

THE AMATEUR TRANSMITTER — See page 75

Practical and Amateur Wireless

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EVERY
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Edited by F. J. CAMM

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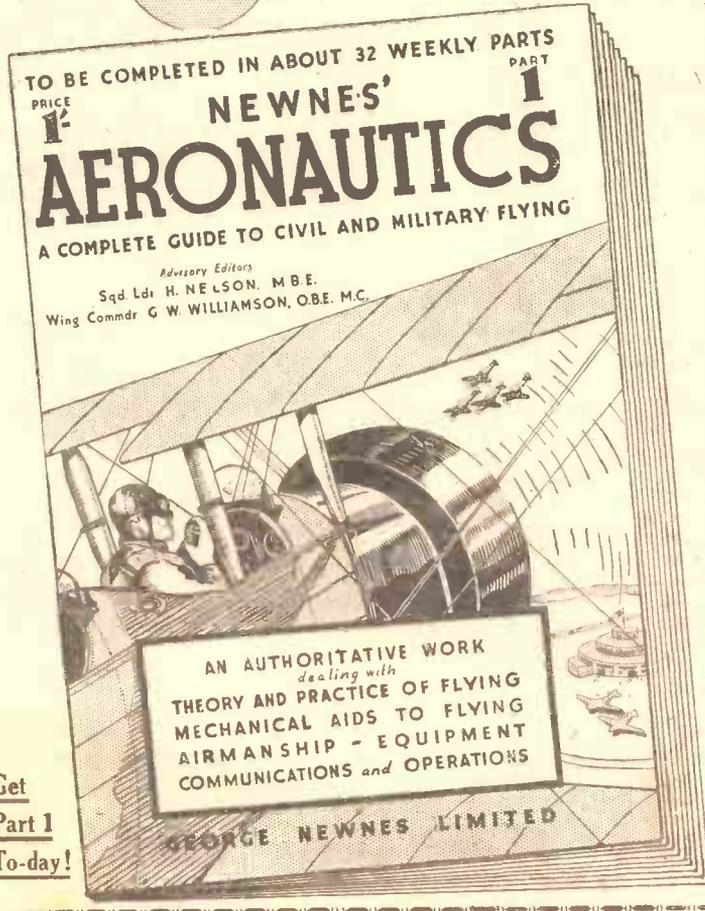
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CURING L.F. INSTABILITY—See page 77.



Practical and Amateur Wireless

Edited by F. J. CAMM

Technical Staff:
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B.Sc., A.M.I.E.E., Frank Preston.

VOL. XIII. No. 316. October 8th, 1938.

ROUND *the* WORLD of WIRELESS

Test Your Components

ALTHOUGH the majority of modern components have to undergo rigid tests before they are sent out by the manufacturers, there is always a risk that during transit or whilst in the dealer's shop, some fault may arise. When components are stripped down from receivers there is also sometimes a doubt as to whether or not they are in good condition. It should always be the aim of the constructor, therefore, to test components before they are wired into a new receiver, and in many cases quite simple apparatus is needed for this purpose. The condition of the component is not always the most important point, however, and it is often necessary to find the exact value of items such as resistors and condensers. This may be done without elaborate apparatus, and in this issue we describe a small tester of the Bridge type by means of which resistances and condensers may be measured accurately. Inductance values may be similarly measured and it is possible to build up a comprehensive tester in which the standards used are plugged in or connected as required.

Bristol Exhibition

THERE was a fall in the attendance figures at this year's radio exhibition at Bristol, the total for the ten days being 19,147 as compared with 25,666 last year. It is stated that the International situation was responsible for the lack of interest.

Cheaper Electricity

REDUCTIONS in the price of electricity are announced by the County of London Electric Supply Co., and associated companies in large areas in Kent, Essex, Surrey, and Dorset. At these places a reduction from 1d. to 3d. per unit under the rural two-part tariff will be made. In certain other areas a decrease from 6d. to 5d. in the lighting flat rate will also be made. Certain reductions in the Business Two-part tariff fixed charge are also announced.

Isle of Wight Show

OWING to lack of support, the Isle of Wight Radio Traders' Association announce that they will be unable to go ahead with the proposed Isle of Wight Radio Exhibition.

Star Gazing

ON November 8th and 11th, in the National and Regional programmes, the romantic stage career of Jessie Matthews

will be given in the series of "Star Gazing" programmes. Jessie has climbed from chorus to stardom in the productions of C. B. Cochran and this should be a most interesting broadcast feature.

A.R.P. Broadcasts

IN the Midland programme on October 10th, a new series of fortnightly talks designed to be of service to the average citizen, and entitled "A.R.P. and You," will commence. In the first programme

Manufacturers, with headquarters at 79a, Parkhurst Road, London, N.7. The company will handle all installation and service work relating to Pye and Invicta television equipment.

Spelling Bees

THE B.B.C. announce that from time to time throughout the autumn and winter there will be spelling bees of various descriptions. The first of these, on the second Sunday in October, will consist of a team of seven employers spelling against their own secretaries. The spelling master will be G. H. Grisewood and the programme will be produced by V. Alford.

General Release

THE next "General Release" programme of current film music to be broadcast will be on October 10th for Midland and Regional listeners. Hugh Morton will be compère, and the artists will be Marjery Wyn, Harry Porter, We Three and the Midland Revue Orchestra, conducted by Reginald Burston.

Trevor Wignall

THE well-known sports writer will give the first talk in a new weekly Sports Feature on October 12th. This will be one of a series to be broadcast on Wednesday nights during the quarter, and it is hoped to deal with each winter sport in turn, but Rugby and Association Football will naturally predominate.

A Matter of Opinion

FOUR Ulster people, a countryman, a schoolmaster, an actor and a girl-farmer, will take part in a new series of discussions to begin on October 10th. The series, which is called "A Matter of Opinion," is a new experiment in Northern Ireland broadcasting. These four people will come to the studio once a fortnight and will discuss every conceivable subject. Before each broadcast they will be given two or three controversial ideas for discussion. There will be no scripts, no set rehearsals and no censorship.

"The Man and the Tune"

"THE Man and the Tune" is the first of a series of programmes to be broadcast in the West of England programme on October 7th, in which the composers of tunes will be present in the studio.

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Major John Lees will explain what the local authorities are doing.

Return of Variety

THE Midland programme will also commence a new series of programmes on October 11th, entitled "Variety Comes Back." This will consist of a series of outside broadcasts from those Midland theatres which, after being devoted chiefly or entirely to films, have returned to variety. The first programme will come from the Victoria Theatre, Lye, near Stourbridge.

Vision Service

MESSRS. Pye and Invicta have combined in a new television service company to be known as United Television

ROUND the WORLD of WIRELESS (Continued)

The World's Radio Listeners

STATISTICS show that the United States of America still heads the list in respect of the number of radio receivers used in the land. There is one wireless set to every four American citizens. Great Britain, Denmark and Sweden follow in the proportion of one to five; Belgium, one to six; Germany, one to seven; Switzerland, one to eight; and France, one to nine head of population.

In Czechoslovakia only one person in thirteen is a registered licence holder; Finland, one in fourteen; Lithuania, one in sixteen; Hungary, one in twenty-two; Japan, one in twenty-seven; Poland, one in fifty; Romania, one in seventy-two; Portugal, one in eighty-eight; and Yugoslavia, one in one hundred and fourteen inhabitants.

The Triumph of Truth

UNDER the title of *Pravda Vitezi* (The Triumph of Truth or Truth Will Out), the Vienna broadcasting station has started transmissions in the Czech language; they are given by a woman announcer. The fact that studios now broadcast in various languages is making identification of individual stations daily more difficult.

International Concert

THE next World Concert—the fifth in the series—will be provided by the Canadian Broadcasting Corporation on



Georgette Vedey, the well-known singer, who was recently heard over the air in the Regional programme with George Scott-Wood and his Six Swingers.

October 23rd; the programme will be drawn from a number of studios in the Dominion, including those at Halifax (Nova Scotia) and Vancouver (British Columbia). The transmission will be relayed to a number of European stations.

Another Death Ray!

FROM a report received from Sgeded, near Budapest, two Hungarian radio engineers, Ladislao Papp and Etienne Kokai, claim to have invented an efficient

INTERESTING and TOPICAL NEWS and NOTES

death-ray which attains its end by setting fire to anything towards which it is beamed. So far, the instrument constructed is only a laboratory model and of comparatively low power, but by its agency they have succeeded—according to their statements—in melting a sheet of glass, thin metal sheets, and in setting sundry wooden objects on fire at a distance varying between 20 and 30

devoted to a description of the docking of a big liner, which is a far more complicated matter than appears to the casual sightseer or passenger on board.

Variety from Bristol

IN the feature entitled "Theatres of Variety," a programme will be broadcast from the stage of the Hippodrome, Bristol, on October 11th.

Aston Hippodrome Orchestra

IN the early evening of October 9th Ivan Huckerby will conduct the Aston Hippodrome Orchestra, which has frequently broadcast, in a programme of popular



The radio section of the Belgian Exhibition at Heysel, which opened recently.

centimetres (roughly 10ins.). In addition, experiments carried out on dogs and cats have demonstrated that it was possible to kill these animals instantly by means of the death-ray when they were placed within a range of five metres.

New Tunis Transmitter

FRENCH newspapers state that the 20 kilowatt broadcasting station which the authorities have erected at Djedeida will shortly carry out its first tests on 345.6 m. (868 kc/s). Tunisia at present only numbers 20,200 registered licence holders.

"Sports Special"

THE seventh edition of "Sports Special," Season 1938-9, a feature for fans edited by "Jem Belcher," will bring, on October 8th, eye-witness accounts of Soccer and Rigger, and a talk about the West of England Open Motor Cycling Trial by Frank Buckland. The programme, to be broadcast from the Western Regional, will be produced by Pat Beech.

Southampton Docks Centenary

IN connection with the centenary celebrations of the Southern Railway, a feature broadcast, produced by Stephen Potter of the B.B.C., with Ralph Keene as guest producer, will attempt to tell Regional listeners something about Southampton Docks. From all over the world goods of every kind, in addition to hundreds of thousands of passengers, are safely docked each year [at Southampton] and continue their journey by rail to various parts of Great Britain. The programme will be

music. The vocalist will be Archie Doorbar, the Stoke [baritone, who first broadcast from North Region about six years ago.

SOLVE THIS!

PROBLEM No. 316

In order to obtain some experience in home-construction, Jackson decided to make a simple one-valver in which he could fit home-made components, and he therefore made up a series-aerial condenser, a choke, fixed grid condenser and coil. For the grid-leak he used the old idea of a pencilled line on the valve-holder and he then tried out the set. When switched on, signals were quite loud on the local, but when he tried to bring up the volume by means of the reaction control, signals faded as the control was increased. He reversed the connections to the reaction condenser, but the effect was just the same. What was wrong? Three books will be awarded for the first three correct solutions opened. Envelopes must be addressed to The Editor, PRACTICAL AND AMATEUR WIRELESS, Geo. Newnes, Ltd., Tower House, Southampton Street, Strand, London, W.C.2. Envelopes must be marked Problem No. 316 in the top left-hand corner and must be posted to reach this office not later than the first post on Monday, October 10th, 1938.

Solution to Problem No. 315

When Atkinson added the high-ratio step-up transformer he overloaded the output valve. His best plan would have been to replace the output triode by a pentode.

The following three readers successfully solved Problem No. 314, and books have accordingly been forwarded to them: F. H. Dugins, 11, Edgeware Road, Stockland Green, Erdington, Birmingham; G. W. D. Spurrell, The Dales, Sheringham, Norfolk; J. Torode, 167, East Barnet Road, New Barnet, Herts.

THE AMATEUR TRANSMITTER

(Continued from previous page)

not oxidise. A cheap component often proves very unsatisfactory and splutters out in the middle of a test.

The key should be selected with the object of using it eventually for transmitting; therefore, once again, get a good one and adjust the contacts to suit your speed and touch. Don't purchase what is known as a "bug" key to start with. The circuit shown in Fig. 2 is that of a triode oscillator wired for the inclusion of a key to enable a pure note to be reproduced in the headphones when the key is depressed. The oscillations are of low frequency, the actual pitch of the resultant note depending on the transformer and condenser used.

When constructing this unit a case should be made to house all the components and batteries, thus forming a neat self-contained piece of apparatus.

Licences

When the amateur reaches the stage where he decides to enter the transmitting side of the movement, it becomes necessary for him to secure permission from the Postmaster General to own and operate transmitting apparatus, before he can take any actual steps in that direction.

Two kinds of permits or licences are issued, one being known as an A.A. and the other as a full or radiating licence. The

beginner will do well to apply for the A.A. first, as this entitles him to construct and use transmitting apparatus, provided that it is coupled to an artificial aerial which does not allow radiation to take place over any appreciable area.

It must be appreciated, from this brief description, that the owner of an A.A. licence has all the facilities of a full licence

thoroughly familiar with the operation of transmitting apparatus. Most valuable knowledge and experience can be obtained in this way, and if full use is made of the A.A. permit for, say, six to twelve months, the possibility of getting a full licence will improve considerably.

Application must be made to the Engineer-in-Chief, Radio Section, G.P.O., Armour House, London, E.C.1, the licence fee being 10s. per annum. No tests have to be passed, but the authorities have to be convinced that the applicant is of British nationality, and that he has serious experimental objects in mind. If the licence is granted, a three-letter call sign will be allocated to the licensee.

A full licence can only be obtained by those holding exceptional qualifications, and who can prove that they wish to carry out certain investigations or experimental work which cannot be undertaken with an A.A. licence.

An applicant must be over 16 years of age, and be prepared to undergo a morse test of sending and receiving at a rate of 12 words per minute for a five-minute period.

The cost of a full licence is 30s. for the first year and £1 per annum afterwards. For the morse test, an additional fee of 5s. has to be paid. Full details, together with application forms, can be obtained from the same address as that for the A.A.

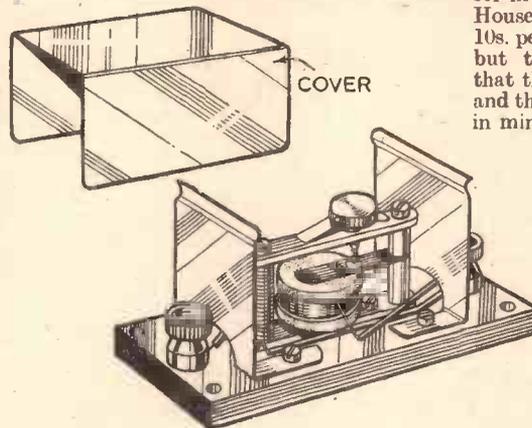


Fig. 4.—Showing the constructional details of a good high-note buzzer.

holder except as regards actual radiation of signals, therefore, he is able to carry out innumerable tests and experiments and get

Our Radiolympia Competition Result

In the Competition which was published in our issue dated August 27th last, only one reader succeeded in accurately drawing the original circuit which is reproduced on this page. Mr. L. M. H. Rawlings, of 28, Burleigh Street, Cambridge, also succeeded in accurately indicating every error as required under the conditions of the Competition. The remaining 24 readers had each one mistake—either in the reproduced drawing or in the indications on the original circuit, and therefore the 25 W.B. Junior Loudspeakers are being despatched to them in due course.

