COLOUR TELEVISION EXPLAINED

See page 657

Practical and Amateur Wireless

AND PRACTICAL TELEVISION

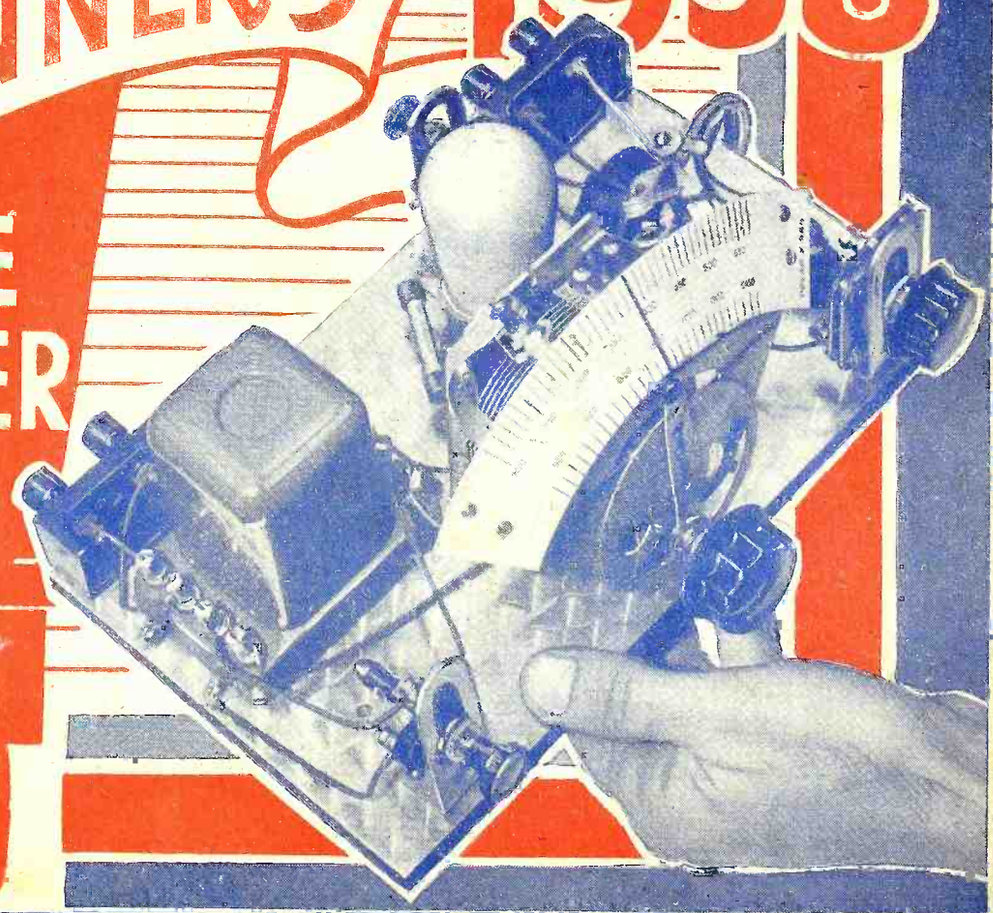
3D. EVERY WEDNESDAY

Edited by F. J. CAMM

a GEORGE NEWNES Publication

Vol. 11. No. 284. February 26th, 1938.

The BEGINNER'S ONE VALVER 1938



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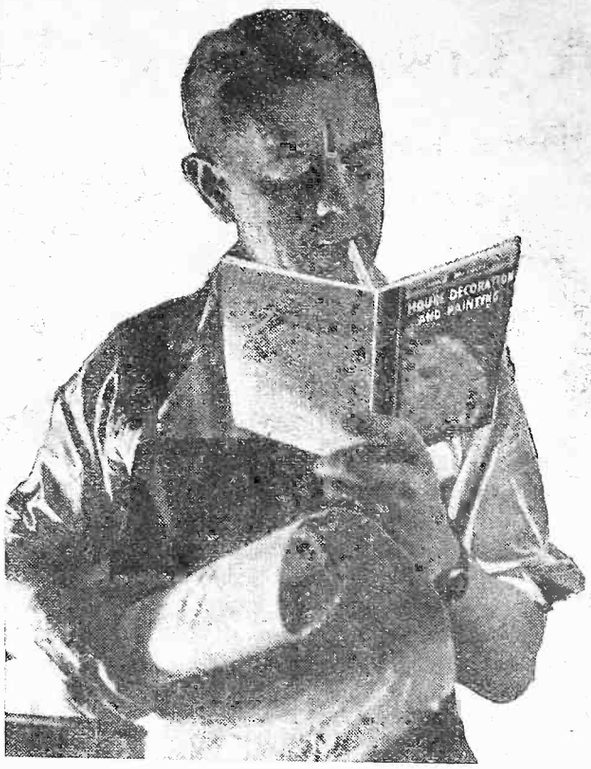
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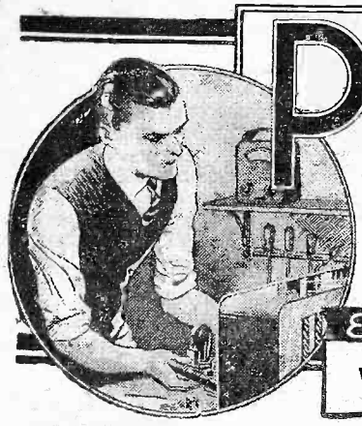
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A Long-Wave Rejector Unit—See Page 664



Practical and Amateur Wireless

Edited by F. J. CAMM

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

VOL. XI. No. 234. February 26th, 1938.

ROUND *the* WORLD *of* WIRELESS

Colour Television

THE present-day television system is admitted by experts in all parts of the world as being the most efficient which can be designed with present-day knowledge. England is the only country in which a regular television programme for domestic use is being transmitted, and in no other country in the world are complete domestic television receivers on sale. Many other countries are experimenting with high-definition systems, and in America and Germany satisfactory transmissions have been carried out and transmitting equipment designed, but so far domestic receivers have not been made generally available. Engineers and technicians connected with the various companies have installed apparatus at different points for test purposes, but we lead the world in this respect, and with the extension of hours which will shortly take place we are establishing a lead which it will be very difficult to overtake. At present, however, the pictures are in monochrome—that is, in one colour, the general tone depending upon the chemical with which the fluorescent screen is coated. The next step in developing television is to produce the picture in natural colours, and Mr. Baird, the well-known pioneer of television in this country, has succeeded in evolving apparatus which enables this to be done, and a full description of the transmitting and receiving equipment is given in this issue for the first time. The next step will, of course, be to produce the coloured picture stereoscopically, and with that step television will be perfected.

Television at Ideal Homes

AT the forthcoming Ideal Homes Exhibition in London it is anticipated that television demonstrations will be given. An extensive television exhibit is being arranged, and if plans so far prepared materialise, a reproduction of the television studio from which various acts will be televised to the receivers in the exhibition may be included.

Bologna Not to Close Down

IT is stated that reports to the effect that Radio-Marconi (Bologna) is shortly to close down are without foundation. This station supplies a definite need in Italian broadcasting and is required in addition to the other stations such as Bari and Trieste.

Cambridge Instrument Company

THE Head Office and Showrooms of the Cambridge Instrument Company, Ltd., have been transferred from 45, Grosvenor Place to 13, Grosvenor Place. The 'phone number remains Sloane 9146.

KTSM Joins N.B.C. Network

DURING the spring the city of El Paso, Texas, will join the regular audience of the National Broadcasting Company, and station KTSM will become a member of the Pacific supplementary group available to either the Red or Blue networks.

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Aerial Television

ALTHOUGH it has not been possible to obtain verification, it is reported that tests are being made in this country with a portable television camera fitted to an aeroplane, with a special transmitter designed so that the 'plane could transmit to a distant point a picture of the ground over which it passes. Such a device would be of the utmost use during war-time, but the standard type of existing apparatus would be very difficult to adapt for such a purpose.

A Ghost Story

HUGH ALLEN'S story, "Gallows Hill," in the Northern programme on March 1st, has a theme sound, the creak of a swinging gibbet, weirdly appropriate to this shocker which links the hold-up of a snow-bound coach in the days of the highwaymen to fatalities at the crossroads to-day.

Theatre Variety

ON March 1st a variety bill will be broadcast from the Opera House, Cheltenham, under the direction of Reg. A. Maddox Theatrical Enterprises, Ltd. The principal acts will be Bob and Alf Pearson, Roy Davey and George Harold.

B.B.C. Orchestra at Aberdeen

ON March 23rd the B.B.C. Symphony Orchestra, under the direction of Sir Adrian Boult, will give a concert in the Music Hall, Aberdeen, at 8.0 p.m. Works by Schubert, Beethoven, Strauss and John Ireland will be included, and tickets may be obtained from Messrs. Paterson, Sons and Marr Wood, Ltd., 183, Union Street, Aberdeen.

Bryan Michie

SINCE he left the B.B.C. Bryan Michie has acquired many "fans" as a result of his stage activities and it is now reported that a fan club has been inaugurated, similar to those which have been started for well-known radio and stage stars. It is stated that he is the first B.B.C. official to be given this honour.

Radio, Stage and Screen

A NEW endeavour is to be made to link the interests of the three fields of entertainment, as a result of which the chiefs of stage and screen production are to be called to the microphone to give their stories of triumphs and failures. Closer co-operation between producers will undoubtedly lead to better and brighter programmes.

Carroll Levis and His Discoveries

IN a special programme on the Regional on March 2nd Carroll Levis will bring to the microphone those artists from all parts of Britain who have been most popular with listeners during the last two series of "Discoveries." At least fourteen acts will be included in this "encore" broadcast and a studio audience will, as usual, be present.

ROUND the WORLD of WIRELESS (Continued)

New B.B.C. Appointment

WE are informed that Mr. Cyril Conner has been appointed Newcastle Director, and will take up his duties after Easter. He was educated at Haileybury and Oxford, and was called to the Bar as a member of the Inner Temple in 1924. He has close family connections with the North East Coast.

INTERESTING and TOPICAL NEWS and NOTES

Belling and Lee at British Industries Fair

THIS well-known firm have staged a very interesting display at the B.I.F., and their stand is devoted almost entirely to appliances for the suppression of electrical interference with wireless communication, for use at the source of trouble, and at the listener's end. All appliances are in accordance with the relative B.S.I. specifications. Specially designed H.F. filters are shown with and without chokes, H.F. chokes in hank form, and as complete units in metal cases, from 2 to 100 amps., lift and neon suppressors, flashing sign suppressors, etc., and small units in bakelite cases for connection to small electrical appliances.



John Snagge, the B.B.C. commentator, receiving final instructions from divers, prior to entering the tank for a rehearsal of his under-water broadcast.

Opera at Stratford

THE Royal Carl Rosa Opera Company is to pay a visit to the Memorial Theatre, Stratford-upon-Avon, in February, and on February 25th there will be a broadcast of the first act of "La Bohème." Luella Paikin plays Mimi and the other principal parts are taken by John Torney, Hubert Dunkerley, George Hancock, Phillip Bertram and Liddell Peddieson.

Orchestral Concert

SIR DONALD TOVEY will conduct the Reid Symphony Orchestra in a Concert broadcast from the Usher Hall, Edinburgh, on February 24th. He will have as his solo artist Ina Souez, a soprano whose beautiful voice has won her countless admirers among the listening public. She will sing two Arias "Come Scoglio" from Mozart's "Cosi fan tutte," and "Casta Diva," by Bellini. Included in the orchestral part of the programme will be Schubert's Overture, in the Italian style, and works by Respighi and Mozart.

"Snow White and the Seven Dwarfs"

IT is interesting to note that within a week or two of the London première of the full-length Walt Disney film, "Snow White and the Seven Dwarfs," a radio version of it is to be broadcast on the National wavelength on March 15th and on the Regional on March 17th—the earliest dates on which space can be found in the programmes. This will be John Watt's first production since he became Director of Variety some months ago and he is adapting the story for a one-hour broadcast.

The film itself runs for an hour and twenty minutes. It took three years to make, cost more than £250,000, and consists of over two and a half million drawings. It is the first full-length screen show without a human actor. In the radio version the part of "Snow White" will be taken by Wynne Ajello, who appeared in most of John Watt's earlier adaptations of the "Silly Symphony" and "Mickey Mouse" films.

Each of the seven dwarfs—Dock, Happy, Sleepy, Grumpy, Dopey, Sneezy, and Bashful—will probably be cast from members of the B.B.C. Revue Chorus, who brilliantly re-created for radio the quaint and amusing animal characters whose "crack's" and capers have so delighted filmgoers.

Ships and Seamen

LISTENERS who like to hear reconstructed history will eavesdrop on Francis Drake and Queen Elizabeth discussing Drake's plans on board the *Golden Hind* in the school broadcast on February 24th. In the same programme, Captain Cook will be heard describing his plans and his needs in connection with his voyage of exploration in the Southern seas.

Televising International Rugger

TELEVISION'S first Rugger game—the international match between Scotland and England—will be seen by viewers on March 19th. Three cameras will be used: one on the north stand, and two opposite the respective twenty-five yards lines. It will thus be possible to cover the whole field, both in comparative close-ups and with plan views. Captain H. B. T. Wakelam's commentary in the National programme will accompany the vision transmission.

Northern Concerts

DURING the present week the North will provide two midday concerts in the Regional programme. On February 25th a quartet led by Eric Eaden in chamber music from Mozart and Beethoven will be broadcast from Sheffield University, and the Northern Orchestra on February 26th seeks southern sunshine with Rossini's "Italian in Algiers," Fauré's "Sicilienne," and Respighi's "The Birds" suite.

"Song Album"

IT used to be a custom in many families to have a song album between whose covers were preserved songs grave and gay, stirring and sentimental, that were most popular with members of the household. Mark H. Lubbock, B.B.C. Music Director of Variety, belonged, quite naturally, to such a family and from his cousin's collection he has chosen eight typical numbers to be broadcast on February 24th (Regional) in a programme called "Song Album."

The songs will be sung by Lorely Dyer and Stanley Hoban, to the accompaniment of The Frank Walker Octet, conducted by Mark H. Lubbock, who, with George Gordon, will present the half-hour show.

SOLVE THIS!

PROBLEM No. 284.

Deville built a Det. L.F. set with band-pass tuning utilising a gang condenser. After some time he decided a better set was needed and accordingly bought an S.G. valve and remodelled the set into portable form. He wound a frame aerial and split the two band-pass coils, using one for the grid circuit of the detector stage and the other for the S.G. stage, connecting the aerial across the first tuning condenser. He found, however, that results were very inferior, only two stations being received. Why was this? 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. 284 in the top left-hand corner and must be posted to reach this office not later than the first post on Monday, February 28th, 1938.

Solution to Problem No. 283.

When Jackson modified his receiver he used the same variable-mu control connections as in the Corona, the grid being returned to the control potentiometer through a grid leak. The control was mounted on a bracket on the metal surface of the baseboard, and he had chosen a control with a "live" spindle. Accordingly the grid of the first valve was earthed through the potentiometer and this prevented the first stage from functioning. The control should have been insulated from the bracket, or the metal surface cut away below the bracket.

The following three readers successfully solved Problem No. 282, and books have accordingly been forwarded to them:—B. R. Sparrow, St. Julian's House, St. Stephens, St. Albans; G. J. Begg, 24, Quarryside Buildings, Nybster, Aukengill, Wick; F. G. Cockerill, 133, Beckett Road, Doncaster.

The 1938 One-valver

Completing the Wiring, Modifying the Selectivity, and Making a Coil for Use in this Simple Receiver - - By W. J. DELANEY

IN the main constructional details which were given last week there was one important point which was not dealt with, but which must be given very close attention when building the receiver. On the blueprint it will be found that three sets of insulating washers are shown attached to the three component-mounting brackets, and it is essential to use these or adopt some other scheme to insulate the switches and the reaction from the metal baseboard. If the circuit is examined it will be seen that the metal baseboard is employed for certain earth return leads, these being marked with the letters M.B. At these points bare wires are joined beneath heads of screws driven into the baseboard, and this saves a certain amount of wiring, as the various M.B. points are interconnected through the metal surface. The component-mounting brackets will also be in contact with the base and thus will be earthed through it, and as the spindle of the reaction condenser and also the spindles of the switches will come into contact with the bracket, steps must be taken to prevent the circuit from being completed through them. If this step is not carefully watched the L.T. and H.T. supplies will be short-circuited. Small circular insulating washers are obtainable, however, and may be attached on each side of the lock-nuts used for mounting these components, and when attaching the outer nut the components should be carefully moved so that the spindle does not come into contact with the sides of the brackets.

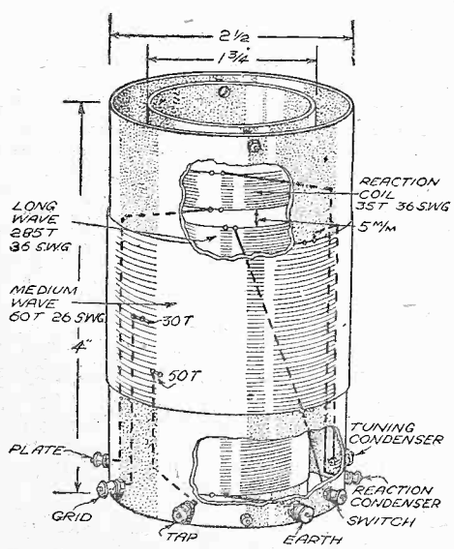


Fig. 2.—Constructional details of an experimental coil for this receiver.

An Alternative Scheme

There is a simpler scheme which may be adopted if difficulty is experienced in obtaining the washers, and this is to cut away the metal surface beneath the mounting bracket, cutting out a square of the metal slightly larger than the foot of the bracket. This may be done with a chisel or a sharp knife, making quite certain that when the bracket is screwed down no part of it touches the metal surface. To ensure that the two wires from terminals No. 3 and 5 on the coil unit make good contact with the base, the paint on the projecting lugs should be scraped away until the metal is left clean and shiny and then the two wires may be attached by means of two of the screws used to hold the coil in position. In one of the illustrations on this page it will be noted that instead of using a bolt for earthing the wire from the fuse the wire has been placed underneath the H.F. choke and this saves a bolt or screw. Similarly, the wire from the wavechange switch which is shown connected to the chassis may, if desired, be attached to the screw holding down the coil.

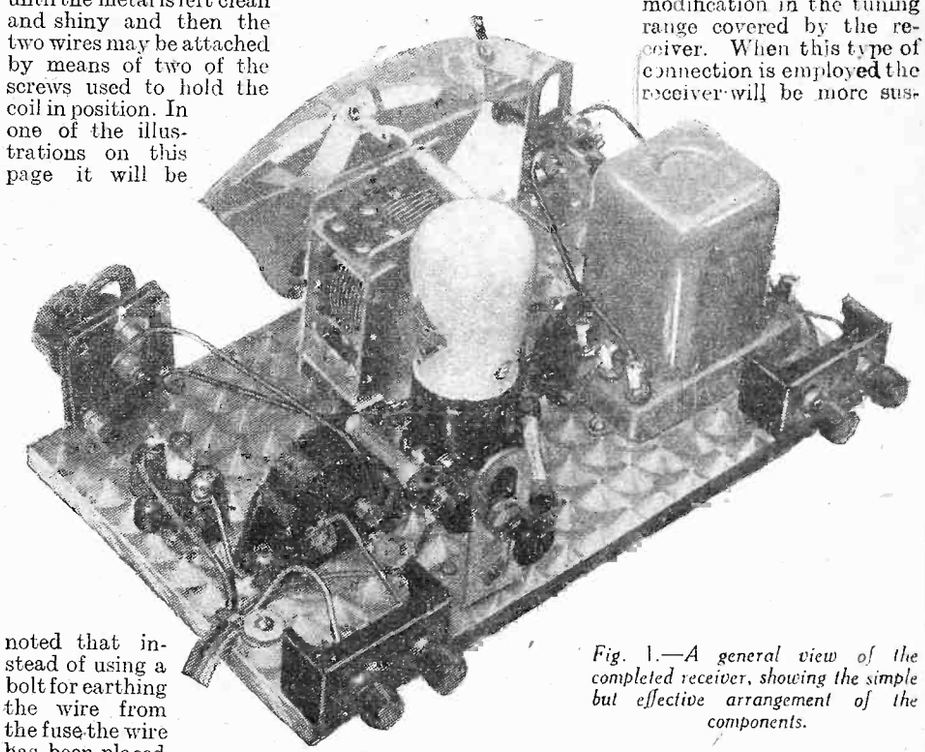


Fig. 1.—A general view of the completed receiver, showing the simple but effective arrangement of the components.

Improving Selectivity

Under the majority of conditions met with in this country the selectivity of the set should be adequate to separate the local stations, but in some parts it may be found that the two local stations just overlap. Alternatively it may be found that conditions are extremely good in some places and that distant stations are received so well that they afford entertainment value, but the local stations form a background which prevents the satisfactory reception of those stations. The selectivity may be improved by fitting a condenser between the aerial terminal and terminal 4 on the coil, and this condenser may be a fixed component or a variable, or semi-variable device, the latter type affording scope for adjustment to suit varying conditions. A maximum value of .0003mfd. should be chosen, and if a pre-set condenser is employed it may be mounted by the side of the aerial-earth terminal mount and the lead from the aerial terminal disconnected from terminal 4 on the coil and joined to one side of the condenser, the other side of this being joined to terminal 4.

In some cases it may be found that results are improved if this condenser is joined between the aerial and terminal 1 on the coil unit and this will cut out the primary winding, giving a reduction in selectivity, an increase in volume, and a modification in the tuning range covered by the receiver. When this type of connection is employed the receiver will be more susceptible to differences in aerial size than when the connection to terminal 4 is employed, and in most cases this latter connection will be found preferable.

Making a Coil

For those who wish to experiment, a very suitable type of coil to make is illustrated in Fig. 2, and from this it will be seen that two formers are used, one fitting inside the other and kept in position by four fixing screws and distance pieces, the

(Continued overleaf.)

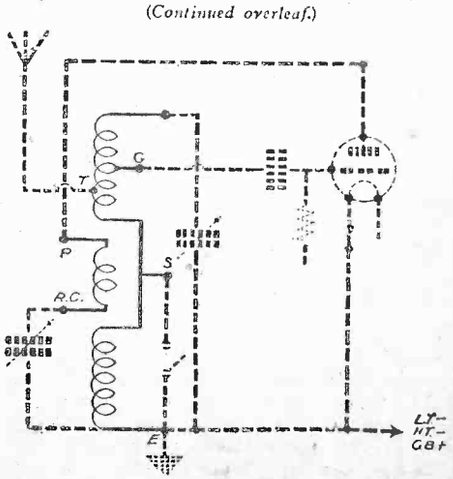


Fig. 3.—Theoretical circuit of the coil shown in Fig. 2.

THE 1938 ONE-VALVER

(*Continued from previous page*)

outer former being used to provide connecting points by the terminals shown.

The theoretical circuit is shown in Fig. 3, and it will be seen that it differs slightly from the Wearite coil. The tappings are provided to secure the highest degree of selectivity possible with a coil of this type, but it must be appreciated that, efficient as the coils are, they cannot be expected to compare with the specified iron-cored type. For the reaction coil, the winding connected to the terminals "plate" and "reaction condenser," 35 turns of 36 S.W.G. enamelled wire is required, while for the long-wave section, i.e., the coil connected to the "earthy" end of the medium-wave winding and the terminal "switch" and the "earth" terminal, 285 turns of the same wire is necessary.

