AN A.C. MAINS S.W. UNIT—See Page 204.

Practical and Amateur Wireless

AND PRACTICAL TELEVISION

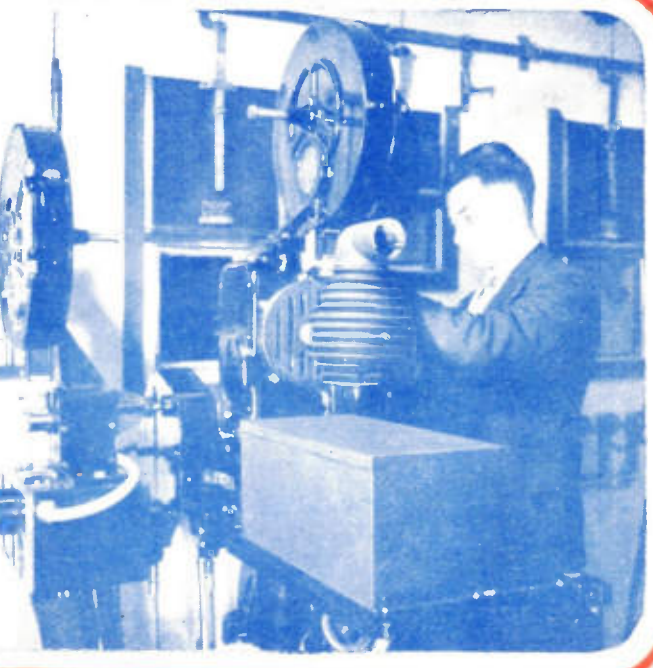
3D. EVERY WEDNESDAY

Edited by F. J. CAMM

A GEORGE NEWNES Publication

Vol. 10. No. 243. May 15th, 1937.

Best WEEKLY TELEVISION Features!



TRANSMITTING TOPICS—See page 195

ROUND *the* WORLD *of* WIRELESS

Fault Tracing

ALTHOUGH the modern radio receiver is an instrument of entertainment, one of the most interesting branches of the hobby is fault finding. Every receiver fails or develops a fault at some time or another, and the expert service man will in most cases be able to identify the cause at once. An inexperienced person might spend days and even then be unable to trace the cause of the trouble, even with good instruments at his disposal. Many radio clubs make a point of introducing competitions in the form of fault-finding, introducing some fault into a receiver and allowing a certain time for so many members to endeavour to trace it. The modern serviceman must be prepared to tackle any type of receiver, and some of the faults which arise are calculated to turn many heads grey unless a sound knowledge of the theory and practice of modern radio apparatus is first obtained. In view of the interest now being taken in service work we are commencing in next week's issue a short series of articles on the subject of fault tracing, designed both for the ordinary amateur and the would-be service engineer, and all of the more important points will be covered in this series.

Motor-car Interference

THE ordinary electrical equipment of a modern car can give rise to severe interference with broadcast receivers, and it has now been found that even moving parts of a car can generate forms of electrical energy which are radiated over a considerable area and thereby introduce noises into a wireless set. We now understand that in the Federated Malay States the Government recently introduced legislation compelling all cars now on the road, as well as all new cars to be imported, to have adequate interference-suppressing devices incorporated so that broadcast listeners would not experience interference from that source.

Television in U.S.S.R.

WE understand that the Soviet has ordered some transmitting and receiving television equipment from a well-known English company Unlike the majority of other countries, however, this apparatus is of the mechanical, as distinct from the electrical, type, and does not utilise the cathode-ray tube.

Five-studio Broadcast

ON May 16th a special broadcast of "A Midsummer Night's Dream" will be given in which an all-star cast will be featured. To make this even of greater importance, it is proposed to use five studios, and the music (selected from Mendelssohn's score) will be conducted by Clarence Raybould with the B.B.C. Orchestra, Section E, and the B.B.C. Chorus, Section A. Among the artists may be mentioned Fay Compton, Arthur Sinclair, Mary Hinton, Jay Laurier, Ernest Thesiger and Leslie French.

ON OTHER PAGES

A Coronation Acrostic

ON May 14th, in the London Regional programme, a novel broadcast will be made by Reginald Foort at the B.B.C. organ, accompanied by Phil Park and Ivor Dennis at two pianos, and Styx Gibling as percussionist. The vocalists will be Esther Coleman and Bert Yartlett. The broadcast will be a series of songs, the initial letters of the titles of which will, together, form an appropriate acrostic.

Radio for Wife

IN Uganda the natives used to exchange two oxen for a good-looking woman suitable for a wife, and prices varied according to the demand and looks of the "fairer" sex. Now that broadcasting has reached the country the price has been changed, and fathers now demand a good radio receiver in place of the oxen. The present rate of exchange is roughly one crystal set for an elderly spinster and a radiogram (all-wave) for an attractive girl in her teens, but as radio receivers are not yet common the would-be husband has to part with many oxen before he can obtain a suitable radio receiver. Actually, therefore, the arrival of broadcasting has put up the market value of wives in Uganda.

Workers' Choice of Records

WHAT type of gramophone record do you prefer? In a series of broadcasts from the Midland, commencing on May 18th, various workers will broadcast a recital of their choice, and the first speaker and recitalist will be a Birmingham engine-driver. The series is to be broadcast fortnightly.

Flat as Salesroom

THE increased interest in television has led to the need for a showroom which will enable the television receiver to be demonstrated more nearly as it will be used in the home of the listener. Accordingly, a well-known London dealer has taken a flat near his shop, and this is being furnished by a well-known London store and is to be used as the showroom. Prospective clients will receive special invitations to attend these demonstrations.

Another Torquay Concert

DOLAN EVANS (mezzo-soprano) will be the vocalist at the concert by the Torquay Municipal Orchestra to be broadcast from the Pavilion, Torquay, on May 18th.

Variety from Swindon

FLOTSAM and Jetsam, and Haver and Lee will be among the artists in a variety programme from the stage of the Empire Theatre, Swindon, on May 20th, broadcast in the Western programme.

Binding Cases and Indexes

BINDING cases and indexes for volume 9 of PRACTICAL AND AMATEUR WIRELESS are now available. The binding case, complete with title page and index, costs 3s. 6d., and the index alone 7d. by post.

ROUND the WORLD of WIRELESS (Continued)

Millions of Sets to Tune In for the King's Coronation Speech

IT is estimated that more than 108,000,000 men, women and children in English-speaking countries throughout the world will hear King George VI when he speaks to his subjects shortly after his Coronation on May 12th.

A cable-survey has been conducted by Philco Radio which shows there are more than 36,000,000 wireless sets in those countries. Thousands of additional sets aboard ships at sea, in desert and mountain retreats will reach into the ether to catch the King's historic message.

Figures compiled in Philco's radio receiver census show: 25,000,000 in United States; 8,000,000 in England; 1,500,000 in Canada; 1,000,000 in Australia; 40,000 in British India; 90,000 in South Africa, and 55,000 in Egypt. It is estimated that an average of three persons will be grouped around each of the 36,000,000 wireless sets during this dramatic and unprecedented broadcast. The vast majority of the sets are expected to be turned on most of Coronation Day to receive other programmes of description and commentary relative to the event.

Their Majesties at a "His Master's Voice" recording session.

Victoria Hopper to Play in Coronation "Music Hall"

WE are informed that in John Sharman's 90-minutes Music Hall programme—the last Variety production of Coronation week, to be broadcast on Saturday, May 15th—Victoria Hopper, film star wife of Basil Dean, the producer, playing the part of Elizabeth Sydenham, will take part with Matheson Lang and Irene Vanbrugh in an excerpt from "Drake," (by Louis N. Parker) specially adapted for broadcasting by Julian Frank. Will Fyffe, famous Scottish comedian, ever-popular Bertha Willmott, Florence Desmond, and Elsie Carlisle, have also now been booked to take part in the show.

Other "acts" include Flanagan and Allen, Billy Caryll and Hilda Mundy, and 200 Boy Scouts from "The Gang Shows." Reginald Foort will be at the B.B.C. Theatre Organ, and Charles Shadwell will conduct the B.B.C. Variety Orchestra.

New Victoria Orchestra

THE Rutland Square and New Victoria Orchestra, directed by Paul Belinfante, will broadcast on May 21st from the New Victoria Cinema, Edinburgh: "Escapada," by Phillips; Selection, "Balalaika," by Posford and Grün; "Hungarian Serenade," by Joncières; Foxtrot, "Red, White, and Blue," by Noel Gay; "Andante and Allegro from Sonata in G Minor," by Handel; Selection from "The Girl from Paris," by Schwartz; "La Gitana," by Kreisler; "Chinese Rhythm," by Hellier; "Cuban Lament," by Charrosin; Entr'acte, "Willow Pattern," by Lowry; "Arabesque," by Debussy; "On the Banks of the Don," by Ferraris.

INTERESTING and TOPICAL NEWS and NOTES

Whit Monday at Blackpool

THE Whitsun Bank Holiday will no doubt see Lancashire people gathered in their thousands at Blackpool. In the evening Victor Smythe is presenting another broadcast, "Blackpool Night" entertainment, in the Northern programme. This year's tour will be conducted by a new compère, who goes by the name of "Our Albert." He will speak Lancashire verses, written by Frank A. Terry, which will serve to link up the various items. The part of Albert is being taken by Charles Nesbitt, who was one of the old Manchester Station Repertory players, in the early days of broadcasting. Under Albert's guidance, listeners will be able to visit the Tower Ballroom, from which Reginald Dixon, and Norman Newman and the Tower Band will broadcast; the Palace Theatre, where Charlie Kunz is appearing; and the South Pier, to which the Arcadian Follies have returned once more.

Coronation Broadcast from Birkenhead

IN the Northern programme, on May 14th, an excerpt from the special Coronation bill will be broadcast from the Argyle Theatre, Birkenhead.

Student Songs

A NUMBER of songs from the Scottish Students' Song Book will be sung by the Male Voices of the B.B.C. Scottish Singers on May 17th. They will be accompanied by the B.B.C. Scottish Orchestra, conducted by Kemlo Stephen.

Week-End Away

PLYMOUTH is chosen for the "Week-End Away" broadcast series on May 20th from the Western Regional. A motorist, a cyclist and a walker will describe some routes to assist the hundreds of people who leave the scene of their everyday work to explore the surrounding countryside.

Band Concert from Western Regional

THE City of Bristol Police Band, conducted by Captain F. W. Wood, M.V.O., Director of Music, will broadcast (by permission of the Watch Committee) on May 16th. The soloist will be Marjorie Harper (soprano), who is one of the soloists at a Plymouth City Church.

"Design for Listening"

AN interesting programme entitled "Design for Listening," which will be broadcast on May 17th from the Western Regional, illustrates the preferences of different types of people, and how they listen to broadcast programmes.

SOLVE THIS!

PROBLEM No. 243

Ashley's A.C. mains receiver developed a steady popping noise which mutilated the speech and music. When voltage tests were made it was found that the anode voltage fluctuated slightly in unison with the popping noise. What was the defect? Three books will be awarded for the first three correct solutions opened. Address your solutions 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. 243 in the top left-hand corner, and must be posted to reach this office not later than the first post on Tuesday, May 18th, 1937.

Solution to Problem No. 242

The speech coil on the set speaker had developed an open circuit.

The following three readers successfully solved Problem No. 241, and books are accordingly being forwarded to them: J. W. Feast, 12, East Park Street, Chatteris, Cambs.; W. N. Carter, 93, Orme Road, Bangor; R. Cambrook, 103, Carr Road, Walthamstow.

TRANSMITTING TOPICS

A Practical Article Dealing with Various Types of Masts, Their Construction and Erection

By L. ORMOND SPARKS

WHILE careful consideration should always be given to the placing, design and erection of an aerial, it is necessary to pay particular attention in the case of transmitters, as losses, unsatisfactory location, and careless design can seriously affect the efficiency of the station.

It is not always possible to select the most suitable aerial system or the best site for greatest radiation at the first attempt, so I would repeat the advice I have given previously: "Don't be discouraged by poor reports of your transmission during your initial tests; experiment with the aerial arrangement and, if possible, vary its direction."

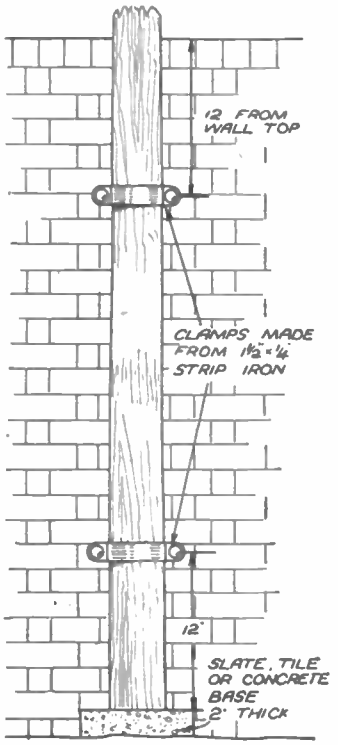


Fig. 1.—Method of bolting an aerial pole to a wall.

Aerial Suspension

The station owner who possesses a large garden, free from large trees and other earthed objects, is very fortunate, as he is then in the happy position of being able to swing the aerial through many points of the compass and try out systems which the less fortunate owner cannot do through lack of space. A considerable amount of interest and information can be gained through such experiments, even with a low-powered outfit, especially if several wavebands are worked.

While one's activities are often cramped by the lack of ground space, it does not always follow that all parts of the aerial system have to suffer accordingly; for example, the construction and measurement of the electrical path can be made as perfect as possible, particular attention paid to all insulation, and, an item which is very important, viz., height. The first of these calls for care in calculating the exact length, according to type of aerial and waveband operated, the selection of good wire of reasonable diameter, and arranging matters so that joints are eliminated. If, however, circumstances force them to be made, make sure that good soldered connections are used only, and do *not use* spirit for the soldering flux. The joint should always be bound with electricians' black insulating tape to protect it from the weather.

As regards insulation, too much attention cannot be paid to this item. Be generous with the use of insulators. The large shell or barrel types are far superior to the very small egg type. Better still, use some of the light corrugated insulators which are specially designed for such work.

If guys are used with the mast, especially if they are of wire, always insert insulators in each one, say, six feet from the mast end. The barrel type are most suited for this, providing, of course, that they are fastened in the proper manner.

A lattice mast built by the author of this article, and which will be described in next week's issue.

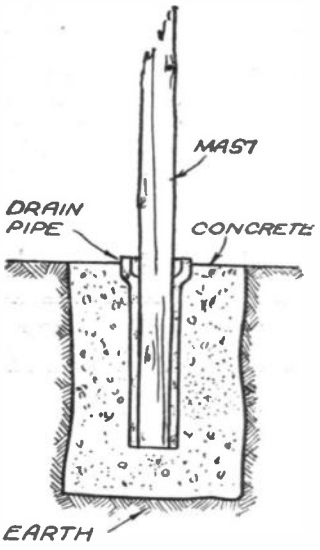


Fig 2.—When the mast is to be buried in the earth this arrangement will prevent rotting.