The following reader gave an all-correct result:

L. M. H. Rawlings, 28, Burleigh Street, Cambridge.

The following readers had one mistake each:

J. R. G. Hill, 13, Erlanger Road, New Cross, S.E.14.

T. McClelland, 483, Old Park Road, Belfast.

H. Twinn, 221, Marlborough Road, Dagenham, Essex.

W. A. L. Smith, 16, Lenham Road, Lee, S.E.12.

W. E. Hills, The Gables, Bolney Road, Cowfold, Horsham, Sussex.

L. J. Roffey, 135, Hertford Road, Dalston, N.1.

R. Chamberlain, 2, Cardigan Street, Canton, Cardiff.

H. Burkwood, 1, Swetenham Place, Plumstead, S.E.18.

W. C. Russell, 68, Titchfield Road, Troon, Ayrshire.

G. Smith, 10, Cluny Square, Buckie, Banffshire.

P. W. E. Duffy, 68, Burghfield Road, Reading, Berks.

W. R. Taylor, 3, Belvidere Crescent, Aberdeen.

W. Taylor, 12, Amber Street, Derby.

A. W. Brady, 22, Frome Street, Islington, N.1.

V. L. Comyn, Deans Grove, Wimborne, Dorset.

F. North, 50, Limbrick, Blackburn, Lancs.

R. H. Eastop, 164, Cloudesley Road, London, N.1.

J. E. Lane, 53, Fairholme Road, Ward End, Birmingham, 8.

H. C. Jones, Wynlys, Greenfield Road, Ruthin, North Wales.

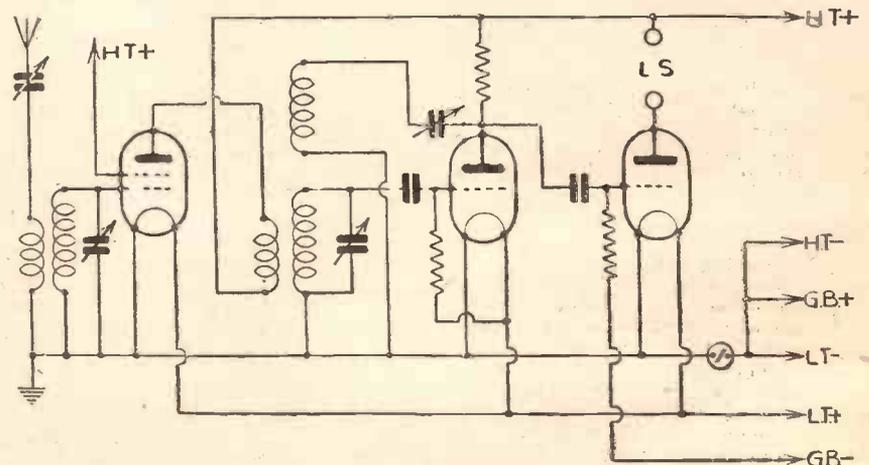
A. D. Bates, 50, Moseley Avenue, Coventry.

A. McInnes, 190, Commercial Way, Peckham, S.E.15.

J. Boulderstone, 36, Bolton Road, Salford, 6, Manchester.

J. Stratton, 122, Hydethorpe Road, Balham, S.W.12.

R. Vernon Watson, 34, Vincent Court, Green Lane, Hendon, N.W.4.



This is the correct circuit which should have been submitted.

Curing L.F. Instability

Differentiating Between H.F. and L.F. Faults : Inadequate Decoupling : Bias Components Faulty : Defective Valves : New Valves as Replacements

LAST week we dealt with causes and remedies for instability in the pre-detector circuits. When dealing with the low-frequency side of the set it is often rather difficult to recognise instability as such and to separate it from normal distortion due to causes often quite apart from instability. As before, we shall assume throughout this article that the receivers in question are not new and that they have previously operated satisfactorily; in other words, that a fault not due to incorrect initial design has developed.

In all tests it is always best to attempt to isolate the section of the circuit responsible for the trouble. Thus, one very straightforward method of finding whether the instability detected is in the H.F. or L.F. part of the set is to eliminate the H.F. portion by making a test with a pick-up connected to the appropriate terminals; if the set then behaves correctly (as an L.F. amplifier only), the H.F. and detector sections can generally be held responsible. On the other hand, if the trouble is just as pronounced on gramophone as on radio, there need be little doubt that it is confined

circuiting of the H.F. choke or resistor included in series with the grid lead to the first L.F. valve; both are illustrated diagrammatically in Fig. 1.

The anode by-pass condenser is used only in connection with a triode detector, but when a diode is used open-circuiting of the

by The Experimenters

small fixed condenser in parallel with the load resistor might produce a similar effect, although it would probably affect demodulation as well.

Detector Anode Circuit

When a triode detector or second detector is used, a fault in the anode decoupling circuit can, of course, upset the L.F. amplifier because, if the decoupling is not effective the H.T. circuit might well be modulated. In that case the modulation would be passed on to the anodes of the

L.F. valves, producing a form of instability that might cause reproduction to be badly distorted, especially on strong signals, or even give rise to the "plopping" sound commonly known as "motor-boating." It is thus well to check the resistor and condenser, which behave in a manner similar to the corresponding components in the H.F. circuits. If the resistor is short-circuited, or if its value is much less than that at which it is rated, it is entirely ineffective; in the same manner, an open-circuited

by-pass condenser or one with too low a value, will not provide a satisfactory leakage path and, therefore, detector anode-circuit fluctuations will be applied to the other valves. In this connection it is sometimes worth remembering that electrolytic condensers, particularly some of the older types, are inclined to suffer a capacity drop after continuous use.

Bias-circuit

A rather obvious cause of L.F. instability and generally impaired performance is a defective grid-bias circuit to one of the valves. Should the bias resistor or its by-pass condenser develop a short-circuit the valve will operate without bias. Not only will this mean that the valve is seri-

ously over-run and that its life will thereby be considerably shortened, but that pronounced distortion must arise, this becoming increasingly serious as the volume control is turned up. On the other hand, if the bias resistor has developed a partial open-circuit, making the bias voltage excessive, distortion and "thin" reproduction must result. The two components referred to are shown in Fig. 2. Test for an open-circuited, bias-resistor by-pass condenser, and also note the effect of using one of higher value; a capacity up to 25 mfd.

is by no means excessive.

In many cases a grid-decoupling resistor is included in the bias circuit, as shown in Fig. 3; it will be clear that if this is short-circuited the grid decoupling is removed and, thus, that unstable operation will be probable. The value of this resistor is not critical, but it should usually be about 100,000 ohms. This particular component is of especial importance when a comparatively old valve has been replaced by a new one of corresponding type but with better characteristics. In such cases it is often desirable to add the resistor even if it were not previously incorporated in the circuit.

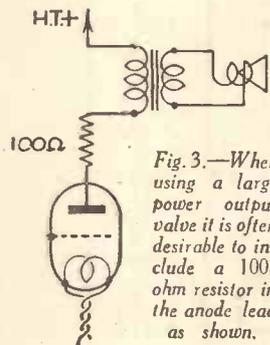


Fig. 3.—When using a large power output valve it is often desirable to include a 100-ohm resistor in the anode lead as shown.

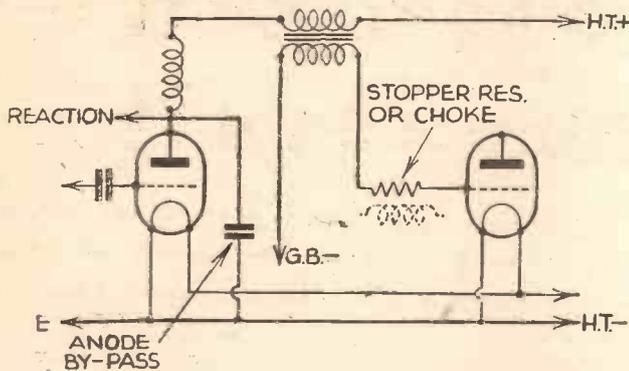


Fig. 1.—Instability might be caused by H.F. reaching the L.F. circuits. Check the detector anode by-pass condenser and any "stopper" choke or resistor in the L.F. grid circuit.

to the low-frequency end. Make sure, however, that the pick-up leads are suitably screened and, if necessary, try shunting the pick-up terminals with a resistor of value between .1 and .25 megohms. This will not be necessary if the set is a radiogram, or if the same pick-up is used as previously when the receiver was operating satisfactorily.

Audible Signs

L.F. instability is often recognisable as a low-pitched "howl" or "groan," but it can present itself as a "pop-plopping" sound, or simply as distortion which renders reproduction "thin" and weak. It is not easy to differentiate between pre-detector and post-detector instability, partly because the latter is often due to H.F. escaping into the L.F. circuits. This can take place due to the disconnection or open-circuiting of an anode by-pass condenser between the anode of a triode detector and earth or to the short-

ing of the H.F. choke or resistor included in series with the grid lead to the first L.F. valve; both are illustrated diagrammatically in Fig. 1.

Higher-Mu Valve

It should also be borne in mind that whenever an old valve is replaced by one of a more recent type, additional decoupling is often desirable. Thus, a larger by-pass condenser might be used between the anode resistor and earth, the resistor might be in-

(Continued overleaf)

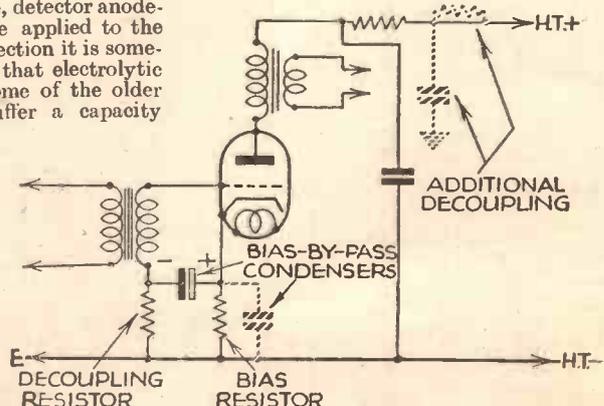


Fig. 2.—Grid and anode circuit decoupling, which should be checked.

CURING L.F. INSTABILITY

(Continued from previous page)

creased in value (remembering that this will reduce the working anode voltage and, perhaps, necessitate a change in the value of the bias resistor), or a second resistor and by-pass condenser might be added to the circuit, as shown in Fig. 2.

When a larger output valve is substituted it is often a good plan to insert a 100-ohm resistor in series with the anode, as shown in Fig. 3. It should be made sure that the resistor used has a sufficiently high wattage rating for the anode current to be passed.

In dealing with a low-power set with push-pull output, and when one of the push-pull valves needs to be replaced, it might be necessary to fit a 1,000-ohm resistor in each of the two grid leads if the resistors were not fitted in the original design. Another arrangement that is sometimes very satisfactory when the push-pull transformer has a single centre tap is to disconnect the lead from this, taking it to the slider of a 250,000-ohm potentiometer connected between the two grid terminals of the transformer. A small-capacity condenser might have to be joined between each end of the potentiometer and the slider. Connections just referred to are shown in Fig. 4.

Class B Howl

Some of the earlier class B amplifiers give trouble due to a peculiar form of instability, which is noticeable as a high-pitched whistle or "background shriek."

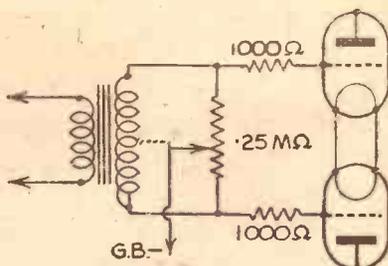


Fig. 4.—Stability of a push-pull circuit might sometimes be improved by using the connections indicated.

The trouble is inclined to develop as the valve ages. A cure can be effected in the majority of cases by connecting a .01-mfd. tubular condenser between the ends of the secondary winding of the driver trans-

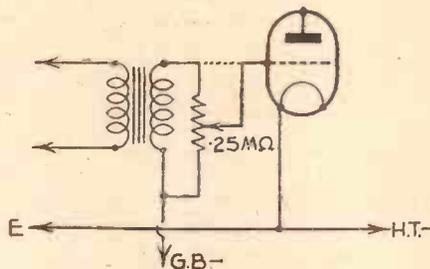


Fig. 5.—Method of obtaining stability and L.F. volume control at the same time by using a .25 megohm potentiometer.

former. This condenser was fitted as standard to nearly all of the later receivers. Even when a background noise is not audible, distortion might be caused by a form of heterodyne. When this occurs, by the way, the consumption of H.T. is higher than it should be; a simple check can be made by measuring the standing current when the set is tuned to a station but at a time when the carrier is not being modulated. This may then be compared with valve totals.

Volume Control

It is fairly well known that a valve which is beginning to age can be the cause of instability and serious distortion. And although the proper course would be to replace it, this might not be essential. In any case there is no harm in checking the points already raised and experimenting with a slightly modified bias voltage. Additionally, it might be worth while to connect a fixed resistor of between .1 and .25 megohms in parallel with the secondary of the transformer which precedes it. If the set is not provided with a means of L.F. volume control, the opportunity might be taken of adding the useful refinement by using a potentiometer instead of the resistor mentioned. The method of connection is shown in Fig. 5. To ensure silent operation, the potentiometer should be of good quality; a carbon or composition type is often to be preferred, although many of the first-grade modern wire-wound components are perfectly satisfactory.

IMPORTANT BROADCASTS OF THE WEEK

NATIONAL (261.1 m. and 1,500 m.)
Wednesday, October 5th.—Band Waggon: Variety programme.

Thursday, October 6th.—Autumn, from The Seasons, by Haydn: Musical programme.

Friday, October 7th.—The English Family Robinson—first incident.

Saturday, October 8th.—I Have Been Here Before, a play by J. B. Priestley.

REGIONAL (342.1 m.)

Wednesday, October 5th.—What Every Woman Knows, a play by J. M. Barrie, from Scottish.

Thursday, October 6th.—Afternoon Calling: Mr. and Mrs. Whiffleton at home.

Friday, October 7th.—Variety programme.

Saturday, October 8th.—Elgar Song Recital.

MIDLAND (297.2 m.)

Wednesday, October 5th.—The Maid of the Mill—I: A song-cycle by Franz Schubert.

Thursday, October 6th.—An orchestral programme.

Friday, October 7th.—An orchestral programme.

Saturday, October 8th.—Gliding on the Long Mynd: Eye-witness account.

WEST OF ENGLAND (285.7 m.)

Wednesday, October 5th.—Victorian Vignette, a musical programme.

Thursday, October 6th.—The Torquay Musical Festival.

Friday, October 7th.—The Man and the Tune: Music by Jimmy Kennedy.

Saturday, October 8th.—Torquay Musical Festival.

WELSH (373.1 m.)

Wednesday, October 5th.—Chian Dog: A short story by Llewelyn Wyn Griffith.

Thursday, October 6th.—Welsh National Lecture: Of Prime Ministers and Cabinets.

Friday, October 7th.—Where We Came From—I: Men of Rhymney, a talk feature programme.

Saturday, October 8th.—Chamber Music Concerts, from the Reardon Smith Lecture Theatre, National Museum of Wales.

NORTHERN (449.1 m.)

Wednesday, October 5th.—Festival of Youth (in connection with Autumn Convention of National Sunday School Union) from Manchester Free Trade Hall.

Thursday, October 6th.—Benchill Flitch, from trials, Withenshawe, Manchester.

Friday, October 7th.—Blackburn Cathedral Extension Service: The laying of the Commemoration Stone.

Saturday, October 8th.—Spotlight on Sport: Football: Eye-witness accounts of Manchester United v. Charlton and Middlesbrough v. Leeds.

SCOTTISH (391.1 m.)

Wednesday, October 5th.—What Every Woman Knows, a play by J. M. Barrie.

Thursday, October 6th.—Orchestral programme.

Friday, October 7th.—Variety programme.

Saturday, October 8th.—Song Recital.

NORTHERN IRELAND (307.1 m.)

Wednesday, October 5th.—Music Story: Dolores, from Regional.

Thursday, October 6th.—Stop Dancing: Musical programme.

Friday, October 7th.—The Enthusiast: A comedy in two scenes by Lewis Purcell.

Saturday, October 8th.—A Hymn Recital from St. Enoch's Presbyterian Church, Belfast.

TELEVISION PROGRAMMES

Water Divining

EACH afternoon from October 24th to October 28th an interesting event will be specially staged for television. On October 24th water diviners will practise their art on the slopes of Muswell Hill to demonstrate their different methods. It will be interesting to see if water is located, while metal will be buried here and there to show viewers the reaction to its presence. A scientific point of view on water divining will also be contributed to the programme.

Riding will be the subject of the programme on October 25th. Several riders and horses will demonstrate different schools of riding, jumping and other stunts in the saddle. Major Faudel-Phillips is organising the display and will give the commentary. On October 26th it is hoped to televise sheepdog trials.

Balloon Barrage

WITH the co-operation of the Air Ministry the work of a balloon barrage unit will be televised on October 27th. A lorry and trailer—the lorry conveying the balloon and cables, and the trailer the cylinders of hydrogen for inflating the balloon—will be drawn up outside Alexandra Palace and viewers will see the balloon being inflated and then floated into the air with its trailing cables.

ON YOUR WAVELENGTH



Dilatory Club Secretaries

THIS journal has done more than any other to foster the club movement. Right from its first issue it has regularly published, without missing a single week, reports of the activities of local clubs. On more than one occasion I have referred to the fact that clubs come and clubs go, chiefly due to the want of energy or lack of ability of the secretary and the committee. It is fortunate indeed that over 180 clubs are still in existence with an active membership—and the club movement I am glad to note is growing. In order that clubs might get into touch with one another and arrange inter-club meetings and lectures I went to a lot of trouble to compile a complete list of all the wireless clubs in this country. This list has been published several times in this journal, and it also appears in the latest Edition of the Wireless Constructor's Encyclopædia. I am most keen on the club movement, and my own personal efforts have been responsible for eliminating those catch-penny clubs started by some private individuals for their own benefit. You know the sort of clubs to which I refer, and which operate somewhat in the following way: An individual will start a club under some grandiose title such as the European this, that, or the other. Note that its title takes it outside the ambit of a local club. He sends a notice to the press inviting readers from all over the country to get into touch with him. He then writes to those who are unwise enough to respond to his appeal (which, needless to say, is never published in this journal) stating that the club has been formed, and inviting subscriptions. The members have no say in the election of the officers or committee, if any, and apparently just pay their fee for nothing.