The reaction and long-wave windings are wound on the inner former, there being a distance of 5 mm. or about ⅕in. between them. It is advisable to note, at this point, that the actual position of the reaction coil in relation to the medium and long-wave windings is very important, if smooth and adequate reaction is to be obtained on both wavebands.

The above remarks also govern the position of the L.W. winding to that of the M.W.; actually the top ends of both windings should be level with each other, otherwise there will be excessive or a loss of reaction on one waveband.

The medium-wave grid coil consists of 60 turns of 26 S.W.G. enamelled wire, and tappings are taken at the 30th and 50th turns from the upper end. Note the connections to this coil; the commencement goes to the "tuning condenser" terminal; the first tap (30th turn) to "grid"; the second tap (50th turn) to "tap"; and the end of the coil to "switch" and the start of the L.W. winding.

H.F. Choke

For those who wish to experiment with a home-made choke there are various forms which may be employed, the simplest consisting of a hank of wire, say gauge 26 or 28 D.C.C., wound round a small diameter object (such as a broom-handle) using 150 to 300 turns, wound simply as a coil without any regard to orderliness. When completed it should be slipped off the former and tied round with cotton or wrapped with insulating tape. A better type will be wound in sectional form on a tube such as a glass test-tube, winding each section in hank form as in the previous case, but dividing the total amount of wire into four or five sections. The sections may be kept in position by means of dabs of sealing-wax.

The method of getting foreign or long-distance stations is to adjust the reaction to the desired point to give sufficient volume and to adjust the tuning condenser at the same time, as adjustments of the former necessitate slight adjustments of the latter.

Tune Carefully

Thus, two hands are needed to keep the controls "in step" and it will be found that as the reaction is turned up the selectivity sharpens so that a little skill is needed until the "hang" of the set is obtained. Remember that the better the aerial the longer the range of the receiver, and use the best earth you can obtain. A long aerial is not needed, but it should be as high as possible, unless you live close to a B.B.C. station, when adequate volume will no doubt be obtained with an ordinary indoor aerial.

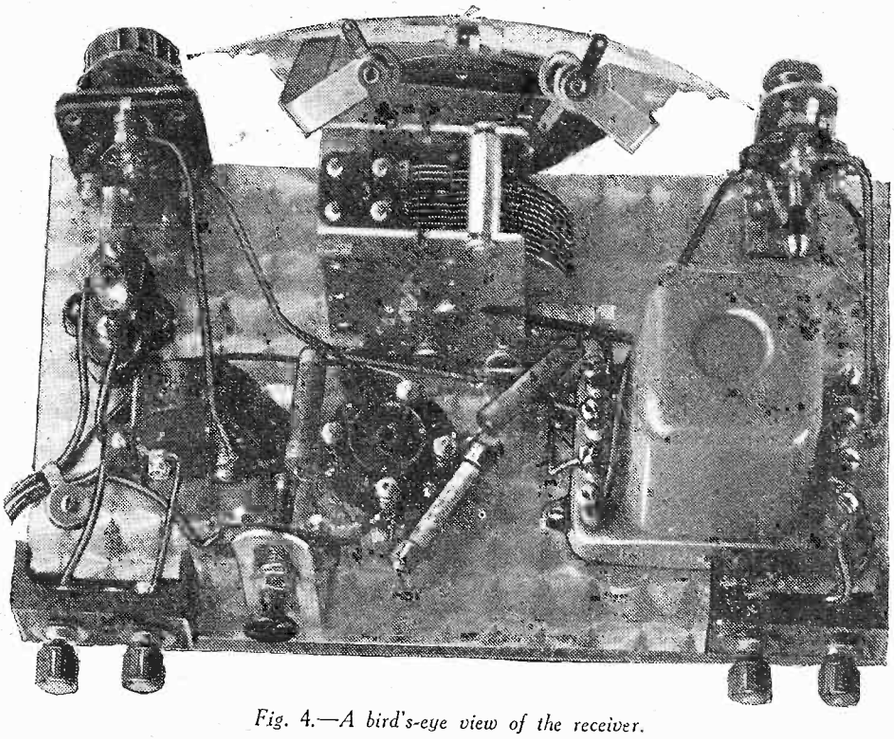


Fig. 4.—A bird's-eye view of the receiver.

NEW RADIO STAMPS

WE have mentioned on previous occasions the interesting link between the hobbies of radio and philately, and many amateurs collect the stamps which are received when QSL cards are sent to them. It will often be found that stamp-collecting will form friendships which might otherwise be lost, and when sending out reports of reception some amateurs enclose with the report a request for an unusual stamp, and in return send with their report a stamp of this type for the use of the amateur to whom they are writing. Unfortunately we, in this country, do not issue so many special stamps as foreign countries, and as a matter of interest we attach herewith two illustrations of some new stamps which have been issued by Italy and Egypt. The former has been issued in honour of the late Marchese Marconi, whilst the latter commemorates the Radio Conference which takes place at Cairo. By keeping a specialised selection, that is, by grouping all radio stamps in one album or by keeping only this type of stamp if you are not generally interested in stamp collecting, a most interesting collection may be formed, and the majority of amateurs in all parts of the world are quite willing to co-operate in acquiring the necessary stamps.



Two new Radio commemoration stamps issued by Italy and Egypt.

A SCIENTIFIC AGE

A LEADING newspaper the other day was dealing with the fact that the news-reel is proving a useful adjunct to history. It was also stressed that in an age which has seen the rapid growth of broadcasting from a scientific novelty, and toy, to a national necessity, and the growth of the cinema in a comparatively short space of time, from a penny peepshow to a world-wide mirror, it may well be that television will come forward just as unexpectedly, and supersede them both. But in television the film may not have a rival but a valuable ally, although at the present time the two seem to have little in common.

A Question of Cost

Whereas the editor of the news-reel can select the work of a dozen different cameras, and edit them at his leisure, the television producer must do this on the instant. On the other hand, the television authorities need not worry about the cost of film, for modern electron cameras do not use any. Small wonder, then, that the present television service has to build up a transmitting and receiving technique of its own, without the ability to refer to what has been done before. It is pioneering work of an intriguing, and interesting kind.

ON YOUR WAVELENGTH



By Thermion

I Break the Chain!

I EXPECT every one of my readers has received at some time one of those absurd "Chain Letters" which are supposed to have been started by an officer in the War. There is no accounting for the mentality of the sort of people who waste their time in sending this sort of letter, and it is my fervent hope that most of them have at long last been taken to asylums or put in padded cells, those of them, that is, who are not in gaol, for there can be no doubt that these people are either criminally ignorant or mentally deficient. One or two of them, however, are still at large, for I have received one of these chain letters during the last week. My regret is that the poor idiot that sent it did not append his name and address. Had he done so I should have had no hesitation in informing the police or the local Relieving Officer. This is how the letter went:

"Slow the chain to none,
The Chain of Good Luck."

"This Chain was sent to me, I am sending it to you, within three days, so that the chain may not be broken. Make three copies of it and send them to whom you wish good luck. This chain was started by an officer in Flanders. Do not forget to send it on or it will bring you bad luck (it is remarkable how the prediction has come true since it was started). Send this and three more copies within three days and see what happens on the fourth. Do not keep it or it will bring you bad luck. This chain was started in 1915."

I have not kept it. I have torn it into shreds and hurled it with disgusted annoyance into the waste-paper basket. I do not believe this nonsense about an officer in Flanders. If the chain of good luck has had the effect mentioned, there would no wars, no Income Tax, no squabbles, no rows, no law courts, no police, no poverty, no dissatisfaction even with the B.B.C. If any of my readers are aware of the person or persons who are sending these letters round I hope they will give me their names and addresses in confidence so that I can put a period to their activities. It is illegal to issue threatening letters, and this chain letter is a threat of evil if you do not comply with the request to send three copies. Why should you only pick *three* people whom you wish good luck? I advise any of my readers who receive such letters to keep the envelopes so that I can trace the person or persons by means of the post mark.

Those Good Samaritans

I MUST ask all of those readers who may be so kindly disposed as to wish to distribute spare parts to other readers to refrain from asking me to help. I have inserted one or two offers of this nature, but find that regular readers of the paper do not respond to them. I do, however, receive hundreds of letters from readers who see the paper in public libraries, and in many cases they pitch a pitiable tale which upon investigation is found to be quite untrue. Most of them start off by saying that they have been a regular reader from No. 1. They then follow on with some lying story about being out of work, starving wives and children, deeply interested in the hobby but can't afford the parts, and so on. I happen to know that in some cases the correspondents care nothing about wireless, had never read this paper, and merely wanted the parts to sell. My advice to those readers who wish to dispose of their junk is to distribute it locally, where they can investigate claims on the spot, and distribute to the most worthy case. The drivel I have been reading as a result of my paragraph under the title of "A Good Samaritan" has destroyed my last fragmentary belief in the power to do good.

An Idea

A READER, referring to my attack on crooners, says that he has often tuned in to dance music, and on hearing the crooners, says he has heard better music from a couple of cats on his garden wall. He thinks, therefore, that those readers who like crooners cannot have garden walls. That's an idea!

Hire Purchase

I NOTICE the following in the *Efficiency Magazine*. It is headed "As Others See Us."

"Last month, in the island of Competitia, I chanced to drop into a conference of small radio dealers.

"On a big sign at the back of the platform were these words—*Make It Easy for Anybody to Buy Anything.*

"In his opening speech, the Chairman said: 'We have found that the ordinary hire-purchase methods, reckless as they are, are not good enough to enable us to get rid of our radio sets.

"'We allow a man who pays us 2s. to come in and take away a radio set, but what about the man who does not possess 2s.? I ask you for suggestions.'

"One of the dealers sprang up and said: 'Suppose we offer any man or woman or child a Penny Box. We can say: "A penny a day takes a radio set away." In 3½ years a £5 5s. radio set will be paid for.'"

. . . We Get Madder and Madder!

BUT the writer's imagination does not stop short there, for he goes on:

"Another dealer said: 'My scheme is to allow any family to take away a radio set and we will collect the money from their grandchildren. You can't beat that.'

"'Yes, I can,' said a third dealer. 'I say—make a sporting offer. If a man wants a £10 radio set, let him put 2s. on a 100 to 1 horse and hand the bet over to us. Then we'd be sure to get our full regular price once in a while, anyway.'

"This last suggestion seemed to win the approval of most of the dealers. There was much excitement and enthusiasm. I felt that I needed fresh air. So I went out."

Variable Mule!

E. T. R., of Hull, vouches for the veracity of the following story: "I was inspecting some valves in a second-hand shop, and enquired the price of a screened-grid valve. I began to examine the same for markings

which would indicate the type, when the owner of the shop said: 'That's not an ordinary screen-grid; it's variable mule.' I said: 'You mean variable mu.' The dealer, however, was insistent." I know some valves play monkey-tricks, and perhaps this variable mule accounts for it.

Colour Television

I HAD a 'phone call the other day from Mr. J. L. Baird asking me to go along to the Dominion Theatre to witness a demonstration of large-screen colour television. There were only about six technical journalists present. The demonstration satisfied me that the system has great possibilities, and is reasonably perfect to-day. The colour picture of His Majesty The King was particularly excellent, whilst all of the other pictures were good. This demonstration indicates that with a little encouragement television will create a demand for programmes, and sets, which would make existing demands for wireless apparatus seem small. Television is inevitable, and the sooner we make up our minds to encourage it the better. It seems such a pity that those who are behind the scenes in developing television should lack the encouragement they deserve.

Auto Tuning

AS in past years, attention this year will be focused on producing special tuning dials, and automatic gadgets like press-button tuning. I cannot see the purpose of this unless the set itself is capable of receiving the stations, and of separating them. Let us first of all get rid of interference, break-through, overlapping, spread, side-band splash, and make our sets reasonably selective before we introduce gadgets which merely do automatically what we can now do by turning a knob, and do just as well. I learn that at least 17 manufacturers will announce receivers incorporating automatic tuning, and we shall probably see them at Radio-Iympia. Some, of course, are already on the market. Some of the systems are employing motor drives, another uses a dial like an automatic telephone dial. I cannot see why we should want to be so lazy; still, the proof of the pudding is in the eating, and if the great public requires such a system, the firms are wise in supplying public demands.

Now Then, Sleuths!

I HAVE before mentioned some of the peculiar effects which often arise with standard receivers, and in many cases there is a simple solution to the problem. There are occasions,

Notes from the Test Bench

Dismantling Components

AN interesting case of a fault arising through a component being dismantled recently occurred. A receiver had been built from parts which had been lying idle in an amateur's junk-box, and to make sure that everything was in good order the various items had been taken apart, cleaned, and assembled. The receiver which was built was the simple H.F., detector and L.F. arrangement, with a two-gang condenser and a two-gang coil unit, and when tested out the long-wave National transmitter was received, but the London Regional was heard faintly in the background. The builder did not try to get any other station, but made various tests with a view to cutting out what he assumed was break-through, and a considerable amount of time was spent in modifying the aerial, fitting H.F. filters, and so on. Eventually the trouble was found to be due to the fact that in putting together the switch assemblies on the coils one had been reversed, with the result that one coil was tuned to the long and the other to the medium waves. The tuning for Regional and long-wave National approximately coincided and thus accounted for the two stations being heard together.

Switch Contacts

THE majority of switches are of the self-cleaning type, and it may be found that with constant use the springs become slightly weakened, with the result that the cleaning action ceases. This is due to the fact that the switches are generally in the form of bent "fingers," which are forced beyond their maximum position as the switch cam moves and this exercises a scraping motion at the points of contact. Consequently, if it is found that a switch of this type becomes noisy after a period of use, the fingers should be examined and, if necessary, bent again slightly to exercise the necessary wiping motion as the switch is operated.

Self-centring Device

WHEN ganging two or more condensers or components, such as may be needed in a short-wave set, it is sometimes found to be difficult to get both components straight in line so that the spindles may be easily joined. To avoid this difficulty, it should be remembered that special connecting or ganging devices are available in which any out-of-truth is rendered of no account. This type of ganging device has a pair of flexible connectors on each side, and these are attached to a ring so that the device can turn from side to side as the spindles are rotated. This device is referred to as a "Flexible Coupler."

however, when no ordinary solution is forthcoming, and the following is an instance. J. W., of Wigan, writes:

"I constructed a three-valve det. 2L.F. short-wave set, and on trying it out could get no results, with the exception of a weak Morse signal which remained unaltered over the entire tuning range.

"Peering round for likely faults, etc., I happened to pull the coil (a standard Eddystone 22-47 metres) *out of its socket*—out, mind you—and I was flabbergasted to hear dance music which turned out to be *both* the National and Regional programmes (this was proved a few minutes later when the programme changed). Neither tuning nor reaction had any effect on the signal, the same strength being maintained over the entire range of the dial. When I put the coil back it disappeared and vice versa.

"The set itself I had standing on a small table under the shelf on which rests the family broadcast receiver, and thinking that perhaps some kind of inductive effect was going on between the transformers of the separate sets, I altered the tuning and reaction of the ordinary set, but to no effect, when it suddenly dawned on me that such an occurrence was an impossibility, as I was using the valves, batteries, aerial and earth of the big set, e.g., it was completely dead.

"Anyway, I gave it up for the night and resolved to sleep on it. Morning came and I set about testing the set, locating a faulty aerial series condenser which I set right, and then tried the set again with precisely the same results, except that I did not get the National or Regional signals when I pulled the coil out. Messing around again with the batteries, I happened to pull the GB+ plug leading from the transformer out of its socket and, lo and behold, the set worked perfectly!"

Perhaps some of my readers can offer suggestions as to the effects which mystified J. W. There are no prizes!

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The "Experimenters"

Discuss Tuning "Pull" by Reaction Adjustment; "Inspector Hornleigh's" Theory

This is the Conclusion of Last Week's Article, which was unavoidably held over due to pressure on our space.

YOU will remember that at the end of the first portion of this article published last week we were dealing with a very interesting transceiver circuit received from a reader.

As Mr. Kettingham points out, one of the chief advantages of this circuit is that there is no need to alter the tuning circuits when changing over from transmit to receive. That is an important advantage and overcomes one of the objections to the transceiver that we mentioned in an earlier article. It will be clear that the valve marked V.2 acts as a detector during reception and as a modulator for transmitting, the modulation being injected into the grid circuit of the oscillator in the same manner as in a single-valve circuit that we described four weeks ago.

Reaction "Pulls" Tuning

And now let us turn to a question raised in an interesting letter from Reader P. Jacobs, of Goodmayes, Essex, this time in connection with a short-wave receiver. Mr. Jacobs sends us a circuit of the fifth short-wave receiver that he has made (reproduced on this page and which is "certainly the most satisfactory so far.") Although the set operates well and reaction is very smooth, there is one point that our reader does not like, which is that reaction adjustment alters tuning a good deal. That is certainly a bad fault when making fine-tuning adjustments on a weak signal, and we think that it might be connected in some measure with the tuning coil.

Some designers like to use a small-capacity reaction condenser in conjunction with a relatively large reaction winding; others prefer a smaller winding and larger condenser. We favour the latter idea, because we find that there is less trouble due to the fault in question: that is, there is less risk of reaction adjustment "pulling" the tuning. There is, however, one mistake in the circuit, which is that the L.F. coupling is taken directly from the anode of the detector, instead of from the junction between the choke and the transformer primary. We have indicated the new connection by means of a broken line and placed a cross on the lead that should be removed.

Blind Spot for South Africa?

We scarcely think that this is the cause of the tuning "pull," however, but it might effect an improvement in that direction. An earth lead is not shown on the original circuit, and we suggest that it should be added. Another possible method of overcoming the trouble experienced is by including a fixed resistor of 100 to 200 ohms in the reaction circuit—between the winding and the detector anode, for example. Throttle-control reaction could also be tried, for this is sometimes more successful with certain coils. For this, the reaction winding is connected in series between the detector anode and the H.F. choke, the reaction condenser being joined between the anode and earth. When this is done, reaction is increased by *reducing* the capacity of the reaction condenser.

Another question set by this reader is as follows: "Do you happen to know if my district (near Ilford) is in a 'blind spot' for South African and South American reception? I have never heard a sound from either of these districts, although all others, including *North* African, come in well." This is a problem that we cannot

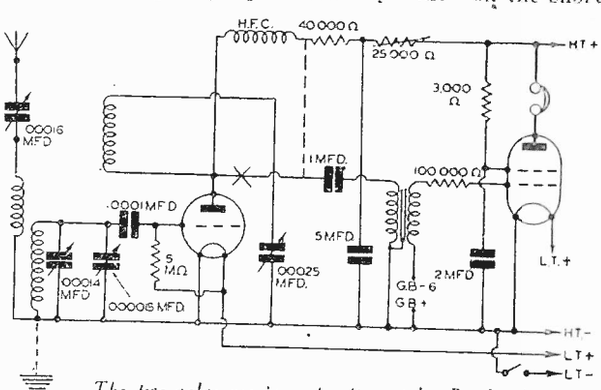
by The Experimenters

answer: we have not had any similar experiences reported from Ilford, but perhaps other readers in that area would be good enough to pass on details of their results.

Superhet Oscillator Instability

Mr. Jacobs' reaction problem reminds us of a similar difficulty sometimes experienced with short-wave superhets. In this case, it is the oscillator tuning circuit that "pulls" the input tuning circuit, causing peculiar forms of "humped" tuning and two tuning points for one station. One of the best methods of avoiding the trouble is by using a triode-hexode frequency-changer, although much can be done by careful experiment with anode and screening-grid voltages. This is because the trouble is in part due to the generation of oscillations which are too strong in relation to the signal strength.

The reverse sometimes occurs when the oscillator frequency produced by the



The two-valve receiver circuit sent by P. Jacobs, of Goodmayes. Although the set is very efficient, trouble is experienced due to reaction "pull."

oscillator section of the frequency-changer is too feeble. In consequence, there might be "dead spots" on the tuning band and "fluttering" on some of the more powerful signals. Probably the easiest method of overcoming the objection is by connecting an additional triode in parallel with the oscillator section; that is, the two grids and two anodes are joined together. No other alterations are normally required and the doubled capacity does not usually produce any deleterious effect. By using two triodes—or, at least, a triode and the triode section of the "double" valve—in parallel a steady oscillator frequency can more easily be maintained over the tuning range.

"Inspector Hornleigh Investigates"

How many of you heard "Inspector Hornleigh" the other night in "Monday at Seven," and how many solved the problem? Frankly we did not, nor did we agree with the solution offered by the B.B.C. You remember that the butler said that he was "a well-known radio amateur," and that he was listening to American short-wave stations between 1.30 and 2.0 a.m. During that time a car was outside the house, its engine running. That was sufficient to convince the popular and famous "radio detective" that the butler must have known that the car was outside and must therefore have some knowledge of the burglary that had been carried out in his master's house by the owners of the car.

The Explanation!

The explanation given was that the ignition system of the car would have interfered with reception. In raising our eyebrows we ask "Would it?" If our villain the butler had been a keen radio experimenter he would have had a modern anti-interference aerial system, or would at least have erected his aerial away from the road. But in any case the interference would be almost certain to be slight on wavelengths above 20 metres—reception would probably be carried out on the 31- or 47-metre band—since the "natural wavelength" of the ignition circuit of the modern private car is generally around 10 metres.

If ignition interference were pronounced on the short waves it would be hard lines on those "fans" who live on a main road.

If the solution had been that the butler was evidently not a "well-known radio amateur," we would have accepted it, because "Inspector Hornleigh" read from his log book that "volume strength" was "R.9." We never heard an experienced amateur use such a clumsy expression as "volume strength, R9," and do not believe that any amateur would write all that in a log book; as an indication of volume he would simply write "R.9." Don't you think?

Pse. QSL. Dah-de-dah.

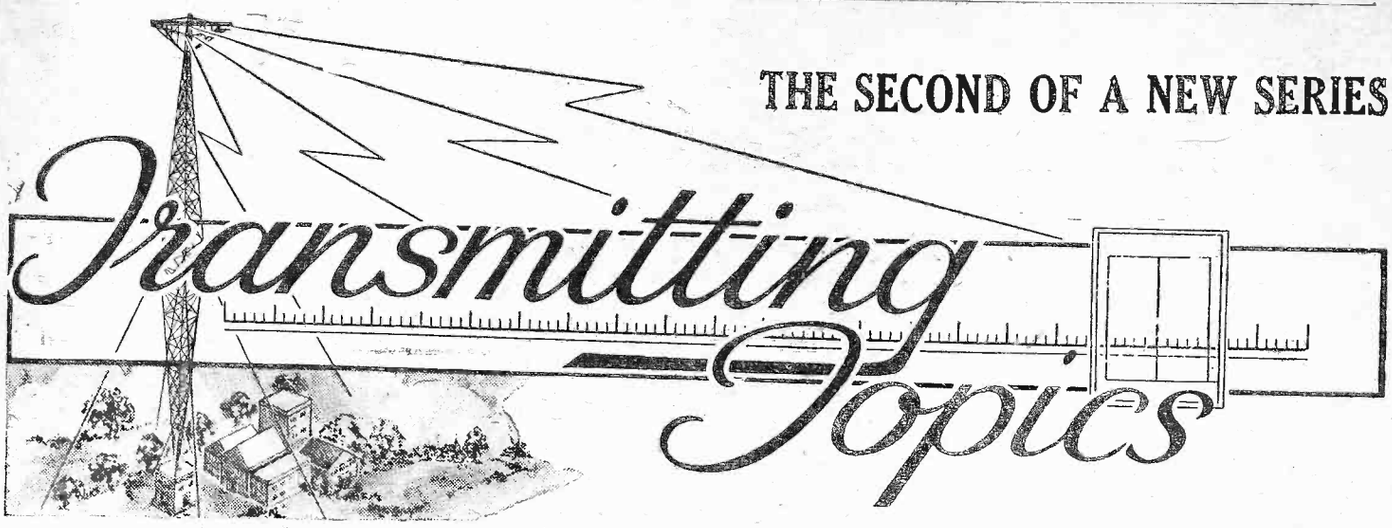
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Edited by

F. J. CAMM

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How the Oscillator Functions, and Preliminary Details of a 10-watt Transmitter — By L. O. SPARKS

TO enable the beginners to keep pace with the more advanced readers, I propose devoting one column, at least, of each article to explain the operation of the essential parts of a complete transmitting circuit.

