WIND DRIVEN CHARGING PLANT

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WIRELESS COILS, CHOKES AND TRANSFORMERS: AND HOW TO MAKE THEM.

Edited by P. J. CAMM.

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Electricity From Wind Power

Although it is proposed to enable everyone in this country to have access to mains power for lighting, heating and other purposes, there are still hundreds of places where no such facilities will be available for a long time. There are also many places in the country where the mains supply cables pass close to houses which are unable to make use of the supply, owing to the fact that the district is not provided with the necessary feed from the main supply. To listeners in these places the problem of battery charging is a serious one, as they may have to travel many miles to the nearest service station, and on this account their hours of listening are seriously curtailed. The question of using a mains receiver to obtain the greater advantages which such a receiver offers is, of course, right out of the running. But in such localities it is possible to obtain power for battery charging, or for operating a mains-type receiver, as well as lighting the house by means of a generator driven through a small windmill device, and in America and Canada such apparatus is very common in the wilder parts. Although we do not get winds in this country at such high levels as on the American continent, sufficient power may be obtained with suitable apparatus to fulfill the purposes mentioned, and we give in this issue some further details of the methods of solving this wind-power problem. Further articles will appear on the subject from time to time.

D.F. Reconstruction and Changes

The Lorenz "blind approach landing" installation at Croydon airport is being reconstructed, and during the period for which this will be out of action (about two months) the beacon which is installed at Heathrow Airport will operate on the Croydon frequency—33.35 mcs for the main beacon and 38 mcs for the inner and outer marker beacons.

Arabic Programme Organiser

The B.B.C. announce that Mr. A. E. H. Paxton has accepted the appointment of Arabic Programme Organiser in the Overseas Department of the Corporation. Mr. Paxton was educated at Eastbourne College and Oxford, where he obtained honours in Oriental languages and gained the James New Scholarship in Arabic. He was English master in Egyptian Government Secondary Schools and afterwards Lecturer in the English Department, Faculty of Arts, at the Fund University (then University of Egypt).

Swiss S.W. Stations

The short-wave station at Schwarzenburg, Switzerland, is carrying out tests on eight different wavelengths—11.70, 13.94, 16.87, 19.60, 25.28, 31.46, 48.60, and 49.55 metres. It is believed that directional aerials are being employed on certain of these wavelengths.

Television and the Cinema

In view of the possibility of television being a definite part of cinema installation in the future, a special series of free instructional courses for cinema projectionists is being given by Baird at a special section of their factory at Sydneyham. Four lecturers will deal with the theory and practice of big-screen television, and at the end of a two-weeks course the students will undergo a test.

New "Discoveries" by Carroll Levis

The name of Carroll Levis, inseparably associated with radio "discoveries," again appears in the B.B.C. variety schedule for July 12th. That night he will introduce to Regional listeners something like a dozen further "finds" that he has made in his unending search for talent. Usually he brings his discoveries to one of the studios at Broadcasting House for their premiere, but on this occasion the broadcast will take place before an audience from the stage of the Palace Theatre, Plymouth.

The programme will be his first from the West Country, and it will be broadcast also on the West wavelength. It will be a surprise show, and the names of the artists will not be revealed in advance.
NEW STATIONS FOR THE NETHERLANDS

In addition to the Lojik transmitter now under construction, a contract has been placed by the Dutch broadcasting organisations for another high-power station. The transmitters will eventually work on 335.9 m. (843 kc/s) and 413.2 m. (726 kc/s) respectively.

"A Rose by Any Other Name"

According to an official announcement made in Germany, the Prague (No. 2) station at Melnik (289.3 m., 1,113 kc/s), is to be known in future as Reichsender Bohmen, and that of Brno (225.4 m. 922 kc/s) as Reichsender Mährer.

ARGENTINE'S FONOPOST

The Ministry of Posts and Telegraphs at Buenos Aires (Argentina Republic) has authorised the establishment of a correspondence service to be known as "Fonopost", by which electrical recordings of verbal communications can be forwarded through the postal system as ordinary mail. The sender registers a message up to 300 words in length through a microphone placed in special kiosks installed in various parts of the city; it is recorded on an unbreakable disc which can be reproduced on any ordinary gramophone instrument. A strong envelope is supplied with the record, the cost of postal being fixed at 1 peso for the Argentine, and slightly more for foreign destinations. If the service proves successful it is proposed to extend it by permitting the sender to secure such recordings through a telephone transmitter in his own home. By this means time would be saved, as the resulting record, duly addressed, would be dispatched direct to its destination by the postal authorities.

More European Stations

The Plan de Montreux allocates the channels 219.0 m. (1,366 kc/s) to the Principality of Monaco, and 186.7 m. (1,510 kc/s) to the Little State of Liechtenstein, both of which propose installing transmitters in the near future.

SEVILLE, 410.4 m. (731 kc/s) ; EAJI, Barcelona, 377.4 m. (795 kc/s) ; EAJJ, Barcelona, 293.5 m. (1,022 kc/s) ; EAJE, Madrid, 269.0 m. (906 kc/s) ; EAJE, San Sebastian, 219.2 m. (1,386 kc/s) ; Burgos, 238.5 m. (1,558 kc/s) ; Albacete, 201.7 m. (1,487 kc/s) ; Santiago, 201.1 m. (1,492 kc/s) ; Alacala and Santander, 200 m. (1,500 kc/s).

THE speech by Lord Halfax at the Annual Dinner of the Royal Institute of International Affairs, which takes place at Grosvenor House, will be broadcast in the National programme on June 29th at 9.15 p.m. Lord Astor, who will introduce Lord Halifax, will also be heard.