Having paid their fee they will be invited to buy a badge and thereafter they will be invited to buy notepaper at a fabulous price. Such clubs fortunately do not appear in our list. They are just catch-penny concerns, and I advise my readers to have nothing to do with them. I do, of course, exclude such well-known National Clubs as the R.S.G.B.

By *Thermion*

Those local clubs which are formed and fail shortly afterwards do so because, as I have said, the secretary is a sleepy individual. A case in point occurred a short time ago. A letter was addressed by the Editor to a particular club asking for its opinion on a certain matter. Several months later the secretary writes to say that he has just discovered the letter amongst some papers in his pocket, and desires to know whether he should answer it! Now a club secretary has a duty to place all club correspondence before his committee, and in this case he was not only failing from a business point of view, but also as a secretary. If a secretary can mislay one letter like this, he must mislay many. It is idle to say that he overlooked it, for even dilatory secretaries must go through their pockets now and again. This one evidently believes in not putting off till to-morrow what he can do a year after. My advice to the club concerned is to appoint an energetic secretary. Alternatively, clubs should have all correspondence addressed to their Headquarters, making the arrangement that letters are only to be opened in the presence of the committee.

The Rights of Writers

THE Performing Right Society reminds me to inform my readers that in spite of all that has been said and written on the subject, the strangest views seem still to prevail on the Rights of Composers. In other directions it is accepted that the labourer is worthy of his hire, but because the composer's contribution to the wealth of the country is of the intangible sort his hire is sometimes begrudged him, and he seems to be regarded as fair game for anyone who can filch his work, and play it in public without his knowledge. On

the other hand, when he insists on his rights he is represented as greedy and grasping. The composer is sometimes a man of genius—not often, because most of the slush turned out to-day merely requires a sufficient degree of imbecility. But, in any case, he is a person with the same needs as other men—food, a house, a family, and a holiday. We pay the great conductor and the great singer, and we should therefore pay the composer, without whom the singer and the conductor would be thrown out of employment. The composer depends for the collection of the fees due to him. Legally, they are his work, and no one may use them in public without his permission. But the composer cannot check the number of times his music is performed so he commissions the Performing Right Society to do it for him.

The Speaking Clock

HOW many of my readers have observed when they dial "Tim" that the words *Thirty* and *Forty* sound almost precisely the same so that you have to listen for the announcement after it before you can get the exact time? When we remember the great amount of care which was used in selecting the girl with the golden voice, it is somewhat astonishing to find that this indistinct articulation of words whose correct pronunciation is totally dissimilar should be allowed to continue. I wrote to the Post Office about it and the Regional Director replied: "The fact that misunderstanding between *thirty* and *forty* may occur has already been noticed, though a caller would not be misled if more than one announcement is received, as is usually the case." What causes this defect? Is it due to a faulty voice, faulty recording, or faulty transmission?

Radio at the Motor Show

THE results of five or six years of steady pioneering work on the part of a few car manufacturers have now been given official recognition by the action of the S.M.M.T. in accepting car radio for Exhibition as a recognised accessory for the first time at this year's Motor Show. Car radio has progressed from being a novelty and an amusement for the wealthy car owner to the stage where

it is accepted by about 50,000 motorists as a normal and practical adjunct to the amenities of the modern motor-car.

Unnecessary Programme "Cuts" By B.B.C.

S. M. F. writes: "We all realise that B.B.C. programmes must end to time if confusion is to be avoided, but why the slavish use of the 'fader' on the last few bars of some orchestral piece when the station concerned is at the end of its day's broadcast?"

On a recent Sunday night the orchestra (a well-known one) was playing a piece of music which is world-famous, written by a composer who numbered his admirers up into the millions. . . . The piece had just a few bars to go before it finished as the composer meant it to finish, but that didn't suit the gentleman with the 'fader'! No! He had to assert his rights—and thirty seconds before the fatal 10.30 p.m. off went the music—to make way for a sanctimonious gentleman who proceeded to pray for us in a voice which, to say the least of it, failed to carry much in the way of conviction. . . .

"Now, we normal people have not the slightest objection to the B.B.C. keeping their programmes out of chaos; neither have we any objection to their arranging for a gentleman to pray for us at the end of the Sunday night programme. . . . But is it not possible that those of us who happen to like music might be given a little leeway—say for about a minute (which amount of time would often make all the difference between ending a piece decently and making an abrupt 'cut' of it), when all that is to follow is five minutes' prayer-and-hymn-singing, before the whole of the Portland Place Pundits pack up and toddle off to their beds—or what not?"

"Surely one is permitted to imagine that the gentleman of the prayers could usefully employ a wait of some sixty seconds in meditation, suitable to one who is about to put the Listeners of England one further step on the path of rectitude?"

"And even if he could not so usefully employ his time, we think (in all reverence) that listeners would still be there at the end of such a short delay—and just as interested in the Epilogue of the B.B.C.!"

"Let us admit that there is considerable improvement since the days when 'chamber music' was the only alternative to 'religious music' on the British air on Sundays. . . . Let us also admit that there is still room for improvement, and point

Notes from the Test Bench

Wiring Simplification

WHEN making up some modern types of receiver it is found difficult to make satisfactory connections to certain parts of the circuit which are supplied from a common source. For instance, earth connections all have eventually to go to chassis or the earth terminal, and all anode feeds have to be taken to the H.T. positive line. A good idea in cases such as these is to provide at some suitable point on the chassis a common bus-bar, such as was used in the early types of receiver. For the earth connections a strip of narrow copper tape will often greatly simplify wiring, and if this is supported between two bolts or pillars it will be found that wire end components may be taken across direct to such a bus-bar instead of having to solder lengths of wire to the ends to enable it to reach to the desired point. A similar wire for H.T. may also be used and if properly positioned this arrangement will remove necessity for insulated leads in the actual wiring.

Extension Sockets

NOW that the popular stores are supplying low-priced two-pin sockets and plugs, many constructors are obtaining these for use at extension listening points. A case recently was reported where such an arrangement had been adopted, and the loudspeaker point was fitted to the skirting board fairly close to a small power point, and a member of the family who was not familiar with the arrangement inadvertently inserted the speaker two-pin plug into the mains socket and thereby destroyed a good loudspeaker.

Tone Control

ALTHOUGH the usual method of tone control in a standard broadcast receiver is to use a variable resistance and a fixed condenser in series, it should be remembered that this only acts by reducing the high-note response. A comprehensive tone control should, of course, give bass boost as well as bass cut, and treble boost and treble cut, and for best results a special type of iron-core choke must be used. It is possible to make use of existing L.F. and H.F. chokes in combination, but by adopting one of the specially-made chokes now on the market more reliable results are obtainable, and it is possible to draw up a calibrated dial showing exactly the effects produced by the control knob.

out that there is just as much need for the decent presentation of the music of a great composer, as for the due and reverent presentation of a religious epilogue.

"On Sunday evenings, at all events, neither need be made to suffer on account of the other."

Plans for "Famous Music Halls" Broadcasts

I AM informed by the B.B.C. that John Watt, Director of Variety, will shortly introduce a series of broadcasts in which B.B.C. variety producers in London and the Regions will once more co-operate following the successful "Seaside Nights" programmes of the Summer.

This time, however, the productions will come, mainly, from the studios and their theme will be "Famous Music Halls." Eight programmes have already been organised by Leslie Baily, Variety script editor, as pageants of entertainment, past and present, at Britain's most historic variety theatres.

The series opens on October 14th on the National wavelength, with an hour's review of the eighty years of music and laughter at the oldest "living" music-hall in the metropolis, The South London Palace. Then, fortnightly, and usually on Friday nights, subsequent shows will deal with The Argyle, Birkenhead; The Coventry Hippodrome; The New Metropole, Glasgow; The Palace, Plymouth; The Empire, Belfast; The Holborn Empire, and, finally, a second hall in the North Region.

Each will tell, in speech, song, dramatised scenes and recorded numbers by old-time "stars," the story of the hall under review. In addition, each programme will include broadcasts from the actual theatre—interviews, perhaps, with folk "behind the scenes"—and excerpts from the show on the stage that night. John Watt plans to compère the studio sequences of all the shows.

In the first programme, Bryan Michie, former compère of the Variety Department, will return to the microphone to act as interviewer at the South London Palace. Listeners will hear him chatting to Harry Davis, the manager; James Scott, veteran patron—he is seventy-four years old and has been going to the old "Sarth" since he was a boy; George Bailey, electrician; and Joe Wood, the fireman; all of whom have many interesting memories and anecdotes of the old days. The studio players will include Dick Francis, John Rorke, Bertha Willmott, Audrey Cameron, Ernest Sefton, and Archibald Haddon.

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A PAGE OF PRACTICAL HINTS

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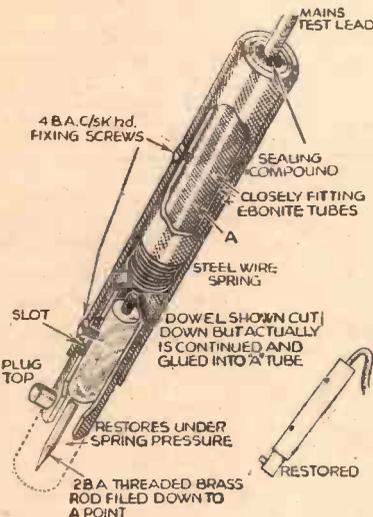
READERS
WRINKLES

THE
HALF-
GUINEA
PAGE

A High-voltage "Safety" Test Prod

FOR a new voltage break-down tester I have just made I required suitable safety-type test prods, and constructed two, as shown in the accompanying sketches.

I managed to obtain some close-fitting lengths of ebonite tubing, a light steel spring, and some sealing compound of

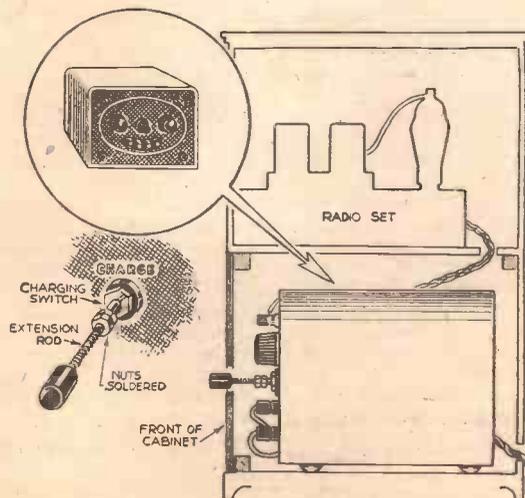


A high-voltage "safety" draw-back test prod.

well-known make. From the illustration it will be apparent that the length of the spring had to be such that, on restoring immediately the finger is removed from the plug top, the "cover" tube must effectively shroud the conductor, and therefore care had to be taken to ensure the correct length of this cover tube. For the conductor or test point I used a length of 2BA threaded brass rod, letting this into the wood dowel, which is in turn fitted securely into the "A" tube with glue, being finally secured with the rest of the assembly by the two 4BA grub screws. The test leads, of good quality rubber-covered flex, are in each case soldered to the end of the conductor as shown.—G. C. WESTCOT (Redditch).

An Eliminator Improvement

MANY amateurs will have in use the type of H.T. eliminator incorporating a trickle charger, for charging the L.T. accumulator. The type to which I refer is illustrated in the inset of the accompanying sketch, and has a push-pull type of switch for change over from H.T. supply to the L.T. charging current. As the various H.T. plugs, accumulator terminals, etc., are (in this pattern) also fitted to the front of the unit.



A handy eliminator switching arrangement.

THAT DODGE OF YOURS!

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

SPECIAL NOTICE

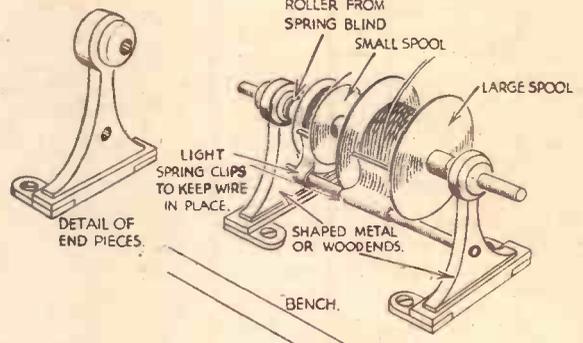
All wrinkles in future must be accompanied by the coupon cut from page iii of cover.

when this is housed in the radio cabinet, it is usually necessary to open a hinged flap each time it is required to operate the charging switch referred to. I have found that a very simple way of overcoming this trouble is to fit an extension shaft to the shank of the switch, and drill a hole in the front of the cabinet through which it can project.

The shaft can be of ordinary brass screwed rod, the same thread as that of the switch, and can be soldered to the switch shank after fitting one nut on each, as shown in sketch. In the writer's own case the rod was 2BA! The front of the cabinet can still be hinged for inspection, or removal of the accumulator, but with the extension rod described, the operation of switching over to charging is greatly facilitated.—R. L. GRAPER (Chelmsford).

A Wire-spool Holder

THE handy wire-spool holder illustrated was made with a spring blind roller fitment and two shaped metal end pieces. The spools are made from cardboard, thus keeping the weight down to the minimum, and four pieces of brass strip were drilled and cut for attaching to the bench. The action of the whole fitment is the same as for a blind; it snaps back, rewinding the loose end of wire after being released. The small clips hold the wire and keep it neatly in place, but not sufficient to stop the action of the spring in turning. Care must be taken to see that the total amount of wire to be used will not be such that the spring cannot fully wind up.—G. CARTER (Sudbury).



A wire-spool holder made from a spring-blind fitment.

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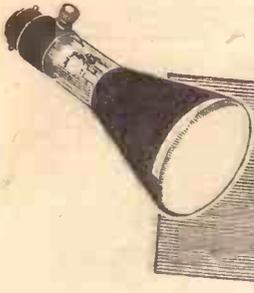
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Practical Television

October 8th, 1938. Vol. 3. No. 120.

Both Points of View

THE General Council of the Cinematograph Exhibitors' Association issued a report recently dealing with the many matters which are of importance to its members. Quite naturally the subject of television was one of the special items to which considerable attention had been given. The secretary contended that up to the present the cinema industry had been the only branch of entertainment which had brought up and maintained millions of patrons over a number of years. (He has apparently overlooked the fact that radio must inevitably fall into the same category.) In any case, he said that the cinema still maintained that position, but it would be increasingly difficult to do so if television was to become general in institutions, clubs and societies, particularly with interesting programmes, and taking into consideration its appeal when members of the public did not want to leave their homes in the evenings to go to the cinema. On the other hand, another member put the case for watching television with a more hopeful eye, pointing out that its development might not necessarily be a menace, but turn out to be one of the greatest developments to their own good that they had ever had. There is much to be said for both points of view, and the council have taken a wise course in referring the matter to a committee for a permanent watch to be kept on it.

Of Modern Appeal

NOISES in various forms have always proved a difficulty in human life when they are of the unwanted variety. It is for this reason that builders of modern dwellings have given the problem careful consideration, and at the Building Exhibition at Olympia were many interesting examples of sound insulation. From the radio and television point of view perhaps the most interesting was the special Study designed by Mr. Goodsmith for the Easiwork exhibit. There are no windows, while the walls are insulated from the floor so that the construction is effectively soundproof. Comfortable in every sense of the word, the idea behind the scheme is to permit anyone to retire to the room, and be isolated from exterior sound, while any sound generated in the room is not heard outside. Ventilation is maintained by an air conditioning plant, and special furniture has been built in to give every convenience in a compact manner. On one side of the wall is a piece of furniture which among other things incorporates a modern Baird television receiver, giving a directly viewed picture 10in. by 8in., complete with a one-knob vision control. In addition there is one of the latest Bush push-button receivers so that anyone using the room can have entertainment when not working. The scheme is an admirable one, and is capable of being applied to any room in the house; there seems little doubt that in the future we shall find more of these ideas being included in modern houses.

