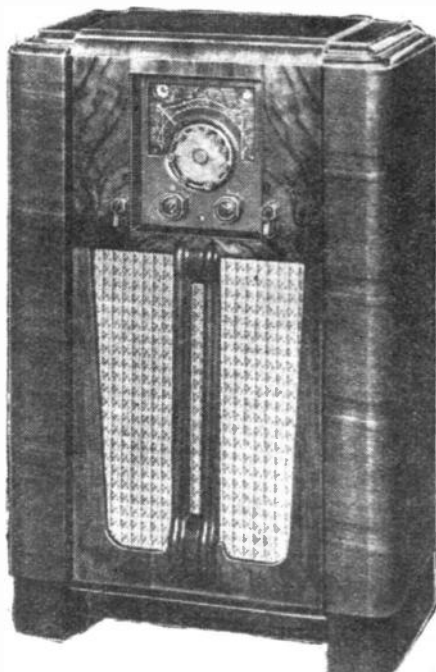
**BRITISH ROLA CO., Minerva Road, Park Royal, N.W. Stand No. 108.**

INTEREST in the Rola exhibit will centre largely around the new 8Z and 10Z dustproof models of 8in. and 10in. diameter respectively. Available in both energised and permanent magnet types these units are of special patented construction whereby dust and dirt, the root cause of the great majority of speaker troubles, are totally excluded from the air gap. The well-known Rola "Roma" and Rola "Rex" cabinet extension speakers are also equipped with 8in. diameter dustproof units, whilst the F742-PM "high sensitivity" model and the 12in. diameter

devices, loud-speakers, etc., by prominent makers. There will also be a representative range of battery charging plant, with technical staff available for advice, and a full technical and sales staff will be available for dealers for the selection of stock and for advice on any points which may arise.

**A. F. BULGIN & CO., LTD., Abbey Road, Barking, Essex. Stand No. 72.**

IT would be impossible to enumerate all of the various items which will be displayed on this stand, but it may well be referred to as the "Home Constructor's Stand." The push-button units will probably prove of most interest, introducing, as they do, the latest scheme in receiver design. In addition, there will be many small items, from simple push-pull switches up to multi-range coil units and the associated switchgear.



Here is the British Belmont 7-valve all-wave console with automatic tuning. This is on view on Stand 23.

Mains transformers, oscillators, electrolytic condensers, quench coils, scratch filters, television components, watt and other meters, cathode ray resistors and anti-interference units are only a few of the most interesting components which may be inspected on Stand No. 72.

**BURNDEPT, LTD., Light Gun Factory, Erith, Kent. Stand No. 46.**

AN interesting feature of the receivers on this stand will be the "continuous tuning" band. In the 8-valve all-wave radiogram, for instance, this tunes from 13.5 to 2,000 metres and there are no blank spots. In the 9-valve superhet a similar range is covered with the exception of a small band from 580 to 750 metres. Other prominent features of the receivers to be shown here are the high fidelity reproduction, the good selectivity and the special iron-core Litz coils which are employed.

**BUSH RADIO, LTD., Power Road, Chiswick, W.4. Stand No. 28.**

"BUSH BUTTON" is the keynote of the Bush receivers, and this is, of course, the standard push-button tuning device, renowned to render it distinctive. The large open tuning scale, and the fine finish to the cabinets are two of the main features which will present themselves to the visitor, and for those who are interested in circuit design there are many interesting features incorporated in these receivers which will repay study. Provision for pick-up and remote speaker is, of course, a standard arrangement on the Bush receivers.

**CARR FASTENER CO., LTD., Finsbury Court, Finsbury Pavement, E.C.2. Stand No. 98.**

ON this stand will be seen a very varied collection of small parts such as are now used in

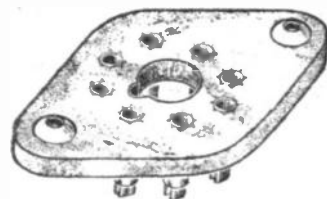
modern receiver construction. To illustrate the application of these parts a number of dummy receiver chassis will be on view. The parts include screened plugs and sockets, valveholders, terminals and terminal strips, voltage tapping plugs, contacts, and eyelets of all description. The range of Benjamin valveholders, which are made by Carr Fastener, will also be on view.

**CELESTION, LTD., London Road, Kingston-on-Thames. Stand No. 95.**

HERE will be seen the wide range of both Celestion and Magnavox speakers. These range from the very small miniature cone models, used for portables and other apparatus, to the large public-address units in single and band units. In addition to the various chassis models, there will be a wide range of cabinet models suitable for domestic use.

**CHARLTON HIGGS (RADIO), LTD., Stanley Works, Edward Street, Dudley Hill, Bradford, Yorks. Stand No. 85.**

AN important feature of the receivers to be exhibited on this stand is that they are custom-built. Included in these is a radiogram incorporating a nine-valve chassis with "Solar" tuning and a six-watt "straight-line" output amplifier. Dual auditorium



A Clix valveholder for the international valves.

loud-speakers. Drift-compensated push-button tuning giving nine pre-set stations is fitted, and an automatic record-changer is included in the massive piano-finished cabinet. The price of this model (Type AW99AG) is £42 10s.

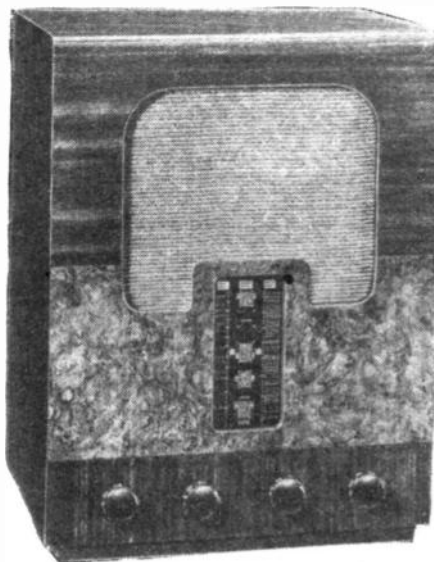
**CHLORIDE ELECTRICAL STORAGE CO., LTD., 231, Shaftesbury Avenue, W.C.2. Stand No. 15.**

FOLLOWING the Exide "Mass" type low-tension cell incorporating the visible charge indicator, a new range of Exide "Hycap" accumulators, specially designed to meet the demands of high-powered modern radio receivers, was introduced. This new range, like its predecessors, has proved an unqualified success, and will again be on view on the Exide Stand, together with a comprehensive display of other Exide and Drydex batteries.

Of particular interest are the Exide unspillable cells, of which there is a size and type to fit practically every well-known portable receiver, and which bear on their labels details of the receivers for which they are suitable. In addition, a complete range of special unspillable low-tension cells for Midget Receivers will be on view on the same stand.

Continuing the policy of having available a suitable H.T. battery for every Radio Receiver, Drydex have augmented their range to cover all latest model wireless sets, and in addition offer alternative batteries for a number of popular sets.

The use of cardboard sleeves to protect batteries in transit is still being extended, and the practice of showing the battery type number and price on the ends of the cartons—a great convenience to the trade.



Bush Radio are showing this battery receiver on Stand 28.

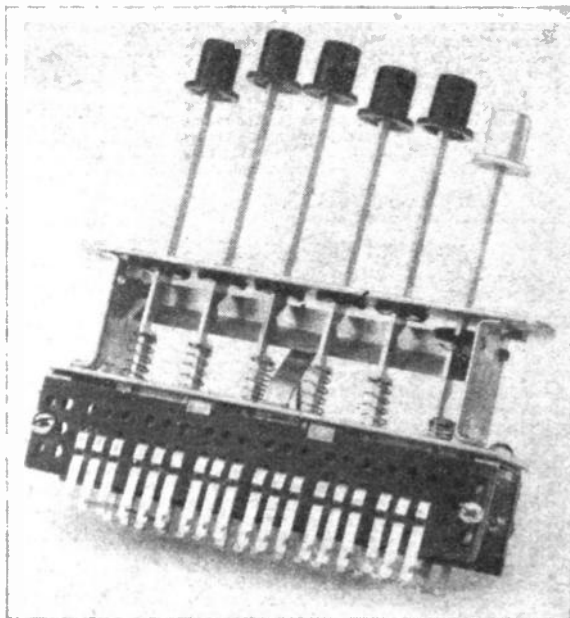
G.12 Energised and G.12 P.M. high fidelity speakers are retained unchanged. 6in. diameter models are also available.

**BRITISH TUNGSRAM RADIO WORKS, LTD., West Road, Tottenham, N.17. Stand No. 20.**

PROMINENCE will be given on this stand to a complete series of valves which have been designed as standard replacements for any other "E" type valve. Some very interesting additions to the "E" range will be seen, especially the E.L.1.1, which is a dual pentode in one bulb, capable of delivering 41 watts with a total consumption of only 35 mA. There is also a double-diode which has two cathodes and is suitable for noise suppression and expander circuits, etc. The two-volt battery user is also well supplied and will be represented on the stand by a complete range of 2-volt valves. The transmitting amateur will also find several special transmitting valves which will be of interest.

**BROWN BROS., Brown's Buildings, Great Eastern Street, E.C.2. Stand No. T.13.**

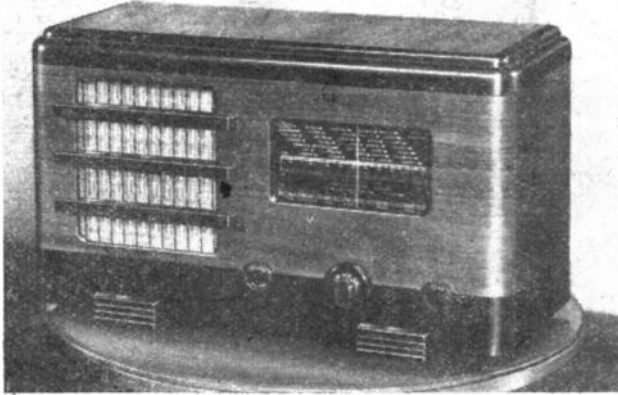
ON this stand will be seen a representative range of radio receivers and radiograms of leading makes; a special display of radio service equipment, with technical staff available for demonstration; a full range of radio components, accumulators, interference



The home-constructor push-button unit produced by Bulgin. Other Bulgin new goods may be seen on Stand 72.

**E. K. COLE, LTD., Ekco Works, Southend-on-Sea, Essex. Stand No. 48.**

SOME interesting novelties are incorporated in the Ekco receivers, amongst which may be mentioned "Motor Tuning" and "Motor Cruising." A development of the push-button system, the cruising idea is to simplify manual tuning by permitting the motor to turn the tuning condenser quickly from one end of the scale to the other so that a desired station which may not be tuned by a normal button may be obtained. The normal station selector button is also available



One of the new season's Cosmor receivers—an A.C. all-wave 6-valve superhet on Stand No. 42.

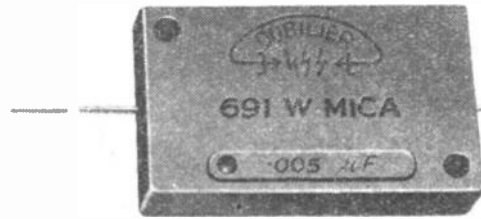
**EDISON SWAN ELECTRIC CO., LTD., 155, Charing Cross Road, London, W.C.2. Stand No. 18.**

ON this stand the largest battery of cathode-ray tubes to be run from a single receiver will be seen. Five tubes, ranging from 9in. to 15in. in diameter will be so arranged as to supply vision to five separate viewing booths. Each booth will have its own speaker. Special monitoring devices are to be fitted to ensure maximum results. There will also be a historical collection of interest, including the original Fleming valve of 1904, surrounded by its successors. A complete range of Mazda miniature valves, battery valves, and other types, cathode-ray tubes, radio accessories and batteries will comply to this interesting exhibit.

taneous station selection by single operation on any waveband. The television sound band is included in certain of the models, and high fidelity reproduction is an important feature of these receivers.

**FERRANTI, LTD., Meston, Manchester, 10. Stand No. 14 and 75.**

IN the receivers to be exhibited on this stand will be two television sets at 50 gns. and 60 gns. These provide a 10 x 8in. picture, have a safety-glass screen; and the angle of vision is 120°. One model is for television only, and the other includes the broad-cast wavelengths. A wide range of domestic radio sets will also be shown, in which "prestune" automatic tuning will be featured. Car radio is also to be represented by a new Ferranti set of the 6-valve superhet type giving 2.5 watts output. Special aerials are available for these, and are designed for roof or running-board mounting. There will also be a wide range of small accessories, such as meters and other items, which will be of interest to the home-constructor.



New Dubilier items, to be seen on Stand No. 69, include mica condensers with wire ends as shown here.

and receivers will be on view this year in which pre-set condensers are brought into action, as well as the motor driven sets. In the pre-set models a new system of permeability tuning is introduced with high-quality ceramic and silver fixed condensers to give stability. The maximum drift is stated not to exceed more than 1 per cent. of inductance or .05 per cent. of the station frequency. The approximate settings for each of 60 stations are given on the backs of spare name-cards supplied with the set.

**COSMOCORD, LTD., Cambridge Arterial Road, Enfield, Middlesex. Stand No. 67.**

THE Cosmocord Playing Desk is an important item which will receive prominence on this stand, and in addition there will be a new crystal pick-up. This gives very high-quality reproduction and sells for 25s. The playing-desk is available in several models, from the "Desk for the Masses" at £4 7s. 6d., to the de-luxe pedestal de-sk at £11 10s. This is enclosed in a highly-finished walnut cabinet with crystal pick-up, motor, record storage space and record index, and an electric light for illuminating the record turntable.

**COSMOR, A. C., LTD., Cosmor House, Highbury Grove, N.5. Stand No. 42.**

A WIDE range of receivers will be seen on this stand, in addition to the extremely varied range of valves. Included among the many old favourites in this section will be a number of new valves designed for the two-volt battery user, and as a complete departure from previous items, Cosmor will be showing at this year's show a range of electric clocks and a vacuum-cleaner. A range of batteries, both for radio and associated purpose, an extension speaker, and television equipment will also be featured. The Teledial tuning device, fitted to some of the new Cosmor receivers, enables a number of stations to be tuned in by dialling as in the case of the standard automatic telephone. In the receiver range there is a portable in two patterns—for battery or A.C. D.C. mains use. At the other end of the scale is a de-luxe all-wave superhet radiogram tuning from 13 to 2,000 metres, with two super-triodes in a push-pull output stage. This model also has an automatic record-changer, and costs 40 guineas.

**DUBILIER CONDENSER CO. (1925), LTD., Ducon Works, Victoria Road, North Acton, W.3. Stand No. 69.**

A NUMBER of new and interesting developments in condensers and resistances will be introduced at the Show, including a new range of trimmer condensers, mica dielectric twin trimmers, air trimmers, and ceramics in disc, cup and tube shapes. In addition there will be moulded metallised mica condensers, dry electrolytics, surge-limiting wet electrolytics, surge-proof dry electrolytics and special models of various types. In the range of resistances there will be an extensive exhibit, from the small half-watt units up to the large power components of the wire-wound type.

**DYNATRON RADIO, LTD., Perfecta Works, Ray Lea Road, Maidenhead. Stand No. 44.**

ALL the receivers exhibited by Dynatron are redesigned, although in some instances the changes are only small. In addition a number of new models will be shown. Television receivers will be seen on this stand, and a further improvement in the Searchlight Tuner will be noted. Other improvements in the receivers include a new development in A.V.C., high fidelity from more distant stations by a special selective tuner, an improved loudspeaker system, and the combination of a straight and a superhet circuit in a single receiver. The television is a 35-valve radiogram, selling at 165 guineas.

**E.M.I. SERVICE, LTD., Sheraton Works, Hayes, Middlesex. Stand No. 60.**

A VERY wide range of accessories and gear for the serviceman will be displayed here. In addition to the elaborate electrical equipment, E.M.I. Service



Another new Dubilier line—an air-dielectric trimmer.

also produce many workshop accessories, such as benches and tools which are essential to the running of a proper workshop used for the servicing of modern radio and television receivers.

**EVERETT, EDGEMOUE & CO., LTD., Colindale Works, Hendon, N.W.9. Stand No. 55.**

AMONG the many interesting test instruments to be seen on this stand is a combined Set Tester, which is making its first appearance. This is a combination of several of the popular instruments of the Everett Edgemoué range and forms a most valuable addition to the modern workshop. It is designed for A.C. mains working. In addition, there will be an All-purpose Tester, All-wave Oscillators, Workshop Test Set, and sundry other modern instruments.

**FERGUSON RADIO CORPORATION, LTD., 105 109, Judd Street, W.C.1. Stand No. 32.**

IN accordance with the policy of this company, all receivers on the stand will be of the All-wave type, employing from three to five wavebands. New features in this year's models will be edge-lighted full-vision glass tuning scales with linear pointer movement, and press-button operation. In the latter arrangement, wave-changing is also effected by the button so that the pressure of a button automatically gives instant

**FULLER ACCUMULATOR CO. (1936), LTD., Woodland Works, Chadwell Heath, Essex. Stand No. 57.**

HERE will be seen representative types of the popular "Manmoth" Plate range accumulators, feature in the display of L.T. accumulators which include multi-plate and de-luxe plate types in glass and ebonite containers. Three sizes of H.T. accumulators in 10-volt units will also be shown. As in previous years, a large section of the display will be devoted to batteries selected from the comprehensive range of H.T. units for all types of receiver.

**GARRARD ENGINEERING & MFG. CO., Newcastle Street, Swindon, Wilts. Stand No. 25.**

THE exhibit which, as in past years, consist of a unique display of gramophone accessories including motors, pick-ups, playing desks and automatic record-changing mechanism. The small units are suitable for incorporation in existing radio-gramophones, or may be used as accessories in the building of a new receiver.

**TWO NEW HANDBOOKS**

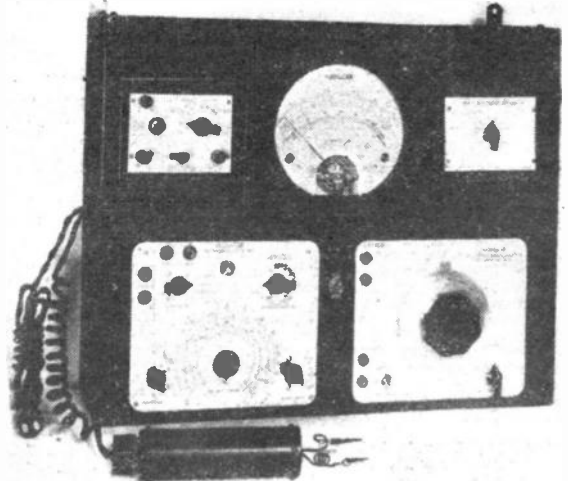
**PRACTICAL WIRELESS SERVICE MANUAL**

5/- (5/6 by post.)

**WIRELESS TRANSMISSION FOR AMATEURS**

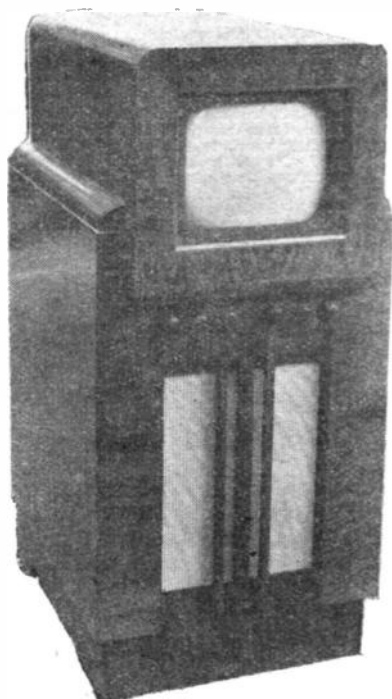
2/6 (2/10 by post.)

See them on our STAND No. 9, Ground Floor.



Everett, Edgemoué—Stand No. 55—have produced this valuable serviceman receiver test panel.

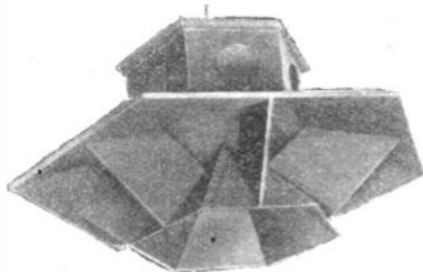




One of the new Ferranti television sets to be seen on Stand No. 13.