Variety from the North

MAY BAMBER, Laurie Howard and his Harmonie Rascals will be the artists of a twenty-minute Variety programme on the North Regional wavelength on Saturday, July 1st.

Radio-telephone Service with Ships at Sea

The Postmaster-General announces that the radio-telephone service with ships on the Atlantic route has been extended, as of Saturday, June 17th, to the new liner Mauretania.

The charge for a person-to-person call will be 30s., for the number of messages sent by or at the ship is within approximately 1,000 miles of Land's End, and 72s. for three minutes at other times; the charges for each additional minute will be 12s. and 24s. respectively.

July Out of Doors

The many enthusiastic followers of Argentine's Fonopost, "Fono Post," by which electrical recordings of verbal communications can be forwarded in such a likeable manner on out-of-doors subjects, will be glad to know that he will soon be at the microphone again. "July Out of Doors" is the subject for his talk on the Northern wavelength on Monday evening, July 3rd.

"New Brighton Night"

Victor Smythe is putting on a "New Brighton Night," on July 6th, with broadcasts from the resort's Tower Ballroom, where the Playboys Dance Band will be busy; from Frank A. Terry's show; "Pleasure on Parade," at the Floral Pavilion; and from the variety bill at the Tivoli Theatre.

Brass Band from the North-east

Of the best of the many good miners' brass bands in the North-east, the Ravenworth Colliery Band is to broadcast from the Newcastle-on-Tyne studios on Sunday afternoon, July 2nd. Before it was taken over by the local (Ravensworth, Co. Durham) miners' lodge in 1933 this was known as the Birtleby Brass Band. Through the board, the band is very well supported by the colliers of the Anne and Betty Pits, who pay a weekly levy to it.

SOLVE THIS!

Problem No. 354

Matthews had an A/C/D/I receiver which gave very good results and which he used on his A/C supply. He changed his address to a district which was supplied with D/C and when he connected his receiver to the supply he could obtain no signals. He thought that it had been damaged in transit and returned it to the makers, but it was sent back marked O.K. He tried it again but could still obtain nothing on it. What was wrong? Three books will be awarded for the first three correct solutions submitted. Entries should be addressed to The Editor, PRACTICAL AND AMATEUR WIRELESS, Geo. Newnes, Ltd., Tower House, Southampton Street, London, W.C.2. Any entry which is not marked Problem No. 354 in the top left corner and must be posted to reach this office not later than the first post on Monday, July 6th, 1939.

Solution to Problem 353

The wire which Jackson found in his spares box was copper wire and thus the coil which he wound for his wave-trap was heavily damped and the tuning was impossible with very flat. This accounted for its failure to function in the recognised manner.

The following three readers have successfully solved Problem No. 352 and books have accordingly been forwarded to them:

H. V. Kerrick-Walker, 50, Holywell Avenue, Monmouthshire; C. W. R. Northumberland, 1, Stuart, 72, Dean Road, Liverpool, 7; H. G. Reed, 298, Malden Road, Texas, Surrey.
Further Notes on the Construction of Windmills for Driving Generators for Accumulator Charging or Receiver Operation

The interest being shown in the design of wind-operated chargers, it seems advisable to publish some more ideas that have been put forward by various readers in connection with this subject. As already explained in these pages, the basic idea is to erect a mast upon which an ordinary car generator may be mounted, and this is operated through gearing from a small windmill device. There are thus three main problems—the design of the windmill, the method of driving, and the method of mounting so that the windmill may always face into the wind. The generator is a standard device but is available in many different patterns. One of the simplest ideas is to pay a visit to a car-breaker's yard, where generators may be picked up from 10s. upwards. The same yard will also be able to supply gearing suitable for connection between generator and windmill. With regard to the generator, the 12-volt type should be selected and if possible the appropriate cut-out should be obtained at the same time. In some cases readers who have tried out the device find that if a 6-volt cut-out is to be preferred. From details which have been submitted by various readers the following data may be summarised.

### Windmills

The best form of drive is undoubtedly a large aeroplane type propeller, but this is expensive and, unfortunately, Government surplus of this type is not now readily available. A good carpenter could make up a suitable prop, and a length of about 3ft. to 4ft. for each blade is most satisfactory. If you wish to make a really reliable propeller for yourself one of the best plans is to make it in laminated form, obtaining 1in. boards 6in. wide by 6ft. in length. These should be thoroughly cleaned and glued together, afterwards drilling at various intervals and pinning with short pins made from 3in. dowel rod. The assembly should be put under firm pressure whilst the glue hardens. The blades should then be marked out and carved, checking the pitch and cross-section at intervals, and to ensure both halves being properly matched templates should be cut for the various sections from stout sheet metal. The work is tedious but a good job can be made with the exercise of a little patience, and when approaching the propeller should be carefully balanced by driving the centre and placing on a spindle locked to the workbench. Perfect balance is, of course, essential to avoid vibration and, if necessary, a deflection should be introduced in the lightest breeze. A simpler windmill can be made from sheet metal cut to a number of small blades, bolted to a disc of metal as indicated in the sketch. Constructional details at the end of this article, and as illustrated in Fig. 2.