It is of little use for the beginner to commence his activities by making up apparatus with which he is not familiar, unless he has a fair amount of elementary knowledge of the theory; therefore, as dry as technical descriptions might seem it is essential that they should not be skipped by one's eagerness to get on with the job.

Apart from fundamentals, one might say that the first step towards transmitting is to become familiar with the various forms of oscillator circuits used by the amateur.

It must be appreciated that the first requirement of a transmitter is some means whereby oscillations can be generated, and as most constructors are familiar with the oscillations produced in a receiver by the transference of energy from the anode to the grid of a valve by means of the reaction circuit, it should not be difficult to follow the descriptions given below.

Examining the matter from a practical point of view, it can be said that there are two types of oscillators, namely, those which are classified under the heading of "Self-controlled" and those under the heading of "Crystal-controlled." Actually, the amateur, particularly the beginner, is only interested in the "Crystal-controlled" arrangements; however, it will be wise, at this stage, to deal with the other types as well.

Self-controlled

Oscillators coming under this heading can really be split into two distinct classes: those which depend on inductive coupling between plate and anode for the generation of oscillations, and those which make use of capacity to provide the necessary feed-back.

The most common form of inductive coupling is that employed in the well-known Hartley oscillator circuit, which is shown in Fig. 1. It will be noted that the variable condenser C1 is connected across the whole of the coil L1 which, in turn, is across the plate and grid circuit. The frequency of the oscillations will be governed therefore by the values of L1 and C1, while the amount of feed-back or "grid-excitation" will depend on the position of the tapping point "t" which, in effect, completes the circuit. The small condenser C2 prevents any H.T. voltage from flowing through the coil to the filament and, providing it is capable of offering a low impedance path for the high-frequency currents, its value is not supercritical. An average capacity is in the neighbourhood of .01mfd. There is one important item regarding this condenser, however, and that is, it is very important to use one of the mica-dielectric type.

The closer the tapping point "t" is moved towards the anode end of the coil the greater will be the feed-back, so its actual position usually has to be determined by experiment, as much depends on the type of valve in use. The condenser C3 prevents any D.C. voltage from reaching the grid from the filament while the resistance R allows the valve to receive the bias necessary for satisfactory operation, therefore, its value cannot be fixed definitely as it will depend, like the tapping point "t," on the characteristics of the valve.

If the circuit is examined it will be seen

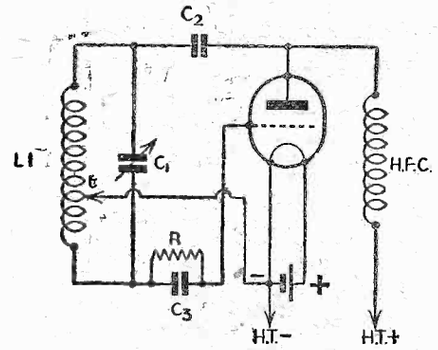


Fig. 1. The standard Hartley circuit.

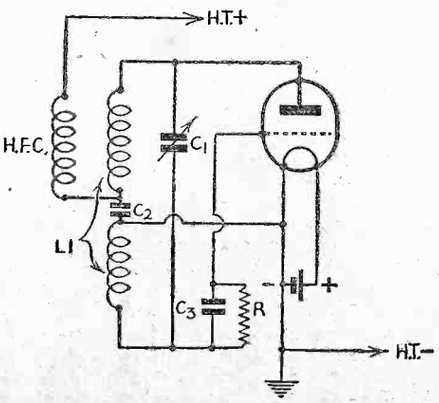


Fig. 2,—A modification of Fig. 1—known as the series-fed Hartley.

that the H.T. is applied to the anode of the valve via the H.F.C., and as the anode is at a high-frequency potential it is obviously essential that the H.F. choke must be really efficient to prevent the high-frequency currents from leaking back into the filament circuit via the H.T. battery. One might say, therefore, that the efficiency of the circuit depends to a very great extent on the efficiency of the choke under consideration. To overcome this little defect another version of the Hartley circuit was devised, Fig. 2, and this is known as the "series-fed" Hartley. By adopting this arrangement and applying the H.T. at a more suitable point, the efficiency of the choke is not so critical; in fact, if so desired, an ordinary resistance H.F. stopper can be used.

Constructing an A.C.-operated 10-watt Transmitter

To enable those with an A.A. or full licence to get busy on making up fresh gear, here are the preliminary details of a Tritet Crystal-controlled Transmitter which will be described in future articles.

Bearing in mind cost and ease of operation it was decided to use the Tritet arrangement as quite a good output can be obtained, at a comparatively low voltage, with one valve, and, what is more, two wavebands can be covered really satisfactorily without the use of additional crystal or frequency-doublers. So much, for the present, of the circuit. To make it a neat and compact arrangement the rack system of construction is used, but unlike the larger transmitting racks the one about to be described is made with timber, likewise, the constructor will not be worried by the work involved by metalwork.

All dimensions and constructional details will be indicated in the illustrations and it will be appreciated that the design lends itself most readily to easy adjustment and experimental work, while the actual space occupied by the complete transmitter is no more than that of, say, an average three-valve receiver.

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Practical Television

February 26th, 1938. Vol. 3. No. 89.

COLOUR TELEVISION

Complete Details of Mr. Baird's Latest Colour Television Process Were Revealed to the Editor the Other Day, and this Article Describes the Equipment and the Results Seen.

THE first demonstration of colour television undertaken by Mr. Baird was in the year 1928 when, with quite crude equipment and using the low-definition picture scan of thirty lines which was then the standard, the inventor was able to show pictures in colour about half the size of a postcard. The transmitter equipment used an apertured disc with three primary colour filters—red, blue and green—while the receiver had a geometrically similar disc which scanned a double light source composed of a neon lamp and a combined mercury and helium lamp. The connection between transmitting and receiving ends was by line, but the results seen, although of inferior quality when compared with modern standards, established the principles of colour television and pioneered the way to future developments.

As will be seen from the accompanying photograph and pictorial illustrations, the apparatus now employed bears little resemblance to its ten-year-old prototype. The transmitting equipment is located in a modern studio at the base of the South Tower of the Crystal Palace, and a study of Fig. 2 will enable the reader to obtain a good impression of the process involved in producing the picture signals. A combination of mechanical and optical scanning is employed, the apparatus being housed in a specially designed camera (seen clearly in Fig. 1) mounted on a "dolly truck" with all the panning facilities associated with a talking-film studio camera. Carefully balanced on trunnions, the operator is able to keep the person or object being televised in perfect focus. The subject is floodlit by means of two side arc lamps, while back lighting is given by illuminating a translucent back screen from the rear.

The Camera

An image of the person is focused by a large lens accommodated at the front of the camera on to a mirror drum at the back. This drum has 20 facets with an angular spacing of 18 degrees, and is revolved at a constant speed of 6,000 revolutions per minute. By this means a succession of rapidly moving and displaced optical images of the person being televised is focused by an achromatic lens system on to the face of the disc; the exact position being settled by interposing a mirror reflector in the optical path, as seen in Fig. 2.

The disc has twelve staggered slots cut in its face, the slots being covered alternately with blue-green and red filter material. A gear drive with the high-speed drum revolves this disc at 500 revolutions per minute, while in front of the disc is a diaphragm having a rectangular-shaped slot at the centre. Both the mirror drum and slotted disc revolve in a vertical plane, the reflecting mirror ensuring that the optical path is "bent" to enable the optical images to pass correctly over the slot in the diaphragm. The slots in the disc, as they pass in turn over the slot in the diaphragm, form an aperture which moves backwards and forwards as the disc revolves at constant speed. The net result of this ingenious mechanical and optical combination is that an appropriately light-filtered image of the subject being televised is broken up into a scan which passes through the moving aperture as elemental light areas which activate the rubidium cathode surface of a Baird multiplier photo electric cell, mounted in a small screened compartment on the right-hand bottom side of the camera framework.

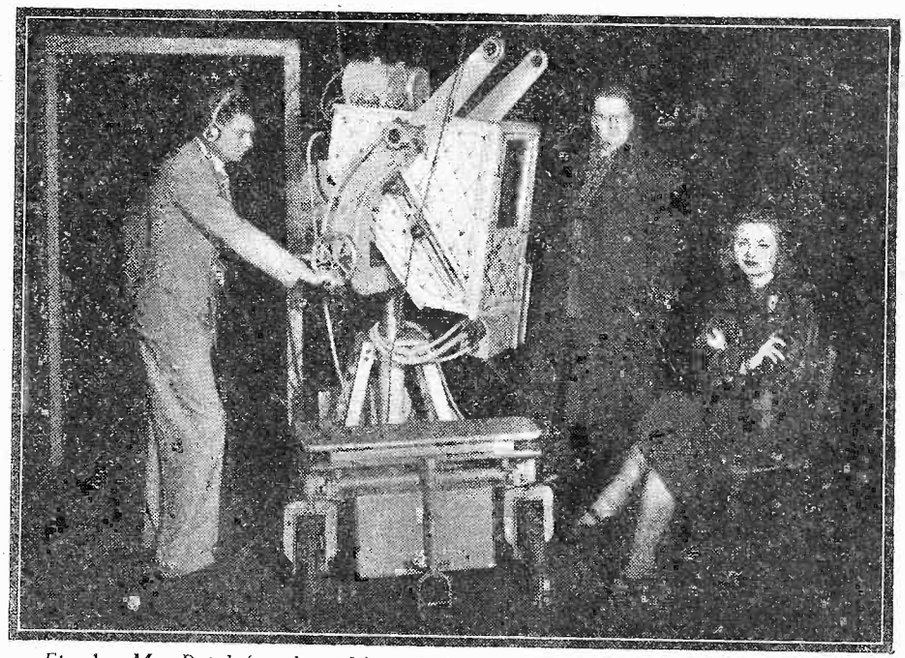


Fig. 1.—Mr. Baird (on the right) with the new colour television transmitter referred to in this article.

Transmission

The cell converts these variations of light into equivalent electrical currents which are in effect the television picture signals. After being fed through A and B amplifiers, the signal passes to the control room where the engineer in charge "monitors" the picture through the medium of a check seen as a monochromatic picture on the screen of a cathode-ray tube. The electrical arrangement of this chain is shown in Fig. 2, and after further amplification, the vision signal is made to modulate the low-powered ultra-short-wave radio transmitter. The output from this unit passes to the aerial at the top of the South Tower to be radiated in the normal manner on a wavelength of 8.3 metres.

The colour television receiving apparatus is installed at the Dominion Theatre, Tottenham Court Road, London; a special fireproof room having been built to house the equipment at the back of the stage. Elaborate precautions had to be taken to ensure that all the apparatus was enclosed in order to conform to L.C.C. fire regulations; a necessary factor in any place of public entertainment. The actual scanning arrangement employed at the receiver is identical with that of the transmitter, that is a fixed slot diaphragm, a disc revolving at 500 r.p.m. having 12 slots covered alternately with blue-green and red filters working in conjunction with a 20-facet mirror drum revolving at 6,000 r.p.m. This is seen in Fig. 2, which shows in simple pictorial fashion the whole layout.

Modulation

A beam of light from a totally enclosed high-intensity automatic arc lamp is focused on to the diaphragm, behind which revolves the slotted disc. This produces the moving elemental light aperture and the colour-filtered beam which emerges from this combination is intensity-modulated by a Kerr cell interposed in its path. The degree of modulation is controlled by the strength of the television signal received from the Crystal Palace. On the roof of the Dominion Theatre is a dipole aerial mounted on a well-stayed mast, and a concentric feeder passes the signals to an ultra-short-wave superheterodyne receiver. From here the signals are fed to intermediate and output amplifiers prior to being connected to the Kerr cell proper with which is, of course, associated two pairs of nicol prisms. The emerging modulated light beam from the second pair of nicol prisms is deflected by a mirror so as to pass through an achromatic lens on to the rapidly revolving mirror drum, whose angulated facets back project the moving spot of light on to the large screen mounted behind the theatre stage curtains. As the drum revolves the screen is covered by a succession of coloured vertical light strips, the number of disc slots and the number of mirrors on the drum, together with their relative speeds, determining the number of lines in the final picture. By choosing a suitable combination any desired number

(Continued overleaf)

COLOUR TELEVISION

(Continued from previous page)

of lines can be secured, but in the Baird colour equipment demonstrated a total field of 120 lines was employed with vertical scanning.

A Large Screen

The screen itself is actually 12ft. high by 9ft. wide, and a reference to Fig. 2 will show the relative proportions when compared to Mr. Baird standing on the left-hand side of the stage where the large loud-speakers are positioned. The screen material presented considerable difficulties, it being found, for example, that a screen which appeared sufficiently brilliant in a laboratory was not nearly bright enough to be seen properly throughout the large auditorium of the Dominion Theatre. Many experiments had to be undertaken before the right type of screen was eventually evolved, and it now consists of a specially-treated canvas which gives a non-directional and brilliantly-coloured television picture, capable of being seen in comfort from every seat in the cinema.

During the course of the demonstration, a compère, with a few well-chosen words, pointed out that this was the first occasion in the world where colour television signals had been transmitted by radio from a point some miles away to be reproduced on a large screen. While agreeing that the process at this stage in its development possessed certain imperfections when compared to the modern high-definition black and white processes, development work was proceeding rapidly towards their removal. In time to come it was anticipated that cinemas would be equipped with colour television screens for the entertainment of patrons and the present experiments would then be looked upon as an important landmark in the progress of the art.

Coloured Television Pictures

The curtains then parted and showed a coloured television picture of the Union Jack. This was followed by a colour demonstration of the latest hat fashions shown to effect by a lady artist in the Crystal Palace studio; various characteristic uniforms by a quick-change artist; one or two cartoons, flags, and a photograph of the King. The colours seen were exceedingly brilliant, flicker was negligible and the result left no doubt as to the progress which had been made in developing colour television to a state capable of providing adequate entertainment value to a theatre audience. In this connection it is interesting to note that the form of multi-mesh scanning employed by Mr. Baird for his colour process is in effect a modification of the scheme he used as far back as 1923. This original apparatus is now housed in the Science Museum, South Kensington; a lens disc then being used in place of the present mirror drum, although the slotted disc was of a similar type. The multi-mesh arrangement built up by the mechanical and optical combination is claimed to have certain advantages over the straight scanning and simple interlacing as used at present. The light efficiency was certainly high, while the optical system was of a fairly simple type, and the show arranged left no doubt that colour television using a radio link and reproduced on a large screen was an accomplished fact.

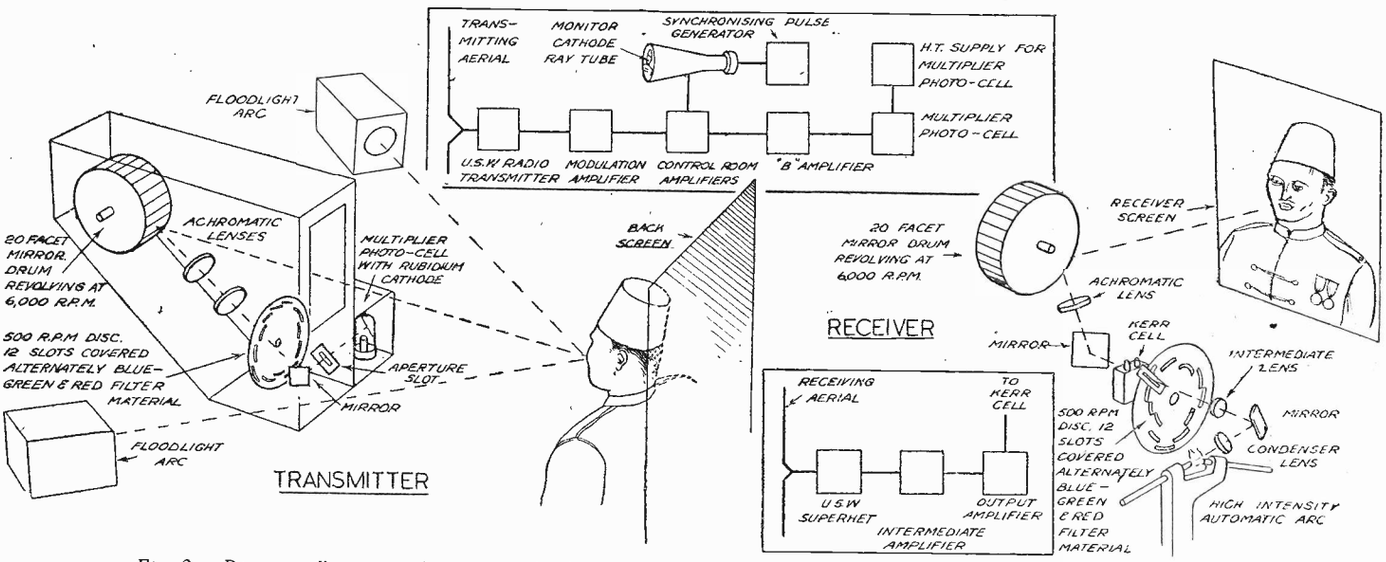


Fig. 2.—Diagram illustrating the process of colour transmission and reception as used in the recent Baird demonstration.

TELEVIEWS

An Australian Honour

TOMORROW (February 24th) Mr. J. L. Baird will leave this country for Australia. He has accepted the invitation of the Australian Institute of Radio Engineers to be their guest of honour at the World Radio Convention, which is being held to celebrate the Australian sesqui-centenary. Mr. Baird is to give an address on television, the science which he did so much to pioneer, and which has always been recognised by the largest island in the British Empire. Among those of the audience who will listen to Mr. Baird's speech will be the wife of the late Senator Marconi, for she has agreed to take her husband's place, and accept the honours which Australia had arranged to confer originally on Marconi himself as the leading radio pioneer.

An Important Point

THE early users of cathode-ray tubes and other electronic devices which had some form of fluorescent screen material coating on the inside of the glass envelope, experienced considerable difficulty as a result of the unsatisfactory adhesion making parts of the coating flake off. In the case of television receivers using cathode-ray tubes mounted vertically for indirect picture observation, this fault was a frequent cause of tube failure since the portions of screen coating which detached themselves from the tube top generally found their way into the electrode system, and ruined the cathode emission or blocked the small anode apertures through which the electron stream passed. A great deal of research has been applied to this problem, and one of the most satisfactory solutions to be found is to cover the fluorescent material after it has been applied to the glass with a solution of water glass, potassium silicate or silicon ester, and then bake the whole tube. Using this method one leading television firm has eliminated entirely all its previous troubles, and the C.R. tubes never fail now from flaking screen causes.

The Educational Angle

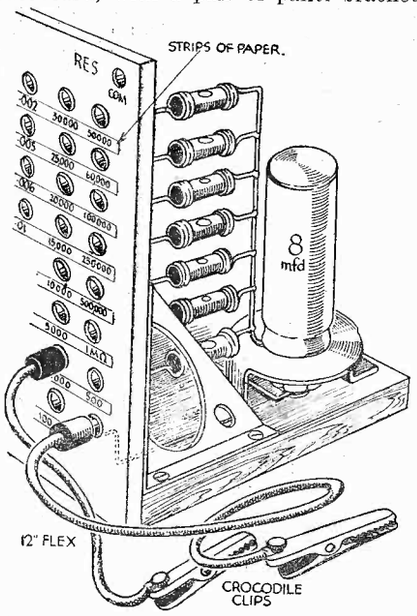
ALREADY the question of television for schools is being earnestly discussed by the authorities closely interested in modern aids to education. While the present programmes are very primarily produced for entertainment in the home, there are several sections which have a highly educational value, particularly the illustrated talks and scientific demonstrations. The rapidity with which wireless developed, and so enabled transmissions to schools to become a regular feature is undoubtedly being borne in mind by the Central Council for School Broadcasting, so that, in readiness for television's anticipated rapid progress, plans will be available to take full advantage of the service for the education of the young and eager mind. The superiority of a television service over that of aural broadcasting for schools is, of course, quite obvious, for nothing impresses a boy or girl more than what he or she can see. Already some of the technical institutes have found television receivers of value in their work. A set has been in use for nearly a year at the Norwood Technical Institute, which, in addition, has a television course included in its part-time teaching curriculum, while a similar state of affairs exists at the Regent Street Polytechnic. In these and other places a close watch is being kept on the programmes, and items known beforehand to have an educational value are viewed by classes studying that particular subject so as to acquire another angle of treatment additional to that followed by the regular teacher.

READERS WRINKLES

A PAGE OF PRACTICAL HINTS

A Useful Test Panel

THE useful piece of apparatus, shown in the accompanying drawing, requires about three dozen small sockets, some strips of paper, a piece of old panel and baseboard, with a pair of panel brackets.



A bank of resistors and condensers neatly arranged for test purposes.

I would advise the use of a combination of the most used resistors and condensers, and you will notice that you can parallel any two required. I would also suggest that the common ends of resistors and condensers are kept separate, so that you could use each separately and at the same time. One word of warning: when substituting resistors or condensers in H.F. circuits you will get a certain amount of instability, which you must allow for, but keep the leads short and you will have little trouble.—G. A. LEE (Balkwell).

An Automatic Record Counter

THE accompanying illustration gives details of a simple device which enables a pick-up needle to be left in the pick-up for the whole of its effective life without the fear of losing count of the number of records played. The device is intended to be mounted on the motor-board of a radiogram in such a position that each time the pick-up is replaced on its rest after playing each record, its arm depresses a small lever which moves a pointer round a dial on the "counting" mechanism.

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.

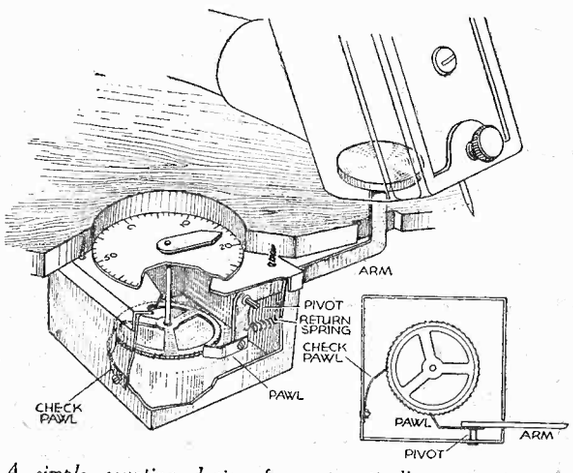
SPECIAL NOTICE

All wrinkles in future must be accompanied by the coupon cut from page 666

As the accompanying diagrams show, the only requirements are a small box (made from sheet brass or aluminium), a toothed wheel, and some odd pieces of brass for the pivotted arm, etc.

