GREATLY ENLARGED NUMBER: COMPLETE GUIDE TO THE SHOW

Practical and Amateur Wireless

Vol. 18 No. 330
August 27th, 1938

EVERY WEDNESDAY

3d

GEORGE NEWNES Publication

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,
and many other interesting features

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A general advance along the entire front is sounded in the new season's range of "H.M.V." Radio to be exhibited at Radiolymnia, 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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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 581. Remember there is nothing to pay and no irksome restrictions. Fill up the form on page 581 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 Soot 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 Beatock 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 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 a theatre of the intimate type, and a large area in Gloucestershire is served by it.

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.
ROUND the WORLD of WIRELESS (Continued)

Radio Amateur's Work Appreciated

IN a résumé of the decisions made at the International Telecommunication Conference 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, 30,000 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!

For Philatelists

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

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 to the usual way to the grid circuit of the detector stage. He used the correct 1.2 volt grid-bias for this valve, but results were very disappointing, signals from standard records being heard 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 received. Address your envelopes to The Editor, PRACTICAL AND AMATEUR WIRELESS, 866, Newnham, Ltd., Tower House, Southampton Street, Strand, London, W.C.2. Envelope 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. 309, and have accordingly been forwarded to them: J. Robertson, Aukland Road, Wrexham, Denbighshire, W; Storrs, 20, Lyndhurst Road, New Minton, Manchester.
An Open Letter to Our Readers and the Trade

By THE EDITOR

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.
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 slots 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 1½ in. for the two 7-pin and 1⅛ in. for the 6-pin. At the rear runner two slots or clearance holes for the separate 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 ¾ 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 3½ 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.

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.

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

- One half-circular dial (Polar).
- One B.P. 114 coil (Varley).
- One tuning condenser, 2-gang, .0003 mfd type (Polar).
- One push-button switch, S.221, with knobs and escutcheon (E101 (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 aode-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 431, .04 mfd. (T.C.C.)
- One H.F.C. H.F.9 (Bulgin).
- Two taping-potentiometer, one 5-pin (Clax)
- Two grid-leaks, .3 meg. 1 watt (Erie).
- Two screen resistances—one 30,000, and another 20,000 or watt (Erie).
- One anode resistance, 40,000 or watt (Erie).
- One anode resistance, 10,000 or watt (Erie).
- One bias switch, S.132 (Bulgin).
- Two terminal strips—A., A.1, and E., L.S. (Clax).
- One panel, 11 in. x 9 in. alu. (Peto-Scott).
- One chassis, 11 in. x 2 in. x 9 in. alu. (Peto-Scott).
- One bias pot, 50,000 without switch (Erie).
- Fuse, 100 mA (Micro fuse).
- Fuseholder (Micro fuse).
- One valve, 210 V.P.T., 7-pin metalised (Cessor).
- One valve, 210 S.P.T., 7-pin metalised (Cessor).
- One valve, O.T. 220, 5-pin (Cessor).
- One 12-volt H.T. battery and one 2-volt 40 A.F. accumulator (Erie).
- One Stentorian loudspeaker (W.B.).

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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 newest 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 Tungsram H.P.210.

The coil windings allow the aerial coupling coil and the grid coil to be switched for medium and long waves.

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.P. 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 may 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.

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 431, .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.14 (Bulgin).
One switch—S.22 (Bulgin).
Two terminal strips—1 1/2-sections A, A1, and E, 1 1/2 sections E, S.14 (Clix).
One panel—9 in. x 7 in.—Alu. (Peto-Scott).
One chassis—7 in. x 6 in. x 1 1/2 in.—Alu. (Peto-Scott).
Fuse—100 m.A. (Microfuse).
Fuseholder (Microfuse).
One H.P.210 metalised valve (Tungsram).
One pair earphones (Eriecon).
One 120-volt H.T. battery (Esme).
One 2-volt 40 A.H. accumulator (Esme).
One Stentorian loudspeaker (W.B.).

NEXT WEEK!

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

Theoretical diagram of the o.v.-valve.
Welcome!

We WELCOME to every reader on the occasion of the 17th Radiolymnia, and a particular welcome to Stand No. 9—Ground Floor. It was not so long ago that the wall stands at Radiolymnia 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 posters 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

SPECIALY produced in time for Radiolymnia 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 useful tool to amateurs and professionals. The contents include:


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 formula. Each volume is neatly bound in cloth, printed on good paper, and fully illustrated. The Transmitting Book costs 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 Radiolymnia 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 the makers that Germany 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 overseas to muffle 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

M R. 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 strain-in 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 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 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, Scout" 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 Kimber Court.
No programme would be complete without a Short-Wave, 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 decided to combine constructional simplicity with maximum efficiency and use, therefore, the reliable detector-L.F. combination.

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, gives an amazing all-over 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 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 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 tank 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 feedback.

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 11in. holes for the two 7-pin valve-holders 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.

**LIST OF COMPONENTS FOR THE "FLEET" S.W. TWO-VALVE RECEIVER.**

- One Airplane degree marking dial—dual ratio (Jackson).
- Two tuning condensers—.0015 S.W. Special, and .00015, Midget U.S.W. (Jackson).
- One .0005 Dickeys reaction condenser (Jackson).
- One .0005 serial series condenser (Jackson).
- One S.P.1 coil and holder (B.T.S.).
- One .002 type 4662/S grid condenser (Dubiller).
- One .001 type 4608/S H.F. condenser (Dubiller).
- One .001 type 4608/S anode by-pass condenser (Dubiller).
- One .025 type 4606/S coupling condenser (Dubiller).
- One .06 type 4601/S tone condenser (Dubiller).
- One .01 type 4603/S screen condenser (Dubiller).
- One .002 type 1 watt grid leak (Eric).
- One 80,000 ohm I watt anode resistance (Eric).
- Two valveholders—one 7-pin V2, one 5-pin V1. Chassis type (Clix).
- One switch, S.102 (Belgian).
- Two seater, E.P.T. (Belgian).
- Two terminals strips—A., A.1—and E., E.1. (Clix).
- H.T. S.W., (B.T.S.), Panel: 10in. x 9in. aln. (Peto-Scott).
- Chassis: 10in. x 21in. x 7in. aln. (Peto-Scott).
- Fuse: 100 mA (Microfuse).
- Fuseholder (Microfuse).
- Two valves, H.P.210 and P.P.223 (Tongram).
- One pair electrolyte (Ericson).
- One 120-volt H.T. battery and one 2-volt 40 A.H. accumulator (Ericson).
- One Statutory loudspeaker (W.B.).

The circuit diagram is shown below.
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 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 painted knob will be found extremely useful.—R. Phillips (West Cramlington, Northumberland).

A Simple Screw-down Switch

When trying out some remote control circuits I needed three press-button type switches to be controlled by one knob. I could not obtain apparatus of this kind anywhere, so I adopted the simple dodge illustrated. The hole in the bobbin is widened to ⅜ in. for about half-way up. The insulator (which is the sleevings of a divided plug) is not needed if the screw already fits the hole in the bobbin neatly.—H. Newby (Morton, Co. Durham).