### Gearing

The next problem is the drive between propeller and generator. The standard timekeeper may be obtained with usual gears having a ratio of 2 to 1 and these are quite useful. The only difficulty is that of providing lubrication and an enclosed oil-bath may be difficult to arrange. This may be overcome by using bicycle gearing and chain, either the standard chain-wheel and rear sprocket, or two rear sprockets being employed, according to the gear ratio needed. When using a chain drive the tension may be easily adjusted, the best method being to mount the generator on a sliding bracket. From some metal yards it may be possible to obtain larger gear wheels, but a useful limit may be set by the weight of the entire assembly.

### Electrical Connections

The next and most important point is that of obtaining the electrical pick-up from the generator. As the head of the device must turn in the wind it is obvious that a wiping contact must be used as the head must be free to rotate continuously in every direction. A slip ring is one way of arranging for the contacts, using spring-loaded brushes for contact, but they must be totally enclosed to protect from dirt and water. Rings of copper or brass, with copper gauze or carbon brushes, are obtainable for standard electrical purposes and may be tuned to accord with this. They should be mounted horizontally and well greased and enclosed in a weatherproof box. The leads should be taken through weatherproof conduit or weatherproof covered wire and the cut-out should be mounted on the mast or as near to the unit as possible.

### The Mast

For a support either a built-up lattice or a metal tubular structure may be used. In either case, as the unit has to be free from movement it may be used to support a standard small bore electrical conduit is suitable for the purpose, and by using the 1-in. material for the main support, this may be dropped inside the larger diameter material and will give a free movement. One interesting suggestion which has been made is to cap the lower end of this large diameter tube and place inside three large ball bearings. These could be of such a size that they nearly touch in the centre, and then when a fourth ball is dropped in it will ride on the other three, and thus by placing a disc, or segment of the small tube and dropping this in it will turn freely on the top ball. Furthermore, it will then be possible to take out one of the electrical circuit from this, provided that the balls are a good fit.

To keep the unit into wind a tail must be employed, and again standard small bore electrical conduit or gas piping may be used to support this. Screwed joints enable it to be locked to the main part of the arrangement, and it may be seen through for part of its length with a hasp and staple, that the metal may be locked to the rod and then bolted in position. Weight is not necessary in this position, but as large a wind-deflecting area as possible should be obtained. It may then be leaned back, the tail being made of about 12 or 18 in. should be sufficient, and it should be about 2 to 3ft. behind the pivotal point. It is obviously impossible to deal with all the points of construction in one general article, but it is hoped that the foregoing remarks will assist those who wish to undertake experiments in connection with this type of apparatus, and in the meantime we are preparing constructional details of a definite design which will be published due course. In the meantime the following are the main details of one such unit which has been made up by one of our readers, and he claims that this is giving very good results.

In this case the fans are made from zinc sheeting, fastened to an old fan taken from a motor lorry. This is of the ball-bearing type, and an old fan bears a 12-volt arm dynamo. On the rear of the fan is a large sprocket wheel with 106 teeth, and this is cut from a sheet of boiler plate, with four large holes in it to reduce weight. It is bolted to the fan, and ad

(Continued on next page)
WIND-DRIVEN CHARGING PLANTS
(Continued from previous page)

It does on a 5 amp. load. Although the fan may appear rather large and with too many blades, it does not turn as fast as one would imagine. An important point to be remembered is that a 6-volt cut-out must be used, and not a 12-volt one, as is generally employed with a 12-volt dynamo.

It is important to remember that if the unit is mounted at a distance from a house, then very heavy gauge wire must be employed for connecting to the receiver or accumulator to avoid loss in the connections. For normal charging purposes, of course, a shed may be in a convenient position and will avoid this difficulty, but even so, good heavy flex should be utilized for the connections in the apparatus so that full advantage may be taken of the maximum output.

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The terms Class A, B and C are so closely allied to P.A. stages, L. O. SPARKS explains the main features of each system.

Forms of Amplification

So far as this article is concerned we will assume that the various forms or types of amplifying circuits suitable for the work under consideration can be divided into three distinct classes. These are Class A, Class B, and Class C. The most common of these is Class A, and a thorough understanding of the operation of a valve or valves when working under these conditions can be obtained from the curves shown in Fig. 1. The small curve G represents the input signal and by projecting it on the vertical lines A and B it will be seen that it affects only the straight part of the characteristic curve C. To the right of this point will be seen another curve which, if its wave form is examined it will be found to be an identical though magnified reproduction of the input signal curve G.

To obtain this faithful reproduction it is essential for definite operating conditions to exist, and as these are invariably supplied by the makers of the valve, it is not difficult to obtain satisfactory amplification under such conditions. The main requirements are correct anode and bias voltages and an appreciation of the power-handling capabilities of the valve in use.

For the purpose of enabling Class A amplification to be compared with the other types to be described, it should be noticed that the plate current is, for practical purposes, constant irrespective of whether an input signal is applied or not. Another point to observe is that the grid is never driven into a positive state or so far that it reaches the "cut-off" point of the plate current. This point is indicated on the diagram.

