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If you do not wish to cut your copy, send a postcard mentioning "Practical Wireless" to address above.
Home-made Components

Considerable interest has been aroused by our new series of articles describing the making of components. Many readers, however, are anxious to obtain instructions for making items which are either beyond the average home constructor or which will not justify the work involved. Iron-core coils, for instance, cannot be satisfactorily made with ordinary materials. Suggestions for using ordinary iron wires or similar materials have been received, but it must be remembered that the core used in high-frequency components is a special powdered material suspended in a medium in such a manner that all particles are separated. Attempts have been made by some constructors to use wax and iron filings, but the results are not comparable to the commercial product. The cores are not obtainable from retail stores and, therefore, ordinary air-core coils are the only efficient component in this direction which may be made up. Iron stampings are obtainable in various shapes for transformers and chokes for L.F. circuits, and details for the construction of these components will be given in due course.

Danish Police Radio

It is now announced that following the completion of tests in Denmark the government and the Copenhagen municipality has provided a subsidy to enable the police force in that city to install a transmitter and receiver equipment for use in police cars.

Scophony for America

Upon his return to this country, Mr. S. Sagall has announced that a station is shortly to be erected in New York to work on the Scophony system, and that he is shortly returning to America to complete negotiations for the formation of an American Scophony company.

Marconi Portrait

There is an annual custom of issuing a portrait of a pioneer in the field of electrical communications, adopted by the Bureau du l'Union Internationale des Tele-communications, and they have just produced an engraving of the late Marchese Marconi. Proofs, on art paper, may be obtained on sending 2.50 Swiss francs to the Bureau's address, Effingerstrasse 1, Berne, Switzerland.

B.B.C. Freeze-up

Following the recent breakdowns due to freezing, and anticipating further cold spells before the spring, the B.B.C. have taken special precautions to avoid further troubles due to stoppage of the water supply at their various transmitters. In future, instead of draining out the water-cooling systems, the water will be kept circulating and the temperature will be taken every half-hour. At a given temperature the transmitters will be started up on low power to avoid freezing. Special arrangements are being made to maintain a skeleton staff through the night time.

Tight Corners, No. 2

The modern entertainment industry has brought into being a host of curious trades and professions, but perhaps none more fantastic than that of the car crasher. Reg Kavanagh, who, on January 26th, will tell listeners of some of his more spectacular accidents—though that, since they were deliberate, is hardly the word—formed a team of professional "stunt" men for the films in 1931. On numerous occasions he has taken his life in his hands and it has only been by continual rehearsal and perfect timing that serious danger has been avoided. He, however, quite unperturbed about the risks incident to his profession. "I never," he says, "feel nervous about even the worst crashes. I have got it down to a job now. It is just like you doing your job." Listeners will certainly agree with the speaker's dictum that "we have to have perfect nerves and perfect self-control at this business." That is why," he adds, "I do not drink and do not smoke, but I do drink gallons of tea."

Enter Sexton Blake

To play the part of Sexton Blake, fiction's famous detective, in the new weekly serial thriller, the B.B.C. has chosen George Curzon, well-known actor, who has never before broadcast in this country. He has signed a contract to play twelve weekly ten-minute episodes from January 26th in the feature entitled "Enter Sexton Blake," which producer William MacLure will include in the new variety programme called "Lucky Dip."

For the past five seasons, Mr. Curzon has played the part of Captain Hook in " Peter Pan," and has done a lot of other stage work. He has just finished making a film in which he is the dreaded villain, but the main point of interest is that he has played the part of Sexton Blake in three successful sound films. Before doing so he "had to read every Sexton Blake story I could get hold of, so as to find out what kind of man he was."

European Table Tennis Championships

Listeners will be able to follow the progress of the Men's Singles Final of the European Table Tennis Championships from a commentary which will be given by Stewart MacPherson from the Empire Pool and Sports Arena, Wembley, on January 28th. Stewart MacPherson, who is now a popular sports commentator, has previously broadcast a commentary on table tennis from Haslings Pier, where England met France. The preliminary bouts for the Wembley Final will be staged at the Royal Albert Hall on January 27th, and a commentary on these will also be given by Stewart MacPherson.
ROUND the WORLD of WIRELESS (Continued)

N.B.C. Network Invades Cuba

I

T

is reported that the National Broadcasting Company of America has taken
over the ownership and operation of the 25-kilowatt station CMQ, at Havana
(Cuba), thus increasing the transmitters in its network to the number of 174.

Radio Montpellier Starts Again

T

The old 2-kilowatt private station at Montpellier (France) has resumed its
daily broadcasts on 300.9 m. (968 kc/s); it was previously working on 200 m.

Another Mystery Station

L

ISTENERs report the reception of broadcasts from an illicit transmitter
located in the Ukraine (U.S.S.R.), and from which propaganda talks may be heard
daily at G.M.T. 06.45 and 17.00 on channels varying between 25 and 36 metres. An
announcement is made in the Polish, Ukrainian and German languages.

Italy Broadcasts in Sixteen Languages

F

ROM January 1st the E.I.A.R. has con-
siderably increased its foreign lan-
guage broadcasts, most of which are made
on short wave lengths. News bulletins and
special talks are now given in Arabic,
Russian, French, Romanian, English,
Bulgarian, Magyar, Slovene, Turkish, Greek,
Spanish, Albanian, German, Italian, Swe-
dish and Esperanto.

Television Across the Atlantic

A

ccording to a recent report, B.B.C.
television pictures transmitted from
Alexandra Palace have been received in
New York, a distance of 3,300 miles away.
This is a record for long-distance reception
of high-definition television. The pictures
were picked up at the Riverhead receiving
station of the Radio Corporation of America
on Long Island, where a series of tests has
been in progress.

Behind the Scenes

T

HE next programme in the series
titled "Leisure Time" will come from
Swansea Little Theatre, on January

8th. Listeners will be taken "Behind the Scenes" just before the performance
in the dressing-room to catch the excitement of the twenty minutes before
the rise of the curtain. This theatre is one of the oldest ventures of its kind in South
Wales. It is composed entirely of amateur
players and has a remarkable record of
productions.

Cinema Organ Recital

A

ROADCAST from Chester's Regal
Cinema will be heard by Northern
listeners for the first time when Horace
Pilling will be playing the organ there in a twenty-five minute pro-
gramme of popular light music.

The Microphone at Large

O

N January 28th "The Microphone at
Large" series will be continued by a
visit to the Dukeries. The broadcast
will be from a village which is on the edge of an
industrial area, and S. P. B. Mais will study the impact of coal-mining, oil-drilling and
iron-working on country life in some of the
great estates. A number of local people,
representing agriculture and industry, will be interviewed at the micro-
phone. The programme is arranged by David Grettan and will be heard by Regional
listeners.

Studio Variety

A

SHORT variety programme on
January 25th will include C. Capab迪
piano-accordionist, who has broadcast
from the North and now lives in Gloucester;
Barney Johnson, who has been a profes-
sional entertainer in Birmingham and South
Staffordshire for thirty-five years, specialis-
ing in Black Country stories; and Maurice
Turner, of Oxford, whose songs with ukulele
were heard in Savoy Hill days.

Midland Dance Band

H

ALF-HOUR radio dance music by
Percy Freeman and his Band will be
heard by Midland listeners on January 29th.
He first broadcast nine or ten years ago.

SOLVE THIS!

PROBLEM No. 331

After he had installed an A.C.D.C. sour-
cede set, Rowland decided that the perfor-
manca was capable of improvement. He
noted some traces of instability and lack of
range and decided that this was due to an
immediate earth connection. After improving
this he still found results unsatisfactory and
learned that they could be corrected by
connecting the metal chassis direct to earth.
He did this and when he switched on failed
to obtain any signals. Why was this? Three
books will be awarded for the correct solution.
Envelopes must be marked
Problem No. 331 in the top left-hand corner.

Solution to Problem No. 330

The 1-mfd. fixed condenser which Jackson used
was internally short-circuited, and consequently the
D.C. to the detector was very high.

The following three renders successfully solved
Problem No. 330. Notice how they are forwarded to:
D. Honor, 79, Dyer Hall Road, Leytonstone, E.11.
J. Edwards, 17, Benedict Street, Clapham, S.W.7.
G. Shepherd, Somerleyton, Nr. W. Nune, 5, Arundel
Road, West Croydon, Surrey.
Making Your Own Components 3

Construcational Details and Wire Data for Components Suitable for Bias Resistors, Anode Resistors, and Potential Dividers. A Simple Method of Making Experimental Grid Leaks is also Described

Fixed resistors are among the components construction of which can easily be carried out by the average home constructor with a moderate amount of mechanical skill. At the same time, it should be understood that high-resistance, low-wattage components of first-class quality can be bought so cheaply that home construction would not be justified. But high-wattage types, often referred to as power resistors, are far more expensive and at the same time are easier to make.

Those components required for automatically heating power or penode output valve in a main set, in effect, are well within the scope of the constructor. What is more, a component can be made to the precise value required for any particular valve or circuit, whereas when buying ready-made components it is often necessary to compromise in order to make use of a part of standard value.

Finding the Value

Suppose that a bias resistor were required for a valve with anode current and grid bias voltage of 35 mA and 40 volts respectively (at maximum anode voltage). The value of resistor required would be found by dividing the voltage by the current in mA and multiplying by 1,000. Thus, in the example chosen the resistance would be 40/35 times 1,000, or approximately 1,150 ohms. Consulting Table 1 on this page it can be seen that the 46-gauge wire listed is capable of carrying up to 250 mA, so it would be adequately stout for present requirements. It will be understood that the only important requirement when choosing wire is that it should be capable of carrying the maximum current likely to be passed through it when the finished resistor is in use.

The table shows that the resistance per yard of 46-gauge nickel-chrome wire is about 345 ohms. Consequently, it may be seen that the total length of wire needed is 1,150 divided by 343, which equals 3.35 yds., or about 3 yds. 10 in. First, then, the length of wire should be cut off the reel. Then, in measuring the wire take care that it is not stretched or damaged.

Fibre-strip Former

A suitable former might consist of a strip of fibre as shown in Fig. 1. This is cut to the shape shown and all corners are rounded by rubbing down with glass-paper. Next two holes are drilled and terminals are fitted with soldering tags under the lower nuts. It is most convenient to use enamelled or oxidised wire, so that the turns can be wound side by side and allowed to touch each other, but bare wire may be employed provided that turns are spaced slightly.

In the first place it will be assumed that the wire is insulated with enamel or oxide. Carefully bare one end for a distance of about ½ in. by lightly rubbing with fine glass-paper or by dissolving the enamel by dipping it in methylated spirit, and then rubbing off the softened enamel with a rag. Tm the soldering tag and solder the wire using a small, clean soldering iron and employing resin or Fluxite as the flux.

The wire can then be wound on carefully, making sure that none of the turns overlaps and that the insulation is not damaged by scratching. Care must be also exercised to ensure that the wire is not stretched by pulling it too tightly. After winding on the full length, bare the other end and solder to the second soldering tag.