The chief point about the toothed wheel is that it should have the same number of teeth as the number of "sides" (usually about 60), which can be played with one needle of the type in use, and the wheel may be taken from an old clock or similar piece of mechanism. It is mounted as shown, on a verticle spindle in the centre of the small box.

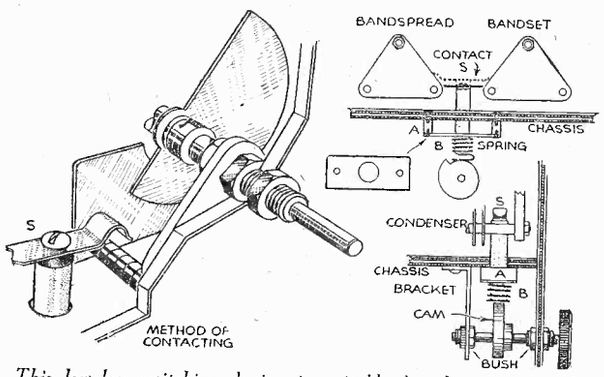
The two pawls are made from springy brass, one being fixed to the pivotted arm, and the other to the side of the box. The pivotted arm itself passes through a slot in the side of the box and has a small disc at its extremity upon which the pick-up arm presses when on its rest, and so turns the wheel one tooth each time.—S. C. BLACKSHAW (Wolverhampton).



A simple counting device for automatically registering the number of records played.

A Low-loss Switching Device

THE accompanying sketches show an efficient low-loss switch, quite easily made, which can be used where extra wiring would cause losses. It is very useful for short-wave listeners, who use their receivers mostly for the amateur bands, but who listen to broadcast now and again. With it the tank condenser can be cut out, then, tuning with the bandspread, the 12-26 m. coil covers the 10 m. band, the 22-47 the 20 m., and so on, thus giving high L/C ratio for greatest sensitivity. This switching arrangement brings signal strength up 3 R points more than when using the coils in the normal way, with the "tank" bandset. The insulating rod (taken from an old short-wave component) has the screw and nuts on top, and the base removed, and a strip of brass (S) ¼in. wide, bent as shown, is screwed on top. The cam is made out of an old ebonite knob, drilled through, and is supported by a ¼in. shaft held in a bush through the panel, and another held in a bracket. The guide (A) can be made of wood or metal and screwed firmly under the chassis. To the bottom of the insulating rod the spring (B) and a piece of thin brass are fitted. After the screw is tightened the piece of brass is bent over to provide a smooth surface to slide on the cam.—K. W. HOLYLAND (Harrogate).



This low-loss switching device is suitable for short-wave work.

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THE HEART of a TE

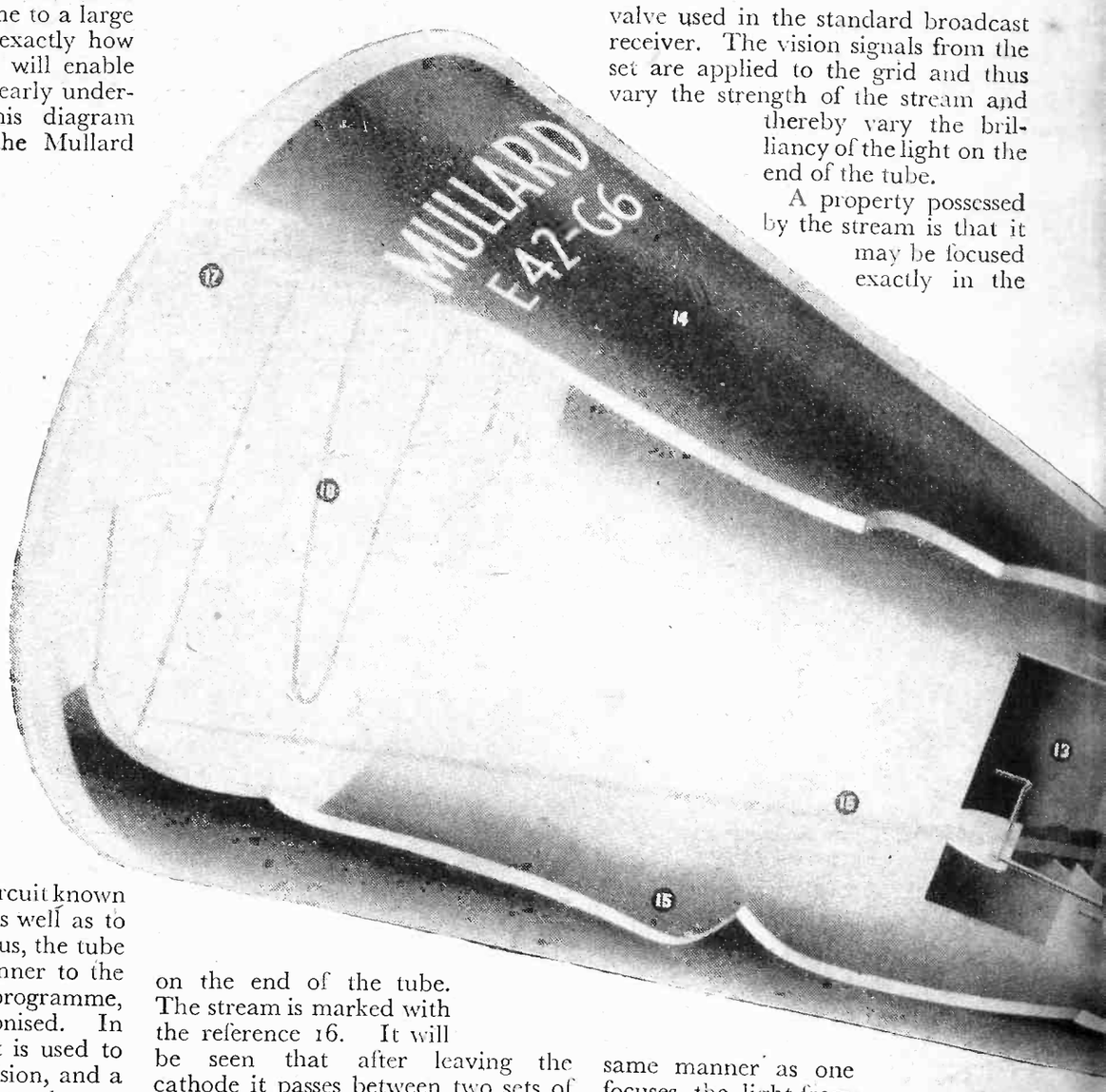
An Interesting Description of the Workin Tube, with Especial Reference to the P

AS the majority of listeners know, the modern television receiver employs a cathode-ray tube, and this is a component of mystery to many. It is, of course, a very old and well-established device which has only of recent times been developed for the reception of television pictures, and the accompanying illustration will reveal for the first time to a large number of our readers exactly how the tube is built up and will enable the working of it to be clearly understood. Incidentally, this diagram has been prepared by the Mullard Company, and a large reproduction, in colour, is available for the use of clubs, schools, and similar institutions. The chart measures just over 3ft. by 2ft., and bears, in addition to the large reproduction of the tube, a number of diagrams illustrating the many wave-forms and patterns which may be obtained and their use in modern science.

In the modern television receiver an ordinary wireless receiver, designed to provide high-quality on the ultra-short wavelengths, is connected to a loudspeaker in the ordinary way. This provides the sound component of the television programme. A similar set is also employed to receive the picture component, and this is connected to a circuit known as a time-base generator as well as to the cathode-ray tube. Thus, the tube acts in a very similar manner to the loudspeaker of the sound programme, and the two are synchronised. In some receivers a single set is used to pick up both sound and vision, and a special arrangement separates the two and feeds them to the tube and the speaker.

Object of the Time-base

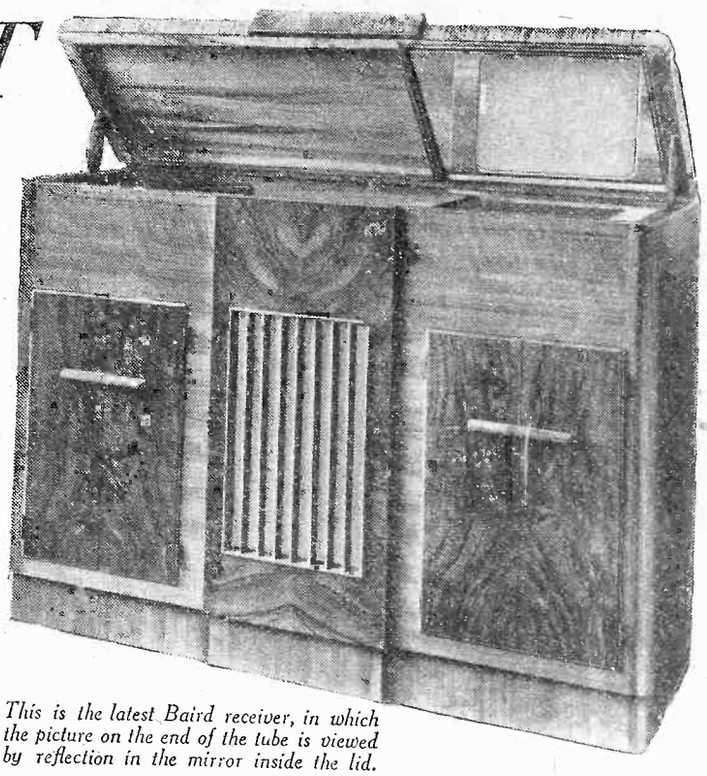
The main vision signal controls the strength of the electronic beam in the tube and gives the light and shade of the picture, but the most interesting part of the working of the tube is the movement of this beam to build up the picture. In our illustration the electron stream is shown by a grey shadow extending from the point 5—which is the cathode, up through the electrode assembly and then bending down to form a pattern on the end of the tube. The stream is marked with the reference 16. It will be seen that after leaving the cathode it passes between two sets of parallel plates, one set being arranged at right-angles to the other. These deflector plates, as they are called, are marked with the reference numbers 11 and 13. If these deflector plates are left unconnected the electron stream will shoot from the cathode and impinge directly on the end of the tube, and the inside of this is coated with a special chemical which, upon impact of the electron stream, glows with a brilliance depending upon the strength of the stream as regulated by the voltage applied to the control electrode (or grid), numbered 6. In this respect the tube is very similar to the ordinary valve used in the standard broadcast receiver. The vision signals from the set are applied to the grid and thus vary the strength of the stream and thereby vary the brilliancy of the light on the end of the tube.



A property possessed by the stream is that it may be focused exactly in the same manner as one focuses the light from a magic lantern, and the design of the tube and the voltages used at the focusing anode (number 7) enable the light on the end of the tube to be made in the form of a very small spot or a large spot. In use the tube is adjusted to give a very small sharply-focused dot, although for some types of picture it is advisable to put the spot slightly out of focus in order to break up the lines seen in the picture. The time-base generator is connected to the two sets of deflector plates and the voltages vary in a definite manner according to the number of lines required in the finished picture. The effect of these varying

LEVISION SET

of the Modern Cathode-ray
nt-day Television Receivers



This is the latest Baird receiver, in which the picture on the end of the tube is viewed by reflection in the mirror inside the lid.

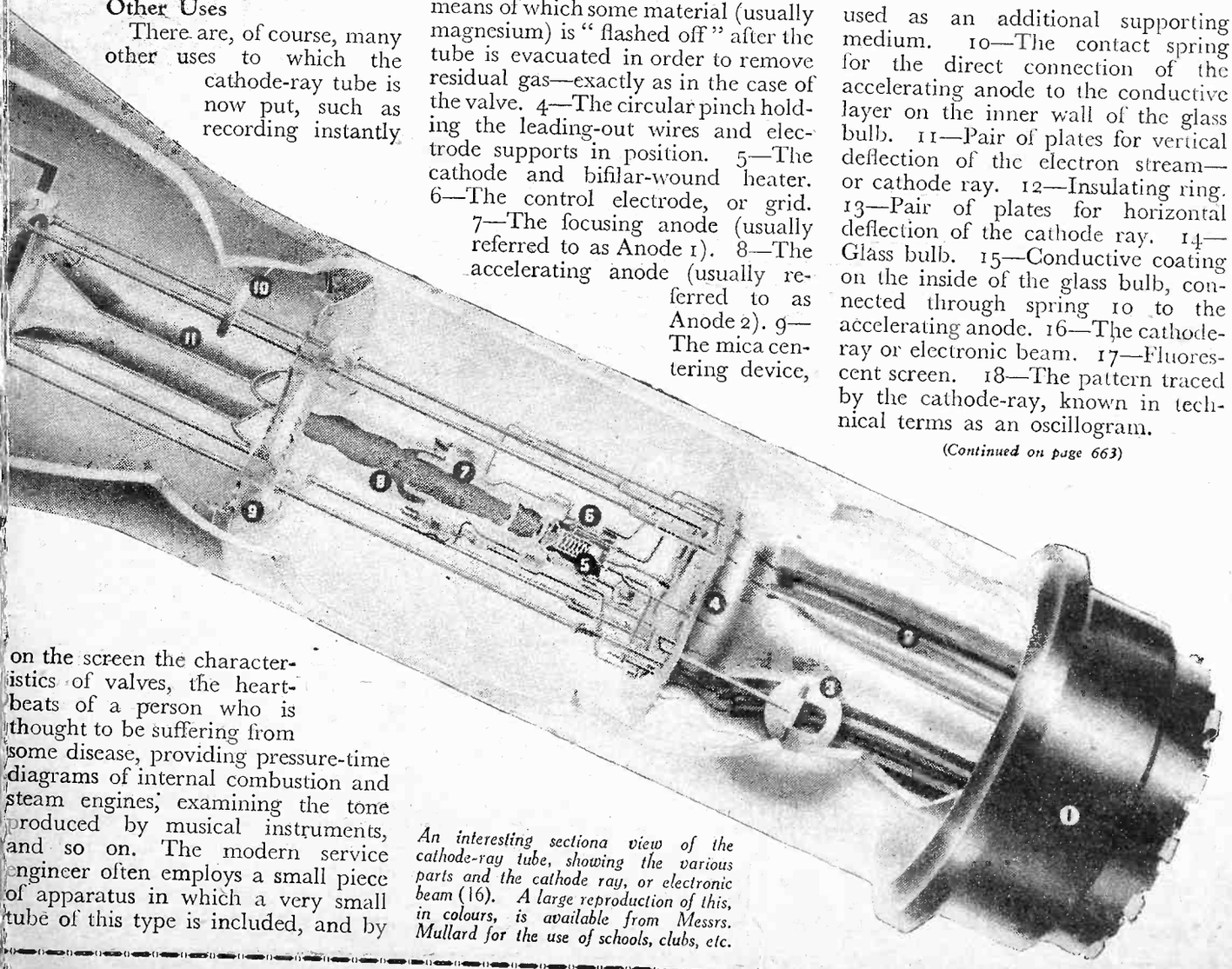
voltages is to bend or deflect the stream as shown in the illustration, and the time-base unit for the present television system causes the spot formed by the stream to travel from one side of the tube to the other and at the same time to travel slowly downwards so that a rectangle of light is built up. This is repeated so that the next rectangle is formed by interlacing the lines between those of the first scan, and the process is repeated very rapidly. It will thus be seen that in addition to the rectangle of light, the variations caused by the signals on the grid will build up a picture in light and shade and thus the process is really quite a simple one in spite of the many intricacies of the construction and the circuit.

Other Uses

There are, of course, many other uses to which the cathode-ray tube is now put, such as recording instantly on the screen the characteristics of valves, the heart-beats of a person who is thought to be suffering from some disease, providing pressure-time diagrams of internal combustion and steam engines, examining the tone produced by musical instruments, and so on. The modern service engineer often employs a small piece of apparatus in which a very small tube of this type is included, and by means of this circuits may be matched, and the performance of a modern wireless set may be checked.

The various sections of the tube are as follows: 1—the base, provided with 10 or 12 contacts, usually of the side-contact type, and designed for use with a special tube holder. 2—Insulated leading-out wires. 3—the Getter plate, by means of which some material (usually magnesium) is "flashed off" after the tube is evacuated in order to remove residual gas—exactly as in the case of the valve. 4—The circular pinch holding the leading-out wires and electrode supports in position. 5—The cathode and bifilar-wound heater. 6—The control electrode, or grid. 7—The focusing anode (usually referred to as Anode 1). 8—The accelerating anode (usually referred to as Anode 2). 9—The mica centering device, used as an additional supporting medium. 10—The contact spring for the direct connection of the accelerating anode to the conductive layer on the inner wall of the glass bulb. 11—Pair of plates for vertical deflection of the electron stream—or cathode ray. 12—Insulating ring. 13—Pair of plates for horizontal deflection of the cathode ray. 14—Glass bulb. 15—Conductive coating on the inside of the glass bulb, connected through spring 10 to the accelerating anode. 16—The cathode-ray or electronic beam. 17—Fluorescent screen. 18—The pattern traced by the cathode-ray, known in technical terms as an oscillogram.

(*Continued on page 663*)

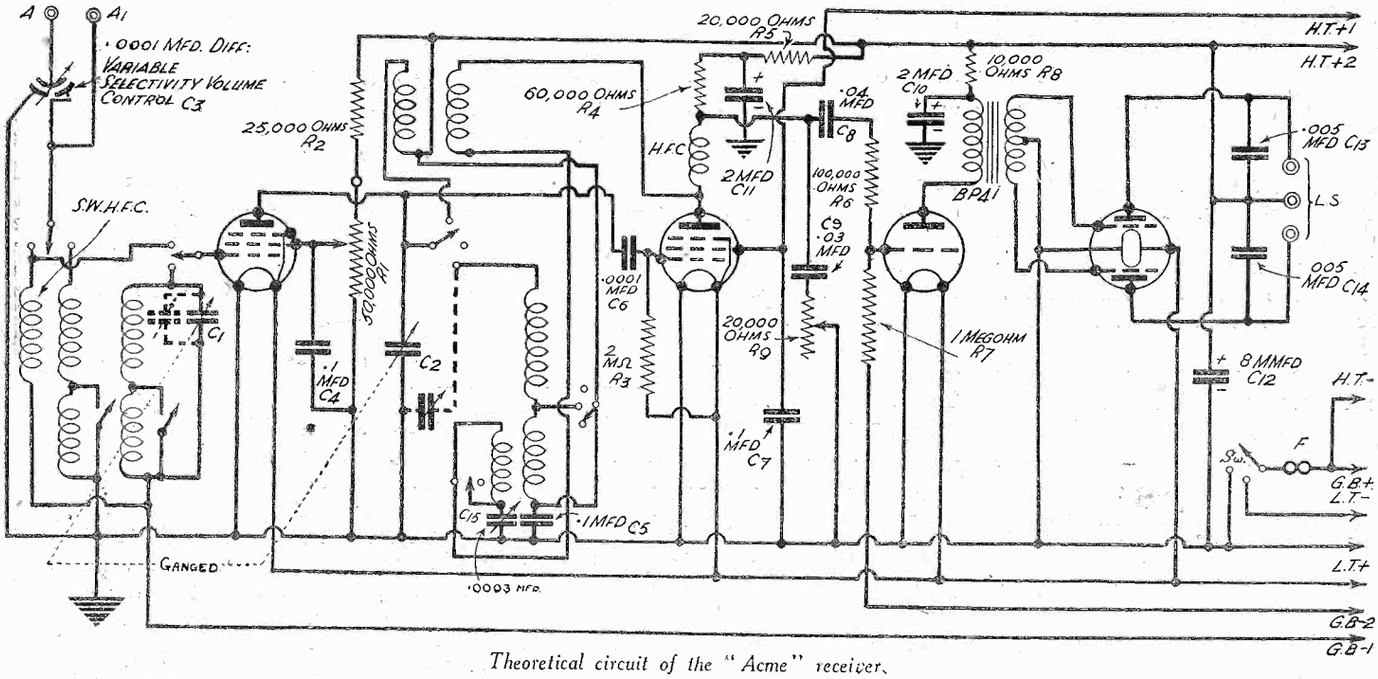


An interesting sectiona view of the cathode-ray tube, showing the various parts and the cathode ray, or electronic beam (16). A large reproduction of this, in colours, is available from Messrs. Mullard for the use of schools, clubs, etc.

THE "ACME" ALL-WAVE 4

IN our issue dated February 12th we gave constructional details of this new all-wave battery receiver and included a theoretical circuit diagram and Free Blueprint. We have to point out, however, that our draughtsman made a slip or two in these, and we are accordingly giving herewith a corrected theoretical circuit. It will be noted on comparison with the original diagram that he had linked together one anode and grid of the Class B valve, and had connected the filament of the third valve to the G.B.—2 line instead of to the L.T. positive line. These errors do not, of course, appear in the Blueprint and thus should the receiver be wired from the latter, or, as is usually done, the theoretical circuit be used as a check when wiring the receiver, these points will have been noted and no mistakes in the wiring should occur.

It will also be seen on some of the Blueprints which have been sent out that the positive and negative signs attached to two leads taken to the fuseholder on the top of chassis view have been transposed. These two leads are also shown on the under chassis view and are there correctly marked as H.T.— and G.B. positive. On the upper view, however, the draughtsman had reversed the two signs to read H.T. positive and G.B. negative, but this discrepancy does not appear on all the Blueprints, and, of course, a cross check with the theoretical circuit will remove any doubt which may exist in this connection.



Theoretical circuit of the "Acme" receiver.

Important Broadcasts of the Week

***NATIONAL* (261.1 m. and 1,500 m.)**

Wednesday, February 23rd.—Symphony Concert, from Queen's Hall, London.
Thursday, February 24th.—Scrapbook for 1900, feature programme.
Friday, February 25th.—Concert Party programme.
Saturday, February 26th.—A running commentary on the International Rugby Union Football match, Scotland v. Ireland, from Murrayfield, Edinburgh.

***REGIONAL* (342.1 m.)**

Wednesday, February 23rd.—Variety from the Alexandra Theatre, Hull.
Thursday, February 24th.—Hallé Society's Concert from the Free Trade Hall, Manchester.
Friday, February 25th.—Scrapbook for 1900, feature programme.
Saturday, February 26th.—B.B.C. Ballroom, feature programme.

***MIDLAND* (296.2 m.)**

Wednesday, February 23rd.—Variety from the Empire Theatre, Peterborough.
Thursday, February 24th.—Sportsman's Variety programme.
Friday, February 25th.—La Bohème, Act I, from the Memorial Theatre, Stratford-on-Avon.
Saturday, February 26th.—Compton Wynyates, feature programme.

***NORTHERN* (449.1 m.)**

Wednesday, February 23rd.—Variety from the Alexandra Theatre, Hull.
Thursday, February 24th.—The Cold Yeare, 1614: talke betweene a London shopkeeper and a North-countryman.
Friday, February 25th.—Variety from Her Majesty's Theatre, Carlisle.
Saturday, February 26th.—Dramatis Personæ: some unfamiliar aspects of the work of a Repertory Company.

***WELSH* (373.1 m.)**

Wednesday, February 23rd.—Choral and instrumental programme.
Thursday, February 24th.—The National Welsh Festival from St. Paul's Cathedral, London.
Friday, February 25th.—At Random: Border Dialects.
Saturday, February 26th.—Programme of music by Welsh composers.