**GENERAL ELECTRIC CO., LTD., Magnet House, Kingsway, W.C.2. Stand Nos. 39 and 49.**

ON these stands the G.E.C. will display their many interesting radio products, including receivers, television sets, batteries, valves, etc. Touch-tuning and Selective Tuning will be features of the broadcast receivers, and some interesting improvements are to be noted in these sets. Floating edge cone speakers,



A novel public-address speaker produced by Goodmans, and shown on Stand No. 3.

rubber mounting for chassis, automatic two-speed tuning, and novel tuning dials are some of these. The wide range of 0-rum valves and cathode-ray tubes will be seen, together with the special batteries and other accessories which have been produced in the G.E.C. works.



Push-button tuning is included in this new H.M.V. receiver. It is shown on Stand No. 47.

**GOODMAN'S INDUSTRIES, LTD., Lancelot Road, Wembley, Middx. Stand No. 3.**

HERE will be seen an interesting range of public-address speakers and accessories. Some novel speaker designs will be shown, and special speakers, designed for large assemblies indoors and out, will also be displayed.

**GRAMOPHONE CO., LTD., 108, Clerkenwell Road, E.C. Stand No. 47.**

THE well-known H.M.V. receivers will be displayed on this stand and undoubtedly the many interesting novelties incorporated in them will attract the attention of everyone. Apart from the simpler types of receiver, there will be the larger radiograms and television receivers. A new hyper-sensitive pick-up, designed on entirely new lines, will also be shown, together with a new record player at 39s. 6d. A special feature will be the low-priced television receivers in which small pictures are produced—the lowest-priced model being the 15-valve model 994 at 29 gns., in which the picture size is 4in. by 4 1/2in.

**HEAYBERD & CO., F.C., 10, Finsbury Street, London, E.C.2. Stand No. 2.**

THIS firm is well known for its main products, and among the many familiar items to be seen on the stand the AOB battery charger will be seen in a new form. This has been re-designed, but the price remains the same. The popular Tom Thumb charger, which charges at 5 amps. 2 volts for less than 2d. a week, is still to be seen at 12s. 6d. A full range of transformers for metal and valve rectifiers, and chokes for use with home-constructed receivers, will remain the same as for last season.



Push-button tuning is also found on this Invicta receiver

**HIGH VACUUM VALVE CO., LTD., 111-117, Farringdon Road, E.C.1. Stand No. 103.**

IN addition to the complete range of 60 battery, mains, midjet and short-wave valves to be seen on this stand there will also be a new cathode-ray tube with a 3in. screen—the price of which is £2 2s. Other new additions to be seen on the stand will be the special cathode-ray tube designed for photographic work, a high-voltage half-wave rectifier for use with C.R. tubes, and delivering up to 6,000 volts at 3 mA, two grid-controlled rectifiers, a 5-pin output tetrode and a 2-volt variable-mu H.F. pentode designed to operate at 150 volts on the screen. This valve requires no separate screen dropping resistances and will cost 9s. 6d.

**HUNT, A. H., LTD., Bendon Valley, Garratt Lane, Wandsworth, S.E.18. Stand No. 12.**

ON this stand you will see the new anti-static aerials combined with "L" and dipole designs; an interference suppressor, capacitor analyser; signal generator; exact replacement service-fixed condensers; dry and wet electrolytics in various



For the music lover. This is one of the fine G.E.C. radiograms.

patterns: paper condensers and mica condensers and trimmer condensers. It is interesting to note that last season Hunt's made more than 100,000 fixed condensers per day, and that they keep in stock more than 800 different types of exact service replacement and over 1,000 types of standard condensers.

**INVICTA RADIO, LTD., St. Andrews Road, Cambridge. Stand No. 17.**

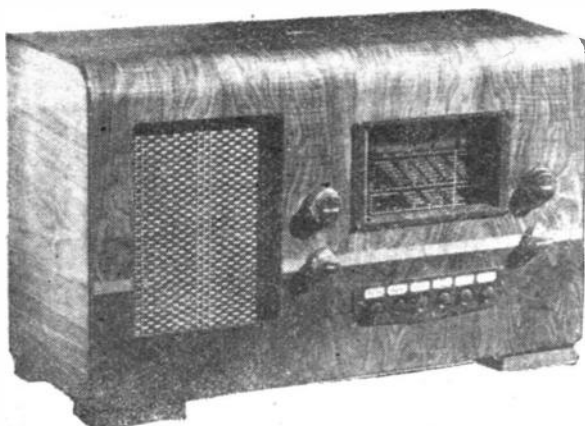
PUSH-BUTTON tuning is incorporated in some of the receivers which will be exhibited on this stand, and in addition to several popular models Invicta will also be showing a range of H.T. batteries. An interesting model in the range of receivers is the Junior portable, which is a 4-valve midjet set measuring only 11 1/2in. by 9in. by 7in. This is complete with moving-coil speaker and frame aerial.

**KOLSTER-BRANDES, LTD., Cray Works, Sidcup, Kent. Stand No. 41.**

INCLUDED in the range of K.B. receivers to be seen on this stand is a "Key-board" Push-button set which incorporates 5 valves and a cathode-ray tuning indicator. Another interesting model to be seen is the all-wave A.C. superhet with 8 watts push-pull output



The modernised AOB charger which is to be found on Heayberd's Stand No. 2.



Marconiphone are introducing push-button tuning in this model.

**MARCONI-EKCO INSTRUMENTS, LTD.,** Electra House, Victoria Embankment, W.C.2. Stand No. 33.

ON this stand will be seen a range of very high-class instruments, the majority of which are designed for use with modern transmitting equipment. A very interesting model is a special distortion factor meter, which is a mains-operated portable instrument measuring directly the total harmonic content in the output of audio-frequency oscillators and amplifiers and having a frequency range of 100 to 8,000 cps. fundamental.

**MORRIS & CO (RADIO), LTD.,** Jubilee Works, 167, Lower Clapton Road, London, E.5. Stand No. 74.

HERE will be seen the wide range of Premier components, including items for every type of receiver and transmitter. Among the new

**MULLARD RADIO VALVE CO., LTD.,** 225, Tottenham Court Road, W.1. Stand Nos. 29, 30 and 99.

IN addition to the well-known Mullard valves the Mullard Company will be exhibiting receivers and test equipment. A wide range of receivers is to be shown, including battery and mains apparatus, in which the push-button tuning device is prominently featured. In these receivers the push-button rotates the gang condenser which consists of two cylinders, one sliding inside the other, the capacity thus being varied by a "sleeve" action instead of the usual rotational movement. In the range of valves there is a special Red "E" series of valves specially designed for short-wave reception. The design is such that there

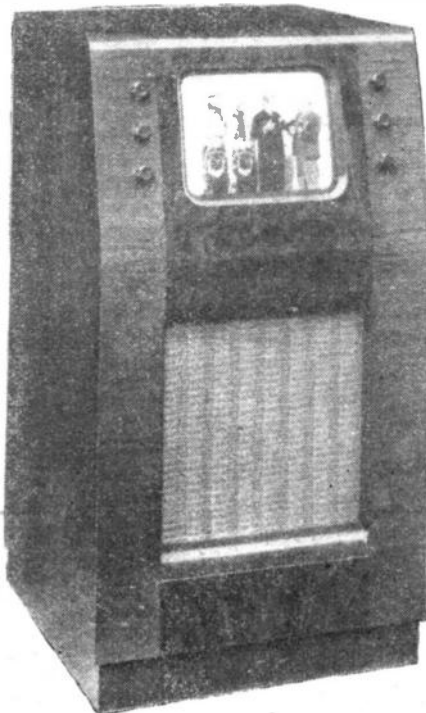
stage. A valuable feature of this set is that it incorporates 4 wavebands, two of which cover the short waves from 11.5 to 109 metres. Two television sets, an extension speaker and the Rejectostat all-wave Antidisturbance Aerial outfit will also be exhibited.

**McMICHAEL RADIO, LTD.,** Wexham Road, Slough, Bucks. Stand No. 24.

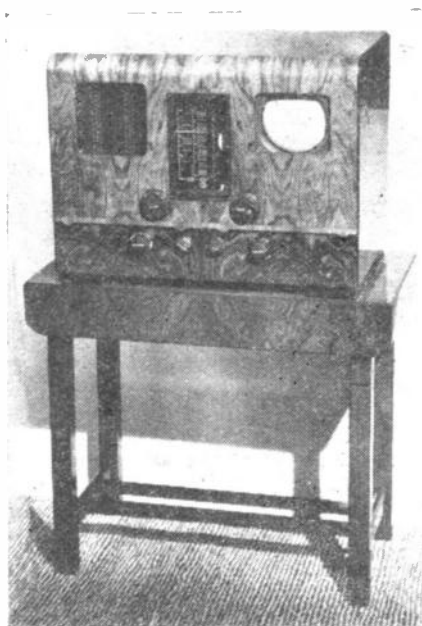
AN extensive range of receivers will be seen on this stand, and among the special models will be a low-priced radlogram. This is an 8-stage 5-valve all-wave set tuning from 16 metres upwards. The receivers incorporate many interesting features amongst which may be mentioned frequency-controlled negative feedback. With this there are three positions: "Normal" in which bass and treble terminate at the orthodox frequencies, "Bass" in which the treble is further reduced and the bass considerably accentuated, and "Foreign" when the bass is normal but the treble below normal.

**MARCONIPHONE Co., LTD.,** 210, Tottenham Court Road, W.1. Stand Nos. 54 and 65.

THE new receivers to be seen on Stand No. 65 include the latest small television instruments. At 29 guineas Model 706 provides, in addition to an all-wave radio, a television section providing a picture 4 1/2 in. by 4 in. This receiver is of the table type, and a special stool is available upon which it may be placed if desired. This costs an extra 3 guineas. The stand is immediately adjacent to the B.B.C. Television Studio, and thus visitors will be able to see the programme being enacted in the studio and pass directly to the Marconiphone stand and see the results on the screen, and will thus be able to compare and see the high quality which is provided in these sets. A four-valve two-waveband lightweight battery portable, and a five-valve three-waveband push-button receiver are particular models which will repay time spent in inspection, and in the accessories range will be a new Contrastatic aerial, designed for use on the medium and long wavebands where man-made static is particularly bad, and a new record player. On Stand 54 a display of the latter and records by Columbia, Parlophone, etc., will be seen. Visitors will be able to hear their favourite artists by means of Post Office telephones connected direct to Marconiphone Radiograms.



A neat television receiver produced by K.B.

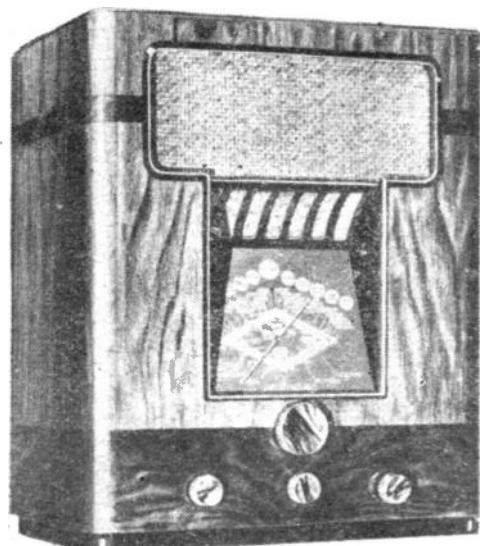


This neat television receiver costs 29 gns. and is a Marconiphone product. See it on Stand No. 65.

is a great reduction in noise on short-wave receivers and sensitivity is increased. Receiver model MASS is an interesting model, as it incorporates a single control by which all the normal operations are carried out. This receiver incorporates an inverse feedback circuit and a tone diffuser in the loudspeaker.

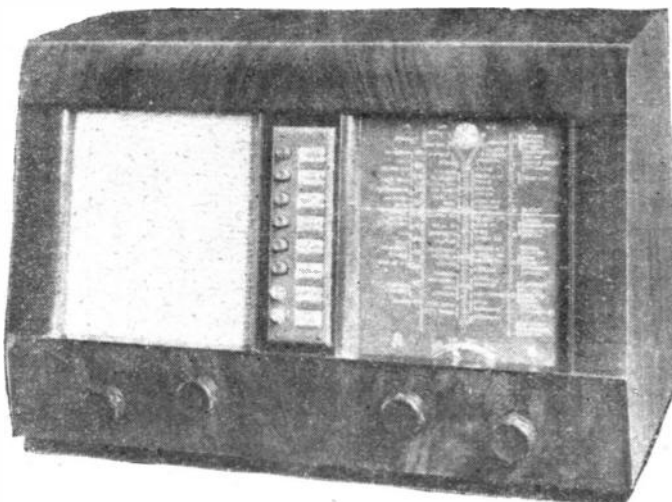
**MURPHY RADIO, LTD.,** Broadwater Road, Welwyn Garden City, Herts. Stand No. 27.

THE main feature of the receivers to be shown on this stand is the effective cabinet design. The receivers are quite distinctive, and the cabinets have been designed to provide high-quality reproduction with all the usual cabinet faults eliminated. The tuning dials fitted to some of the models are also of interest, providing a full alphabetical index to the stations for easy location. Television receivers are also to be shown.



Note the novel panel design on this Invicta receiver

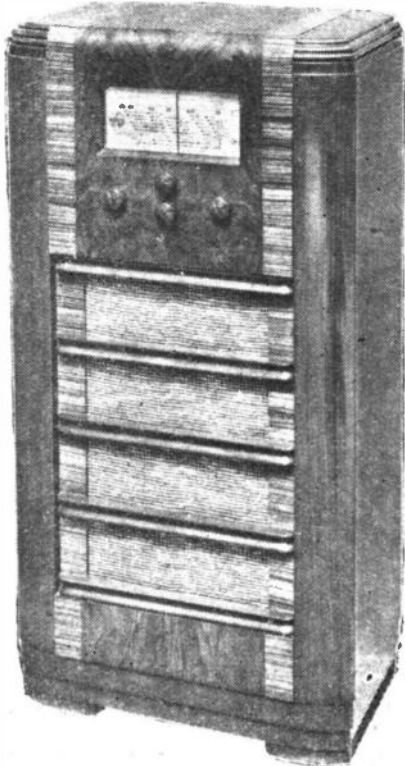
lines to be shown for the first time is a five-valve "Communications" receiver, a complete range of seven high-fidelity P.A. amplifiers for A.C. and A.C. D.C. operation, a five-valve all-wave superhet receiver chassis, a six-valve all-wave superhet chassis, a ten-valve deluxe superhet chassis and a new 3 in. cathode-ray oscillograph. For the transmitter there will be many items of interest, including the Variable Impedance Modulation Transformers, and a 10-watt all-band transmitter which is entirely self-contained and may be used for phone or C.W.



Push-button tuning is included in this K.B. receiver, which is to be seen with the above television receiver on Stand No. 41.

**NEW LONDON ELECTRON WORKS, LTD., East Ham, London, E.6. Stand No. 34.**

**A**N exhaustive range of aerial wires and aerial equipment is to be exhibited here. The well-known Electron All-wave Long Distance Aerial, the Braided and Compounded Aerial, the special Earth Wire and the Globe Aerial are a few of the items to be seen again this year, whilst in addition there will be the Varial (a simple selectivity device), an earth mat, a Screened Superior insulator pins, and a Simple Strip for wiring a receiver.



Substantial cabinet work is embodied in the Pilot receivers. See these on Stand 37.

**PILOT RADIO, LTD., 87, Park Royal Road, N.W.10. Stand No. 37.**

**I**n the range of battery and mains table, console and radiograms to be seen on this stand push-button tuning will be featured under the title of "piano tuning." "Pilotime" press-button control is incorporated in other models, and a novel elliptical dial is provided in certain models in the interests of simpler tuning. The models range from a four-valve battery superhet to a 10-valve mains unit in which the wavebands covered extend from 4.5 to 2,200 metres in six bands.

**PYE, LTD., Radio Works, Cambridge. Stand No. 31.**

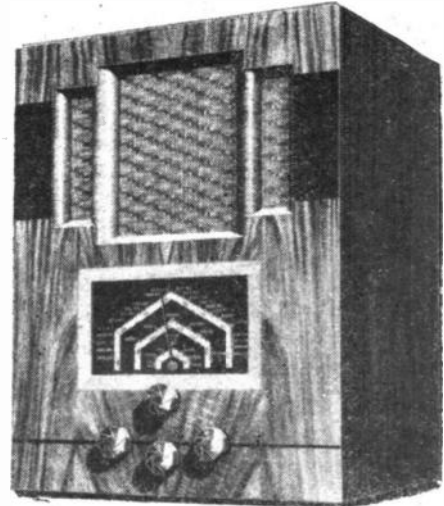
**I**n addition to the new portable which will be seen on this stand, there will be an exhaustive range of receivers of outstanding interest are the special high-fidelity radiograms and consoles. These incorporate Planetary Selector Units, negative feedback and many other details. The Paramagnetic Radiogram is claimed to have an amplifier with an effective response from as low as 1 cycle to 15,000 cycles per second. The circuits also include volume expansion. Push-button tuning is also included on certain models.

**RADIO-AID, LTD., 45, Duke Street, Oxford Street, London W.1. Stand No. 94.**

**M**ICROPHONES and deaf-aid equipment will be seen on this stand and a new radio-phonograph transmission system will be demonstrated. This apparatus enables people to listen to radio programmes without the necessity of a loud-speaker blaring forth. The arrangement incorporates an earphone fitted to an armchair under which is fitted a search coil. The chair may be placed in any part of a room which is wired and no connecting leads are thus needed.

**RADIO-GRAMOPHONE DEVELOPMENT, LTD., Globe Works, Newtown Row, Birmingham, 6. Stand No. 36.**

**A**n interesting feature of this year's R.G.D. receivers is that provision has been made on all of them for operation by means of a special remote control



One of the Pye Battery receivers—model QAC 38. Note the design of the tuning dial.

**REGENTONE PRODUCTS, LTD., Worlton Road, Isleworth, Middx. Stand No. 45.**

**T**HIS exhibit will include a varied collection of mains equipment of all kinds: receivers with motor-driven and permeability push-button tuning; two battery portables, and mains transportables. In addition a novelty which will appeal to all users of receivers, which has been kept in the "hush-hush" class until to-day, will be shown for the first time, and we understand that it will create great interest among visitors to the Show.

**ROTHERMEL, R. A., Rothermel House, Canterbury Road, N.W.6. Stand No. 80.**

**H**ERE will be seen the range of piezo-electric microphones and pick-ups. In addition there will be several amplifiers, headphones, faders, attenuators, gain controls and special cables. Of interest to the home-constructor is the announcement that at Olympia will be for the first time a new crystal pick-up head for use with existing apparatus. This will cost 2s. 6d., and is designed to be fitted to any existing carrier or tone-arm. The weight is only 3 ozs., and the output is approximately 1.5 volts.

**ROSE (ELEC.), NORMAN, LTD., 43, Lamb's Conduit Street, W.C.1. Stand No. 87.**

**O**N this stand the makers will be exhibiting a wide range of service equipment, test gear and associated equipment. Among the many items present are replacement components such as resistors, pilot bulbs, condensers, transformers, etc.

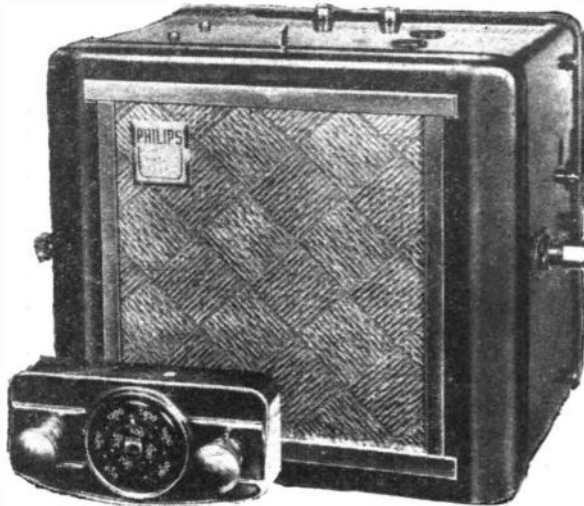
**NEWNES LTD., GEO., Tower House, Southampton Street, Strand, London, W.C.2. Stand No. 9.**

**O**N this stand you will be able to obtain a book or periodical on practically any subject. Messrs. George Newnes Ltd. undoubtedly publish more technical books dealing with radio and television than any other publisher, and in addition to the various books there is a complete range of blueprints to be obtained.