Using Bare Wire

Bare wire is slightly less expensive and sometimes more easily obtainable. The only difficulty in using it is to space the turns to prevent adjacent turns from touching. This is easily overcome by winding by placing the wire a length of cotton thread, allowing this to run between every turn. After winding and finally attaching the end of the wire, the thread may be unwound since it is no longer required.

Cost of Wires

The nickel-chrome wire suggested above is very expensive, costing about 50 per quarter ounce in oxidised and about 85 per quarter ounce in enamelled. The actual cost per yard is not great because there are several hundred yards in a quarter ounce, but if only a few resistors are to be made the cost of the smallest quantity that can be bought might be too high.

An alternative is to use oxidised nickel-copper resistance wire. This is far less expensive, but has a lower resistance per yard. Details of a few gauges are given in Table 2, from which it will be seen that the resistance per yard of 46 gauge is less than 100 ohms, as compared with the 343 ohms for nickel-chrome. Even so, the resistor taken as an example above could be made by using 1,150/100 or 7½ yds., which could easily be spent on the former shown in Fig. 1. In the majority of instances, this less expensive wire would be completely satisfactory.

Bear in mind, however, that different makes of wire might have different characteristics, and therefore if other wire than the Bulgin product shown in the two tables is used the required lengths must be calculated from the makers' data. Incidentally, Lewcos Eureka wire has characteristics similar to those shown for nickel-copper wire, while Lewcos nickel-chrome resistance wire has characteristics almost identical with those shown for Bulgin nickel-chrome.

A Potential Divider

Another type of power resistor that it might be proposed to make is that often referred to as a potential divider. It is simply a tapped wire-wound resistor suitable for connection across an H.T. power unit output to provide a number of voltages, the voltages remaining sensibly constant irrespective of the current taken from them—within limits of about ⅓ to ⅓ of the total current passed by the resistor.
MAKING YOUR OWN COMPONENTS (Continued from previous page)

For a total H.T. output of, say, 250 volts a potential divider having a total resistance of about 5,000 ohms is suitable. At this resistance and voltage the current passed would be less than 0.005 mA. That means, in effect, that the total H.T. output current from the rectifier or smoothing choke should exceed the requirements of the receiver by 0.005 mA. When no more than about 5 mA is required from intermediate taps, or when great accuracy of output voltage is not required (and it seldom is) the resistance could well be increased so that the "wastage" current through the potential divider does not exceed 20 mA—10,000 ohms for 20 volts.

Suppose it were required to make a 10,000-ohm unit and that 46-gauge nickel-copper wire were to be used, the total length required would be 10,000/190 (approximately), or about 67 yrs. This could well be wound on a glass test tube fin, in diameter and fins long. If the unwound wire is sliced in half with a knife and the two halves are brought close together, the wires will take up a length of about 3 fins, but if bare wire were to be used and unwound, and is twisted by means of a length of thread, more than twice this length would be required. In that case, long one glass tube could be employed, or there could be two test-tube windings connected in series.

Making Tappings

Tappings would be taken after every 100 ohms and these could be provided as shown in Fig. 2 by taking a couple of adjacent turns over a short length of glass rod or fibre strip, leaving a short length of the wire held off the former by the rod and soldering a length of flex, which would be brought out to a terminal by connecting somet.

As before, great care must be exercised in winding, since the wire is extremely thin, although not as delicate as copper wire—46-gauge is about the thickness of a fine hair. In all cases the winding is considerably simplified if wire of not less than (higher number than) 40-gauge is employed, but that means that a much greater length is necessary and that the resistor is appreciably more bulky than when using the finer wire. Nevertheless, winders using resistors up to 1,000 ohms made from 40-gauge nickel-chrome wire—whose cost is about 6s. 6d. per half ounce—can be wound on a small fibre strap, as shown in Fig. 1, provided that the current to be passed through them is not more than half the maximum circuit the table gives. The current given applies when the wire is suspended in air so that there is free circulation round it. It will be seen that only about 11 yrs. of 40-gauge nickel-chrome wire is needed for a 1,000-ohm resistor, and as approximately 180 turns can be wound per inch on the wire is enamelled, such a length can be accommodated in a very small space.

Non-inductive Components

When using resistors to carry a current up to ½ amp, or so it is usually convenient to wind the inductive wire on a former made from two strips of fibre, as shown in Fig. 3. In winding care should be taken that the turns are not scraped so that insulation is removed whilst the complete winding should be well divided into a number of sections as shown. This form of construction is also suitable when making a non-inductive resistor. All that is necessary is to reverse the direction of the winding for each slot. Thus, if the first slot is filled by winding clockwise, the direction of winding should be anti-clockwise for the second slot, clockwise for the third, and so on.

Grid leaks, which do not have to carry any appreciable current, can be made as shown in Fig. 4 by making a line with soft solder on an indium ink on a strip of drawn cardboard or on a piece of fibre. First make two circles of black and drill holes through the centres of these for the terminals. Wind the circles together with a fibre. The width of the fibre governs the resistance value, and the most suitable value in any case is obtained by bending over the excess from the total length. When the most suitable value has been found the complete component should be given a coat of shellac varnish to protect the "resistor" element from moisture.

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IMPORTANT BROADCASTS OF THE WEEK

NATIONAL (261.1 m. and 1,500 m.)
Wednesday, January 18th.—Symphony Concert, from Queen's Hall, London.
Thursday, January 19th.—Congress Dances—film musical.
Friday, January 20th.—English Chamber Music—Stravinsky:

REGIONAL (342.1 m.)
Wednesday, January 18th.—Speaches from the D.A. Territory Headquarters.
Thursday, January 19th.—Job to be Done, a symphony of industry, America, by Louis Lutz.
Friday, January 20th.—Orchestral programme.
Saturday, January 21st.—Preludio, the story of Mary Robinson, compiled from her memoirs and dictated by Cyril Roberts.

MIDLAND (297.2 m.)
Wednesday, January 18th.—Alroy on Business: On the Continent, Selling for the Central League: all mans of a thesis.
Thursday, January 19th.—Orchestral concert.
Friday, January 20th.—The Sleeping Beauty as the fairy-tale at the Theatre Royal, Birmingham.
Saturday, January 21st.—A Concert by the Worcestershire Artists from the Winter Gardens, Malvern.

WEST OF ENGLAND (285.7 m.)
Wednesday, January 18th.—A commentary on boxing from the Westover Ice Rink, Bournemouth.
Thursday, January 19th.—Choral and orchestral concert.
Friday, January 20th.—Western Magazine.
Saturday, January 21st.—Preludio, the story of Mary Robinson compiled from her memoirs and dictated by Cyril Roberts.

WELSH (373.1 m.)
Wednesday, January 18th.—Choral programme.
Thursday, January 19th.—The Death of a Martian, a play by Glyn Jones.

TELEVISION FEATURE

In the new series of outside broadcasts on Sunday afternoons, the Post Office will come under the television lens this January 19th, when the mobile unit will visit the International Telephone Exchange at Fawley House. A camera tracking slowly past the switchboard boys will show how the highly trained telephone girls—some of them speak four or five languages maintain communication by wireless or cable with all parts of the world. It is hoped to arrange several interesting telephone conversations.

Friday, January 20th.—Orchestral concert.
Saturday, January 21st.—A Concert by the Worcestershire Artists from the Winter Gardens, Malvern.

NORTHERN (449.1 m.)
Wednesday, January 18th.—The Northern countrywoman—1, A Personal Miscellany.
Thursday, January 19th.—Relics of Hymns from the Monksteed Methodist Church, York.
Friday, January 20th.—The Sheffield Philharmonic Society's Concert from the City Hall, Sheffield.
Saturday, January 21st.—All's-Op, Pelle Var's Tenth Mournful Crawl, from King's Hall, Pelle Var, Manchester.

SCOTTISH (391.1 m.)
Wednesday, January 18th.—A programme of dances for String Orchestra.
Thursday, January 19th.—Scottish Music of To-Day; C. H. F. O'Brien—orchestral programme.
Friday, January 20th.—A Gaelic Concert.

NORTHERN IRELAND (307.1 m.)
Wednesday, January 18th.—The Spanish Captain: His adventures in Cowgough and Ulster, feature programme.
Thursday, January 19th.—Choral programme from Coleraine.
Friday, January 20th.—A Hymn recital from the Cathedral Church of St. Patrick, Armagh.
New Sound for Old

Practical Suggestions Concerning Some of the Older Types of Speaker Units. Showing How to Put Them Into Service Again, and Obtain Good Quality Reproduction

ALTHOUGH it cannot be denied that a good moving-coil loudspeaker properly matched to an equally good receiver or amplifier approaches the ideal method of reproducing amplified sounds as closely as modern conditions and apparatus permit, one cannot overlook the fact that some of the speakers of a few years ago are also capable of putting up quite a good performance.

Because of the wide publicity given to the moving-coil speaker, its efficiency, and its now more reasonable price, many constructors have obtained the impression that all other speakers of the earlier type are only fit for the junk box or the dustbin. This is far from the truth, and it is rather ironic to note that many of those who hold the above views often go to the trouble and expense of securing a perfectly good moving-coil speaker, and then operate it under conditions which practically eliminate the possibility of the speaker giving anything like the quality of reproduction it can, or should.

The money spent on the purchase of a good moving-coil speaker will be more than recouped by the additional satisfaction obtained, but this only holds good if the signal or input to the speaker is capable of doing it justice. When the signal is itself distorted or of unreasonable strength for a given speaker, then the finest moving-coil model will not give satisfaction to its owner.

Early Types

Ignoring for a moment the question of inherent defects in the design of some of the speakers of a few years ago, and the fact that it is possible to find flaws in their response characteristics, let us consider other items which contributed to the general lack of quality, and which, incidentally, were more responsible for the dissatisfaction than the question of frequency response.

Going back to the very early days when we were more satisfied with volume than quality, it must not be forgotten that receiver design and L.F. amplification were far from perfect, and very little attention was given to the problem of matching the output values of the speaker.

Loudspeakers were of the diaphragm and horn type, and in many instances were little more than an oversize telephone earpiece fitted with a horn or trumpet which was not always designed to conform with the acoustic requirements. Later on came the moving-iron, balanced-armature, and inductor types of units operating various forms of cones. These represented a step in the right direction towards better quality, and as their introduction coincided with a more general appreciation of the correct operating conditions necessary for good L.F. amplification, quality of reproduction started to become a serious consideration.

It is highly probable that most constructors will have at least one, if not more, of the speaker units mentioned above in the spares box, and the suggestions given below are intended to show that it is worthwhile devoting a little time to them and putting them once again in commission.

If the magnets are still good, that is easily verified by testing their power of attraction with a small iron or steel rule, it is possible for them to be more sensitive than many of the moving-coil types; therefore, they can be very useful for short-wave and monitor work, apart from the question of extensions and room to room communications.