Class B

A striking example of the difference between Class A and Class B can be obtained by comparing Fig. 1 with Fig. 2. The latter shows that the input signal G is no longer applied to the straight portion of the characteristic curve C, but to a point quite close to the "cut-off" point. This condition is produced by biasing the valve to such an extent that hardly any anode current flows (Continued on page 330).
Signal Strength Measurements

How to Fit Various Forms of 'R' Indicators to Standard Types of Superhet Receivers

By W. J. DELANEY

The amateur transmitter needs for his work a standard by means of which reports may be made concerning amateur signals which he picks up. At present these reports are given in "R" values, from R1 to R9, and there is no standardisation. It is usual to give R9 as an indication that the signals are only just audible, and R9 for those signals which are heard at full loudspeaker strength, but on most receivers it is not a simple matter to differentiate between an R8 and an R9 signal, and it may often be found that one transmission is very much louder than another, but the interval between switching over from transmitting to receiving may result in a difficulty in judging any slight difference in the strength of the received signal. Unfortunately, many amateurs use only simple types of receiver, or commercial receivers which are not provided with a calibrated dial, meter, or other control, and this is just what is needed to control the indicator, and therefore to obtain an exact comparison between signals. At all that is required is a dial to the control and with a pointer knob on it we may mark off settings indicating the R values from 1 to 9. For this purpose a very weak station should be tuned in, and this should be one which just causes the shaded area to close, as distinct from a station which is so weak that it does not move the indicator on your particular receiver. In this position, of course, the H.F. gain control will have to be set at minimum. A point should be indicated on the gain control dial to be afterwards marked R1. Now tune in a very powerful signal, one which you will designate R9, as distinct from an R9 plus signal. This should, preferably be one which, with the H.F. gain control at minimum, just gives the same amount of movement to the shaded area of the indicator as was obtained by the R1 signal. This point on the gain control dial must be marked R9.

The intervening space between R1 and R9 may now be divided to indicate the intermediate values, and a logarithmic sub-division is the one to be preferred to an equal division. Small indications should be made on the panel to show the exact boundaries of the shaded area on the tuning indicator and thereafter when ascertaining a signal level all that is necessary is to adjust the H.F. gain control so that the edge of the shaded area coincides with the panel marks and the pointer of the gain control will show directly the R value. In some circuits it may be necessary to switch off the A.V.C. when making signal measurements. Although the R values as given by this arrangement will not agree with another listener's values, your own measurements will be standardised and therefore when working a station you will be able to give your indications of changes in volume which may be effected by any changes made by the transmitter, or by variations in local conditions.

Current Meters

An anode current meter may also be calibrated for use as a signal meter, but in some circuits the meter will give a steady reading which will fall back towards zero when a station is tuned in. The meter may be in the anode or cathode circuit of a controlled valve, or of the second detector in a superhet. A low reading meter is needed and in some circuits it may be necessary to shunt the meter with a variable resistance which may be adjusted for a "zero" setting and which may be calibrated as in the case already cited. A better arrangement is to connect the meter so that it forms part of the screen supply of the I.F. stage (the last if there are two or more). In this case a rather complicated network is called for so that a standard bridge circuit is formed, one variable element being included so that the meter may be balanced. The screen-cathode resistance of the valve forms the variable factor in the bridge and thus, by balancing it in the "no signal" condition by the variable resistance, a true indication of signal strength may be obtained on the meter.

The arrangement may be seen more clearly on reference to Fig. 2, which shows the essentials of the meter circuit. A potential divider is used to obtain the screen voltage, and as this may serve more than one valve a decoupling resistance must be included (R3). The bridge is formed by this network of resistances, and internal valve resistance as already mentioned, and the balancing resistance should be about 1,000 ohms.

Precautions

With all those forms of signal measurements there are two or three points to be borne in mind. Firstly, if A.V.C. is fitted it may or may not be necessary to switch this off when making measurements, and therefore before giving a report of signal strength the A.V.C. control should be operated so that reports are standardised. Similarly, if there is a B.F.O. unit this should be switched off, as it will not be used for telephony reception, and for C.W. there may be a movement of the signal indicator due to its attempting to indicate carrier level. Therefore, reports must be made with a steady carrier (without signals), or alternatively some special form of meter may have to be adopted, combining an input sensitive voltmeter with an accurate output A.F. meter.

PRACTICAL MECHANICS HANDBOOK

By F. J. CAMM.

400 pages, 6/- or 6/6 by post from GEORGE NEWNES, LTD., Tower House, Southwark Street, Strand, W.C.2.
Is He Fey?

We often use the expression that people talk through their hat, but have you ever considered the possibility that they may be able to listen through it? The following letter seems to suggest that someone is either talking or listening through a hat, or else the person concerned is fey—which doesn’t mean that he is a fairy but gifted with some occult power. This is the letter I have received: "I am writing to you in the hope of getting your assistance and advice in a very queer yet pressing case that I have to name them. A medical practitioner is able to hear wireless signals from outside without the aid of any apparatus whatsoever. He has been suspected of suffering from hallucinations, but careful medical observations refute this charge. As I am the only amateur in the town, I have been approached by him to solve the mystery. I remember reading on occasions some such cases reported, and I should be much obliged if you could inform me of any literature on this subject or any tests which I can apply."

I cannot trace any literature on this subject, nor do I believe that any person can receive wireless signals without apparatus, otherwise he would be suffering noises in the head, reminiscent of the Tower of Babel, all day long and all night. I suspect a catch somewhere. An easy test would be to have the person concerned thoroughly examined to make sure that there was no apparatus secreted upon him, and then to put him in a room out of earshot of any wireless programme radiated by a wireless set, and to have another individual in another room receiving a programme from a foreign station, preferably one whose programme has not been announced. This assistant should make a note of the items, and then ask the faery one to name them. I am certain that he will not be able to answer such a test. There are still people who would believe in the impossible, and who think that in future instead of buying a wireless set we shall only have to take a dose of ether—the right type of ether, of course—in order to be able to pick up the world’s wireless programmes. I dismiss the suggestion with contempt.