***WEST OF ENGLAND* (285.7 m.)**

Wednesday, February 23rd.—They Made the West, a chronicle of English History—6, The Bible and the Sword, a talk.
Thursday, February 24th.—Dance Band programme.
Friday, February 25th.—Should old houses be reconditioned, and can they be made fit to live in?—a discussion.
Saturday, February 26th.—Band concert.

***SCOTTISH* (391.1 m.)**

Wednesday, February 23rd.—Ballad Days: another musicale in the Victorian manner.
Thursday, February 24th.—Variety from the Theatre Royal, Edinburgh.
Friday, February 25th.—Scots songs.
Saturday, February 26th.—Lewis: an impression of Island Life in the most Northerly of the Outer Hebrides.

***NORTHERN IRELAND* (307.1 m.)**

Wednesday, February 23rd.—Country Concert: Killough, County Down.
Thursday, February 24th.—The King of Spain's Daughter, a play by Teresa Deevy.
Friday, February 25th.—Organ recital from the Ritz Cinema, Belfast.
Saturday, February 26th.—First Prize-winners (Senior) North of Ireland Bands' Association Championship Contest held in the Ulster Hall, Belfast, November, 1937.

THE HEART OF A TELEVISION SET

(*Continued from page 661*)

Tube Sizes

In the larger types of television receiver the diameter of the end of the tube is such that a picture just over 10in. by 8in. may be obtained, and this is, of course, not the full area of the tube end. Owing to the curvature of the tube, which has to be maintained in the interests of strength, the picture is accommodated in the central portion in order to keep a fairly flat field. The tube is made in various other sizes, the most usual for television receivers being 10in. and 12in. For the new types of large-screen television sets a very small tube is employed and the screen of this is coated with a special material giving high luminosity, whilst the picture is less than two inches in width. This tube is placed beneath a lens assembly and the picture is thereby projected on to a mirror placed at an angle behind a ground glass or similar screen, and thus a larger picture is obtainable than with the directly-viewed tube. Much higher voltages are, of course, needed to obtain the desired brilliancy to enable the picture to be projected. This small type of tube (usually having a three-inch end) is also used in the small oscilloscopes used for servicing purposes and in special types of electrical equipment which are now used for medical and other purposes.

The end of the smallest tube so far available commercially is only 3ins. diameter, whilst, as already mentioned, the largest (manufactured by Baird, Cossor and Mullard) is 15ins. The fluorescent coating in all tubes is available to produce approximately seven different colours —white, blue, green, light blue, red, blue-green, and sepia.

EST. **PETO-SCOTT** 1919

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4 VALVE S.W. RECEIVER. 8-97 metres. Amazingly efficient S.G., Pentode output circuit. Latest design. Complete Kit with 4 coils. *List value* £3/12/0. Special price less valves 22/15/0 or 5/- down and 11 monthly payments of 5/-.

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A Long-wave Rejector Unit

In this Article Details are Given of a Double-tuned Unit for Improving Reception on the Long-wave Band - - - - By G. V. COLLE

FOR many listeners throughout the British Isles the morning concerts from some of the long-wave stations represent one of the few sources of entertainment open to them during the early hours of the day. Housewives particularly look upon the broadcasts as a pleasant background to their morning toils.

Unfortunately, these concerts are practically wiped out, at least in most parts of the North, by occasional barrages of interference. This interference is not due to heterodyne whistles caused by overlap, because on the average receiver most of the long-wave stations can be easily separated without mutual interaction. The noises which cause the "wipe-out" are apparently created by a broadly tuned spark transmitter operating on the C.W. (continuous-wave) principle.

The "mush" created by the interfering transmitter blankets adjacent stations and creates such an intolerable din that one is forced to switch off. With a view to assisting listeners whose reception is spoilt in the manner described, and by the heterodyne whistles, the following description of a double-tuned rejector unit should prove of interest.

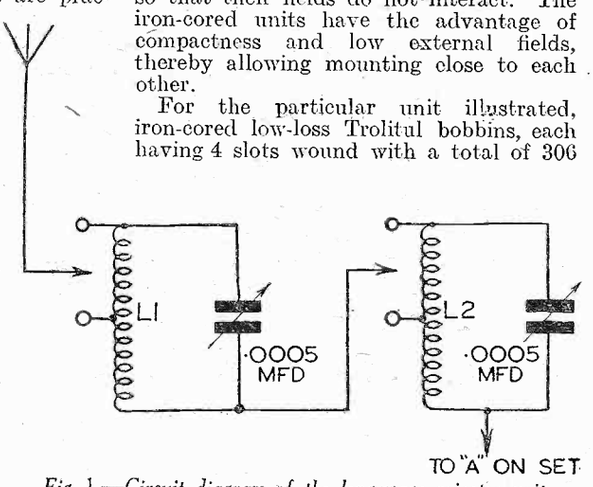


Fig. 1.—Circuit diagram of the long-wave rejector unit described in the text.

Circuit Arrangements

Fig. 1 shows the theoretical circuit arrangement of the rejector, which merely comprises two simple centre-tapped long-wave coils, each separately tuned by a small bakelised-paper dielectric or preset .0005-mfd. condenser. The use of the former variable type allows the rejector to be employed for all long-wave stations, whereas preset capacities, although as effective once adjusted, are more suited for permanent setting on the one station.

It will be seen that the unit connects in series with the aerial lead to the receiver, and in actual fact can be fitted at any convenient point where it will be readily accessible.

Each tuned circuit, when in use, is adjusted to the wavelength immediately above and below that of the desired transmission. If the resonance point of each circuit is sharp enough, little or no loss of signal strength will be noted, but any other signals or interference of a C.W. type on the adjacent wavelengths will be demodulated, and thereby reduced or eliminated. The rejector cannot suppress electrical static because it is not tunable.

Iron-cored Coils

Much of the success of the device depends on the efficiency of the coils, which must have a low H.F. resistance, and be capable of tuning as sharply as possible. Damping due to the loading effect of the aerial can be obviated to a large extent by connecting it to the tapping on the first coil. The same remarks are true of the second coil; it is best to connect the bottom end of the first coil to the centre tapping on the second when initially installing the unit.

If the tuning on either of the condensers is too critical, then it is possible to broaden the effect merely by employing the high tappings. Adequate selectivity can be achieved by using iron-cored coils, or some wound on about 3in.-diameter slotted formers. Air-cored coils, on the latter style, need to be arranged a few inches apart, and at right-angles to each other, so that their fields do not interact. The iron-cored units have the advantage of compactness and low external fields, thereby allowing mounting close to each other.

For the particular unit illustrated, iron-cored low-loss Trolitul bobbins, each having 4 slots wound with a total of 306 turns of No. 34 s.w.g. D.S.C. wire, are employed. Winding is commenced in the wide end slot with 100 turns, continued with 53 turns for the next slot, a tapping brought out by doubling about 6in. of the wire, carried on for 100 turns in the next wide slot, and finally completed with 53 turns in the narrow end slot. Those readers who desire to purchase the coils complete can obtain them from Ward and Goldstone, at 2s. 6d. per pair.

Assembling the Unit

Assembling the complete unit is extremely simple, the variable condenser being mounted on an ebonite strip or panel about 5in. by $2\frac{3}{4}$in. by $\frac{3}{16}$in. or $\frac{1}{4}$in. thick. The coils are mounted, as shown, on a plywood baseboard about 5in. by $3\frac{1}{2}$in. by $\frac{5}{16}$in. or $\frac{3}{8}$in. thick. Pieces of fibre strip or any other insulating material $\frac{3}{16}$in. wide are passed over the coils, being held rigidly in position by small wood screws passing through holes in the strip, and into the baseboard.

Four sockets, or terminal sockets, capable of taking wander plugs are required. One wander plug will connect to the aerial lead-in, and the other to the flex lead on the unit. A flex lead is permanently joined to the unit for connection to the aerial terminal on the receiver, and can be made any convenient length. Its extremity can be finished by a wire hook, wander plug, or spade, to suit the particular mode of aerial connection provided on the receiver.

To avoid the introduction of noises, and to prevent tuning drift in the rejector unit, the use of good quality tuning condensers with permanent pigtail leads to the moving electrodes are recommended. Provided that sockets and tuning condensers are fitted with terminals, the need for soldering is obviated.

Nothing is said here about the construction owing to its simplicity, and the fact that the connection of the unit is self-explanatory from Fig. 2. Before proceeding to describe the method of operating the unit, it is as well to remind prospective users again that it will do nothing to eliminate electrical man-made static. These noises comprising clicks, crackles and bangs are only curable by means of a high noise-proof aerial system, and perhaps the additional use of a mains filter.

Operating Notes

Assuming the set is accurately tuned to the desired long-wave station, and the rejector connected in the aerial lead with the wander plugs in the left-hand terminals (see Fig. 2) for L1 and L2, the operator should turn both rejector condensers anti-clockwise so that they are at minimum capacity.

Now slowly rotate one condenser (preferably the left-hand one for L1) until a point

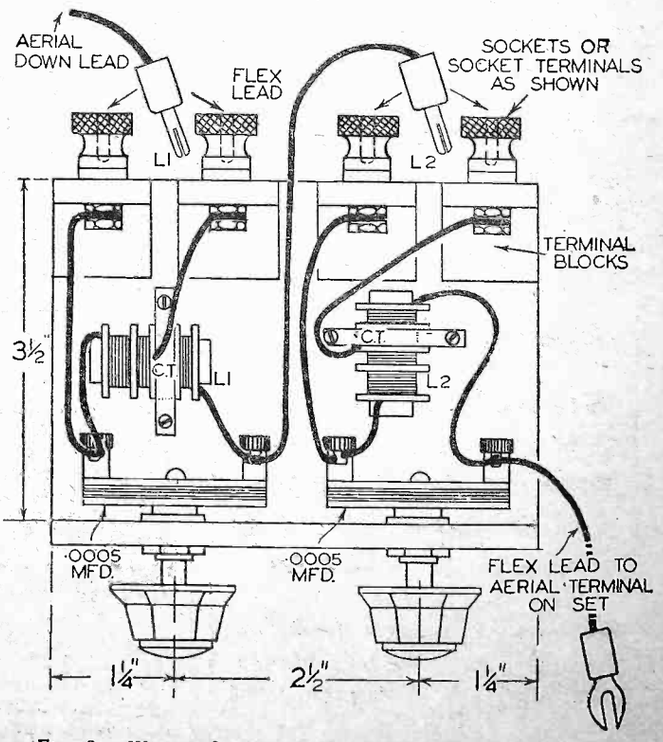


Fig. 2.—Wiring diagram. If required, engraved scales and pointers may be used in place of the knobs shown.

is reached where volume is suddenly reduced. The condenser should then be retarded by a fractional amount to barely regain volume. Repeat the process for the right-hand condenser, but even more slowly, as this time the drop in the volume will not be so discernible. When the second point where volume is affected is reached, *advance* the condenser by a similar fractional amount to regain it. Both sections are now tuned immediately above and below the desired transmission, and should considerably reduce "mush," and heterodyne whistles. If the receiver itself incorporates input and output volume controls, it is also worth while readjusting the relationship of these to see if a further improvement in the signal-to-noise ratio can be effected.

Reducing the treble by the receiver tone control will aid results in removing very severe radio interferences, but this should only be a last resort, since one of the objects of the rejector is to avoid spoiling reproduction by eliminating high-note response.

Where adjustment of the right-hand rejector condenser does not appear to affect volume despite critical operation, the wander plug for L2 should be transferred to the "C.T." socket (extreme right).

In the Manchester area, where the unit was tried out, Berlin (between Droitwich and Paris) was completely freed from side-splash interference, and Huizen increased in volume. The latter effect was due no doubt to the rejector tuning the aerial, although "mush" on this station was decreased owing to the larger signal-to-noise ratio.

It will seem, therefore, that the rejector can act in a number of ways, such as (1) demodulating transmissions above and below a desired station, thereby reducing side-splash, (2) rejecting in two stages radio interference above a desired wavelength, (3) as in (2) but in two stages below, (4) increasing the signal-to-noise ratio by tuning the aerial and thereby increasing the signal input.

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4 Terminal blocks (or 2 double blocks).
4 Sockets or socket-terminals.
2 Long-wave iron-cored coils (see text).
2 Wander plugs (to fit sockets).
2 .0005 mfd. bakelised paper dielectric variable condensers with knobs (or pointer-knobs and scales).
Miscellaneous wood screws, flex, wire, Systoflex, and fibre strip.

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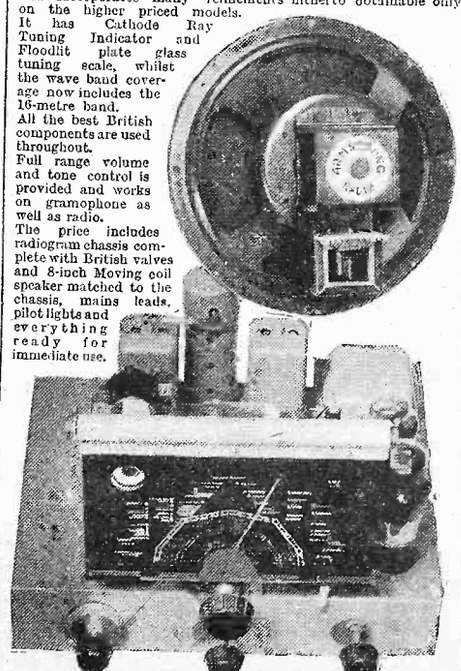
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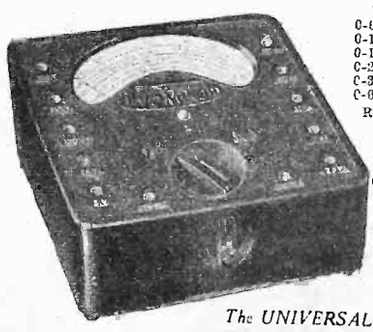
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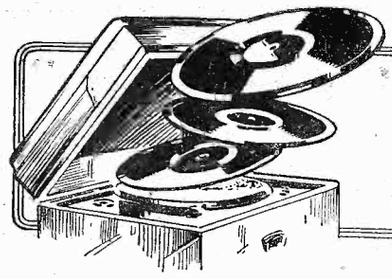
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PRACTICAL AND AMATEUR WIRELESS, 26/2/38.



Impressions on the Wax

MOST readers will remember the famous records made by Ernest Lough, the Temple Church choirboy, over 10 years ago. He now makes his re-appearance for H.M.V. as a baritone, and has recorded the Bach-Gounod "Ave Maria" and the "Vesper Hymn" on *H.M.V. B* 8697. Derek Oldham's voice shows up to great advantage in two old-time ballads, "Come Sing To Me" and "The Sunshine of Your Smile" on *H.M.V. B* 8682.

An interesting record is that of the Comedy Harmonists singing two German folk songs, "How Can It Be" ("Ach, Wie Ist's Moglich") and "Must I Then" (Muss I denn) on *H.M.V. B* 8688. They are both excellent examples of well-balanced part singing.

From the Films

FILMS and shows supply most of the material for the new records. Jack Hulbert sings "In a Paradise for Two" and "When You Hear Music," from his new film, "Paradise for Two"—*H.M.V. BD* 494. Elsie Carlisle is heard in "Little Old Lady" and "I Still Love to Kiss You Goodnight," the latter from the film "Fifty Second Street"—*H.M.V. BD* 487, and on *H.M.V. BD* 490 she sings two songs from the film "Mr. Dodd Takes the Air," "Here Comes the Sandman" and "Remember Me."

The big hit of the moment is "Bei Mir Bist Du Schoen." This, with another popular number, "Marie," is sung by Al Bowlly on *H.M.V. BD* 493. Revnel and West "oblige" with two of their laughable numbers, "We Do See Life" and "Looking After Baby," on *H.M.V. BD* 492, and Issy Bonn makes his first recording for the H.M.V. Company with "Issy Goes to Lunch" and "My Best Friend" on *H.M.V. BD* 498.

Other newcomers are the Three Musketeers who have recorded two songs from the film, "Lovely To Look At." These are "There's a Gold Mine in the Sky" and "My Swiss Hilly Billy," on *H.M.V. BD* 497. There is also a selection from the new show, "Venus in Silk," with Hella Foros and Jan Van Der Gucht with the New Mayfair Orchestra—*H.M.V. C* 2990. Marek Weber and his Orchestra play one of the loveliest of the waltzes, that from Tchaikovsky's Ballet, "The Sleeping Beauty," and with it is coupled the ever popular Liebestraum No. 3 (Liszt) —*H.M.V. C* 2948.

Another famous Continental orchestra, that of Barnabas Von Geczy, is represented by "Red Lips" and "Southern Skies"—*H.M.V. B* 8696, and the Victor Concert Orchestra plays "Salut d'Amour" (Elgar) and "Chanson Indoue" (Hindu Song) on *H.M.V. BD* 496.

Lively marches—"Spirit of Youth" and "Liberator's" — are played by the London Palladium Orchestra on *H.M.V. B* 8662 and Anton and the Paramount Theatre Orchestra contribute an attractive medley of Paso Dobles on *H.M.V. BD* 495.

Dancing Time

THERE is a fine array of new issues, including the new hit, "Bei Mir Bist Du Schoen." This, coupled with "Once in a While," is played by Jack Harris and his Orchestra on *H.M.V. BD* 5321. Roy Fox's four new titles this month are "True Confession" and "There's a Gold Mine in the Sky"—*H.M.V. BD* 5315, and "Trusting my Luck" and "Souvenir of Love"—*H.M.V. BD* 5319. Two titles from the new show, "Me and My Girl," now playing to packed houses at the Victoria Palace, are recorded by Ronnie Munro—"Me and My Girl" and "Lambeth Walk"—*H.M.V. BD* 5324.

Parlophone

FOR his latest record Richard Tauber has chosen "Still as the Night" and "Calming of the Tempest," both sung in German on *Parlophone RO* 20379.

In the historical series of famous voices of the past appears "The Flying Dutchman" (Senta's Ballad) and "Tristan and Isolde" (Isolde's Liebestod) sung in German by Emmy Destinn, with orchestral accompaniment. Both of these songs were originally acoustically recorded in 1911. The number is *Parlophone PXO* 84.

On the humorous side we have that popular comedian Ronald Frankau, accompanied by Monte Crick at the piano, singing "Kick It About Until It's Lost" and Dolara, the Daughter of Bo-Bo the Great," on *Parlophone R* 2471. Murray and Mooney also talk "A Lot of Nonsense" on both sides of *Parlophone F* 1023.

Leslie A. Hutchinson ("Hutch") sings that popular song "My Gypsy Dream Girl," from the film "Command Performance," coupled with "Please Remember," on *Parlophone F* 1016, and "A Foggy Day," and "By the Sweat of Your Brow" on *Parlophone F* 1017.

If you enjoy pianoforte solos you should hear Patricia Rossborough playing a selection of tunes from the film "Damsel in Distress" and "Popular Medley," on *Parlophone F* 1019, and Billy Thorburn playing a waltz and foxtrot medley of tunes with drum accompaniment on *Parlophone F* 1015.

Then we have Ivor Moreton and Dave Kaye on two pianos with drums playing "Midnight in Mayfair" and "Four Hands on a Piano," on *Parlophone F* 1004.

Harry Roy and his Orchestra have made two new records this month, "Swing is Here to Sway," from the film "Ali Baba Goes to Town," and "Got a New Pair of Shoes," on *Parlophone F* 1006, and "Home Again Blues" coupled with "Popcorn Man," on *Parlophone F* 1007.

Nat Gonella and his Georgians also have two records, "Big Chief 'Swing It'," from the film "The Joy Parade," and "Goona Goo"—*Parlophone F* 1008, and "Blues in my Heart" and "Cocktail Swing," on *Parlophone F* 1009.

Massed Military Bands have recorded "Gasparone" and "Fatinitza," two marches, on *Parlophone F* 1018, and Victor Silvester and his Ballroom Orchestra have coupled "Once in a While" and "Giamina Mia" on *Parlophone F* 1013.

Leaves from a Short-wave Log

New Station in Dominican Republic

HID, Trujillo City, to which reference was made in these notes (PRACTICAL AND AMATEUR WIRELESS, issue February 12th), has altered its call-sign to HI2D, and also its wavelength to 43.48 m. (6.9 mc/s). The programme schedule is now as follows: G.M.T. 11.30-13.30; 15.30-19.30, and from 21.30-02.00 daily. The studio opens the broadcast with the playing of a gramophone recording of Gounod's *Ave Maria* on the violin. The call is coupled with the slogan: *La Voz de la Asoçiaçion Catolica Dominicana en Ciudad Trujillo.*

Good Signals from Mozambique

The broadcasts from CR7BH, Lourenço Marques, on 25.6 m. (11.72 mc/s) are occasionally well received in the British Isles between G.M.T. 17.30-21.00 on week-days, and on Sundays from G.M.T. 19.00-21.00. Interval signal consists of a single chime, and announcements are made in a female voice. You may hear sponsored programmes, including publicity for commodities sold by firms in Bulawayo, Mafeking, Pretoria, Johannesburg, and so on, in both Portuguese and English. The programmes are S.B. on 48.88 m. (6.137 mc/s) through CR7AA in the same city.

South African Broadcast Schedule

Daily on week-days ZRK, Cape Town, is on the air between G.M.T. 04.45-16.45 on 31.23 m. (9.6 mc/s), and ZRH, Pretoria, from G.M.T. 04.45-12.30 on 31.5 m. (9.523 mc/s). On the longer channels the programme times are as under: ZRH, Pretoria on 49.94 m. (6.007 mc/s), on weekdays between G.M.T. 15.00-21.00, and on Sundays from G.M.T. 08.30-10.00 and from 15.30-20.15. ZRK, Cape Town, on 49.2 m. (6.1 mc/s), works on weekdays from G.M.T. 17.00-21.00, and on Sundays from 08.30-10.00 and 13.20-20.30. ZRJ, Johannesburg, using the single channel, 49.2 m. (6.1 mc/s), works daily (exc. Sundays) from G.M.T. 04.45-16.30, and on Sundays from 08.30-10.00 and 13.00-16.30. ZRD, Durban, on 48.8 m. (6.15 mc/s), although a small station, has been heard in the British Isles, so I am told. It operates on week-days from G.M.T. 04.45-05.45; 08.30-12.30, and 14.00-21.00; on Sundays from G.M.T. 13.00-20.00.



New Channels for Radio Colonial

Tests are being carried out with a new transmitter by Radio Colonial (Paris) on 49.67 m. (6.04 mc/s), 31.41 m. (9.55 mc/s), and 25.32 m. (11.85 mc/s). The call emanates from Essarts-le-Roi, near the French capital.

League of Nations Broadcasts

Every Friday and Saturday transmissions in English describing the workings of the League of Nations during the preceding week are made through HBO, Prangins, on 26.31 m. (11.4 mc/s), and HBL, on 31.27 m. (9.595 mc/s). The times are: G.M.T. 19.00-19.15 for Great Britain; Scandinavian countries and South Africa through HBO; and at G.M.T. 00.30-00.45 for the United States of America and Canada through HBL.

Proposed Yugoslavian High-power Station

It is reported from Belgrade that a contract has been placed with a German concern for the supply and erection of a 10-kilowatt short-wave transmitter in the vicinity of Batajnice, with a view to the relay of special broadcasts to Yugoslav nationals resident in North and South America. Listeners report that a station giving the call-sign YUA, Belgrade, is already testing on about 49.5 m.