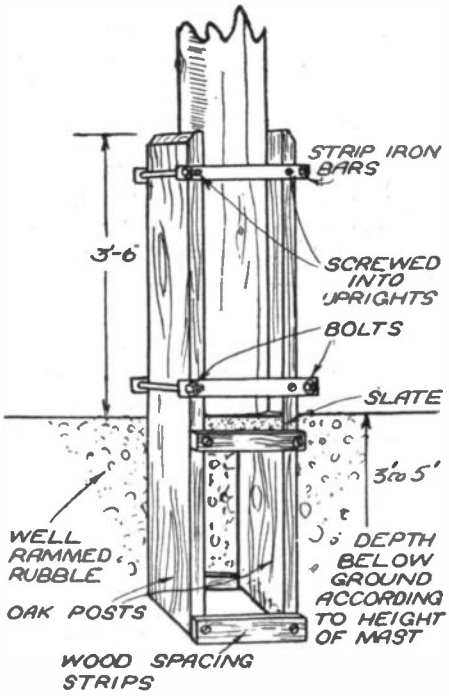


Fig. 3.—To enable the mast to be lowered adopt the scheme shown here.

Height of Masts

Metal masts possess the advantages of strength and neatness, but unless space permits the effective portion of the aerial to be well away from the mast, and unless a high-powered outfit is being used, I would suggest that the average amateur cannot do better than use some form of wooden support.

Scaffold Poles

These provide one of the cheapest forms of support, and, if properly selected and treated, one of the neatest and simplest. The average price, in London, is 3s. 6d. for a 30ft. pole, delivered, but, of course, in its natural state.

When selecting the timber, pick one that is straight with a gentle taper to the top end the diameter depending on its height. For a thirty-foot pole, 13ins. round the base is ample, otherwise it will tend to look very clumsy. After the bark has been removed, smooth off all knots and, if time and weather permit, allow a few days for it to dry out before putting on the first

(Continued overleaf.)

TRANSMITTING TOPICS

(Continued from previous page)

coat of paint. If it is desired to paint it, three coats of good outside paint will be necessary, but if on the other hand a brown colour is not objected to, one cannot do better than apply a good coating of creosote or other wood preservative.

Fixing Methods

The actual method of fixing depends on available conditions and where it is not possible to use a wall, as in Fig. 1, the alternatives, Fig. 2 and Fig. 3, are the most satisfactory. Referring to Fig. 2, it must be remembered that the effective height will be reduced by the amount that is let into the ground; therefore, the arrangement shown in Fig. 3 is preferable as it also has the advantage of allowing the mast to be lowered to the ground again easily should it be necessary for repainting or fitting fresh tackle.

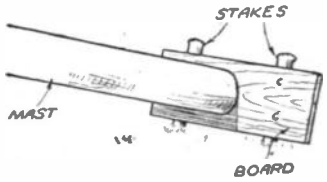


Fig. 4.—An easy way of obtaining the leverage necessary to erect a pole in the garden.

With a thirty-footer, guys are not usually required, providing the base fixing is really secure, but for greater heights they are very essential, and care should be taken in placing them and adjusting their tension.

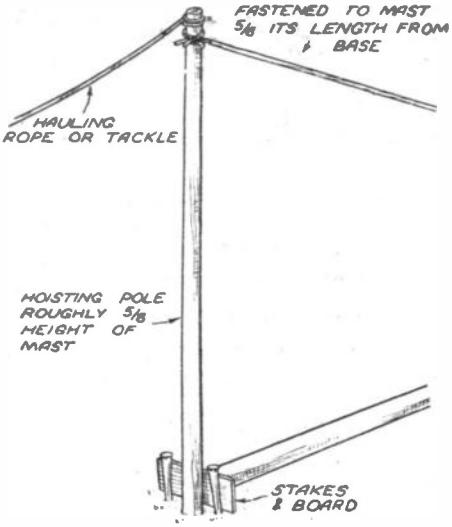


Fig. 5.—An alternative method of putting up the mast where space is restricted.

As it is not always easy to obtain a single pole having a height of 40 to 45 feet, it becomes necessary to join two suitable poles together when such heights are required.

While such procedure is quite satisfactory if the joints are properly made, it should be noted that careless fixing and slap-dash methods can make such an arrangement very dangerous, so it is up to the constructor to pay particular attention to the matter, and satisfy himself that all is well as regards the material used and the method adopted.

If the ideas outlined in Fig. 6 are followed, a safe and neat job will be obtained, producing a mast of 45 to 50 feet according to the length of the individual sections.

All the necessary tackle can be obtained from any ships' chandler, rope merchant, or large ironmongers stores, and it is well worth the slight additional cost to obtain the correct and essential fittings.

When a top mast is used, as in Fig. 6, it is advisable to take guys—three will be sufficient—to the top clamp, and one to the top of the top mast to counteract the pull of the aerial. When deciding on anchoring points for the guys, don't make the angle too acute, and don't forget to see that the anchoring points are *really* secure, otherwise they are more than useless.

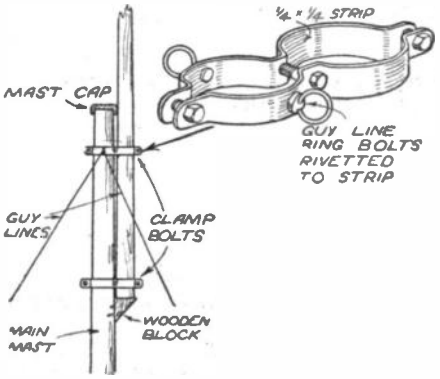


Fig. 6.—To obtain additional height an extension piece may be attached in this manner.

(To be continued)

A NEW PORTABLE "LEVEL" METER

IN repeater stations the indication of power level or voltage in a circuit is now usually performed by means of a direct-reading attenuation measuring set. There are, however, many measurements in the audio-frequency range where an instrument of less precision is perfectly satisfactory, and The General Electric Co., Ltd., of Magnet House, Kingsway, London, W.C.2, has recently developed from the original attenuation set a portable level meter that is direct reading, and is no more difficult to use than an ordinary voltmeter. Such an instrument can be used not only for measuring telephone line attenuation and repeater gain but also by broadcasting organisations, radio manufacturers and gramophone recording companies. It can be operated either from A.C. mains or from battery supplies.

The G.E.C. portable "level" meter, which is manufactured at the Company's Salford Instrument Works, consists essentially of a thermionic amplifier feeding a logscale moving coil voltmeter of the rectifier type. Facilities are provided for maintaining the amplifier gain at the required value and for setting the output of an associated oscillator to any level between +20 and —35 db on 1 milliwatt in 600 ohms. By means of a key, this level can be readily applied to any external circuit, the input of the level measuring circuit being simultaneously switched to a jack plug, from which leads may be taken to other points in the circuit under test.

The instrument covers a frequency range of 100 to 12,000 cycles per second, which is sufficient for all normal requirements of telephone and high-quality amplifier and recording practice. The accuracy over the range 400 to 12,000 cycles per second is ±0.25 db, and, over 80 to 400 cycles per second, ±0.5 db. The calibration is independent of fluctuation of battery voltages, and for A.C. mains a neon stabiliser is used. The most suitable generator to use is the G.E.C. beat frequency oscillator.

The standard design is suitable for connection to a 230-volt 50-cycle single phase A.C. supply, or to a 24-volt 0.25 amp. L.T. battery and a 120-volt 5-milliamp. H.T. battery. It can be adapted for L.T. battery supplies down to 16 volts, and a design for operation from any particular A.C. mains supply can be provided.

The various measurements that can be carried out fall into two groups:—

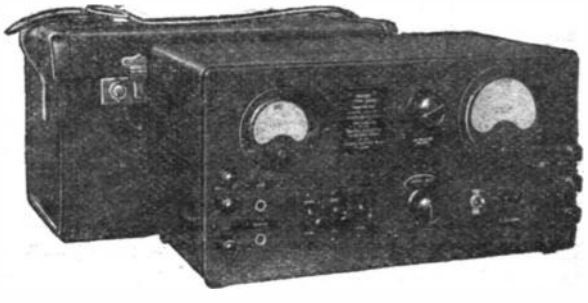
(a) When a known power level is to be applied to one part of a circuit, and the level at another is to be measured, and;

(b) When only the power level at a point is required.

Examples of the first group are the measurement of attenuation or amplification for instance, the gain of a repeater or the loss on a line. The oscillator is adjusted by means of the portable level meter to give the required output level, and this level is then switched to the desired points in the circuit by means of a key. Simultaneously the meter is switched on to a jack plug, the leads from which may be used as voltmeter leads and connected across the circuit as required, giving a reading of the level. Typical applications in this group are the measurement of the frequency characteristics of repeaters or amplifiers or of a filter or other circuit.

Examples of the second group of measurements are monitoring the level of a broadcast programme or a recorded performance. Here the leads from the level meter are used as voltmeter leads and connected in circuit as required. Since the input impedance is high, the addition of the meter to the circuit will, in general, only affect the circuit to a negligible extent. The reading of level is then direct and continuous.

The G.E.C. portable "level" meter is robust and compact, an all-metal construction that is suitable for tropical use being employed. The case is of light sheet steel, finished in ripple black enamel. The whole set measures about 16 x 8 x 8½ins. and weighs 27lbs.

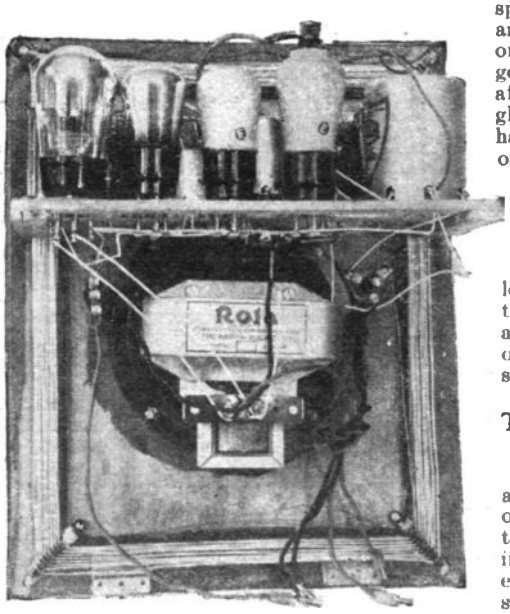


The new G.E.C. portable "level" meter.

Constructional Details of "Practical Wireless" Receivers—4

THE Featherweight Portable was notable for the fact that the cabinet was designed to overcome the weight difficulty and at the same time to provide adequate strength and rigidity. The circuit was quite orthodox, employing an S.G. H.F. stage, detector, driver and Class B valves, and thus provided a large output. The circuit is given on this page, and it will be noticed that there is no departure from the original design, the only modification now required being the substitution of the tuning coil. The original coil is no longer on the market, but the Bulgin type C.22 coil provides a similar winding and necessitates the same wave-change switching. It is very similar in physical dimensions also, and thus may easily be used in this receiver. A diagram is given on the right showing the connections to the terminals, which are numbered slightly differently from the original coil, and to enable this particular unit to provide maximum results it is suggested that the H.F. coupling condenser be reduced in capacity to .0003 mfd.

An Original Lightweight Portable in a Home-made Cabinet is the Subject of this Article



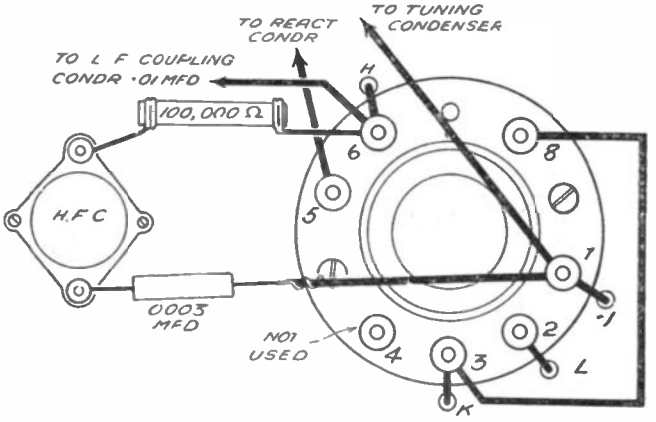
View of the rear of the receiver, showing the frame aerial winding.

The Cabinet

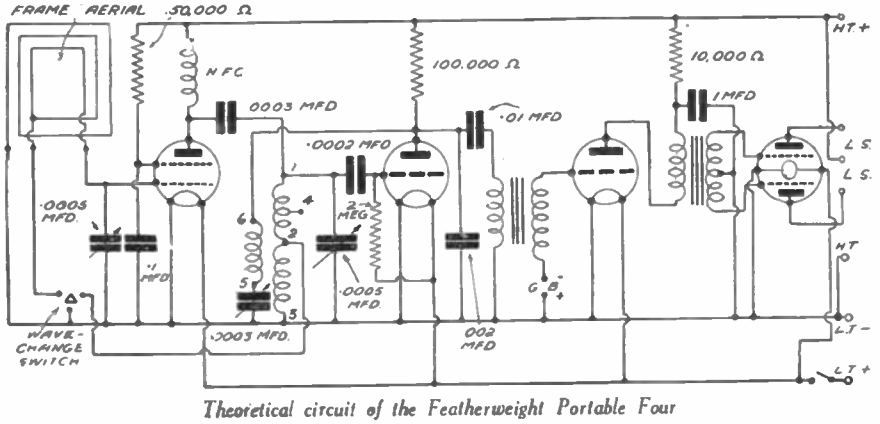
The framework of the cabinet is constructed from stripwood 1in. wide by ½in. thick and this is screwed together by means of short metal strips found in a well-known constructional toy. The illustrations on page 198 show the method of building it and give all dimensions. The opening or speaker grille is 5½in. in diameter, and is covered on the inside with silk or the special fabric obtainable from any good radio dealer. The cabinet is afterwards covered with leatherette glued in position, and a carrying handle is attached to the cross strips on the upper surface. The front of the cabinet is attached by hinges to the lower edge so that it may be lowered to insert the batteries and make tests or voltage measurements.