Wireless Licences

The Post Office issued 455,174 wireless receiving licences during May, this figure representing a net increase of 21,644 in the number of licence holders during the month, after making allowance for expired licences and renewals. The approximate total number of licences in force at the end of May, 1939, was 8,984,250, as compared with 8,927,850 at the end of May, 1938, an increase during the year of 356,390. During the month there were 536 successful wireless prosecutions.

Radiolympia Suggestion

One of our keen members of the B.L.D.L.C. makes the suggestion that it would be a good idea if various members of the B.L.D.L.C. got together a Radiolympia party and visited the Show. They could then fix up future meetings, have a dinner at Radiolympia and invite the Editor or Thermion to be present. If any B.L.D.L.C. reader is interested in the suggestion I shall be glad to act as compere.

Wireless Dens

A PROPOS my remarks recently concerning wireless dens, H. S. (Bradford) writes me as follows: "You made a remark, 'fitted with wire and apparatus.' Never O.M.; the true fan takes a pride in his experiment den." He also encloses a photograph of his den, which I reproduce on this page.

Mr. Gerald Cock on Television Prospects

MR. GERALD COCK, B.B.C. Director of Television, who has just returned from a visit to the U.S.A. where he has been inspecting the progress of television there, addressing a gathering of the Radio Manufacturers' Association recently said: "England still leads the world in television, but American interests are watching us." The National Broadcasting Company, Columbia, the Film Industry, the New Deal itself, all these organisations with their vast resources are waiting to take up television at the point to which we have brought it. It behoves this country to move forward in the television field at such a pace that we still continue to maintain our lead.

"If only this country will go on developing television, the rest of the world will come to us for television equipment, not only for receivers, but for the transmission equipment itself. In every country of the world, except England, television is in the experimental stage. In this country, it is already a practical proposition."

"We know we have a three-years lead on the others. It is up to us to maintain this lead while offering the results of our experience to other nations with the object of helping them to enjoy the facilities we already possess."
the Television Development Sub-Committee of the R.M.A., said that the sooner the whole of the people of Britain were given the facilities of receiving television, the more certain we should be of providing a new market for British export and a new source of employment for British labour.

The Radio Industry in this country has expended vast sums of money in bringing television to its present state of perfection. The officials of Alexandra Palace had always done their best to co-operate in this work. It was now up to the Government and the Post Office in particular, to assist in enabling the Radio Industry to reap the reward of its labours in providing the facilities for Provincial transmission.

Ammuricanese

A HUNDRED per cent. Tough Guy Ammurican from Chicago, replies to "Thermion's" criticism of American "English."

"TOUGH GUY"

Hoo! So ya won't talk Ammurican, hey? Well, listen to this story. Jeu cua ovah here to Ammurica, An' we'll put ya on de spot.

Caise ya can't pull dat stuff on us, Buddy, Fer de English we talks in "O.K.," An' Ah guess, when it comes to talkin', De Lineys is beat any day.

Caise de hanner per cent. Ammurican, He sure can spill de beans;

He can talk all round de clock, brother, An' say things in between!

Waall, maybe yer up in raddio, Okey-Dokey, yer second name, Although it'll 'ole England.

As "Thermion" yer known ter fame.

But ya gotta get dis, ole timer,

If ya wanna come out on top.

Ya mus' learn Ammuricanese, bo,

Caise dat language ain't gonna stop.

Dead on da snoozle it gets ye,

An' Ain't nothin' a gold-darn bug.

Don't yer B.B.C. give lessons

When de songs dey starts ta plug?

Don't dat bring home da bacon.

An' de British public please?

Dat puts yer in big money

When ya writes in Ammurianese,

When yer jays on yer "gun" keeps a-workin',

An' dey sees ya's a poker face,

Dey knows yer ain't never yaller;

An' der's more . . .

"Thermion: Sure! But dey ain't no space!" "TORCH."

Television Features

IT is interesting to note that television programmes are becoming more and more entertaining. For instance, Ruth Draper, the famous American discus, will perform selections from her repertoire before the television camera at Alexandra Palace in the afternoon and evening programmes early in July. It is believed that Miss Draper's unique art will be specially suited to the television medium as much of the action can be performed in close-up. Accustomed as she is to holding the stage by herself, and yet taking the parts of many people in a single sketch, she will be able to concentrate on the cameras to a degree that is rarely possible in the more normal television performance in which a number of actors are engaged.

Ruth Draper will appear for a quarter of an hour in the afternoon, and half an hour in the evening. Television production will be by Eric Crozier.

"Fiat Justitia"

DESMOND DAVIS, the television producer, set a new fashion with "O Mistress Mine," a series of famous love scenes which were televised last January. On July 1st, a new motif—Justice—will be the main-spring of a programme, entitled "Fiat Justitia," in which excerpts will be taken from Shakespeare's "Much Ado About Nothing," A. P. Herbert's "Misleading Cases," Galsworthy's "The Silver Box," and Elmer Rice's "Judgment Day."

Interspersed will be excerpts from the Trial Scene in "Alice in Wonderland." The cast includes D. A. Clarke Smith, Jessica Tandy, Barbara Nixon, Alan Wheatley, and Newton Blick.

"Me and My Girl": July 17th.

B.B.C. television cameras will pay a return visit to the Victoria Palace—the home of the "Launabth Walk"—on the evening of July 17th, to bring viewers another performance of "Me and My Girl," and thus repeat one of the most successful experiments—judged by viewers' letters—yet carried out in televising direct from a theatre.

"Me and My Girl" was first televised from Victoria Palace on May 1st. Since then Lupino Lane has fallen into the orchestra more than eighty times. He has never missed a performance. Altogether, he has made over a thousand appearances. The cast includes George Graves, Toddie St. Denis, Doris Rogers, and Betty Frankis.