Operating Mechanism for Sub-chassis Toggle Switches

Toggleswitches mounted below the sub-chassis (to suit short wiring and layout) are difficult to adopt for panel operation. The simple yet robust mechanism illustrated which gives every satisfaction, possesses a lock action to prevent spindle backlash and is easily constructed. Two bushes, holding operating discs, are fixed to a ⅜ in. brass spindle. The extreme end of the spindle is approximately ½ 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 gramo lid, and the movement is as follows:

A strong brass control arm “M” activates a cam fashion the double shaft “A-B,” this shaft causing “SI” to release a strong brass contact arm which in turn contacts with the back contact, thus completing the necessary converter circuit.

“SI” functions in rather a novel way, instead of the rotation of a flat piece of brass, previously let into the “B” shaft, engages smartly with a well-tempered contact piece "KC": 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.

"E" is a section of a bakelite former, and as the wood end-ont 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 “SI” went to earth potential, and in my case I was able to separately earth the whole assembly.—R. C. Collett (Croydon).
Be guided by the expert use

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.

The D.C. AVOMinor Electrical Measuring Instrument
An accurate 13-range moving-coil instrument for all normal radio tests, including H.F., L.F. and G.B., Rectifiers, D.C. Mains and Eliminator Voltages; Valve and valve circuits, etc.

<table>
<thead>
<tr>
<th>CURRENT</th>
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<tr>
<td>1-250 mA</td>
<td>0-15 V</td>
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<tr>
<td>1-2.5 A</td>
<td>0-150 V</td>
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</table>

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.

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<tr>
<th>D.C. VOLTS</th>
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<tr>
<td>0-2000 volts</td>
<td>0-50,000 ohms</td>
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Complete with instruction booklet, leads, interchangeable testing prods and crocodile clips. £5.10s.

The AVODapter Valve Testing Holder
Simplifies valve testing. Enables all valves to be tested under working conditions outside the set. Eliminates the need for severing connections and grouping about inside the set. Instantly adaptable for 4-pin, 5-pin and 7-pin valves. 9-pin AVOCoupler, An attachment for rendering the AVODapter suitable for 9-pin valves 27/-

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THE AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO., LTD.,
Winder House, Douglas Street, London, S.W.1 Telephone: Victoria 34247
YOU HAVE JUST HEARD
OUR SIGNATURE TUNE. WE ARE
NOW GOING TO PLAY FOR THE FIRST TIME
IN ENGLAND A SPECIAL SWING NUMBER

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

‘NEXT TIME I’LL FIT
Exide AND Drydex
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

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.

DUBILIER CONDENsER CO. (1925) LTD.
DUCON WORKS, VICTORIA ROAD, NORTH ACTON, W3
The "JUNIOR" CRYSTAL SET
The Ideal Set for the Beginner

Knowing 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

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 plywood.

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-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-coiled coil, produced by Messe-Bulgin, the normal reaction winding being utilized 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 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.

---

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

- One tuning condenser, without dial or slow motion. Popular leg. .0003 (Jackson).
- One tuning dial, square plane, degree and scale (Jackson).
- One coil, C-203 (Bulgin).
- One crystal detector, R.D.40 (Jewel Pen).
- One switch, S.96 (Bulgin).
- Two terminal blocks, A.E. output (with terminals) (Belling and Lee).
- One panel, Bm. x Gm. walnut (Peto-Scott).
- One fusible condenser, .001 mfd., type 4601/S. (Dubliner).
- One fixed condenser, .0001 mfd., type 4601 S. (Dubliner).
- One pair earphones (Ericsson).
Guide to the Exhibitors

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

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<tr>
<th>Stand</th>
<th>Name and Address</th>
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<tr>
<td>1</td>
<td>Armstrong Manufacturing Co., 100, King's Road, Camden Town, N.W.1</td>
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<tr>
<td>2</td>
<td>Automatic Cover Winder and Elec. Equipment Co., Ltd., 45, Duke Street, W.C.2</td>
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<td>3</td>
<td>Baird Television, Ltd., Worsley Bridge Road, S.E.20</td>
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<td>4</td>
<td>Balcombe, Ltd., A. J. B. T., Tabernacle Street, E.C.2</td>
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<td>Beethoven Electric Equipment, Ltd., Chase Road, North Acton, N.W.1</td>
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<td>Belling &amp; Lee, Ltd., Cambridge Arterial Road, Enfield, Middlesex</td>
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<td>Bird &amp; Sons, Sydney S., Cambridge Arterial Road, Enfield, Middlesex</td>
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<td>Britannia Batteries, Ltd., Union Street, Redditch, Worcs</td>
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<td>British Belmont Radio, Ltd., 4-5, Ridgmount Street, W.C.1</td>
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<td>British Broadcasting Corporation, Broadcasting House, London, W.1</td>
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<td>British Mechanical Productions, Ltd., 79a, Rochester Row, London, S.W.1</td>
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<td>British Pict Co., Ltd., Pict Works, Lilliehall Road, S.W.4</td>
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<td>British Tungsten Radio Works, Ltd., West Road, Tottenham, N.17</td>
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<td>Bulgin, A. F., &amp; Co., Ltd., Abbey Road, Bayswater, Ebury</td>
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<td>Burnett Ltd., Light Gun Factory, Erith, Kent</td>
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<td>Bush Radio, Ltd., Power Road, Chiswick, W.4</td>
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<td>Carr Fastener Co., Ltd., Finsbury Court, Finsbury Pavement, E.C.2</td>
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<td>Celestion, Ltd., London Road, Kingston-on-Thames</td>
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<td>Chelsea Hi-Fi (Radio), Ltd., Edward St., Dudley Hill, Bradford</td>
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<td>Childe's Electrical Storage Co., Ltd., 231, Shaftesbury Avenue, W.C.2</td>
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<td>Chiumana &amp; Co., Ltd., Elko Works, Southend-on-Sea, Essex</td>
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<td>Commoncord, Ltd., Cambridge Arterial Road, Enfield, Middlesex</td>
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<td>Cossor, A. C., Ltd., Cossor House, Highbury Grove, N.3</td>
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<td>Davies, D. M. (Slough), Ltd., Trading Estate, Slough, Bucks</td>
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<td>Davis &amp; Timmins, Ltd., Brook Road, Wood Green, N.22</td>
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<td>De Lave Rue, Thos., &amp; Co., Ltd., 94, Shermeshall Street, F.17</td>
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<td>Dow, A. J., &amp; Co., Ltd., 33, Rathbone Place, W.1</td>
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<td>Dibben, Horace, Ltd., 34, Carlton Crescent, Southampton</td>
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<td>Dublin Condenser Co. (1923), Ltd., Duncon Works, Victoria Road, North Acton, W.3</td>
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<td>Dynatron Radio, Ltd., Perfecta Works, Ray Lea Road, Maidenhead</td>
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<td>East London Rubber Co., Ltd., 29, Great Eastern Street, E.C.2</td>
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<td>Eastick, J. J. &amp; Sons, 118, Bunhill Row, E.C.</td>
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<td>Easmon Co., Ltd., 92, Victoria Street, S.W.1</td>
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<td>Edison Swan Electric Co., Ltd., 155, Charing Cross Road, W.C.2</td>
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<td>Garrard Engineering &amp; Manufacturing Co., Newcastle St., Swindon, Wilts</td>
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<td>43</td>
<td>General Electric Co., Ltd., 15, Magnet House, Kingsway, W.C.2</td>
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<td>Goodmans Industries, Ltd., Lancet Road, Wembley, Middx.</td>
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<td>Haleyon Radio, Ltd., Sterling Works, Dagenham</td>
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<td>Haywood, F. C., &amp; Co., Ltd., 10, Finsbury Street, E.C.2</td>
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<td>High Vacuum Valve Co., Ltd., 111, Farrington Road, E.C.2</td>
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<td>Hobday Bros., Ltd., 21, Great Eastern Street, E.C.2</td>
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<td>Hulfe &amp; Sons, Ltd., Dorset House, 11, W-Stanford Road, E.C.2</td>
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<td>Radio Society of Gt. Britain, 53, Victoria Street, London, S.W.10</td>
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<td>Reayton Products, Ltd., Worton Road, Iddesleigh, Middx.</td>
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<td>Rotheram Chemical House, Canterbury Road, W.X.6.</td>
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<td>Rupery, Ltd., Thurnham Lodge, Campland Hill, W.8</td>
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<td>Selecta Gramophones, Ltd., 81, Southwark Street, S.E.1</td>
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<td>Siemens Electric Lamps and Supplies, 39, Upper Thames Street, E.C.4</td>
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<td>Steatite and Porcelain Products, Ltd., 25, Upper St. Ermin Street, S.W.1</td>
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<td>Sterling Batteries, Ltd., Sterling Works, Dagenham, Essex</td>
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<td>Stratton &amp; Co., Ltd., Eddystone Works, Bromsgrove Street, Birmingham</td>
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<td>Wharncliffe Bridge Signal Co., Ltd., 82, York Rd., King's Cross, N.1</td>
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<td>Weston Electrical Instrument Co., Ltd., Cambridge Arterial Road, Eufield, Middlesex</td>
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<td>Whiteley Electrical Radio Co., Victoria Street, Mansfield, Nottingham</td>
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<td>95</td>
<td>Wire &amp; Rodgers, Ltd., 6, Old Swan, Liverpool</td>
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<tr>
<td>96</td>
<td>Wireless and Electrical Trader, Dorset House, Stamford St., S.E.1.</td>
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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