The Frame Aerial

The frame aerial is wound on the inside of the front, spacing strips of ebonite being screwed diagonally in the four corners. These strips are no longer on the market but may be made by obtaining a piece of ⅛in. ebonite and cutting strips ½in. wide and 2½in. in length. Drill holes at each end so that they may be screwed to the front of the cabinet and then with a hacksaw make eight cross-cuts about ¼in. deep, followed by two further slots made by making two cuts and breaking out the intervening piece of ebonite so that these two slots are nearly ½in. in width. All of the slots should be cut at an angle so that when the wire is wound in it will be prevented from falling out. One end of the 24-gauge wire is soldered to the upper right-hand contact of the tuning condenser and the wire is then passed across to the upper slot of the nearest spacer. Run the wire across to the left, through the upper slot on the left-hand spacer and down to the lower spacer, across the lower edge, and so continue to the slot where you commenced. Carry the wire through this slot again, and make a further turn, repeating the process so that there are three turns in the first slot. Pass to the second slot, and wind three turns in this, after which two turns only are wound in each remaining slot until eight slots have been used. There now remains the two wide slots. The end of the 24-gauge wire must be cut, and it should be soldered, together with the beginning of the 34-gauge wire to the upper terminal of the three-point switch. The long-wave winding con-



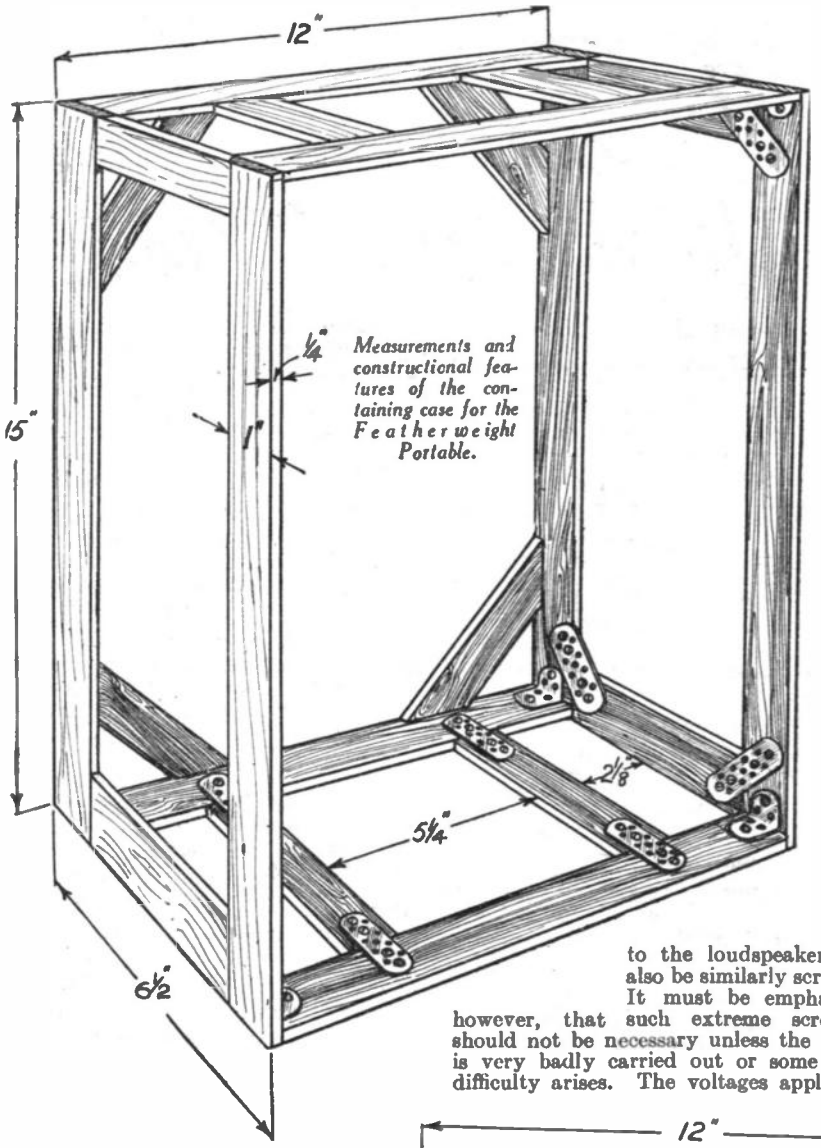
Connections for the Bulgin coil, type C22, which is now specified for this receiver



Theoretical circuit of the Featherweight Portable Four

LIST OF COMPONENTS FOR THE FEATHERWEIGHT PORTABLE.

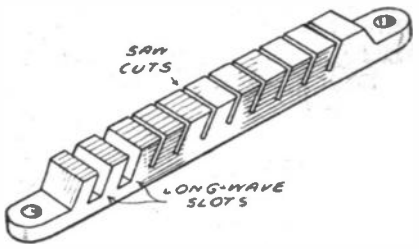
2 Bakelite condensers, .0005 mfd. (Litlos) (Graham Farish).
1 .0003 Litlos condenser (Graham Farish).
1 H.F. choke, type H.F.P.A. (Wright and Weaire).
1 dual range coil, type C.22 (Bulgin).
1 10,000 ohm wire-end resistor (Eerie).
1 50,000 ohm wire-end resistor (Erie).
1 100,000 ohm wire-end resistor (Erie).
3 4-pin chassis type valveholders (Clix).
1 7-pin chassis type valveholder (Clix).
1 on-off switch, type S.38 (Bulgin).
1 3-pt. switch, type S.36 (Bulgin).
1 Lissen Class B driver transformer (Lissen).
1 2 megohm grid-leak with wire ends (Erie).
1 .01 mfd. fixed condenser, type M (T.C.C.).
1 .0003 mfd. fixed condenser, type M (T.C.C.).
1 .0002 mfd. fixed condenser, type M (T.C.C.).
1 .002 mfd. fixed condenser, type M (T.C.C.).
1 .1 mfd. fixed condenser, type 50 (T.C.C.).
1 1 mfd. fixed condenser, type 50 (T.C.C.).
1 Cossor 220 S.G. valve (metallised).
1 Cossor 210 H.F. valve (metallised).
1 Cossor 215 P valve.
1 Cossor 240 B valve.
1 Rola loudspeaker, type F5, PM.14, Class B.
Quantity 24 D.C.C. and 34 D.S.C. wire.
1 Ediswan 120-volt H.T. battery, ref. 69706.
1 Ediswan 9-volt G.B. battery, ref. 69807.
1 Ediswan 2-volt accumulator, type E.L.M.2.
4 wander plugs, H.T.+, H.T.—, G.B.+ and G.B.—.
2 spades, L.T.+ and L.T.—.
Connecting wire, flex, screws, wood for case, leatherette, carrying handle and hinges.



Measurements and constructional features of the containing case for the Featherweight Portable.

to the loudspeaker may also be similarly screened. It must be emphasised, however, that such extreme screening should not be necessary unless the wiring is very badly carried out or some other difficulty arises. The voltages applied to the various parts will occasion no difficulty. The H.T. positive lead is inserted into the maximum voltage socket on the H.T. battery and the two L.T. leads are connected to the appropriate terminals on the accumulator. The grid bias positive lead is inserted into the positive socket on the G.B. battery, and the negative lead should be inserted into the 9-volt socket, although where economy is not such an important item, this may be reduced to 7.5 volts. The latter voltage will enable slightly more volume to be obtained, although the anode current consumption will be increased. Therefore, the user of this particular receiver may experiment with voltages between 4.5 and 9 volts in order to find the voltage which gives the most satisfactory volume compatible with economy of operation. Finally, the two outside controls on the panel front are for tuning and must be kept more or less in step, the centre control operating the reaction condenser. Do not forget that a portable with a self-contained frame aerial of this type must be orientated so that the directional properties of the frame are utilised. Maximum volume is obtained when the frame is in a line with the station being received.

A full-size blueprint for this receiver, No. P.W.12, may be obtained from this office, price 1/-.

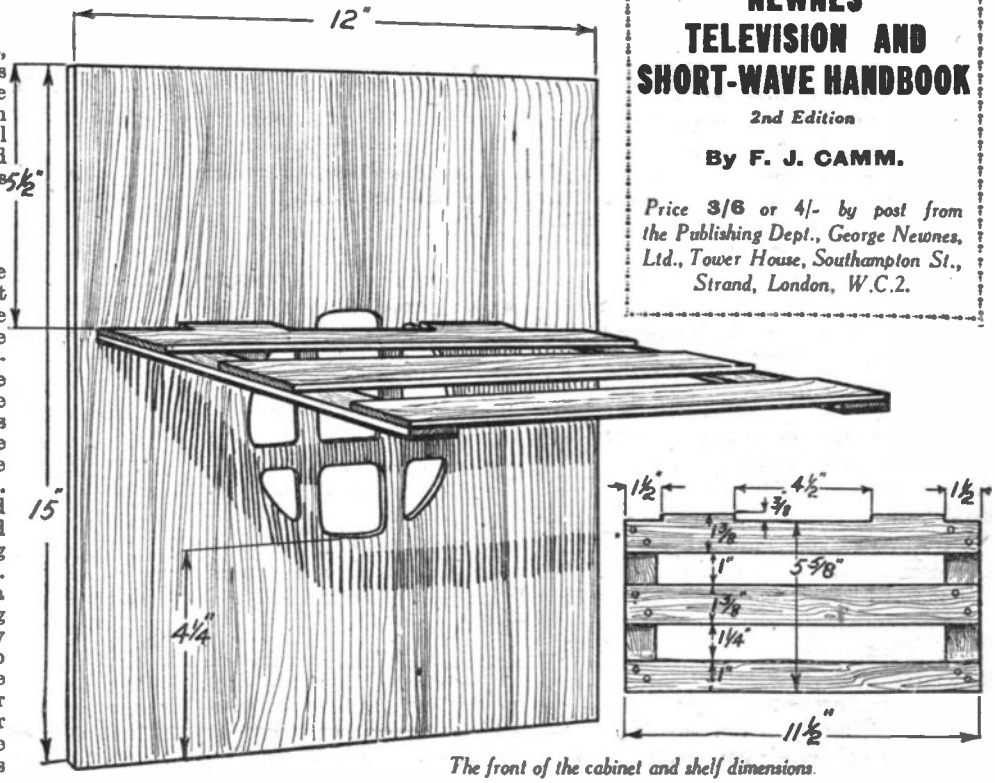


Spacers for the frame aerial may be constructed as shown here from strip ebonite.

sists of 23 turns in each slot, and the finish of the winding is joined to the lower terminal of the left-hand tuning condenser. Upon completion of the frame aerial winding the slots may be sealed with sealing-wax or Chatterton's compound.

Operation Notes

Normally, the receiver should be perfectly stable in operation, but it was originally found that due to the compact form taken by the receiver, some constructors experienced instability. This is due to the fact that many of the wires were run too close together, and thus the first step to take if this trouble is experienced is to space out the wiring as much as possible. Initially, no screening of leads should be introduced, but if it is found impossible to obtain stable working the lead from the anode of the S.G. valve may be passed through a length of ordinary screened sleeving and the sleeving connected by means of a short length of wire to the nearest earth terminal. The leads to the reaction condenser may also be screened in a similar manner, whilst in a very severe case of instability, the two leads



The front of the cabinet and shelf dimensions.

On Your Wavelength

By THERMION

Coronation Day

THE date of publication of this issue coincides with Coronation Day—which is the first since broadcasting commenced. There is usually not more than two Coronations in any one lifetime, so the occasion which will enrich our Island story should be one in which the B.B.C. should excel itself. As most of my readers know, I dislike medieval flummery, and I consider that flummery does not add to the dignity of the occasion. The decoration of the streets and the construction of special programmes are excellent as giving some timely colour to the occasion, and to make us realise its importance. History is in the making, but that is no reason why we should adopt the methods of history. I am all in favour of bringing things up to date, instead of endeavouring to live in the past. We should not be constantly reminded of the scandalous conditions which obtained in this country 500 years ago. In those days kings could impose taxes ; they could have people shot, and compel you to work for nothing. The pomp and ceremony of those days was meant to instil fear into the people. To-day people do not suffer that fear. Now several firms are endeavouring to signalise the occasion by marketing special Coronation receivers, and I think this cheapens the occasion, and brings it to the level of the fanatical enthusiasm which you see on the countenances of those nitwits from the North who periodically descend on London for the Cup Final, complete with rattle, hooters, kazoos, streamers, and, of course, ties, comic hats, and other impedimenta in the club colours. I pity their mentality, and do not like to see the Coronation, a serious national occasion, besmirched by these methods. Let us keep the radio trade as a radio trade ; let us consider a wireless set as an instrument for listening to the special programmes; do not let us think that it will be a better wireless set because it is sold under some Coronation title.

Epistle from Ormskirk

J. B., of Ormskirk, has, judging from his letter, been working himself up to the fever heat of excitement, the Ultima Thule of rage, the apogee of irascibility, and the apex of anger, and in order to relieve his blood-pressure I publish his letter :—

" I have been for some time saving my powder to have a go at you, although I admit you are quite right in a good number of your perpetual moanings, but with a large number I don't agree, e.g., dance music. In a recent number of PRACTICAL AND AMATEUR WIRELESS you say that everyone who wants dance music should buy gramophone records. No, not at all, Thermion. You have more money than we working men, so it is you who should buy records for such rubbish as concerts, promenade concerts and such-like piffle ! And again, please remember that my 10s. for licence, although earned by manual labour, is worth just as much as yours.

" Then there is the matter of sponsored programmes. I travel a few hundred miles in a month and call in a few thousand houses, and 99 per cent. have the Luxembourg programme on when the transmitter is radiating. The same on a Sunday ; how many listen to the B.B.C., except for the news and weather forecast ?

" Well, having got a bit off my chest, I will take your side and will start with the dealers. How many are there that are *good* men at their trade ? Very few ; the rest are worse than I am with my typewriter ; in fact, I almost had to fight one man over a resistance value. He said a megohm is a thousand ohms and I said a million. What do you say about it ?

" There is also the question of dud components. My first experience of this nature was when building the *Amateur Wireless* Lucerne Ranger. I bought kit ' A ' from one of your advertisers and the rest of the parts were purchased locally. I completed the assembly and wiring on a Saturday night, and after trying until 2 a.m. I went to bed almost heart-broken. On Sunday I tried again until 11.5 p.m., still with no results (I may say here that my knowledge was then small and my test gear less). However, I was doubtful of the S.G. valve, so I walked eight miles (four each way) to a friend to borrow the valves from his set. Immediately I put his S.G. valve in, away she went. The dud was a B.V.A., so I returned it to the dealer, who tested it (so-called). His test was merely on the filament, and he refused to replace it. He said : ' The filament is O.K., what more do you want ? ' I have never been there since, but I have learned a lot since then, especially through PRACTICAL AND AMATEUR WIRELESS.

" Well, Thermion, may I suggest a nice superhet with home-made components—about four valves (battery), not too expensive, all-wave if possible. What about touching the ' Experimenters ' about it ? Maybe you are one of them ?

" Well, I think I have taken enough of your time. I have none of those thundering big words you use (and no one but yourself can understand them), so I will close wishing you and all the staff (not forgetting the Editor) of PRACTICAL AND AMATEUR WIRELESS all the best."

Television in the Café

ON Friday, April 30th, Miss Anne Grey acted as hostess to a small party at the installation of the first television set to be installed in a café. This was at the Odeon Theatre, Southgate. I congratulate Odeon Theatres, Ltd., on their enter-

prise and I hope that the television receiver will be appreciated by their patrons. Such an installation should also help along the sale of television receivers.

Television at Radiolympia

WITH plans for this year's Radiolympia, which is open on and August 26th and extends to September 4th, now being formulated, and the promise of television demonstrations which will outweigh in both quality and magnitude those organised last year, it is gratifying to learn that the B.B.C. on their part are making every effort to improve the transmitting side. The camera work has not been quite so good of late, but this is attributed, I am told, to lack of studio space. This factor has militated against the most efficient of programme organisation and accounts partly for those annoying intervals when gramophone records are played and one gazes on a still showing the exterior view of Alexandra Palace. Surely a greater use of properly selected films could be made during the period separating direct vision material, for the stills are reminiscent of old magic-lantern days. It is stated, however, that the theatre at Alexandra Palace which the B.B.C. leased some months ago is now to be entirely reconstructed on most ambitious lines to meet the growing needs of television production. Several stage sets will be accommodated, with fades from one camera to the other to give continuity of subject and no long interruptions between separate items. A really efficient overhead lighting system will be installed, while platforms will allow top shots with cameras to be taken when desirable. It is to be hoped that the minimum of delay will transpire before this new proposal is put into effect and so remove the rather cramped atmosphere which now exists.

Coronation Day Recorded

I UNDERSTAND that, in order to obtain a permanent picture in sound of the Royal Procession on Coronation Day, apparatus which normally equips one of the Corporation's mobile recording units will be temporarily installed in an office overlooking Admiralty Arch. As the cavalcade passes this spot on May 12th, hidden microphones will pick up the sounds which will be recorded on a series of discs.