Victoria Palace is conveniently situated for television. Just outside the main entrance, a special television cable, which encircles the West End of London, and gives direct communication, via Broadcasting House, with the transmitter at Alexandra Palace.
**Short-Wave Section**

**An Experimental Three-valve S.W. Receiver**

In this article, A.W. Mann describes the construction of a choke-capacity coupled three-valve S.W. Receiver.

**Headphone** type short-wave receivers are preferred by a large number of short-wave enthusiasts, and whilst this type of receiver can be built at low cost, it is not the chief consideration.

Given a suitable receiver and a pair of headphones, weak carriers which would in many instances be missed by the loud-speaker type receivers can be resolved into strong signals, due to the fact that the ratio of signal to background noise is high.

There are various types of circuit from which to choose, and one of the most popular is the regenerative detector, followed by a one or two-stage L.F. amplifier.

When a two-stage receiver (detector, L.F. combination using R.B.C. or parallel fed transformer coupling) is used, it is not difficult to obtain a satisfactory signal to noise ratio.

Cautions, however, is necessary when two stages of low-frequency amplification are to be used, as much depends on the combination chosen. For example, quite apart from considerations of stability, the use of two L.F. transformers for head- phone type receivers is undesirable, due to the higher noise ratio which would result in the obliteration of weak carriers, and thus offset the advantages of the increased volume step up, apart from the fact that loud-speaker reception of the more powerful transmissions would be possible with increased volume.

For the above reasons, and in the interests of stability, the most satisfactory combination is to use resistance-fed transformer and R.C.C. combinations.

The writer has been using a receiver in permanent form for a period of about two years, and later replaces it with another which is of a different type.

**Phone and C.W. Reception**

As a permanent receiver was required for amateur telephone and C.W. reception, in addition to short-wave broadcast reception, and which could be used as a basis of comparison when experimental receivers were on test, it was decided to consider the impossible to receive anything below 15 due to the high ratio of background noise, and to overcome this, in the choice of circuit the signal to noise ratio was one of the primary considerations, together with average sensitivity, selectivity and ease of operation.

It was therefore decided to rule out the use of L.F. transformer coupling in favour of R.B.C. This being, however, to meet a favourite type of quality circuit as used years ago for R.B.C. reception, which, so far as the writer is aware, has received but little if any consideration from the short-wave fraternity. I refer to choke-capacity coupling.

As suitable components were to hand it was decided to carry out a series of experiments with a view to designing a headphones-type receiver of the 4x2 type capable of providing good quality reproduction with a high ratio of signal to noise.

**Circuit Details**

The first essential was a suitable circuit which, if necessary, could be modified or improved. The original circuit, as shown in Fig. 1, was used as the basis of experiments on test proved so satisfactory as to require neither modification nor attention.

It is a straightforward arrangement consisting of a regenerative detector followed by two stages of L.F. choke-capacity coupling. Standard four-pin coils are used, and two aerial input arrangements are specified, which will be dealt with later. L.F. choke output is also specified, and the result is a good all round and stable receiver.

Congested bands call for careful tuning, and bandspread is nowadays a necessity, rather than a refinement. Before going further, a few remarks with reference to the various choices used in the receiver will perhaps remove the possibility of snags being experienced by experimenters.

**H.F. and L.F. Chokes**

In the plate circuit of the detector valve we have an L.F. choke. As the coverage of the receiver, i.e., the tuning range, includes the 10-metre band, also the 120- metre band, together with trawler 'phone bands, the L.F. choke should be of the type which has a guaranteed range through which it will function of from 5 to 170 metres.

(Continued on next page)
SHORT-WAVE SECTION (370)

This advice should not be ignored, as it is most desirable, for obvious reasons, to avoid peaking due to choke resonance within the specified tuning range.

To match the L.F. choke is the first L.F. choke, which is, of course, an iron-core type of similar construction to the original choke, but with different characteristics. The same type is used in the first L.F. plate circuit and is of 100 henries, whilst a 32 henries output choke is used in the final stage.

It will be noted that in the theoretical circuit, Fig. 1, the cores are shown earthed to the chassis. As the original ones used by the writer were of the metal case type, earthing was carried out by means of a fixing bolt which made sound electrical and mechanical contact with clean metal and the chassis foil, respectively.

Where bakelite case L.F. chokes are used, the earth is carried out by a separate terminal provided for the purpose. In addition, the individual chokes are arranged so that the fields will not produce interaction being mounted at ninety degrees to one another.

The well-tried parallel method band-spreading is used, and has much to recommend it, and whilst the band-spread condenser is of 15 mfd. capacity, this may be varied according to the amount of spread desired by the individual.

A spread of 80 degrees on the 40-metre band, which is what the writer considers should be less than the full dial scale in order to include the commercial marker stations at each end of the band.

Layout of Components

Passing to Fig. 2, we have the general layout of the component parts. Insufficient ceramic low-loss type valveholders are to hand, these should be used: If not, the detector valveholder and coil base should be of the low-loss type.

The layout, as shown, is a very satisfactory one, and the original receiver is built on a foil-lined wooden chassis, and totally enclosed in a steel cabinet complete with steel panel.

The band-spread, reaction control, and on-off switch are mounted on the front panel, whilst the band-setter is mounted on the left-hand side of the cabinet.