Typical diaphragm, inductive, and balanced-armature units are shown in Figs. 1, 2 and 3, and it is interesting to note that these can still be obtained from some of our advertisers who deal in surplus components.

The success of the reproduction obtained with units of these types does not solely depend on the efficiency and construction of the unit. The size, weight, and material of the cone have also to be considered, while the effective area of the surrounding baffle board and cabinet will also directly affect the resultant response.

When these units were in more general use, it was a common practice to try to accentuate the low notes by fitting large cones made from soft material, which appeared to produce the desired effect. Unfortunately, however, the upper register and sensitivity of such an arrangement had been overlooked, and likewise the reproduction was inclined to be woody and far from perfect on speech.

Constructing Cones

Even if a cone is still fitted to the speaker you have in stock, it will be well worth while experimenting with others of different size and materials. If you are tempted to try the existing cone, remember that if its surface is cracked, distorted, or flabby, you will only be wasting your time so far as quality is concerned. Fig. 4 shows how to mark out a cone for a given diameter and angle, and it is advisable to exercise care when doing this, cutting it out and sealing the two edges together. The vertical line AB is drawn to represent the exact height or depth of the cone required, while CD is drawn to represent the diameter.

The points CA and AD must be connected to form the triangle, and then with the radius AD describe an arc as indicated by the line DC1.

The length of this line must be equivalent to the circumference of the cone at its base or, in other words, CD multiplied by \( \pi \).

The points A and C1 are then joined together and the piece to be cut out to form the cone is that enclosed within the points A, D, C1.

As this only gives the exact material for the cone it will be necessary to leave an additional 1\( \frac{1}{4} \) in. on to the edge AD to provide an overlap for fixing the two edges together. Stiff brown paper, Bristol board, good tracing cloth, and hot pressed drawing paper are all good materials for cone construction where a crisp response is required. For cones of a lower natural frequency, various kinds of blotting paper, the entire variety of brown paper, and buckram should be used, but whatever material is ultimately selected, a coat of dope, in the form of any acetate or cellulose varnish, will, no doubt, be found beneficial, as the question of the cone being affected by the moisture in the atmosphere must not be overlooked.

If the cone is to be of the fixed-edge
NEW SOUND FOR OLD
(Continued from previous page)

out the cone shape, the edges being stuck together in the normal manner. When the joint is dry and perfectly secure the outer edge of the cone should be taken in both hands and, while rotating it, gradually introduce the fold back until the outer edge is turned in the opposite direction to that of the cone. With an assembly of this kind, the apex or centre of the cone must be securely fastened to the operating reed of the unit by means of conical shaped washers lined with very thin baize, and held in position by a fixing and locking nut. A long reed is not so efficient with this form of cone as a short one.

Linen Speaker
Another type of reed operated speaker, which was quite popular and capable of giving most pleasant results, was the stretched linen model, a general idea of which is shown in Fig. 6.

It consists essentially of two strong wooden frames over which thin linen of even texture has been stretched to the utmost extent. The reed is then securely fastened to the centre point of the linen, and the unit mounted by means of suitable supports to the outer edges of one of the frames. The next step is to separate the two frames by means of four lengths of screwed rod, one in each corner of the two frames, or other suitable spacers which will allow the separating process to be adjusted until the required degree of tautness is obtained. The final operation is the dipping of the linen in the same manner as mentioned for cones. With a unit of average size, the frames can be made as large as 2ft. square, and if experiments are carried out with these in conjunction with baffles and/or cabinets, the results can be particularly pleasing.

Matching
As the pentode valve is now so widely used in the output stage of a receiver, and as the majority of the earlier types of speaker units were designed for operation with power and super power valves having a much lower impedance, it will be necessary to use a matching transformer when a pentode is employed to enable the best response to be obtained.

American Radio Drama Producer's London Visit
WE are informed that William Robson, Director of the Columbia Workshop, the Experimental Drama Department of the Columbia Broadcasting System of America, has accepted an invitation from the B.B.C. to come to London at the end of January in order to produce several radio plays in this country.

William Robson is the leader of the most advanced school of American radio drama producers, and will bring outstanding examples of the American technique for his productions from London. His visit is a new indication of the close co-operation existing between the B.B.C. and broadcasting authorities in North America.

It will be remembered that earlier this year Val Gielgud was a guest-producer for the Columbia Broadcasting System when he visited New York, and that Laurence Gilliam, on his way home from a six-months visit as a programme adviser to the Canadian Broadcasting Corporation, also produced a programme from New York for listeners in Great Britain.

At present H. Rooney Pelletier, Montreal Programme Director, is another visitor to the B.B.C., while Lance Sieveking, B.B.C. producer, is in Canada.

B.B.C. Director-General to be Televised
THE B.B.C. inform us that a special television programme will be broadcast at 10.30 a.m. on January 20th, when Mr. J. W. Ogilvie, the Director-General, will speak for a few minutes to television prospects. He will be followed by Mr. C. O. Stanley, Chairman of the Television Development Sub-Committee of the Radio Manufacturers' Association.

Items of Interest

American Radio Drama Producer's London Visit

He has just returned home after making another round-the-world tour for his firm, General Electric Co., Ltd. He was away for nearly a year, travelling 56,000 miles at an average of more than 170 miles a day. He was a passenger in 21 different aeroplanes and 12 ships, and he visited 21 countries.

During this tour Mr. Moxham travelled 17,000 miles by air and he called at 32 main overseas branches of the G.E.C. radio organisation and on 31 of these the company's principal agents. He went from Liverpool to the west coast of Africa and thence to Nigeria, the French Cameroons, South Africa, Northern and Southern Rhodesia, Kenya, Tanganyika, India, Burma, Siam, the Malay States, China (Hong Kong and Shanghai), Australia, New Zealand, Canada, the United States, and then back to Britain.

He had many adventures, of which the most thrilling was a flight from Bangko to Hong Kong, while Japanese fighters were in the sky. His pilot took the precaution of covering the plane with Union Jacks. August Bank Holiday weekend he spent snowbound in a roadman's shack in the heart of the New Zealand Alps.

On a previous tour Mr. Moxham took a radio set to the foot of Mount Everest and tested reception there.

56,000 Miles Testing Radio Sets

TRAVELLING all over the world to report on radio reception and market conditions in distant lands is the job of Mr. Roy Moxham, of Coventry.

Using a gang for sending the time signal from one of the Rome radio stations.
The main difference now is that the unused coils are on the "earth side" of the circuit, whereas in the former arrangement the dead end is "in the air" at the high potential end. A simple test with a home-made coil will show that in the latter case there is a definite loss at certain wavelengths which is not observable with the Fig. 2 arrangement.

**Switch Contacts**

In many of the ideas which have been proposed for coil changing, the majority are at present changing the complete coil for each band, thus introducing six contacts. Again, two or more coils will be left out of circuit on each band, and if these coils are entirely unconnected it will be found that they introduce all kinds of erratic results—again the effects depending upon the wavelengths in use. A number of tuners have been made up and used in an experimental multi-band receiver, and it was found that these erratic effects were most noticeable on the 25 to 35-metre band and not on the 10 to 20-metre band, in spite of changes in various component values. The simplest scheme for coil changing is to mount the desired number of coils on a flat base upon which standard coil-holders are mounted. The pins of the holders are all made equal in length and travel over spring fingers made from thin brass. In its simplest form the arrangement shown in Fig. 3 is suggested, the flat coil unit being made to travel from front to rear by means of a threaded rod or a simple pull-push plunger having notches cut in it to ensure accuracy in placing the contacts. With an arrangement of this type a two-coil circuit could be built up, a vertical screen between the two sets of coils ensuring stability by cutting out inter-action.

An alternative scheme which is often advised is to mount the coils on a circular disc which is rotated in order to select the required coil. Modifications of these two ideas will no doubt suggest themselves to various readers, and it should be noted that instead of moving the coils, exactly the same effect may be obtained by moving the contacting strip or strips, flexible leads being used in this case, and a limited travel being provided with some form of stop device to avoid damage to the leads.

**Coil Positions**

With the ideas suggested it will be found that, as the coils are all arranged

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**Fig. 1**—The circuit for tapped coil wave-changing—based on three separate bands.

**Fig. 2**—Separate coils used for wave-changing avoids dead ends at the H.F. end of the coil.

**Fig. 3**—One suggestion for using separate coils on a moving coil base.
retain the advantages of coil switching, several interesting schemes were tried, but

finally it was found that maximum results were obtained when the coils were so placed

that all windings were at right angles. Three coils were the maximum used, and it was thus not a difficult matter to place these on a panel so that each coil was at right angles to the remaining two. Standard 6-pin plug-in coils were used, and it was found possible to use the three-point switching arrangement of Fig. 2, a very weak signal on the 14-metre band giving no improvement in signal when the unused pair of coils were removed. A flat board was made for the coil mount and a springing contact was provided in the centre for the earth connection. This was in contact through the whole travel, whilst the remaining three points were charged for each band. Strips from a flash-lamp battery were employed as the "Bridge" for these three points, and to provide good contact the small plungers from electric lamp-holders were used.

Fig. 4.—A rotating coil holder with locating device.

Strips of ebonite were placed between the contact fingers so that the metal plungers rode smoothly on to the fingers without fouling in each direction. The method of mounting the coils and the contact

channel, as the broadcast may have been confused with a transmission from ZP14, Villarec (Paraguay), on 25.58 m. (11.725 mc/s).

Fig. 5.—Three coils each at right angles on a changing base.

device may be seen in Fig. 5. Instead of standard plug-in coils home-made components could, of course, be employed and the results with the scheme will be found to justify the time required in making up the tuner.

U.S. Radio Plans for Olympic Games

The N.B.C. is already organizing its personnel for the relay of the running commentaries on the Olympic Games which are to be held in 1940 at Helsinki (Finland). The broadcasts of the various events will be telephoned to Berlin, thence transmitted through the German short-wave stations at Zeessen, to be picked up at Riverhead (Long Island) for conveyance by cable to Radio City. Transmissions will be made daily throughout the period July 20th to August 4th inclusive.

More Broadcasts from the Argentine

The Argentine Ministry of Foreign Affairs through the Government station LS1Y (LRA), on 16.56 m. (18.115 mc/s) and LRA1, 30.96 m. (9.698 mc/s) broadcasts every Friday at G.M.T. 20.00 and 22.00 o'clock news bulletins and talks destined to European listeners. They are given in Spanish, Portuguese, French, German and English.

Asuncion Reported to be Testing

A CORRESPONDENT informs us that he has picked up a test broadcast from Asuncion (Paraguay), in which the transmission mentioned was heard. Originally heard on 32.5 m. (9.23 mc/s), it was later again logged on 25.52 m. (11.71 mc/s). Some doubt may be cast on the latter

Regular Broadcasts from Iraq

Y 130, stationed at Baghdad, is now daily heard on the other end of G.M.T. 13.30-21.00 on 41.67 m. (7.2 mc/s). In addition to a news bulletin and occasional announcements in English, transmissions mostly consist of native music. The broadcast closes down at G.M.T. 21.00 with the playing of the Iraqi National Anthem.