Together with recordings of the actual broadcasts on Coronation Day, these will be available for use in future reminiscent programmes. Some of them will also be used the same night, and they will convey to those who were unable to hear the actual broadcast a concise and vivid picture of the ceremony; for instance, many people such as policemen, ambulance men and others, who will be on duty along the Coronation route during the day, will be unable to follow the broadcast as it is relayed through loudspeakers to the waiting crowds.

The recordings will also be of interest even to those who did listen to the "live" broadcast, as the sound picture of the procession at Admiralty Arch will not previously have been heard.

Then, until the need arises for their incorporation in a programme, and afterwards, these records will find a place in the archives of Broadcasting House. Generations yet unborn will be able in years to come to hear the story of the day in sound.

Mr. H. L. Fletcher, who is in charge of recorded programmes, will supervise the work, and his department will also be responsible for recording the broadcast ceremony and description of the procession. This will be made available for those parts of the Empire which, because of difference in time, were unable to hear the actual broadcasts.

In addition, it is hoped that recordings will reflect the celebrations of Coronation Day in the provinces.

Notes from the Test Bench

Speaker Fault

AN A.C. Record Three was handed to us for test last week, the constructor complaining that the quality of reproduction was very poor. When the receiver was tested in our laboratory reproduction was found to be good and the general performance normal. Voltage and current readings were taken and were also found to be normal. The reader was consulted and asked to deliver the speaker for test, as the set was obviously quite in order. When his speaker was connected up the quality of reproduction was certainly poor, and a choking effect was produced. When the cone movement was checked it was found that a very small particle of solder was lodged in the gap, and as soon as this was removed the reproduction improved and the choking effect previously experienced disappeared. The effect was actually very similar to that produced by a low emission output valve, and therefore constructors who suspect their output valve should check the speaker cone movement before having the valve tested.

Condenser Noises

DUST can also become lodged between the fixed and moving vanes of the tuning condensers, thereby causing crackling noises. This fault is usually fairly easy to detect, as the crackling occurs when the tuning control is rotated. Crackling of this nature is not always due to dust between the vanes, however—it can also be caused by poor connection between the spindle and the wiper contact attached to the moving vanes, or to a loose dial lamp.

Minimum Tuning Capacity

A READER complained to us the other day that the minimum wavelength to which his receiver would tune was too high. He wanted to tune down to 200 metres, but could only reach 220 metres. We suggested that the minimum tuning capacity was too high and advised him to reduce the trimmer capacity by unscrewing the trimmer condenser screws and reducing the grid lead screening to the necessary minimum. He replied that his grid leads were unscreened and trimmers were at minimum, and asked whether he could reduce the minimum capacity by filing the vanes or reducing their size by cutting them! Of course, we told him that the minimum could not be reduced in the manner he suggested—cutting the vanes would reduce the maximum capacity and not the minimum. We advised him to remove a few turns from the grid winding of his tuning coil, but this would also reduce the maximum tunable wavelength.

Broadcasts and the Blind

A COMPETITION was recently organised amongst the blind, for a play which would be suitable for those who have lost the use of their sight. It is, of course, well known that when one faculty is missing other faculties are developed beyond the average, and it appears that those who cannot see are extraordinarily keen of hearing. Accordingly, the wireless provides a very fine medium of entertainment. More than 60 plays from all parts of the English-speaking world were submitted by blind writers for this competition (organised by the National Institute for the Blind). The first prize of £25 has been awarded to a Yorkshireman, Mr. H. H. Coldwell, of Barnsley, and the second prize of £15 to an American girl, Miss Edna Mae Evelyn, of Berkeley, U.S.A.

The importance attached to the sense of hearing by people deprived of sight is indicated by Mr. Val Gielgud, of the B.B.C., who adjudicated, in his comments on the work submitted. "I notice," he says, "a general curious insistence upon small audible effects which, in my experience, I have discovered to be for the most part far better left to the listener's imagination."

Practical Television

May 15th, 1937 Vol. 3. No. 50.

Another American Television Station

FROM the earliest days of television's history various American interests have concentrated on developments dealing with the different aspects of the science. The large radio combines of that country are now making a determined effort to bring transmission and reception to a stage where it will not only be acceptable to a critical public, but also ensure that the service is of a high standard both from the technical and programme points of view. It is in keeping with this policy that the Columbia Broadcasting System has made an application to the Federal Communications Commission for the necessary permission to construct an even more powerful television station than is at present being used in this country. The site chosen, after a very exhaustive study had been made by the engineers of the television research department, was the top of the Chrysler building in the city of New York. The carrier frequency will be between 42 and 56 megacycles, while the sideband employed will be at least seven megacycles so as to accommodate the accepted American picture standard of 441 line definition, 5 to 4 picture format and 30 pictures per second interlaced scanning, giving 60 frames per second. Bearing in mind the note published in PRACTICAL AND AMATEUR WIRELESS, dated April 24th, 1937, it will be seen that the line definition is derived from squaring the odd numbers of 3 and 7 and multiplying the products together. Whereas the peak power of the Alexandra Palace station is 17 kilowatts, the new C.B. station, when fully modulated, is to have a peak power of 30 kilowatts, and so be in line with the Eiffel Tower station now under construction. The station coverage is very conservatively estimated at 40 miles' radius (4,800 square miles' area), but bearing in mind the extension obtained with the B.B.C. station after practical tests, these figures should be very materially exceeded. The ultra-short-wave radio transmitter is to be located on the seventy-fourth floor of the building, so that the feeder cable linking this with the roof aerial will be relatively short and so ensure the maximum of power transfer without signal distortion.

O.B. Problems

THE ambitious attempt to televise the Coronation procession from the Apsley Gate, Hyde Park, is presenting the B.B.C. engineers with a variety of intricate problems. The situation is made more difficult by the fact that most of the mobile equipment employed will be relatively untried owing to the late delivery of the apparatus by the manufacturers concerned. The vision signals generated by the cameras after being handled in the mobile control room will be fed into the coaxial cable linking the point of transmission with Alexandra Palace via Broadcasting House. Since the use of this cable is also in the nature of an experiment, a standby directional radio transmitter is to be available to take over in the event of failure. The multiple cable between the camera points and the mobile control room contains 27 conductors suitably insulated from one another both electrically and mechanically, and having an outer rubber and jute protection. This cable incorporates the two low-capacity vision signal lines, low-tension and high-tension feeds to the head amplifier in the camera, telephone wires for passing instructions from the producer to the camera operator, together with synchronising pulse lines for line movement, frame movement and focusing, and spares.

Television Films

TELEVISION'S inevitable link up with films and the film industry is brought a stage nearer by the news that special B.B.C. films are being produced with as much secrecy as possible at the Stoll Studios, Cricklewood. Mention has already been made in these notes of the proposed historical television film, but now a film has been produced under the direction of Dallas Bower which includes several well-known variety stars, including George Robey, Leonard Henry and Nina Mae McKinney. These films have been made with the aid of a new type of American talking film camera, and to obtain the required light and shade effects special soft-toned grey-coloured scenery has been employed. The successful televising of films with the present equipment available needs a very careful choice of subject, while the film gamma or contrast range must be low if the best results are to be secured. No doubt the film industry, when the exact needs of television are known, will themselves make the necessary films, but at the moment the market for such products is small, and the work so far can only be regarded as an interesting, although very important, experiment.

Coaxial Cable Progress

BEARING in mind the importance of the coaxial cable for future television signal distribution purposes when the provincial stations are being planned, the recent paper read before the Institution of Electrical Engineers was particularly interesting as it revealed the revolution which is taking place in trunk telephone working in this country. Hitherto it had been thought that the telephone circuits (some 200 in number) would be put out of action when the cable was required for television purposes, but it is now learned that four separate transmission units are embodied in the cable; two for television and two for telephones. The spacing of the repeater stations is to be nearly eight miles, while the single conductor in each coaxial link is one-eighth inch in diameter. In addition to the four coaxial cables, there are 16 pairs of other cables for trunk telephony purposes. The London to Birmingham section will be working in the autumn, and the further sections passing to Manchester, Leeds and Newcastle, will follow suit as soon as possible. In the light of the present knowledge concerning the signal radius covered by the London television station it is anticipated that the whole of the television position may be reviewed by the Television Advisory Committee in about two months' time. The greater range of reception will affect very materially the choice of the provincial station sites.

Fewer Stations

A wider station spacing is contemplated than was thought possible when the findings of the original committee were published in January, 1935, and the pressing claims of the important cities will be analysed very thoroughly before definite decisions are made. There is every reason to expect, however, that those centres linked with the coaxial cable of the Post Office will be among the first to be equipped with television broadcasting stations.

Fixing loudspeakers on trees in Constitution Hill ready for the Coronation broadcasts.

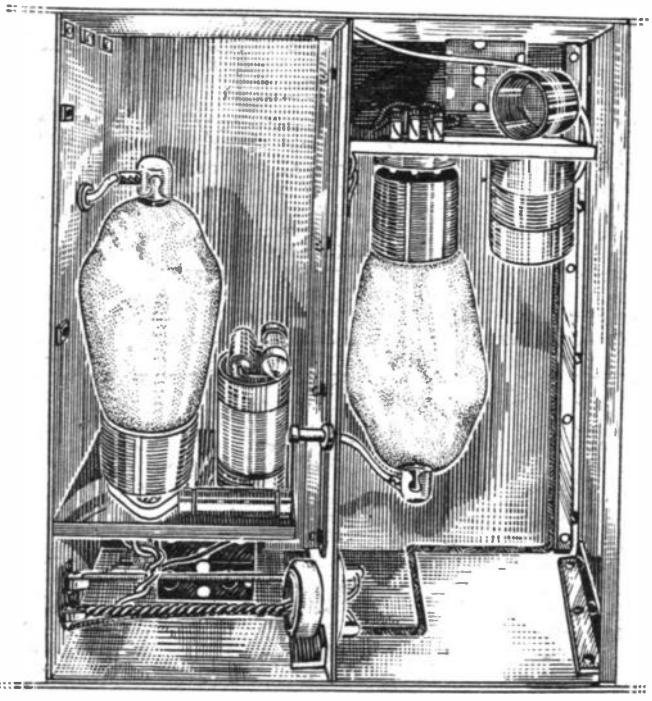
SOUND Plus VISION

The Reasons for a Single Tuning Control and the Best Methods of Arranging for it - - - - - By W. J. DELANEY

MANY amateurs meeting for the first time a commercial television receiver are intrigued by the fact that the vision receiver is not provided with a tuning control. In most cases the television receiver is arranged so that when switched over to the television band a small trimmer knob only is operated and this tunes both the sound and the vision programmes. To obtain the correct adjustment the operator adjusts this trimmer until the sound is correctly tuned, and automatically the picture is then obtained at its best, except, of course, for adjustments of brilliancy and focusing. There are several reasons for this method of arranging for tuning, apart from a simplifying of the controls, of which there are already a large number in a combined television and radio receiver. First, the vision programme occupies a band of about 5 mc/s. Those amateurs who are used to handling a modern highly-selective receiver will know that as the set is put "off tune" the side-band cutting which takes place results in the speech being distorted and this is very noticeable. In the case of a very flatly-tuned receiver (such as a simple crystal set, for instance) one may put the set many degrees off the correct tuning point and no ill-effects of any kind are noticed. Thus, in the television receiver, it would be possible to put the receiver many kilocycles off tune so far as the vision section is concerned and on the majority of scenes broadcast no ill-effects would be noticed. On titles and certain scenes, however, the distortion would show up in various ways, according to the degree of mis-tuning. Therefore, if the vision receiver is in some way locked to the tuning of the sound receiver, it will be possible to adjust the vision to the exact resonant point, simply by tuning until the sound is clear, and this accounts for the usual method of arranging the combined sound and vision receiver.

Circuit Arrangements

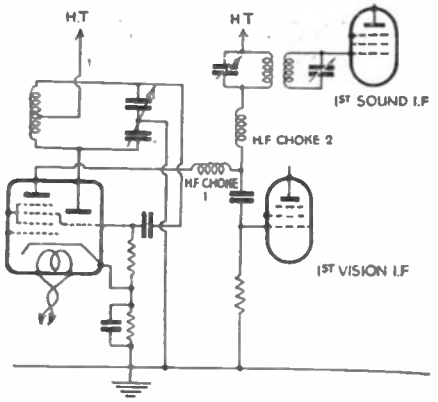
There are, however, several methods of carrying out this single tuning scheme, but the majority of them depend upon careful and accurate alignment of circuits with suitable oscillators and other instruments found in the factory but not in the hands of the average experimenter. No doubt the simplest scheme for the home-constructor is to build the vision section of the receiver as a complete unit, paying all the care and attention to detail necessary to produce a first-class picture. For this purpose inter-valve couplings must be very carefully arranged, and losses in the leads from the anodes must be avoided by keeping these as short as possible. In most cases this means that adjacent valves must be inverted so that the anode of one stage is in one direction and that of the other in the opposite direction. Each stage must also be adequately screened, but it will generally be found that screening of the anode by means of the popular screened cap connectors is inadvisable in view of the high capacity to earth which may be introduced.



One method of building the I.F. stages of a vision receiver to reduce losses.

Tuning

A superhet will obviously be employed, and the frequency changer which is found to provide best results on the ultra-short wavelengths is the combined triode-hexode or similar multi-valve. The output from this stage should be arranged to provide two intermediate frequency beats and fed to a stage containing two I.F. circuits, one adjusted for the vision and one for the sound wavelength. A typical arrangement is shown below, where the anode circuit is tuned by a split condenser which gives rise to the two required intermediate

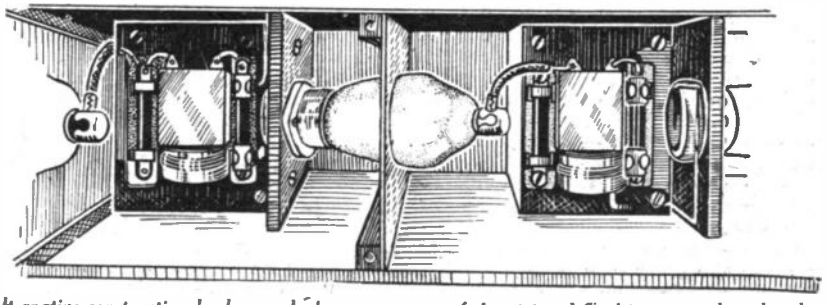


Skeleton circuit arrangement of the input for combined sound and vision receivers.

frequencies. For the sound section the ordinary type of I.F. transformer may be employed, but for the vision there are a few alternative schemes, one of the most popular, which is favoured by many manufacturers as well as by many constructors, is the single-sideband arrangement in which ordinary chokes are provided. This avoids certain constructional difficulties and does not require trimming in each stage.

One way of providing the desired flatness of tuning is to wind the choke or transformer with resistance wire, and a simpler way is to use a standard component with a resistance connected in parallel. A suitable component which is now on the market may be obtained from Messrs. Bulgin, and with an appropriate screen-grid valve will provide an amplification or stage gain of about 10, thus enabling the total number of valves to be kept to a minimum. It is possible, with suitable care and attention to detail, to make use of a standard all-wave receiver for the purpose of receiving the sound section of the television programmes, but for the home-constructor there are a number of difficulties in the way of making a satisfactory job of this type of receiver. Screening, in any case, has to be carried out to the limit, and the slightest interaction between one receiver and another, not only through the inter-circuit wiring, but through the medium of radiated oscillation from the frequency-changer stage, will result in interference in either of the two sections of the television chassis.