Make a Note of It!

"Practical and Amateur Wireless," the Leading Wireless Journal with the Largest Net Sales, is on sale at Stand No. 9, Ground Floor, with its stable companions, "Practical Mechanics" (6d. monthly), "Practical Motorist" (3d. every Friday), and "The Cyclist" (2d. every Wednesday). Full range of our standard works on Wireless, Blueprints, etc., are also on sale.
**National Radio Exhibition**


Complete Guide to the Exhibits

In a few cases details of exhibits have not been

This Baird television, which may be seen on Stand No. 19, gives a black and white picture 7½in. by 6½in.

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

The floor plan appears on page 583.

Complete Show Report next week.

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**Armstrong Manufacturing Co., 100, King's Road, Chelsea, W.4. Stand No. 98.**

On this stand the receivers will all be in chassis form and will include 6, 7, 8, 9, 10, and 12-valve units. Some 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 L.F. stages with variable selectivity on both stages and delivers an output of 10 watts. The price is 17 guineas complete with valves.

**Belling & Lee, L.T.D., Cambridge Arterial Road, Enfield, Middlesex. Stand Nos. 4 and 5.**

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

**Armstrong Manufacturing Co., 100, King's Road, Chelsea, W.4. Stand No. 98.**

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 L.F. stages with variable selectivity on both stages and delivers an output of 19 watts. The price is 17 guineas.

**Armstrong Manufacturing Co., 100, King's Road, Chelsea, W.4. Stand No. 98.**


These receivers on this stand are known as "Slim" models, and a feature of them will be the automatic push-button tuning. In these receivers it is known as the "Pre-set-line," and will be found on the receiver's all-wave superhet. The pre-selection models will include table, floor and console cabinets and one of the most interesting will be a 4-valve three waveband superhet radiogram at 12 guineas.

**Armstrong Manufacturing Co., 100, King's Road, Chelsea, W.4. Stand No. 98.**

These exhibits here will consist in the main of test apparatus, amongst which are the popular Weston, Avometer, Avovoltage, etc. These are applicable 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 the company also produces a neat photo-electric photographic exposure meter.

**Armstrong Manufacturing Co., 100, King's Road, Chelsea, W.4. Stand No. 98.**

This exhibit on this stand will consist of a display of every type of condenser that is used with in modern tuning circuits. These range from the small micro-electrolytic projects or trimpots up to the large transmitting models with high quality insulation suitable for use on high-voltage circuits. An interesting addition to the exhibit is the new "Blindside," which will operate in such a manner that an indication as to which condenser is correct may be obtained.
PRACTICAL AND AMATEUR WIRELESS

BRITISH BELMONT RADIO LTD., 4-5, Ridgmount Street, W.C.1. Stand No. 26.

The range of Belmont receivers which will be shown on Stand No. 25 will include some novel designs. These are finished in attractive coloured cabinets and range in price from £4 4s. Among the features announced is the Belmont receiver, which may be mentioned transformer coils, silver-mica trimmers, iron, volume control, automatic circuit, and amplifying feeds back 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.


Here will be seen the wide range of "Pix" receivers contained amongst which are valve holders, running plugs, sockets, etc. The valve holders are suitable for a variety of types of receiver and valves, and include classic or low-circuit type for tetrode, n.tetrode, or triode types. Vacuum plug connectors, bases, transformer condensers, and a new wall plug are among the remaining items which may be seen on this stand.

BRITISH PIX CO., LTD., Pix Works, Lilliehall Road, S.W.4. Stand No. 52.

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

BRITISH ROLI CO., Minersa Road, Park Royal, N.W.10.

In the Roli display in the Holida exhibit will feature largely around the new 86 and 106, double-point models of box, and combined transformer respectively. Available in both engraved and permanent magnet types these units are of special patented construction wherein dual dual transformer within the range of the great makers of speaker troubles, are totally eliminated from the air gap. The well-known "Roli "forna" and "forn" type cabinet extension speakers, are also equipped with no diameter threaded units, whilst the FT-225 "high sensitivity" model and the 15m. diameter column loudspeakers, etc., by prominent makers. There will also be a dependability 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.

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 Makers' Stand." The push-button units will probably prove of most interest, inasmuch as they do the boxed 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.

BURNEDEPT, LTD., Light Gun Factory, Erith, Kent. Stand No. 94.