In the writer's instances the receiver has used this arrangement for a number of years, and provided that the band-setter is fitted with a slow-motion dial, as in the case of bandspread and reaction condensers, the receiver will prove very easy to operate.

The Eddystone bandspread kit could be used to advantage in a receiver of this type, although not used by the writer. In any case, once the use of the controls have been mastered and the various band-settings have been noted, operation will not raise any difficulty, and the general scheme will be found to reduce wiring to the minimum.

It is general practice where a metal panel is used to omit the lead coupling the moving vanes of the band-setter and spreading condenser, and depend on the direct contact with the metal panel.

As modern receivers are capable of working down to 10 metres without modification, as in this instance, the writer does not recommend this practice, and strongly advises that the two condensers be wired in parallel, as would be the case if a metal panel were used, and in the H.F. circuit to any voltage amplification in the case of the L.F. transformer. Consequently, we depend for amplification on the valves themselves.

In the writer's opinion choke-capacity cutting out crowling effects, etc. This the Tokio, and the Metropolis of Japan and capital of the Land of the Rising Sun.

The broadcast programme is one of the most popular of its kind in the world, and is heard by millions of people every day. The broadcasts are made by the Japanese Government, and are transmitted by the Tokyo Broadcasting Station, which is located on the coast of Japan.

Leaves from a Short-wave Log

(1.26 m.c.s.) The call letters are CWS. Broadcasts are only made on Saturdays, Tuesdays and Thursdays from B.S.T. 22.00-23.00.

Japan Assumes a Title

The broadcasts destined to overseas listeners the Tokyo (Japan) transmitter gives out that "This is the Tokyo, the Metropolis of Japan and capital of the Land of the Rising Sun."

From the Land of Coffee Trees

TJXRF, Heredia (Costa Rica), on 30.95 m. (0.69 m.c.s.), usually opens its broadcasts with a bugle call, followed by the announcement in Spanish and English to the effect that the transmission emanates from La Voz del Comercio (The Voice of Commerce), installed at Heredia in the city of flowers "in the Land of Coffee Trees" (Costa Rica). Its signals are well heard between B.S.T. 02.00-03.00, when, as a rule, a special concert is given for North American listeners. The programme closes down with the playing of the "March of the Toy Soldier."
**Variable-Pitch Audio Oscillator**

**Constructional Details are Here Given of a Serviceable Instrument for the Experimenter**

It is particularly desirable in an audio installation used for practising the Hisst code to provide means for pre-setting and adjusting the frequency pitch, so that the keying signal may be matched, when required, with a signal obtained, say, from a tape sender, gramophone record, or actual transmission.

Various methods of frequency modulation are possible, and depend on the type of circuit used for the permissible range under given values of H.T., and the characteristics of the L.F. valve employed.

Each circuit, however, is, of course, governed by the resonant characteristics of the tuned circuit provided by the usual parallel condenser (C2), and the ability of the valve to oscillate over the desired frequency range depends finally on the leaky-grid constants.

After carrying out a number of experiments to determine the most suitable circuit giving a wide variety of uses, the theoretical diagram in Fig. 1 shows the final choice, in which an L.F. pentode of average impedances is employed.

As the anode current of the valve is derived through the medium of the tone-control choke, it will be apparent that variations in H.T. will influence the inductance of the choke, and whereas this condition would normally be undesirable, advantage is taken of it in this instance in the form of a "vernier" pitch control, separate to that of the five-position pitch-control switch.

The volume control circuit constitutes a potentiometer across the 'phones, but whilst this is connected through the medium of the screen-grid, the potential difference and ultimate variation in the screen-grid current will not noticeably alter the frequency pitch from minimum to maximum position of the volume control, as would be the case if this arrangement were included in some form in the anode circuit other than by filter feed.

For Morse practice it may be that the operator requires a signal which will only be audible to the user of the headphones, so that any disinterested party in the same room will not be distracted, or, again, it may be that there are insufficient pairs of headphones to go round when more than one person is using the apparatus, and in each case it is only necessary to adjust the H.T.

In the former instance, the minimum H.T. supply on which the set will operate is only 7.5 volts, with the pitch control set on the .5H tapping (the control to the extreme left), this providing a very pleasing signal of the switch it is necessary to insulate the bush from the front panel by fibre-embossed washers (W), these washers also serving to securely hold the switch which, having a strong rotary contact action, may tend to work loose after considerable use.

The phone jack also will require insulating from the front panel (W), and for both fittings fibre-embossed washers can be obtained from Bulgin and Co., with a component order. The key jack is common to the chassis.

**Constructional Details**

The construction of the oscillator is quite simple and along conventional lines, the chassis being of 16-gauge aluminium throughout.

Figs. 2 and 3 show the chassis and front panel arrangements, and all drillings not otherwise indicated should be made with a 11⁄64 in. drill. It will be noticed that the front chassis runner, to which is fitted the front panel, is 11⁄32 in. deep, as against the 11⁄32 in. depth of the rear chassis runner; this is simply to permit the flush mounting of the completed set in a box cabinet, as adopted by the writer, and the front panel width, therefore, exceeds that of the chassis by 11⁄32 in. on each side, the thickness of the wool box being 11⁄32 in. throughout.

This method of housing can, of course, be varied to suit individual conditions.

When mounting the components, 6BA bolts should be used, underneath which should be included shakeproof washers for rigidity, and the front panel controls, particularly the five-point pitch-control switch, should be firmly fixed; in the case (continued on next page)
For preference, the majority of the wiring should be carried out with tinned copper wire in the form of stranded wire. All wiring as the wiring is carried out, this provides a clean and durable job.