Constructional details will be given in a later issue.



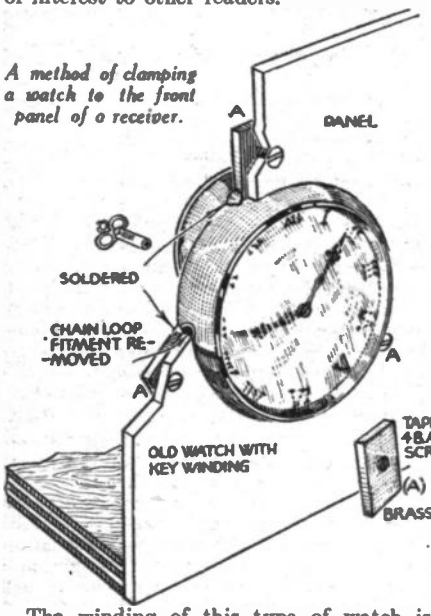
An alternative constructional scheme which prevents some of the wiring difficulties met with in the scheme shown above.

A PAGE OF PRACTICAL HINTS

SUBMIT YOUR IDEA — READERS WRINKLES — THE HALF-GUINEA PAGE

Clamping a Watch to a Front Panel

I HAVE incorporated on the front panel of my short-wave receiver an old-fashioned watch for checking times when logging DX signals, and the method which I adopted to secure the watch without obtrusive fitments proved itself so efficient and simple that I thought it might be of interest to other readers.



A method of clamping a watch to the front panel of a receiver.

The winding of this type of watch is accomplished by a fancy key and, owing to my receiver not being enclosed in a cabinet, I have very little difficulty in re-winding and setting, the whole assembly being kept as near to the one edge of the panel as appearance and components permit.

The brass strips were cut from a length of ¼in. by ¼in. strip, and then tapped as shown. After the holes have been drilled in the panel the construction is a matter of a few minutes, and the final rigidity is attained by soldering these small strips of brass to the watch case.—R. O. SEGERS (Northampton).

A Simple Signal Generator

HAVING found innumerable duties for this simple generator, I thought perhaps other readers would like to try the principles adopted. As will be seen from the illustration, the employment of a tuning fork provides the necessary vibrations for flux interruption in the pick-up coil. To cause the fork to resonate, an electro-magnet is assembled with a small air-gap between the pole piece and one arm of the tuning fork, this arm providing the armature and having a back stop contact wired to one side of a 6-volt battery (D), one side of the coil going to E (contacting with the fork) and the other side of the coil going to the other pole of the battery, thus completing the normal bell circuit. This unit may be used for continuity tests, coil matching, speaker adjustments, amplification tests, etc., and adjustment of pitch (not modulation) is attained by altering the pressure of the back stop contact by means of the worm gear and control arm.—A. S. E. PETERS (Bournemouth West).

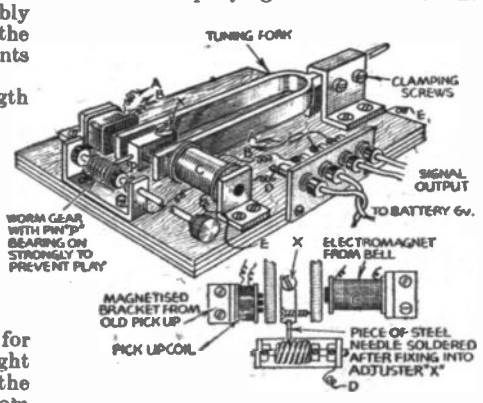
THAT DODGE OF YOURS!

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 Wrinkle.

Novel Low-loss Coil Construction

IT is well known that variation in turn spacing of coils affects the ultimate range owing to alteration of interwinding capacity and consequently self-induction, so I set to work to design a coil which would embody this characteristic, at the same time being adjustable to variations in circuit design. This then meant (1) an interchangeable inductance with this spacing feature; (2) secure fitment when in use; (3) minimum metal work; (4) facility for tapping; (5) ease of inductive coupling to other like coils.

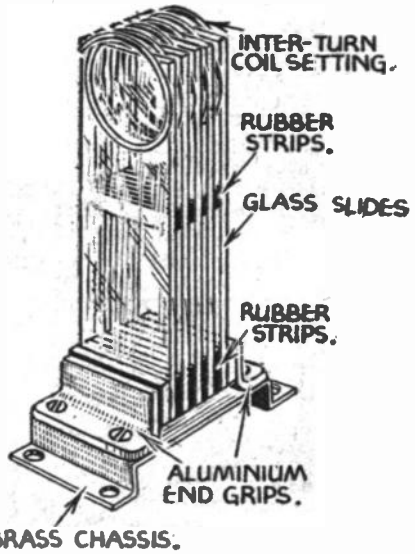
The accompanying sketch shows the method I employed, and I can vouch for its effectiveness and low-loss characteristics. The rubber strips were cut from rubber bands (square rubber type) and the slides were the microscope type, priced at ½d. each for a quantity. It will be seen that thicker rubber protecting strips are used between the slides and end grips. The end turns of any inductance, so assembled, may be varied by the employment of thicker rubber strips between the slides in question.—T. N. GOODWIN (Cambridge.)



A simple signal generator in which a tuning fork is used for the vibrator.

Declining Selectivity

THE selectivity of some receivers is liable to decline gently, until a point is reached where its owner wakes up to the fact that whereas it used to be possible to get this station free from that station, it has become impossible. Go to the local dealer and he will tell you that it is valves, which is a wise diagnosis, as it is almost, but not quite certain, to be correct. Assuming that the set is not out of gang, all components are O.K., and there are no loose connections, the "not quite" element will be resistance in the actual switch contact. Recently, a troublesome switch was carefully measured for its resistance, and revealed the astonishing figure of .892 ohms, rather more than 25 per cent. of the H.F. resistance of a good grid coil at 400 metres. The trouble was that the wiper blades which formed one half of the switch contact had become tired, had lost the springiness they enjoyed in their youth, and touched the rotor portion of the switch so gently that a piece of tissue paper could be slipped between without the edge of the tissue paper being in any way crumpled, added to this the face of both the rotor and wiper had become oxidised, the pressure being no longer sufficient to keep them clean by friction.—D. LEIGH (Brighton).



An effective method of mounting short-wave coils.

SH

A Very Use

Used as an

A ONE-VALVE short-wave unit using a triode valve operating on the leaky grid principle is a very adaptable piece of apparatus. It can be used as an adapter in conjunction with the low-frequency amplifier of a broadcast band receiver, as a converter in conjunction with a receiver employing one or more high-frequency stages, or as an independent one-valve short-wave set. When used as an adapter or a one-valve set, the unit will work satisfactorily on all wavelengths above approximately 10 metres, and normal reception on the medium- and long-wave bands is obtainable provided that coils of the correct inductance are used. When it is used as a converter, however, it is unsuitable for reception on wavelengths above approximately 100 metres. If reception above this wavelength is desired, a frequency-changer such as the pentagrid, triode-hexode, or triode-pentode should be used. The use of these valves complicates the design and greatly increases the cost however, and therefore, if the converter is to be used for short-wave reception only, a triode valve is preferable.

Battery-operated Units

Several designs of battery-operated units have appeared in this journal, but the constructor having a mains supply has been somewhat neglected. For the benefit of new readers, the diagram of a battery-operated unit is given in Fig. 3, however. The valve in this type of unit should have an impedance of approximately 10,000 ohms—any reliable make of L.F. valve will be found suitable. The H.T. and L.T. current may be obtained from the battery and accumulator supplying the broadcast receiver, or a separate 60-volt H.T. battery, and a 2-volt accumulator may be employed.

A.C. Mains Unit

When an A.C. mains supply is available, the cost of running can be reduced and the efficiency slightly improved by using an indirectly heated mains type valve. It is not always safe to supply the L.T. current from the broadcast receiver mains unit, because in commercial receivers the mains transformer is designed to supply the receiver valves, and the extra load imposed by the valve in the unit can cause damage to the mains transformer winding, or a reduction of output voltage. A separate L.T. supply should, therefore, be provided. The anode current passed by the triode type of valve used in the unit is very low compared with the total consumption of the receiver valves, however, and therefore it is quite safe to supply the H.T. current from the receiver mains unit. This fact is of great importance, as it obviates the necessity for using separate rectifying equipment in the unit; raw A.C. can be supplied to the valve heater, and this can easily be obtained from an L.T. mains transformer. The price of a suitable transformer is approximately the same as that of an accumulator and, consequently, the A.C. unit need not cost more than a battery-operated type.

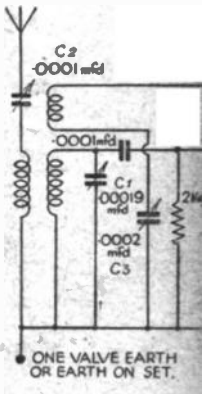


Fig. 2.—Theo

Components

The constructor is advised to use the components specified on the accompanying list. It is permissible, however, to use a home-constructed coil, and the one used in the "Simple Short-Waver" described in the issue of PRACTICAL AND AMATEUR WIRELESS dated December 12th, 1936, may be employed. The valve type is somewhat critical, but it is not essential to use the 41MHL—most A.C. mains valves of the HL type will give satisfactory results. It will be noted that a Heayberd L.T. mains

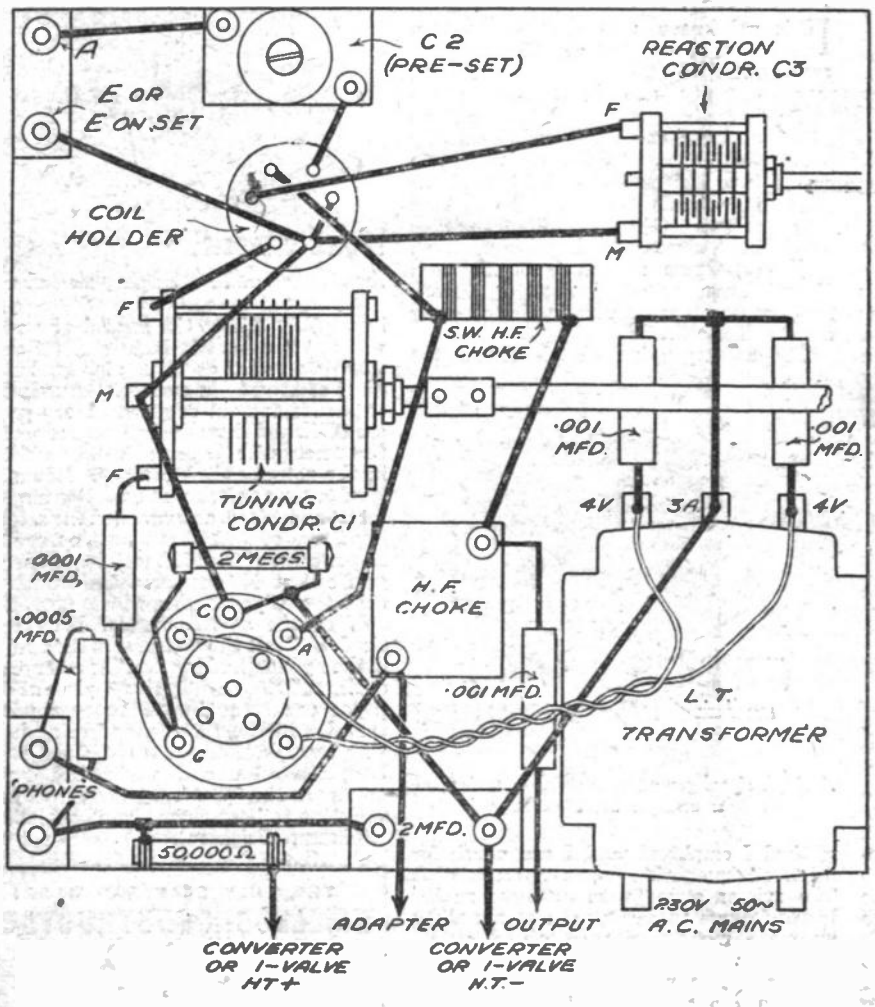


Fig. 1.—Practical wiring plan of the S.W. unit.

LIST OF COMPONENTS FOR A.C. MAINS S.W. UNIT.

Two six-pin coils—type 6LB and 6Y (Eddystone).
One six-pin coil base—No. 269 (Eddystone).
One 192 mmfd. condenser—No. 942/180 (C1) (Eddystone).
One preset condenser 100 mmfd.—No. 1088 (C2) (J. B.).
One 200 mmfd. condenser—No. 957 (C3) (Eddystone).
Slow-motion driving head, coupler, bracket, and extension rod (Eddystone).
Short-wave choke 10-100 metres (B.T.S.).
Broadcast-band choke 200-2,500 metres (B.T.S.).
Headphones (B.T.S.).
L.T. mains transformer 4v. 1-3A—No. 723 (Heayberd).
Five-pin valveholder—No. 1016 (Eddystone).
Two terminal blocks (Belling and Lee).
Six fixed condensers: One .0001, three .001, one .0005 (Tubular 300); one 2mfd. (65) (T.C.C.).
Two fixed resistances, 50,000 ohms, 2 megohms (Dubilier).
Metallised valve 41MHL (Cossor).
Wooden baseboard, 8in. by 8in. (Peto-Scott).
Aluminium panel, 8in. by 5in. (Peto-Scott).

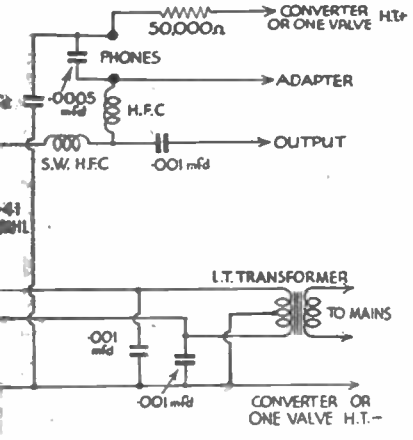
ORT WAVE ECTION

A.C. MAINS S.W. UNIT

One-valve Short-wave Unit which Can be ...ter, a Converter, or a One-valve Receiver

By IDRIS EVANS

transformer is specified for supplying the 4 volts required by the valve heater. Many constructors will have a spare mains transformer having H.T. and L.T. secondary windings on hand, however, and if this has a 4 volt 1 amp. winding it may be used for supplying the unit valve. Others will have a spare 4 volt 1 amp. winding on the transformer used in their home-constructed set. In most cases, therefore, the special L.T. transformer will only be necessary if the receiver is a commercial type.



...ircuit of the A.C. Mains S.W. unit.