An interesting feature of the receivers on this stand will be the "continuous tuning" band. In the extensive all-wave radiograms, for instance, this hits from 155 to 2,500 watts and there are no blank spots. In the "broad band" a similar measurement is made with the exception of a small band from 500 to 754 meters, other prominent features of the receivers to be shown here are the high fidelity reproduction, the great selectivity and the special iron-core L10 coils which are used.

BUSH RADIO, LTD., Power Road, Shenfield, W.4. Stand No. 59.

"SWITCH BUTTON" is the key device of the Bush receivers, and this is a standard push-button tuning device, recessed to make it distinctive. The large opening scale, and the fine finish to the cabinet are two of the main features which will prevent them from looking like another box, and will appeal to the more discriminating tastes of those who are interested in circuit design. The small, stylish, and Economical Provisions for pickup and remote control is, of course, a frequent arrangement on the Bush receivers.

CElL FASTENER CO., LTD., Flinsbury Court, Finlays Park Estate, S.E.2. Stand No. 99.

One of the most popular sets is the "batterya" or "batteryless" receiver, which is made in a wide variety of shapes and sizes and is particularly suitable for use in the home. The receiver takes its name from the fact that it is not provided with a battery, and is entirely self-contained. It is supplied with a set of aerials and connecting leads, and is ready for use at once.

A series of "batterya" or "batteryless" receivers is also available, and these are particularly suitable for use in the home. The receiver takes its name from the fact that it is not provided with a battery, and is entirely self-contained. It is supplied with a set of aerials and connecting leads, and is ready for use at once.

Here is the British Belmont 7-valve all-wave console with automatic tuning. This is on view on Stand 21. Mains transformers, oscillators, electronic condensers, a switch, trimmers, television components, watt and other meters, cathode ray oscilloscope and other accessories are only a few of the many interesting components which may be inspected on Stand No. 72.

CHLORIDE ELECTRICAL STORAGE CO., LTD., 215, Shasta Avenue, W.C.2. Stand No. 15.

FLIZMOD is the 12-valve type 20x2. The "batterya" or "batteryless" console for the self-contained receiver is housed in a standard finishing cabinet. The price of this model (Type A30W) is £10 10s.

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Interesting novelties are in the form of an air-dielectric tuner which may be used
in the "Motor Tuning" and "Motor Tuning". A development
of the tuning system, the component system, is to simplify manual tuning by permitting the motor
in the control range of the receiver to be turned from one end of
the scale to the other, so that a desired station which has been tuned to by a normal button may be reached.

The normal station selector button is also available.

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

O n this stand the latest battery of cathode ray
screen tubes is being shown. Five tubes, ranging from 0.5 to 66 inches in diameter
will be conveyed to each of the separate tubes selected for the display, and the angle of vision is 120°. Our model is for television only, and the other includes the broadcast
wavelength. A wide range of domestic radio
sets will also be shown, in which "patent" automated tuning will be featured. 6508 range is also to be represented by a new Ferranti set of the 12-water superflute type giving 25 watts output.

Another new Dailbier line—in a air-dielectric tuner.

EMI. SERVICE, LTD., Sharron Works, Hayes, Middlesex. Stand No. 42.

A very wide range of accessories and gear for the
service man will be displayed here. In addition to the elaborate electrical equipment, E.M.I. serv-

EMI, LTD., 11a, Aberdeen Street, Toronto, Stand No. 32.

A range of new models, including many workshop accessories, is being displayed here. It is to
the workshop equipment, E.M.I. servicing of modern radio and television receivers.


A new range of+B&K models for A &.I.M.O. use. No.

Featuring is the "Edward" model, a radio and television receiver for the

FERRANTI LTD., Mosley, Manchester, Stand No. 14 and 75.

TV receivers to be exhibited on this stand will be

F ULLE R A C C U M U L A T O R, LTD. (1936), LTD., Wood
dale, Near Warrington, England. Stand No. 57.

Here will be seen representative types of the

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

This exhibit will, as in past years, consist of a

DUBILLER CONDENSER CO. (1925), LTD., Queen
Works, Victoria Road, North Acton, W.3. Stand No. 45.

A range of new and interesting developments in

DYNATRON RADIO, LTD., Perfecta Works, Ray Leigh
Park, Stand No. 44.

All the receivers exhibited by Dynatron are re-

DUNSIL FORD, LTD., Stand No. 55—have reduced the "valuable reception service test panel.

TWO NEW HANDBOOKS
PRACTICAL WIRELESS SERVICE MANUAL
WIRELESS TRANSMISSION FOR AMATEURS
See them on our STAND No. 8, Ground Floor.
One of the new Ferranti television sets to be seen on Stand No. 14.

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

Push-button tuning is also found on this Invicta receiver on Stand No. 17.

The modified A03 charger which is to be found on Hurricane's Stand No. 2.
Masonic horn are introducing push-button tuning in this model.


This stand will be seen a range of very high-fidelity instruments, the majority of which are designed for use with modern transmitting equipment. A very interesting model is a special distortion 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 50,000 Hz. Fundamental.


H.R.E. will be seen the wide range of Poet equipment, 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 relates the same condenser which consists of two cylinders, one sliding inside the other. The capacity thus being varied is a "shear" action instead of the usual rotational movement. In the range of valves there is a special tend "E"-series of valves specially designed for short-wave reception. The details of which there

MARCONIPHONE Co., LTD., 310, Tottenham Court Road, W.1. Stand Nos. 54 and 65.

This stand will be seen on Stand No. 53 include the latest small television instruments. 29 inches Model 7396 portable, in addition to an all-wave radio, a television section providing a picture 4Jm. by 3m. This receiver is of the table-type, and a special color is available upon which it may be placed if desired. This costs an extra guinea. The stand is immediately adjacent to the B.B.C. Television Studio, and thus visitors will be able to see the programme being presented 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-wayband lightweight battery portable, and a five-valve three-wayband push-button receiver, are popular models, which will receive time spent in inspection, and in the necessary range will be a new concise aerial, designed for use on the medium and long wavelengths, where main-mode static is particularly bad, and a new record player, the Stand 54 4 display of the latter and results for Columbia, Pathéphone, etc. will be seen. Visitors will be able to hear their favorite artists by means of Post Office telephones connected direct to Marconiphone Radiograms.

A neat television receiver produced by K.B.,

Note 1. n-set panel design in this latest receiver

PULL-BUTTON tuning is included in this K.B. receiver, which is to be seen with the above television receiver on Stand No. 41.
PILOT RADIO, LTD., 87, Park Royal Road, N.W.10.

Stand No. 37.

In the range of battery and mains table, console and radiograms to be seen on this stand production values will be the keynote. The model "Concerto," receiver, which has been kept in the "back-benchers" class until today, will be shown for the first time, and we understand that it will create great interest among listeners to the show.


Stand No. 80.

This exhibit will be a collection of radio equipment of all kinds; receivers with motor-driven and permeability post-tuning; two battery sets, and mains-transportable. In addition there will be several amplifiers, head-phones, inductors, gain controls and special cables. All interested in the home-constructor is the announcement that at Ottington there will be for the first time a new crystal pickup head for use with existing apparatus. This will cost £1.50, and is designed to be fitted to any existing receiver or transmitter. The weight is only 2 cwt., and the output is approximately 1.5 volts.