And from Turkey

The three short-wave transmitters in Ankara are TAR, 16.38 m. (18.3 mc/s), 60 kW; TAO, 19.74 m. (15.185 mc/s), 20 kW; and TAP, 31.7 m. (9.465 mc/s) of the same power. TAR may now be heard daily from G.M.T. 04.00-10.00, the two other stations still being in an experimental stage. The call is: Radio Ankara and occasionally Radio Turque. Announcements are made in the Turkish, German, French and English languages, and although most of these are given out by a man, the news bulletin destined to English hearers is broadcast by a woman.


Europe’s Mystery Station

RADIO Libertad, alias The Freedom Station alias Der Deutsche Freunds.
sender, to give it its numerous titles, still continues to broadcast anti-Fascist and anti-Nazi propaganda in German, Spanish and Italian. The transmitter would appear to be located in Madrid (Spain), although announcements are made to the effect that all reports should be addressed to 13, Boulevard d’Aragon, Paris (France).

Nominally working on 29.8 m. (10.067 mc/s), on occasions you may pick up a statement that the station will "shift to 30.1 m., then five minutes later to 30.8 m. and back again to 29.8 m." in order to dodge the continuous barrage of interference put up to drown its transmissions.

Leaves from a Short-wave Log

Martinique’s Winter Schedule

FZPB, Fort-de-France, Martinique, The French Voice of the West Indies, on 30.93 m. (9.7 mc/s), has established its winter programme schedule as follows. Daily: G.M.T. 16.15-17.45, with an extra programme on Sundays from G.M.T. 19.00-21.00. Every Monday and Wednesday, from G.M.T. 10.00-10.30, a concert by French artists is given for English and American listeners. Announcements are made in French and English throughout the programme. The broadcasts open with the striking of seven chimes, and close down with La Marseillaise. The studio possesses a male and female announcer.

A Good Signal from Cuba

Broadcasts from COBX, Havana (Cuba), on 32.61 m. (9.2 mc/s), now working on 500 watts, are now heard at 13.15 on the 1500 watt sets between G.M.T. 05.00-06.00. The call is Radio Nacional, as the short-wave station relays the medium-wave transmitter CMBX in the Cuban capital. Interval signal: one stroke on a high-pitched gong, followed by another on a lower note, usually every 15 minutes throughout the programme. Announcements are made in Spanish and English. Address: Radiodifusores CMBX y COBX, San Miguel, 194, Havana (Cuba).

New Ultra-short-wavers

Station WOR, Newark (N.J.), U.S.A., of the Mutual Broadcasting System of America, has recently inaugurated an ultra-short-waver, W2XH, New York, operating daily on 25.3 mc/s from G.M.T. 17.00-23.00.

W3XD, Dallas (Texas), broadcasts daily (Monday to Friday inclusive) on 31.6 mc/s from G.M.T. 16.30-18.30.

A new experimental station, W9XA located at Kansas City (Missouri), has been recently logged on several occasions during the past fortnight on 26.45 mc/s.

Special Swiss Broadcasts

Transmissions destined to the North and South American continents will be carried out by the Swiss broadcasting organisations every Monday at midnight, preceded by a 15-minute programme of popular music, in the period February 6th to March 13th. The broadcasts will be made simultaneously by HBL, 32.1 m. (9.345 mc/s), for North America, and by HBP, on 38.45 m. (7.797 mc/s), for South American States.
USEFUL COMPONENTS INTRODUCED BY BULGIN

There’s always something NEW from BULGIN

NEW TELEVISION AERIAL
An improved weather-proof Television half-wave aerial, with centre-mounted feeder and aluminium Antenna: suitable for use as aerial or reflector. The feeder is taken off from the centre of the aerial before the highest path tube. Complete with kit of accessories and feeder.

- OCTAL ADAPTOR
  - Comprises a cup-moulding of black bakelite with pins and locating peg and top disc with sockets.
  - List No. F.T.62... 2/- each.

- OCTAL CABLE PLUG
  - Has light hollow pins and central locating lug spigot. Screw-cover and provision for cablegrip.
  - List No. F.T.112... 1/6 each.

- SCREENED CHOKES
  - Have low self capacity and high D.C. resistance. Available with 2,000 M.H. to 8,000 M.H. inductance.
  - List No. F.T.28-23... 2/- to 1/- each.

- PANEL MOUNTING FUSEHOLDER
  - For standard 100-cartridge fuses. Un-screw removable knurled member, fuse is automatically ejected. With fuse, fuse, 3 amp., limit.
  - List No. F.T.24... 1/2 each.

- PLUGS AND SOCKETS
  - Socket fits panels up to 0.1-in. thick. Pin, fitted to charger leads connects correctly without “shunting.”
  - List No. F.T.120, Plug, 1/- each.
  - List No. F.T.121, Socket, 1/3 each.

- 5-AMP. PLUGS AND SOCKETS
  - Has two pins and socket. Maximum rating: 5 amp.
  - List No. F.T.101... 2/9 pair.

COLOUR IN SWITCHES
- O.M.B. Toggle on-off Switch, with coloured, insulated dolly.
  - Rating 250 volts, 3 amp.
  - List No. F.T.184... Black, Red, Blue, Green or White, 1/10 each.

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ALL-STAGE ALL-WAVE SUPERHET described in this issue, employs HIVAC VALVES ONLY.

OUR SPECIAL OFFER
To reduce the cost of constructing this All-stage, All-wave Superhet, we offer you a COMPLETE KIT OF NINE VALVES for only £4-1-0.

The KIT includes 7 type A15 (as illus.) All-stage valves and 2 type UU 120/500 rectifiers.

HIVAC
THE SCIENTIFIC VALVE
BRITISH MADE


Please send Abridged List of Chassis, free.

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Address......................................
P.W. 211/39
A Resilient Crystal Holder

Many methods of holding a crystal suggest themselves, but to stabilise resonance, it is necessary for a good deal of trial by error experimenting in the case of loose crystals.

The illustration shows how, by introducing a certain amount of resilience into the assembly, the disc brought to bear upon the crystal is fairly well maintained at an even pressure, whilst taking into consideration the possible chassis vibrations.

Both discs (A) and (B) are of copper or brass, and (A) is insulated from the brass side cleats by a disc of reasonably thin ebonite glued to the top. (B), on the other hand, is soldered to the springy strip which is clamped by a nut and shakeproof washer to the small insulating or stand-off pillar, this pillar providing insulation from the cadmium chassis.

A Calibrated Pick-up

Being interested in the home broadcasting of plays, I have devised the following simple arrangement for a pick-up of the turn-up-end type. When broadcasting plays it is often necessary for music to be played between scenes, and very frequently the piece of music suitable is somewhere in the middle of the record. Although, by noting several times the exact position of the needle, it is possible to guess roughly where it should be placed during the play, this is a very unsatisfactory method, and is not very accurate. Some form of calibration is therefore necessary.

The only materials required for this arrangement are a piece of thinner dowel rod, two screws, and an old ebonite dial. The dial required is the type very popular some years ago, and is of the shape shown in the diagram. It is about 4in. diameter, and is calibrated in degrees. (It is very likely that the experimenter will have such a dial in his spares box.)

This is mounted above the pick-up arm with the centre of the dial corresponding to the axis of the pick-up arm. It is supported just above the arm, allowing a small clearance, by means of two pieces of dowel rod of suitable lengths fixed opposite one another near the outer edge of the dial. The rod is fixed by drilling holes in the dial and passing brass screws through them into the dowel rod. The bottom is fixed in the same way to the motor-board.

Next, a mark should be made on the pick-up arm just outside the outer edge of the dial. It is very simple now to set the needle on the part of the record required. The record should be run through and, when the music required is reached, the dial table should be stopped and a reading taken. This is done by noting the position of the mark on the pick-up arm in relation to the markings on the dial, and the reading will be in degrees. The script can be marked, say, like this:

End of Scene 2. Falls in music—record 2298A, position 105°.

This arrangement will give a fairly good degree of accuracy. —R. Winkle (Llanelli, S. Wales).

A Simple Meter Stand

Some pieces of thin mahogany, together with an old condenser case, were used for making this meter stand.

Two circular recesses, one in each end piece of mahogany, are made, the size of which should correspond to the width of the condenser case used.

A corner of each piece of wood is cut away, the cut being across one of each recess. A screw is inserted in each corner acting as a pivot. The meter is set in the centre of the condenser case, as shown. —C. Parker (Hull).
ON YOUR WAVELENGTH

Seeing Across the Atlantic

The newspapers have hailed the recent freak reception in America of the Alexandra Palace television transmissions as a phenomenon, and most of the newspapers said that this was the first time it has been done. Having a good memory for what has been done before, I looked up the first issue of a journal published in 1928, wherein it was stated that at the beginning of that year the record distance over which television had been publicly demonstrated was between London and Glasgow, by Baird. Then on February 9th, 1928, Baird spanned the Atlantic with television reception. This was, of course, on the low-definition system. This latter demonstration was witnessed by representatives and privileged guests, and the transmissions commenced at midnight, or 7 p.m. New York time. This transmission was the first in which the Atlantic was spanned. In order to give the watchers at the New York end a chance to get a receiving apparatus in trim the image of a ventriloquist's doll was transmitted. The "image sound" which this doll produced was transmitted over a telephone line to the Baird Company's experimental station at Coulson, and from there it was flashed across the Atlantic on a wavelength of 45 metres. The signal was picked up by an amplifier receiving station at Hartsdale on the outskirts of New York, and after the necessary amplification the signal was applied to the receiving television, and was clearly visible upon the ground-glass screen, measuring 5in. by 5in. Those who witnessed the reception in New York were Captain O. G. Hutcheson, joint Managing Director of the Baird Company; Mr. Clapp, one of the company's engineers; Mr. Hart, the owner of the amateur wireless station at Hartsdale, and Reuter's representative. After the doll's head image had been satisfactorily tuned in, the transmitter was started up, and a receiver operator at Purley, near London, was called up and asked if Mr. Baird should take his place before the transmitter instead of the doll. Mr. Baird complied with this request, and for half an hour sat before the transmitter until the message came through from New York that his image had been seen. Mr. Baird was followed by Mr. Fox, a Press representative; another journalist was similarly televised. Last week's freak reception in America of our television transmissions indicates that our old ideas about the Alexandra Palace transmissions being limited to the optical spectrum are so much bunk, and indicates that we are trying to find theory to fit fact. The performance shows that when we understand our practice a little better and have devised a correct theory, we shall be able to transmit pictures in this country over greater distances. The peculiar turn of fate which carried the pictures across the Atlantic via the ether on ultra-short wavelengths is a broad hint to our television engineers to drop some of their technical jargon and to get busy with long-distance transmission in this country.