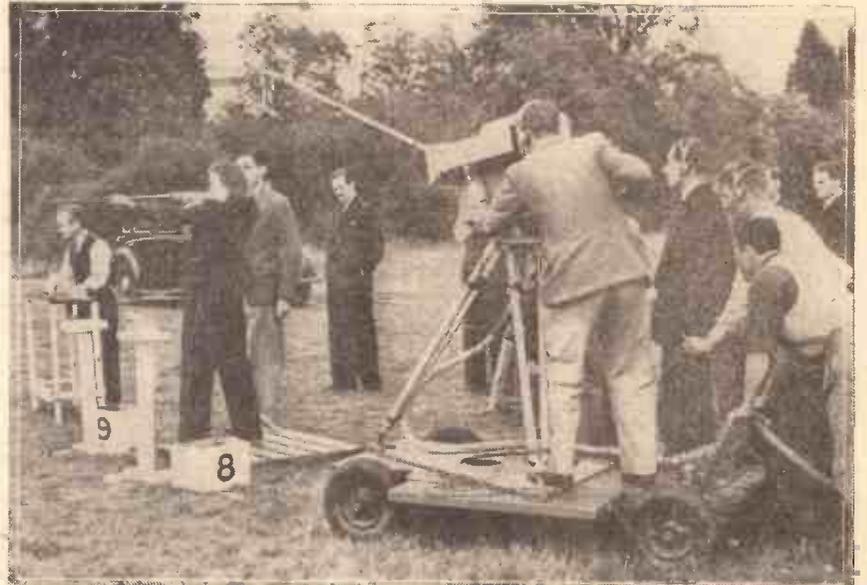
More Long-distance Efforts

IN an effort to regularise the whole position, the television industry has put a ban on the exhibition of television receivers in those areas where it is not possible to receive consistently a sound and vision signal capable of giving a picture of sustained good quality on a standard commercial set. This has been done with the idea of causing the minimum amount of dislocation to the radio trade proper, and to remove from the minds of possible sound-set purchasers the idea that by delaying purchase it will soon be possible to have a combined set, because a service of television signals will soon be available in that district.

for it seems certain that with an increase in transmitting power, together with the more modern sensitive sets, and a properly designed aerial system, the pleasure of looking-in will be extended to a wide public who are anxious to take advantage of the B.B.C. service.

Television Adapters

AT present there seems to be a good deal of controversy concerning the value of the adapters or add-on units which work in conjunction with an existing radio set in the home. The unit gives the television picture and adapts the home receiver to the reception of the ultra-short-wave sound, so that together the results are similar to that provided by one complete television set. Fundamentally, the idea is certainly a good one for it saves immediate expense, as the initial cost is less than that of a combined television and all-wave radio set. Furthermore, it enables a person to continue to use his home set to which perhaps he has become specially attached and which from the cabinet point of view may have been designed to match in with the decorative scheme of the room. On the other hand, those opposing the idea of an adapter point out quite clearly that first of all the



Many well-known film stars recently took part in the series of "Film Stars at Play," which was televised by the B.B.C. for the first time. Our illustration shows Miss Joan Gardner clay pigeon shooting at Pinewood during the television. In private life she is Mrs. Zoltton Korda. They are shortly leaving for Khartoum to finish the film "Four Feathers."

This policy, however, has in no way deterred those enthusiasts who are well outside the Alexandra Palace signal range, but who are convinced that by making special arrangements it is possible to operate a television set satisfactorily. This is borne out by the results achieved in many distant places. For example, in Taunton, which is about 150 miles from the B.B.C. television station, there is a 24-valve home constructed receiver which in conjunction with a dipole aerial erected nearly 80ft. high in the garden gives quite good results. Then, again, at an experimental station at Dore More, near Sheffield, there is a wireless station where pictures are seen regularly on a specially built set working in conjunction with a high aerial. The site is an ideal one, for it is 750ft. above sea-level, and remote from main roads and all forms of electrical interference. Although 160 miles away from the source of television signals the results are good. All this work is very praiseworthy,

high fidelity of the television sound transmission is sacrificed. The ordinary broadcast receiver as a rule has a frequency cut-off at about 5 kilocycles, whereas the television sound is characterised by a frequency response up to 20 kilocycles, and the all-in vision sets take full advantage of this feature. Then, again, the broadcast receiver may be installed in a room in which conditions are not the best for viewing. There will nearly always be mis-matching with colour, size and shape, while additional leads are necessary which may prove a source of trouble, and be difficult to conceal to meet aesthetic tastes. Unless placed side by side, the sound will not appear to come from the picture screen, and this is a most annoying effect. The cheap adapter set may stimulate interest, therefore, but where possible it would seem a far more satisfactory arrangement to have a complete television set, and leave the home broadcast set for normal purposes.



SHORT-WAVE SECTION

THE IMPORTANCE OF BAND-SPREAD TUNING

How the ordinary simple type of short-wave receiver may be made more efficient

MANY constructors have heard of the term "Band-spread" but think that it is some special form of tuning which can only be adopted in special types of receiver. Unfortunately, certain receiver specifications, by reference to "Electrical" and "Mechanical" band-spread systems, have only served to confuse matters more. Circuits of receivers employing this system of tuning all appear to vary, some having two condensers in series,

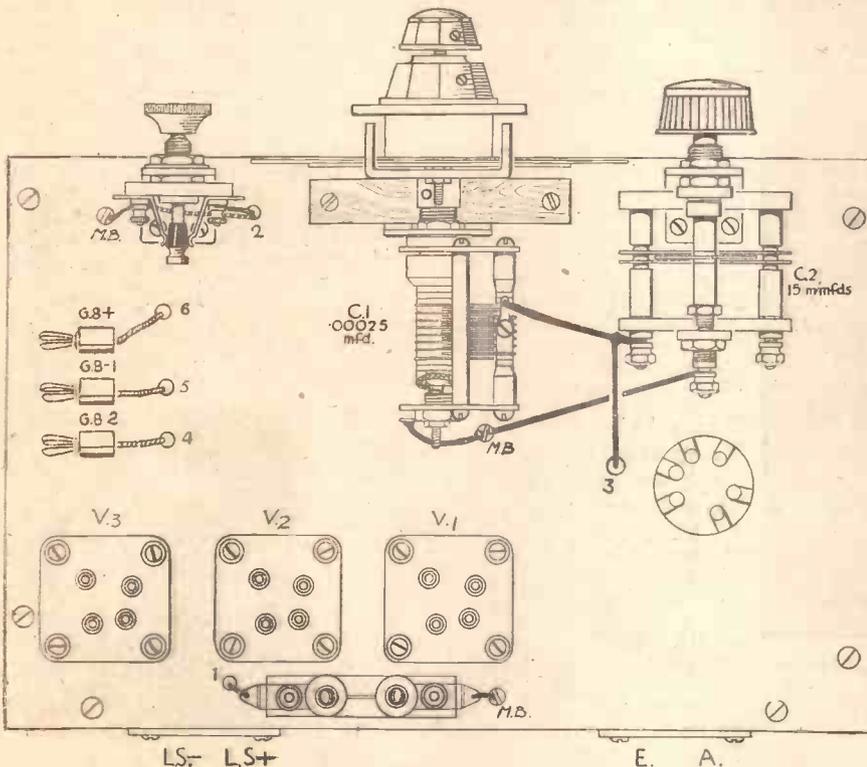
taken that the two leads connecting the main condenser and the band-spreader must be very short and kept well apart. In this connection it might be pointed out here that the main condenser is sometimes referred to as the tank condenser and more often as the band-setter. When two separate condensers are employed for band-spread tuning the system is known as the Electrical band-spread system, but as already pointed out it is not essential that

facilitate searching. If this is not done it will be found that stations can be tuned in in all sorts of positions, as it is possible to obtain a given parallel capacity with the two condensers in various positions in relation to each other. When, however, a dividing plate is used and the capacity of the band-spreader properly chosen, this difficulty will be removed and then it will only be necessary to advance the band-setter one division at a time and then turn the band-spreader through its maximum movement in order to spread out the tuning for a given movement of the band-setter. This is, of course, the principle adopted in the Eddystone band-spreading outfit. In this the band-setter has a maximum capacity of 140 mmfd. and the dividing plate is provided with 10 stops. The band-spreader has a maximum capacity of approximately 15 mmfd., and in addition is provided with a slow-motion drive with dial and pointer marked off in 100 degrees.

Mechanical Band-spread

The other form of band-spread is known as the mechanical system, and this term is often wrongly applied to ordinary slow-motion dials. It should, of course, only be applied to the specially made dials which are so designed that a similar indication to that provided by the double condensers above mentioned are obtained. In the majority of these a system of gearing is employed with dual pointers, one of which acts in the same manner as the band-setting condenser dial and the other coinciding with the band-spreader. In its simplest form, therefore, it may be regarded as the two hands of an ordinary clock, the hour hand giving the band-setting degrees, and the minute hand the band-spreading degrees. In some cases two separate control knobs are employed for the two pointers, but in others a dual control knob of the divided type is provided, one spindle working inside the other and each driving through its appropriate reduction gear. There is a great deal to be said for this type of band-spread tuning, as only one condenser is required, mounting is facilitated, and all settings may be reproduced more accurately than when separate condensers are employed.

Finally, it may be pointed out that band-spread tuning is of little use above 50 metres, although for a set of the amateur experimental type it may be provided more or less for experimental use. Below 50 metres, however, it may be regarded as essential if the receiver has any pretensions to a reliable job, and where accurate long-distance logging is needed one or other of the systems mentioned above must be adopted.



Top chassis view of the Perfect S.W. Three, showing the band-spread tuning combination.

others having a condenser joined across a portion of the coil in addition to the normal parallel condenser, whilst others have both condensers in parallel. The latter is the commonest form of band-spread tuning and it may be used with any type of short-wave coil. All that is needed is a very low capacity condenser—say, one moving and two fixed plates—connected in parallel with the tuning condenser now fitted. The accompanying illustration shows the above-chassis view of our Perfect S.W. Three, in which this system is employed, and this should serve to make the idea quite clear.

Connections

The moving plates of each condenser are joined together and the fixed plates also similarly connected. One important point in regard to this form of circuit is that when employed on the very short waves—for which it is most useful—care must be

the band-spreading condenser be joined in parallel with the band-setting condenser. It is often better to connect it between the earth and a tapping on the coil—usually about 25 per cent. of the total turns will be found a suitable point.

There is an advantage in using this form of band-spread tuning in that plug-in coils may be used in a set with a ganged band-spreader, the band-setting condensers being of the pre-set type mounted direct on the coils, thus reducing wiring and enabling coils to be used for lower wavelengths. The capacity of the band-spread condenser is not critical, although for best results it should naturally have a very low maximum capacity. Another important point in this connection, however, is that if it is chosen to have a maximum capacity which is a direct proportion of the main or band-setting condenser, a dividing plate may be used in conjunction with the latter to

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Leaves from a Short-wave Log

The Short-wavers of Panama City
THE most powerful station in the Republic of Panama is situated at Panama City, namely, HP5J (3 kilowatts), working on 31.28 m. (9.59 mc/s). Address: *La Voz de Panama*, Apartado Postal 867. The studio opens and closes with a march: *Black Horse Troop*. Although the distance from London is roughly 5,000 miles, the following stations have also been heard in Great Britain: HP5A, on 25.64 m. (11.7 mc/s), 300 watts, of which the studio is installed in the *Teatro de la Estrella*, the

(11.68 mc/s), and 39.89 m. (7.52 mc/s) respectively.

Trujillo City in the Log

BROADCASTS from HIJ, Ciudad Trujillo (Dominican Republic), *La Voz de la Farmacia*, on 47.77 m. (6.28 mc/s), have been regularly picked up recently from G.M.T. 22.45 onwards. The station gives out the call in Spanish and English. References are frequently made to "La Opinion," which is taken to be the name of the daily paper providing the news bulletins. This transmitter should not be confused with HIZ, *La Voz de los Muchachos*, in that city, operating on 47.5 m. (6.31 mc/s), which is owned and controlled by the Secretaria de Estado de Comunicaciones y Obras Publicas (State Ministry of Communications and Public Works).

Summer Time Ends

THE United States of America reverted to Standard Time on September 25th last, and Great Britain to G.M.T. on October 2nd. From this latter date until next year when Summer time is again adopted the difference between Eastern Standard Time and G.M.T. will again be five hours, i.e., 08.00 E.S.T. equals 13.00 G.M.T., and so on.

Canada's Proposed High-power Short-waver

LA T E S T news from Montreal reveals the fact that the Canadian Broadcasting Corporation is seriously con-

templating the installation of a high-power short-wave transmitter to make the *Voice of Canada* heard throughout the world. Although no information is given in respect to the possible site of the station the vicinity of either Quebec or Montreal is alternatively suggested, but the former city is favoured.

Not Lyndhurst But Melbourne

AS VLR, Lyndhurst is now the main outlet on short waves of the Melbourne (Victoria) radio programmes, the name Lyndhurst is no longer coupled with the call. Enter it in your log as VLR, Melbourne, on 31.32 m. (9.58 mc/s). The station is also entitled to work on 25.25 m. (11.88 mc/s), and 48.86 m. (6.14 mc/s). All reports should

be sent to the National Broadcasting Service, Australian Broadcasting Corporation, P.O. Box 1,586, General Post Office, Melbourne (Victoria), Australian Commonwealth.

More Spanish Transmissions

IN addition to EDR3, el Tablero (Teneriffe), on 28.93 m. (10.345 mc/s), "Franco" war bulletins may now be heard through EA9AH, Tetuan (Spanish Morocco) on 21.75 m. (13.99 mc/s). Address: Apartado Postal, 124, Tetuan. Another Spanish broadcast has also been logged on 20.76 m. (14.44 mc/s), which appears to have emanated from Malaga, and during the afternoon hours (about G.M.T. 14.30) a transmission can be picked up on 41.96 m. (7.15 mc/s) from EA1BH, Jaca. FET5, Burgos, on 40.8 m. (7.353 mc/s), is a regular daily transmitter from G.M.T. 18.00 onwards.

Prague's New Schedule

FOR its all-world broadcasts Prague has recently brought four short-wave transmitters situated at Podebrady into operation. The new timings are, as follows: OLR3A, 31.41 m. (9.55 mc/s), G.M.T. 21.40-22.00 on Mondays and Tuesdays OLR4A, 25.34 m. (11.84 mc/s), and OLR4B, 25.51 m. (11.76 mc/s), daily from G.M.T. 18.55-21.30; also on Mondays, Tuesdays, Thursdays and Fridays from G.M.T. 23.55-02.55, and on Sundays from G.M.T. 22.55-01.55. OLR5A, 19.7 m. (15.23 mc/s) and OLR5B, on 19.58 m. (15.32 mc/s) are used on Mondays, Tuesdays, Thursdays and Fridays from G.M.T. 23.55-02.55, and on Saturdays Sundays and Wednesdays from G.M.T. 22.00-02.15. Reception reports should be addressed to Radio Podebrady, Pochova, 16, Prague (Czechoslovakia).



Adjusting the transmission monitoring set in the control room of the new Aberdeen transmitting station.

address being Apartado Postal, 954; HP5B, *Estacion Miramar*, on 49.75 m. (6.03 mc/s), 200 watts, for which reception reports should be sent to Apartado Postal, 1,910; HP5G, on 25.47 m. (11.78 mc/s), 750 watts, (Apartado Postal, 545); and HP5H, *La Voz del Pueblo*, on 49 m. (6.122 mc/s), 400 watts (Apartado Postal, 1,045). In every instance the language used is Spanish, but for most announcements of international interest an English translation is also provided.

For Your List

A 2-KILOWATT short-wave transmitter with call-letters YV4RQ, has been inaugurated at Puerto Cabello (Venezuela); the channel used is 59.76 m. (5.02 mc/s).

Radio Concerts from Hawaii

FOR the benefit of listeners in the United States of America native musical radio entertainments are relayed to the N.B.C. and Columbia networks through the Kahuku transmitters, KKP, KIO and KKH, on 18.71 m. (16.03 mc/s); 25.68 m.



The modern way of telling it to the Marines, is by portable radio, by which messages are received and transmitted. The illustration shows Royal Marines practising with a portable radio—which is carried on the back.

MAKING A "C" AND "R" METER

Constructional Details of a Simple Condenser and Resistance Test Meter.
By W. J. DELANEY

MANY constructors find from time to time that they accumulate odd resistances and condensers from which the values or other identifications have become obscured or defaced. These become so much scrap as the experimenter hesitates to use them on account of the doubt which exists as to their value. It is possible with quite a simple arrangement to ascertain the values of resistances, but it is slightly more difficult to ascertain the capacity of a fixed condenser. To measure a resistance it is usual to make use of a battery and a milliammeter, calculating the resistance value from the current indication. However, as we have pointed out on many occasions recently in these pages, prac-

damage to the neon due to a high current a resistance R is joined in series with the circuit. The transformer should be of the 1 to 1 or step-down type to render identification easier, and any standard type of L.F. transformer can be employed here, connected with the secondary on the neon side and the primary on the bridge side.