**PRACTICAL AND AMATEUR WIRELESS, Practical Mechanics, Practical Motorist and The Cyclist** are a few of the leading journals which will be on view. In addition, the wide range of handbooks, amongst which may be mentioned "The Wireless Constructor's Encyclopedia," "Everyman's Wireless Book," "The Television and Short-wave Handbook," "The Practical Motorist's Encyclopedia," "The Home Mechanic's Encyclopedia" will be on view and two new handbooks will be seen this year under the titles "Practical Wireless Service Manual" and "Wireless Transmission for Amateurs." "Sixty Tested Wireless Circuits" has been revised and will appear in an up-to-the-minute form, whilst specimen models of the receivers described in this issue will be on view for inspection. Mr. F. J. Camm and the technical staff will be available to answer readers' queries free of charge. Call and see us.

**PHILIPS LAMPS, LTD., 145, Charing Cross Road, W.C.2. Stand No. 51.**

**A**MONG the features to be seen on this stand will be motor-driven push-button tuning; new short-wave technique, and a new car radio. A new type of condenser is employed in the push-button sets and the buttons are so designed that each will control the full movement of the condenser. A simple method of station setting is provided. The short-wave performance of the new sets is improved by the incorporation of a new Silentrone valve. The new car radio provides an unusually high standard of reproduction, is simple to install, and has a much lower consumption than existing models. Large screen television will also be seen here.

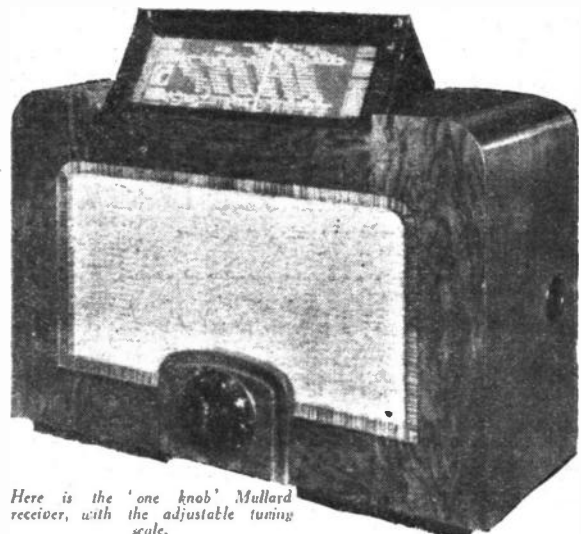


The latest in car radio receivers. The new Philips car radio casts 13½ lbs.

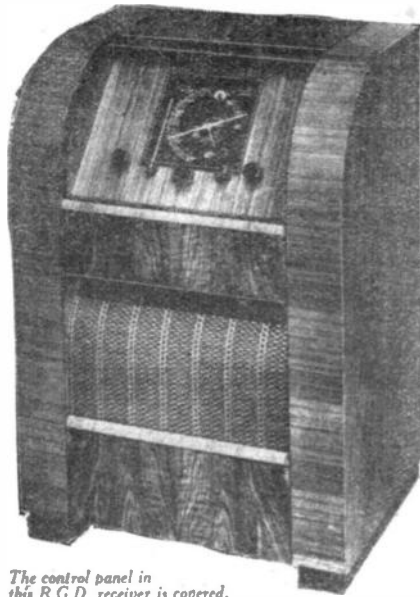
unit. This will be seen in two forms, one for use on all models up to the 1153 radiogram and the other with an additional volume control for use on the two larger radiograms. One of these is shown on page 590. In these an interesting point is the incorporation of volume expansion. On other models the new "Auto-tune" dial will present a popular appeal. This has an additional pointer which simplifies tuning settings. In the luxury class Model 1295, at 95 guineas, has a 12-watt resistance-coupled push-pull stage, acoustically balanced pressure chamber (bary-rhythm) giving improved bass tone, a synchronised electric clock and an illuminated control panel with lamp operated automatically from the lid stay. The high quality delivered by the labyrinth method of cabinet construction sets a new standard for loud-speaker reproduction.

**RADIO SOCIETY OF G.T. BRITAIN, 53, Victoria Street, S.W.1. Stand No. 10.**

**A**S usual, this stand will be devoted to an exhibition of transmitting and associated equipment designed by members. This will include a Utility Two transmitter, a 50 mc. crystal controlled transmitter, an impedance meter, signal generator, field-strength meter, etc.



Here is the 'one knob' Mullard receiver, with the adjustable tuning scale.



The control panel in this R.G.D. receiver is covered, when not in use, by a roll-top cover.

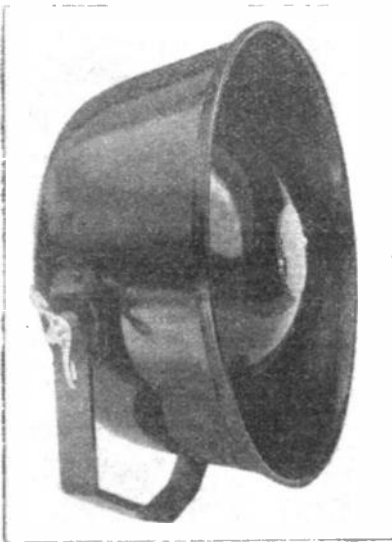
**SCOPHONY, LTD.,** Thornwood Lodge, Campden Hill, W.8. Stand No. 22.

**SCOTT INSULATED WIRE CO.,** Queenstand Works, Westmoreland Road, N.W.9. Stand No. 8.

A COMPLETE range of silk insulated wire, cotton insulated wire and enamel insulated wire will be seen here. This is available in copper and resistance material, and of great interest to visitors will be the demonstration of silk covering which is to be carried out on the stand.

**SIEMENS ELECTRIC LAMPS & SUPPLIES, LTD.,** 38-39, Upper Thames Street, E.C.4. Stand No. 18.

A COMPLETE range of the well-known Full O'Power batteries may be seen on this stand, the exhibit comprising types and sizes suitable for all makes of battery-operated radio receivers. The Cadet series is intended for modest sets taking 6.75 milliamperes, the Special series Super type for receivers taking from 9.10 milliamperes, and Power Type Triple Capacity for sets consuming 12.15 milliamperes.



Tannoy produce this novel loudspeaker which may be seen on Stand No. 70.

peres. In addition, there are special types of Double Capacity batteries for superhets, and receivers with Class B or Q.P.P. output stages.

The exhibit also includes Full O'Power pocket and torch batteries, dry cells, and a comprehensive range of "Cryptacel" L.T. accumulators in glass boxes.

A special feature this year is being made of Tung-ram valves for which Siemens are the sole distributors. The literature available includes a useful reference list of special replacement batteries for various makes of sets, which will be very helpful to the public.

**STEATITE & PORCELAIN PRODUCTS, LTD.,** Stourport-on-Severn. Stand No. 76.

MOST of this display will be devoted to a comprehensive range of insulators and insulating parts made in "Frenuentite" low-loss ceramic

material. The range includes aerial and feeder cable insulators, bushings and stand-off insulators, coil-formers, trimmer bases, wave-change switch parts, end-plates and mounting bars for condensers, valve fuses, etc. "Faradex," a material of very low-loss at high frequencies, is also to be shown.

**STERLING BATTERIES, LTD.,** Sterling Works, Dagenham, Essex. Stand No. 59.

HERE will be seen a range of batteries of all types, products of this company. Some of the processes involved in the manufacture of the batteries will be demonstrated and should prove of interest to all battery users.

**STRATTON & CO., LTD.,** Eddystone Works, Bromsgrove Street, Birmingham. Stand No. 77.

THIS stand will illustrate the vast range of short-wave components, all of which are made under the Eddystone trade-mark. The products will range from a miniature air trimmer to laboratory and transmitting equipment. In addition to many familiar items on this stand a number of new lines will be seen, and several receivers of interesting design are also to be exhibited. These include an "All-world Eight" as well as an "All-world Two," and of special value to the constructor is a chassis for a 4-band receiver in which a novel all-wave tuner and special die-cast I.F. unit are the main items. The tuning dial on this unit consists of a cylinder 10in. long, rotated by the wave-change switch and providing a separate scale for each frequency range. Calibrations are in metres and megacycles for the short waves and station names and metres for the medium and long waves. It tunes down to 13 metres.



Another fine example of modern receiver design in the R.G.D. range.

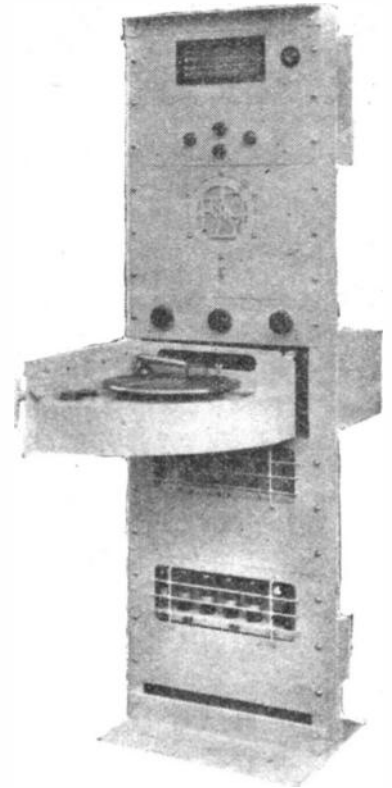
**TANNOY PRODUCTS,** Canterbury Grove, West Norwood, S.E.27. Stand No. 70.

THE main products of this company are for public address work, and some interesting specimens are to be shown. These will include a novel loudspeaker which is illustrated on this page. This is so designed that the air column is of the co-axial re-entrant form. The frequency response is excellent for intelligibility and the speaker may be mounted on a car or any other desired position. In addition to this several other speakers will be shown, together with special amplifiers of all types and for all purposes. A power microphone is an interesting development, capable of fully loading a speaker without the use of an amplifier between the two sections. The output is stated to be comparable to that produced by the average 8-10 watt amplifier.

**TELEGRAPH CONDENSER CO., LTD.,** Wakes Farm Road, Acton, W.3. Stand No. 81.

A VERY complete range of condensers will be seen on this stand, and in addition to those which were seen in past years a number of new lines will be seen. These will include non-inductive tubular paper condensers, moulded mica condensers with wire ends, silvered mica condensers, ceramic precision condensers, dual wet (surgeproof) electrolytic condensers, surgeproof dry electrolytics, and high-

voltage condensers for television equipment. At the moment a number of these special items will only be available for set manufacturers, but they



For public address installation here is a Tannoy product.

will be eventually available for the home constructor.

**TELEGRAPH CONSTRUCTION & MAINTENANCE CO., LTD.,** 22, Old Broad Street, E.C.2. Stand No. 78.

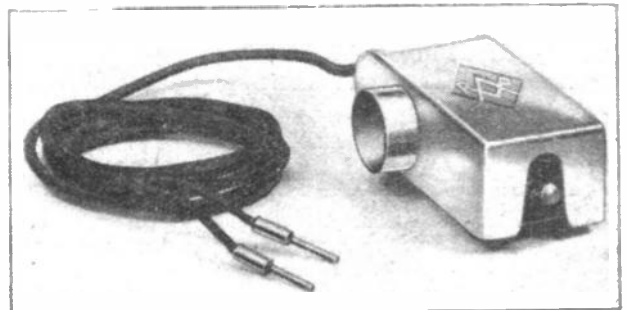
ON this stand will be seen many special metals developed and used in modern wireless and television apparatus. These will include Telon materials such as Mumetal, Radometal, Rhometal, etc. These are employed for the cores of input, microphone and other transformers, shields for C.R. tubes, screening boxes and similar apparatus. Also to be shown are many types of high-frequency cables such as are employed commercially in such apparatus as relay works, trunk television cables and similar purposes.

**TUCKER, GEO., EYELET CO., LTD.,** Cuckoo Road, Birmingham, 7. Stand No. 58.

THE products of this firm consist of press-ware of all kinds and include eyelets, solder tags and so on. The exhibit is, of course, primarily of interest to manufacturers.

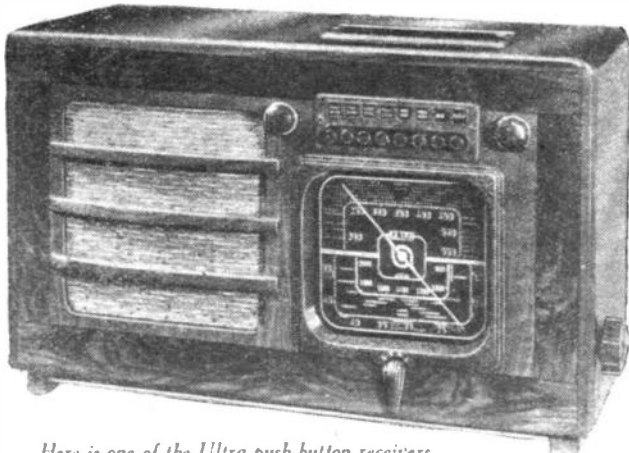
**ULTRA ELECTRIC LTD.,** Western Avenue, Acton, W.3. Stand No. 50.

A RANGE of existing receivers is to be seen on this stand, and among the newer models will be several with push-button tuning. This will be seen in two forms, one in which the buttons are arranged horizontally, and in another they will be arranged in circular form. Finger-tip tuning and all-wave coverage are other features of these receivers, and two of the new models are rated to deliver an output of 8 watts.



Here is something new for constructors. A crystal pick-up head from Rothermels. See it on Stand No. 80.





Here is one of the Ultra push-button receivers.

VACUUM-SCIENCE PRODUCTS, LTD., 166, Weir Road, S.W.12. Stand No. 105.

THIS firm will be showing various types of photo-cells, various types of multipliers with a new type of grid control, a midjet valve with an indirectly-heated cathode, a still picture transmitter for television manufacturers and various types of cathode-ray tubes. There will also be on the stand for inspection a high-pressure mercury vapour lamp.

VIDOR, LTD., West Street, Erith, Kent. Stand No. 46.

ON this stand two neat portables will be seen, one of the closed or "suitcase" type, and one of the open type which may be used open or closed. Both of these are of the battery-operated type. The remaining receivers in the Vidor range to be seen all include all-wave tuning, and in addition to these there will be seen a complete range of Vidor H.T. batteries.

WESTINGHOUSE BRAKE & SIGNAL CO., LTD., 82, York Road, King's Cress, N.1. Stand No. 35.

A FULL range of Westinghouse metal rectifier units for all purposes in radio and television will again be on view.

These include the high-tension and low-tension types for mains units, battery charging, and loud speaker pot supply; "Westectors" — the high-frequency rectifiers for detection, automatic volume control, battery economy, etc.; "H" and "A" types for television purposes — H. T. supply to cathode-ray tubes, time-base, picture — slit circuit, etc.

A full range of commercial battery chargers will be on view.

one of which, the R.G.C.10, will be working to demonstrate the flexibility and ease of operation. All the standard models of this year will again be available for the coming season.

In addition to above there will be interesting exhibits of metal rectifiers, large and small, as supplied for broadcasting and other telecommunication purposes, such as those supplied in large quantities to the G.P.O. for amplifier equipment, etc., etc.

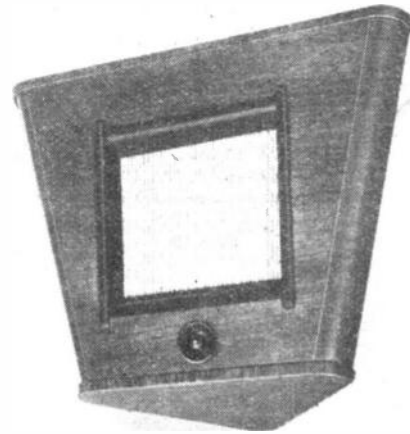
Copies of the latest edition (1938) of the well-known publication, "The All-Metal Way," will be available on request. This book contains an enlarged section dealing with rectifiers for television power supplies, complete with circuits.

WESTON ELECTRICAL INSTRUMENT CO., LTD., Cambridge Arterial Road, Enfield, Middlesex. Stand No. 83.

NEW instruments will be shown this year, but many of the old familiar models will be seen with improvements. A Sensitive Analyzer is probably the most interesting of these. This provides D.C. and A.C. voltage ranges, D.C. and A.C. current ranges, resistance measurements, output measurements and measurements of capacity. Extremely wide ranges are provided on each section, and at £16 16s. this represents a very valuable accessory for the dealer or service man.

WHITELEY ELECTRICAL RADIO CO., Victoria Street, Mansfield, Notts. Stand No. 26.

THE W.B. speakers need no introduction to our readers, and this year, in addition to cabinet (Continued on page 599.)



A novel W.B. speaker cabinet.

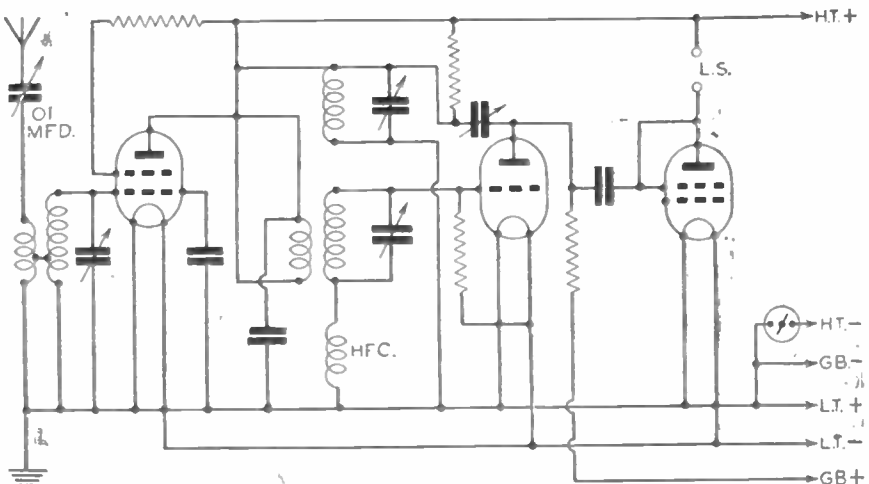
# Our Annual Radiolympia Competition

## 25 W.B. SPEAKERS FREE

### IN A SIMPLE FREE-FOR-ALL COMPETITION.

Once again we offer in our annual Radiolympia Competition, twenty-five W.B. Junior Loudspeakers in a simple competition free to every reader. This year you are invited to discover the number of mistakes in the circuit shown to the right. Our artist has been instructed to draw this circuit and deliberately to make a number of mistakes. You must redraw the circuit eliminating the mistakes and submit it to us not later than September 17th. The following are the simple rules:

1. The circuit appended must be stuck to a sheet of paper and the mistakes indicated on it in ink.
2. Readers may send in as many entries as they wish provided that the circuit appended is attached to each entry.
3. Entries should be addressed to the Editor, PRACTICAL AND AMATEUR WIRELESS, George Newnes, Ltd., Tower House, Southampton Street, Strand, W.C.2, marking the envelope in the top left-hand corner with the word COMPETITION.
4. The prizes will be awarded to those whose corrected circuit most nearly complies with the correct circuit which we shall publish in our issue dated September 24th.
5. The Editor's decision is final and legally binding and this is an expressed condition of entry.
6. We cannot enter into correspondence regarding this competition.



Competitor's Name.....

Address .....

.....