And a 50-Kw Station for Austria

Following a series of tests, the Ravag authorities have decided that the two most favourable channels for their short-wave world broadcasts are 25.42 m. (11.8 mc/s) and 49.41 m. (6.072 mc/s). In order that the programmes may be available to their nationals all over the world it is proposed to build on Mount Bisamberg, close to the site of the present high-power medium-wave transmitter, a 50-kilowatt short-wave transmitter equipped with beam aerials. The work is to be started without delay, and it is hoped that the station may be ready by the end of 1938.



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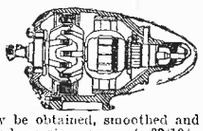
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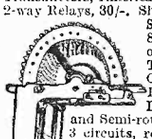


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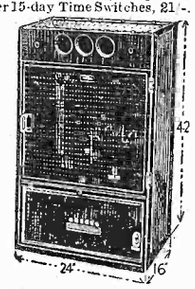


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LIGHT DUTY SWITCHES for Wave-change and Semi-rotary D.P.C.O., 6d. R.A.F. Switch Boxes for 3 circuits, rocker type, 1/3. 6-way Rocker-toggle, 2/-. 8-way ditto, 3/6. Yaxley and Rex Wave-change, D.P., 5-way, roller contact, new, 1/3. Bulgin 3-point Wave-change, 9d. Tunewell S.P. on-off semi-rotary, 8d.

MAGNETIC SWITCHES.—Automatic. 2 to 4 amps., 7/6; 6 amps., 10/-; 10 amps., 12/-; 15 amps., 14/-; 20 amps., 16/-. 4½ozs. 5 m.a. model control. Relays, 8/6. Venner 15-day Time Switches, 21/-.

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Radio Clubs and 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.

PROPOSED CLUB FOR SUTTON

ANY readers interested in the formation of a Radio Club in the Sutton district are invited to get in touch with Mr. Norman H. Hanton, 6, Manor Court, Benhill Avenue, Sutton, Surrey.

SPEN VALLEY LITERARY AND SCIENTIFIC SOCIETY: RADIO SECTION

THE above newly formed club welcomes new members, who are invited to attend meetings. Arrangements for morse practice are being made, and a club receiver is in course of construction. Further particulars can be had on application to the secretary, J. Clegg, 38, Shirley Grove, Gomersal.

THE CROYDON RADIO SOCIETY

ON Tuesday, February 8th, the above society was joined in St. Peter's Hall by the Short-wave Radio and Television Society of Thornton Heath, the meeting being presided over by Mr. G. A. Hoskins, vice-chairman. The subject discussed was "Electrical Interference as Applied to Broadcast Reception," given by Mr. H. J. Walters, of Belling and Lee, Ltd. Of interfering voltages, he said there was the conducted component travelling along the mains cable, and also the radiated component entering the receiver by the aerial and earth system. Regarding suppression at the receiving end, he dealt with the use of condensers and the choke filter method, while the Doublet aerial was popular. A transmission-line aerial, however, had no real drawbacks, as it was not directional nor did it cause much loss, and was efficient on all wavelengths.

Suppression at the source was a fascinating part of Mr. Walters' lecture, and he discussed how earthed and unearthed appliances were treated. In a commutator motor, for instance, a condenser was inserted between the brushes and frame. Neon signs were a big problem, and here condensers were connected in the middle of the tubing. Interference from motor-car engines chiefly came from the ignition system, and resistances effected a cure in the plug leads. Mr. Walters felt sure that legislation would be introduced for the compulsory suppression of interference. On Tuesday, March 1st, Mr. G. A. Hoskins, vice-chairman, will give another musical programme on records.

Hon. Pub. Sec., E. L. Cumbers, Maycourt, Campden Road, S. Croydon.

THE DERBY SHORT-WAVE RADIO AND EXPERIMENTAL SOCIETY

MR. L. JACKSON (2AJM) gave an interesting lecture to a good attendance of members on Tuesday, February 8th, the subject chosen being rectification. On Tuesday, March 1st, a talk on aerials will be given by the President, Mr. E. V. R. Martin (G2TL). A hearty welcome will be extended to any radio amateur attending any of our meetings.

H. Turner, Secretary, Nunsfield House, Boulton Lane, Alvaston, Derby.

BRADFORD SHORT-WAVE CLUB

THE Bradford Short-wave Club have now commenced construction of the new transmitter. On most previous occasions constructional work has been done at members' homes, only experiments with completed apparatus being conducted on the club premises. This time the work is to be done at the club, and therefore anyone interested will be able to see the transmitter in course of being built. All enthusiasts in the district are therefore invited to Bradford Moor Council Schools, the club headquarters, any Friday evening, or are asked to communicate with the secretary, S. Fischer, Edenbank, 10, Highfield Avenue, Idle, Bradford, Yorks.

RADIO, PHYSICAL AND TELEVISION SOCIETY

AT a meting of the society held on Friday, February 11th, Dr. C. G. Lemon delivered another of his interesting lectures. The subject was "Ultra-short-wave Receivers." In the course of the lecture various types of receivers suitable for use between the wavelengths of 1½ and 5 metres were described, including several suitable for use on the society's proposed 2½ metres field-days to be held at dates to be announced later. Superheterodyne receivers being not yet of great utility on the ultra-high frequencies on account of the poor quality of amateur transmissions, the greater part of Dr. Lemon's lecture dealt with super-regenerative sets. Various types of self-quench receivers were described in detail, although it seems probable that the set which will be most used on the occasions of field-days is a three-valve separate-quench set. A receiver of this type was demonstrated and found to be satisfactory, the degree of hiss, unavoidable in all super-regenerative sets, was found to be insufficiently loud to spoil reception, even of weak signals, with a carrier not strong enough to cause complete cessation of hiss.

Meetings of the society are held at 72a, North End Road, West Kensington, London, W.14, every Friday evening during the winter months. Further particulars may be obtained from the Hon. Secretary at the above address.

THE NORTH LONDON RADIO SOCIETY (Incorporating The Tottenham Short-wave Club)

THE Tottenham Short-wave Club are forming a new society to be known as the North London Radio Society in order that persons interested in all fields of radio may be taken as members and not only those interested in short waves, as has been the principle in the past. The society are holding three Visitors' Evenings at the New Trades Hall, Tottenham, N.17, on the 24th, 25th and 26th inst., and tickets may be obtained on receipt of a stamped-addressed envelope to the Hon. Sec., Edwin Jones, 60, Walmer Terrace, Firs Lane, Palmers Green, N.13.

BRENTWOOD AMATEUR RADIO SOCIETY

AT the last meeting of the above society, held on Friday, February 11th, a very interesting demonstration was given by Mr. B. A. Pettit (2CRJ) of his short-wave receiver.

A welcome visitor at this meeting was Mr. R. C. Beardow (2BZB), Hon. Sec. of the Chadwell Heath Amateur Radio Society. The two societies are now co-operating and propose holding several joint meetings. At the conclusion of the meeting the usual morse practice was held.

The society will soon be on the air under their call-sign, G8HV. The Post Office have recently consented to Mr. A. H. S. Scott (G6UP) as a second operator. Mr. H. N. Tweddell is now 2DJB, and is building a TX, whilst Mr. K. R. Acton is a new member.

The journal of the society has now been reorganised and is being published quarterly. The Editor is Mr. S. Dunlam Jones (G8KM).

The following future programme has been arranged:

February 25th: Demonstration of 56 Mc. transmitting and receiving apparatus.

March 11th: Demonstration by the M.P.R. Electrical Company of their 7-watt amplifier and double button microphones.

March 25th: Lecture. Details to be announced later.

April 8th: Lecture and demonstration by Mr. S. R. Walker of the Automatic Coil Winder and Electrical Company.

April 22nd: "The Equation X-X-O," Cinematograph film showing in a practical form the construction of Harmonics.

Readers of this journal who would like further particulars of the society are invited to communicate with the Hon. Secretary, Mr. J. R. Deane Sainsbury (2CYW), "Brunook," Crossways, Shenfield, Essex.

EALING AND DISTRICT SHORT-WAVE CLUB

ON January 26th the above club held a very interesting meeting at their headquarters, when Mr. Hathrill (2CCK) gave a description of the receiving aerials at his QRA (two half-waves in phase).

On February 2nd, a Junk Sale was held, which as usual proved a great success. The proceeds of this sale are going towards the production of the new club magazine, "The Monitor," which we hope to publish for the first time early in March. Copies may be had by non-members for 3½d. each, post free. It contains World Friendship Society of Radio Amateurs, and British Short-Wave League notes.

All enquiries concerning the club and magazine should be made to the Secretary, and a stamped-addressed envelope would be appreciated. Hon. Sec., W. Colchang (2CKL), 31, Lancaster Gardens, Ealing, W.13.

THE EXETER AND DISTRICT WIRELESS SOCIETY.

AT the meeting of the above society held on Monday, February 14th, Mr. E. Gibbs, of Bristol, gave a lecture on "The Evolution of the Superhet." Mr. Gibbs traced its growth from the early days, and stated that the first one was made in 1917, long before broadcasting was thought of. Each stage of the superhet was analysed, and the talk made more interesting in view of the personal experience which Mr. Gibbs had in the putting into practice of the theories which were formed in the early days.

At the next meeting a talk is being given jointly by Mr. and Mrs. Rumball on "Electricity in the Home."

Meetings are held each Monday at No. 3, Dix's Field, Exeter, and all those interested should get in touch with the secretary, Mr. W. J. Ching, 9, Sivell Place, Heavitree, Exeter.



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).

Radiation Interference

SIR,—I was interested to read Mr. K. Smith's letter in the February 12th issue of PRACTICAL AND AMATEUR WIRELESS because I have had a similar experience. About eighteen months ago I built an all-mains receiver consisting of a "straight" H.F. pentode, triode detector, and pentode output. Single-circuit tuning was employed in both the aerial and H.F. stages.

During daylight there was no interference, but after darkness had fallen both medium- and long-wave bands were interfered with, by a background of morse. This was subject to slow fading, and was more prominent on some evenings than on others. Sometimes, also, an Italian broadcaster could be faintly heard. This background affected the long-wave band most. I cured it by fitting a short-wave H.F. choke in the aerial lead.

Later, when rebuilding the set, I replaced the H.F. pentode with one of the variable-mu type, and fitted a band-pass filter in the H.F. stage, whereupon the trouble disappeared altogether.

Recently I built a short-wave converter, and picked up a morse station on about 25 metres, but which of the Italian stations came with it I do not know.—F. HAWKINS (Edgware).

Aerials for Television: A Correction

SIR,—I wish to point out a slight error in my article, "Aerials for Television," which was published in the February 12th issue.

The formula: Z=276 log.D/d should be: Z=276 log.2D/d. It occurs twice in the article—once on the first page in the third column, and once over-page—as Z=276 log d/d, thus in the following calculation, D=3.26in., not 1.63in. as stated.

Also, the sentence at the bottom of the second column on the first page should read:

"It is advisable to use tube, or at least a fairly heavy gauge of wire, in order to have sufficient bandwidth for good definition and to give adequate input on sound, for the same aerial is invariably used for both vision and sound.—A. HASTINGS (Highgate).

Logged At Mablethorpe

SIR,—Since my last letter to you regarding the stations I had logged on 20 metres, I have received some particularly good DX stations, which I give below. They were logged on February 9th, on 'phones.

VU2CQ, KA1JR, KA1ZL, FI8AC, FR8VX and ZB1L.—W. H. RUSSELL (Mablethorpe).

"The Superhet's Rival"

SIR,—I was very interested to read the article in PRACTICAL AND AMATEUR WIRELESS about the use of two R.F. stages. I have used sets of this type for some time now, and I definitely prefer them to superhets for use on the long and medium waves.

I found that if I connected a S.G. valve between the two coils of my band-pass tuner, the selectivity was greatly improved. Since, for reasons of stability, the magnification of this stage had to be kept very low, I rebuilt the set to incorporate two R.F. stages of medium-efficiency. I have already experimented with a further low magnification stage as before, and results have been, if not successful, at least encouraging.

I see that four tuned circuits are shown in the skeleton diagram of the proposed set; and so I ask: "Why not use three R.F. stages?"

The use of three stages would not materially increase the R.F. amplification of the set, but it would improve the selectivity and the action of the A.V.C., thus reducing (i.e., improving) the effective sensitivity of the set. I think that when greater selectivity than that given by such a circuit is required, a tone control in the L.F. circuits has the necessary effect.

I shall await with some impatience the description of a "straight" set in PRACTICAL AND AMATEUR WIRELESS.—"O. L." (Kings Lynn).

CUT THIS OUT EACH WEEK.

Do you know

—THAT erratic tuning effects in a superhet may often be traced to vibration of the condenser plates when powerful signals are received.
—THAT excessive scratch from a pick-up may be due to dirt or dust on the record.
—THAT when instability arises in a new receiver and screening is tried out, the anode or other leads should be screened in preference to the grid leads.
—THAT serious "breakthrough" effects may often be traced to direct pick-up on the wiring or leads in a receiver.
—THAT a speaker field may be used as a resistor either for biasing an L.F. stage or for providing delay volts in an A.V.C. circuit.
—THAT screening cans, chassis and other metallic surfaces may be protected by paint or enamel, provided that it is of a non-corrosive nature.

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 Newnes, 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.

A Short-wave Log from Bordon

SIR,—I have read with interest the short-wave logs of other readers, and enclose my log of stations received from January 13th to February 9th.

Being in the service, my listening hours are very limited; usually from 5 p.m.-10 p.m. in the evening and 8 a.m.-10 p.m. on Sundays, so that I miss the late evening and early morning DXers. At present I am using a commercial receiver (5v. superhet), with aerial N-S 35ft. high and 50ft. long, including lead in.

All the stations were heard at good loudspeaker strength.

American amateurs (20 m. band): W2AIM, W4IS, W2JO, W1SLH, W2AH, W3UH, W1COY, W8GJ, W3HEA, W4CQG, W3FMY, W1IED, W8CLY, and W3JKQ.

Canadian: VE3MB and VE2FO.

Indian: VU2CQ.

Various (20 m. band): SU1CH, SU1RK, ES5D, F8MG, ZE1JA, CT1QE, ON4QA, IV1DK, CT1QG, LA1F, I1KN, F3EQ, LA1G, and EA3SI.—L. W. BROWN (Bordon Camp).

REPLIES IN BRIEF

The following replies to queries are given in abbreviated form either because of non-compliance with our rules, or because the point raised is not of general interest.

L. B. (Withington).—The double valve could be used, but obviously would not be so desirable as the two separate valves referred to.

S. B. (E.).—The trouble may be due to microphony, and the only cure would be to use a different detector valve, or screen this to prevent it from being affected by the sound waves from the speaker.

J. B. (Dundee).—Unless there is some unusual fact not revealed by your description, we can only conclude that the device is acting as a capacity aerial, which often gives exceedingly good results, being non-directional and in many cases better than the orthodox aerial wire.

G. T. (Padstow).—The Prefect S.W. Three could be used for the range you mention, using suitable plug-in coils. We have not designed a set giving continuous tuning over that band.

H. C. (Bradford).—The capacity of the condenser may not be critical in your set, and a value from .1 mfd. upwards may be used. It is sometimes found worth while to use an 8 mfd. electrolytic, and you should therefore experiment with a view to finding a suitable value for your particular case.

W. F. M. (Llangorse).—You could use your storage supply, and tap off the necessary low voltage in the same way as in an H.T. battery. Alternatively, you could obtain the lower voltage by means of a 30,000 ohm resistance in series with the H.T. 1 feed connecting the other end to the H.T. 2 lead, and joining a 2 mfd. fixed condenser from the H.T. 1 side of the resistance to earth.

W. J. M. (Mumbles).—Difficulty is sometimes experienced when using an eliminator for a short-wave set, and you may find it necessary to introduce additional smoothing circuits.

R. M. (Portuil).—We regret that the receiver is not one of our designs and accordingly we are unable to assist you in obtaining better results. The paper in which it was described is no longer on sale.

T. B. (Haltwhistle).—The fact that you are using a permanent type of detector is an improvement, and your lack of results may be due to your particular locality, or to the fact that you are using an inefficient aerial-earth system.

P. K. (Tankerton).—You could not use the rectifier for the purpose outlined as the current delivered is too small. You must obtain one of the special rectifiers designed for accumulator charging.

T. A. T. (Rhos).—Your best plan is to get into touch with a good Patent Agent who will be able to advise you and carry out the necessary filing, etc.

E. R. P. (Sth. Croydon).—A breakdown in the cathode insulation of a valve can give rise to the trouble mentioned. We advise you to have all of the valves tested.

F. J. W. (Leamington Spa).—Write to J. J. Laker & Co., Kent House Lane, Beckenham, Kent, who specialise in tubular and other metal masts.

D. F. A. (Camberley).—So far as we can trace, there is no book on the market dealing with the subject.

J. A. S. (Grimsby).—It would be better to use a metal rectifier of the type specially designed for trickle charging. A transformer giving an output of 8 to 12 volts would be needed, according to the type of rectifier you obtain.

Practical and Amateur Wireless

BLUEPRINT SERVICE

These Blueprints are drawn full size.
Copies of appropriate issues containing descriptions of these sets can in some cases be supplied at the following prices, *which are additional to the cost of the Blueprint.* A dash before the Blueprint Number indicates that the issue is out of print.

Issues of Practical Wireless	..	4d. Post Paid
Amateur Wireless	..	4d. ,, ,,
Practical Mechanics	..	7½d ,, ,,
Wireless Magazine	..	1/3 ,, ,,

The index letters which precede the Blueprint Number indicate the periodical in which the description appears: thus P.W. refers to PRACTICAL WIRELESS, A.W. to *Amateur Wireless*, PM to *Practical Mechanics*, W.M. to *Wireless Magazine*.

Send (preferably) a postal order to cover the cost of the blueprint and the issue (stamps over 6d. unacceptable), to PRACTICAL AND AMATEUR WIRELESS Blueprint Dept., George Newnes, Ltd., Tower House, Southampton Street, Strand, W.C.2.

PRACTICAL WIRELESS

	Date of Issue.	No. of Blueprint.
CRYSTAL SETS.		
Blueprint, 6d.		
1937 Crystal Receiver	9.1.37	PW71
STRAIGHT SETS. Battery Operated.		
One-valve : Blueprint, 1s.		
All-wave Unipen (Pentode)	—	PW31A
Beginner's One-valver	19.2.38	PW85
Two-valve : Blueprints, 1s. each.		
Four-range Super Mag Two (D,Pen)	—	PW36B
The Signet Two (D & LF)	29.8.36	PW76
Three-valve : Blueprints, 1s. each.		
The Long-range Express Three (SG, D, Pen)	24.4.37	PW2
Selectone Battery Three (D, 2 LF (Trans))	—	PW10
Sixty Shilling Three (D, 2 LF (RC & Trans))	—	PW34A
Leader Three (SG, D, Pow)	22.5.37	PW35
Summit Three (HF Pen,D, Pen)	—	PW37
All Pentode Three (HF Pen, D (Pen), Pen)	29.5.37	PW39
Hall-mark Three (SG, D, Pow)	12.6.37	PW41
Hall-mark Cadet (D, LF, Pen (RC))	16.3.35	PW48
F. J. Camm's Silver Souvenir (HF Pen, D, (Pen), Pen) (All-wave Three)	13.4.35	PW49
Genet Midget (D, 2 LF (Trans))	*June* '35	PM1
Cameo Midget Three (D, 2 LF (Trans))	8.6.35	PW51
1936 Sonotone Three-Four (HF Pen, HF Pen, Westector, Pen)	17.8.35	PW53
Battery All-Wave Three (D, 2 LF (RC))	—	PW55
The Monitor (HF Pen, D, Pen)	—	PW61
The Tutor Three (HF Pen, D, Pen)	21.3.36	PW62
The Centaur Three (SG, D, P)	14.3.37	PW64
The Gladiator All-Wave Three (HF Pen, D (Pen), Pen)	29.8.36	PW66
F. J. Camm's Record All-Wave Three (HF Pen, D, Pen)	31.10.36	PW69
The "Colt" All-Wave Three (D, 2 LF (RC & Trans)	5.12.36	PW72
The "Rapide" Straight 3 (D, 2 LF (RC & Trans))	4.12.37	PW82
F. J. Camm's Oracle All-wave Three (HF, Det, Pen)	28.8.37	PW78
1938 "Triband" All-Wave Three (HF Pen, D. Pen)	22.1.38	PW84
Four-valve : Blueprints, 1s. each.		
Sonotone Four (SG, D, LF, P)	1.5.37	PW46
Fury Four (2SG, D, Pen)	8.5.37	PW11
Beta Universal Four (SG, D, LF, Cl. B)	—	PW17
Nucleon Class B Four (SG, D (SG), LF, Cl. B)	6.1.34	PW34B
Fury Four Super (SG, SG, D, Pen)	—	PW34C
Battery Hall-mark 4 (HF Pen, D, Push-Pull)	—	PW46
F. J. Camm's "Limit" All-Wave Four (HF Pen, D, LF, P)	26.9.36	PW67
All-Wave "Corona" 4 (HF Pen, D, LF, Pow)	9.10.37	PW79
"Acme" All-wave 4 (HF Pen, D (Pen), LF, Cl. B)	12.2.38	PW83
Mains Operated.		
Two-valve : Blueprints, 1s. each.		
A.C. Twin (D (Pen), Pen)	—	PW18
A.C.-D.C. Two (SG, Pow)	—	PW31
Selectone A.C. Radiogram Two (D, Pow)	—	PW19
Three-valve : Blueprints, 1s. each.		
Double-Diode-Triode Three (HF Pen, DDT, Pen)	—	PW23
D.C. Ace (SG, D, Pen)	—	PW25
A.C. Three (SG, D, Pen)	—	PW29
A.C. Leader (HF Pen, D, Pow)	—	PW35C
D.C. Premier (HF Pen, D, Pen)	31.3.34	PW35B
Ubique (HF Pen, D (Pen), Pen)	28.7.34	PW36A
Armada Mains Three (HF Pen, D, Pen)	—	PW38
F. J. Camm's A.C. All-Wave Silver Souvenir Three (HF Pen, D, Pen)	11.5.35	PW50
"All-Wave" A.C. Three (D, 2 LF (RC))	17.8.35	PW54
A.C. 1936 Sonotone (HF Pen, HF Pen, Westector, Pen)	—	PW56
Mains Record All-Wave 3 (HF Pen, D, Pen)	5.12.36	PW70
All-World Ace (HF Pen, D, Pen)	28.8.37	PW80
Four-valve : Blueprints, 1s. each.		
A.C. Fury Four (SG, SG, D, Pen)	—	PW20
A.C. Fury Four Super (SG, SG, D, Pen)	—	PW34D
A.C. Hall-Mark (HF Pen, D, Push-Pull)	24.7.37	PW45
Universal Hall-Mark (HF Pen, D, Push-Pull)	9.2.35	PW47
A.C. All-Wave Corona Four	6.11.37	PW81
SUPERHETS		
Battery Sets : Blueprints, 1s. each.		
£5 Superhet (Three-valve)	5.6.37	PW40
F. J. Camm's 2-valve Superhet	13.7.35	PW52
F. J. Camm's £4 Superhet	—	PW58
F. J. Camm's "Vitesse" All-Waver (5-valver)	27.2.37	PW75
Mains Sets : Blueprints, 1s. each.		
A.C. £5 Superhet (Three-valve)	—	PW43
D.C. £5 Superhet (Three-valve)	1.12.34	PW42
Universal £5 Superhet (Three-valve)	—	PW44
F. J. Camm's A.C. £4 Superhet 4	31.7.37	PW59
F. J. Camm's Universal £4 Superhet 4	—	PW60
"Qualitone" Universal Four	16.1.37	PW73
SHORT-WAVE SETS.		
Two-valve : Blueprint, 1s.		
Midget Short-wave Two (D, Pen)	—	PW38A
Three-valve : Blueprints, 1s. each.		
Experimenter's Short-Wave Three (SG, D, Pow)	—	PW30A
The Prefect 3 (D, 2LF (RC and Trans))	7.8.37	PW63
The Band-Spread S.W. Three (HF Pen, D (Pen), Pen)	29.8.36	PW68
PORTABLES.		
Three-valve : Blueprints, 1s. each.		
F. J. Camm's ELF Three-valve Portable (HF Pen, D, Pen)	—	PW65
Parvo Flyweight Midget Portable (SG, D, Pen)	19.6.37	PW77
Four-valve : Blueprint, 1s.		
Featherweight Portable Four (SG, D, LF, Cl. B)	15.5.37	PW12
MISCELLANEOUS.		
S.W. Converter-Adapter (1 valve)	—	PW48A