Television Interference

I see that a certain firm marketing ignition suppressors has embarked upon a campaign to lessen interference due to the ignition system of motor-cars. It is said that the Government departmental vehicles will soon be suppressed, and it is also stated that motor manufacturers will follow suit voluntarily and without waiting for legislation. If they do so, you may take it as a fact that legislation will follow. The firm in question makes the suggestion that every manufacturer of television receivers should insist upon their staff fitting suppressors to their cars; that dealers be asked to advise their television customers to do so, and to sell each customer a set of suppressors, and that the B.B.C. should make a rule that all their vans and employees' cars are suppressed. Even if all these suggestions are adopted it will not solve the television interference problem. There are nearly five million vehicles on the roads, but, in any case, by far the greater proportion of interference does not come from motor vehicles. I also express the opinion that the Government will not introduce legislation until television has become a National service, instead of merely local to London as it is at present. It is unthinkable that every motorist should have to fit suppressors merely because a few thousand people wish to look in. I think that the problem is one which must be solved by the designers of television apparatus. Car manufacturers, on the other hand, state that the fitting of suppressors for ordinary car radio purposes is unnecessary as it does not give rise to interference. Personally, I am of the opinion that the use of ultra-short wavelengths for television will not last for ever. Once the television wavelength has increased the problem, so far as motor-cars are concerned, will vanish.

The Listeners' Service Bureau

The old Listeners' League has been disbanded, and now bobs up again as the Listeners' Service Bureau with more or less the same facilities. For 2s. 6d. a year the Bureau offers an insurance cover (one announcement says a "free insurance," but I am not quite sure how the 2s. 6d. ties up with this statement), which includes damage to sets by fire, burglary, lightning, storm, etc., up to £50 on one set, or a maximum of £100 on two or more sets. £5 will be paid on damage to an aerial, and third party risks are covered up to £500.

Crooners Again

Reverting to the subject of crooners, here is an amusing story culled from an Irish contemporary:

A crooner died in very needy circumstances, and a friend had a 'whip round' at the broadcasting studios to pay for his funeral expenses.

"The first person he approached was the very hard-boiled commissioner.

"'I'm collecting money to bury a poor crooner,' he said, 'could you spare just a shilling?'

"'Certainly!' replied the other.

'Here's ten shillings—bury ten of them!'"
BUILDING AN ALL-WAVE

This Week We Continue the Description of this N.

Constructional Details

Having made and drilled the chassis, commence with the output stage and power pack and run out the mains transformer and all components in position. Wiring is quite straightforward, and should not take long. Wire up the speaker lead with four-core flex, if obtaining otherwise two lengths of ordinary twin flex will do, and having connected the grid of the output valves to the chassis as to make sure that they will obtain a grid bias supply, you can join leads "X" and "Y" together, and set on at the actual mains power point. If a slight hum is heard in the speaker after the valves have warmed up you can take it that the output stage is at least in some semblance of working order.

With regard to the radio chassis, the first thing to do here is to mount the condenser and coil unit. The wavelength range on short waves depends a good deal on the layout of the coil unit. By mounting the coil unit quite close to the tuning condenser, and having only 3 ft. of wire between the coils and condenser, the maximum wavelength range is obtained. In order to do this, and allow the wave-change switch to clear the tuning dial, it is necessary to mount the condenser on 4BA rods about 1½ in. above the chassis. Having done this, the leads to the condenser should be soldered, and the coil unit then fixed in position. It is a bit tricky connecting these soldered leads to the coil unit terminals. If extreme wave-length coverage on short waves can be sacrificed in favour of ease of construction, the coil can be mounted farther way, but this will, of course, mean increasing the length of the chassis somewhat.

Having the most of the rest of the components may be fixed to the chassis, and the valve heaters, dial lamps, etc., wired up.

LIST OF COMPONENTS FOR THE

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Varley P.B.120 645 k/c a-wave coil unit.</td>
<td>1</td>
</tr>
<tr>
<td>One Varley 645 k/c P.F. transformer, type P.B.122.</td>
<td>1</td>
</tr>
<tr>
<td>One Varley 465 k/c P.F. transformer, type P.B.124.</td>
<td>1</td>
</tr>
<tr>
<td>One Wearsite P.H.F.2 coil, complete with trimmer.</td>
<td>1</td>
</tr>
<tr>
<td>One J.B. 9-gang bar-type condenser with all-wave dial.</td>
<td>1</td>
</tr>
<tr>
<td>Five 8-pin valveholders—Clia V111.</td>
<td>1</td>
</tr>
<tr>
<td>Ten 8-pin valveholders—Clia V209.</td>
<td>1</td>
</tr>
<tr>
<td>One octal ceramic valveholder—Clia V248.</td>
<td>1</td>
</tr>
<tr>
<td>Five valve screens—Bellin type 5000.</td>
<td>5</td>
</tr>
<tr>
<td>One aerial-earth socket strip—Bellin P.31.</td>
<td>1</td>
</tr>
<tr>
<td>One aerial-earth socket strip—Bellin P.62.</td>
<td>1</td>
</tr>
<tr>
<td>Ten 10-watt group boards—Bellin C.32.</td>
<td>1</td>
</tr>
<tr>
<td>Two 4-way group boards—Bellin C.50.</td>
<td>1</td>
</tr>
<tr>
<td>One 4-pole 3-way midget rotary selector switch—Bellin S.204.</td>
<td>1</td>
</tr>
<tr>
<td>One 1L.F. choke, 30 henries at 120 ma.—Wearsite H.T.30.</td>
<td>1</td>
</tr>
<tr>
<td>One midget transformer, 200-250 volts primary, secondary 500 0 v. 4. 3A C.T. 15V. 5A C.T. manufacturers type, colour-coded leads—London Transformer Products.</td>
<td>1</td>
</tr>
<tr>
<td>Three 8-pin valveholders—P.16.</td>
<td>3</td>
</tr>
<tr>
<td>One baseboard fuseholder with 250 ma fuse—Bellin F.260.</td>
<td>1</td>
</tr>
<tr>
<td>One 50 ohm 1W resistance—Dubbier F.1.</td>
<td>1</td>
</tr>
<tr>
<td>One 100 ohm 1W resistance, Dubbier F.1.</td>
<td>1</td>
</tr>
<tr>
<td>One 100 ohm 1W resistance, Dubbier F.1.</td>
<td>1</td>
</tr>
<tr>
<td>Two 1 meg. 1W resistances, Dubbier F.1.</td>
<td>2</td>
</tr>
<tr>
<td>One 150 ohm 1W resistance, Dubbier F.3.</td>
<td>1</td>
</tr>
<tr>
<td>One 200 ohm 1W resistance, Dubbier F.1.</td>
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</tr>
<tr>
<td>One 450 ohm 1W resistance, Dubbier F.1.</td>
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<tr>
<td>One 50,000 1W resistance, Dubbier F.1.</td>
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<tr>
<td>Two 200,000 ohm 1W resistances, Dubbier F.1.</td>
<td>2</td>
</tr>
<tr>
<td>One 2 meg. 1W resistance, Dubbier F.1.</td>
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</tr>
<tr>
<td>One 10,000 ohm 1W resistance, Dubbier F.1.</td>
<td>1</td>
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</tbody>
</table>

*Complete kit of Hivic Valves is offered

Adjusting the Trimmers

The trimmers should be adjusted on a station as low down on the scale as possible, a little at a time, and adjust the medium-wave oscillator trimmer (the middle one on the rear coil) until the station is heard on the lower dial setting, after which the medium-wave trimmer (middle one front coil) is adjusted for maximum volume.

Theoretical circuit
VE ALL-STAGE SUPERHET

New Receiver, and Give Constructional and Wiring Details

If the station is too low on the scale, unscrew the I.F. trimmers slightly until the station is received at its correct setting and then adjust them all for maximum volume. If the station comes in above its correct wavelength, screw the I.F. trimmers down about half a turn, and repeat the above procedure. When the top part of the scale is tuned correctly, return to the bottom and re-adjust the medium-wave trimmers to bring the station in at its correct setting. Again tune in at the top end of the scale, and adjust the I.F. trimmers once again to make the setting correct. This time the adjustment should hold good for all parts of the scale.

Now turn the wave-change switch to long waves, set the scale to Luxembourg, and adjust the long-wave oscillator trimmer (top rear coil) until the station is received at its maximum volume. Now tune in frequency round about 465 ke/s but, unless they are all accurately adjusted to exactly 465 ke/s, selectivity will suffer, and the stations will not all come in at their correct settings. The line is simple to use. Connect the input circuit to the main H.T. line and earth, and the output to condenser CI, and earth. An 0.1 mfd. condenser should be joined between terminal "B" of the coil unit and earth. If an output meter is available, simply adjust the I.F. trimmers until a maximum reading is obtained. If no meter is used, carry out the adjustments for maximum volume. Lining up I.F. transformers is by far the most difficult part of trimming, and the Bulgin accessory is well worth while to any serious experimenter.

Having completed the medium- and short-wave adjustments, "go round the dial" and see what stations you can tune in.

The receiver control layout and the output and power chassis.

Hilversum, and note whether Droitwich, Radio-Paris and Hilversum come in at their correct settings on the dial. If they are too high on the scale, screw up the long-wave padding condenser (left-hand rear of coil unit). If they are too low, unscrew the padder. Having made this adjustment so that the stations come in correctly, return to Luxembourg, and adjust the long-wave aerial trimmer (top front coil) for maximum volume.

Operating Notes

By proceeding slowly and carefully the trimming need not prove difficult, but it becomes far easier and more accurate if a Bulgin 465 ke/s I.F. liner is used to adjust the I.F. transformers. It is obvious that these can all be brought into line at any

The All-wave All-stage Superhet, showing the division of the receiver and mains sections on the two separate chassis, A and B.
WIRING DIAGRAMS OF THE ALL-WAVE ALL-STAGE SUPERHET

Wiring diagrams of chassis B (mains and output section) will be given in next week's issue.
Notes from the Test Bench

HERE'S QUALITY RADIO
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A Library Nucleus

STIR.—Many thanks for “Practical Wireless Service Manual” awarded to me in “The Best Set I Ever Built” competition. This book, plus the one you awarded me in the same week of 1937 and the one I received as a Christmas present, make a splendid nucleus of works by the Editor for forming a library around. Like all other things, interest grows by what it feeds on, and an occasional browse in the Editor’s books helps to digest the food Practical and Amateur Wireless profitably supplies.—W. H. Stacky (Ringmore, Devon).

A Prizewinner’s Thanks

STIR.—Once again I accept my best thanks for the book which I received for submitting the correct solution to Problem No. 326. I should like to mention that I started taking Amateur Wireless some time before its amalgamation with Practical Wireless and have kept every copy, considering them to constitute a valuable reference library. Chiefly as a result of knowledge gained from your valuable magazines, I have been able to make quite a useful spare-time hobby of wireless services.