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| Sixty Tested Wireless Circuits                               | 2/6    | 2/10     |
| Wireless Coils, Chokes and Transformers and How to Make Them | 2/6    | 2/10     |
| Wireless Constructor's Encyclopædia                          | 5/-    | 5/6      |
| Everyman's Wireless Book                                     | 3/6    | 3/10     |
| Television and Short-Wave Handbook                           | 3/6    | 3/10     |

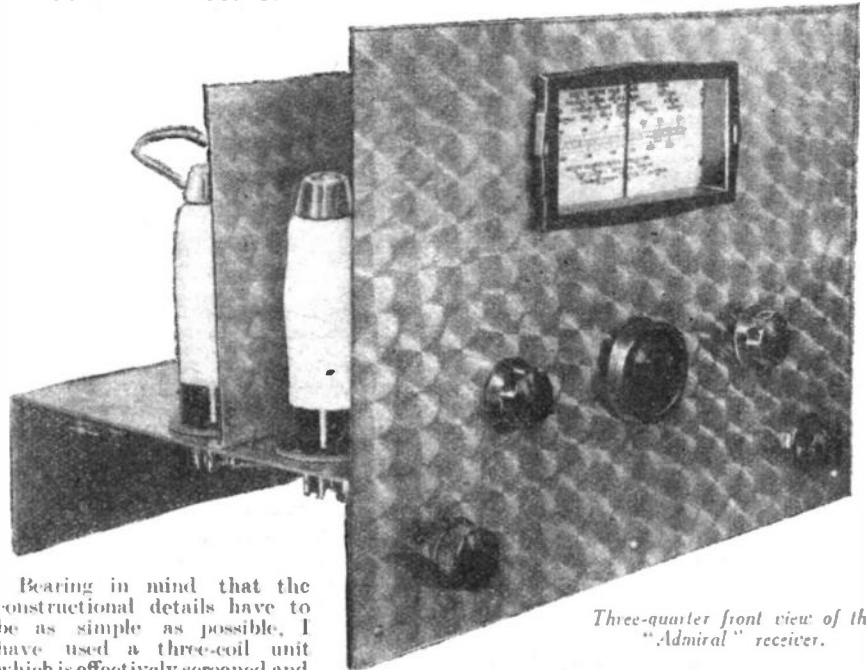
See them on our Stand 9, Ground Floor.

# F. J. Camm's "Admiral" 4-valve Receiver

A 2-H.F. Two-band Broadcast Receiver

CONSIDERABLE controversy has raged round the question of superhet versus straight H.F. receivers, and in response to numerous requests, I have produced a design which I feel confident will prove that a receiver embodying two tuned stages of H.F. amplification is worthy of every consideration from those who require quality of reproduction combined with a high degree of selectivity and long-range reception.

Space forbids further discussion on the merits of the two schools of thought in this issue; therefore, a brief description of the "Admiral" must suffice and serve as its introduction. Complete constructional details, together with further illustrations, will appear in our next issue.



Three-quarter front view of the "Admiral" receiver.

**LIST OF COMPONENTS FOR F. J. CAMM'S ADMIRAL 4-VALVE RECEIVER.**

- One coil unit—B.P.116 (Varley).
- One variable condenser—Baby gang, 3-section (Jackson).
- One micro-horizontal dial (Polar).
- Four valveholders (Clix).
- Terminal strips, A., A.I. and E., L.S., P.U. (Clix).
- H.F.C., H.F.10 (Bulgin).
- One switch—S. 139 (Bulgin)
- One aerial series condenser, type 451 (T.C.C.).
- One reaction condenser—Compax .0002 (Polar).
- One volume control, 50,000 type B (Dubilier).
- Fixed resistances:
  - Three type F. 30,000 1 watt, three type F. 20,000 1 watt, two type F. 1,000 1/2 watt, one type F. 1,000 1 watt, two type F. .1 meg. 1/2 watt, one type F. 50,000 1/2 watt, one type F. .5 meg. 1/2 watt, one type F. 1 meg. 1/2 watt, one type F. 5,000 1 watt (Dubilier).
- Fixed condensers:
  - One 2.0 mfd. type T.C.C. 50; one 1.0 mfd., type 341; six 0.1 mfd., type 341; two .05 mfd., type 341; one .005 mfd., type 451; one .0002 mfd., type 451; one .0001 mfd., type 451 (T.C.C.).
- Tone-control potentiometer, 25,000 type B (Dubilier).
- Chassis—14in. x 9in. x 3in. Alu. (Peto-Scott).
- Panel—14in. x 10in. Alu. (Peto-Scott).
- Four valves—Two VP210, one HL2, one Pen220 (Mazda).
- Fuse—100 mA (Microfuse).
- Fuseholder (Microfuse).
- One 120-volt H.T. battery and one 2-volt 40 A.H. accumulator (Exide)
- One Stentorian loudspeaker (W.B.).

Bearing in mind that the constructional details have to be as simple as possible, I have used a three-coil unit which is effectively screened and thus reduces the need for external screening. Only one additional screen is used.

A metal chassis and panel is employed which, with the clean and neat layout, presents quite a professional appearance and renders the whole assembly most pleasing to the eye.

**Circuit**

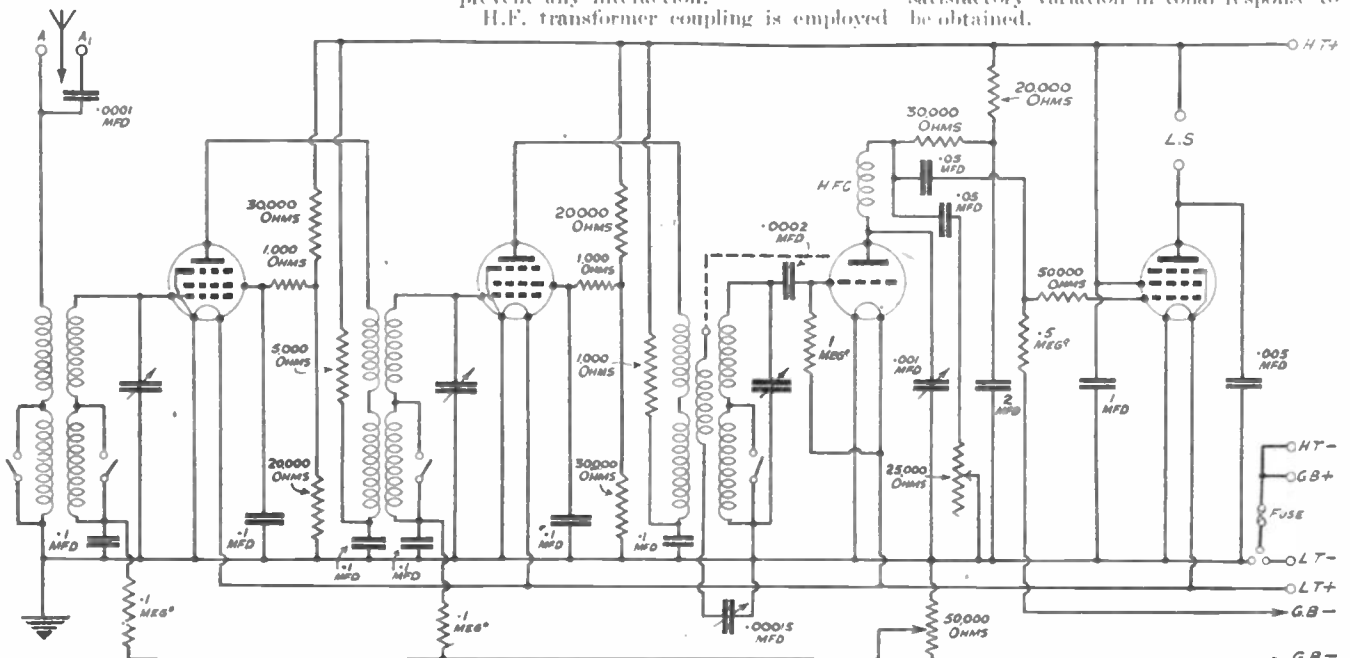
For the H.F. stages, two variable-mu H.F. pentodes are used, the bias being applied to them by means of a normal potentiometer across the bias battery, each circuit being adequately decoupled to prevent any interaction.

H.F. transformer coupling is employed

between the first two valves and the second and third, this bringing the signal to the detector stage in which a normal leaky-grid triode is used.

The output of the detector is fed into the L.F. pentode by means of a standard resistance capacity coupling, but in view of the pre-detector arrangements I have taken ample precautions to provide adequate decoupling.

An efficient tone-control circuit is embodied and this, together with the bypass condenser fitted between the output pentode, anode and earth, allows a most satisfactory variation in tonal response to be obtained.



Theoretical circuit. Note the optional reaction arrangements.



# OUR NEAREST BRANCH— YOUR NEAREST PILLAR-BOX

EVERYTHING RADIO · CASH · C.O.D. · EASY-WAY—(NO THIRD PARTY COLLECTIONS)

## PILOT AUTHOR KITS

**F. J. CAMM'S ADMIRAL 4**  
KIT "A" <sup>CASH</sup> £6:7:6 or <sup>C.O.D.</sup> 12/- down  
balance in 11 monthly payments of 12/3.  
Comprising all first specified parts for receiver including drilled aluminium chassis and panel, wire, flex and screws.  
Set of specified valves 37/9, or add 3/6 to deposit and to each monthly payment.

**THREE-VALVE RECEIVER**  
KIT "A" <sup>CASH</sup> £5:14:3 or <sup>C.O.D.</sup> 11/- down  
balance in 11 monthly payments of 11/-.  
Set of specified valves 33/-, or add 3/3 to deposit and to each monthly payment.

**FLEET SHORT-WAVE 2**  
KIT "A" <sup>CASH</sup> 62/- or <sup>C.O.D.</sup> 6/- down  
balance in 11 monthly payments of 6/-.  
2 specified valves 22/-, or add 2/- to deposit and to each monthly payment.

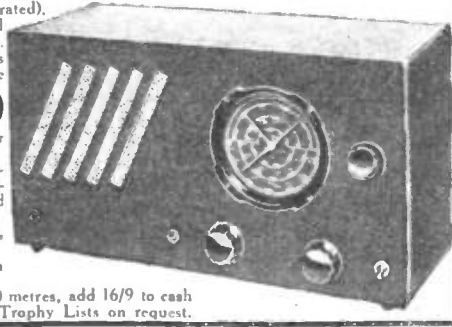
**PYRAMID ONE-VALVER**  
KIT "A" <sup>CASH</sup> 47/- or <sup>C.O.D.</sup> 4/6 down  
balance in 11 monthly payments of 4/6.  
Specified valve 11/-, or add 1/- to deposit and to each monthly payment.

**JUNIOR CRYSTAL SET**  
Complete kit, comprising all parts for building, including Metapax baseboard and drilled panel, wire flex and screws. **Cash or C.O.D. 28/9**, or 2/6 down and 11 monthly payments of 2/9.  
**DETAILED PRICE LISTS ON APPLICATION.**

**FREE.** Send now for complete lists covering Peto-Scott 1939 range of Push-Button, All-wave Receivers, Experimenter Kits, Mains Units, Speakers, A.C. and Battery Amplifiers and Short-wave Receivers.

## B.T.S. TROPHY SHORT-WAVE RECEIVERS

**TROPHY 5** Junior Communication Receiver (as illustrated). Continuous wave-range 10-550 metres. Mechanical bandspreading, A.V.C. and B.F.O. on-off switches. Alternative scales now available calibrated in metres or kc/s. Built-in speaker. Pleasing black crinkle finish metal cabinet, size 17in. x 9in. x 8 1/2in. deep. For A.C. mains 200/250 volts 40/100 cycles. **£9**  
Guaranteed, fully tested. **Cash or C.O.D. £9**, or yours for 10/9 and 18 monthly payments of 10/9.  
**TROPHY 3**, Highly efficient self-contained short-wave receiver. Speaker incorporated. Phone jack. Effective wave-range 6.2 (television) to 550 metres. Supplied with tuners for 12-52 metres.  
**BATTERY MODEL.** **Cash or C.O.D. £5 15 0**, or 7/- down and 18 monthly payments of 7/-.  
**A.C. MODEL.** **Cash or C.O.D. £6 6 0**, or 7/6 down and 18 monthly payments of 7/9.  
N.B.—If coils required for complete coverage, 6.2-550 metres, add 16/9 to cash prices or 1/- to deposit and payments. Complete Trophy Lists on request.



## 1-VALVE ALL-WAVE RECEIVER



This superior one-valve all-wave receiver covers 18-2,000 metres. Extremely simple to build—6 connections only required for special all-wave tuner incorporated. Recommended for the beginner or where an efficient low-powered but low-priced receiver is required for all-wave operation.

**KIT "A"** comprises all parts for building with drilled panel and chassis, drawings and instructions. **Cash or C.O.D. 29/6**, or 2/6 down and 11 monthly payments of 2/9. Efficient detector type valve 3/9 extra.

## Peto-Scott MICROPHONE

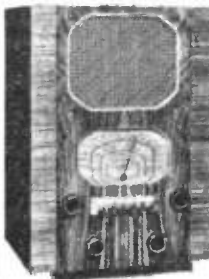
Recommended Transverse current type for use with battery or A.C. Amplifiers. Can be attached to your existing set via P.U. sockets. Provides high-fidelity reproduction. On-off switch fitted.



Two models available, supplied complete with matching transformer, 9V G.B. battery and 25 feet of flex.  
**TABLE MODEL** as illustrated, 25/- or 2/6 down and 11 monthly payments of 2/6.  
**FLOORSTAND model,** 42/- or 2/6 down and 11 monthly payments of 4/-.

## 1939 RECEIVERS

**BUSH, B.T.S., COSSOR, EKCO, FURGUSON, PYE**  
all available on lowest easy-payment terms.  
**SEND FOR COMPLETE LISTS** and purchase by the famous Peto-Scott easy-payment plan. Strictest privacy ensured with no third-party collections.

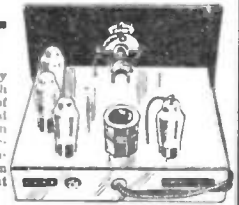


**Peto-Scott PUSH-BUTTON Receivers**  
**MODEL 9033** illustrated—a 4-valve push-button all-wave battery receiver, is one only of a comprehensive range available for the new season and representative of our usual policy of supplying modern and efficient apparatus at prices and terms within the reach of everyone. You are urged to send for the beautifully-illustrated catalogue, post free on request.

**MODEL 9062.** Five-valve 6-stage A.C./D.C. all-wave receiver. Wave-range 16-2,000 metres. A.V.C. 2-watts output. 8in. cone moving-coil speaker provides wonderful reproduction. Manual tuning only (not press-button). Beautiful walnut cabinet similar to type illustrated but with tuning controls below speaker fret. Price 8 gns. or 8/6 down and 18 monthly payments of 10/3.

## THE PILOT SHORT-WAVE EXPERIMENTER

### 8-IN-1 KIT



You can build alternatively 8 short-wave receivers with this popular kit. Many of the components employed are continually specified in radio journals and furthermore by buying the complete kit you save £2 2/6 on your short-wave component purchases.

We think we have aptly combined the original name of the Peto-Scott "Experimenters' Kit" with that of the "8-in-1 Kit." Eight different circuits are provided for the constructor, including a simple resonant detector converter, a three valve Bandspread H.F. tuned detector pentode-output receiver and an efficient battery operated four valve for D.N. work. The 8-in-1 Experimenters' Kit is supplied absolutely complete—there is nothing more to buy. Components are all of well-known manufacture and for the alternative building of 8 receivers the kit includes 8 low-loss coils covering 8-97 metres, four valves (comprising L.F. Detector, R.F. and Pentode), drilled metal Chassis and Panel, black crackle Steel cabinet, set of eight blueprints and comprehensive building instructions. For both the experimenter and the newcomer to the short-wave the advantages in possessing the 8-in-1 kit can be readily appreciated. There is another important factor—by buying the complete "8-in-1 Experimenters' Kit" you save money—you avoid the unnecessary expense incurred by purchasing individual—and probably unnecessary—components. Invest in this new kit now. Complete Kit. **£5 15 0** Cash or C.O.D., or 7/6 down and 14 monthly payments of 8/-.

**7/6 DOWN**

For building alternatively, 8 Short-wave receivers—any one available as a separate kit—but it's cheaper to buy the ALL-IN-KIT. Described fully in the Peto-Scott "Short Wave Experimenter" booklet post free on request.

## Anti-Noise

## ALL-WAVE AERIAL

Minimises man-made electrical interference. Increases signal strength. Improves selectivity. Weatherproof outfit comprises set transformer with changeover switch for short, medium and long Waves. Duplex aerials, insulators, waterproof "lead-in" wire, with instructions for erection. **Cash or C.O.D. 17/6** or 8 monthly payments of 2/6.

**2/6 DOWN**



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—PLEASE SEND COMPLETE LISTS—

## Leaves from a Short-wave Log

### Luxembourg on Short Waves

ACCORDING to certain Paris newspapers, as a result of an agreement reached between Radio Luxembourg and the Government of the Grand Duchy, permission has now been granted to the former to carry out broadcasts on a short-wave channel. Transmissions are therefore likely to be made in the very near future, but it is pointed out that for some time they will only be of an experimental nature.

### Chiclayo on New Channel

THE Peruvian station OAXIA, *La Voz de Chiclayo*, which has been working on 48.78 m. (6.15 mc/s), has been reported to be testing on 24.98 m. (12.01 mc/s), in view of the congestion on the former channel. The studio is said to be on the ether daily from G.M.T. 00.00-04.00. Address: Apartado Postal, 171, Chiclayo (Peru).

### La Voz de Valdivia

CD1190, a short-wave relay station of CD 69, Valdivia (Chile), now operating on 25.21 m. (11.9 mc/s) with a power of 250 watts, carries out three daily broadcasts, namely, between G.M.T. 16.00-19.00; 21.00-24.00 and from 01.00-04.00. Interval signal: Chimes. Man and woman announcers. Address: Radiodifusore CD 69 y CD 1190, Señor Alberto Carrasco, Valdivia (Chile).

### Delete from Your List

ACCORDING to official publications the following broadcasting stations have now permanently suspended their transmissions: H14V, formerly on 46.51 m. (6.45 mc/s), and H18A, on 46.3 m. (6.48 mc/s), both located at Ciudad Trujillo (Dominican Republic).

### New Station in China

NEWS bulletins relative to the Sino-Japanese conflict in German, French, and English are now broadcast daily from G.M.T. 12.00-12.30 from XTJ, Hankow (China), on 25.66 m. (11.69 mc/s), 3 kilowatts.

### More Broadcasts from Chile

A MEDIUM-WAVE station CB118, at Santiago (Chile), is stated to have recently inaugurated a short-wave transmitter (CB1180), on 25.42 m. (11.8 mc/s). Address: Estacion CB. 1180 (Markoff Hermanos Limitada), Santiago (Chile).

### And Also from Costa Rica

T1XD, the medium-wave station at San José (Costa Rica), has added to its network a 200 watt relay (T12XD) operating on 25.15 m. (11.93 mc/s). The slogan of the studio coupled to the call is: *La Voz de la Republica*. Address: John Gilbert Daly, Station T12XD, Apartado Postal, 1729, San José (Costa Rica). The station was previously reported as located at Limon.

### Broadcasts from St. Kitts

A LISTENER writes that he has picked up a transmission with the call VP2LO, which would appear to emanate from St. Kitts (British West Indies). The wavelength was 47.02 m. (6.38 mc/s).

Although not yet verified, it is believed that the station is on the air daily between G.M.T. 20.00-21.00; it is operated by the Caribbean Broadcasting Service. Reference to this transmitter has already been

made in a former issue of PRACTICAL AND AMATEUR WIRELESS.

### La Voz del Corazon

AT Villarrica (Paraguay), the owners of the medium-wave station ZP15 have installed a short-wave transmitter, namely

ZP14 y ZP15, Señores Friedman Hermanos, Villarrica, Paraguay (South America).

### As You Were!

RADIO SOFIA (Bulgaria) following a series of experimental transmissions on 35.44 m. (8.645 mc/s), in anticipation of the opening in the spring of 1939 of a 20-kilowatt short-wave transmitter, has now reverted to its former channel, 20.04 m. (14.97 mc/s).

The times of the broadcasts are as under: G.M.T. 10.00-12.00 and 15.00-22.00 on



Some of the competitors and officials round the television camera during the televising of the various events of the European Swimming Championships at the Empire Pool, Wembley, recently.