ROSE (ELEC.), NORMAN, LTD., 43, Lamb's Conduit Street, W.C.1.

Stand No. 97.

On this stand the makers will be exhibiting a wide range of wireless equipment, test gear and associated apparatus. Among the many items present are replacement components such as resistors, pilot lamps, condenser, transformers, etc.

Substantial cabsing work is embodied in the Pilot receivers. See them on Stand 37.

PHILIPS LAMPS, LTD., 115, Charing Cross Road, W.2.

Stand No. 51.

New models this year will be seen on this stand will be a 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 control of station setting is provided. The short-wave performance of the new sets is improved by the incorporation of a new filament valve. The new car radio provides an unusually high standard of reproduction, is simple to install, and less non-linear consumption than existing models. Large-screen television will also be seen here.

NEWES LTD., GEO., Tower House, South-amerbit Street, Strand, London, W.C.2.

Stand No. 9.

In this stand you will be able to obtain a copy of an up-to-date form of electrical and radio equipment. A complete range of board-books, amongst which may be mentioned "The Wireless Constructor's Encyclopaedia," "Everyman's Wireless Book," "The Practical Wireless Handbook," "The Home Mechanic's Encyclopaedia," etc. Also on view and two new handbooks will be seen, one under the titles "Practical Wireless Service Manual" and "Wireless Transmission for Amateurs." This is a special feature of this stand, and in addition there will be several amplifiers, head-phones, inductors, gain controls and special cables. All interested in the home-constructor is the announcement that at Ottington there will be for the first time a new crystal pickup head for use with existing apparatus. This will cost £1.50, and is designed to be fitted to any existing receiver or transmitter. The weight is only 2 cwt., and the output is approximately 1.5 volts.

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

STERLING BATTERIES, LTD., Sterling Works, Dagenham, Essex. Stand No. 58.

There will be seen a range of batteries of all types, products of the 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., Edyptos Works, Bromsgrove Street, Birmingham. Stand No. 72.

This stand will illustrate the wide range of change components, all of which are made under the Edyptos 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 interest are also to be exhibited. These include an "All World" as well as an "All World Two," and of special value to the constructor is a chassis for a loud receiver in which a novel all-wave tuner and special glass I.F. unit are the main items. The tuning dial on this unit consists of a cylinder into long rotated by the wave-change switch and providing a separate scale for each frequency range. Calibrations are in meters and multiples for the short waves and meter and metric for the medium and long waves. It tunes down to 25 meters.

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

TANNOW PRODUCTS, Canterbury Grove, West Norwood, E.7. Stand No. 72.

The main products of this company are for public address work, and some interesting specimens are to be shown. There will include a novel loud-speaker which is illustrated on this page. This is so designed that the air column is of the coaxial exhaust form. The frequency response is excellent for intelligibleness and the speaker may be suspended 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 loudspeaker is an interesting development, capable of fully furnishing a speaker without the use of an amplifier between the two sections. The output is so stated to be comparable to that produced by any of the standard amplifiers.

TELEGRAPH CONSTRUCTION & MAINTENANCE CO., LTD., 22 Old Broad Street, E.C.2. Stand No. 72.

On this stand will be seen many novel metals developed and used in modern wireless and television apparatus. These will include Tessen materials, such as Moneral, Endrometal, Photomens, etc. These are used for the cores of inductance coils, transformer, and other waveguides, windings for T.C. tubes, receiving 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 waveguides.

TUCKER, GEO. EYETLE CO., LTD., Cocke Road, Birmingham, T. Stand No. 58.

The products of this firm consist of glass-wave of all kinds and include systems, feeder lines 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 these, the newer models will be several with pushing-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 vertical form. Five-frequency and four-frequency receivers are other features of these receivers, and two of the new models are rated to deliver an output of a watt.

Here is something new for constructors. A crystal pick-up head from Patterham. See it on Stand No. 80.
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. 2, marking the envelope in the top left-hand corner with the word “Competition.”
4. The prizes will be awarded to those whose corrected diagrams most nearly resemble the correct circuit which we shall publish in our next dated September 21st.
5. The Editor’s decision is final and legally binding and he reserves the right to refuse to accept any entries.
6. We cannot enter into correspondence regarding this Competition.

A FINE TECHNICAL LIBRARY OF STANDARD WORKS

| Practical Wireless Service Manual | 5/- | 6/- |
| Wireless Transmission for Amateurs | 2/6 | 2/10 |
| Sixty Tested Wireless Circuits | 1/6 | 2/10 |
| Wireless Coils, Chokes and Transformers and How to Make Them | 2/6 | 2/10 |
| Wireless Constructor’s Encyclopaedia 1/- | 5/- |
| Everyman’s Wireless Book | 3/- | 3/10 |
| Television and Short-Wave Handbook | 3/6 | 3/10 |

See them on our Stand 6, Ground Floor.
CONSIDERABLE controversy has raged concerning 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 constructive details, together with further illustrations, will appear in our next issue.

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 (Clia).
Three terminal strips, A, A.1, and E, L.S., P.U., (Clia).
H.F.C., H.F.10 (Bolgin).
One switch—S. 119 (Bolgin).
One aerial series condenser, type 451 (T.C.C.),
One reaction condenser—Compact 600 (Polar).
One volume control, 50,000 type B (Dubilier).
Fixed resistors:
Three type F, 30,000 1 watt; three type F, 20,000 1 watt; two type F, 1,000 1 watt; one type F, 1,000 1 watt, two type F, 1 watt; one type F, 500 1 watt; one type F, 500 1 watt; one type F, 100 1 watt.

One switch—P.C. (Dubilier).
One earphone—B. P. 116 (Varley).
One valveholder—Microscope.
One 120-volt-H.T. battery and one 2-volt 0.5 ampere accumulator (5.6 volts). One Sterenior loudspeaker (10 watts).

Bearing in mind that the constructive details have to be as simple as possible, I have used a three-valve 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-nu 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.

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

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 feedthrough triode is used.

The output of the detector is led 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.

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

Theoretical circuit. Note the optional reaction arrangements.
PILOT AUTHOR KITS
F. J. CAMM'S ADMIRAL 4
KIT "A" c/o D., £67:6 or 12/- down
balance in 11 monthly payments of 12/-.
Comprising all first specified parts for receiver
including drilled aluminum chassis and panel,
wire, etc. and screws.
Sold out.
THREE-VALVE RECEIVER
KIT "A1" c/o D., £51:1:3 or 11/- down
balance in 11 monthly payments of £1:11.
Set of specified valves, 11/-, or add 2/- to deposit
and to each monthly payment.
FLEET SHORT-WAVE 2
KIT "A" c/o D., £62:6 or 6/- down
Set of specified valves 25/-, or add 2/- to deposit
and to each monthly payment.
PYRAMID ONE-VALVER
KIT "A" c/o D., £47:6 or 4/- down
Specified valve 11/-, or add 1/- to deposit and
to each monthly payment.
JUNIOR CRYSTAL SET
Complete kit, comprising all parts for building,
including Metajux hamradio and drifted panel,
wire and screws.
Cash or c/o D. £6 or 2/- down and 11 monthly payments of 2/-.