A standard potentiometer may be used, and in the model illustrated this had a maximum value of 10,000 ohms, and to simplify readings a two-ended pointer was made from a strip of brass. This was cut with one arm shorter than the other, and the ends were bevelled, slotted and cut as shown in Fig. 3. The centre portion was left with parallel sides, and the length of this section was equivalent to the diameter of the control knob. This was then sawn and filed on the underside to accommodate the pointer, and the spindle of the control was sawn off short so that by placing a thick felt washer over the spindle and then dropping on the pointer and knob the pointer will be held firmly and will turn with the control knob without the need for making special locking bushes, etc. By adopting this arrangement a large dial may be drawn up, and there is no limit to the

poses and that accurate ratings are needed—the normal tolerance adopted in standard components being rather unsatisfactory if the meter is to be used as a reliable test instrument. It is possible to mark out

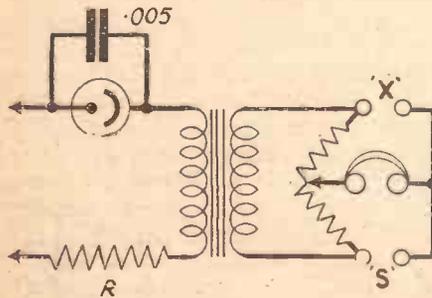


Fig. 1.—An outline of the Bridge component test meter.

tically every component used in a modern receiver may be measured against a standard by means of a test instrument making use of the Bridge circuit. Not many components are needed, and in Fig. 1 is seen the main outline of a meter which may be used for testing condensers and resistances, the standard being connected at "S" and the component to be measured being joined across the two terminals marked "X."

An oscillator is fed to the bridge through a transformer, and the bridge is balanced by means of a variable resistance or potentiometer, the position of balance being ascertained by means of a pair of ordinary head-

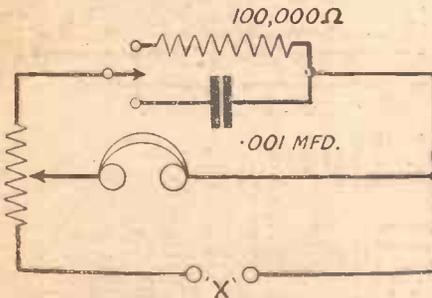


Fig. 2.—How alternative standards may be selected.

phones. To avoid the necessity of connecting the appropriate standard a simple change-over switch of the single-pole type is fitted and the two standards are connected permanently, thus making use of the arrangement as seen in Fig. 2. The oscillator is made up from a small neon discharge tube fed from a D.C. source, and in the meter described this was a Bulgin component, type N.L.1. A fixed condenser with a capacity of .005 mfd. is joined in parallel with the neon, and to prevent

size which may be used. The readings for resistances may then be marked round one scale and the readings for condensers on the other, care being taken, of course, to follow the correct end of the pointer when making tests. This may be simplified by colouring the pointer ends, and by using a colour-code of the same standard to identify each side of the selector switch.

The standards are a .001 mfd. condenser and a 100,000 ohm resistor, and these may be obtained from any of the makers of such components with a special test rating at a slight extra charge. Therefore, when ordering these specify that they are for test pur-

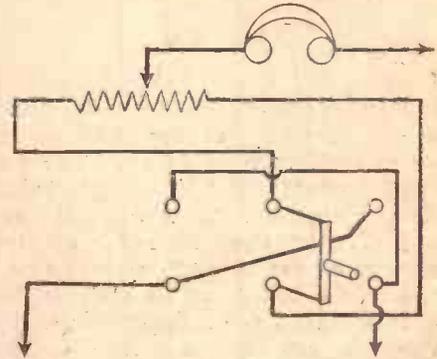


Fig. 4.—A change-over switch may be used with the potentiometer as shown here.

the scale of readings on the meter if you can draw up a logarithmic table and plot off the divisions, but as this is rather a tedious process it is easier to obtain several standard components and mark out the scales from these, and by using several components a check may be obtained and the scale then accurately plotted off. The range of the instrument may, of course, be chosen according to the uses to which it is to be put, and the standards selected accordingly. Similarly, the voltage with which it is employed may also be modified by a suitable choice of the resistance on the input side. From 120 to 240 volts may be used, the value of the resistance given being suitable for the higher voltage. A regular D.C. source should be used—either from H.T. batteries or from a well-smoothed mains unit, but in the latter case care should be taken that there is no trace of hum in the output side.

Using the Meter

To use the meter the voltage source is
(Continued on page 87)

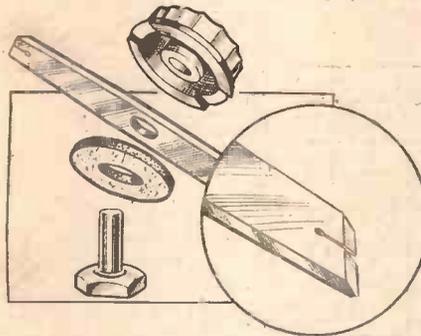


Fig. 3.—How the pointer is made and assembled.

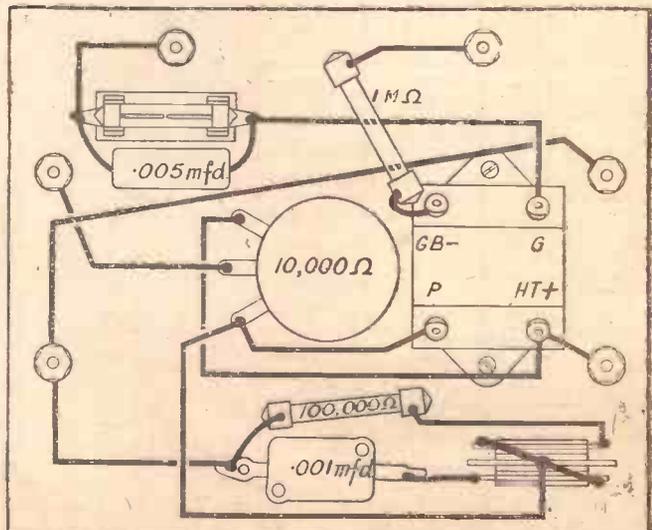


Fig. 5.—Wiring diagram of the meter.

MAKING A "C" AND "R" METER

(Continued from page 85)

connected, the component under test applied to the "X" terminals, and the appropriate standard selected by means of the change-over switch. The 'phones should then be donned and the control arm slowly turned until the hum which can be heard dies away. There should be a definite silent point, but this will not be easily ascertained if the input voltage is too high. The silent point will indicate on the appropriate scale the value of the component being tested.

It will be noted that the scale has been drawn in opposite directions for the two components, but if it is desired to use one scale for both, adopting suitable markings on the scale, then a change-over switch of the double-pole type should be joined to the ends of the potentiometer as shown in Fig. 4, and this should then be operated in conjunction with the standard-selector switch so that it is connected in the appropriate sense. The double-ended pointer avoids this difficulty, and the two scales are much easier to read and prevent errors which might in some circumstances prove troublesome. A properly calibrated scale cannot be given as an illustration to be attached to the meter when made up, as various makes of potentiometer are wound with different "laws" and the readings will thus vary according to the type of winding which is being used. Most components are of the "log. law" type, and thus a logarithmic scale is required for these. Tapered windings and other special windings will call for different types of scale, and thus where doubt exists as to the type of winding, the use of separate components for calibration purposes is the best method of ensuring an accurate marking out of the scale.

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- One Midget Neon Indication Lamp, List N.L.I.
- One Lamp Holder, List No. F.27.
- One L.F. Transformer (ratio 3 or 4 to 1).
- One 10,000 ohm Volume Control.
- Six Terminals.
- One Single-pole Change-over Switch, List S.81.T.
- One .005 Tubular Condenser.
- One 1 megohm Grid Leak.
- One 100,000 ohms Resistance and
- One .001 mfd. mica condenser, both of guaranteed accuracy for standards (see Text).
- One Pointer and Scale (see Text).

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Transformers on the Test Bench

An Article Briefly Explaining the Various Tests which Mains Transformers Undergo Before Being Placed in Service

THE mains transformer in the average receiving set is an unassuming member of the chassis assembly, yet it is the direct link between the supply mains and your entertainment. On its reliability depends the safety of your apparatus, and in the factory where hundreds of receivers are produced daily, every care is taken that this component is as safe as human ingenuity can make it.

Layer Windings

In the interests of economic production, various methods of winding have been employed. In some factories a bank winder is used, which "layer-winds" a number of complete bobbins at a time. The primary and various secondaries are wound one on top of the other, with paper insulation between, and a batch of bobbins, usually 6 at a time, leaves the winding machine every few minutes.

These layer-wound components are surprisingly reliable, for one might be forgiven for imagining that a mere paper interleaving was insufficient for mains insulation. Actually, the bobbins are vacuum-impreg-

ated with varnish or wax, and the value of the paper insulation considerably increased.

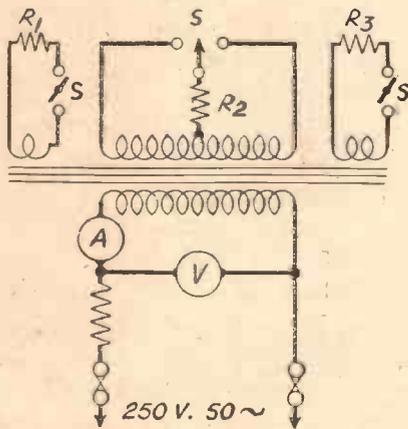


Fig. 2.—"Overall" test for regulation, output and efficiency.

nated with varnish or wax, and the value of the paper insulation considerably increased.

Separate Windings

A second method of construction which has much to recommend it, is to wind the transformer in separate sections. Thus one bobbin will contain the primary winding, another the H.T. secondary and rectifier heater windings, and a third bobbin possibly two valve heater windings.

A fault on any one section in the completed assembly does not mean scrapping the winding when this method is employed.

Each bobbin, whether "multiple-layer" or "section-wound" is tested for short-circuited turns and continuity as it leaves

the winding benches, prior to delivery on the assembly benches for making up. Expert hands make short work of "ironing up" the core, whether the transformer irons are placed alternate ways, or interleaved in pairs or threes as factory practice determines. The end clamps are then bolted in position, terminal panel mounted, and the complete unit delivered to the test bench.

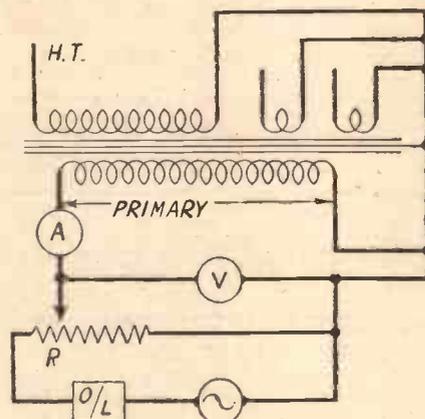


Fig. 1.—Break-down test. Voltage regulator R is adjusted till at least twice the working pressure is applied to the primary winding. O/L is an overload release.

Flash Test

Here each winding is first of all subjected to a "flash" test in accordance with British Engineering Standards specifications. These stipulate that in the case of double wound transformers, the insulation between primary and core shall withstand a test voltage of 1,000V.A.C., R.M.S. Each secondary winding must also withstand this voltage to the primary winding, or twice its own induced voltage, whichever is the greater.

One thousand volts as a test pressure is manifestly dangerous to life, and accordingly this process is carried out in a steel cage. The transformer is connected up with heavy insulated cable, and on closing the cage door, the operator automatically switches in the test voltage. Each winding is tested in turn, and should breakdown occur, a relay in the E.H.T. circuit will trip the supply voltage and light an indicator lamp.

Television Transformers

In the case of television transformers, the high-voltage windings are often tested on a circuit similar to that shown in Fig. 1. A variable voltage is applied to the primary, using a higher frequency than that for which the transformer is designed. This avoids saturation of the core with the increased excitation current. In this manner the E.H.T. winding is tested to

frame and other windings without the need for excessively high tension test apparatus.

Following the 1,000v. "flash," the windings are tried on a D.C. test pressure of 500 volts. The insulation resistance must not be less than 20 megohms at this voltage.

A test for breakdown follows, whereby the transformer is run in excess of its rated voltage to ensure against partial short-circuits in the windings. Again as in the high-voltage tests, the excitation frequency is higher than the working frequency to avoid saturation of the iron circuit. This overload test enables a higher voltage to be obtained across each turn of the winding, so that any tendency towards internal short-circuits is more likely to occur at this stage than during the transformer's working life.

An ammeter in the primary circuit indicates the magnetising current, and limits are set on this as the primary voltage is increased to twice its normal value.

Transformation Ratio

A check on performance then follows. This enables the efficiency of the transformer to be measured, and also its regulation. The transformation ratio may also be obtained, and the readings will give an indication of the losses in transformation.

The windings are connected to a load panel, Fig. 2, the values of which are preset by the Production test specification. The transformer is put on test with the switches S open, and a series of readings taken showing the open-circuit voltage. The switches are then closed and a second series of readings noted.

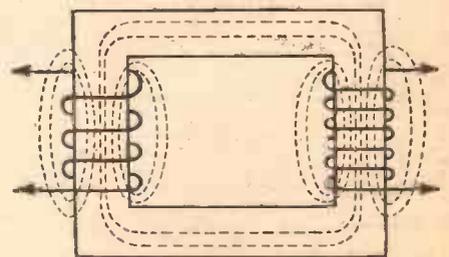


Fig. 3.—Diagram illustrating leakage flux.

The "regulation," defined as the change in secondary voltage from "no load" to "full load" conditions under constant primary voltage, is obtained from these measurements.

The regulation is expressed as a percentage and is given by the formula:

$$\% \text{ Reg.} = \frac{100 (E_2 - V_2)}{V_2}$$

where E₂ is the secondary open-circuit E.M.F. and V₂ the full load secondary volts.

It may be observed in passing that under certain conditions the open-circuit voltage

(Continued overleaf)

TRANSFORMERS ON THE TEST BENCH

(Continued from previous page)

may be less than the full load voltage, and the percentage regulation will therefore be negative.

The transformation ratio is determined by

$$\frac{\text{primary voltage}}{\text{open circuit secondary E.M.F.}}$$

and will be different for each winding. Usually, this measurement is of little interest, the ratio being tested indirectly by stipulating limits for the different secondary voltages.

The readings which determined the regulation will also give an approximation of the transformer efficiency, also expressed as a percentage. Efficiency is determined by

$$\frac{(\text{Output watts})}{(\text{Input watts})} \times 100$$

and an efficiency of 75%-80% may be expected from a well-designed receiver unit.

Transformation Losses

Losses in transformation can best be considered under the following heads:

1. Magnetic leakage, or leakage inductance.
2. Copper loss, or I²R loss.
3. Eddy current loss.
4. Hysteresis loss.

In a well-designed instrument, practically the whole of the magnetic flux induced by the primary current links with all the turns of the secondary winding. Considering a poorly made unit, Fig. 3, it is clear that some of the primary flux will not link with the secondary winding, and conversely, the secondary flux will not link with the primary winding.

The effect of magnetic leakage is therefore to reduce the secondary voltage for a given primary voltage, and thus to increase the percentage regulation.

For copper losses, the common enemy, D.C. resistance must be held responsible. Under "no load" conditions, when current is low, the losses due to resistance are negligible. When load is applied, however,

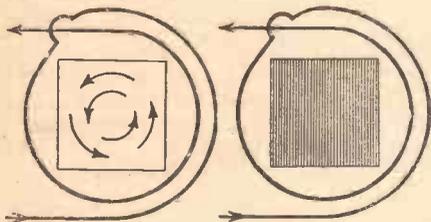


Fig. 4.—Illustrating eddy current effect, and the use of laminated core.

a larger current flows, and the losses due to resistance become appreciable.

The effect is to reduce the secondary voltage by an amount equal to I_s R_s, where I_s is the secondary current and R_s the resistance of the secondary winding. A similar voltage drop in the primary due to I_p R_p reduces the primary flux and consequently the secondary voltage.

The total copper loss is given by $(I_p^2 \times R_p) - (I_s^2 \times R_s) = \text{watts loss.}$

From this it follows that the use of conductors of small cross-sectional area increases the copper loss, and results in overheating, with the consequent risk of damage to the insulating material between windings.

If the core of the transformer were a solid bar of metal, the alternating flux

would set up heavy currents in it in the same sense as the windings. These are termed eddy currents, and if permitted, would result in energy loss and the production of heat. To guard against this wastage the transformer core is made up of thin sheets of steel, one side of each sheet being coated with paper or insulating varnish. Thus the eddy current paths are broken up, and the losses kept to negligible proportions.