ZP14, working on 48.78 m. (6.15 mc/s) with a power of 200 watts. In announcements both call-signs are mentioned with the slogan: *Radio Cultura, La Voz del Corazon et Sud America*. Broadcasts are occasionally heard from G.M.T. 22.00 onwards. The station closing down towards G.M.T. 03.00. Address: Estaciones

Monday, Wednesday, Friday and Saturday: G.M.T. 18.00-20.00 only on Tuesday and Thursday. On Sundays and Holy Days an early transmission is made between G.M.T. 05.30-13.00, and the afternoon session, starting at 15.00, lasts until 21.30. Woman announcer. Call: *Radio Sofia*. Address: 19, Moskovska St., Sofia (Bulgaria).

## FEATURE FILMS

WITH uncanny regularity the film industry finds something in the television service to which they take exception. The latest is feature films, for the B.B.C., as an experiment, televised a full length film as a Sunday evening programme. The idea was a good one and seemed to find favour with the majority of viewers. As far as the film papers are concerned, however, they state that film television is looming as a new aspect of B.B.C. policy and this first feature broadcast may set the pace for regular transmissions with serious implications for the industry. There is no doubt that the whole position needs regularising, but it should be pointed out that the first experiment was undertaken with a foreign film at least four years old. The B.B.C. have tried repeatedly to reach some form of mutual understanding with the film industry, but so far without success, although they offered to show excerpts from current films in order to publicise them. It is fantastic to keep talking of television as being a menace here and a

menace there; it is developing rapidly both technically and in programme value and the sooner a happy co-operative spirit is engendered by those who feel that television may cause them inconvenience, the better it will be for all concerned. In this connection it was gratifying to find one leading film paper put forward a good suggestion the other day. They stated that the time was ripe for an investigation to examine the possibility of converting television, at least to some extent, into an ally. It was felt that one excellent opportunity was through the medium of big-screen television equipment, which has already been installed in some cinemas. The idea put forward was for the formation of a negotiating committee to draw up a "pact of mutual assistance" with the B.B.C., with the object of securing the right to re-diffuse in cinemas televised items of wide popular appeal. Whether this will culminate in a separate service for cinemas is largely a matter for the Postmaster-General and it would be more satisfactory to have this whole position aired and settled satisfactorily at once than to wait until the television industry has grown to very large proportions.



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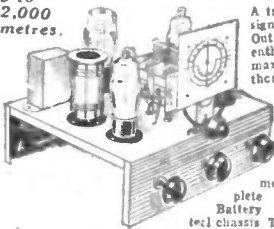
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ALL CHASSIS and KIT  
BARGAINS PREVIOUSLY  
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VALVES FREE!!

NEW "WORLD" S.G.3  
BARGAIN 29/6

LIST VALUE  
£4 : 15 : 0

STATION-NAME DIAL  
9 to  
2,000  
metres.



VALVES FREE!!  
A triumph in Receiver design. Two 5.G. and Pentode Output stages. For the enthusiast who requires maximum efficiency and these extra stations on the Short, Medium and Long Waves. 3 Short-wave ranges. Employs famous B.T.S. Ore-shot inductors or N.T.S. 6-pint coils. Slow-motion Tuning. Complete Kit for Battery use with steel chassis Twin-gang condenser, Slow-motion Tuning, station-name dial, Transformer, Resistances, etc., Cash or C.O.D. or 2/6 down and 12 monthly payments of 2/10.

2/6  
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COMPLETE KIT. Comprising above kit with set of 6 N.T.S. Valves. Cash or C.O.D. 4/6 or 3/- down and 12 monthly payments of 4/-. VALVES GIVEN FREE.

N.T.S. BATTERY S.G.3

"A neat and efficient Receiver"  
vide—"Practical Wireless."

LIST VALUE  
£6 : 6 : 0

BARGAIN—  
CASH or 52/6  
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or 5/- down and 12 monthly  
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Wavelength 200-2,100 metres. Concert-Grand Moving-coil Speaker. New-type No-trouble Switch. Complete with Valves less Batteries. READY TO PLAY. Will bring you British and Foreign programmes with remarkable fidelity and volume. New screened-grid high frequency, high-efficiency detector, and Pentode output. Only 9 w.a.s. H.T. consumption. Latest improved components. Steel chassis. Slow-motion tuning. Illuminated wavelength scale. Beautiful walnut-veneered cabinet, 19 1/2" high, 14" wide, 10" deep. CHASSIS ONLY, as employed in the above complete receiver. Ready for fitting in your own cabinet. Dimensions, 19" wide, 7 1/2" deep, 8" high to top of scale. 19/8. OR COMPLETE with 3 matched valves, CASH OR C.O.D. 39/6, or 2/6 down and 11 monthly payments of 4/-.

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**STRAIGHT THREE CHASSIS.** less valves, only tested, 12/6.

**KNOBS.** 1 doz. assorted control knobs, 1/-.

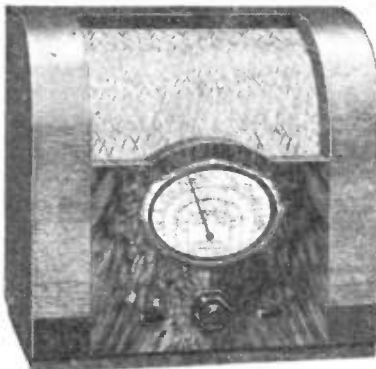
**VOLUME CONTROLS, POTENTIOMETERS.** Well-known makes, all values up to 1 meg., 2/-; with switch, 2/6.

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2/6  
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6-VALVE ALL-WAVE  
A.C. DECCA RECEIVERS

PRESENT LIST PRICE £14-3-6

BARGAIN 7 1/2 GNS

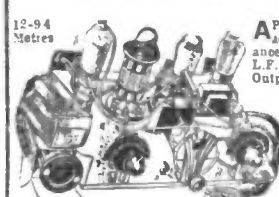
OR YOURS FOR 7/6 DOWN

6-valve All-wave A.C. 1938 Superhet. 12 to 2,000 metres. Seven tuned circuits, A.V.C. Beautiful hand-polished upright walnut cabinet. Bold station-named dial. Spread-tuning, 4 separate easy-to-read wave-bands. Over-size speaker providing wonderful reproduction. Provision for external speaker and gramophone pick-up. Supplied in sealed manufacturer's cartons and covered by maker's guarantee. Supplies strictly limited. An amazing bargain which must not be missed. Yours for 7/6 down, balance in 12 monthly payments of 10/-.

★ SHORT-WAVE  
BARGAINS—VALVES FREE

4-valve BANDSPREAD  
Battery SHORT-WAVE KIT

List Price £4. 17. 6 BARGAIN 42/-



VALVES FREE  
APERIODIC H.F. reacting detector, resistance and transformer L.F. Stages, Pentode Output. Slow-motion bandspread tuning SIMPLIFIES WORLD RECEPTION! Efficient low-loss reaction condenser. Air-spaced bandspread and tank condensers.

2/6  
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SPECIAL ANTI-BLIND SPOT CONDENSER.  
3 calibrated scales.

KIT comprises every part for assembly, including 3 6-pin coils, wiring, and assembly instructions. Cash or C.O.D. Corr. Pd. 42/-, or 2/6 down and 12 monthly payments of 4/-. 4 MATCHED VALVES FREE.

4-VALVE A.C. BANDSPREAD KIT.  
12-94 metres. Entirely new design. Unmatched world-wide reception. KIT Complete with all coils. List value 27/5/6. BARGAIN, £4 15/0, or 5/- down and 12 monthly payments of 7/-. Four matched valves FREE.

1-VALVE SHORT-WAVE KIT.  
Complete 1 Valve Receiver Kit, including 3 coils, 12-94 metres and pair of super-sensitive headphones, 27/6 cash or 2/6 down and 11 monthly payments of 2/6. Matched valve FREE.

Secure This

USEFUL and HIGHLY EFFICIENT  
Ready-built  
NEW 4 WATT  
BATTERY AMPLIFIER



Here is a new 4-watt battery amplifier with Class "B" output meeting every requirement and available at a fraction of actual list value. Special circuit arrangement provides full output using 150 v. H.T. Lower voltage can be used when full output is not needed. Ideal for boosting up all types of battery sets and recommended for amplifying speech and gramophone records. Yours for 4/6 down and 12 monthly payments of 4/9.

BARGAIN 55/-

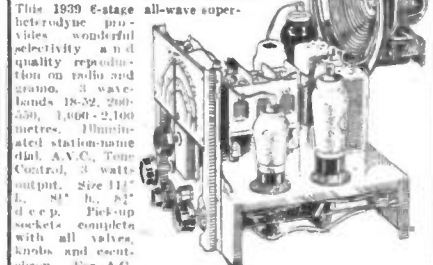
5-valve ALL-WAVE A.C.

RADIO-GRAM CHASSIS

WITH 5 VALVES, LESS SPEAKER  
LIST VALUE £8 : 18 : 6

BARGAIN £4:17:6

GUARANTEED. FULLY TESTED



This 1939 6-stage all-wave super-heterodyne provides wonderful selectivity and quality reproduction on radio and gram. 3 wave-bands 16-32, 200-550, 1,000-2,100 metres. Illuminated station-name dial, A.V.C., Tone Control, 3 watts output. Size 11 1/2" L. x 8 1/2" H. x 3 1/2" D. deep. Pick-up sockets complete with all valves, knobs and connections. For A.C. mains 200-250 v. 50-100 cycles. Cash or C.O.D. £4 17/6, or yours for 7/6 down and 15 monthly payments of 7/11.

Or with matched moving-coil speaker, £6 5/0 cash or C.O.D., or 7/6 down and 17 monthly payments of 8/9.

7/6  
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WHILE THE PRICE IS RIGHT

7-WATT A.C. AMPLIFIER only. 4-valve push-pull circuit. Undistorted output 7 watts. For microphone or pick-up. Size: 7 1/2in. high, 4in. wide, 10in. long. For A.C. Mains 200-250 volts, 40-80 cycles. Complete with 4 valves, ready for immediate use. List Value, £4/10/0. BARGAIN, Cash or C.O.D., £3 10/0, or 5/- down and 12 monthly payments of 6/3.

MICROPHONES. Transverse current type for use with N.T.S. amplifiers. OR FOR USE WITH YOUR PRESENT RADIO. Faithful reproduction at all musical and speech frequencies. Complete with transformer and ready for instant attachment.

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2/6  
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★  
3 MATCHED Battery Type VALVES,  
2-volt type (2 G.U. H.F.'s and one Output Pentode) List value 35/- YOURS FOR BARGAIN 5/6 only. POST FREE. Ideal Phono holders given FREE. Ideal Phono type valves for experimental purposes, Short Wave, All-Wave receivers and replacement purposes. Secure your set NOW.

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Why waste time tracing faults when a PIFCO ROTAMETER De Luxe will find the trouble in a matter of seconds.

This PIFCO ROTAMETER De Luxe abolishes old-time hit-or-miss methods of fault-finding; with it, any amateur electrician can swiftly and surely trace electrical faults in radios, vacuum cleaners, irons, clocks, bells, house lighting systems, automobile ignition and lighting circuits, etc. In fact, faults in everything electrical immediately respond to the magic touch of the PIFCO ROTAMETER De Luxe.



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

Complete in velvet-lined case with testing leads

**42/-**

**PIFCO ALL IN ONE AC/DC RADIOMETER**

**PIFCO RADIOMETERS.** The only instrument of its kind in the world for making both A.C. and D.C. Tests.

**RANGES:**  
 100 volts 0.250 mA 0.250 mA  
 Filament and Resistance Test, (ed socket for plug-in test for valves, 2,000 ohms De Luxe. Complete with two 1 1/2-inch flex cables. Fitted with PIFCO DRY CELL.

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**12/6**

THE SHERLOCK HOLMES OF RADIO

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

Chosen for use with the  
**FLEET SHORT-WAVE 2-VALVER & EMPIRE JUNIOR CRYSTAL SET**



No wonder! For Ericsson Super-sensitive Telephones are simply unexcelled for sound reception in purity, tone strength, and amplification. The short-wave fans know how essential these fine telephones are for really good DX listening—they are just as essential in television reception. Wonderfully sensitive, comfortable in wear and very pure in tone. Hook them up to your FLEET SHORT-WAVE 2-VALVER and EMPIRE JUNIOR CRYSTAL SET and notice the exceptionally fine results you will obtain.

**Ericsson** Three resistances 15/-  
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**"Practical Wireless"**

**SPECIFIES**

**TUNGSRAM**

You don't find experts recommending a thing without good cause, without knowing that their choice is sound and will be justified in use. Tungfram Valves have *again* been exclusively specified. The reason?

**STAND No. 20 RADIOLYMPIA**

Tungfram do all that a good valve should do, *well*—Tungfram Valves can be relied upon, trusted to give unremitting and faithful service. Tungfram Valves are *dependable* valves. "Practical Wireless," now specifies Tungfram Valves for two receiving sets mentioned in this issue—The Pyramid One Valve (HP 210 Metallised) and the Fleet Short Wave 2 Valve (HP 210 and PP 225).

The quality of Tungfram Valves never changes, their excellence of performance has been proved by test. There is a Tungfram Valve for every circuit, and the range includes both English and American types (pin and octal bases).

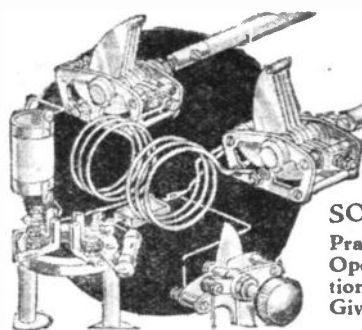
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# Short Wave Section

## SOME TECHNICAL CONSIDERATIONS

Practical Suggestions on the Choice, Layout and Operation of Components to Ensure Improved Reception on the Short and Ultra-short Wavebands are Given in this Article.  
By A. W. MANN

**S**PECIALLY designed components, improved methods of construction and production, together with most exacting methods of testing, have done much to reduce the possibilities of erratic and unsatisfactory operation, which was often the experience of short-wave home constructors and experimenters. Consequently, the performance of a sponsored design can be taken for granted, provided the designer's instructions and recommendations are noted and adhered to in every way.

When, however, the experimenter specialises in the design and construction of purely experimental receivers, snags are invariably experienced, and the writer feels safe in assuming that the percentage of experimental receivers, built from components to hand, which function in every way exactly as a good short-wave receiver should without adjustment or further alteration after first switching on is very small indeed.

A few years ago we were content if our receivers functioned efficiently between 16 metres and 100 metres. Nowadays, a range of from 9 metres to 180 metres is desirable, and recent experiments show that using low-loss ceramic insulated tuning condensers, a ceramic insulated coil-holder, and valve-base plug-in coils, it is possible to obtain oscillation in the region of  $4\frac{1}{2}$  metres to 5 metres.

### Layout and Wiring

In order to achieve this, however, careful layout and the minimum of wiring is essential, and such apparatus is, in fact, ultra-short-wave apparatus adapted to suit the higher short-wave bands.

Generally, however, a 9-metres minimum should be aimed at with a view to receiving the various 9.4-metres American experimental transmissions as radiated by commercial stations, in addition to the reception of world-wide 10-metres transmissions.

The fact that it is desired to receive ultra-short as well as short-wave transmissions introduces complications in design and construction. For example, it is accepted and sound practice to use self-supporting coils of about  $\frac{3}{4}$  in. diameter and of comparatively heavy gauge wire for ultra-short-wave reception.

As we desire to receive also on wavelengths up to 180 metres, the idea of fitting dual coil-mountings, i.e., a ceramic four- or six-pin coil-base in parallel with a four- or six-socket ultra-short-wave coil-base comes to mind.

### Condenser Capacities

This idea can in some instances be made to work. The additional wiring between the two coil mountings, however, introduces considerable losses, even when shortened to extreme limits, and although workable, must be regarded as a compromise.

Now comes the problem of tuning capacity. Tuning condenser capacities of

.00005 mfd. are recommended. Obviously in the case of full S.W. range receivers this capacity value will call for additional coils in order to cover the higher ranges. Selectivity on the higher ranges will thus be affected.

From the theoretical point of view, a capacity of .0001 mfd. is unsuitable for ultra-short-wave reception; nevertheless the writer has found it possible to receive below 10 metres using a tuning capacity of .0001 mfd., a modified 15 mmfd. band-spreading condenser, and standard plug-in coil formers. It must, however, be admitted that careful attention was paid to layout and wiring of the receiver, and careful choice given to the type of detector valve used.

The latter was, however, of standard HL type. A ceramic coil-base and valve-holder were also incorporated.

### H.F. Chokes

One of the snags experienced with experimental ultra-short-wave receiving apparatus centres around H.F. choking. When it is desired to tune from  $4\frac{1}{2}$  metres to 180 metres, there is a problem to solve.

There are a number of single H.F. pile-wound chokes of various makes which will prove to be most efficient from 5 metres to 180 metres and entirely free from peak resonance points.

The Eddystone No. 1010-5-180 metres type is strongly recommended. Such components, however, should be carefully handled, as the choke windings are of fine-gauge wire soldered to heavier-gauge short connection wires.

To those who are making their first ultra-short-wave and short-wave combination type receiver, adapter or converter, metal panel and chassis construction is not recommended. Condenser extension rods, a wooden chassis and panel are advisable.

Ceramic coil-bases and valveholders, together with special ceramic end-plate type tuning condensers, should be used to reduce losses to the minimum.

### Condenser Mountings

This brings to mind the subject of condenser mountings. There are various makes and types of mounting brackets available. Both adjustable and non-adjustable as regards height.

When using an Eddystone type bracket, together with a tuning condenser of the same make, everything is straightforward

and trouble-free. If, however, it is desired to use them in conjunction with the Raymart RMX or Premier Trolitule type condenser, a snag arises and some modification is necessary.

For example, twin nuts are fitted to the condenser bushes which are of the one-hole fixing type. The back nut which holds the moving plates assembly in place is the thicker nut of the two. The thinner nut being for panel-mounting the condenser.

The combined thickness of the back nut and mounting bracket is such that it is, at the most, only possible to obtain a purchase of one thread if an attempt is made to fix the condenser in place. Now one thread is insufficient, and any attempt to tighten up will result in stripped threads on bush, nut, or both. If, however, these condensers were mounted on a 20-gauge metal bracket or panel, everything would be satisfactory, as they are obviously intended for this purpose, and designed accordingly.

The most satisfactory modification is to reverse the locking (thick) and fixing (thin) nuts, using the latter as the assembly-holding nut and the former as the panel-fixing nut. The accompanying sketch will make the necessary modification clear.

### A.C. Operation

The operation of short-wave receivers from A.C. mains is one of increasing interest. There are, no doubt, many who have endeavoured to adapt existing receivers to mains operation and have failed or achieved but a small measure of success.

When we come to consider A.C. operation, we think of A.C. mains hum and its elimination. If the receiver is to be all A.C. operated the possibilities of hum are increased, and due precautions must be taken to safeguard against it, and provision should therefore be made for additional smoothing.

It is a good plan to change the detector valve, especially if this is of the S.G. type. Hum is in some instances accentuated due to pinch leakages in the detector valve, and having found a satisfactory substitute stick to it, and if H.F. valves of the same type are used, replace them with the same make as the detector. To test for this fault, note if hum is increased when reaction is applied.

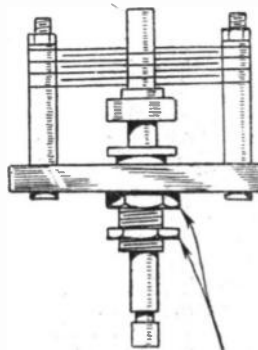
### H.T. Eliminators

Now we come to the problem of operating battery type S.W. receivers from A.C. mains for H.T. supply. The majority of standard eliminators are not suitable or designed for this purpose. Nevertheless, some of those produced years ago and in the then high-price class, and employing valve rectification, will, with a new rectifying valve fitted, be found suitable for hum-free headphone operation on short and ultra-short waves, provided decoupling and choke output arrangements are incorporated in the receiver.

In the case of existing H.T. eliminators, where it is found that A.C. hum is not too pronounced, additional smoothing arrangements suggested in past issues of PRACTICAL AND AMATEUR WIRELESS will prove effective.