AMATEUR WIRELESS AND WIRELESS MAGAZINE

CRYSTAL SETS.		
Blueprints, 6d. each.		
Four-station Crystal Set	12.12.36	AW427
1934 Crystal Set	—	AW444
150-mile Crystal Set	—	AW450
STRAIGHT SETS. Battery Operated.		
One-valve : Blueprints, 1s. each.		
B.B.C. Special One-valver	—	AW387
Twenty-station Loudspeaker One-valver (Class B)	—	AW449
Two-valve : Blueprints, 1s. each.		
Melody Ranger Two (D, Trans)	—	AW388
Full-volume Two (SG det., Pen)	—	AW392
B.B.C. National Two with Lucerne Coil (D, Trans)	—	AW377A
Big-power Melody Two with Lucerne Coil (SG, Trans)	—	AW338A
Lucerne Minor (D, Pen)	—	AW426
A Modern Two-valver	—	WM409
Three-valve : Blueprints, 1s. each.		
Class B Three (D, Trans, Class B)	—	AW386
New Britain's Favourite Three (D, Trans, Class B)	15.7.33	AW394
Home-built Coil Three (SG, D, Trans)	—	AW404
Fan and Family Three (D, Trans, Class B)	25.11.33	AW410
£5 5s. S.G.3 (SG, D, Trans)	2.12.33	AW412
1934 Ether Searcher; Baseboard Model (SG, D, Pen)	—	AW417
1934 Ether Searcher; Chassis Model (SG, D, Pen)	—	AW419
Lucerne Ranger (SG, D, Trans)	—	AW422
Cossor Melody Maker with Lucerne Coils	—	AW423
Mullard Master Three with Lucerne Coils	—	AW424
£5 5s. Three: De Luxe Version (SG, D, Trans)	19.5.34	AW435
Lucerne Straight Three (D, RC, Trans)	—	AW437
All-Britain Three (HF Pen,D,Pen)	—	AW448
"Wireless League" Three (HF Pen, D, Pen)	3.11.34	AW451
Transportable Three (SG, D, Pen)	—	WM271
£6 6s. Radiogram (D, RC, Trans)	—	WM318
Simple-tune Three (SG, D, Pen)	*June* '33	WM327
Economy-Pentode Three (SG, D, Pen)	*Oct.* '33	WM337
"W.M." 1934 Standard Three (SG, D, Pen)	—	WM351
£3 3s. Three (SG, D, Trans)	*Mar.* '34	WM354
Iron-core Band-pass Three (SG, D, QP21)	—	WM362
1935 £6 6s. Battery Three (SG, D, Pen)	—	WM371
PTP Three (Pen, D, Pen)	*June* '35	WM389
Certainty Three (SG, D, Pen)	—	WM393
Minitube Three (SG, D, Trans)	*Oct.* '35	WM396
All-wave Winning Three (SG, D, Pen)	*Dec.* '35	WM400
Four-valve : Blueprints, 1s. 6d. each.		
65s. Four (SG, D, RC, Trans)	—	AW370
"A.W." Ideal Four (2 SG, D,Pen)	16.9.33	AW402
2HF Four (2 SG, D, Pen)	—	AW421
Crusader's A.V.C.4 (2HF,D,QP21)	18.8.34	AW445
(Pentode and Class B Outputs for above :-Blueprints, 6d. each)	25.8.35	AW445A
Self-contained Four (SG, D, LF, Class B)	*Aug.* '33	WM331
Lucerne Straight Four (SG, D, LF, trans)	—	WM350
£5 5s. Battery Four (HF, D, 2LF)	*Feb.* '35	WM381
The H.K. Four (SG, SG, D, Pen)	*Mar.* '35	WM384
The Auto Straight Four (HF Pen, HF-Pen, DDT, Pen)	*Apr.* '36	WM404
Five-valve : Blueprints, 1s. 6d. each.		
Super-quality Five (2HF, D, RC, Trans)	*May* '33	WM320
Class B Quadradyne (2 SG, D, LF, Class B)	*Dec.* '33	WM344
New Class B Five (2 SG, D, LF, Class B)	*Nov.* '33	WM340
Mains Operated.		
Two-valve : Blueprints, 1s. each.		
Consoelectric Two (D, Pen) A.C.	—	AW403
Economy A.C. Two (D, Trans) A.C.	—	WM286
Unicorn A.C.-D.C. Two (D, Pen)	—	WM394
Three-valve : Blueprints, 1s. each.		
Home-Lover's New All-electric Three (SG, D, Trans) A.C.	—	AW383
S.G. Three (SG, D, Pen) A.C.	—	AW390
A.C. Triodyne (SG, D, Pen) A.C.	19.8.33	AW399
A.C. Pentaquester (HF Pen, D, Pen)	23.6.34	AW439
Mantovani A.C. Three (HF Pen, D, Pen)	—	WM374
£15 15s. 1936 A.C. Radiogram (HF, D, Pen)	*Jan.* '36	WM401
Four-valve : Blueprints, 1s. 6d. each.		
All-Metal Four (2 SG, D, Pen)	*July* '33	WM326
Harris' Jubilee Radiogram (HF Pen, D, LF, P)	*May* '35	WM386
SUPERHETS.		
Battery Sets : Blueprints, 1s. 6d. each.		
Modern Super Senior	—	WM375
Varsity Four	*Oct.* '35	WM395
The Request All-Waver	*June* '36	WM407
1935 Super Five Battery (Superhet)	—	WM379
Mains Sets : Blueprints, 1s. 6d. each.		
1934 A.C. Century Super A.C.	—	AW425
Heptode Super Three A.C.	*May* '34	WM359
"W.M." Radiogram Super A.C.	—	WM366
1935 A.C. Stenode	*Apl.* '35	WM385
PORTABLES.		
Four-valve : Blueprints, 1s. 6d. each.		
Midget Class B Portable (SG, D, LF, Class B)	20.5.33	AW389
Holiday Portable (SG, D, LF, Class B)	1.7.33	AW393
Family Portable (HF, D, RC, Trans)	22.9.34	AW447
Two H.F. Portable (2 SG, D, QP21)	*June* '34	WM363
Tyers Portable (SG, D, 2 Trans)	—	WM367
SHORT-WAVE SETS—Battery Operated.		
One-valve : Blueprints, 1s. each.		
S.W. One-valve converter (Price 6d.)	—	AW329
S.W. One-valve for America	23.1.37	AW429
Rome Short-Waver	—	AW452
Two-valve : Blueprints, 1s. each.		
Ultra-short Battery Two (SG det., Pen)	*Feb.* '36	WM402
Home-made Coil Two (D, Pen)	—	AW440
Three-valve : Blueprints, 1s. each.		
World-ranger Short-wave 3 (D, RC, Trans)	—	AW355
Experimenter's 5-metre Set (D, Trans, Super-regen)	30.6.34	AW438
Experimenter's Short-waver (SG, D, Pen)	*Jan.* 19, '35	AW463
The Carrier Short-waver (SG,D,P)	*July* '35	WM390
Four-valve : Blueprints, 1s. 6d. each.		
A.W. Short-wave World-Beater (HF Pen, D, RC, Trans)	—	AW436
Empire Short-Waver (SG, D, RC, Trans)	—	WM313
Standard Four-valver Short-waver (SG, D, LF, P)	*Mar.* '35	WM383
Superhet : Blueprint, 1s. 6d.		
Simplified Short-waver Super	*Nov.* '35	WM397
Mains Operated.		
Two-valve : Blueprints, 1s. each.		
Two-valve Mains Short-waver (D Pen) A.C.	—	AW453
"W.M." Band-spread Short-waver (D, Pen) A.C.-D.C.	—	WM368
"W.M." Long-wave Converter	—	WM380
Three-valve : Blueprint, 1s.		
Emigrator (SG, D, Pen) A.C.	—	WM352
Four-valve : Blueprint, 1s. 6d.		
Standard Four-valve A.C. Short-waver (SG, D, RC, Trans)	*Aug.* '35	WM391
MISCELLANEOUS.		
Enthusiast's Power Amplifier (1/6)	*June* '35	WM387
Listeners' 5-watt A.C. Amplifier (1/6)	—	WM392
Radio Unit (2v) for WM392	*Nov.* '35	WM398
Harris Electrogram (battery amplifier) (1/-)	*Dec.* '35	WM399
De-Luxe Concert A.C. Electrogram	*Mar.* '36	WM403
New Style Short-Wave Adapter (1/-)	*June* '35	WM383
Trickle Charger (6d.)	*Jan* 5, '35	AW462
Short-wave Adapter (1/-)	—	AW456
Superhet Converter (1/-)	—	AW457
B.L.D.L.C. Short-wave Converter (1/-)	*May* '36	WM405
Wilson Tone Master (1/-)	*June* '36	WM406
The W.M. A.C. Short-Wave Converter (1/-)	—	WM408



QUERIES and ENQUIRIES

Record Wear

"I have recently fitted a pick-up to my set and am now keenly interested in gramophone record reproduction. I find, however, that every time I play a record there is a heap of fluff and stuff around the needle and I wonder if this is wear on the record due to the needle or weight of the pick-up. Perhaps you could give me some indication as to how to stop this or whether it is detrimental?"—F. E. (Gt. Yarmouth).

THERE is always a certain amount of dust removed from the grooves when the record is played. A special brush or felt pad should be used to keep this at a minimum, as, when piled under the needle, a record can become damaged—especially if the dust is gritty. If possible, you should examine the dust removed under a microscope or high-power magnifying glass in order to make certain there is no record surface material. If there is, the needle is either bearing on one side of the groove due to the pick-up being wrongly mounted, or is pressing too heavily on it, and in this case it should be counterbalanced.

Station Name Dials

"I have built up a set comprising a 3-gang condenser, and as the stations do not fall in their proper place on the dial, and some not at all, could you give me some idea as to the adjustment and how to trim same?"—E. E. M. (Salcombe).

THE station name markings are intended when a certain type of gang condenser is used in conjunction with coils of a certain inductance value, and only when the combination is correct will the name indications come in their right place—provided that the receiver is properly trimmed. If you are using the condenser and coils specified for use with the dial then the set must be trimmed by adjusting the trimmers on top of the gang condenser until the pointer falls in the correct position. If the set is a superhet it may also be necessary to adjust padders or other adjustments in connection with the oscillator coil.

Short-Wave Sets

"Please can you tell me where I can obtain a circuit for a short-wave 2- or 3-valve set employing 4-pin coils, and if possible tuned by a .00025 mfd. condenser. I already possess the latter and also a .0001 mfd. reaction condenser and set of 4-pin coils and would like to use these up if possible."—G. B. (Northampton).

WE receive many requests of a similar nature to this, and would point out that in a simple set of the detector type the grid winding must be employed and reaction is practically essential. This gives two complete windings and thus four terminals or pins would be needed for this. Unfortunately, on the short waves the effects of damping due to the aerial-earth system are very marked, and it is advisable to remove the damping effect by taking the aerial connection away from the grid circuit, and although this may be done by using a condenser in series with the aerial much better effects are possible by using a separate coupling winding for the aerial which introduces the need for at least one further pin. Thus, the most suitable coil for a simple detector circuit for short-waves is that having three windings, and this necessitates the use of a 6-pin type of coil. This was the type used in our Prefect S.W. Three and we suggest you follow this, although if you intend to retain your 4-pin coils you will have to omit the aerial coupling coil and connect the aerial, via a small variable condenser, to the grid end of the grid winding.

American Dial Markings

"I have an all-wave American radio and I wish to know what the dial is calibrated in. The following are the numbers on the dial—short, medium and long, respectively: 5.8–18, 55–170, 14–36. Could you also tell me what the farthest distance is that television *pictures* have been clearly picked up? I disagree with my brother, who told me 200 miles."—E. C. I. (Liverpool 9).

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 queriists.

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.

THE markings on your dial are undoubtedly in megacycles and kilocycles. The short-wave band is in megacycles, corresponding approximately to 16.9 to 51.72 metres, and the medium waveband is marked in an abbreviated form of 550 to 1,700 kilocycles, corresponding roughly to 172 to 540 metres. The long waveband is from 140 to 360 kilocycles, corresponding roughly to 840 to 2,100 metres. The farthest distance, so far as we can trace, over which good pictures have been obtained from the B.B.C. transmitter at Alexandra Palace is at Moston, Manchester, by the Ferranti Company. The vision signal has, however, been heard in America and in South Africa, although in each case a picture could not be resolved.

Open Aerial Circuit

"I have constructed a set similar to the Experimenters' quality set for local reception, with an untuned stage. The point is—whether the choke is in circuit or not (that is, aerial connected direct to grid of valve and choke removed) makes no difference to quality or volume. Is this as it should be; if so, why use it? If not, can you give me some idea as to what might be wrong. Volume is not quite what it should be?"—H. M. (Cawthorne).

THE choke is an untuned device and therefore it will not make any difference to tuning. However, if the choke is removed, and nothing is joined across the grid circuit, you should find that the H.F. stage will not pull the same weight. If the choke may be removed without any effect whatsoever, it indicates either that the choke is open-circuited or that there is a high-resistance leak across your aerial and earth.

Field Replacement

"Recently I purchased a W.B. Junior speaker and I wish to substitute it for a mains energised model on my set. The latter has a field of 5,000 ohms, with an output valve Mazda Pen 3520. What components are necessary for the replacement? I have seen this query answered in a previous issue, but cannot trace it."—H. G. N. (New North Road, N.1.).

THE field is the only part of the speaker which is missing in your new model and therefore all that has to be replaced is that winding. Special L.F. chokes for this purpose are readily available from firms such as Sound Sales, of Marlborough Road, Upper Holloway, N.19. and these have a very high inductance value (60 or 70 henries) with a resistance (D.C.) similar to the resistance of the speaker field. These chokes are known as "Speaker field replacement chokes."

Component Suppliers

"Can you tell me the address of the firm which makes the Ferrocart coils recommended for the 'Four-range' set in Fifty Tested Circuits. Is the transcoupler a standard component?"—P. R. G. (Stapleton, Bristol).

THE Ferrocart coil is made by Messrs. Colvern, of Mawneys Road, Romford, Essex. The Transcoupler referred to is a special resistance-fed transformer, that is, an L.F. transformer plus a resistance and condenser, used in the parallel-fed circuit. If difficulty is experienced now in obtaining this component you may use a standard transformer and separate resistance and condenser, the latter components having values of 20,000 ohms and .02 mfd.

Coil Design

"I have been given a set of screened coils and one of them has a lead sticking through the top of the screen. I assumed this was for the anode, but the wireless fan who passed these parts on to me said that he thought it was for the grid. As neither of us is certain, I wonder if you could tell me, to avoid disappointment when I use the coils?"—U. D. (Harrow).

YOU may both be right, as it is possible to obtain coils of the type mentioned, with an external pigtail connection for either grid or anode. It is essential before you use the coils to know the pattern and this will enable you to ascertain the type of valve to use with them. The majority of H.F. valves are now available with either grid or anode top cap, but the anode is most usual. On the other hand, the frequency changer is generally made with the grid as the top cap and this may enable you to identify your coil connection.

The coupon on page 666 must be attached to every query.

Miscellaneous Advertisements

Advertisements are accepted for these columns at the rate of 3d. per word. Words in black face and/or capitals are charged double this rate (minimum charge 3/- per paragraph). Display lines are charged at 6/- per line. All advertisements must be prepaid. All communications should be addressed to the Advertisement Manager, "Practical and Amateur Wireless," Tower House, Southampton Street, Strand, London, W.C.2.

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shows dozens of New Short wave Components. **1½D** *Post Free.*

RADIOMART

44, HOLLOWAY HEAD, BIRMINGHAM, 1

OLIVERS, 676, Christchurch Road, Boscombe, Hants, offer: Erie 1-watt resistances, 3½d. each; 3/- dozen; 2/6 dozen in 3-dozen lots.

Centralab Volume Controls with switch, 2/- each. Chassis mounting Valve Holders, 5-pin, 2½d.; 7-pin, 3½d. Americans and Octal, 6d.

Aluminium Chassis, 16in. by 10in. by 3in., 18-gauge 5/3, 16-gauge 7/6. All undrilled. Any size manufactured to your specifications; quotations per return. Screens, panels, a speciality.

Transformers. Output, Power/Pen.; Class "B"/Q.P.P. 3/3 each. Class "B" Drivers and L.F.s 3/9 each. All brand new and guaranteed. Let us have your rewinds. Lowest prices with highest standard of workmanship. Every job fully guaranteed.

Cardboard case electrolytics, B.I. 8 mfd., 1/9; 4 mfd., 1/9; 8mfd. plus 4 mfd., 2/5; 8 mfd. plus 8 mfd., 2/9.

Olivers, 676, Christchurch Road, Boscombe, Hants. Orders under 5/6 postage extra. Stamp for full valve and component lists.

SOUTHERN RADIO'S Guaranteed Wireless Bargains, post paid.

PLESSEY 3-valve Battery Sets, complete in sealed cartons with three Mazda valves, moving coil speaker, Pertrix batteries and accumulator, in exquisite walnut cabinet, 57/6.

GARRARD Record Changers, A.C. 200-250 volts, changes eight 10- or 12-inch records; £6 (complete sealed cartons); universal A.C./D.C. model, £7/10/-.

GARRARD A.C. Radiogram Units, with pick-up and all accessories, in sealed cartons; 42/-.

TELSEN (1937-38) Components, iron-core coils W.349 (Midget size), 3/6. W.477 (triple ganged, for band-pass or straight circuits), 14/6; W.476 (triple ganged superhet), 14/6. W.478 (twin ganged), 9/-; all ganged coils complete on bases, with switch; I.F. transformer coils, 4/6; dual range coils, 2/9, with aerial series condenser, W.76, 3/9.

TELSEN A.C./D.C. Multimeters, 5-range (tests anything radio or electrical), 8/6; loudspeaker units, 2/6, Ace (P.O.) microphones, complete with transformer ready for use with any receiver, 4/6; headphones, 4,000 ohms, 3/- pair.

VALVES.—Full range for American receivers, 6/- each.

MORSE Tappers, complete radio-telegraph set (flasher, buzzer and tappers), with batteries, bulb, code, 3/-.

BARGAIN Parcels of Assorted Components, including coil, resistances, condensers, chokes, wire, circuits, etc., value 21/-; 5/- per parcel.

SOUTHERN RADIO, 323, Euston Rd., London, N.W.1; and 46, Lisle St., London, W.C.1. All mail orders to

SOUTHERN RADIO, 323, Euston Rd., London, N.W.1 (near Warren St. Tube). 'Phone: Euston 3775.

S.T.900 specified kits, including valves and 10 coils, £4/19/6. A.C. Versions, £8/15/0. S.T.800 Authors Kit B, £2/10/0. S.T.700 Kit A, £1/10/0. Sterwell Wireless Supplies, 64, Prestbury Road, London, E.7.

ALL 1938 Radio Goods at lower prices than any advertised.—Coulphone Radio, Ltd., Dept. P2, 25, Grimshaw Lane, Ormskirk.

PREMIER SUPPLY STORES

POST ORDERS
Jubilee Works, 167, Lower Clapton Rd., London, E.5.
Amherst 4723

CALLERS
165 & 165a, Fleet Street, E.C.4
Central 2833
50, High Street, Clapham, S.W.4.
Macaulay 2381

Now Ready. Our New 1938 Enlarged Illustrated Catalogue, Handbook and Valve Manual. Price 6d.

PREMIER 3-watt A.C. or A.C./D.C. Amplifier Kit Complete with valves, **40/-**, Wired and Tested, **55/-**. 8-watt A.C./D.C. 3-stage Amplifier Kit. Complete with valves, **£4/4/0.** Wired and Tested, **£5/5/0.**

UTILITY PROFESSIONAL 4" MICRO-CURSOR DIALS. Direct and 100 : 1 ratio, **3/9** each.

BATTERY VALVES, 2 volts, H.F., L.F., **2/3.** Power, Super-Power, **2/9,** Var-mu-S.G., 4- or 5-pin Pentodes, H.F. Pens, V-mu-H.F. Pens, **5/-.** Class B, **5/-.** Freq. Changers, **7/6.**

EUROPA MAINS VALVES. 4 v. A.C. Types, A.C./HL, A.C./L., A.C./S.G., A.C./V.M.S.G., A.C./H.P., A.C/V.H.P., A.C./P., and 1 watt D.H. Pentodes, all **4/6** each. A.C./Pens. I.H., **5/6**; A.C./P.X.4, **6/6**; Oct. Freq. Changers, **8/6**; Double Diode Triodes, **7/6**; Triode Hex. Freq. Ch., **8/6**; Tri. Grid. Pen., **10/6**; 3½ watt I.H. Triode, **7/6.**

UNIVERSAL TYPES. 20 v. .18 a. S.G., Var.-Mu. S.G., Power, H.F. Pen., Var.-Mu. H.F. Pen., **4/6** each.

13 v. .2 a. Gen. Purpose Triodes, **5/6**; H.F. Pens. and Var.-mu. H.F. Pens., Double Diode Triodes, Oct. Freq. Changers, **7/6** each. Full-Wave and Half-Wave Rectifiers, **5/9** each.

AMERICAN VALVES. We are sole British Distributors for TRIAD High-grade American Valves. All Types in stock. Standard types, **5/6** each. All the new Octal base Tubes at **6/6** each. 210 and 250, **8/6** each; 81 and 2A3, **8/-** each.