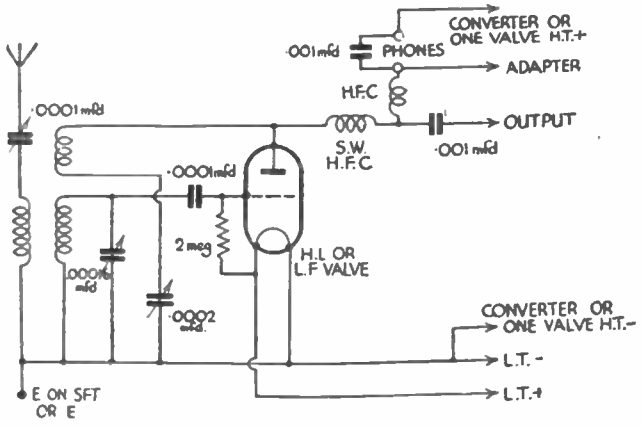


Fig. 3.—Circuit of a battery-operated short-wave unit.

Construction

The constructional work should not present any difficulties. A wooden baseboard measuring approximately 8in. by 6in. may be used, and the components should be mounted in the positions indicated in Fig. 1. It is advisable to use extension rods for the reaction and tuning condensers, and the leads joining the tuning condenser to the tuning coil should be kept very short.

Connecting and Operating

If the unit is to be used independently as a one-valver, a dry battery of 120 volts may be used for H.T. supply. This will last a long time as the consumption of the valve will only be approximately 2½ m/A—about a quarter of the consumption of a normal three-valve battery set. The headphones should be connected in the position indicated on the diagram, and the tuning and reaction controls operated in the normal manner. When the unit is to be used as an adapter in conjunction with an L.F. amplifier the lead marked "Adapter" should be plugged into the anode socket of the detector valve-holder of the receiver, the valve having been removed. H.T. will then be supplied through the anode resistance or the transformer primary in the anode circuit of the receiver detector, and the battery H.T. supply will not be necessary, of course. When used as a converter, the unit lead marked "Output" should be connected to the aerial terminal of the receiver. The lead marked "Converter or One Valve H.T.+" should then be connected to a high-voltage point on the receiver—the L.S.+ tag or terminal will probably be the most easily accessible. If the receiver speaker is parallel fed the H.T.+ terminal of the choke in the output-valve anode circuit may be used.

'Phone Terminals

The aerial lead should be transferred from the aerial terminal of the set to that of the unit, and the earth terminal of the unit should be joined to the earth terminal of the set. When the unit is to be used as a one-valver the earth lead should be connected to the unit-earth terminal and the H.T.— lead to the H.T.— socket of the battery—the H.T.— lead is not used when the unit is employed as an adapter, as the H.T. circuit is completed through the lead joining the two earth terminals. When the unit is used as an adapter the headphones should be removed from the 'phone terminals, and these two terminals must not be joined together, but when it is desired to use the unit as a converter the 'phone terminals should be joined by means of ordinary connecting wire.

Aerial

It is advisable to use a short outside aerial in conjunction with the unit—approximately 30ft. will be suitable. If the aerial is longer than this it will probably be found necessary to use the present condenser C2 in order to obtain reaction. This has the effect of reducing the effective length of the aerial, thereby eliminating reaction dead spots.

When the unit is to be used as an adapter or a one-valve receiver, best telephony reception will be obtained when the reaction condenser is set as near as possible to the oscillation point. When using the unit as a converter, however, the valve must be kept oscillating for telephony and morse reception, and the receiver should be switched to long waves with the tuning condenser set to approximately 900 metres.

Leaves from a Short-wave Log

Sunday Talks from Reykjavik

EVERY Sunday at B.S.T. 19.30 you may listen to a broadcast in English from TFJ, Reykjavik (Iceland), on 24.52 m. (12.235 mc/s). Following the reading of a news bulletin and a very interesting chat about the Island's activities, you will hear the National Anthem sung by a mixed choir. Later, a Scandinavian transmission is carried out and the station usually closes down towards B.S.T. 20.45 or 21.00. The studio opens with a tuning note, the call in Icelandic being: *Riksutvarp Island*. Short concerts are occasionally broadcast. Announcements are made in English in the earlier part of the programme, and in Swedish, Danish, and German for the second portion; the official presiding at the microphone proves himself to be an expert linguist.

Listen to Trujillo City

Almost nightly it is now possible to pick up transmissions from HIN, Ciudad Trujillo (Dominican Republic) working on 48.05 m. (6.243 mc/s) with a power of 750 watts. In its bi-lingual announcements (Spanish and English) the studio repeats its slogan *La Voz del Partido Dominicano* (The Voice of the Dominican Party) adding, in English: *The Land that Columbus lored*. The call is regularly put out every fifteen minutes, namely, at 10, 25, 40 and 55 minutes past each hour. The interval signal between items broadcast in the programmes consists of 3 chimes. Transmissions are made daily with the exception occasionally of Saturdays between G.M.T. 17.20-19.00 and again from 00.30-02.30.

Another Peruvian Station

In addition to OAX4G, Lima, operating on 49.34 m. (6.08 mc/s), there would seem to be a new transmitter in the Peruvian capital. Readers report the reception of broadcasts from OAX4J, styling itself *Radio Internacional*, on 32.12 m. (9.34 mc/s). The interval signal heard was somewhat akin to that used by the N.B.C., i.e., 3 notes or chimes. Details of the programme are given out by both female and male announcers in Spanish and English.

"Keepalite" Floating Battery Equipment

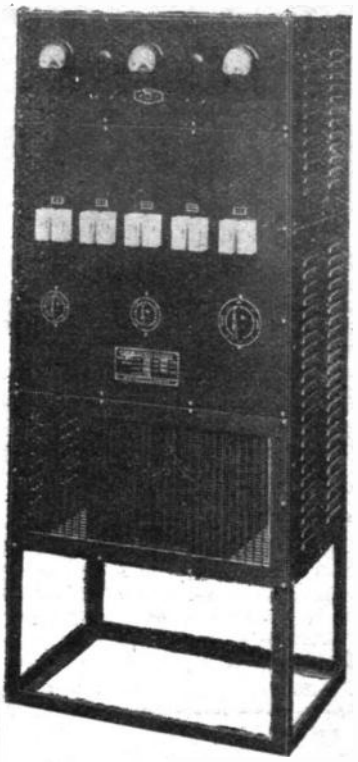
MANY of our readers are interested in battery charging, and it is well-known that many listeners use a "floating" charging scheme. This term is applied where a charge is fed into an accumulator whilst it is being discharged at an equivalent rate, and some listeners use a trickle charger arranged to deliver the same current as is taken by the valves in their receiver, and connect the on/off switch to the mains supply feeding the charger. In view of these facts the following details concerning a "floating" supply for an emergency lighting system such as is used in a cinema will, no doubt, be of interest.

One drawback common to the scheme in the past has been that no matter how carefully the rectifier output has been adjusted to keep the battery floating, i.e., neither charging nor discharging (or, if anything, slightly charging), any change in the circuit conditions has quickly thrown the floating out of balance, and the battery may either have been charged too much, with a consequent rise in voltage on the secondary lighting, or may have discharged too much, with consequent reduction in the capacity of the battery available for emergencies. This has led in many cases to the stipulation that the whole of the secondary lighting load of a cinema shall be switched on at one time, even though some parts of the cinema, such as daylight-lit staircases, corridors, crush halls, etc., would not require such emergency lighting by light until dusk.

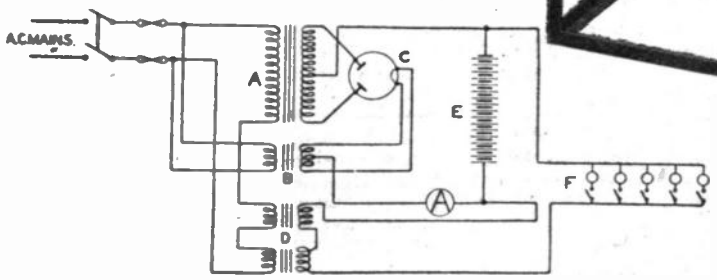
A new equipment is now available in which the above-mentioned drawback has been completely overcome; the equipment is of the floating type approved by the authorities, and the secondary lighting is connected to the battery at all times. It is known as the Keepalite "B" equipment (the invention of Mr. Basil Davis under licence, patent No. 377,671). The equipment, incorporating Chloride batteries, is marketed by The Chloride Electrical Storage Company, Ltd., for safety lighting in cinemas.

The principal feature of the new equipment, which employs a rectifier, is a set of governing chokes specially wound and so connected between the circuits that wide changes in loading can be made without affecting the accurate floating of the battery.

With the new equipment, it is only necessary for a cinema attendant to switch on the A.C. supply to the rectifier and then switch on the secondary lighting. The control automatically gives the proper floating position without further manipulation or adjustment. This ensures that the battery receives proper treatment and is thus maintained in good condition and fully charged with the minimum of attention.



View of the complete unit.



Simplified circuit diagram of the arrangement. A—Main transformer. B—Filament transformer. C—Full wave valve. D—Control chokes. E—Storage battery. F—Cinema safety lights.

The Keepalite "B" equipment is available in a range of sizes to cover all usual requirements from small to large cinemas, and full particulars may be had from The Chloride Electrical Storage Company, Limited, at their Head Office, Exide Works, Clifton Junction, near Manchester, or 137, Victoria Street, London, S.W.1.

Coronation Week Dance Music

THE B.B.C. announces that the arrangements for providing dance music throughout Coronation Week are now complete.

The dance music high spot of the week will occur on Coronation Night, i.e., from 10.15 p.m. on May 12th to 1 a.m. on May 13th. The programme, entitled "Britain Dances," has been devised by Paul Askew, and the dance bands who will co-operate have been drawn from all over the country. The B.B.C. Dance Orchestra, directed by Henry Hall, in London, will act as the link between the various contributions by bands in the provinces. At each provincial centre Coronation revelries are taking place. The B.B.C., through its Regional organisation, has selected dance bands representative of the area and they will furnish a sound picture of Britain celebrating in dance the crowning of the King.

Henry Hall, at the end of his opening broadcast in London, will hand over to the next band, Bobby Hind of Aberdeen. As Aberdeen finishes its contribution, the Aberdeen announcer will take listeners back to Henry Hall in London. This method of announcing will be adopted throughout the programme. The music, except for the usual announcements, will be non-stop.

The schedule below sets out the timing, the origin and the name of each dance band taking part in "Britain Dances."

A Full Rhythm Day

Thursday, May 13th, is a full rhythm day. Billy Thorburn broadcasts in the afternoon and will have with him three guest artists, including Esmé Percy. In the early evening in the National programme listeners will hear George Scott Wood and his Band. The late night dance music will be played by Ambrose and his Orchestra from the Coronation Ball at the Albert Hall, where a compère will introduce the dance numbers, and by Jack Payne and his Band from the Scottish Empire Coronation Ball at Grosvenor House.

Thus listeners will hear two first-class dance bands on this night and will also have the opportunity of hearing Gracie Fields in an interval in the dance music from Grosvenor House, as well as the pipers of the Scots Fusiliers.

On May 14th three sessions of dance music will be given. The B.B.C. Dance Orchestra, directed by Henry Hall, will be heard on the National wavelength during the lunch hour; Geraldo and his Orchestra on the National wavelength in the early evening; and Joe Loss and his Band will play during the late night session.

On Saturday, May 15th, four dance sessions will be provided. The B.B.C. Dance Orchestra, directed by Henry Hall, are to broadcast the lunch and tea dance music; Al Collins with the Berkeley Hotel Orchestra will be heard in the early evening; while the late night dance music will be provided by Billy Cotton and his Band.

TIME.	BAND.	PLACE.
10.15 to 10.30 p.m.	The B.B.C. Dance Orchestra, directed by Henry Hall	B.B.C. Maida Vale studio.
10.30 to 10.45 p.m.	Bobby Hind and his Band	Beach Dance Hall, Aberdeen.
10.45 to 11.0 p.m.	The B.B.C. Dance Orchestra, directed by Henry Hall	B.B.C. Maida Vale studio.
11.0 to 11.15 p.m.	Frank Rea and his Orpheans	Orpheus Restaurant, Belfast.
11.15 to 11.30 p.m.	The B.B.C. Dance Orchestra, directed by Henry Hall	B.B.C. Maida Vale studio.
11.30 to 11.45 p.m.	Larry Brennan and his Band	Tower Ballroom, Blackpool.
11.45 to 12 midnight	Douglas Swallow and his Band	Palaisde Danse, Birmingham.
12.0 to 12.15 a.m.	The B.B.C. Dance Orchestra, directed by Henry Hall	B.B.C. Maida Vale studio.
12.15 to 12.30 a.m.	Glyn Samuel and his Band	Rolls Hall, Monmouth.
12.30 to 12.45 a.m.	Harry Evans and his Band	Grand Hotel, Torquay.
12.45 to 1.0 a.m.	The B.B.C. Dance Orchestra, directed by Henry Hall	B.B.C. Maida Vale studio.

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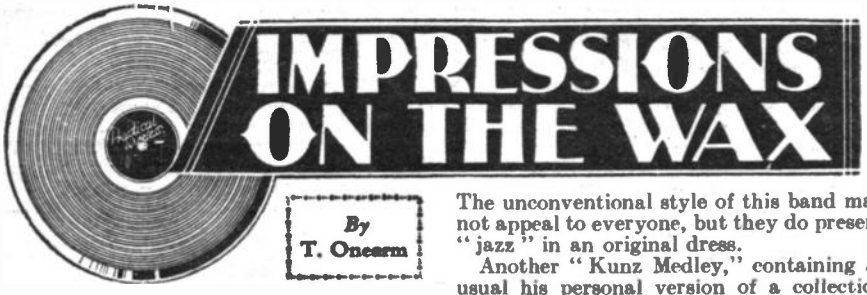


IMPRESSIONS ON THE WAX

By T. Onearm

Decca and Brunswick

OF interest in this month's Decca releases is the first recorded performance of the Dvorak Piano Trio in F minor, Op. 65, by the Budapest Trio on *Decca X* 161/4. Most readers will no doubt know the "Dumky" Trio, but it is nowadays thought that the F minor Trio (violin, 'cello and piano) is a superior musical work to its more frequently played brother. I specially recommend this fine set of records.

If you feel jaded you should hear "A Truro Maggot," by Frederick Thurston (clarinet) and Myers Foggin (piano) on *Decca K* 858. Frederick Thurston is principal clarinet of the B.B.C. Orchestra and is one of our leading clarinet virtuosos. A jolly record this.

Two pre-eminent film stars appear on *Brunswick* 02406, singing "Good night, my Love" and "Will You?" They are Gene Raymond and Alice Faye.

"Trust In Me" and "Where are you" is presented by Connie Boswell, accompanied by Ben Pollock and his Orchestra on *Brunswick* 02401. The first tune is extremely good and I expect it will be a big "hit."

Ella Fitzgerald has teamed up with the Mills Bros. on *Brunswick* 02399, singing "Big Boy Blue" and "Dedicated to you." Definitely a good thing.

Crosby records are always popular and his latest recording on *Brunswick* 02402 is well up to standard. "What will I tell my heart?" is recorded in association with Jimmy Dorsey and his Orchestra, and "Moonlight and Shadow," with Victor Young and his Orchestra.

Another popular vocalist—the Street Singer—has also made a new recording—"Good night, my Love" and "Harbour Lights," on *Decca F* 6351.

"Rex" Coronation Records

A RECORD which is topical at the moment is that made by Gracie Fields and Sandy Powell. It is entitled "Gracie and Sandy at the Coronation," parts 1 and 2, on *Rex* 9022.