The H.T. eliminator correctly applied to a short-wave receiver is, in the writer's opinion, the finest combination, together with accumulator L.T. supply, one can have, because it assures constant and never-failing voltage and a dead silent background.

In conclusion, a note of warning. If an H.T. eliminator is to be used with S.W. and U.S.W. receiving apparatus for headphone reception, incorporate choke output arrangements in the receiver in the interests of safety.



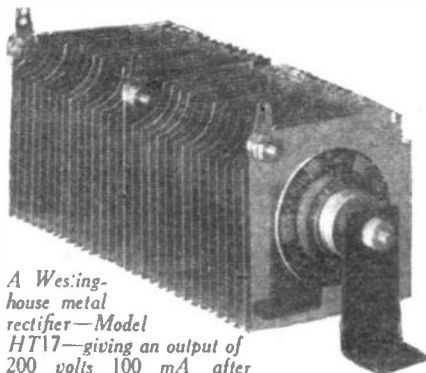
REVERSE THESE NUTS (SEE TEXT)

A condenser fixing modification for use with mounting brackets.

# What Will Radiolympia Offer the Constructor?

THE curtain has gone up and the show is on. What a day of hustle and bustle. Eager crowds surging along the wide avenues between the stands, which look so spick and span with their exhibits, decorations and paint, as yet untouched by the crowds and the atmosphere. Salesmen, sales managers, and directors all looking very much alive and ready for the fray. Each one hoping that this year is going to be a record, and trying to look as though they are not examining the stands of their nearby rivals.

The same old atmosphere, the same old building; the crowds even seem to be the same, but the exhibits are, thank goodness, somewhat different to look upon.



A Westinghouse metal rectifier—Model HT17—giving an output of 200 volts 100 mA after smoothing.

On Stand No. 9 we were all ready and waiting for the speakers to boom out eleven o'clock, and it seemed that the last stroke had hardly faded away when our first visitors were holding out their hands for the usual bargain of periodicals which is given with certain current issues. The stacks and stacks of supplies soon began to decrease at a rate hardly credible to those who have not experienced exhibition work.

Fortunately, I am free to come along with you round the show, so let's get busy before all the avenues get too packed.

## Accumulators and H.T. Batteries

Quite close to No. 9 is Stand No. 15. Here we can see all the latest products of the makers of the famous Exide batteries. Accumulators in amazing numbers. From the tiny unspillable cells for deaf-aids and portables to those massive looking things for house lighting installations. If you want to know anything about the construction of an accumulator, well, now is your chance to examine all details. Dry H.T. batteries, and their like, can also be seen, and as the makers list a type for practically every make of receiver on the market, they can satisfy any wants you may have in that way.

## Meters

Next door to the Chloride stand is Messrs. Ferranti (No. 14), and as we can't afford to miss a chance of seeing their latest products, let us go over to their counters. Television and radio receivers, meters and transformers are there for our inspection,

In the first part of our tour, which was described in the last issue, stands exhibiting push-button units, small components, short-wave accessories, variable condensers, fixed condensers and electrolytics, and loud-speakers were visited.

though I am sure that the last two items will prove the greatest attraction so far as we constructors are concerned. Good meters and transformers are always items we can do with and gloat over; if they are made by Ferranti there is really no need to stipulate "good" as the very name is a sufficient indication and guarantee. Now come to Stands Nos. 4 and 5 and meet some very old friends of the constructor fraternity, namely, Messrs. Belling and Lee. Since the earliest days of radio they have always supplied a most useful range of connectors, plugs, terminals, and such like, but this year they are not only exhibiting a more extensive range but are also including all their anti-interference devices and television aerial arrays. As with their original products, they are looked upon as specialists in the last two developments, and it is interesting to hear the effect of various types of interference eliminators which they are demonstrating. A few minutes spent on these Stands will convince you that there is no need to have your reception, broadcast or short-wave, ruined by man-made static interference.

## Metal Rectifiers

As we continue our tour, stopping here and there to examine the construction, finish and lines of some of the receivers, which, personally, I find to be most instructive and interesting, we shall come across another very old supporter of the con-

structor movement, the makers of the Westinghouse Metal Rectifiers, on Stand No. 35. Rectifiers from the minute little units for use with D.C. meters to those rather unimportant-looking specimens for use with cathode-ray tubes are displayed, and no constructor can fail to be interested in one or more of the various products. H.T. eliminators, L.T. chargers, Westectors to replace detector valves, rectifiers for A.C./D.C. receivers, and H.T. battery chargers are but a few of the items so closely associated with Westinghouse. If you are contemplating any modifications or additions to your installation or equipment so far as rectifiers are concerned, then here is your chance to get first-hand advice on the matter. By the way, don't forget to bring away a copy of their "All-Metal Way," a little booklet full of valuable information and diagrams.

To leave components and accessories for a few minutes, let's go over to Stand No. 88 and browse over the exhibits of Messrs. Armstrong and Co. There are occasions when even the most ardent constructor cannot spare the time to make up a complete receiver, or when it is desired to make use of some particular cabinet to house a receiver, and, therefore, one does not wish to buy a commercial receiver complete with cabinet. In such circumstances, Messrs. Armstrong can provide the solution as they specialise in producing most efficient receivers in chassis form which, from the examples they are showing, allows one to select a model to satisfy both specification and size requirements. There are battery and mains operated models, and the design, finish and construction leaves nothing to be desired, while the prices are certainly most reasonable. When purchasing one of their chassis, one has the satisfaction of knowing that all testing has been done, so it is only a matter of housing it, and getting on the air right away.

## Playing Desks

Speaking of receivers makes one think of radiograms, and in this direction a visit to the Stand of Messrs. Cosmocord (No. 67) is suggested. Here we can see several examples of their neat and efficient Playing Desks, which again allows the constructor to jump a step and convert his receiver into a complete radiogram without carrying out any work. A few minutes' inspection of the models will soon prove that such an easy conversion does not mean a "bits and pieces" arrangement, as the size, finish and construction of the "Desks" are such that they are worthy of being used in conjunction with any good-class modern table model receiver. The model No. 876 is outstanding as regards price, bearing in mind that it is only £4 7s. 6d.

Pick-ups, crystal and magnetic, are also on show on the same Stand.

Testing and servicing are items ever before us, and as these need meters or universal testing apparatus, a visit to the Stand of the makers of the famous "Avo" testing instruments will be most interesting and instructive. The Stand No. is 21.

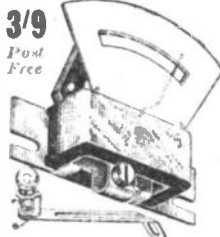
(Continued on the opposite page)



The "Cosmocord" Playing Desk and record cabinet, Model 130.



**ELECTRADIX**



**A BARGAIN IN MILLIAMMETERS**  
 A bank of panel illuminated type for D.C., 970 ohms. Plain slot scale, 1" needle with mica panel, back lamp and bracket. Neat, compact job by famous English maker. Can be used as voltmeter with extra res. **3/9 Post Free.** Bulgin 8 m.a. midgets, Bush, nickel 8 m.a., 6-, Siam bakelite, 11" to 10 m.a., 8/6. All other

ranges in stock. Hundreds to select from.

**SET EXPERIMENTERS' BARGAIN.** New Tuning Meter Movement by first-class maker, pivoted skeleton type D.C., 0-8 m.a., 970 ohms, slotted plain scale line, needle 1/2 in. long. Rise 2 in. sq. with 2 1/2 m.a. panel back lamp and bracket, 3/9. Post free.

**SWITCH DIALS.** 10-point Finger Switch Dial, as illus., used on G.P.O. Automatic Telephones. These have spring drive, governor, clutch and contact inside. Price 2/6.



**AUTOMATIC SWITCHES.** Relay operated, 8 amps., 25 ways each, platinum contacts, G.P.O. model, 10/-.

**HAND COMBINATION MICROTELEPHONE.** Transmitter and Receiver. For use on any bell circuit. **7/6. POCKET HEADPHONES.** With all leather headband, strap and cords. 2/6 pair. 1/6 pair with aluminium headbands, 2/9. Brown's lightweight 4,000 ohms, 4/6. House, Office and Field Telephones, wall and table, 10/- and 15/-.

**CHEAP HOME RECORDING.** Fresh sets complete for radiogram, 37/6. Blank 6" discs, 8/3 per dozen.

**DIX-MIPANTA VEST POCKET TESTER.** A versatile multi-range meter for service on A.C. or D.C. THREE ranges of volts: 0-7.5, 0-150, 0-300. Used for MILLIAMPS, reads: 12 1/2 m.a., and 75 m.a. In black bakelite case, 2 1/2 in. by 2 1/2 in. with pair of test leads and plugs, 10/6.



**WIND DYNAMOS** for windmill drive, 6 volts, 10 amps., slow speed, 35/-. Lucas Aero high speed, 6 volts, 3 amps., and 200 volts, 80 m.a., 25/-. Electric Pumps deliver 120 galls. to 6 ft., A.C. or D.C., 67/6. Electric Air Compressors for paint spray, etc., 25/18-. Parcels of Experimental Old Coils, Magnets, Chokes, Wire Switches, Terminals, etc., Post free, 10 lbs., 7/-, 7 lbs., 5/-.

**SMALL D.C. DYNAMOS.** 110 volts 1 amp., 15/-; 200 volts 1 amp., 17/6; 200 volts 1 amp., 25/-.

**MOTORS.** All sizes from 1/40 h.p., 15/-; 1/2 h.p. D.C. Motors, 25/-.

**MORSE KEYS.** Air Force Keys with indicator lamp, K.B.S.L., 7/6. Practice Sets, complete with buzzer, 4/6.

**LIGHT RAY CELLS.** Selenium, 7/6; Raycraft outfit with relay and amplifier, 45/-; Photo-cells, for sound on Film, Television and Ray Work, E.C. 4., 25/-.

**AMPLIFIERS,** to work relay with above: Battery 1-valve, with boiler, trans. and switch, Oak case, 25/-; A.C. Mains Model (Philips), in steel case, 80/-.

1,000 other Bargains in New Sales List "N." Post Free.

**ELECTRADIX RADIOS**

218, Upper Thames Street, London, E.C.4.

Telephone: Central 4611

**GUIDE TO THE SHOW**

(Continued from page 591)

extension speakers, public address loudspeakers and amplifiers, relay cabinet speakers, manufacturers' stripped chassis speakers, valveholders, switches, mouldings, stampings, loud-speaker cones, there will be, of course, a range of the Stentorian class speakers which have become so well known to our readers. Four new items will be of particular interest. One of these is the Stentorian Pendant cabinet speaker, which is of triangular construction and is fitted with a hook at each side for hanging to a picture rail. The cabinet front faces downwards for correct sound diffusion into the room. There will also be a Pedestal Table and a Coffee table fitted with a speaker beneath the top surface. All models of the cabinet speakers, except the Baby, have a three-winding distortionless volume control in which is embodied a switch for optional use of the long-arm remote control. There will also be a range of domestic receivers and public-address amplifiers all designed with a particular view to obtaining the utmost quality of output.

**WINGROVE & ROGERS, LTD.,** Mill Lane, Old Swan, Liverpool. Stand No. 106.

HERE will be seen the existing range of Polar, Polar-N.S.F. and Wearite components. In some of these, interesting price variations have been made. Among these components will be seen gang condensers, drives and dials, reaction condensers, volume controls, tubular condensers, resistors and grid-leaks, electrolytic condensers, tuning coils and test instruments. In the Wearite range of test equipment are a number of units which will prove of value to the keen experimenter as well as to the service man or dealer.

**FLASHES FROM THE SHOW**

SEE the new tuning condenser incorporated in the Mullard and Philips Receivers.

A CRYSTAL pick-up head which may be used with an ordinary type gramophone may be seen on the Rothermel Stand.

DO not fail to call at our Stand, No. 9, and see the new receivers described in this issue. Our two latest handbooks are also on sale there—The Practical Wireless Service Manual and the Amateur's Guide to Transmitting.

NEW types of valve may be seen on the Philips and Mullard Stand. These are designed to provide better short-wave reception.

PUSH-BUTTON tuning for the home- constructor is now possible. See the push-button units on the Bulgin Stand.

SMALL-PICTURE television receivers may be inspected on the H.M.V. and the Marconiphone stands. They are the cheapest yet!

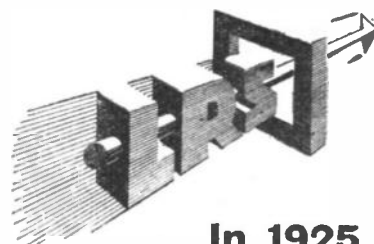
**WHAT WILL RADIOLYMPIA OFFER THE CONSTRUCTOR?**

(Continued from previous page)

Such instruments are rather too comprehensive to describe in these columns in detail sufficient to do justice to the products, therefore, while at the Stand, examine all the models and note the amazing number of applications for which even the moderately priced instruments are designed. There is no need to fiddle about and guess when testing a receiver, amplifier, or transmitter, when such efficient apparatus is available at prices to suit all pockets, and no self-respecting constructor should be without at least one instrument of this type of proven reliability.

Although we have by no means visited all the Stands exhibiting items of great interest to the constructor, space prevents us from giving mention to them all.

In case you do forget, let me remind you that Stand No. 9 will be the meeting-place of all keen constructors, and that a warm welcome awaits you there.



**In 1925**

the London Radio Supply Company was founded to give genuine SERVICE to the Wireless Enthusiast.

The policy of this firm was to offer goods of the highest quality and reliability on terms so favourable and with deliveries so prompt that no keen constructor, experimenter or listener need be without the means of satisfying his urge to become one of the great army of radio-minded citizens.

So there was built up a reputation which has stood the test of thirteen difficult years—without a break—through trade depressions, cut-throat competition and scientific progress with its consequent change in the enthusiasts' requirements.

Always the 'square deal with quick deliveries' policy has been carried out whilst keeping abreast of the times, and to-day L.R.S. is still recognised as the firm to which you may go for anything radio or electrical with complete confidence that you will be really satisfied.

Unlike purchasing through an ordinary Radio Shop, the London Radio Easy Payment Service ensures the strictest privacy in all transactions. There are no dealings with Finance Companies, etc., all instalments being payable direct to us. Cash or C.O.D. orders receive the most careful and prompt attention obtainable anywhere, and all goods are despatched Carriage Paid.

Stocks are maintained of all well-known Sets, Radiograms, Speakers, Valves, Components, etc., besides all PRACTICAL AND AMATEUR WIRELESS kits throughout the season.

A complete range of McCarthy & Armstrong Chassis and Receivers are demonstrated daily in our Showrooms—you are cordially invited to call and hear them for yourself, without any obligation to purchase.

We also supply Electric Clocks, Fires Table and Standard Lamps, Fans, Vacuum Cleaners, and all domestic Electrical Equipment, all well-known makes being available for Cash or C.O.D. or on specially favourable terms.

Whatever your requirements—write, call or 'phone for our quotation.



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# STANLEY BARNETT



Stanley Barnett.

## A BRIEF BIOGRAPHY

**S**TANLEY BARNETT, whose popular band at the Café Anglais, London, was heard over the air recently in "Thé Dansant," in the Regional programme.

Stanley studied the violin under Paul Bekinfante, the well-known broadcasting violinist and orchestra leader. He formed his own band at the age of twenty. After playing at all the principal towns throughout the country, he took his lads—all in their early twenties—to Copenhagen, and then on to Finland (Helsingfors and Riga), where it proved a little too cold for them.

Later he went to Berlin, where he met and married a German girl and was in the thick of political riots, just missing a street shooting episode by mere seconds. Stanley Barnett will always remember his wedding day in Berlin. He had decided to hold a celebration party at the Restaurant Palais-Am-Zoo, and just as he was on his way from one side of the street to the other, there was a clash between Communists and Nazis, involving shooting. It was an hour or so before police cleared the square sufficiently to allow the wedding guests to go to the reception.

Returned to London and, after important engagements, was spotted by an impresario, who brought him to the notice of Ambrose, dance music maestro. Ambrose engaged Stanley on the spot, and appointed him to the post of director of Ambrose's "Blue Lyres." Barnett then went to Monte Carlo and spent a short season in Cannes, returning to take up work at Blackpool.

When the band went to Copenhagen, after three and a half years at Blackpool, Stanley Barnett took with him the first woman crooner, Aida D'Amato, sister of the famous Chappie D'Amato. By the way, all the six original members of Barnett's outfit are now leaders of their own bands!

### NOW READY!

WIRELESS COILS, CHOKES AND TRANSFORMERS, AND HOW TO MAKE THEM.

Edited by F. J. CAMM.

2/6, or 2/10 by post from Geo. Neumes, Ltd., Tower House, Southampton Street, Strand, London, W.C.2.

### ASHTON AND DISTRICT AMATEUR RADIO SOCIETY

**A**LTHOUGH only formed a few weeks ago the membership already numbers fifteen, nine of whom hold radiating permits. There are several A.A. men among the remaining members.

Membership is not confined solely to amateur transmitters, but is open to anyone genuinely interested in short-wave amateur radio. Prospective members are invited to communicate with the secretary, or to attend one of the meetings which are held fortnightly at the QRA of the Treasurer, Mr. N. Dunkerton (G3NX), Commercial Hotel, Old Street, Ashton-under-Lyne. The next three meetings will be held on August 31st and September 14th and 28th next, and will commence at 8 p.m. Morse practice is given from 8 p.m. until 8.30 p.m., and anyone interested is asked to bring along a pair of 'phones.

It is proposed to hold a Field Day in September, and details will be published later.

Secretary, K. Gooding (G3PM), 7, Broadbent Avenue, Ashton-under-Lyne, Lancs.

### NEWCASTLE AND DISTRICT SHORT-WAVE CLUB (FORMERLY NEWCASTLE RADIO SOCIETY)

**T**HE above-named club has now decided to devote all its time to short-wave work. At the monthly meeting, Mr. G. C. Castle resigned the secretaryship,

## CLUBS AND SOCIETIES

as he will be unable to give his full attention to the activities of the club. Mr. K. Scott was then elected hon. sec. pro tem. Recent meetings have been devoted to the building and testing of receivers ranging from 5-94 metres. A full programme is being drawn up for the winter session. The next club night will be held on September 4th at the hon. sec.'s address, from 6 to 9.30 p.m., and a cordial invitation is accorded to local enthusiasts. Membership is free.

Hon. sec., K. Scott, 1, Farquhar Street, Newcastle-on-Tyne, 2.

### ROMFORD AND DISTRICT AMATEUR RADIO SOCIETY

**T**HIS club has settled down in its new headquarters, and has increased its activities. A team was entered for the DF competition organised by the Brentwood Society, and obtained third place. At the last meeting all members joined in a technical "bee," in which technical questions were asked and answered by members called upon. The club amplifier should be working very shortly.

Meetings are held on Tuesday evenings at 8.30 p.m., at the Red Triangle Club, North Street, Romford. Sec., R. Bearlow (G3FT), 3, Geneva Gardens, Chadwell Heath.

Every constructor already has a speaker. Why does Mr. Camm



include a new one in each specification? Because however

sensitive his receiver,  its results could be spoiled by a

speaker with poor response to weak signals. Because however

good  his set's reproduction,  it could sound

lifeless through a mediocre reproducer. So he always specifies

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the stations you now receive. 

You can prove this. Ask your dealer to let you hear the new Stentorian, today. Prices from 23'6.

WHITELEY ELECTRICAL RADIO CO., LTD., MANSFIELD, NOTTS

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Have been selected by  
Mr. F. J. Camm for his  
Exhibition Sets

F. J.

## Camm's Admiral 4-Valve Receiver

The B.P.116 Coil Unit was specially selected for this receiver. Unit comprises one aerial coil and two intervalve H.F. coils complete with screened anode leads. Covers medium and long-wave bands and switch has three positions to control external on-off or radio-gram switch.

**B.P. 116 THREE GANG COIL UNIT**

PRICE

**21/-**

\* \* \*

## Press Button 3-Valve Receiver

The well-known Varley B.P.114 coil unit is featured for this receiver. Built on similar principles to the B.P.116 coil unit.

**B.P. 114 TWO GANG COIL UNIT**

PRICE

**13/6**

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Write for complete catalogue of L.F. Transformers, Chokes, Coils, etc.