A Five-valve Battery S. W. Superhet

STIR.—I must congratulate your paper on publishing another year of good work towards the cause of amateur radio, and I am very grateful to Practical and Amateur Wireless for a year’s good reading. During the year you have given us the details of many short-wave receivers, and one communications receiver, but what I think is lacking is a short-wave battery communications receiver employing from five to six valves, for the man who is either out of the power line, or who does not like using mains on the short-wave service. A suggestion for a circuit which I now put forward is as follows: R.F. amplifier, frequency-changer and oscillator, iron core I.F. stage, 2nd detector, A.V.C. and 1st I.F. output pentode; if it were extended to six valves a separate oscillator could be included. Instead of a double diode-triode and output pentode, a double diode-pentode could be used, thus enabling the valves to be kept down to five, with a separate oscillator.—C. H. Neve (Brixton Ferry, Glam.).

[What do other readers think of this suggestion?—Ed.]

A 20-metre Log from Notts

STIR.—Here is a log from a Nottingham district which may be of interest to other readers; also a copy of my log-book. All stations received by loudspeaker. Receiver, three-valve, all-wave, with home-made QSL cards from VK2XU, W7BYO, W2IKV, and others. D.X. on 20 Metres: VK2XU, K5ASEK, K4APY, YV5AG, V0Y6B and VP6MR, VP7NII and VK0KXTB, PY1AF, PY1AH, PY1AI, ZBIL, W1-33; W2-33; W3-25; W4-10; W5-2; W6-2; W7-3; W8-17; W9-9; VEI-6; SU-4; CN7-7; FA-4; I-4.

This above is an example of my log-book entry. Further details in a report includes aerial, distance, power, and distance from London.—Charles Shepperson (Orhton, Notts).

Multiple Mains Connections

STIR.—I should like to add a comment to the article on Multiple Mains Connections in the B.L.D.L.C. section of your issue dated December 25th, 1938.

In dealing with the loading of a light pendant it is pointed out that great care must be exercised not to overload the flex and in no case more than 1 lb. of fire. Actually, there is another factor which comes into force before the carrying capacity of the flex is considered. This is the capacity of the lamp-holder; in accordance with the L.E.E. regulations the maximum current which can be taken from it is 2 amperes, and it is necessary to keep the connected load within this figure to avoid overheating.—Frank Webb (York).

Amateur Transmitting—the Friendly Spirit?

To Norman A. L. Timbers, Esq. (GSTR) D.EAR O.M.—With reference to your letter of the 28th instant, in Practical and Amateur Wireless (issued dated December 31st, 1938), I am informed that I, the writer of the “sour grape” letter of the 3rd inst., do swear by all I hold sacred that the said letter was emphatically true to their finding. That is to say, I spoke the truth as was my experience, “reading on your pet corn”—that is, you being a fully-licensed amateur. No offence in the remark, O. M., and I am sorry that distance is such—London to Lanarkshire—but I did not mean to materialise your sincere “welcome to get acquainted.” I believe you meant it.

I am sure you will agree that there is a difference in the psychological effect of schoolboy to man and of man to man. Who could be so blind as to schoolboy when he pays the approached person the honour of offering him a little help.

By the G.P.O. being unfair, my reference meant in this respect: How is it that when there is but a difference in the angle of age from fifteen to seventeen (not so much the latter age) are holders of the A.A. licence, whereas, on the other hand, conscientious fellows (oh, yes, there are many who are more unlucky than unlearned) just fail in getting their A.A. licence.

Of course, a junior has a guarantor, but where does the privilege to have and to hold (until twenty-one years of age) from the age of fifteen come in?

Anyhow, I hope you won’t take my letter as a rude one, because it is far from being meant as such.

Although still on my own in a “one-eye-nice place,” I am getting on quite nicely: even my eye is slow, and I am not daunted. My luck will change some time. Without prejudice to your letter, O. M., very best to all andIp: good health, and tons of QSOs not forgetting the “sour grapes” best left alone unless one feels better for “plucking” at one.—A Genuine Guy Still (Havens, Middlesex).
Broadcast Talks

It is interesting to note that in addition to the mention in the B.B.C. programme, several new talks will be included in the schedule of talks for January to March, 1939.

On Sundays, F. Buckley Hargreaves will continue his fortnightly film talk which will be accompanied with "Bookshelf." The speakers in the latter programme will be chosen from a regular panel which includes Sir John Hope, the Master of Walpole, Desmond MacCarthy, Frank Swinnerton, Arthur Bryant and John Brophy.

The five-minute Monday talks from New York on "The Week on Wall Street" will continue. In the Regional programme a new series entitled "Recent Inventions" will alternate at 7.30 p.m. with "Science Revealed." At 8 p.m. in the National programme, W. E. Williams will be the editor of a series of talks entitled "Children at School."

The Press To-day

A series of ten talks on "The Press To-day" will be heard each Tuesday at 9.25 p.m. on the National wavelength. The rise of the Press in this country will be described and many aspects of journalism will be touched on by speakers with first-hand experience. The series opened on January 8th with a talk by Tom Clarke on "How a Newspaper Works." On Wednesdays, E. Donough O'Brien will continue his "Whitehall Tour." Visits will be held, among other places, to the Foreign Office, the Air Ministry, and the Ministry of Transport. Also on Wednesdays, the popular last-minute news feature, "The World Goes By," will continue. Mr. F. Rayns will continue his Friday talks on "Farm To-day."

All Air Cos. will continue talking 'Mainly About Manhattan" on Thursday evenings. The speakers in "The Week in Westminster," to be broadcast each Friday at 8.45 p.m., will be Ronald Corbett, M.P., Meredyth Roberts, M.P., and Fred Marshall, M.P. At 9.25 p.m. talks entitled "Eight Corners" will be given by people who have escaped in the course of their involvement in hairbreadth escapes of one sort or another. The first man will be a will whom profession it is to crash aeroplanes. This series will be followed by "Australia Speaks," which will run on the same lines as "Canada Speaks." The difficulties of direct transmission have made it necessary for the talks to be recorded in Australia. They will be introduced each week by Michael Terry, an Australian living in London.

On Mondays and Wednesdays Eric Gillett will be heard giving readings from Tolstoy's epic historical novel, "War and Peace." Talks on the theatre, short stories, parlour games and spelling bees will continue in the programme and there will be several discussions on topical topics of the day.

Further details of all these talks will be found in a booklet called "Broadcast Talks," 1939. Further interesting talks may be obtained upon application by post to the B.B.C. Publications Department, 35, Marylebone High Street, London, W.1."

January 21st, 1939

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**-EST. 1934**
A Welcome Gesture

THE vexed question of interference, insofar as it upsets the performance of television receivers, has been the subject of investigations by more than one technical committee, and the conclusion has been reached that the worst offender is the ignition system of motor vehicles of all classes. Any domestic residence, within fifty yards or so of a road on which there is a considerable volume of traffic, has been almost ruled out as a prospective site for a television receiver installation, because the pictures have been ruined by the familiar light flashes which appear on the screen, while, in addition, the accompanying sound has also suffered. Valiant attempts have been made by television manufacturers to overcome this trouble, but this has meant very elaborate and expensive aerial arrays often located in a most inconvenient position, with the result that there is a long length of feeder cable. There were, however, that the only right and logical way of tackling the problem was to suppress the cause of the interference at the source, and not evolve a cure or palliative at the receiving set itself. It was known then to the Government that there were sympathetic to the representations which had been made to it from responsible quarters, but legislation is inevitably hindered by long periods of delay. It is for this reason that the news of active cooperation from the Society of Motor Manufacturers and Traders is regarded as a most welcome gesture. By all accounts this body has been convinced of the serious situation in which the growing industry of television was placed, and has agreed to investigate the position. The solution is very inexpensive, and merely consists of fitting suppressors to the engine ignition system. Opinions vary as to whether this upsets engine performance in any way, but the Institution of Automobile Engineers are carrying out tests, and it is hoped that, apart from the case of expensive high-powered racing-car engines, there will be no material reduction in efficiency. This voluntary effort on the part of the motor industry is indicative of the helpful spirit existing between British industries.

Standardised Terms

THE Technical Section of the R.M.A. Television Development Sub-Committee, under the Chairmanship of H. J. Barton-Clarke, are to be congratulated on the work they have done in connection with the standardisation of television terms and receiver-control markings. The whole of their recommendations were set out in detail in PRACTICAL AND AMATEUR WIRELESS dated December 31st, 1938, and it is clear that the committee were guided by the feeling that some of the chaos which existed in the early days of radio should be avoided in the new science of television. The editor of this journal, Mr. F. J. Omm, has, right from the first issue, always been opposed to any looseness of expression, and although it is difficult now to break away from what has become accepted practice in the realm of radio terms and expressions, there is certainly no need to follow this practice in television. A recent investigation brought to light the fact that with the commercial television receivers on the market, quite widely differing terms were being used to mark controls which really carried out identical functions in the sets. Not only does this lead to confusion in the dealers' shops when demonstrations are being undertaken by the salesmen, but the customer is often at a loss to understand what is being done. By reducing the number of major controls on the front of the set to the barest minimum, and having uniformity of marking for both major and minor controls, the customer will be handled more intelligently, and increased efficiency from the point of view of picture quality will accrue.
TELEVISIONS

Long-distance Television

The recent report of the reception in America of television pictures of far-off places has given rise to a great deal of interest in long-distance television services in the ordinary daily press. As readers of this journal will know, this is far from the truth. It is not the least of our arguments that the human face has been seen as a televised image on the other side of the Atlantic, for Baird spanned the continents nearly eleven years ago, using a 35 Lakes transmitter, and followed this up a little later with mid-Atlantic reception on the Beaugonia. Two years ago R.C.A. engineers started studying the long-distance transmission properties of ultra-short waves, and built a special directive aerial system at Riverhead for this purpose. Consistent scientific observation has enabled them to forecast with a remarkable degree of accuracy the range of wavelengths which will give long-distance reception at various periods of the year. This is based primarily on the reflective properties of the different ionised layers of the upper atmosphere. As a general rule, it has been found that except on rare occasions the reflective properties do not extend to wavelengths below 10 metres. On the other hand, the uppermost and densest of the layers attain its maximum density during the winter months, November and February being particularly favourable months, and it is in these periods that vision and sound signals from Alexandra Palace have been seen and heard by the Americans. Another curious fact has been learned by using the directive receiving aerial array is that these television signals often travel by the longer route to America, the better results being secured by the aerial beamed on the west instead of the east. Until very much more data has been accumulated dealing with the vagaries of the propagation of ultra-short wave signals, it will be impossible to be at all dogmatic or lay down hard and fast rules. One thing is certain, however, and that is the present wave lengths for vision and sound service areas is at least doubled or trebled unless the environment at the site of reception has some very peculiar geological features.