B.T.S. TROPHY SHORT-WAVE RECEIVERS
TROPHY 7, Junior Communication Receiver (as illustrated).
Continuous wave-range 100-550 metres. Mechanical band-switching.
A.C. and R.F. on switch. All parts required for complete receiver.
Complete instructions for building.
£9.6.
TROPHY 3, Highly efficient self-contained
short-wave receiver. Speaker incorporated. Phone jack. Effective
wave range 62-550 metres. Supplied
with licence 1951-1952.
£5.6.
BATTERY MODEL, Cash or c/o D. £5 15/- or 10/-
down and 18 monthly payments of 10/-.
No extra cash required for complete coverage. 62-550 metres, add 10/- to cash
prices or 1/- to deposit and payments.

PETO-SCOTT MICROPHONE
For Home-broadcasting and P.A. Work
Neat current type for use with
any 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
transformer, G.B. battery and 50ft microphone.

1-VALVE ALL-WAVE RECEIVER
This superior one-valve all-
wave receiver covers 2,000 metres. Extremely simple to
build—no additional parts required for special all-
wave tuner incorporated. Recommended for the
beginner or where efficiency is the
aim. £2 24 down and 11 monthly payments of 24.

1939 RECEIVERS
BUS H, B.T.S., COSSOR,
ECKO, FURGUSON, PYE
all available on lowest easy-payment terms
SEND FOR COMPLETE LISTS
and purchase by the famous Peto-Scott
easy-payment plan. Strictly private,
ensured with no third-party collections.

THE PILOT
SHORT-WAVE EXPERIMENTER
8-IN-1 KIT
From our latest experimental
short-wave experimenter with
this unique kit. All of the components employed are
continually specified above normal and further-
more for testing the complete
kit you get £1 75 c.o.d. to
Please send your order.
...PLEASE SEND COMPLETE LIST...
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 on 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 OAN1A, La Voz de Chiclayo, which has been working on 48.78 m. (6.15 m/c), has been reported to be testing on 24.98 m. (12.01 m/c), in view of the congestion on the former channel. The station is said to be on the ether daily from 01.00-04.00. 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 m/c) with a power of 220 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: Chimbis. Man and woman announcers.

Delete from Your List

According to official publications the following broadcasting stations have now permanently suspended their transmissions: H14V, formerly on 46.61 m. (6.45 m/c), and H18A, on 46.3 m. (6.48 m/c), both located at Chinad Trujillo (Dominican Republic).

New Station in China

NEWS bulletins relative to the Suny-Sing short-wave channel in German, French, and English are now broadcast daily from G.M.T. 12.00-12.30 from XJ33, Hankow (China), on 25.06 m. (11.60 m/c), 3 kilowatts.

More Broadcasts from Chile

A MEDIUM-WAVE station CB180, at Santiago (Chile), is stated to have recently inaugurated a short-wave transmitter on 25.42 m. (11.8 m/c). Address: Estacion CB, 1180 (Markoff Hermanos Limitada), Santiago (Chile).

And Also from Costa Rica

TXD, the medium-wave station at San José (Costa Rica), has added to its network a 200 watt relay (T12X10) operating on 25.15 m. (11.93 m/c). The slogan of the studio coupled to the call is: La Voz de la Republica. Address: John Gilbert Daly, Station TXD, Apartado Postal, 1720, 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 VP8CD which would appear to emanate from St. Kitts (British West Indies). The wavelength was 47.02 m. (6.38 m/c).

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

A T Villarica (Paraguay), the owners of the medium-wave station ZP15 have installed a short-wave transmitter, nano of ZP14, working on 48.78 m. (6.15 m/c) with a power of 200 watts. In announcements both call-signs are mentioned with the slogan: Radio Voleadora, En Contra del Corazon and del Sur America. Broadcasts are occasionally heard from G.M.T. 22.00 onwards. The station closing down towards G.M.T. 09.00. Address: Estaciones ZP14 x ZP15, Soles Friedman Hernandez, Villarica, Paraguay (South America).

As You Were!

Radio Sofia (Bulgaria) following a series of experimental transmissions on 35.44 m. (8.64 m/c), in anticipation of the opening in the spring of 1939 of a 20-kilowatt short-wave transmitter, has now reverted to its former channel, 20.01 m. (11.97 m/c). The times of the broadcasts are now G.M.T. 10.00-12.00 and 15.00-22.00 on 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. Monovskaya St., Sofia (Bulgaria).

FEATURE FILMS

With uneasy 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 values, and the sooner a happy cooperative 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 an outstanding 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 auxiliary. It was felt that one excellent opportunity was through the medium of big-seventeen 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.
N.T.S. BARGAINS AND SAVE ££'s

SECURE THESE

STILL AVAILABLE.
ALL CHASSIS AND KIT
BARGAINS PREVIOUSLY
ADVERTISED.

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

LIST VALUE 30/-
STATION-NEXT DIAL
5 to 1000 metres.

NEW "WORLD" S.G.3
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LIST VALUE 30/-
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5 to 1000 metres.

N.T.S. BATTERY S.G.3
"A neat and efficient Receiver"—Practical Wireless.
LIST VALUE 5/- 6/-
BARGAIN 5/- 6/-

SPECIAL OFFERS

SPEAKERS. P/W, wireless천, tunes, sm. tone, for Power of
P/W, W.B., Goodmans andournemouth, G. P/ W.
Electrical, 1/4 size, £2.50. Price 3.50, cased.

METAL CHASSIS. Steel, very useful for 1 0 0 , 0 0 0 watts.
Exteriorly similar to 10 and 60 watts. Inner drawer.

2 MATCHED QUARTZ STONES.

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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 quickly and easily trace electrical faults in radio, vacuum cleaner, lights, bell, 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.

RANGES
1—0.5 volts
2—0.10 volts
3—0.100 volts
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

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

Again and again and again
"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. Tungsrarn Valves have again been exclusively specified. The reason? Tungsrarn do all that a good valve should do, well—Tungsrarn Valves can be relied upon, trusted to give unerring and faithful service. Tungsrarn Valves are dependable valves. "Practical Wireless" now specifies Tungsrarn Valves for two receiving sets mentioned in this issue—The Pyramid One Valve (HP 210 Metalised) and the Fleet Short Wave 2 Valve (HP 210 and PP 225).

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

SPECIALY 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 experimental work has preceded the prototype. Modifications are noted and adhered to in every way.

When, however, the experimenter specializes in the design and construction of purely experimental receivers, snags are invariably experienced, and the writer feels it is as well to mention 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 10 metres and 100 metres. Nowadays, a range of from 2.5 metres to 150 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 .43 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-lightweight 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 higher HF. A 6.4-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 .5-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-pin 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 a minimum and although workable, must be regarded as a compromise.