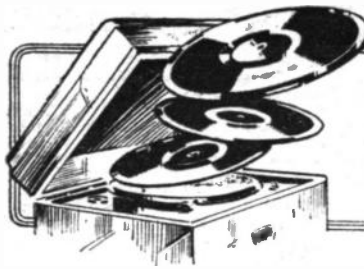
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P.W.



# Impressions on the Wax

## A REVIEW OF THE LATEST GRAMOPHONE RECORDS

### Decca

IN the "permanent" music series the Decca Company have recorded "Beethoven Symphony No. 7 in A major, Op. 92," on five 12in. discs, *Decca X 206-10*, which are issued in an album. It is played by The Berlin Philharmonic Orchestra, conducted by Carl Schuricht.

Harry Horlick and his Orchestra have made an attractive recording of Strauss Waltz series No. 3 and 4, on both sides of *Decca F 6752*, whilst two evergreens, "The Blue Danube Waltz" and "The Lost Chord," are played by Reginald Foort at the organ—*Decca F 5691*. He also has recorded "In a Persian Market" and "Cavatina" on *Decca F 6720*. Two rumbas, "Maria Antonia" and "Louissette," are played by Don Barreto and his Cuban Orchestra on *Decca F 6717*, whilst Donald Novis, accompanied by Eddie Dunstetter at the organ, sings "Angela Mia" (My Angel) and an old favourite, "Charmaine," on *Decca F 6722*.

Tessie O'Shea, the popular radio comedienne, is extremely humorous in "It All Belongs to Me" and "That 'Kruschen' Feeling," on *Decca F 6723*.

Lawrence Wright's new show, "On With the Show," is featured by Felix Mendelssohn and his Orchestra, who play two tunes from it—"The Blackpool Walk" and "The Girl in the Upstairs Flat."—*Decca F 6726*. This band have also made a "King Revel" selection, parts 1 and 2, on *Decca F 6728*, introducing "When the Steamboat Whistle is Blowing," "Two Dresden Dolls," "You're at Blackpool by the Sea," "Swing and Sway," "The Music of the Fountain" and "The Beat of the Drum." The vocal choruses are sung by Paula Green and George Barclay.

### H.M.V.

HARRY RICHMAN, who made his first H.M.V. record last month, makes his second recording with "Down and Out Blues" from "Happy Returns," coupled with "Daddy's Boy," on *H.M.V. B 8770*. Betty Driver is very amusing in "Oh! Ma-Ma" (I want to Marry the Butcher Boy), but is quite serious in "So Little Time," on *H.M.V. BD 575*.

Revnell and West give two of their vignettes of cockney life. As "Two London Costers Making Whoopee," they give examples of coster girls' sentimental "crooning" of a type that is fast disappearing, and their study of urchins trying to negotiate a traffic crossing is extremely funny—*H.M.V. BD 569*.

### Dancing Time

THE strict dance tempo enthusiast is well catered for this month by Henry Jacques playing "Something Tells Me" (quick-step), coupled with a slow foxtrot "Moonlight and Roses"—*H.M.V. BD 5381*, and "The First Quarrel" (waltz) and "My Heart Will Never Sing Again" (slow foxtrot), on *H.M.V. BD 5382*. Palais Glide Medley No. 2 has been recorded by the New Mayfair Orchestra—

*H.M.V. BD 5385*, and a newcomer to the lists, Jose M. Lucchesi, plays two tangos—"Champagne Bubbles" coupled with "Song of the Sea"—*H.M.V. BD 5378*.

Roy Fox's numbers include "I Won't Tell a Soul" and "Two Shadows"—*H.M.V. BD 5379*, also "What is Romance?" with "Chocolate Soldier's Daughter" on the reverse side—*H.M.V. BD 5380*. "So Little Time" and "Says My Heart" have been recorded by Jack Harris on *H.M.V. BD 5383*, whilst "Fats" Waller's contribution is "Beat It Out," coupled with "Lost and Found" on *H.M.V. BD 5377*.

Benny Goodman and his Orchestra have this month recorded "I Would Do Anything for You" and "Sandman"—*H.M.V. B 8764*, whilst his quartet is represented by "Ida, Sweet as Apple Cider" and "Dizzy Spells"—*H.M.V. B 8765*. The swing version of "Coming Thro' the Rye" coupled with "Yearning Just for You" is played by Tommy Dorsey and his Orchestra on *H.M.V. B 8766*, whilst Dicky Wells and his Orchestra have recorded "Sweet Sue" and "Hangin' Around Boudon"—*H.M.V. B 8763*.

### Rex

GRACIE FIELDS has chosen two tunes from her latest film, "We're Going to be Rich," for her latest record. The tunes are "There is a Tavern in the Town" and "The Sweetest Song in the World," recorded on *Rex 9325*. Roy Sméck and his Hawaiian Sereaders play "When the Organ Played 'O Promise Me'" and "A Gipsy Told Me," from the film "Happy Landing"—*Rex 9334*. Jack Payne has dug up an old favourite, "Tiger Rag" which he couples with "Lazy Rhythm" on *Rex 9339*. Maxwell Steward's Ballroom Melody give a strict dance tempo version of "The First Quarrel" (waltz) and "Good-night Angel" (slow foxtrot) on *Rex 9336*.

### Brunswick

CONNIE BOSWELL, accompanied by Harry Sosnik and his Orchestra, sings "You Took the Words Right Out of My Mouth" from the film "The Big Broadcast of 1938," whilst on the reverse she has Bob Crosby and his Orchestra to accompany in "Mommy"—*Brunswick 02612*. Judy Garland, on *Brunswick 02611*, seems to contradict herself with "Cry, Baby Cry" and "Sleep, My Baby Sleep." Chick Webb and his Orchestra has recorded "A Tisket a Tasket" with Ella Fitzgerald singing the vocal, and couples it with "Liza" (All the Clouds'll Roll Away), on *Brunswick 02614*.

### Vocalion

MAXINE SULLIVAN sings in her typical style "It's Wonderful" and "You Went to My Head" on *Vocalion S 194*, whilst Billie Holiday, who sings the vocals, and her Orchestra play "When a Woman Loves a Man" and "Sailboat in the Moonlight"—*Vocalion S 171*.



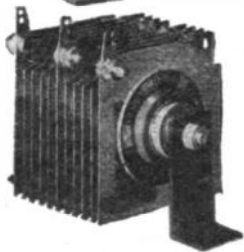
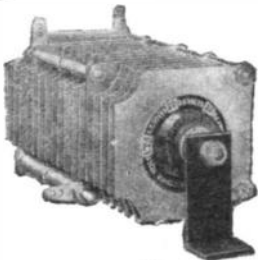
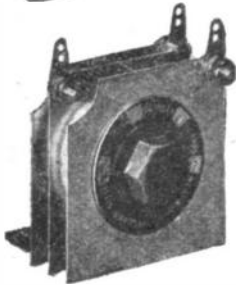
Stand

35

There is a Westinghouse Metal Rectifier to suit every rectification need. In sound and vision receivers, time bases, detection, A.V.C.

Visit Stand 35 and inspect this very comprehensive range of rectifiers. They are used by the B.B.C., the G.P.O. and the principal broadcasting stations of the world.

Make a point of getting your copy of the new 1939 edition of "The All Metal Way," or send 3d. to Dept. Pra.W.



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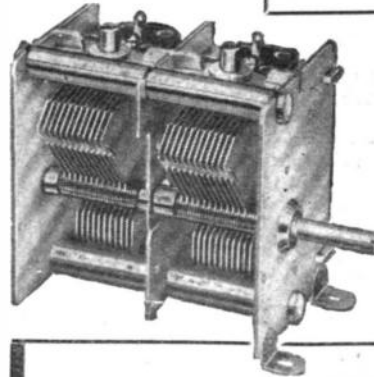
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82, York Way, King's Cross - - London, N.1.

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STAND  
**106**  
RADIOLYMPIA



**POLAR BAR  
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CONDENSER**

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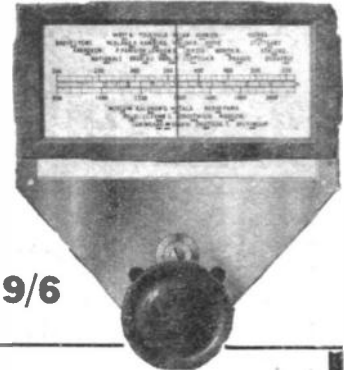
**Price 12/-**

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**POLAR MICRO  
HORIZONTAL  
DRIVE**

Provides two reduction ratios of 10-1 and 50-1 operated by a single knob. Scale marked in station names and degrees. Moulded escutcheon and knob. Lampholders supplied.

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**ADMIRAL 4-VALVE  
RECEIVER**

1 Micro Horizontal Drive. Price 9/6  
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**PRESS BUTTON 3-  
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1 Bar Type 2-gang Condenser 2 x .0005. Price 12/-  
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**PYRAMID ONE-  
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1 Condenser No. 5 .0005. Price 4/6  
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1 Differential .00015. Price 3/-

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188/189, Strand, London, W.C.2.

'Phone : Temple Bar 2244. Works : Old Swan, Liverpool, 13.



# Practical Television

August 27th, 1938. Vol. 3. No. 115.

## An Ingenious Scanner

A VERY ingenious television scanner has been developed by the Fernseh Co. in Germany and was shown for the first time at the Berlin Radio Exhibition. It is a mechanical scanner employing the German standard of 441 lines interlaced and shows an extraordinary increase in efficiency when compared with the earlier forms of mechanical equipment. By means of a simple electrical change-over which can be effected instantaneously it is possible

the light spot method has been resorted to, and owing to the use of very high efficiency photo-electric cells in conjunction with secondary amplification it has been found possible to dispense with arc lamps for all three scanning devices, in spite of the high number of lines. In each case incandescent lamps have been employed, a scheme which is preferable because of the greater degree of reliability, coupled with the simplicity of operation. Mention should also be made of the lighting arrangement of the cabin

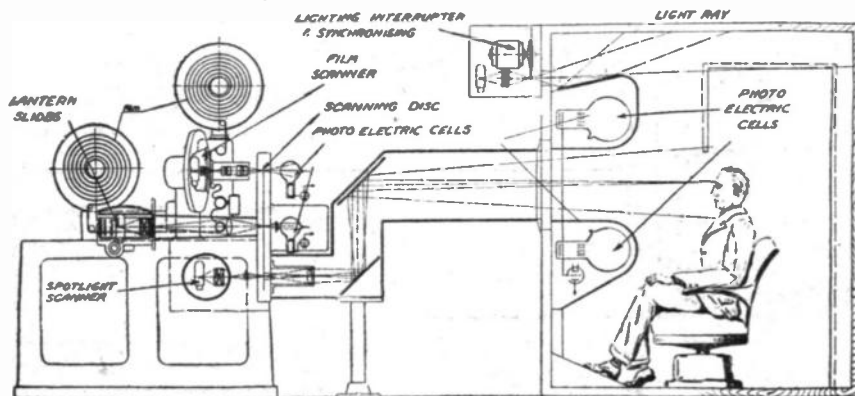


Fig. 1.—Schematic diagram of a universal mechanical television scanner.

to use the machine alternately for film, lantern slide or actual person transmissions. This has been done by employing one single scanning disc which rotates at the very high speed of 10,500 revolutions per minute in a completely evacuated casing. The scanning apertures are arranged in two seven-fold spirals; one spiral being used for the scanning of films, while the other is the medium for scanning persons or lantern slides, as desired. The disc has as many as 882 very fine apertures of about .06 mm., together with 441 slots for the generation of the line synchronising pulses and another set of slots for the frame synchronising. The very high degree of accuracy necessary on account of the large number of apertures, and the use of interlaced scanning has been achieved by a specialised production method developed only after years of research work. The three scanning sets for film, persons and lantern slides are arranged in such a way that they can be operated and supervised at the same time. By using this arrangement the three transmissions are ready for operation at any moment and the engineer in charge is in a position to change over from one transmission to another at any desired moment. This adaptability is useful for many purposes. For example, in the case of a lecture it is possible for the lecturer himself or films and lantern slides illustrating the talk to be transmitted without any delay except a straightforward electrical fade over.

The whole scheme is shown very clearly in the diagrammatic illustration of Fig. 1, where the individual sections of the equipment and their function have been itemised. For individual scanning it will be seen that

for the scanning of persons. Up to the present it has been usual with light spot scanning to have the cabin always in darkness, but with this equipment the small



Fig. 2.—The type of picture produced by a German projection tube home receiver.

studio is illuminated during the fly-back or synchronising pulse period and is then darkened while the picture signal is being generated. The person seated in the studio, therefore, with this arrangement, is quite capable of reading a manuscript, a factor of great importance with either lecturers or

announcements. The demonstration of this apparatus shows quite definitely that for certain purposes mechanical scanning still has specific advantages and the resulting pictures are sharp and clear.

## Home Projection Receivers

IRRESPECTIVE of the public demand for the small type domestic television receivers there is sure to be a growing market for the projection tube receiver which gives a picture up to two feet wide. With the present line definition standards employed both in this country and abroad, these pictures must be viewed at a reasonable distance from the set itself, otherwise the line formation of the picture becomes apparent and so tends to detract from the programme value. For clubs and hotels, however, they form an ideal source of entertainment. Under proper viewing conditions the quality of the received picture is good and an idea of the results secured in Germany is shown by reference to Fig. 2. Here the picture is nearly 18ins. wide, while the cabinet housing the equipment is relatively small, approximately 3ft. high by 2ft. square. In most of the sets seen up to the present the picture is back projected by a mirror reflector on to a translucent glass screen. With the set illustrated, however, front projection has been used for the first time in Germany, and the results are certainly of a very high standard. The special lens employed gives a sharp, bright picture and the screen which is fixed to the inside of the lid is completely protected when the set is not in use. A single switch is used for the individual selection of programmes and is arranged to provide television, ultra-short-wave sound, the local medium-wave station and the national long-wave programme. Tuning is pre-set on installation and operation is therefore of an extremely simple character.

## A Matter Requiring Settlement

IT has already been suggested that plans are afoot for an early extension of the television service to the Midlands, but it is impossible to secure any official statement on this most important point. Reports have long been current that a second television station is to be established at Birmingham, while others declare that Manchester would be a better choice. Without in any way advancing the claims of either city, the situation is becoming rather intolerable without having a plain official statement of what extension programme is contemplated by the authorities charged with this side of the work. Germany has made no secret of her intentions

with regard to furnishing a much wider public with signals of adequate strength for ordinary receiver operation, so why should Britain after two years' service still keep potential viewers in the dark? The 441 line service is to be inaugurated on October 1st from the transmitter on the Amerika-Haus

at the Adolf Hitler Platz, the highest point in the west end of Berlin. A power of 20 kilowatts is to be employed and in a short time about a quarter of Germany's population will be able to receive television programmes through the opening of equally high powered stations on the Feldberg and Brocken.

## TELEVIEWS

### Coaxial Cable

WHETHER the Post Office coaxial cable can be employed for television in this country now seems to be a moot point, because of the large revenue which can be obtained by using it for ordinary telephonic purposes. If such is the case a twin wire feeder system could be laid down or a network of inexpensive directional micro-wave link relay stations set up. This is, of course, on the assumption that the major portion of Midland or Northern television programme material must emanate from London. Local programmes would be preferable with a constant interchange of material, so as to provide more variety, and the Television Advisory Committee, which has been working quietly, should take advantage of the great drive contemplated at Radiolympia to make a full official statement, and so clarify what for some time now has been an annoying and entirely unnecessary situation both for manufacturer and potential set user alike.

### Relaying Television

THAT the idea of relaying television programmes between two distant points via ultra-short-wave transmitters is feasible is borne out by the investigations which are now being undertaken both in this country and abroad. One of the countries most likely to be affected by programme distribution schemes is America, because of its vast area coupled with tall city buildings. The R.C.A. have been actively engaged on this work and Zworykin has made some enlightening suggestions for tackling the problems. Many variable factors have to be taken into consideration and among these the ionisation of the upper layers of the atmosphere which are now known to cause reflection of the carrier waves is important. If the height above the earth or refractive index of these layers alters, then communication between any two fixed points may be upset completely because of skip distances. This can to a certain extent be offset by changes in aerial configuration and/or alterations in wavelength. In Zworykin's scheme, therefore, a special receiver is provided with two separate aeriels located a certain calculated distance apart. If any atmospheric changes occur, then the strength of the signal received by each aerial will alter. This has the effect of altering slightly the wavelength used between transmitter and receiver, which incidentally are linked by a cable in order that the carrier frequency adjustment is automatic between both points. It is claimed that this form of monitoring is quite effective in countering changes in the ionised atmospheric layers and could be extended to bring about any other necessary alterations which may be additional to or even in lieu of changing the wavelength, as desired.

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## IDENTIFICATION



of amateur wireless transmitters can be found in the RADIO AMATEUR CALLBOOK. This book is essential to owners of short-wave, or all-wave sets. Contains complete lists of amateur transmitters (with names and addresses) from Alaska to Zanzibar, also short-wave commercial stations, lists of International Abbreviations (the "Q" code), International Prefixes, etc. Price 6/- per copy, post free. Send for lists of other books dealing with amateur transmitting.

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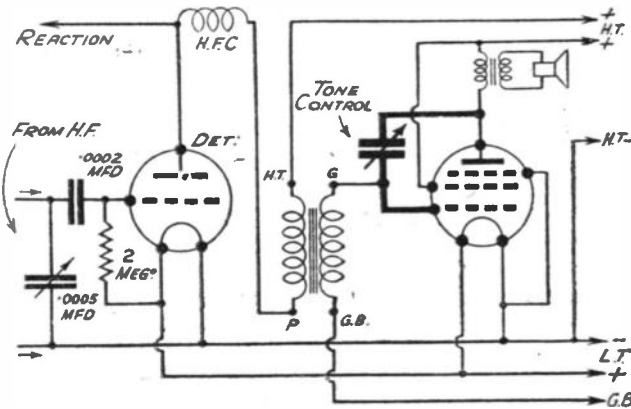
# LETTERS FROM READERS

The Editor does not necessarily agree with the opinions expressed by his correspondents. All letters must be accompanied by the name and address of the sender (not necessarily for publication).

## High-note Control

**S**IR.—The recent article on tone-control circuits reminds me of a simple, yet comparatively unknown, method of high-note control. The method consists of connecting a solid dielectric reaction condenser between the anode and grid (not cathode) of one of the L.F. valves, either the first L.F., if there is one, or the output valve. The condenser, which should be of .00015 mfd. or .0003 mfd., must be capable of standing the anode voltage; otherwise the grid and anode will be short-circuited. Also, of course, the system cannot be used on a reacting detector valve, as it would immediately stop the set from oscillating.

With the vanes of the condenser fully meshed, there is very good control—why there should be such an effective cut-off with so small a condenser I am not certain, but the fact remains that the device is just as effective, and less expensive than the usual resistance and condenser combination.—R. HOOK (Surrey).



Circuit diagram showing application of high-note control, as mentioned in Mr. R. Hook's letter.

## Swiss Broadcasts

**S**IR.—It may interest other readers to know that the new Helvetican Government transmitter at Schwarzenburg, Berne, is now on the air daily. The station transmits on every day except Sunday, and the schedule is as follows:

19.00-20.00 (B.S.T.) on 31.46 m. (9,535 kc/s).

00.45-01.45 (B.S.T.) on 19.60 m. (15,305 kc/s).

02.00-03.00 (B.S.T.) on 25.28 m. (11,865 kc/s).

Announcements are made very frequently in English, French, German and Italian. This station confirms reports by letter and the address is: The Swiss Telegraph Administration, Berne, Switzerland.—J. L. HALL (Thornton Heath).

## Component Construction

**S**IR.—I wish to support the plea of V. C. T. (Blackheath) on Component Construction, which appeared in the August 13th issue.—"ANOTHER CONSTRUCTOR" (Bridgeton, Glasgow).

**S**IR.—With regard to the recent letter by V. C. T., it would be interesting to know what the reader had in mind when he said "certain" components, since so few

can now be made by the amateur; such things as tuning condensers, large fixed condensers, volume controls and even valveholders are absolutely outside the field of the home constructor possessing normal equipment.