An extremely impressive recording is "Coronation Cavalcade," parts 1 and 2, on *Rex* 9023. Part 1 is "Procession to the Abbey," introducing "Old Comrades," "Galopede," "The March of the Cameron Men" and "Distant Greetings." Part 2 is "Inside the Abbey"—"The King is Crowned," introducing "Coronation March," "Yadoc the Priest" and "God Save the King." These are just two of the excellent recordings made by Rex in their Special "Souvenir Coronation" issue.

Dancing Time

DANCE bands have also been busy. Ambrose and his Orchestra have made "The Coronation Waltz" and "On the trail where the sun hangs low," on *Decca F* 6369, and "I may be poor but I'm honest," coupled with "Rhythm's O.K. in Harlem"—*Decca F* 6370, and Reginald Foresythe and his Orchestra have recorded "Aubade" and "Burlesque." The unconventional style of this band may not appeal to everyone, but they do present "jazz" in an original dress.

Another "Kunz Medley," containing as usual his personal version of a collection of "hits" of the moment, appears on *Decca F* 6368. Hear this record.

For those of you who are interested, I draw your attention to the new batch of Irish records issued by Decca, full particulars of which are given in their latest supplement. It is not every Irishman that lives in Ireland, and I think most of these records should have more than a local appeal.

H.M.V. Releases

SEVERAL of the new H.M.V. releases are, very naturally, of the national and patriotic type. Quite a novelty is the decorated Souvenir Coronation record which contains fanfares specially composed by Herbert Menges. John Gielgud then declaims two appropriate Shakespearian speeches in praise of England from "Richard II" (John of Gaunt's speech), and "King John," and the record closes with a mighty rendering of "God Save the King" to Elgar's arrangement. The price is 3s. and the profits are being handed to King George's Jubilee Trust. The number of the record is *H.M.V. SCB* 1.

Other records recommended as being in tune with the spirit of Coronation month are Meyerbeer's Coronation March from "Le Prophète" and Elgar's "Imperial March," played by the B.B.C. Symphony Orchestra, under Sir Adrian Boult on *H.M.V. DB* 3163. The Band of H.M. Coldstream Guards contribute two Coronation Marches, one being "Royal Cavalcade" and the other "Coronation Bells"—*H.M.V. B* 8556. They also play an attractive "Colonial Medley," introducing what might be called the "signature tunes" of Canada, Australia, New Zealand and South Africa, on *H.M.V. B* 8557.

Well-known Vocalists

"THEATRELAND at Coronation Time" is a tuneful selection featuring popular songs from current West End successes, sung by Garda Hall, Webster Booth, Stuart Robertson and Chorus on *H.M.V. C* 2903.

Peter Dawson in rousing fashion gives a good account of the new patriotic song, "Red, White and Blue" and "So it Goes On," both from the new Palladium show, "Swing is in the Air," on *H.M.V. B* 8558.

For swing music enthusiasts Benny Goodman's Quartet has recorded "Vibraphone Blues" and "Tea for Two," on *H.M.V. B* 8563 and also "Swing low, sweet Chariot" and "Take another Guess," on *H.M.V. B* 8564. "I'm gettin' Sentimental over You" (Tommy Dorsey's signature tune) and "Song of India" are attractively played by Tommy Dorsey and his Orchestra on *H.M.V. B* 8565.

From the Films

BEBE DANIELS and her husband, Ben Lyon, make their first record, "There's a Small Hotel" from "On Your Toes," which contains some amusing dialogue. On the other side Bebe Daniels sings "Sing Something in the Morning," from C. B. Cochran's Coronation Revue, "Home and Beauty"—*H.M.V. B* 8543.

Important Broadcasts of the Week

NATIONAL

Wednesday, May 12th.—Special Coronation Day Broadcasts, including an address by The King.

Thursday, May 13th.—Costume Ball, from the Albert Hall, and the Scottish Empire Coronation Ball, from Grosvenor House.

Friday, May 14th.—Dancing Through, Reminiscent Tunes, special Coronation programme.

Saturday, May 15th.—Gala Variety programme.

REGIONAL

Wednesday, May 12th.—Special Coronation Day Broadcasts, including an address by The King.

Thursday, May 13th.—Gala Revue.

Friday, May 14th.—A story by A. J. Alan.

Saturday, May 15th.—Duchy of Cornwall; a dramatised account of its six hundred years' history and a survey of its varied activities to-day.

MIDLAND

Wednesday, May 12th.—Special Coronation Day Broadcasts, from London.

Thursday, May 13th.—Coronation Celebrations in the Cotswolds, described by E. G. Hilton.

Friday, May 14th.—Variety in the Midlands, a microphone tour including the Theatre Royal, Hanley; the New Theatre, Northampton; and Coventry Hippodrome.

Saturday, May 15th.—Coronation Concert, from the Town Hall, Birmingham.

WESTERN AND WELSH

Wednesday, May 12th.—Special Coronation Day Broadcasts, from London.

Thursday, May 13th.—A Countryman's Contentions, a Devon man discourses on world affairs in the "Pig and Whistle."

Friday, May 14th.—Variety programme, from the Prince's Theatre, Bristol.

Saturday, May 15th.—Duchy of Cornwall; a dramatised account of its six hundred years' history and a survey of its varied activities to-day.

NORTHERN

Wednesday, May 12th.—Special Coronation Day Broadcasts, from London.

Thursday, May 13th.—Gradely Folk, or an hour to spare in the North, a programme of anecdote, verse and song.

Friday, May 14th.—Variety programme, from the Argyle Theatre, Birkenhead.

Saturday, May 15th.—Coronation Carnival, a recorded programme of Coronation Festivities in London and the Regions.

SCOTTISH

Wednesday, May 12th.—Special Coronation Day Broadcasts, from London.

Thursday, May 13th.—Variety programme.

Friday, May 14th.—The River Clyde, its legend, story and song, feature programme.

Saturday, May 15th.—Gaelic Concert.

NORTHERN IRELAND

Wednesday, May 12th.—Special Coronation Day Broadcasts, from London.

Thursday, May 13th.—Gala Revue, from London.

Friday, May 14th.—All British Variety, from the Empire Theatre, Belfast.

Saturday, May 15th.—Duchy of Cornwall, a dramatised account of its six hundred years' history and a survey of its varied activities to-day.

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.

R. G. (Ashton-u-Lyne). Use only 30 or 25 turns for the coil to cover the band in question.

R. T. J. (Porthcawl). We note your comments, but as pointed out in our previous reply there is no publication so far as we are aware which gives the details required. The Amateur Call Book gives the names and addresses and call signs of amateur stations in all parts of the world, but is necessarily incomplete.

D. W. (Rhymney). We regret that we cannot recommend a blueprint in your particular case.

R. A. (Lostock Hall). We regret that the issue in question is now out of print, but we will insert a request in our pages.

L. R. A. (Newcastle, 2). The lower value of resistance will get hotter as there will be a larger current flowing through it. In general, a 30 or 50 ohm component is quite satisfactory and if of the correct type should not get hot. You have apparently used an old type filament resistor designed to pass only .1 amp or so, and the heater current is of the order of 1 amp or more. You should therefore obtain a proper humdinger for the purpose.

A. J. H. (N.W.8). We regret that we cannot trace the valve types mentioned in your letter.

G. A. B. (Hinckley). We have not used the coil in question in any of our receivers.

C. C. H. B. (S.E.23). We are unable to insert your request free of charge, and suggest you take a small advertisement for the purpose.

G. H. W. (Gt. Malvern). We no longer include station identification in our query service.

M. A. W. (Loadan). Messrs. Peto-Scott can supply the complete kit or the receiver ready wired, and we suggest you get into touch with them. We cannot advise you concerning Customs duties, etc.

A. V. B. (S.E.19). What details do you require? Perhaps the back issues of the books in question would be of use to you.

H. S. J. (Prestatyn). The crystal is used only for stabilising purposes in transmitters as it oscillates at a definite frequency. You are apparently confusing this with the crystal used for rectification in a simple crystal set.

W. B. (S.W.10). The special Short-wave Section this week will probably help to solve your difficulty.

L. A. (Newcastle, 2). It seems that the trouble must be due to interaction between certain leads or to the lack of suitable decoupling components and circuits. It is not possible to advise definitely from the details given in your letter.

The Philco Phone

THOSE readers who visit the cinemas regularly will have noticed that when the big business man is shown in an American setting, he always makes use of an inter-departmental 'phone of the loudspeaking type. Instead of lifting a receiver as we do in this country, he presses a switch and then talks to the person at the other end of the line via a microphone and loudspeaker circuit. There are, of course, many advantages to this type of 'phone circuit, and the Philco company are shortly introducing it to this country, the accompanying illustrations showing the essential parts.

The instrument has met with tremendous success in the United States where it has been installed in private houses, business houses, restaurants, doctors' offices, amusement places and many other buildings. Philco Phone provides two-way communication between a master control unit and one, two, three or four remote units. The system can be used between distant points in homes, offices, stores, hotels, factories, theatres, garages, hospitals or similar places. It is the least expensive but most efficient communication system on the market. It will sell for less than £20 for two stations with each additional station about £2 extra.

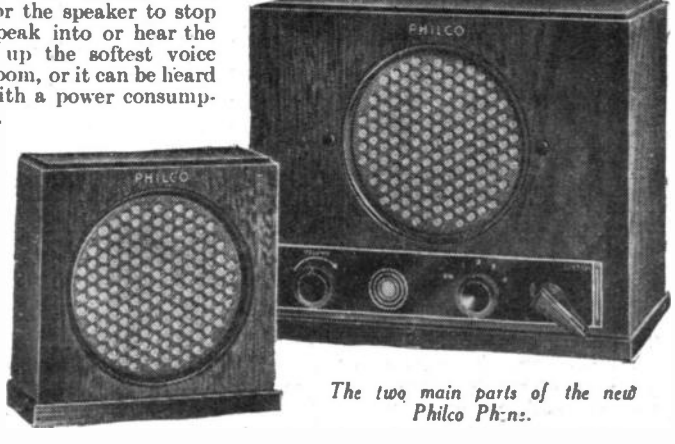
The apparatus is built of all Philco standard components, gives the usual Philco high performance on either A.C. or D.C. mains, and can be installed anywhere within a few minutes. The master control unit is encased in a compact attractive walnut cabinet. Combination speaker-microphone permits instant conversation with one or all remote stations at will. A turn of the volume knob sends the voice to the remote units as loud or as low as desired. A red signal light on the master unit shows when system is in operation.

The remote unit provides instant 2-way conversation with master unit. It is not necessary for the speaker to stop his work either to speak into or hear the unit as it will pick up the softest voice from anywhere in a room, or it can be heard at a long distance, with a power consumption of only 45 watts.

Dealers are interested in Philco Phone because of the wide appeal it has among all sorts of business and professional people, as well as among housewives in both large and small homes. It is simply but sturdily constructed, does not require costly and bothersome installations, and does not cause the dealer any service problems.

For Trade and Home.

Philco Phones are expected to open up a tremendous new market. Plans are being made to interest medical and dental supply houses, office equipment concerns, typewriter dealers, and many other outlets in its distribution. The instrument is of use to architects, banks, solicitors, warehouses, hotels, cinemas and every other business where steps can be saved in delivering spoken messages between members of the staff.



The two main parts of the new Philco Phone.

World's Largest Television Transmitter for Eiffel Tower

A NEW television transmitter, which, it is claimed, will be the most powerful commercial television broadcasting installation in the world, has just been ordered for the Eiffel Tower, Paris.

This new transmitter has been commissioned from Le Materiel Telephonique, the French associates of Kolster Brandes, Ltd., by the French Ministry of Posts, Telegraphs and Telephones. It will have a peak power of 30,000 watts fully modulated at the antenna, and will be capable of broadcasting on the basis of 405 lines, with a band width of 2.5 megacycles.

It is proposed to install the new transmitter at the base of the Eiffel Tower with the antenna projecting from the top of the flagpole, which is 984 ft. above ground-level. The transmission cable from transmitter to antenna will be approximately 400 metres long, over 5ins. in diameter, and will weigh about 12 tons. Of the semi-flexible coaxial type required for the highest quality transmission, it will run up the framework of the tower to the centre of the topmost cupola.

Special Problems Involved

The construction of the transmission cables raises several novel and difficult problems. Since the cable is to pass upward from the point mentioned, it will be necessary to substitute a new hollow metal pole for the one now in place. This with the transmission conductor inside must be pushed up through the opening in the collar that crowns the steel structure to a height of 12 metres. The antenna will continue for another vertical distance of 3 metres above the flag.

Another problem concerns the installation of the transmission cable between studios and broadcaster. This will be accomplished by a specially adapted transmission cable with special terminal equipment necessitated by the alternative systems of positive or negative control which require different characteristics in the transmission lines.

Programme Arrangements

The equipment will include a "monitoring set," corresponding to a listening-in control station on a broadcasting or long-distance telephone circuit. This will enable a technical operator to have full control, and to know at all times just what quality of television broadcast is going out on the air. The audible portion of the programmes will go out from a regular P.T.T. broadcasting station. Programmes will be produced from two studios, situated in the Radio Building of the Exposition and the Post Office Building.

Although the P.T.T. has been broadcasting an hour's television programme daily from the Eiffel Tower since December, 1935, with encouraging results, it was felt by technical experts of the Ministry that progress had been such as to warrant the substitution of a more modern and powerful installation. Thus the Eiffel Tower, whose career began with the Exposition of 1889, is to play a leading role in the 1937 Exposition.

The contract just signed with Le Materiel Telephonique, in whose laboratories the equipment has been developed after two years' research, specifies that the new station shall be ready for service with reduced power by July 1st of this year.

This reproduction of a page of an American radio journal shows the American view of the British Radio Industry.

A CATHODE-RAY TUBE PROBLEM

WHEN considering how the use of the projection type of cathode-ray tubes is likely to lead to future developments which will give a larger picture size than now possible, one or two important factors are overlooked by those not familiar with the intricacies of cathode-ray tube technique. With the greatly reduced screen area of these projection tubes the size of the fluorescent spot which traces out the scan in the shorter available height becomes a factor of extreme importance. The focusing devices, either electromagnetic or electrostatic, have to be adjusted with great care, while steps must be taken to ensure that no defocusing occurs when the electron beam, and, in consequence, the visible spot, is modulated by the incoming television signal. The spot diameter should remain quite constant and only its brightness alter in accordance with the fluctuating intensity of the received signal. Again, if the fluorescent screen should happen to be of a coarse grain this will set the limit of picture clarity irrespective of the smallness of the spot itself. These are only two of the reasons why considerable research is being undertaken by cathode-ray tube manufacturers to ensure that the tube's performance will be satisfactory in every way with the minimum of adjustment by the individual user. It will be some time, however, before these devices are available to the public, and in the meantime advantage should be taken of the present receiver models which give clear, bright pictures with good detail built up directly on the screen face.

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.

The Liverpool S.W. Radio and Transmitting Club.

THE first meeting of the above club was held on Thursday, April 22nd, and it was decided to hold the future meetings at Mr. J. E. Crabtree's premises at 11, Wavertree Road, until suitable club rooms were obtained. Will any interested persons please communicate with the Hon. Secretary, Mr. C. E. Cunliffe, 368, Stanley Road, Bootle, Liverpool, 20 ?