Hysteresis

Hysteresis is a property common to all ferro-magnetic materials, and indicates the phenomenon of the magnetic flux lagging behind the magnetising force, in this case the primary current. Hysteresis represents a loss of energy which is expended in heating up the core. The loss increases with frequency and also with increasing flux density. Hard steel has a greater hysteresis loss than soft iron, and an alloy of the latter with silicon is often used under the trade name of Stalloy.

We have now considered the normal test procedure for mains transformers in production. In the initial stages of development the transformer would be put on a "heat run" under full load, and the temperature rise noted, but generally, after the secondary voltages have been measured under load and the primary current values noted, the transformer is released to the assembly lines for inclusion in the receiver chassis.

NEW BOOKS

MONEY-MAKING Made Easy. By L. Harvey Wood. Published by C. Arthur Pearson, Ltd., 114 pp., 2s. 6d. net.

Persons on the look out for opportunities for increasing their income in their spare time, or who wish to branch out in a new line, will find this book profitable reading. Written in simple language, a hundred and one spheres of activity are explored in a practical manner, and helpful advice is given on the choice of new and well tried lucrative occupations. There are thirteen chapters, each dealing with different subjects. For instance, chapter one tells the reader all about Clubs and Agencies, and how they should be run. Chapter two deals with Profit from Your Garden, and tells you how you can make money by growing mushrooms, making fertilizers, garden ornaments, etc. Various money-making ideas are discussed in the next chapter, while chapter four deals with Money in Entertaining. How to make money from photography is explained in chapter five, and such subjects as Seasonal Money Making, Money from Hobbies, Odd Jobs for Motorists, Property as an Investment, and Money in Games and Sports are amongst the other subjects dealt with in the remaining chapters of this interesting book, which also includes an index.

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By F. J. CAMM.

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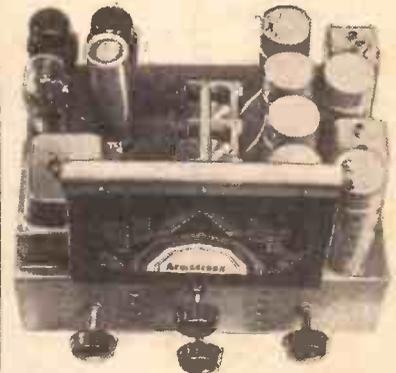
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5 MINUTES FROM STRAITS

LONDON RADIO SUPPLY COMPANY ESTD 1925

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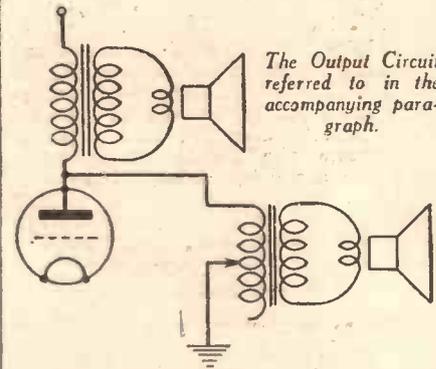
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Simple Mistakes

RADIO is full of pitfalls for the unwary, and from time to time we receive queries which very often fail to reveal the cause of a trouble, and eventually some silly little slip is discovered which the constructor had overlooked and which has caused all of the trouble. Two cases recently came to light which are worth mentioning and both caused endless trouble to the constructor. In one case an American coil unit was being used and most of the markings on the terminals had



The Output Circuit referred to in the accompanying paragraph.

become defaced. The constructor could, however, clearly make out the letter G against one terminal and an A terminal, and accordingly connected the aerial to the latter terminal and the grid to the former. He could obtain no results, had the coil tested and passed O.K., but spent endless hours trying to find a fault in the set. The G terminal was, of course, the earth terminal, joined to the lower end of the coil and the screen, and in America the term Ground is used in place of earth. This eventually solved this trouble, but another fault was not discovered until a diagram of the reader's arrangement was sent in. He had been using a set satisfactorily and decided to fit an extension speaker. He bought one and results were not too good. After some time he went back to his dealer and complained, and after some argument obtained a better speaker with a matching transformer as he was under the impression that the fault was bad matching. This also failed to give the desired results, and after some correspondence with us he eventually mentioned that his H.T. was not lasting so long now that he was using the extra speaker. This immediately suggested the fault and we asked for a diagram of his arrangement. We reproduce it above, and it will be seen that all that is wrong is that the H.T. is being short-circuited. A coupling condenser between the anode and the extra speaker is all that is needed and the arrangement is then quite in order. Very elementary, but one of those little things which can be overlooked.

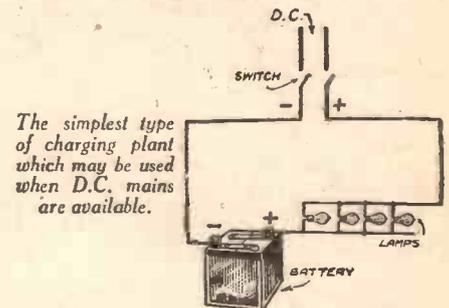
How Many Valves?

An argument which often crops up among keen experimenters is how many valves should be employed in a really good long-distance set. Whilst some amateurs go for the 9 and 10 valve superhet, others

claim that they can get just the same stations with a two or three valver, although, of course, signals will be weaker. This is quite true and some of the lists of verifications from users of two and three valvers show that they can certainly reach out. Another important point is that the multi-valver may often defeat its own ends due to background or valve noises, and several times we have heard amateur-built multi-valvers in which weak Americans could not be read through the general background of noise. Every additional stage in a set adds to the quota of noise and a faulty component in the early stages will be amplified in the successive stages, in addition to the general hiss which comes from the use of a large number of valves working at maximum. Therefore, this point should be borne in mind when designing a set, and care should be taken to see that all connections are absolutely sound and that no faulty components which can give rise to the slightest noise are employed. If 'phones are to be used all the time for listening, then there is much to be said for the small set, preferably operated from a reliable battery supply.

Accumulator Charging

When charging accumulators from a D.C. mains supply the very simplest of apparatus is needed, and, in fact, charging from this type of mains may be carried out without any apparatus. All that is needed is to break down the supply to suit the accumulator, and this may be done by including ordinary lamps in one lead as shown in the accompanying illustration.



The simplest type of charging plant which may be used when D.C. mains are available.

The only drawback to this type of charging is that of expense, but this may be avoided if the lights are employed for illumination purposes in the usual way. In other words, charge during the evenings, and use the lamps in the room as table or floor lights in place of the normal centre light. To be on the safe side, of course, a good ammeter should be included in the leads to the cell to make certain that the current does not rise above the rating given on the label by the makers of the accumulator.

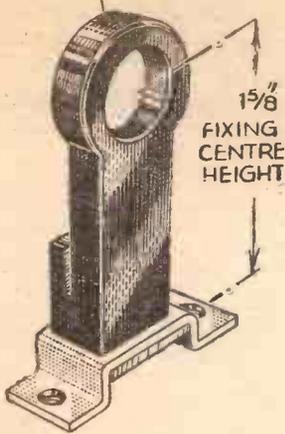
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DL-9 INSULATION



BRACKET CANNOT TURN ON BASE

On the right is the Garrard Type "E" radiogram unit, with the aid of which an existing radio receiver may be converted into a most efficient A.C. radiogram. The unit comprises an induction motor for 200 to 250 volt supplies, 12in. turntable, one-piece bakelite pick-up and arm, fitted with the Garrard automatic switch. The fitting of this unit is extremely simple, and it requires an over-all space of 14 1/2 in. by 13 in. with 3 1/4 in. below the unit plate and 2 1/2 in. above the plate. A speed regulator is provided and the turntable operates the automatic switch which breaks the mains supply to the motor when the needle runs to the centre of the record.

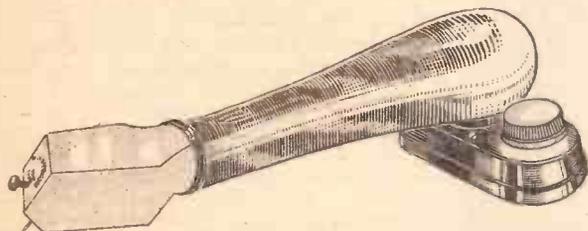
NEW ITEMS FOR THE CONSTRUCTOR

Rigidity is of the utmost importance when mounting short-wave components, such as condensers, and many constructors make do with a home-made bracket. A fitting such as the new Eddystone component seen on the left, however, will ensure that more than one component may be mounted at an identical level for ganging and will simplify construction whilst giving reliability in every direction.

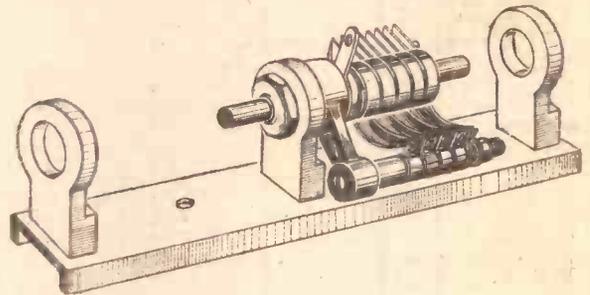


For long-distance reception headphones are generally employed, but really reliable components must be used if good signals are to be obtained. There are various types of headphones and those illustrated above are of the piezo-electric crystal type. These are of the high-impedance pattern, and are supplied in two models—one a general purpose set with wide range and uniform response, weighing six ounces, and the other a very light unit with a slightly less uniform response. These weigh 3 1/2 ounces and an interesting point is that the headphone cord terminals are not of the screw type, but are provided with snap

connectors similar to a glove fastener. The casing is of aluminium and the caps, instead of being threaded on, are pressed together and the outside edge is burnished tightly to the case. The price is £3 15s., and for Type A it is £2. The 'phones are supplied by Messrs. Rothermel.

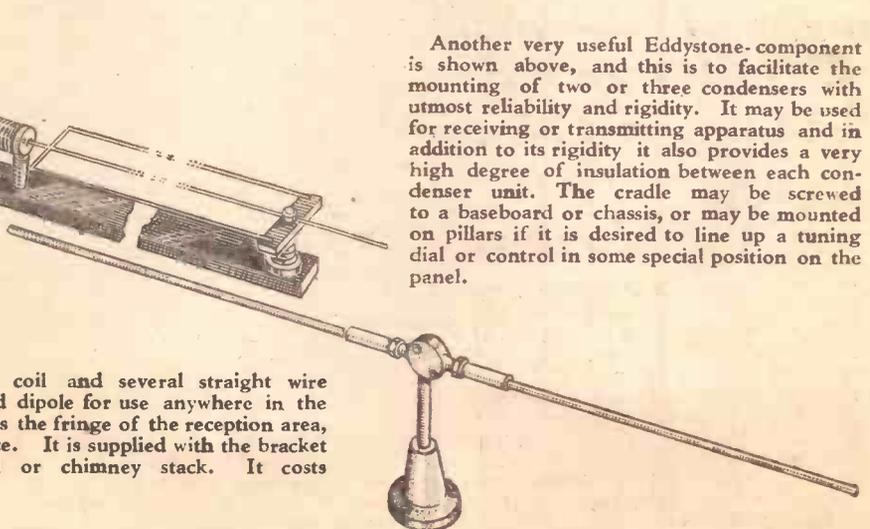


The component above is a piezo-electric gramophone pick-up from the Cosmocord range. This costs 30s. and the weight at needle point is only 2 1/4 ozs., thus providing minimum needle wear and surface noise. The head may be swivelled for each needle change and a rest is provided with each pick-up. The connecting leads are screened.



Another very useful Eddystone-component is shown above, and this is to facilitate the mounting of two or three condensers with utmost reliability and rigidity. It may be used for receiving or transmitting apparatus and in addition to its rigidity it also provides a very high degree of insulation between each condenser unit. The cradle may be screwed to a baseboard or chassis, or may be mounted on pillars if it is desired to line up a tuning dial or control in some special position on the panel.

Television aerials are now available in various patterns, and here may be seen two taken from the E.M.I. range. The upper illustration is a compressed dipole, designed in a compact form for use in areas of high signal strength and low noise level. It has omnidirectional reception properties and consists of tuned elements made up of a coil and several straight wire lengths. It costs 30s. The other is a standard dipole for use anywhere in the television area and is particularly good towards the fringe of the reception area, especially where there is not much interference. It is supplied with the bracket and equipment for securing it to a wall or chimney stack. It costs £1 13s.





Impressions on the Wax

A REVIEW OF THE LATEST GRAMOPHONE RECORDS

Parlophone

RICHARD TAUBER has chosen "The English Rose" from "Merric England," coupled with "Love Everlasting" for his latest recording on *Parlophone RO 20402*. He sings both songs in English. In the 12in. classic series the Berlin State Opera Orchestra play a two-part recording of "Faust" on *Parlophone E 11376*, whilst in the 10in. classic series the same orchestra has recorded "Hansel and Gretel" on *Parlophone R 2556*. Featured are the Gingerbread Waltz and the Witch's Ride. Other orchestras in this series are Eugen Wolff and his Orchestra, who play a "Wild Violets" selection on *Parlophone R 2560*, and the Orchestra Mascotte, who have recorded two of Joli. Strauss' Waltzes "Women of Vienna" and "Die Fledermaus" (The Bat) on *Parlophone R 2561*. "The Merry Widow" music always makes an attractive recording and Frederic Hippmann and his Orchestra play a two-part selection from this famous operetta on *Parlophone R 2558*.

A famous trio and a quartet make their appearance in the Parlophone list this month. The Boswell Sisters introduce an old favourite in Irving Berlin's "Alexander's Ragtime Band," which has just been revived in a film of that name. The coupling is "Dinah," which they sing with guitar accompaniment—*Parlophone R 2562*. The Mills Brothers also revive two old favourites—"Chinatown, My Chinatown" and "Rockin' Chair" on *Parlophone R 2563*.

Coming to dance tunes we have two records by Harry Roy and his Orchestra, who have chosen two of the most popular numbers of the moment. They are "The Highland Swing" from "Happy Returns," coupled with "There's a Little Irish Colleen on Broadway"—*Parlophone F 1203*, and "A Tisket A Tasket," coupled with "I'm Gonna Lock My Heart"—*Parlophone F 1204*. "A Tisket A Tasket" is an American comedy number based upon the English nursery rhyme, "I sent a letter to my Love." Harry Roy's Tiger-Ragamuffin's have recorded four popular tunes, "The Flatfoot Floogee," "The Lambeth Walk," "Down and Out Blues" and "I Can't Face the Music," on *Parlophone F 1228*.

An incredibly crazy record is "Azarola," the acrobatic pianist who has recorded "Rumba Acrobatique" and "Clownerie Swing" on *Parlophone F 1217*. "Humoresque" and "Hungarian Rhapsody" are played as a duet by H. Robinson Cleaver (organ) and Patricia Rossborough (piano), whilst Ivor Morton and Dave Kaye on two pianos, with string bass and drums, introduce Tin Pan Alley Medley, No. 11, on *Parlophone F 1211*.

Leslie A. Hutchinson ("Hutch") has made two new records this month. "There's Rain in My Eyes" and "Take Me in Your Arms," on *Parlophone F 1212*, and "Music Maestro, Please," from "These Foolish Things," coupled with the hit tune of the moment, "Little Lady Make Believe," on *Parlophone F 1213*.

Two records in strict dance tempo with no vocals are introduced by Victor Silvester and his Ballroom Orchestra. "It's D'Lovely," a quick step from "The Fleet's Lit Up," is linked with a waltz, "Sweetest Song in the World," from the film "We're Going to be Rich," on *Parlophone F 1207*, and "This is My Night to Dream," a slow foxtrot, is coupled with "There's Honey on the Moon To-night," a quick-step from the film "Doctor Rhythm," on *Parlophone F 1208*.

A rather striking record has been made by the Massed Military Bands with "Great Times" and "Hessian Infantry March" on *Parlophone F 1218*.

Decca

IF you like impersonations you should hear Afrique on *Decca F 6763*. His impersonations include: The Street Singer (singing "Homo"), George Robey, Sophie Tucker (singing "Some of These Days"), Eddie Cantor (singing "Making Whoopee"), Billy Bennett, and Gigli (singing "Marta"). "Good Night Angel," from the film "Radio City Revels," and "I Won't Tell a Soul," have been recorded by The Street Singer on *Decca F 6761*, whilst Dudley Beaven, at the organ of the Granada, Clapham Junction, plays a "Goldwyn Follies" selection and "We're Going to be Rich" selection on *Decca F 6770*.

H.M.V.