The only components I make at home are S.W. coils, although I have tried making small fixed condensers out of enamelled wire. The latter are, however, more bulky and generally less reliable than their commercial counterparts.

A few components, such as chokes and

transformers, can be made fairly satisfactorily, but it would certainly be more difficult to obtain the required parts, for example, correct transformer stampings, trimmers for I.F. transformers, and also suitable screening cans, than to buy the finished article. Another point not to be overlooked is that in many cases the commercial article would be found appreciably cheaper.—J. L. YARNOLD (Egham).

**S**IR.—I, too, would like to see more articles on home-constructed components, for surely there is no better way of getting a thorough understanding of the action of various parts, both theoretical and practical.

Only once have I bought a commercial coil, which is widely advertised, but it was a failure from the start, and after pulling the set all to pieces and finding nothing wrong with it I wound a coil of my own, and the set is now working perfectly. Since then I have always wound my own coils.

I should like to congratulate you on producing such a grand paper as PRACTICAL AND AMATEUR WIRELESS, and I wish it every success.—J. W. COLLINS (Withyham, Sussex).

**S**IR.—I agree with your correspondent, V. C. T., of Blackheath, as regards his proposed idea of a series of articles on

component construction. I think it is a perfectly sound suggestion, and I am sure there are many other home-constructors who feel the same way about it.

Articles on how to wind transformers, coils, chokes, etc., and many other parts, which are vital to radio experimenting, would be much appreciated.

I found one or two such articles while looking through some old wireless magazines recently.—A. McCASKILL (Aberdeen).

Articles have appeared in our journal from time to time on the construction of various components. We would also refer you to our book "Wireless Coils, Chokes and Transformers, and How to Make Them," Price 2s. 10d. by post; and "The Wireless Constructor's Encyclopedia," Price 5s. 6d. by post.—ED.]

## A "Local Station" Quality Set

**S**IR.—With regard to recent references to special quality sets, I should very much like to see complete constructional details of a "local station" quality receiver to include one H.F. stage, detector, 1st L.F. and push-pull output triodes (such as PX4 or similar). Every stage and component to be designed for best quality only, and to include variable selectivity giving band widths of, say, from about 7 to 15 kilocycles. Such an outfit should surely give at least 6 watts distortionless output.

Since I possess more than one permanent magnet M.C. loudspeaker I am not really interested in an energised model.

I shall be very glad to see an article published on the lines indicated, with full details please, and clearly indicated values of all components.—J. G. CHESHER (Addiscombe).

CUT THIS OUT EACH WEEK.

# Do you know

—THAT the new form of automatic station selection may lead to the design of new types of tuning components.

—THAT careful choice of the pre-set condensers is necessary for reliable results with this form of tuning.

—THAT experiments are now being undertaken with a view to improving the reproduction from existing types of cone loudspeakers.

—THAT when using band-spread tuning it is not essential to select the bandspreeder so that it covers a definite movement of the band setter.

—THAT the above arrangement only facilitates resetting, but does not simplify the actual process of tuning.

—THAT for maximum signal strength there is a definite relationship between inductance and capacity which accounts for the difference in performance at each end of the normal medium-wave band.

The Editor will be pleased to consider articles of a practical nature suitable for publication in PRACTICAL AND AMATEUR WIRELESS. Such articles should be written on one side of the paper only, and should contain the name and address of the sender. Whilst the Editor does not hold himself responsible for manuscripts, every effort will be made to return them if a stamped and addressed envelope is enclosed. All correspondence intended for the Editor should be addressed: The Editor, PRACTICAL AND AMATEUR WIRELESS, George Smees, Ltd., Tower House, Southampton Street, Strand, W.C.2. (Owing to the rapid progress in the design of wireless apparatus and to our efforts to keep our readers in touch with the latest developments, we give no warranty that apparatus described in our columns is not the subject of letters patent.)

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# QUERIES and ENQUIRIES

## Oscillation Indication

"In trying to test a set I have made up I believe that the H.F. stage is oscillating. I am not certain of this, however, and should be glad if you could tell me how to test for this accurately. I do not possess any test equipment, other than the standard all-purpose (cheap) combined voltmeter and milliammeter."—H. R. (Perth).

THERE are two simple methods which you could adopt in your case. First, by touching the grid terminal, a loud and decided pop should be heard when you touch and when you remove your finger from the grid, whilst the valve is oscillating. The meter would give a more accurate indication, however, and if joined in the anode circuit, the current will drop when the finger is removed from the grid. This is

## H.F. Volume Control

"I have made up a set in which I have used a variable-mu H.F. stage. I have tried to control volume by using a potentiometer in series with resistors across the H.T. in the usual manner, the screening being joined to the resistors and a fixed bias resistor being joined between cathode and the arm of the potentiometer. I find, however, that I cannot get good control of volume owing to oscillation. The potentiometer has a total value of 10,000 ohms, and before it has travelled half-way round the set bursts into oscillation. I have used 30,000 and 20,000 ohms for the fixed potentiometer for screen. Can you help me to get over this difficulty?"—D. G. N. (N.1).

THERE may be two or three reasons for your trouble. First, the set may be unstable when the gain is put up to a certain value, and thus a more efficient layout or more effective screening may be called for. On the other hand the type of resistance used for volume control may be wrong. Some of these are graduated and you may have connected yours the wrong way round, or you may be using a special type which gives the wrong control of voltage. Lastly, the value of the resistance may be too high, and to get the same movement of control without oscillation, you may find it desirable to use a 5,000-ohm component with a fixed 5,000 ohms in series, so that the control will then be effective over the 300 or so degrees of the new potentiometer for the same effective resistance variation of your present component.

## Frequency Doubling

"I have seen a reference to frequency doubling, trebling and so on in a book, and should like to know if you can explain what this is. It was in connection with a crystal set."—J. E. (York).

WE are afraid you are confused with the material you have read. The term frequency doubling is employed in connection with transmitters and not crystal receivers. A special crystal is employed in the transmitter to maintain constant the rate of oscillation. The crystal is cut to oscillate at a given frequency, say, that corresponding to 80 metres, and then a special stage is connected following the oscillator, and this is tuned to twice the frequency (half the wavelength). Thus a single crystal may be used for working on two wavelengths, 40 and 80 metres, and by using a further doubler it may be used on another wavelength. They are all harmonically related.

due to the fact that the normal current is higher than when the valve oscillates, and the earthing of the grid due to body capacity stops the valve oscillating and thus the current will rise. If your meter is of a type not giving a low reading of current, the needle will simply kick as you touch the grid and when you remove your finger.

## Trimmers

"In the short-wave set I have made I find that the movement of the knob is much too fine to let me get the setting right. Is there a better slow-motion dial on the market than the one I have which is a Micro Polar? I should like to get some of the stations which are there but are all jumbled together."—J. S. E. (Dorking).

THE trouble may be due to the wrong type of circuit or wrong values of condenser or coil. On the short waves tuning is extremely sharp, and small tuning

capacities are advisable. A plan which you might try, if your coils and condensers are of the correct type, is to connect a very small trimmer (panel type) in parallel with the tuning condenser or band-spreader, and use this as a final adjustment. For this purpose dismantle an old 15 mufd. short-wave condenser and re-assemble it with only one plate on each side, double spaced. This will give a very slight variation which will act as a vernier trimmer.

## Home-made Television Set

"I should be glad if you will kindly let me know if there has been an article published recently on an up-to-date television set (not mains) with list of parts."—N. K. (Northumberland).

WE have not described such an instrument, and you would find it difficult, if not impossible, to make a set which was not mains operated. The modern cathode-ray tube operates with 4,000 volts on an anode, and the large number of valves needed for satisfactory working also call for mains voltage supplied. Furthermore, you would not be able to receive present-day transmissions at your address—at least it could not be guaranteed.

## Substitute Components

"In the July 30th issue of your paper you described the Experimenter's Three. Can substitutes for some of these components be used? I possess these, and I think it a pity to disregard them. Are the mounting brackets metal?"—T. N. L. (Richmond).

ALTHOUGH your components may be of a similar value, there is always a risk in using substitutes for other reasons. In some cases physical dimensions may be important, and also differences may exist in construction which would spoil the performance of a receiver. It is for this reason that we only guarantee our sets when parts which we have used and tried are employed. The same remarks apply to your valves—they may work quite well, but as we have not tried them, we cannot give you a guarantee. The mounting brackets are of metal at the base, with an insulated inset to which the condensers are mounted.

## All-wave Coils

"I am thinking of making an all-wave mains five-valve set, and should like to know whether there are any suitable coils to tune from about 4.5 metres up to the long waves."—B. R. (Smethwick).

THE Bulgin five-range coils would be suitable for your purpose, and these are supplied as a unit, with switching. They may be ganged in various combinations. Alternatively, the Wearite "P" type coils may be used, and wired and assembled in the required combination to give you the circuit desired.

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| 1937 Crystal Receiver ..                    | 0.1.37   | PW71                      | F. J. Cunn's Universal £4 Superhet 4          | —        | PW60   |
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| All-wave Unipen (Pentode) ..                | —        | PW31A                     | <b>One-valve : Blueprint, 1s.</b>             |          |        |
| Beginner's One-valver ..                    | 19.2.38  | PW85                      | Simple S.W. One-valver ..                     | 0.4.38   | PW89   |
| <b>Two-valve : Blueprints, 1s. each.</b>    |          |                           | <b>Two-valve : Blueprint, 1s.</b>             |          |        |
| Four-range Super Mag Two (D, Pen)           | —        | PW30B                     | Midget Short-wave Two (D, Pen)                | —        | PW39A  |
| The Signet Two (D & LF)                     | 20.8.36  | PW76                      | <b>Three-valve : Blueprints, 1s. each.</b>    |          |        |
| <b>Three-valve : Blueprints, 1s. each.</b>  |          |                           | Experimenter's Short-wave Three               | —        | PW39A  |
| The Long-range Express Three                | 24.4.37  | PW2                       | (SG, D, Pow)                                  | —        |        |
| Selectone Battery Three (D, 2 LF            | —        | PW10                      | The Prefect 3 (D, 2 LF (RC and                | 7.8.37   | PW63   |
| (Trans)) ..                                 | —        |                           | Trans)) ..                                    | —        |        |
| Sixty Shilling Three (D, 2 LF               | —        | PW31A                     | The Band-Spread S.W. Three                    | 29.8.30  | PW63   |
| (RC & Trans)) ..                            | —        |                           | (HF Pen, D (Pen), Pen)) ..                    | —        |        |
| Leader Three (SG, D, Pow)                   | 22.5.37  | PW35                      | <b>PORTABLES.</b>                             |          |        |
| Summit Three (HF Pen, D, Pen)               | —        | PW37                      | <b>Three-valve : Blueprints, 1s. each.</b>    |          |        |
| All Pentode Three (HF Pen, D                | 29.5.37  | PW39                      | F. J. Cunn's ELF Three-valve                  | —        | PW65   |
| (Pen), Pen)                                 | —        |                           | Portable (HF Pen, D, Pen)                     | —        | PW65   |
| Hall-Mark Three (SG, D, Pow)                | 12.6.37  | PW41                      | Parvo Flyweight Midget Portable               | 19.6.37  | PW77   |
| Hall-Mark Cadet (D, LF, Pen (RC))           | 16.3.35  | PW48                      | (SG, D, Pen)                                  | —        |        |
| F. J. Cunn's Silver Souvenir (HF            | —        | PW49                      | <b>Four-valve : Blueprints, 1s. each.</b>     |          |        |
| Pen, D (Pen), Pen) (All-wave                | 13.4.35  | PW49                      | Featherweight Portable Four (SG,              | 15.5.37  | PW12   |
| Three)                                      | —        |                           | D, LF, Cl B)                                  | —        |        |
| Genet Midget (D, 2LF (Trans)) ..            | June '35 | PW1                       | "Rap" Portable 4 (D, LF, LF,                  | 19.3.38  | PW89   |
| Cameo Midget Three (D, 2 LF                 | —        | PW51                      | Pen)  | —        |        |
| (Trans)) ..                                 | 8.6.35   |                           | <b>MISCELLANEOUS.</b>                         |          |        |
| 1936 Sonotone Three-Four (HF                | —        | PW53                      | S.W. Converter-Adapter (1 valve)              | —        | PW48A  |
| Pen, HF Pen, Westector, Pen)                | —        |                           | <b>AMATEUR WIRELESS AND WIRELESS MAGAZINE</b> |          |        |
| Battery All-Wave Three (D, 2 LF             | —        | PW55                      | <b>CRYSTAL SETS.</b>                          |          |        |
| (RC)) ..                                    | —        |                           | <b>Blueprints, 6d. each.</b>                  |          |        |
| The Monitor (HF Pen, D, Pen)                | —        | PW61                      | Four-station Crystal Set ..                   | 23.7.38  | AW127  |
| The Tutor Three (HF Pen, D, Pen)            | 21.3.36  | PW62                      | 1034 Crystal Set ..                           | —        | AW444  |
| The Centaur Three (SG, D, P)                | 14.8.37  | PW64                      | 150-mile Crystal Set ..                       | —        | AW459  |
| The Gladiator All-Wave Three                | —        | PW66                      | <b>STRAIGHT SETS. Battery Operated.</b>       |          |        |
| HF Pen, D (Pen), Pen)                       | 29.8.36  |                           | <b>One-valve : Blueprints, 1s. each.</b>      |          |        |
| F. J. Cunn's Record All-Wave                | 31.10.36 | PW69                      | B.B.C. Special One-valver ..                  | —        | AW387  |
| Three (HF Pen, D, Pen)                      | —        |                           | Twenty-station Loudspeaker                    | —        | AW440  |
| The "Colt" All-Wave Three (D,               | 5.12.36  | PW72                      | One-valver (Class B) ..                       | —        | AW440  |
| 2 LF (RC & Trans)) ..                       | —        |                           | <b>Two-valve : Blueprints, 1s. each.</b>      |          |        |
| The "Rapid" Straight 3 (D,                  | 4.12.37  | PW82                      | Melody Ranger Two (D, Trans)                  | —        | AW388  |
| 2 LF (RC & Trans)) ..                       | —        |                           | Full-volume Two (SG det., Pen)                | —        | AW392  |
| F. J. Cunn's Oracle All-Wave                | 28.8.37  | PW78                      | B.B.C. National Two with Lucerne              | —        | AW377A |
| Three (HF, Det, Pen)                        | —        |                           | Coil (D, Trans)                               | —        |        |
| 1938 "Triband" All-Wave Three               | 22.1.38  | PW84                      | Big-power Melody Two with                     | —        | AW388A |
| (HF Pen, D, Pen)                            | —        |                           | Lucerne Coil (SG, Trans)                      | —        | AW420  |
| F. J. Cunn's "Sjrite" Three                 | 26.3.38  | PW87                      | Lucerne Minor (D, Pen)                        | —        | WM408  |
| (HF Pen, D, Det)                            | —        |                           | A Modern Two-valver ..                        | —        | AW392  |
| The "Hurricane" All-Wave Three              | 30.4.38  | PW89                      | <b>Three-valve : Blueprints, 1s. each.</b>    |          |        |
| (SG, D (Pen), Pen)                          | —        |                           | Class B Three (D, Trans, Class B)             | —        | AW386  |
| <b>Four-valve : Blueprints, 1s. each.</b>   |          |                           | New Britain's Favourite Three                 | 15.7.33  | AW394  |
| Sonotone Four (SG, D, LF, P)                | 1.5.37   | PW1                       | (D, Trans Class B)                            | —        |        |
| Fury Four (2SG, D, Pen)                     | 8.5.37   | PW11                      | Home-built Coll Three (SG, D,                 | —        | AW404  |
| Beta Universal Four (SG, D, LF,             | —        | PW17                      | Trans)  | —        |        |
| Cl B)                                       | —        |                           | Tan and Family Three (D Trans,                | 25.11.33 | AW410  |
| Nucleon Class B Four (SG, D                 | 6.1.34   | PW34B                     | Class B)                                      | —        |        |
| (SG, LF, Cl B)                              | —        |                           | £5 5s. S.G.3 (SG, D, Trans)                   | 2.12.33  | AW412  |
| Fury Four Super (SG, SG, D, Pen)            | —        | PW34C                     | 1934 Ether Searcher : Baseboard               | —        | AW417  |
| Battery Hall-Mark 4 (HF, Pen,               | —        | PW46                      | Model (SG, D, Pen)                            | —        | AW419  |
| D, Push-Pull)                               | —        |                           | 1934 Ether Searcher : Chassis                 | —        | AW422  |
| F. J. Cunn's "Limit" All-Wave               | 26.9.36  | PW67                      | Model (SG, D, Pen)                            | —        | AW423  |
| Four (HF Pen, D, LF, P)                     | —        |                           | Lucerne Ranger (SG, D, Trans)                 | —        | AW424  |
| All-Wave "Corona" 4 (HF Pen,                | 9.10.37  | PW79                      | Coscor Melody Maker with Lucerne              | —        | AW425  |
| D, LF, Pow)                                 | —        |                           | Colls   | —        |        |
| "Acme" All-Wave 4 (HF Pen, D                | 12.2.38  | PW83                      | Mullard Master Three with                     | —        | AW426  |
| (Pen), LF, Cl B)                            | —        |                           | Lucerne Colls                                 | —        |        |
| <b>Mains Operated.</b>                      |          |                           | £5 5s. Three : De Luxe Verano                 | 19.5.34  | AW435  |
| <b>Two-valve : Blueprints, 1s. each.</b>    |          |                           | (SG, D, Trans)                                | —        |        |
| A.C. Twin (D (Pen), Pen)                    | —        | PW18                      | Lucerne Straight Three (D, RC,                | —        | AW437  |
| A.C.-D.C. Two (SG, Pow)                     | —        | PW31                      | Trans)  | —        | AW438  |
| Selectone A.C. Radiogram Two                | —        | PW19                      | All-Britain Three (HF Pen, D, Pen)            | —        | AW438  |
| (D, Pow)                                    | —        |                           | "Wireless League" Three (HF                   | 3.11.34  | AW451  |
| <b>Three-valve : Blueprints, 1s. each.</b>  |          |                           | Pen, D, Pen)                                  | —        | WM271  |
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| Pen, DDT, Pen)                              | —        |                           | £6 6s. Radiogram (D, RC, Trans)               | —        | WM327  |
| D.C. Ace (SG, D, Pen)                       | —        | PW25                      | Simple-tune Three (SG, D, Pen)                | June '35 | WM357  |
| A.C. Three (SG, D, Pen)                     | —        | PW29                      | Economy-Pentode Three (SG, D,                 | —        | WM357  |
| A.C. Leader (HF Pen, D, Pow)                | —        | PW35C                     | Pen)  | —        |        |
| D.C. Premler (HF Pen, D, Pen)               | 31.8.34  | PW35E                     | "W.M." 1934 Standard Three                    | —        | WM351  |
| Ubique (HF Pen, D (Pen), Pen)               | 28.7.34  | PW36A                     | (SG, D, Pen)                                  | —        | WM354  |
| Armada Mains Three (HF Pen, D,              | —        | PW38                      | £3 3s. Three (SG, D, Trans)                   | —        | WM362  |
| Pen)  | —        |                           | Iron-core Band-pass Three (SG,                | —        | WM371  |
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| Souvenir Three (HF Pen, D, Pen)             | —        |                           | 1935 £6 6s. Battery Three (SG, D              | —        | WM371  |
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| LF (RC)) ..                                 | —        |                           | PTP Three (Pen, D, Pen)                       | June '35 | WM393  |
| A.C. 1936 Sonotone (HF Pen, HF              | —        | PW56                      | Certainty Three (SG, D, Pen)                  | —        | WM396  |
| Pen, Westector, Pen)                        | —        |                           | Minute Three (SG, D, Trans)                   | Oct. '35 | WM400  |
| Mains Record All-Wave 3 (HF                 | —        | PW70                      | All-Wave Winning Three (SG, D,                | —        | WM400  |
| Pen, D, Pen)                                | 5.12.36  |                           | Pen)  | —        |        |
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| Pen)  | —        |                           | Crusader's A.V.C. 4 (2HF, D, QP21)            | 18.8.34  | AW445  |
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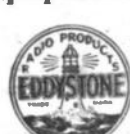
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