Now comes the problem of tuning capacity. Tuning condenser capacities of .0005 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 .001 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 mfd. 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 H.T. type. A ceramic coil-base and valve-holder were also incorporated.

H.F. Chokes

One of the snags experienced with experimental ultra-short-wave receivers, apparatus centres around H.F. chokes. When it is desired to tune from 4½ metres to 190 metres, there is a problem to solve.

There are a number of single H.F. pi-plate wound chokes of for use with mounting brackets.

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

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 intended, or designed for this purpose. Nevertheless, some of those produced years ago and in the then high-prive 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 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 completion of the receiver 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 H.T. receiving apparatus, and in the case of superheterodyne reception, incorporate choke output arrangements in the receiver in the interests of safety.
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 are 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 somewhat different to look upon.

A Westing-house 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 unsippable cells for deaf aids and portable tele-massive looking things for house lighting installations. If you want to know anything about the construction of the 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,

...through 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 gloss 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. Bell 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 constructor 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 important-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,Wave deflectors to replace detector valves, rectifiers for A.C./D.C. receivers, and H.T. battery chargers but a few of the most salutary 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 ignore the time it takes to make 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, and 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" assures 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 very efficient testing instruments will be most interesting and instructive. The Stand No. 21.
**CLIX**

SPECIFIED FOR FOUR SETS

described in this Exhibition issue.

FLEE'T SHORT-WAVE TWO-VALVER
PRESS BUTTON THREE-VALVER
ADMLRAL FOUR-VALVER
PYRAMID ONE-VALVER

Here are the details and prices of all CLIX perfect contact components chosen by the designers.

**VALVEHOLDERS**

Type VI. 4-pin 8d.
Type VI. 5-pin 9d.
Type V. 7-pin 1s. 6d.
Type V. 7-pin 1s. 2d.

**TERMINAL STRIPS**

2-Socket Type. L.S. 6d.
3-Socket Type. A1, A2, and E. 7d.
4-Socket Type. L.S. and P.U. 8d.

See the full CLIX range on

STAND No. 107

RADIOLYMPIA

79a Rochester Row, London, S.W.1

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**ARMSTRONG 7-STAGE**

All-Wave Radiogram Chassis incorporating Pushbutton and Manual Tuning, supplied complete with 8 in. Moving-Call Speaker, model A.W. 3PB.

Price 17s. 6d. complete.

Call at Stand 38 at Olympia and See and Hear this latest chassis.

Specification: New method of Push-button Tuning incorporating genuine Silver Mica Condensers to obtain station drift, principle. Medium Wave Stations and Luxembourg can be obtained by the Push-button method. All latest refinements, including large Tuning Scale calibrated in degrees and station-names on all wavebands. Short-wave covers all principal bands from 15 to 50 metres. Volume and Tone Controls work on Gramophone as well as Radio. Pick-up Leads may be mounted. Moving-coil speaker made especially for chassis.

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**THE FLUXITE GUN**

is always ready to put Fluxite on the soldering job instantly. A little pressure places the right quantity on the right spot and one charging lasts for ages.

Price 1/-

ALL MECHANICS WILL HAVE

IT SIMPLIFIES ALL SOLDERING

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**SEE THE NEW PREMIER PRODUCTS**

ON MORRIS & Co. (Radio) LTD.

STAND No. 74 AT RADIOLYMPIA

G2HK, G5MG and GBBV WILL BE PLEASED TO SEE YOU!

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**NEW PREMIER 1939 ALL-WAVE SUPERHEF CHASSIS**

5-valve All-Wave Superhet Chassis for A.F. Meters. 2 Wave Bands. 16-50. 280-370 and 800-2,100 metres. 41 watts output. Full A.F. Variable Tone and Volume Controls. Complete with latest type International valves and Moving Call Speaker. £5 6s. 6-VALVE ALL-WAVE SUPERHEF CHASSIS. Similar to above but incorporating an R.F. Amplifier stage. 4 Wave Bands. 12-35. 300-1,200. 280-370 and 800-2,100 metres. Fitted with large illuminated dial. £7 19s.

10-VALVE DE LUXE ALL-WAVE SUPERHEF CHASSIS. 5-2,100 metres in 5 Wave Bands. Two I.F. Stages with variable control. Moving Call Speaker. 15 watts output. Complete with latest type International valves and Moving Call Speaker. £8 15s. 9d.

NOW READY


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**SHORT-WAVE KITS**

Premier Short-Wave Kits for all sold complete to the last detail. All valves and coils are boxed in a free sterilised and wrapping material, and hand instructions for building and working. Thousands already built and working results will win over the world. Each Kit includes plug-in set and the coils supplied from 12 to 210 metres. All Kits are supplied with a feed channel and Panel.

1 Valve, Short-wave Receiver or Adoptor Kit $1.75
1 Valve Short-wave Superhet Converter Kit $2.00
1 Valve Short-Wave A.F. Superhet Converter Kit $2.25
1 Valve Short-wave Receiver Kit $2.50
1 Valve Short-Wave Converter and Panel Kit $5.85

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STANLEY BARNETT

A BRIEF BIOGRAPHY

STANLEY BARNETT, whose popular band at the Café Anglais, London, was heard over the air recently in "Thé Descartes," in the Regional programme, studied the violin under Paul Belinfante, 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 band—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 Palats-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.

Returning 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 Lyons." 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'Aimato, sister of the famous Chappie D'Aimato. By the way, all the six original members of Barnett's outfit are now leaders of their own bands.

Every constructor already has a speaker. Why does Mr. Camm not 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 its set's reproduction, it could not sound lifelike through a mediocre reproducer. So he always specifies a speaker he knows—the most widely used by expert amateurs and specified by expert professionals—the speaker which is regularly copied by British and foreign makers—a Stentorian. Your set would be grateful if you bought it a Stentorian.

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

PRACTICAL AND AMATEUR WIRELESS 601
A REVIEW OF THE LATEST GRAMOPHONE RECORDS

Decca

X the “permanent” music series the Decca Company have recorded “Beethoven Symphony No. 7 in A major, Op. 92,” on five 12in. discs, Decca X 260-10, which are issued in an album. It is played by The Berlin Philharmonic Orchestra, conducted by Carl Schuricht.

Harry Hotlick and his Orchestra have made an attractive recording of Strauss Waltz series No. 3 and 4, on both sides of Decca X 6752, whilst two evergreens, “The Blue Danube Waltz” and “The Last Chord,” are played by Regional Foort at the organ—Decca X 5681. He also has recorded “In a Persian Market” and “Cavatina” on Decca X 6720. Two rubbas, “Maria Antonia” and “Lei- sette,” are played by Don Barreto and his Cuban Orchestra on Decca X 6717, whilst Donald Xovis, accompanied by Eddie Dumstedler at the organ, sings “Angelina Mia” (My Angel) and an old favourite, “Charmaine,” on Decca X 6722.

Jeanie O’Shea, the popular radio comedienne, is extremely humorous in “It All Belongs to Me” and “That ‘Krueschen’ Feeling,” on Decca X 6729.