AMONG the fine selection of dance records this month, Geraldo and His Orchestra appear for the first time for this Company. The titles recorded are "You Couldn't be Cuter" and "Just Let me Look at You," both from the film "Joy of Living" on *H.M.V. BD 5394*, and two titles from the new musical show "The Fleet's Lit Up"—"How do You Do, Mister Right" and "The Fleet's Lit Up," on *H.M.V. BD 5395*. Roy Fox has this month recorded "I let a Song go out of my Heart," coupled with "You Went to my Head" *H.M.V. BD 5397*, whilst Jack Harris plays a good version of "Flatfoot Floogee" with "I Can't Face the Music" on the reverse side, *H.M.V. BD 5392*. Guy Lombardo gives his own version of "Oh, ma-ma," coupled with "So Little Time" *H.M.V. BD 5386*. A swing version of "The Blue Danube" and "Black Eyes" is recorded by the Ballyhooligans on *H.M.V. BD 5388*. There are two records by Henry Jacques in strict dance tempo—"I Let a Song go out of my Heart" and "The Whispering Waltz" *H.M.V. BD 5390* also "The Moon of Manakoora" coupled with "You Couldn't be Cuter" *H.M.V. BD 5391* and the New Mayfair Orchestra have made another Palais Glide Medley on *H.M.V. BD 5389*. Larry Clinton provides an amazing version of "Dance of the Hours" from "La Gioconda" and the famous "Gavotte" from "Mignon" on *H.M.V. B 8776*, whilst a popular swing record is Benny Goodman's "Flatfoot Floogee" coupled with "Ti-pi-tin" on *H.M.V. B 8777*.

LEON DANIELS

A BRIEF BIOGRAPHY

LEON DANIELS was born in Amsterdam 45 years ago; his father was an amateur musician.

Leon commenced playing the violin at the age of seven. Studied under Trytel. Then went to the Amsterdam Conservatoire. School teacher asked him to bring his violin to school and give recitals to the other scholars. Went to school until the age of 13. His father wanted to put him into business, but Leon refused, and stuck to his fiddle.

First public performance as a soloist was at the age of 15 when he played Mozart's



Leon Daniels.

concerto at a large hall in Holland. He then joined a string quartet and toured all over Holland until the age of 19.

First came to England at the age of 20, went to Scotland and there led a quintet. Joined a Scottish orchestra with whom he played for three years. Came to London and played in all the well-known restaurants. Also played under Sir Henry Wood, Sir Thomas Beecham, Elgar and Savonoff (Russian), and has been heard over the air many times.

Led a band for two years at the Savoy Hotel and the Café Royal. Had one of the first dance bands in the country, at the London Club. Used to run, in conjunction with another person, the "Rio Grande Tango" band. Was once playing at the Savoy when a bomb hit the building, Leon Daniels was the last man to leave the premises. Has given a recital before the Queen of Holland. Father's uncle was secretary to William III. Has used his present violin for the past 20 years, and his hands are insured for £500 each! Has appeared before most of the Royal Family, and played at practically every big social function as well as many big concerts. Was once leader of the Carl Rosa Opera Company and Covent Garden orchestra. Bought a beautiful violin bow for £30 and somebody trod on it, before he had chance to use it! Was a friend of the late De Groot.

Hobbies: Walking, music (practises three hours daily). Likes to travel, and has toured the world twice. Specialises in light music. Favourite composer is Beethoven. Sends orchestras all over the country. Greatest ambition is to own a large country house with a beautiful garden of flowers.

Last December decided to form his own trio for broadcasting, and was so successful that he has broadcast consistently since that date.

New Ferranti Model 515 PB

THIS is the first Radio Exhibition release model which we have received for test purposes, and it is fitting that it should embody press-button tuning.

The first feature in the design to be noticed is the fully floating chassis, and this is brought to one's attention by the fact that the chassis-holding bolts have to be slackened off to remove packing-pieces and to allow the chassis to take up its floating position. Apart from the elimination of any possible microphonic tendencies of valves, this method also reduces the possibility of any vibration affecting the preset condensers which are embodied in the construction.

The cabinet is most artistic in design and beautifully finished, it being constructed from French walnut and the general appearance enhanced by pleasing figured walnut inlays.

A distinctive touch is added by the use of glass control knobs for the three main controls, the diameter of these being sufficient to allow easy manipulation.

is rated at 4 watts, handled the signal without any distressing signs of overloading or distortion. The variable tone control was most efficient and useful.

Selectivity on all wavebands leaves nothing to be desired, and the absence of heterodyne and second channel interference was particularly noticeable.

The model in question had the push-button circuits set for Radio-Normandy, National, Midland Regional, London Regional, Luxembourg, and Droitwich, and all of these stations were received with ample volume when the appropriate buttons were pressed.

A rather ingenious A.V.C. arrangement comes into operation with the Prestune. Once the volume control is set to a given output it remains reasonably constant for all stations, and inter-station noise is completely absent.

Short-wave reception was most satisfactory; transmissions being received at good volume and free from interference, but, as with other all-wave receivers, it is necessary to select a waveband according to the time of day for most efficient results.

The reverse vernier tuning control simplifies selection considerably and allows the receiver to be adjusted to the exact frequency of the station, an item which is very essential for distortion-free short-wave reception.

Pick-up sockets are fitted to the rear of the chassis and as these are only brought into circuit by means of the selector switch, the pick-up can be left permanently connected. When testing on records it was found that the tone control provided sufficient cut-off to enable scratch and surface noises to be eliminated.

Provision for an external speaker is also provided by two sockets which are fitted to the speaker chassis, and for this is recommended a Ferranti moving-coil speaker type M7, although, if so desired, other types of speakers can be used providing a suitable matching transformer is inserted between the external speaker and the receiver.

The "Chronicle" Wireless Annual NEWCOMERS to radio as well as experienced amateur experimenters, will find much to interest them in the 128 pages of this popular radio manual. The constructional side of this well-established radio handbook is again a strong feature, comprising mains and battery receivers for many purposes.

A new section is designed to help beginners in set building. Three simple inexpensive designs are offered, one being an ultra-selective crystal set, and the others a single and a two-valve receiver. Of special value to the station hunter is a lengthy list of the best short-wave-stations in five continents, showing transmitting hours, together with wavelengths and power.

The book is fully illustrated with photographs and diagrams, and a separate sheet of scale wiring diagrams is given free with each copy. The price of this useful handbook is 1s. or 1s. 2½d. (unsealed), or 1s. 3½d. (sealed) from the Publishers, Allied Newspapers, Ltd., Withy Grove, Manchester, 4.

BARGAINS by ELECTRADIX



MOTORS FOR A.C. MAINS
 Repulsion, self-starting, 150 H.P. with pulley, Type 50, 1,500 revs., 15/6.
 Ditto, Type 36, 1/25 H.P. G.E.C., 3,500 revs., 27/6. Encl. Induction 1/10 H.P. Motors, 2,500 revs., 35/-. Self-starting, 1 H.P., 1,425 revs., 45/- etc. etc. D.E. Mains Motors, 1/40 H.P., 110 or 220-v. series, Type K.B., 1,750 revs., 15/-. D.H.O. G.E.C., 220-v., 2,000 revs., 16/-. Croydon 1/12 H.P., 110 and 220-v. shunt, 1,700 revs., 30/-.
A.R.P. HELPS. Portable Field Telephones in leather case, 35/-. Unbreakable cable, 55/- per mile. SIGNAL LAMPS, Lucas day and night portable, £3. 10s. Aldis, C.A.V. ditto, £3. 5s. Army type, CRYSTAL SETS, 10/-. Headphones, 4/6.



GENUINE D.C. ROTARY CONVERTERS. For A.C. Receivers on D.C. 230 v. A.C. output. All in silence cabinet, with filter. All sizes in stock from 50 watts to octa for televisions of 450 watts.
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METERS. New stock of over 2,000 meters for all purposes. Voltage 2 to 12,000 volts. Current 1 microamp. to 1,000 amps. R.F. Transmitting M.C., M.L., E/8, etc. All sizes.

MORSE KEYS & SIGNAL KEYS, 5/-, 7/6, 18/6 and 25/-. BUZZERS, 1/-, 2/- and 5/-. SOUNDERS, 5/-, 7/6 and 10/-. Morse Practice Sets complete, 4/9. BELLS, circular Desk, vibrator in case, 3/-. War Bell Pushes, Porcelain, 2 1/2 in. 6d., or 5/- doz. Brass Pushes, 9d., 1/6 and 2/6. Pendant Pushes, 6d.

WIRE WOUND POWER RESISTANCES. 5 watt 8,000 ohms, 10 m.a., 103. 5 watt Potential Dividers, tapped 50,000 ohms, 1/6. Mains Transformers, 3/6. 1-mfd. Condensers, 4d.

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METERS. 1,000 Switchboards, Service and panel Meters in stock, lowest prices. Meters, all ranges. 50 microamps, 40/-. Weston Table Meters, 18/6. Charging Pole Testers, 2/6. 0-20 volts, 5/-; 0-50 volts, 5/-; 0-100 volts, 5/6; 0-200 volts, 6/-. All A.C. or D.C. Repair to all types.
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 218, Upper Thames Street, London, E.C.4
 Phone: Central 4611

NEW FERRANTI MODEL 515PB SPECIFICATION

Receiver.—Ferranti Model 515PB.
 Circuit.—"Prestune" high fidelity A.C. all-wave superhet multi-valve 8-stage circuit, with "Prestuning" on six stations.
 Wave-ranges.—Short 16.5-51 metres; medium, 200-560 metres; long, 1,000-2,000 metres.
 Controls.—Four controls, covering manual tuning, tone, volume, and wave-change/gram. switch. Six push buttons.
 Price.—15½ guineas.
 Makers.—Ferranti, Ltd., Radio Works, Moston, Manchester, 10.

The large horizontal station and degree marked dial which, incidentally, is placed at an angle convenient to the eye and edge-lit in three colours, renders identification and tuning a very simple matter. It is brought into operation by the wave-change switch which allows the circuit to be changed over from manual to "Prestune."

The bottom left-hand control is for on-off and volume and that on the right hand for wave-change, manual/Prestune, the gramophone pick-up. A small knob is provided in the centre of these which provides a very effective wide range tone control.

The six "Prestune" buttons are fitted in a recess below the variable controls, and when they are brought into circuit the station name indicators, located above each button, are illuminated.

While on the subject of controls, Ferranti's have eliminated the trouble of having to use the wave-change switch for the push-button circuits, as stations on the medium or long waves are brought in as soon as the appropriate button is pressed, thus giving automatic tuning in the fullest sense of the word.

Our first tests were carried out with the manual control in action and the effectiveness of the reverse vernier adjustment was fully appreciated, especially when receiving the short-wave transmissions. Although our tests were made in the heart of London, and with an aerial a shade below average efficiency, there was ample reserve of power on all worth-while stations, while on the local and more powerful transmissions the speaker and the output circuit, which

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WIRELESS TRANSMISSION FOR AMATEURS
 By F. J. CAMM

The importance of amateur transmitting has been recognised by the Government, as well as by radio manufacturers. This recognition has been implemented by the formation by Sir Kingsley Wood of the Civil Wireless Reserve, which invites all amateur transmitters to join. This is work of first National importance, and there is a big demand amongst experimenters for a book which will explain, not only how to build amateur transmitting sets, but also how to learn the morse code and obtain the licence. WIRELESS TRANSMISSION FOR AMATEURS deals with the subject in a simple yet fascinating way, and the text is rendered even more lucid by the use of many practical and easily understood diagrams.

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LETTERS FROM READERS

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

Correspondent Wanted: Club for Dundalk?

SIR,—I wish to thank you for the article on Amateur Transmission which appeared in your paper on September 24th. It has been a great help to me in forming my station, which has been my ambition since I first took an interest in wireless. Your paper has helped me make a very efficient "listening station," and I hope it will help me, by aid of your new series, to form a better "transmitting station."

I would very much like to hear from a "ham" in my district, who might be kind enough to give me some more ideas, etc., in helping me to form my station.

I have done a good deal of experimenting, having built a number of sets, chiefly short-wave ones, and I always try new circuits which appear in your paper.

There is not a wireless club of any description in Dundalk, so perhaps some Dundalk readers would co-operate with me in forming one.—John R. Bothwell, 5, Stapleton Place, Dundalk, Co. Louth.

A Good DX Log

SIR,—I should like to thank you for your decision to again print a selection of readers' logs. Providing that these consist of real DX, and where necessary the time of reception, etc., they really are of great assistance to the S.W.L. I enclose the best from my 14 mc/s. 'phone log for the past few weeks: W5FDI, ACY, FSS, GGX, GAR, BEK, EHM, DNV, W6FUO, NHB, IGX, KRB, NMI, BPM, RK, YU, W7BVO, EGV, FEZ, EYD, FAQ, FLG, GPY; PK1MX (16.45 B.S.T.), KA7EF (22.15 B.S.T.), VQ4KTB (21.15 B.S.T.), K6OQE (07.45-09.00 B.S.T.), K6OJI (08.00 B.S.T.); YV1AP, 5ABQ, HK3LC, HC1JW, PZ, 2HP; VP3AA, CX1AA, 2AK, AU, CO, CE1AO, 2BX, 3BK, BH, OA4C, AI, XE1LK, 2IK, TG9AA, T2FG, 3AV, K4FAY, EVC, K5AH, NY2AE, HH5PA, VP5IS, VP6YB, OH2OI, VE4ADV, VE5JK, OT, ABD, ACN, EF, NY.

The Editor will be pleased to consider articles of a practical nature suitable for publication in PRACTICAL AND AMATEUR WIRELESS. Such articles should be written on one side of the paper only, and should contain the name and address of the sender. Whilst the Editor does not hold himself responsible for manuscripts, every effort will be made to return them if a stamped and addressed envelope is enclosed. All correspondence intended for the Editor should be addressed: The Editor, PRACTICAL AND AMATEUR WIRELESS, George Newman, Ltd., Tower House, Southampton Street, Strand, W.C.2.

Owing to the rapid progress in the design of wireless apparatus and to our efforts to keep our readers in touch with the latest developments, we give no warranty that apparatus described in our columns is not the subject of letters patent.

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VK2NO, NS, YQ, NQ, VB, AHA, OQ, ABC, HS, BK, VV, DI, TC, XS, DA, ZC, AIB, YL, QR, UC, TO, ADK, VU, AI, ADE, AFO, AFR, TI, JZ, HV, ACL, YO, OZ, NY.

VK3HG, BM, WA, ZX, ZL, ES, KX, PE, XJ, FF, OL, DH, IG, AM, XJ, TZ, EH, ZB, XG, DG.

VK4KO, JU, AP, JP, BB, WS.

VK5BF, SW, AI.

(All VKs heard between 07.00 and 08.30 B.S.T.).

The receiver is an o-v-1 with headphones (battery-operated) and the antenna is an

outdoor circular frame, 30ft. high and using 80ft. of wire together with the downlead.

I have recently received cards from PK1ZZ, 3GD, 4DG, XZ2EZ, VK3ZX, OL, VE5VO, OT, 4VD, FBSAD, VU2CA, VQ4KTB, W7BCU, FEZ, AXS, AMQ, GAE, BWI, etc. All for reception on 20m. 'phone.—L. Singletary (Wisbech, Cambs.).

A Bag of Veri's

SIR,—As a regular reader of PRACTICAL AND AMATEUR WIRELESS I thought perhaps some of the verifications I have received would interest other readers. They are as follows:

S.S. *Queen Mary, Normandie, Manhattan, Otranto and Oransay*. I also have verifications from the following stations: W3XAL, VK2ME, VLR, TI4NRH, PRAS, TFJ, and VP3BG. My best one is, I think, a notification from the Terry Holden expedition, VP3THE, with three snaps on the V. card of the expedition, which was 500 miles up the Amazon when I picked up the transmission. They were experiencing terrible hardship through jungle and swamp. My receiver is a commercial All-World two to which I have made several additions.—G. EUSTACE (Reading).

RADIO CLUBS & SOCIETIES

Club Reports should not exceed 200 words in length and should be received First Post each Monday morning for publication in the following week's issue.

DOLLIS HILL RADIO COMMUNICATION SOCIETY

At the meeting on September 20th, members interested themselves on several "dud" receivers, and under supervision busied themselves in tracing faults. The next meeting is on October 18th on which date Mr. H. J. Walters, of Belling and Lee, will lecture on "Interference Suppression," together with a demonstration, and readers of this paper are invited to attend. Meetings are held fortnightly at 8.15 p.m. in Braintrot Schools, Warren Road, Cricklewood, N.W.2, and further particulars of membership will gladly be sent on request. Hon. Sec., Mr. E. Eldridge, 79, Oxgate Gardens, Cricklewood, N.W.2.