Small Screens Not Favoured

Although the Germans are still not in an advanced stage as far as their television service is concerned, they appear to have definite views as to the minimum size of the picture for domestic receivers. The 5in. and 7in. cathode-ray tubes are by no means popular, and it is for this reason that several manufacturers are carrying out experiments with projected pictures, particularly from projection. To meet this last-named case some tube designers have departed from normal practice, and developed a form of projection tube whose screen is not at right angles to the scanning and picture reconstituting beam of electrons. This normally brings about a keystoning or trapezoid distortion in the picture shape, but by applying an electrical correction to the line scan deflection pulses this is rectified quite efficiently. From the augmented O.C.R. tube fluorescent screen a properly designed lens focuses the picture on to an inclined mirror, and from here the electrons are reflected to a second mirror which gives a front reflection on to a lid screen inclined about ten degrees from the vertical. The results that have been achieved are far better than those of conventional projection, and really follow the accepted practice of cinemas or even home cine outfits.

Furthermore, although there is an additional light reflecting surface it has been found that this does not entail such a high degree of light loss as arises in the case of a screen manufactured for back projection, such as is popular in this country. There is also a reduction in the directional effect of the picture, and this is most important when it is desired to give any form of demonstration to a large gathering of people. With directional screens, the angle of vision is too narrow to give comfortable viewing except to a relatively small audience.

C.R. Tube Screens

I have always been ignorant with normal cathode-ray tube television receivers that the picture on the screen where the electrons strike the powder surface is much brighter than that observed on the reverse side. If the screen powder that is bound to the glass face by a coating mixture is too thick, then picture brightness suffers very materially. It is for this reason that a proposal has been put forward for covering the large glass end of the tube bulb with a loose powder of such a depth that it forms a smooth plane surface. This means, of course, that the tube has to be used and monitored in an inverted position so that the powder can stay in place as a result of gravitation. Observation of the picture would then be undertaken by means of a reflecting mirror and, due to the thickness of the fluorescent powder layer, is considerably brighter than that seen by the more usual method of viewing. Then, again, if chance the screen was burned, due to the beam of electrons becoming stationary, normality would be restored by agitating the powder material until a fresh surface was presented to the beam of electrons.

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LATEST PATENT NEWS

SUPPLY SYSTEMS FOR VACUUM AND LOW-PRESSURE DISCHARGE APPARATUS.—Eberедин, Ltd., and Meller, L. R. No. 492,665.

In a television receiver the cathode-ray tube 1 or other electronic picture reconstituting device has a control electrode supplied with a bias voltage from a power pack 3 which is connected in series in the anode-cathode circuit of the tube with at least part of a second power pack 4 which supplies the anode potential whereby the anode to cathode potential is increased. The biasing source 3 for the modulating electrode also supplies the receiving valves or scanning oscillator. The power pack 3 of the modulating electrode is connected to a potententiometer 2 from which appropriate tappings are taken to the cathode and modulating electrodes so that part of the voltage of the source 3 is added to that of the pack 4 in the anode to cathode circuit. (Fig. 1.)


In an adjusting device for rotatable shafts, for example, the tuning shaft of a radio receiver, a hollow shaft 12 screwed at 13 to the tuning condenser shaft 10 is rigid with a cup member 14 secured to a knob 15 which is manually rotated to effect approximate tuning directly. For fine tuning, a thumb wheel 20 projecting through a slot in the knob 15 is rotated. The thumb wheel is keyed to a spindle 21 rotatably mounted in the cup member 14, and drives a shaft 32 through reduction gearing comprising the thumb wheel. The pointer may, alternatively, be driven circumferentially by a cord from the shaft 12 and co operate with a rectangular dial. (Fig. 2.)

VARIABLE CONDENSERS.—Hunt, Ltd., A. H. No. 491,642.

In a variable condenser of the "trimmer" type a 22-plate plate 224 against the base 220 and bears a stiff tongue 240 extending under the base, pierced with a threaded hole for tight engagement of the adjusting screw 230 which passes freely through the base. The flexible plate has a downwardly extending part clamped by the flange 238 of the bracket and rests on the bottom part held by the rivet 244 which also extends the tongue 240. The fixed plate 220 is riveted to the base at 242. An extending sideways from the bracket may bear feet 235 to secure the condenser to a panel. Modifications are shown in which a "ganz" of such condensers are held in a single bracket electrically connecting all the movable plates. The threaded hole for reception of the screw 230 may be slat at the side to give a resilient grip. (Fig. 3.)

NEW PATENTS

These particulars of New Patents of interest are readied from the Official Journal of Patents, and are published by permission of the Controller of H.M. Stationery Office and the official Journal of Patents can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, price 1s. weekly (annual subscription 12 shs.).


37239.—Frankland, G. D.—Radio receivers employing automatic frequency control. December 22.
37371.—Tullecon Television, Inc.—Electronic amplifier. December 22.
37573.—Jones, W., and Pye, Ltd.—Television, etc., systems. December 22.
37574.—Jones, W., and Pye, Ltd.—Saw-tooth oscillation generators. December 22.
37572.—Jones, W., Cope, J. E., and Pye, Ltd.—Television, etc., systems. December 22.
37493.—Kodak-Brander, Ltd., and Brand, P. M.—Control of television receivers. December 22.

Specifications Published.

49746.—Marconi's Wireless Telegraph Co., Ltd.—Radio receivers and the like.
49747.—Triggs, W. W. (Operadio Manufacturing Co.),—Selective-tuning mechanism for radio-receivers.
49749.—Furneways Television, Inc.—Means and method for transmitting synchronising pulses in television.
49742.—Marconi's Wireless Telegraph Co., Ltd.—Microphones.
49761.—Chay, R. S.—Steroscopic television.
49762.—Marguerat, R., and Chevrier, M.—Diaphragms for loudspeakers.
49763.—General Electric Co., Ltd., and Jones, P. R.—Television receiving sets.
49764.—Bauer Ges.,—Feeding devices for strips bearing sound records.
49766.—Marconi's Wireless Telegraph Co., Ltd.—Cathode-ray television-transmitting tubes.
49767.—Naarmoose—Vennootschap Philips' Gloelampenfabrieken.—Thermionic amplifiers.
49768.—Rupp, E.—Device for transmitting television and the like comprising a photo-electric mosaic.

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at the uniform price of 1s. each.

Replies in Brief

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

R. P. D. (Callington). We have no details of the receiver and cannot, therefore, advise you regarding the changes which are replacements. We do not recommend the building of a new receiver, as it would be wasteful if the old receiver is in good order. O. B. (London). Owing to the differences in filament voltages, it is not possible to carry out an exchange of filaments without changing the voltage settings of the lamp socket. The possibility of modifying the filament voltage will be considered by the manufacturers in the future. S. J. H. (S.L.). There is no open-circuit at present and the conduction from the control grid to the target is due to one side of the switch. Thus the entire coil is in circuit on long waves and a part short-circuited on medium waves. This wire is used to avoid difficulties as mentioned in the question.

R. M. (Stornmouth). The "Constructor's Encyclopaedia" will explain any terms with which you are not familiar, and articles and paragraphs from time to time which will help you.

L. B. M. (London). The amplifier and rectifier valve should be all that is necessary for the conversion.

A. S. (Sunderland). We think it would be advisable to contact a commercial firm of your district regarding the effects you have noticed.

R. B. (Newcastle). We have not described a set of the type you require. You would ostensibly need a superhet for this purpose and it would cost much more than the figure mentioned.

H. F. C. (Pompond). The Air Hark is practically identical with the suggestion on the letter except that it is for mains operation and uses separate Pick-up coils.

H. L. (Skeithley). We suggest you communicate with the manufacturers, and take the trouble to see if their advertisements appear in our pages.
THE CROYDON RADIO SOCIETY
Headquarters: St. Peter's Hall, Ludley Road, S. Croydon.
Meetings: Tuesdays at 8 p.m.
Hon. Sec.: Mr. E. L. Lunner, 14, Candepole Road, S. Croydon.

The next meeting of the above society takes place on Tuesday, January 24th, when an informative talk on "Electrical Waves and Radio" will be given by the hon. secretary, Mr. J. E. Marshall.

BRADFORD SHORT-WAVE CLUB
Headquarters: Bradford Moor Council School, Leeds Road, Thornbury, Bradford.
Meetings: Every Tuesday at 8 p.m.
Hon. Sec.: T. W. Walker, 26, Napier Road, Thornton, Bradford.

The Bradford Short-Wave Club will hold a talk, the subject dealing with station operation. The talk will be given by Mr. T. W. Walker, the secretary, and will be held at the headquarters on Tuesday, January 24th. Further details of the meeting will be announced in the next issue of the society's newsletter.

Personal Paragraphs

Mr. Stephen de Laszlo
We regret to record the death of Mr. Stephen de Laszlo, son of the late Mr. Philip de Laszlo, the artist. He was involved in a motoring accident on the London-Newmarket road on December 30th, in which his wife was killed. Mr. de Laszlo was 32 years old. The accident occurred while he was managing director of the High Vacuum Valve Co., Ltd., and he was buried on January 3rd. Further details may be obtained from the correspondent at the above address.

Mr. C. A. Hiscock
We also regret to record the death of Mr. C. A. Hiscock, secretary of Messrs. Pye, Ltd. He was a director of Invicta Radio, Ltd., and had been a director of the firm since its inception.

Radio Honours
Sir John Reith, late Director-General of the B.B.C., was awarded the M.B.E., in the New Year's Honours list. Amongst other radio personalities who figured in the list were Cecil Graves, Deputy Director-General of the B.B.C., who was made a Knight Commander of the Order of St. Michael and St. George; Alderman Gifford G. Craig (director of Crystal), who was appointed a Knight Bachelor; and Councillor Harold W. Sellers, of Leeds, who received the O.B.E.

THE DEMAND INCREASES DAILY

Issued by The Imperial Tobacco Company (of Great Britain and Ireland), Ltd.
A REVIEW OF THE LATEST GRAMOPHONE RECORDS

THROUGHOUT his long career John McCormack was one of the most popular of the "H.M.V." celebrity artists, and it was fitting, therefore, that after his farewell concert with the record of Albert Hall, this great singer should record two of the most appropriate of the items from his programme. They are "When I Have Sung My Song," and "Earl Bristol's Farewell" on H.M.V. DA 1446.

Peter Dawson must have discovered the secret of perpetual youth; in his latest recordings of songs with organ accompaniment his voice is as round and mellow as ever. "The Lord Is King" is another of his own compositions, for it is now an open secret that McCull is Peter Dawson's pen-name. Coupled with it is a re-recording of O'Hara's "There is No Death"—H.M.V. 8620.

Every radio fan has heard of Mr. Walker's little problems each week in "Band Waggon," and now the H.M.V. Company have recorded him in the January list. His job as a rag and bone man brings him into touch with all sorts of people and queer happenings.

The record contains his famous signature tune complete for the first time, and Mr. Walker propounds one of his problems. A slip of paper is enclosed with the record so that asking purchasers to send in their solution of the problem. Mr. Walker promises, in his own handwriting, to send them a reply during the next month. The number of the record is H.M.V. BD 657.