International Short-wave Club (Guernsey Chapter)

ALTHOUGH less than a year old, the Guernsey Chapter of the International Short-wave Club is forging ahead. Even in such a small island as Guernsey the short-wave interest is apparent, and meetings are held every alternate Tuesday at 8 p.m. at No. 5, Well Road, St. Peter-Port. The obvious difficulties that beset the officers of this Chapter have been met with, and to a certain extent overcome. Morse code lessons are a feature, and a lecture by Mr. P. Denison, A.I.Rad.E., on "Amateur Radio Before Broadcasting" (illustrated with lantern slides), inaugurated an innovation, and a series of lectures on theory in radio are to be given by the members themselves. At the last meeting it was decided to continue activities throughout the summer, and to run a reception contest to sustain interest. The meeting was under the direction of Mr. J. Dowding (G8DO), President, supported by Messrs. T. de Putron (G8MF), E. W. Vaudin, and C. de la Huliniere (Committee), and the Hon. Secretary, Mr. F. S. Le Pavoux (2BTP), from whom full details of the Guernsey Chapter's activities may be obtained. The Secretary's address is: 8, Upper Canichers, St. Peter-Port, Guernsey, C.I.

The British Short-wave League

THE above society is still making steady progress, both in Great Britain and Overseas, and, no doubt, some of its recent developments will prove of interest to the short-wave fraternity.

Having passed the 600 member mark, it has been decided to stimulate interest yet further by producing Certificates of Merit to be issued to members, and these certificates are styled the "Heard All Continents" and the "Heard British Empire." These will be awarded to members producing the requisite verifications from all continents in the case of the "H. A. C." and from zones of the British Empire for the "H. B. E."

Another new feature is the QSL Distributing Bureau under the management of L. J. Le Breton, BSWL 538, 95, Bridport Road, Dorchester, Dorset, but, of course, the Bureau facilities are available to members only and the B.S.W.L. cannot handle non-members' cards.

The League's *Review* is now the official organ of the World Friendship Society of Radio Amateurs, and its notes are published monthly within the *Review*. Next month, the League hopes to produce its first ultra-short-wave number, and it is hoped to publish a fine list of high-frequency stations and their addresses. Regular 10-metre articles by G6PD are proving extremely popular and the majority of members are finding this band the centre of interest.

A firm supporter of International Goodwill, the League invites listeners of any nationality to join. Particulars of the League may be had from the Secretary, F. A. Beane, British Short-wave League, Ridgewell, Halstead, Essex, and a specimen copy of the *Review* will be sent free on request.

Southall Radio Society

A SERIES of meetings dealing with Direction Finding have been well attended. On April 20th, the speaker was Mr. A. Stephens, 2CCH, who dealt with the general construction of D.F. gear. A receiver illustrating his points was exhibited by Mr. W. G. Lee, 2BLX. On April 27th, Mr. C. Rapsey dealt with the theory of Direction Finding, and demonstrated a receiver which included a number of his own ideas.

Other subjects to be dealt with are Map Reading, Sense Finding and Team Work. Meetings are held each Tuesday at 8.15 p.m. at the Three Tuns Hotel, The Green, Southall, and visitors are welcome.

On April 28th a number of Southall members visited the Thames Valley Amateur Radio and Television Society at Twickenham, when Mr. C. Rapsey gave a talk on "Direction Finding" to that society.

Hackney and District Wireless Club

THE first meeting of the above club was held on Monday, April 26th, and all present were interested in a lecture given by Mr. S. Cockerill (2CAU) on the transmitting side of radio. Mr. Cockerill gave diagrams of a simple CO/PA/FD transmitter, and this was received with enthusiasm.

The following members were elected to act on the Club's Committee: Messrs. Brown, Laplain, Cockerill, Kingston, Bates, with E. Penrose acting as Chairman. Morse instructor, Mr. R. Kingston.

The next meeting of the club will be held on Monday, May 31st, and some field days are being arranged.

Particulars of the club can be obtained from the Chairman, Mr. E. Penrose, 2, Coopersale Road, Homerton, E.9.

Morpeth Amateur Radio Society

THE data kindly sent to the above society by readers has now been tabulated and, as promised, we are submitting a very brief summary of our conclusions, which we think will be of interest. Here it is:

1. The weather affects short-wave reception to a greater extent than the moon.

2. The 20-metre band is more affected by weather than the 40 m. band, while 30 metres remains somewhat indifferent.

3. The best possible short-wave conditions exist when the weather is frosty, sky clear, and moon full.

Harry Roy and his Band, whose broadcasts are a popular feature.

Golders Green and Hendon Radio Scientific Society

ON Sunday, May 23rd, in the country about St. Albans, The Coronation Direction Finding Competition on 80 metres will be organised by the Golders Green and Hendon Radio Scientific Society, directed by Lieut.-Col. H. Ashley Scarlett. D.S.O. This annual event is open to all interested in radio. After tea a conference is to be held, to which radio enthusiasts are invited, as well as those participating in the competition.

On June 2nd and July 11th 5-metre field days will be held to test out apparatus; and a 5-metre competition will be organised on September 12th.

Full details of the above may be obtained on sending a stamped and addressed envelope to the Secretary at 60, Pattison Road, N.W.2.

4. Adverse conditions were always experienced when the weather was damp and warm.

As our investigations are really just starting we would like to collect much more data on this subject—so may we appeal to P. and A.W. readers once more ?

To those who are willing to co-operate we ask them to send us reports on W2XAD received on May 22nd, 27th and 31st. Either on any one of these dates or on all of them. The weather conditions should be stated in full at time of reception. To all senders of useful reports a Special Certificate will be issued.

We appeal especially for the help of readers residing in the following counties: Westmorland, Devon, Kent, Norfolk, Pembroke and North Scotland.

Please send reports to: The Hon. Sec., M.A.R.S., Chas. L. Towers, 2, Edward Street, Morpeth, Northumberland.

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).

A Reader's Thanks

SIR,—About a fortnight ago I wrote asking you if you would forward a letter to a Mr. Bowden, of Paignton, asking him for a copy of the America one-valver. I have received same from Mr. Bowden, for which many thanks.

It is service such as this that makes readers feel like one big family, and increases the popularity of a paper.—JAS. A. BRUCE (Dundee).

Back Numbers Wanted

WE have requests for copies of PRACTICAL AND AMATEUR WIRELESS for December 7th, 1935; January 11th, 1936, and also for a copy of *Amateur Wireless* containing the circuit diagram of the Olympus Four. Will any readers having these copies to spare kindly forward them to the address given in the notice at the foot of this page?

Triode v. Pentode

SIR,—In the article on Triode v. Pentode in your May 1st issue, your contributor has been rather unfair to the pentode by not mentioning the improvements to the pentode when negative feed back is used. Using this circuit in an AC/DC amplifier on 230v. D.C. mains an output of between 3 and 4 watts can be obtained, using push-pull Pen. 3520's, with a quality indistinguishable from push-pull PX4's on A.C.

Negative feed back, of course, does reduce the sensitivity of the pentode, but it is not so low as that of the triode, the difference being, roughly, that the same grid swing is required for the Pen. 3520's as for PX4's, but about 80-100 volts less on the anode. The improvements are good damping on the speaker, a lower optimum load, and a more constant output when the load varies, giving a better frequency response.

One disadvantage is that the output may rise with frequency, as much as 15 db. at 10,000 c/s, due to phase shift, but resistances of the order of 70,000 Ω across the input transformer secondaries, effectively cure this. I should be glad to hear of any reader's experience using negative feed back.—M. G. N. HINE (Slapton, S. Devon).

An Enthusiastic S.W. Listener

SIR,—I envy the experience of your correspondent, Cecil Bradbury, Burton-on-Trent, in logging over 10,000 stations over the past eight years. I am a newcomer to short-wave listening, my interest in which was originally aroused by the letters of readers of PRACTICAL AND AMATEUR WIRELESS.

I have been operating an 0-v-1 receiver for three weeks and to date have logged W2XAD, W2XE, W8XAL, W3XAL, W8XK, W1XAL, RAN, JVM, JZJ, all of the European S.W. transmitters, and over 150 amateurs in 12 countries.

I consider this a good send-off, and one day I hope to equal, if not surpass, the record of your correspondent.—A. R. GRAY (London, N.).

A Good Log from Ealing

SIR,—Not having seen an S.W. log from this district in your paper, I submit mine. All calls were heard during the last month, the receiver being a 4v. battery S.W. superhet,. antenna 15ft. inverted L-type (indoor). I only listen between 22.30-00.00 and 06.30-07.30, and all calls were heard on the 20m. band—131 Americans, 9 Canadians:

VK4LJ. 3HK, 2HM, 2XU; PY2EJ, 2EG, 3AW; VP9R; VO4A; VP3VG; LU4A, 1UA; CN8AA. 8MB; TI4AE; XE2W; SU1CH, SU1KG; CO2KC, CE3DW; NY2AE, and CE1AH (all 'phone).

I have been a reader of *Amateur Wireless* and *Practical Wireless* and now PRACTICAL AND AMATEUR WIRELESS, and have been engaged in S.W. work for the last four years. I should like to get in touch with any reader interested in S.W. work in my district.—W. COLCLAUGH (31, Lancaster Gardens, Ealing, W.13).

CUT THIS OUT EACH WEEK.

Do you know

—THAT it is often desirable to include an H.F. choke in each heater lead of a frequency changer for an S.W. mains set.
—THAT it is important to consider the wattage dissipation across chemical fixed resistors.
—THAT to enable the makers' recommendations to be adhered to it is often desirable to connect a number of such components in series rather than to use a single resistor.
—THAT warped gramophone records produce a form of distortion due to the irregular speed produced by the needle travelling up and down the uneven surface.
—THAT records which have become warped may be flattened by placing between two sheets of glass exposed to a gentle heat.
—THAT when measuring the voltage of an L.T. accumulator the valves which are fed from it should be switched on in order to obtain a true reading.

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.

NEW AUSTRALIAN BROADCASTING ORGANISATION

WE are informed that Mr. Stuart Doyle, the Chairman of Directors of the Commonwealth Broadcasting Corporation of Australia, has just organised an Australian Wide Circuit of Commercial Stations on the American principle.

According to Mr. Doyle the Commonwealth Broadcasting Network now covers 3UZ, Melbourne; 3SR, Shepparton; 3YB, Warrambool; 3UL, Warragal; 2UW, Sydney; 2WO, Wagga; 4BC, Brisbane; 4MB, Maryborough; 4RO, Rockhampton; 4GR, Toowoomba; 4BB, Kingaroy; 4RM, Roma; 5KA, Adelaide; 7UV, Tasmania; and 2HD, Newcastle.

The new network was completed recently, following several conferences in Sydney, when the whole organisation of the new network was completed, and plans made for the operation of the Group.

The new organisation will consist of fifteen of the leading broadcasting stations in the Commonwealth, including four high-powered relay stations in the country districts of the three states. The directors of the Commonwealth Broadcasting Network state that their group of stations will have an aggregate coverage of 80 per cent. of the population of New South Wales, Victoria, Queensland, South Australia, and Tasmania.

Better Programmes

Commenting on the matter, Mr. Doyle said that the Commonwealth Broadcasting Network had been formed for the purpose of giving better programmes to the listening public. "Commercial broadcasting," he stated, "can only be operated successfully if service to the public is the first consideration. This service we believe can best be given by a combination of interests whose purchasing power of artist and programme features is unrivalled. The new group, with its theatrical and musical associations, has a great opportunity to give the Australian public an improved service which the Commonwealth Broadcasting Network will concentrate its energies in achieving."

Broadcasting in Australia adopts both the British (B.B.C.) system, operated by a Government commission, and the American sponsored programme system. The latter is by far the most popular with listeners.

It is the commercial stations with which Mr. Stuart Doyle and Mr. Frank Albert control the majority throughout Australia.

"IN TOWN TO-NIGHT" DURING CORONATION WEEK

WE are informed that five continents will be represented by interesting and picturesque personalities who will come to the microphone during the Coronation week broadcasts of "In Town To-night."

Europe, Africa, Asia, America, and Oceania will be represented on successive nights from Monday till Saturday (with the exception of Coronation night). Chosen from the multitude of visitors to the metropolis for this historic and memorable week, they will bring to listeners a unique picture of life in all parts of the world. Who they will be, however, must remain a secret until a moment before they broadcast.

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 PW refers to PRACTICAL WIRELESS, AW to *Amateur Wireless*, PM to *Practical Mechanics*, WM 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., Geo. 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
Two-valve: Blueprint, 1s.		
Four-range Super Mag Two (D, Pen)	11.8.34	PW36B
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, 2LF (RC & Trans))	—	PW34A
Leader Three (SG, D, Pow)	—	PW35
Summit Three (HF Pen, D, Pen)	8.8.34	PW37
All Pentode Three (HF, Pen, D (Pen), Pen)	22.9.34	PW39
Hall-Mark Three (SG, D, Pow)	—	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)	—	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
Four-valve: Blueprints, 1s. each.		
Sonotone Four (SG, D, LF, P)	1.5.37	PW4
Fury Four (2 SG, 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
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)	7.4.34	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)	18.8.34	PW38
F. J. Camm's A.C. All-Wave Silver Souveuir 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
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)	—	PW45
Universal Hall-Mark (HF Pen, D, Push-Pull)	9.2.35	PW47
SUPERHETS.		
Battery Sets: Blueprints, 1s. each.		
£5 Superhet (Three-valve)	—	PW40
F. J. Camm's 2-valve Superhet Two-valve	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-valver)	—	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	—	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, 2 LF (RC and Trans))	—	PW63
The Bandspread S.W. Three (HF Pen, D (Pen), Pen)	29.8.36	PW68
"Tele-Cent" S.W.3 (SG, D (SG), Pen)	30.1.37	PW74
PORTABLES.		
Three-valve: Blueprints, 1s. each.		
F. J. Camm's ELF Three-valve Portable (HF Pen, D, Pen)	16.5.36	PW65
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)	10.5.34	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, QP 21)	*June* '34	WM362
1935 £6 6s. Battery Three (SG, D, Pen)	—	WM371
PTP Three (Pen, D, Pen)	*June* '35	WM398
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
2 H.F. Four (2 SG, D, Pen)	—	AW421
Crusaders' A.V.C. 4 (2 HF, D, QP21)	18.8.34	AW445
(Pentode and Class B Outputs for above: Blueprints, 6d. each)	25.8.34	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)	*April* '36	WM404
Five-valve: Blueprints, 1s. 6d. each.		
Super-quality Five (2 HF, D, RC, Trans)	*May* '33	WM320
Class B Quadradyne (2 SG, D, LF, Class B)	*Dec.* '33	WM344
New Class-B Five (2SG, D, LF, Class B)	*Nov.* '33	WM340
Mains Operated.		
Two-valve: Blueprints, 1s. each.		
Consocelectric 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) A.C.	23.6.34	AW439
Mantovani A.C. Three (HF Pen, D, Pen) A.C.	—	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	WM396
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Battery Sets: Blueprints, 1s. 6d. each.		
Modern Super Senior	—	WM375
Varsity Four	*Oct.* '35	WM395
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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
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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
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Tyers Portable (SG, D, 2 Trans)	—	WM367
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One-valve: Blueprints, 1s. each.		
S.W. One-valver 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
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Four-valve: Blueprints, 1s. 6d. each.		
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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
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"W.M." Long-wave Converter	—	WM380
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Superhet Converter (1/-)	*Dec.* 1, '34	AW457
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