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 Waltz” and “The Girl in the Upstairs Flat.”—Decca X 6728. This band has also made a “King Revel” selection, parts 1 and 2, on Decca X 7269; introducing “When the Steamboat Whistle Blows,” “Two Dresden Dolls,” “You’re at Blackpool by the Sea,” “Swing and Sway,” “The Jockey of the Fountain,” and “The Best 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. B 8771. Revnell and West give two of their vignettes of foxy life. As “Two London Coasters Making Whoopee,” they give examples of crooner girls’ sentimental “crooning” of a type that is fast disappearing, and their study of orchids trying to negotiate a traffic crossing is extremely funny—H.M.V. B 8789.

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 fox trot “Moonlight and Roses”—H.M.V. B 5381, and “The First Quarter” (waltz) and “My Heart Will Never Sing Again” (slow fox trot), on H.M.V. B 5382. Palais Glide Medley No. 2 has been recorded by the New Mayfair Orchestra—H.M.V. B 5383, and a newcomer to the lists, Joe M. Lucchesi, plays two tangos—“Champagne Bubbles” coupled with “Song of the Sea”—H.M.V. B 5378.

Rex

RACHEL FIELDSON 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 9324. Rex Smeeck and his Hawaiian Serenaders play “When the Organ Played ‘I Promise You’” and “A Gipsy Told Me,” from the film “Happy Landing”—Rex 9331. Jack Payne has dug up an old favourite, “Tiger Rag,” which he couples with Lazy Rhum,” on Rex 9320. Maxwell Stewart’s Ballroom Melody gives a strict dance tempo version of “The First Quarter” (waltz) and “Goodnight Angel” (slow fox trot) on Rex 9336.

Brunswick

ONNIE BOSWELL, accompanied by Harry Sunick 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 “Mummy” —Brunswick 8782. Judy Garland, on Brunswick 8764, fails to contradict herself with “Cry, Baby Cry” and “Sleep, My Baby Sleep,” Chick Webb and his Orchestra has recorded “Take a Tisket, a Tasket,” with Ella Fitzgerald singing the vocal, and couples it with “Lisa” (All the Clouds’ll Roll Away), on Brunswick 8761.

Vocalion

MAXINE SULLIVAN sings in her typical style “It’s Wonderful” and “You Went to My Head” on Vocalion 6194, whilst Billie Holiday, who has many vocal hits, and her Orchestra play “When a Woman Loves a Man” and “Swallow in the Moonlight” —Vocalion 817.
August 27th, 1938  PRACTICAL AND AMATEUR WIRELESS

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Practical

Television

An Ingenious Scanner

A VERY ingenious television scanner has been developed by the Fernsch 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 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 10,000 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 lecture 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 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 to form 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 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

INRESPONSE of the public demand for the small type domestic television receiver 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 18 ins. 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 best projected by a mirror selector 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 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 Ameila-Haus
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 incasing direction wireless 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 Radiolympha to make a full official statement, and so clarify what for some time now has been an annoying and entirely unnecessary situation both for manufacture 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 central buildings. The R.C.S. have been actively engaged on this work and Zvorykin has made some enlightening suggestions for tackling the problems. Many variable factors have to be taken into consideration and among these is 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 Zvorykin’s scheme, therefore, a special receiver is provided with two separate aerials 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 counteracting changes in the ionised atmosphere 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.
**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**

SIR,—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 English, French, German or Italian. 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 receiver, for the input 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 (Surbiton).

**Swiss Broadcasts**

SIR,—It may interest other readers to know that the new Helvetian 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:

- Monday to Friday: 18.00-20.00 (L.S.T.) on 21.46 m. (9,733 kc/s).
- 00.15-01.45 (L.S.T.) on 19.00 m. (15,305 kc/s).
- 02.00-03.00 (L.S.T.) on 25.28 m. (11,865 kc/s).

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

**Component Construction**

SIR,—I wish to support the plea of V. C. T. (Blackheath) on Component Construction, which appeared in the August 13th issue, "Another Constructor" (Blackheath, Glasgow).

SIR,—With regard to the recent letter by V. C. T., it would be interesting to understand the mind in which he said "certain" components, since so few transformers, can be made fairly satisfactorily, but it would certainly be more difficult to obtain the required parts, for example, correct transformer tapstnips, trimmers for L.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).

SIR,—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 one 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).

SIR,—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 any experimenting, would be much appreciated.

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

"A "Local Station" Quality Set"

SIR,—With regard to recent letters to special quality sets, I should very much like to see complete constructional details of a "local station" quality receiver to include one Hil-F stage, detector, 1st L.F. and push-pull output tubes (such as PXC or similar). Every stage and component should be designed for quality only, and to include variable selectivity giving bandwidths 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 G.C. loudspeaker I am not really interested in an energized model loudspeaker. I shall be very glad to see an article published on the lines indicated, with full details please, and clearly indicated ways of all components.—J. C. CHESTER (Addlestone).

**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 tone-control 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 ofcone loudspeakers?
- That when using hand-spreading tuned in it is essential to sit in the background so that it covers a definite movement of the band selector?
- That the above arrangement only facilitates result, 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 general nature suitable for publication in Practical and Amateur Wireless. Each article should be short and well written, and should contain the name and address of the sender. While the Editor does not hold himself responsible for manuscripts, every effort will be made to return items if a stamped and addressed envelope is enclosed. All correspondence intended for the Editor should be addressed to "R.A.C.T.I.C.A.L. PR\L\S. M. 104, 126 Strand."

**NOTICE**

Owing to the rapid progress in the design of wireless apparatus and in our efforts to keep our readers up-to-date with the latest developments, we give no warranty that apparatus described in past issues is not the expensive description of that apparatus. All apparatus is sold on the understanding that the apparatus is sold at a price as published in this magazine. All apparatus described is not to be used for any wireless patent.

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H.F. Volume Control

"I have made up a set in which I have used a variable-μu 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 potenti-
ometer is a 10,000-ohm type. Before it has travelled half-way round the set bursts into oscillation, I have used 30,000 and 20,000 ohms for the fixed poten-
tiometer for screen. Can you help if I 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 grid is put up to a certain value, and thus a more efficient output
of 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

frees 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 2,000-ohm component with a fixed 3,000 ohm in series, so that
the control will then be effective over the 500 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.

Oscillation Indication

"In trying to test a set I have made up I believe that the H.F. stage is oscil-
lating. 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 100-volt 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 buzz will be heard when you


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 will lower the voltage 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 motion 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 mmfd. short-wave
condenser and re-assemble it with only one
plate on each side, double spaced, and
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 pub-
lished recently on an up-to-date television
set (not mains) with list of parts."—N. R.
(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 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 Experimenters’s Three.
Can substitutes for some of these com-
ponents be used? I posses these, and I
think it a pity to discard 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 per-
formance 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—may they 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
multiband-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. (Smithwick).

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 combina-
tions. Alternatively, the Weaire "F" type
coils may be used, and wired and
assembled in the required combination to
give you the circuit desired.

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