Mr. Walker is not the only Band Waggoner on record. Mr. Askey is on top of his most comical form in "I Pulled Myself Together" and "Ding Dong Bell" on H.M.V. BD 619.

Dialect Folk Songs

BEWEEN the humour of an Askey and the humanity of "Our Bill's" songs of English country people, and we don't mean County, the only link is the radio. For without the radio, millions of people would have been denied hearing Frederic Grisewood's imaginary character. Mr. Grisewood has made a study of folk songs and the people he has heard singing them in remote country places. Thus his Mr. Grisewood has created "Our Bill," and Bill's first record contains the tragi-comic "Berkshire Tragedy on one side and "A Sad Ending" and "Oliver Cromwell" on the reverse side of H.M.V. BD 636.

Outstanding among the swing records is one that was made under the supervision of Magnus Panassi, who is considered the greatest international authority on this music. Mr. Panassi, who wrote the famous book "Our Bill's Jazz" is now in New York, but before he left Paris he met Teddy Hill and his Orchestra, a coloured American band. With the aid of leading French film artists and other well-known musicians he supervised some remarkable performances. Two of these are recorded on H.M.V. B 8628. The first side contains "I Got Rhythm," and it certainly has. The performance is unique in that it is by a trio of trumpets, accompanied by trombone, guitar, string bass and drums. There is no piano, and there are no saxophones or clarinets. The title on the record is "Japanese Sandman," and it is played by Dicky Wells and his Orchestra.

Benny Goodman and his Orchestra play "Blue Intermediate" and "My Melancholy Boy" on H.M.V. B 8841, and Tommy Dorsey and his Orchestra have recorded the old nursery tune "Sewing Around The Mulberry Bush" on H.M.V. B 8842. On the other side Dorsey leads a smaller band, which he calls "His Clambake Seven," in a jive version of "You Must Have Been A Beautiful Baby."

Vocal

BENIAMINO GIGLI'S latest record is a novelty, for the famous Italian tenor here sings in German. True, it is the original language of the two famous songs concerned, Schubert's "Serenades" and Brahms' "Wiegenlied" which have been introduced into Gigli's latest film "Marionette."—H.M.V. DA 1657.

Another well-known tenor who has also recorded his latest record in German is Richard Tauber, but this is no surprise. He sings "Gypsy Moon" and "Vienna, City of My Dreams" on Parlophone RO 2047.

In the Parlophone "Classic series" appear a number of interesting records. First we have the German tenor Herbert E. Groh singing "Serenade" and "Matinette" on Parlophone RO 2900. Next we have a number of orchestral recordings including "Hansel and Gretel" selection by Frederic Hippman and his Orchestra on Parlophone R 2903; "Love Kelly" by Orchestra Mascotte on Parlophone E 2004; and "Tango Torero" coupled with "Two Sleepy People for the film "Thanks for the Memory," and "When a Cigarette Was Burning" on Parlophone B 1311.

Workshop Calculations, Tables, and Formularae

WORKSHOP CALCULATIONS, TABLES AND FORMULAE 3/6, by post 3/3d from Tower House, Southampton St., Strand, W.C.2
Wave-trap Effects

I am rather troubled with the performance of my four-valve set and believe I have traced the cause of the erratic behaviour. I have experienced some trouble from the local station, and to avoid this I made up a wave-trap from an old spare coil. I now find that when I want the local it is very much reduced in strength, and to get full volume I have to cut out the trap. Is this in order? — R. W. (Barnet).

The trap is presumably an acitator circuit and its purpose is to prevent the signal from passing to the tuning circuit in the receiver. If the trap is properly made and sharply tuned it will obviously do its work, and therefore, when the station to which it is tuned is required it will be unable to pass the trap. You must, therefore, alter the tuning of the trap circuit, or alternatively short-circuit it by means of a simple on/off switch.

Transmission For Beginners

"I am desirous of taking up the study of wireless with a view to qualifying for the Civilian Wireless Reserve and have commenced to subscribe for your paper. My uncle, whose name is recommended in your lists which is recommended. Is this suitable for a beginner without much knowledge? Also can you inform me of the address of the London H.Q. of the Civilian Radio Reserve?" — F. G. B. (S.W.11).

The book is quite suitable for a beginner, especially if it is studied in conjunction with the "Wireless Constructor's Encyclopedia," which will explain clearly any terms with which you are not familiar. For detailed regarding the Reserve you should write to the Under-Secretary of State, Air Ministry (Signals (C.W.R.)), Kingsway, London, W.C.2.

Home-recording

"I was interested in your reply to a correspondent in a recent issue in which you said records could be made quite simply from the wireless broadcasts by using the pick-up. You mentioned two firms who supplied blank records. Will you please give me the full names and addresses of these concerns?" — M. R. (Leeds 7).

The blanks, together with tracking apparatus, and other accessories, may be obtained from the V. G. Manufacturing Company, Ltd., of Gorse Road, North Acton, London, W.3, or from Electrotel Radios, 218, Upper Thames Street, London, E.C.4. The former company issue a neat booklet describing the process and their products, together with some valuable hints. The booklet costs 6d.

Valve Tester

"I am anxious to build a valve tester and would like to make a circuit in one of your back numbers, but this has a 5-pin valve-holder. I have tried to modify this so as to use 5, 7 and 9 pin valves, but am experiencing some difficulty. Could you give me any assistance in this connection?" — H. E. (Ryde).

Although it would be possible to assemble on a test panel a valve-holder of every valve, and to connect all common electrode points together, it may be found that a simpler device could be fitted around a series of adapters. By fitting a 9-pin holder in place of the 5-pin mentioned in your letter, you could obtain a series of adapters for all types, which would go into the 9-pin holder and the appropriate valve could then be inserted into the adapter. Messrs. Bulgin supply suitable adapters at 3s. each.

A.C. or A.C.D.C.?

"I have been given to understand without any specific reason that an A.C. mains receiver is not suitable for use on A.C.D.C. mains to a Universal model A.C.D.C.

RULES

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

(1) supply detailed diagrams of complete multivoltage receivers.
(2) suggest modifications of receivers described in our contemporaneous publications.
(3) suggest alterations or modifications to commercial receivers.
(4) answer queries on the telephone.
(5) grant interviews to quizzers.

A typed or printed envelope must be enclosed for the reply. All sketches and drawings which are sent to us should be marked with the name and address of the sender.

Requests for information cannot be enclosed with queries as they are dealt with by a separate staff.

Read your queries in the Editor, PRACTICAL AND AMATEUR WIRELESS, George Stephenson Building, New Street, London, W.C.2. The coupon must be enclosed with every query.

As I am contemplating purchasing a mains set, I would be grateful if you will be good enough to inform me if this is correct, with any obvious reason?" — W. L. McE. (Ely).

The A.C. model is preferable only because it is possible to obtain a greater output, and in some cases improved efficiency. It is a fact that A.C. may be stepped up, and in a straightforward A.C. receiver the input circuit consists of a transformer from which 30 or 50 volts may be obtained to feed the more efficient A.C. types of valves. In the A.C./D.C. receiver you are restricted to the mains input voltage, less the slight drop across the half-wave rectifier which is usually fitted.

Slow-motion Drive

"I have a rather old set in which the condenser is driven from a pulley on a control spindle, some kind of cord being wrapped round the two. I find, however, that owing to age the cord slips from time to time and erratic tuning is the result. Is there any simple way of overhauling this trouble? If the cord is extremely difficult to get at and is wrapped two or three times round a small pulley behind an escutcheon and dial-light holder, and I think I should have difficulty in fitting on a new one?" — H. D. F. (N.W.5).

The simplest solution would be to dress the cord with some medium which would stick it and at the same time provide a "grip." Ordinary shellac, well diluted with methylated spirit, sometimes proves effective, with some of the paint may be applied by passing the cord through the finger and thumb dressed with this power. You should, however, inspect the pulleys and other points and the cord passes to make certain that no oil or similar matter has been deposited there and is responsible for the trouble.

Repairing Accumulator

"I have a small accumulator in my portable which is apparently leaking and although I have asked several friends, nobody seems to be able to tell me how to repair it. I wonder if you could give me any assistance in this case?" — H. G. (Bromley).

It is not necessary to make quite certain that the cell is actually leaking and that any moisture which you have noticed is due to spray or the effect of fumes from the battery. If you are sure that the cell is leaking, the best plan would be to empty the acid out carefully into a receptacle so that it may be poured back when the repair is completed. Next obtain some distilled water and pour this into the cell, wiping the outside perfectly dry. If the leak is very small evidence may not be forthcoming until some hours have elapsed, but eventually you should be able to trace the hole. Most probably a seam has opened up in the cell, causing the cell to cease. Next obtain a quantity of anyml acetate from the local chemist and dissolve in this some perfectly clean celluloid. Cleaned photographic films are suitable for this. Cut a small square of the material and after brushing the solution round the hole let the water has been poured out and the cell properly dried on the outside) place the square of celluloid over the solution and press firmly in place. Add some more celluloid to the solution until it is thick and creamy and carefully paint round the edges of the patch. The original acid may then be poured back. If the leakage is on the seam it may be possible to repair this merely by wiping some of the solution into the gap and painting the edges for a few minutes after.

Matching Coils

"I have found two old 'matched' coils in my junk box and have endeavoured to use these in a simple set without success. It appears that tuning 'runs out' at the ends of the two scales and I believe this indicates that the coils have become untuned somehow. How could I match them without elaborate apparatus?" — T. S. A. (W.1).

The most likely cause of the trouble is that the coils have become displaced. You should, therefore, carefully move the end turns until the coils are matched again, and this should not prove difficult. If desired, you could be adjusted singly in a simple detector circuit, ascertaining the tuning position of each, making star connections on each side and using both coils so that readings are identical.
DE LAUXE MODEL, 14 to 170 metres, complete Kit with Climate Volls and all parts. 17/6.
NEW 2-VALEU S.W.KIT, 14 to 60 metres, complete Kit with 3 Transistors, 58/6. Metal Cabinet. 3 6/6.- Ideal for Amateur Reception.
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Look in your newspapers and you will be astounded at the large number of vacancies for good travellers. Why? Because a firm can produce saleable articles and yet make no headway—without the all-important traveller, who links them to the customers when they can be persuaded to buy. This book tells you and shows you how to MAKE buyers responsive!

HOW SHALL I WORD IT?
By RONALD M. PHELHAM
The art of correct letter writing for men and women on all occasions. Contains examples of how and what to say in writing a letter on any subject.

STAMP COLLECTING for BEGINNERS
By DOUGLAS B. ARMSTRONG
This book deals with The Lure of the Postage Stamp, Fortunes in Stamps, Rare-Stamp Romances, The Making of the Postage Stamp, First Steps in Philately, Philatelic Terms Defined, etc.

THE HOUSE-OWNER'S GUIDE
By S. A. MAYCOCK
Gives full information on all legal matters concerning house and land purchase, mortgages, garden law and trespass, home insurance, selling a house, property as an investment, etc.

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