NORTH MANCHESTER RADIO SOCIETY

THIS society, which holds meetings regularly at their headquarters at 14, Fairfax Road, Prestwich, and at which Morse lessons are given regularly, as well as the usual demonstration of receivers, and short-wave discussions, etc., is this year showing a collection of short-wave amateur transmitting and receiving equipment, etc., at the City Hall, Manchester, from September 27th to October 8th. On one side of the stand may be seen a complete commercially-constructed amateur band transmitter and receiver, etc., with QSL cards from amateurs on the walls above and around the gear. The other side is similarly arranged except that all the gear is amateur constructed. The rear section of the stand is taken up with various small amateur constructed transmitters, receivers, and ultra-short-wave transceivers, log books, etc. All radio amateur short-wave listeners, etc., are welcome at this stand. The representatives on the stand will be pleased to give any information to anyone interested, regarding short-wave radio, etc. Also information can be obtained regarding any other Manchester district radio societies. Sec., R. Lawton, 10, Dalton Avenue, Thatch Leach Lane, Whitefield, near Manchester.

SOUTH LONDON AND DISTRICT RADIO TRANSMITTER SOCIETY

THE summer season caused no falling off in activity. Recent lectures included Mr. Nixon (G.E.C.) on "Modern Valve Manufacture," the chairman (G2NH) on "A Portable C.C. Transmitter for 56 MC," and "A day in my life," by the radio editor of a London daily paper. An interesting winter programme has been arranged, and commenced with a talk by ZS1AH on October 3rd. Meetings are held at the Brotherhood

Hall, West Norwood, on the first Wednesday in every month. All keen short-wave amateurs are cordially invited. Sec., H. D. Cullen (G5KH), 104, West Hill, S.W.15.

THE CROYDON RADIO SOCIETY

A WAKENING from its summer slumber, the Croydon Radio Society is all ready for a new season. It began on Tuesday, October 4th, in St. Peter's Hall, Ledbury Road, S. Croydon. The new programme covers a wide range of frequencies, as it were, including the latest in Television technique, a continued search for the highest quality reproduction, talks on music and, of course, talks and demonstrations by the society's own members. Nor have last season's evenings on home recording been forgotten as several demonstrations on this topic are scheduled. It must be emphasised, however, that no society can succeed without the enthusiasm of its members, and although this is assured from those already enrolled, newcomers will be very welcome. It is, indeed, to readers of PRACTICAL AND AMATEUR WIRELESS that the society looks for new members, so anyone interested is invited to come along. Finally, a fixture card is available to readers just to give them an idea of the good things in store. Hon. Pub. Sec., E. L. Cumbers, Maycourt, Campden Rd., S. Croydon.

THE EASTBOURNE AND DISTRICT RADIO SOCIETY

AT a committee meeting of this society, held on Monday, September 19th, it was decided to go back to monthly meetings as from November 17th. One new rule was proposed. Mr. W. Morgan of the committee was elected vice-chairman, and to fill his place in the committee, Mr. F. E. Wingfield was chosen. Tuesdays will be tried for the meeting days, as more members seem to be finding Monday difficult. Hon. Sec., T. G. R. Dowsett, 48, Grove Road, Eastbourne, Sussex.

A WIRELESS CLUB FOR SARRE, KENT

MR. A. B. WESTMANCOTT, of Elleswood, Sarre, Kent, wishes to start an Amateur Club for those interested in amateur transmitting. He invites local readers to get in touch with him.

THE EXETER AND DISTRICT WIRELESS SOCIETY

AT our last meeting, Mr. H. A. Bartlett, G5QA, gave a talk on "Amateur Radio Work" during the past ten years.

He emphasised the amount of research that is being done on the ultra-high-frequencies, but especially on 56, 112 and 224 mc/s. Mr. Bartlett then gave a display of the official films which had been specially sent down by the R.S.G.B. and the films illustrated many well-known London amateur transmitting stations and also events in the Annual National Field Day Competition.

At the next meeting members will bring along their own short-wave receivers for discussion and test. Meetings are to be held every Monday at 3. Dix's Field, Exeter, at 8 p.m. and all those interested should get in touch with the secretary, Mr. W. Ching, 9, Sivel Place, Heavitree, Exeter.



QUERIES and ENQUIRIES

course, be eliminated by leaving the connection open.

Bias for Output Valves

"I am going to build an A.C. amplifier with two triodes of the directly-heated type in the output stage. What is the best method of obtaining automatic bias in a case such as this? I believe there are several methods available for an output stage and should like to know the most direct."—K. G. T. (Bletchley).

THE simplest and most direct method is to connect the bias resistance and condenser in parallel between the centre tap of the heater winding for the output valves and the earth line. There are other more comprehensive schemes whereby variable components may be used to adjust the bias, and it is also possible to use

A.C. £4 Superhet

"I recently sent for the blueprint and issue describing the A.C. £4 Superhet, and on writing off for a quotation for the parts was informed that they came to £12 5s. 9d., including valves, speaker, etc. I should be glad to know why this is called a £4 superhet, and should like to know if I have gone wrong or made a mistake in thinking this could be built for £4."—A. E. W. (Clevedon).

THE receiver in question is an A.C. version of the receiver which was known as the £4 Superhet. We generally describe a battery receiver and afterwards publish mains versions, and these naturally take the name of the battery original. The battery superhet cost £4 for the Kit A and thus was known as the £4 Superhet 4. The A.C. model must obviously cost more than its battery counterpart, but to preserve the identity of the set it was known as the A.C. £4 Superhet.

Pick-up Volume

"Could you advise me how to obtain more volume from my wireless set when I am playing the gramophone via pick-up? The volume is hardly sufficient even with the volume control at its maximum. The pick-up is a B.T.H. minor and the set a four-valver (including rectifier) all mains."—T. McB. (Hebburn).

YOU do not state where the pick-up is connected. As the set is a four-valver, including rectifier, we imagine that the circuit is an S.G.-detector-output arrangement, and the pick-up should be connected in the grid circuit of the detector. If this is so, the volume should be ample if the pick-up is in order. If, however, the pick-up is joined in the grid circuit of the output valve this would give poor volume and could account for your trouble. In that case, we advise you to try and transfer the pick-up to the detector stage.

Multi-purpose Neon Tester

"Could you inform me where I could purchase the Neon Lamp for the multi-purpose neon tester published in the July 16th issue? What does this cost?"—W. H. (Oldham).

THE lamp is a type B.C. Osglim and is supplied by the General Electric Company. It should be obtainable from any local electrical store, and the price is 2s. 6d.

Earth and Quality

"I find that on disconnecting the earth lead of my receiver it actually improves the quality of reception, and I shall be glad to know if it will cause the set no harm to use it without an earth connection."—P. P. H. (Girvan).

BY removing the earth connection the efficiency of the receiver is reduced slightly, and this may account for an apparent improvement in quality. Similarly it is possible that interference may be introduced by the earth lead and this would, of

Morse Practice

"I have been trying to pick up Morse in order to qualify for a transmitting licence, but I find it difficult to obtain slow-sending signals, and also many of the signals which I can pick up I am doubtful about as the code does not enable me to check my results. Is there any automatic device on the market which would assist me—I believe there is something of the kind in America?"—H. E. R. (Anerley).

THE automatic apparatus you refer to is quite good, but we think you would find a set of gramophone records more useful. The Columbia Company supply these and they are in the form of a set of three records—double sided. The first part gives the code as used in International telegraphy and the second gives the figures. The third part consists of more difficult plain language matter with some figures and difficult words, transmitted at a little higher speed than Part 2. The fourth part includes stock quotations, etc., similar to that transmitted daily to ships at sea. Speed is a little faster. The fifth part is miscellaneous matter, and the sixth is of a little more difficult matter at a higher speed. A booklet is supplied giving the translation of the signals.

Making a Cabinet

"I am building, or at least thinking of building a radiogram cabinet, and have been told by some friends that ordinary plywood, no matter how thick, is no good. As it seems that the majority of commercial cabinets are made from this material, and as it is not too dear, I should like to use it, but should like to know whether there is any truth in the above statement."—L. S. (Finchley).

IT is quite in order to use ply or laminated wood, but it must always be remembered that should the adhesive between adjacent layers dry out or crack, the vibration from the speaker may easily set up rattles or other noises which may lead to your taking down a receiver in order to trace a fault which does not exist. A good solid wood cabinet is the best, and in spite of the increase in cost is well worth while. It is also worth while to use a plain opening rather than a fretted opening for the speaker in the interests of good quality reproduction.

Coil Connections

"I have a dual-range coil which I wish to use in a simple 3-valve set but I am rather in doubt as to the proper connections. I enclose a sketch of the windings and would be very grateful if you would let me know how it should be connected and what the connections for the reaction condenser are."—H. T. L. (Plumstead).

WHEN tracing out connections for an unknown coil the medium-wave winding is generally found to be that with the thicker wire. Where the coil is tapped the aerial is generally joined to the tapping. Where two separate coils are found in addition to the medium-wave winding one is generally employed for reaction and one for aerial coupling. Unfortunately, however, it is not possible to give any definite instructions for connecting such a coil as various methods of winding and terminal numbers are adopted.

RULES

We wish to draw the reader's attention to the fact that the Queries Service is intended only for the solution of problems or difficulties arising from the construction of receivers described in our pages, from articles appearing in our pages, or on general wireless matters. We regret that we cannot, for obvious reasons—

- (1) Supply circuit diagrams of complete multi-valve receivers.
- (2) Suggest alterations or modifications of receivers described in our contemporaries.
- (3) Suggest alterations or modifications to commercial receivers.
- (4) Answer queries over the telephone.
- (5) Grant interviews to querists.

A stamped addressed envelope must be enclosed for the reply. All sketches and drawings which are sent to us should bear the name and address of the sender.

Requests for Blueprints must not be enclosed with queries as they are dealt with by a separate department.

Send your queries to the Editor, PRACTICAL AND AMATEUR WIRELESS, George Newnes, Ltd., Tower House, Southampton Street, Strand, London, W.C.2. The Coupon must be enclosed with every query.

separate heater windings for each of the output valves with resistances in the centre tap of each.

The Argon Charger

"Having built the Argon Charger as specified in your paper, and having had a little trouble, I should like to know if everything is now O.K. For instance, the output terminals for accumulators give a reading of 25 volts on my meter and the ammeter only varies between 1.25 and 2 amps when the apparatus is functioning. As this does not appear to be correct and I am only a beginner in this line, perhaps you could put me right."—W. C. C. (Farington, Nr. Preston).

THE reading at the output terminals is approximately correct—the output varying according to the load. The current reading should be approximately 1.2 amps, and it should not be permitted to rise above 1.3 amps. You must adjust the series resistance to obtain the necessary output and should remember that the output will vary with the load. If sufficient control cannot be obtained you may employ a larger resistance, but in case of doubt it may be advisable to have the rectifying valve tested. We assume that the transformer is correctly wound.

The coupon on page iii of cover must be attached to every query.

Practical and Amateur Wireless BLUEPRINT SERVICE

PRACTICAL WIRELESS		No. of	F. J. Camm's 2-valve Superhet ..	13.7.35	PW52
CRYSTAL SETS		Date of Issue	F. J. Camm's 4 Superhet ..	—	PW59
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Blueprints, 6d. each.			Mains Sets : Blueprints, 1s. each.		
1937 Crystal Receiver ..	9.1.37	PW71	A.C. 25 Superhet (Three-valve) ..	—	PW43
The "Junior" Crystal Set ..	27.5.35	PW94	D.C. 25 Superhet (Three-valve) ..	1.12.34	PW42
STRAIGHT SETS. Battery Operated.			Universal 25 Superhet (Three-valve) ..	—	PW44
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All-wave Unipen (Pentode) ..	—	FW31A	F. J. Camm's Universal 24 Superhet 4 ..	—	PW60
Beginner's One-valver ..	19.2.33	FW85	"Qualitone" Universal Four ..	16.1.37	PW73
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Two-valve : Blueprints, 1s. each.			Simple S.W. One-valver ..	9.4.33	PW38
Four-range Super Mag Two (D, Pen) ..	—	PW36B	Two-valve : Blueprints, 1s. each.		
The Signet Two (D & LF) ..	24.9.33	PW76	Midget Short-wave Two (D, Pen) ..	—	PW38A
Three-valve : Blueprints, 1s. each.			The "Fleet" Short-wave Two (D (HF Pen), Pen) ..	27.8.39	PW91
The Long-range Express Three (SG, D, Pen) ..	24.4.37	PW2	Three-valve : Blueprints, 1s. each.		
Selectone Battery Three (D, 2 LF (Trans)) ..	—	PW10	Experimenter's Short-wave Three (SG, D, Pow) ..	30.7.39	PW30A
Sixty Stalling Three (D, 2 LF (RC & Trans)) ..	—	PW34A	The Perfect 3 (D, 2 LF (RC and Trans)) ..	7.8.37	PW63
Leader Three (SG, D, Pow) ..	22.5.37	PW35	The Band-Spread 8.W. Three (HF Pen, D (Pen), Pen) ..	1.10.38	PW68
Summit Three (HF Pen, D, Pen) ..	—	PW37	Three-valve : Blueprints, 1s. each.		
All Pentode Three (HF Pen, D (Pen), Pen) ..	29.5.37	PW30	F. J. Camm's ELF Three-valve Portable (HF Pen, D, Pen) ..	—	PW65
Hall-Mark Three (SG, D, Pow) ..	12.6.37	PW41	Parvo Flyweight Midget Portable (SG, D, Pen) ..	19.6.37	PW77
Hall-Mark Cadet (D, LF, Pen (RC)) ..	16.3.35	PW48	Four-valve : Blueprint, 1s.		
F. J. Camm's Silver Souvenir (HF Pen, D (Pen), Pen) (All-wave Three) ..	13.4.35	PW49	"Imp" Portable 4 (D, LF, LF, Pen) ..	19.3.38	PW86
Genet Midget (D, 2LF (Trans)) ..	June '35	PW1	MISCELLANEOUS.		
Cameo Midget Three (D, 2 LF (Trans)) ..	8.6.35	PW51	S.W. Converter-Adapter (1 valve) ..	—	PW48A
1936 Sonotone Three-Four (HF Pen, HF Pen, Westcott, Pen) ..	—	PW53	AMATEUR WIRELESS AND WIRELESS MAGAZINE		
Battery All-Wave Three (D, 2 LF (RC)) ..	—	PW55	CRYSTAL SETS.		
The Monitor (HF Pen, D, Pen) ..	—	PW61	Blueprints, 6d. each.		
The Tutor Three (HF Pen, D, Pen) ..	21.3.36	PW62	Four-station Crystal Set ..	23.7.33	AW427
The Centaur Three (SG, D, P) ..	14.8.37	PW63	1934 Crystal Set ..	—	AW414
The Gladiator All-Wave Three (HF Pen, D (Pen), Pen) ..	—	PW69	150-mile Crystal Set ..	—	AW450
F. J. Camm's Record All-Wave Three (HF Pen, D, Pen) ..	31.10.30	PW69	STRAIGHT SETS. Battery Operated.		
The "Colt" All-Wave Three (D, 2 LF (RC & Trans)) ..	5.12.33	PW72	One-valve : Blueprints, 1s. each.		
The "Rapid" Straight 3 (D, 2 LF (RC & Trans)) ..	4.12.37	PW82	B.B.C. Special One-valver ..	—	AW387
F. J. Camm's Oracle All-Wave Three (HF, Det, Pen) ..	23.9.37	PW73	Twenty-station Loudspeaker One-valver (Class B) ..	—	AW440
1938 "Triband" All-Wave Three (HF Pen, D, Pen) ..	22.1.38	PW84	Two-valve : Blueprints, 1s. each.		
F. J. Camm's "Sprite" Three (HF Pen, D, Tet) ..	26.3.38	PW37	Melody Ranger Two (D, Trans) ..	—	AW388
The "Hurricane" All-Wave Three (SG, D (Pen), Pen) ..	30.4.38	PW89	Full-volume Two (SG det., Pen) ..	—	AW392
F. J. Camm's "Push-Button" Three (HF Pen, D, Pen, Tet) ..	3.9.38	PW92	B.B.C. National Two with Lucerne Coil (D, Trans) ..	—	AW377A
Four-valve : Blueprints, 1s. each.			Big-power Melody Two with Lucerne Coil (SG, Trans) ..	—	AW338A
Sonotone Four (SG, D, LF, P) ..	1.5.37	PW4	Lucerne Minor (D, Pen) ..	—	AW426
Fury Four (2 SG, D, Pen) ..	8.5.37	PW11	A Modern Two-valver ..	—	WM409
Beta Universal Four (SG, D, LF, C, B) ..	—	PW17	Three-valve : Blueprints, 1s. each.		
Nucleon Class B Four (SG, D (SG), LF, C, B) ..	6.1.34	PW34B	Class B Three (D, Trans, Class II) ..	—	AW386
Fury Four Super (SG, SG, D, Pen) ..	—	PW34C	New Britain's Favourite Three (D, Trans, Class B) ..	15.7.33	AW394
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