PREMIER TRANSFORMERS, wire-end type with screened primaries, tapped 200-250 v. Filaments. Guaranteed one year. **H.T. 8 & 9** or **H.T.10** with 4 v. 4 a. C.T. and 4 v. 1 a. C.T., **8/6. 250-250 v. 60 m.a.** or **300-300 v.,** 4 v. 1 a., 4 v. 2 a. and 4 v. 4 a., all C.T., **10/-. 350-350 v. 120 m.a.,** 4 v. 1 a., 4 v. 2 a. and 4 v. 4 a., all C.T., **13/-.** With engraved panel and N.P. terminals, **1/6** extra. **500-500 v. 150 ma.,** 4 v. 2-3 a., 4 v. 2-3 a., 4 v. 2-3 a., 4 v. 3-4 a., all C.T., **21/-. 500-500v. 200 m.a.,** 5 v. 3 a., 4 v. 2 a., 4 v. 2 a., 4 v. 3-5 a., all C.T., **25/-.**

NEW 1-VALVE SHORT-WAVE RECEIVER OR ADAPTOR KIT. 13 to 86 metres without coil changing. Complete Kit and Circuit, **12/6. VALVE GIVEN FREE!**

DE LUXE MODEL, 14 to 170 metres, complete Kit with Chassis, 4 Coils and all parts, **17/6.**

SUPERHET CONVERTER KIT, 15/-. De Luxe Model, 20/-.

S.W. SUPERHET CONVERTER KIT, for A.C. Mains Receivers, **22/6.** A.C. Valve given **FREE!**

NEW 2-VALVE S.W. KIT, 13 to 86 metres without coil changing. Complete Kit and Circuit, **19/6. VALVES GIVEN FREE!**

DE LUXE MODEL, 14 to 150 metres, complete Kit and Circuit, 4 Coils and all parts, **25/-. VALVES GIVEN FREE!**

PREMIER "TROLITUL" Short-Wave CONDENSERS. Certified superior to Ceramic. All-brass Construction, 15 mmfd., 1/6; 40 mmfd., 1/7; 100 mmfd., 1/10; 160 mmfd., 250 mmfd., 2/6; Double Spaced 15 mmfd., 2/9; 40 mmfd., 3/6; S.W.H.F. Chokes, 9d.; screened, 1/6. All-Brass S.W. Condensers with integral slow-motion .00015 Tuning, 4/3; .00015 Reaction, 3/9.

Premier Battery Chargers. Westinghouse Rectification. Complete Ready for use.

To charge 2 volts at ½ amp. 10/-; 6 volts at ½ amp., 16/6; 6 volts at 1 amp., 19/6; 12 volts at 1 amp., 21/-; 6 volts at 2 amp., 32/6.

SHORT-WAVE COILS, 4- and 6-pin types, 13-26, 22-47, 41-94, 78-170 metres, **1/9** each, with circuit. Special set of S.W. Coils, 14-150 metres, **4/-** set with circuit. Premier 3-band S.W. Coil, 11-25, 19-43, 38-86 metres. Simplifies S.W. receiver construction, suitable any type circuit, **2/6.**

COIL FORMERS, 4- or 6-pin low-loss, **1/-** each.

On orders under 5/- please add 6d. postage.

£2 each, Marconi and G.E.C. 3-valve Battery Sets; H.F. pen., S.G.det., Pen. output, Moving-coil Speaker; perfect condition, complete with valves, 65/-. Ever-ready 5-valve Battery Super, complete with valves, perfect. 90/-, 8-valve Crosley A.C. All-wave 4-band Superhet Console, working order. All above carriage paid.—Radiographic, Ltd., 66, Osborne Street, Glasgow.

VAUXHALL.—Polar Midget condensers, 2-gang, 6s. 8d.; 3-gang, 8s. 9d.; 4-gang, 13s. 6d. Polar full vision horizontal drives, 5s.

VAUXHALL, Hivac valves, entire range, full discounts. Polar station-named scales for horizontal drives, 1s.

VAUXHALL. T.C.C. electrolytic condensers, 8 mfd. and 4 mfd. 500 volt, 2s. 6d. 50 mfd. 50 volt, 1s. 6d.

VAUXHALL. Iron-cored coils, 3-gang, on base, with circuit, 17s. J.B. drives with station named scale, 5s. 6d.

VAUXHALL. Magnavox and Rola P.M. speakers, 7in. cone 10s. 6d.; 10in. cone, 22s. Energised models 2,500 field coils, 7in., 12s. 6d.; 10in., 17s. 6d.

VAUXHALL UTILITIES, 163a, Strand, W.C.2. Temple Bar 9338. Send postcard for free list. Post paid 2s. 6d. and over, or C.O.D.

HEADPHONES.—Brown, Ericsson, G.E.C., B.T.H., Standard Telephones, Nesper, Western Electric, Sterling, etc., 2,000 ohms, 2s. 6d.; 4,000, 5s. Postage 6d. **SPECIAL.** Ericsson, 4,000 ohms, as new, 7s. 6d. Telefunken, lightweight, adjustable, 7s. 6d.

CRYSTAL SETS—Burne-Jones. Complete, Guaranteed, 5s. 6d. Ditto, double circuit, 8s. Sensitive permanent detectors, 1s. 6d. Crystal Detectors, complete, 1s. Crystals with silver cat's-whisker, 6d. Postage 1½d.—Post Radio, 2, Copenhagen Street, London, N.1.

CONVERSION UNITS for operating D.C. Receivers from A.C. Mains, improved type, 120 watt output at £2/10/0. Send for our comprehensive list of speakers, resistances and other components.

WARD, 46, Farringdon Street, London, E.C.4. Telephone: Holborn 9703.

3/6 2a. 3-way Linecords with plug and socket, 360 ohms. 2/9, volume control with switch, any size. 4/9, multi-block Electrolytic 10+10+5+5, suit any midget set. 8/6, Midget MC speakers, 2,500 ohm field with output transformer.—Radiographic, Ltd., 66, Osborne Street, Glasgow, C.1.

BANKRUPT BARGAINS.—List free. Decca 5v. 1938 A.C. all-wave superhets. £5 17s. 6d. Decca 5v. A.C./D.C. all-wave portables, 5gns. Truphonic 1938 A.C./D.C. 5v. superhet all-wave, £7 15s. Decca 6v. A.C. 1937 superhets, £4 17s. 6d. Decca 5v. battery superhets, 98s. 6d. Altham 3v. all-wave battery, £3. Many others. Full stock valves, etc.—Butlin, 6, Stanford Avenue, Brighton.

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AMERICAN Valves in Sealed Cartons, all types, 5/6, post paid.—Valves, 661/3, Harrow Road, N.W.10.

BUY VALVES DIRECT.—Fully guaranteed. 2-volt, H2, L2, 2s. 3d.; Power, 3s. Screen-grids, 4s. 9d.; Pentodes, 5s. 6d. Mains, General Purpose, 4s. 6d.; Power, 6s.; Screen-grids and Pentodes, 6s. 6d.; Rectifiers, 4s. 6d. Over 150 types available—Battery, A.C. and A.C./D.C. Mains, and American. Postage 3d. one valve, 4d. two, 6d. three and over. Cash with order.—Luminous Electric Appliances, Ltd. (Dept. 9), Phœnix Works, Tyburn Road, Birmingham.

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LOUDSPEAKER repairs, British, American, any make, 24-hour service; moderate prices.—Sinclair Speakers, Alma Grove, Copenhagen Street, London, N.1.

REPAIRS to Moving Coil Speakers, Cones and Coils, fitted and rewound. Fields altered. Prices Quoted including Eliminators. Loudspeakers Repaired, 4/-. L.F. and Speech Transformers, 4/- post free. Trade invited. Guaranteed. Satisfaction. Prompt Service, Estimates Free.—L.S. Repair Service, 5, Balham Grove, London, S.W.12. Battersea 1321.

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MANUFACTURERS' surplus cabinets for Radiograms, Radio sets and Loudspeakers. Large and varied stock. Inspection invited, or send particulars of your requirements, with measurements of chassis. Photos sent for selection. (No catalogue.)—H. L. Smith & Co., Ltd., 287-289, Edgware Road, London, W.2. (Pad. 5891.)

RECEIVERS, COMPONENTS AND ACCESSORIES

Surplus, Clearance or Secondhand, etc.

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63, HIGH HOLBORN, W.C.1. Holborn 4631.

Greater bargains of Brand New Surplus Goods at a Fraction of the Original Cost.

Huge purchase of Universal 7-valve All-Wave Superhet Chassis. 4 Wave Bands covered, Ultra Short, Short, Medium and Long. Fitted **7 Mullard Valves** as follows: Pre H.F. Stage VP13C, Frequency Changer FC13C, I.F. Stage VP13C, TDD13C for Detection, A.V.C. and L.F., SP13C Muting Valve, Output Pen 36C, URIC Rectifier, plus potential divider on D.C. Spot Light Tuning, Station-named Dial, etc. Brand new, a really magnificent job, **£3 17s. 6d. each.**

Special **Speaker for above**, fitted Pentode Transformer, 600 ohm Field, 7½" cone, etc., **12/6 each.**

Aerodyne 5-valve Battery Superhet, a really magnificent job, listed at 8½ gns. The Chassis is contained in a handsomely finished walnut cabinet of upright design. The Dial is really attractive and is station named. Tuning is indicated by means of a rotating light. The Valves used are as follows: FC2A, VP2, 2D2, PM2B, and Cossor 220 PA. Speaker large type P.M. Rola. **Our price to clear, £4 4s. each.**

Aerodyne 5-valve Battery Superhet Chassis, ex. above, Brand new, **LESS VALVES. Few only, 39/- each.**

Huge purchase Philco 3-valve Battery Short-wave Receivers. A really splendid model, fitted in handsome contrasted walnut cabinet, 2 speed dial, large P.M. Speaker, with the added attraction of a Short-Wave Band. Listed 8½ gns., our price to clear **£4 12s. 6d. each.**

We would emphasize that the above are in all instances Brand New as from the makers.

Huge purchase **Electric Trouser Presses,** made for a Pall Mall firm to sell at 3 gns. Brand new, boxed. **The Press** that steams and presses your trousers in one operation. **12/11d. each.**

Quartz Piezo Crystals, 125 k/c. A unique opportunity to obtain a reasonable and costly crystal at a fraction of the original price. Ideal for Wave Meters, Standard Frequency Test, or could be reground for other frequencies. **Now, amateur transmitters and others, here is your chance at 4/6d. each.**

Quartz Piezo Crystals and 125 k/c I.F. Transformer. Ideal combination for Single Signal Superhet. **7/11d. per pair.**

Huge purchase of Relays, made by well-known manufacturer. Breaks at 1 m.a., Resistance 3,300 ohms. Cost 25/- each, **our price 5/- each.**

Hunts Cardboard Electrolytics. Metal Shrouded, 500-volt Peak. 450-volt working, **16 mfd. plus 8 mfd.,** Separate Negatives, **2/6d. each.**

8 mfd. plus 8 mfd. ditto, 2/- each.

Hellesens 10 mfd., 250-volt working, Cardboard Electrolytics, **9d. each.**

Dubilier Cardboard Electrolytics, 4 plus 4 plus 2 plus 2 plus 2, 350-volt working, **1/6d. each.**

Hunts Cardboard Electrolytics, 4 mfd., 350-volt working, **1/3d. each.**

Muirhead Tubular Condensers, 1 mfd., 375-volt working, **1/- each. .1 mfd. ditto, 4½d. each.**

D.P.D.T. Twist Switches, Toggle pattern, **10d. each.**

S.P.S.T. Toggle, **7d. each.**

Speaker Transformers, Pentode Type only, **2/6d. each.**

Huge purchase **1 Watt Resistances,** well-known makes, **4/- gross, mixed. No duds.**

Bryce Mains Transformers, standard for the season. These Transformers are British made, and are fully guaranteed for 6 months.

350-0-350, 120 m.a., 2-0-2 volts 2.5 amp., 2-0-2 volts 4 amp., **10/6d. each.**

350-0-350, 150 m.a., 2-0-2 volts 2.5 amp., 2-0-2 volts 4 amp., 2-0-2 volts 2 amp., **11/6d. each.**

500-0-500, 150 m.a., 2-0-2 volts 2.5 amp., 2-0-2 volts 4 amp., 2-0-2 volts 2 amp., 2-0-2 volts 2 amp., **17/6d. each.**

All Windings Centre Tapped.

Bryce Mains Chokes.

30 Hys, 40 m.a., 500 Ohms, **4/6d. each.**

40 Hys, 60 m.a., 500 Ohms, **6/- each.**

40 Hys, 150 m.a., 400 Ohms, **10/6d. each.**

80 Hys, 60 m.a., 2,500 Ohms, for speaker replacement, etc., **6/6d. each.**

Huge purchase of **Wet Electrolytic Condensers,** by well-known manufacturer. Following types available:—

8 Mfd., Metal Case, single-hole fixing, wet electrolytics, complete with Locking Nut, 450-volt working, **2/- each.**

16 Mfd., 320-volt working, ditto, **1/10d. each.**

25 Mfd., ditto, **1/10d. each.**

32 Mfd., ditto, **2/3d. each.**

50 Mfd., 35-volt working, One-hole Fixing, Metal Can, **1/6d. each.**

Tubular Condensers, Wire End type, by well-known manufacturer. Sizes up to 0.1. **4½d. each, 4/- per dozen.**

Push-back connecting wire, 10ft. lengths, **3d. each.**

Bell Transformers, British made, **2/9d. each.**

P.M. Speakers, by well-known manufacturer, 7½in. Cone, Pentode Transformer, **9/6d. each.**

Ditto, Less Transformers, Ideal Extension, etc., **7/11d. each.**

1 watt resistances, by well-known manufacturer, **3½d. each, 3/- per dozen.**

Special purchase ex **Aerodyne Mains Transformers,** Unshrouded, **350-0-350, 100 m.a., 4 volts 4 amp., 4 volts 2 amp., all Centre Tapped, 5/- each.**

Lissen R.C.C. Units, Brand New, Boxed, **6d. each.**

Lissen 126 k/c I.F. Transformers, Brand New, Boxed, **1/3 each.**

Lissen Class B Hypernik Transformers, ratio 1-1, Brand New, Boxed, **1/3 each.**

Lissen Universal Iron Cored Coil, with Reaction, Brand New, **2/11d. each.**

Set of **four 4-pin Short-Wave Coils,** 13 to 26 metres, 22 to 47 metres, 41 to 91 metres, 79 to 170 metres, **4/11d. per set.**

Plessey Midget 3-gang Condensers, three .0005 sections, Straight, Unscreened, size approximately 2½in. square, **2/- each.**

Plessey 3-gang Geared Straight Condensers, three .0005 sections, Straight, **2/6d. each.**

Magnum Multi Switches, 4 Positions, Silver Contacts, etc., **1/3d. each.**

Lissen Intervalve Chokes, Brand New, Boxed, **1/6d. each.**

Centralab Volume Controls, Long Spindle, fitted with Switch, Brand New. 1,000, 5,000, 10,000, 25,000, 50,000, 250,000, 500,000, **2/6d. each.**

Special purchase **Centralab 5,000 Ohm Volume Controls,** complete with Switch, limited quantity to clear at **1/- each.**

Coal and Flame effect Electric Fires. 2 k.w. type; separate Switch for each Bar, listed 4 gns. upwards. **Our Price 39/6d. each.**

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FOR CALLERS ONLY. Large and Varied Selection of Gramophone Records.

All orders 5/- or over, post free; orders under 5/- must be accompanied by a reasonable amount for postage; C.O.D. orders under 5/- cannot be executed. Hours of business 9 a.m. to 7 p.m. week-days, 9 a.m. to 1 p.m. Saturdays.

1½d. stamp must be enclosed for a reply.

RADIO CLEARANCE, 63, High Holborn, W.C.1. Holborn 4631.

BATTERY CHARGING PLANT

SPECIAL OFFER.—"Cosmo" 2-volt Trickle Chargers, 200-250v., A.C., complete, 7s. 6d. post paid.—Brighton Radio Service, 34, Middle Street, Brighton.

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MAKE YOUR HOBBY your career or increase its interest tenfold. Britain's Best College, approved by the Inst. Rad. Eng. and leading Radio firms, provides complete training in Radio Engineering by post or day classes. Full details from "P.R.W.," LONDON RADIO COLLEGE, Grove Park Rd., London, W.4 (Chiswick 3244).

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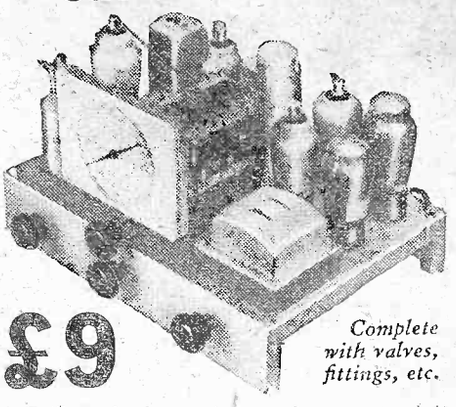
OUR 1937-8 Catalogue contains much information on Transformer Design. Post Free.—Lumen Electric Coy., 1A, Scarisbrick Avenue, Liverpool, 21.

B.T.S. "Adaband" Short-wave Converter A.C./D.C. Nearly new. Cost £6/12/6; sell 65/-.—Whiteley, 17, Vernon Street, Newark.

YOU CAN USE YOUR SPARE TIME to start a Mail Order Business that quickly brings you a full-time income. Follow the lead of others who are averaging £12 per week net profit. Get away from the drudgery of a routine job—join the big-money class. No previous experience necessary. Few pounds capital only needed. No samples or outfits to buy; no rent, rates or canvassing. New method makes success certain. Write to-day for FREE BOOKLET to Business Service Institute (Dept. 743D), 6, Carmelite Street, London, E.C.4.

VIBRATORS, 2 to 6 volts, from 12/6. H.T. units complete from 55/-. Lists free. Simmonds Bros., Rabone Lane, Smethwick.

ALL-MAINS ALL-WAVE SIX (*With RF. Stage*)



£9 *Complete with valves, fittings, etc.*

A De-Luxe 6-valve receiver—performance equal to many receivers employing at least 8 valves. High performance on all three wavebands even under most difficult reception conditions. Enthusiastic reports from foreign and colonial users.

Special features: Stout cadmium-plated 16-gauge steel chassis. Iron-cored I.F. coils, Litz-wound tuning coils. 3 wave-ranges cover 16.5-2,000 metres. Illuminated "Airplane" dial with principal station names. Variable tone control and volume control both operative on radio and gramophone.

Circuit in brief: Pre-selector, radio frequency amplifier (operative on all wavebands), triode-hexode frequency-changer, I.F. amplifier, double diode detector (applying A.V.C. to preceding valves), and L.F. amplifier, 3-watt pentode output.

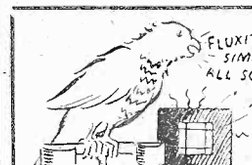
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McCARTHY RADIO LTD.

44a, Westbourne Grove, London, W.2.

Telephone: Bayswater 3201/2.



Said the parrot they call Willie Walker,
"They say I'm a pretty good talker,
Which they can't say,
I'll bet,
Of their FLUXITE-LESS set,
Which at best is a terrible squawker."

See that FLUXITE is always by you—in the house—garage—workshop—wherever speedy soldering is needed. Used for 30 years in government works and by leading engineers and manufacturers. Of Ironmongers—in tins, 4d., 8d., 1/4 and 2/8.

Ask to see the FLUXITE SMALL-SPACE SOLDERING SET—compact but substantial—complete with full instructions, 7/6.

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TO CYCLISTS! Your wheels will NOT keep round and true, unless the spokes are tied with fine wire at the crossings AND SOLDERED. This makes a much stronger wheel. It's simple—with FLUXITE—but IMPORTANT.

THE FLUXITE GUN

is always ready to put Fluxite on the soldering job instantly. A little pressure places the right quantity on the right spot and one charging lasts for ages. Price 1/6.

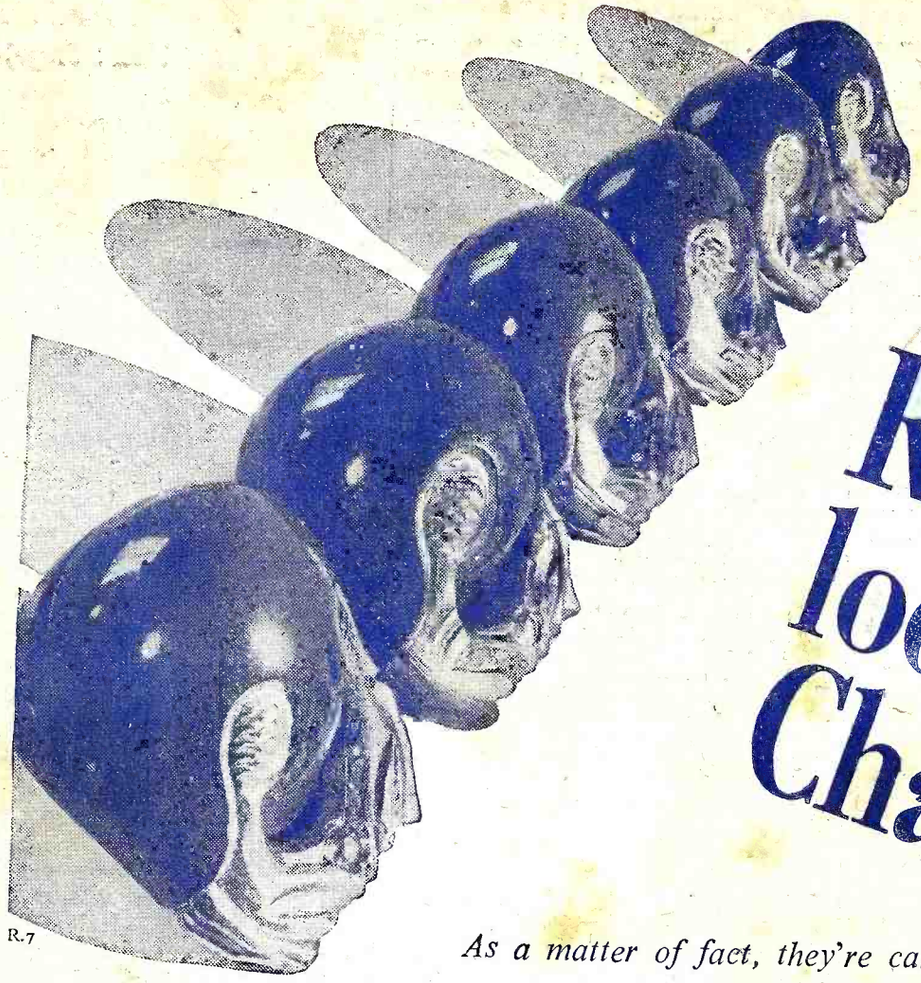


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IT SIMPLIFIES *ALL* SOLDERING

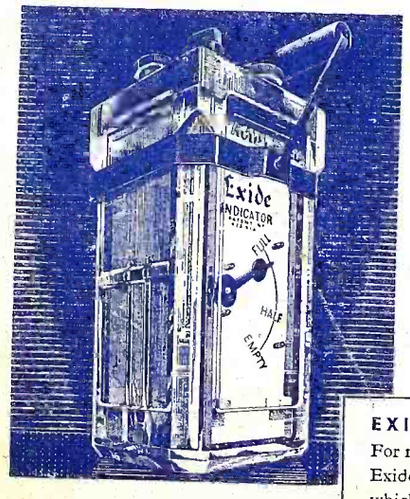
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R.7

Rumba looking Chaps

As a matter of fact, they're called "temple blocks." They make the rattle in West Indian music. If they sound as weird on your radio as they look in this picture, it's high time you changed to an Exide.



Exide

BATTERIES FOR RADIO

'Still keep going when the rest have stopped'

EXIDE 'HYCAP' BATTERY (*High Capacity L.T. Battery*)
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