As the above chassis view of the wiring gives a slightly complicated aspect, it will possibly help beginners here if this is detailed as follows.

The coloured leads should be attempted first of all, the position of this component will have been checked when mounting so that the red and black leads are to the right, shown on this page.

The coloured leads should be carefully chosen and soldered to their respective points on the pitch-control switch, this giving an increase in inductance from left to right, looking at the front of the oscillator.

'Phone Jack and Volume Control

With the potentiometer contacts at the top, as shown, the left-hand side contact and the centre contact only are used, these being wired directly to the two jack contacts immediately underneath the potentiometer. A wire should then be taken from the centre contact of the potentiometer to the wiper-arm contact of the five-position switch.

One side only of the key jack 12 is wired, and this is taken through hole No. 6, using flex, out through the grummet hole in the rear chassis runner (Fig. 5), terminating in a wander plug for H.T. negative. The H.T. positive flex passes through hole No. 5 and is connected to the jack contact which is common to the potentiometer centre contact and wiper wire; the other wire from the jack (sleeve) passing through this hole goes to the screen-grid socket of the valve-holder (S.G.).

The on/off toggle switch is connected to one filament socket of the valve and passed through the other grummet hole to the L.T. positive wander plug, the leads from this switch passing through No. 4 hole in the chassis.

Also from this filament socket is taken a lead through hole No. 3 to one side of the 2W. 5 starter pilot bulb holder, the other side being commoned to chassis by soldering a bare copper wire to the panel-fitting bush nut. The rest of the wiring is clearly illustrated, and if care is taken in the soldering, a lasting job will result.

There is one other point concerning the wiring, and this is with regard to the red and black leads from the choke, which pass through holes 1 and 2. To prevent these frail leads wearing against the edges of the holes, a short length of tinned wire should be worked over these wires also.

A little experimenting will soon acquaint the operator to the use of the instrument, and the many tests purposes which can be fulfilled by this simple audio oscillator will make its construction well worth while.

For example, it may be found particularly useful as a capacity-fid oscillator adapter for measurement purposes in connection with the design or servicing of audio amplifiers, or again by the easy expedient of fitting a couple of test probes in place of the stereo key, a useful continuity tester will be provided, due regard being, of course, given to the question of H.T. voltage used in this instance.

With regard to the ultimate finish of the job so far as a suitable cabinet or box is concerned, fixing holes are not included in the diagram, as this is an optional feature, but this should be determined beforehand so that the panel or chassis can be drilled appropriately before the components are mounted.

The Bulgin 1P.7 dial plate is recommended for the volume control, but as there is not available an undesignated five-position dial plate suitable for the pitch-control, it is suggested that (and as adopted by the writer) a white card disc be cut and marked off in increments of 30° for the switch location.

Finally, there is one further consideration with regard to the on/off toggle switch. If desired, the L.T. switching can be carried out through a combined potentiometer and switch movement, but as it is often desirable to leave the volume control set at any pitch control set at any purpose, this is only possible by utilizing a separate on/off switch as adopted herein.

WIRING DIAGRAM

**LIST OF COMPONENTS FOR VARIABLE-PITCH AUDIO OSCILLATOR**

- Condensers (fixed): Two type 4601 S.01 mfd. (Polycarbonate N.S.E.)
- Potentiometer: One type En. Racib (V.4)
- Resistors (fixed): One 100,000 ohm ½, W. (Omega)
- Tone-Control Choke: One type L.F. 43 (Bulgin)
- Jacks: Two type J.2 (Bulgin)
- Pilot Light: One type P.18 (Bulgin)
- Pilot Light Bulb: One type B.206 (Bulgin)
- Rotary Stud Switch: One type S.519, with two fibre-embossed washers, type 1935 (Bulgin)
- Wiper Switch: One type S.40T (Bulgin)
- Warder Plugs and Spades: Two No. 14 spades and two lugs (Clix)
- Warden Plugs gold 'H.T. — H.T. — Clix)
- Warden Knobs: Two No. K.92 (Bulgin)
- Dials: One type 1P.7 (Bulgin)
- Bulbs: One type V.177 (Tungsten) (Clix)
- Valve: One type P.31L.E. pentode (Tungsten)
- Chassis: Petco-Scan
- Miscellaneous: 6A.R.38, 1.5. brass bolts and lugs (Bulgin)
- Shakerproof washers (Bulgin)
- 18 S.W.G. T.C. wire (Bulgin)
- Soldering, Flex.
A Motor-driven Coil-winder

BECOMING tired of the slow hand winding of solenoid coils, etc., I devised an automatic winder, driven by a small electric motor, as shown in the accompanying illustration. Most of the parts were discovered in my "oddmens" box. The supports are of 7-gauge brass, bent "U" shaped. The former-holder support is mounted on a plywood baseboard, together with the driving motor, the base being fixed to the baseboard proper by means of slotted holes, enabling the disc J to be moved along W2 so altering the speed of guide G to suit various gauges of wire and diameters of formers. It will be observed that in the former-holder the metal above the shaft holes is cut away so that the shaft can be lifted direct from the support. The disc J is made to press firmly on to W2 and locked there by the grub screw G2; to mount a former the disc, cone-nut and cone are removed, after, of course, lifting the shaft from its support. The former is then placed over the shaft and the cone, cone-nut and disc replaced, tightening the former by means of the cone-nut. The wire-guide G consists of a piece of large gauge wire, twisted to form an eye, soldered to a large nut. To prevent G turning with its shaft a groove is filed in the nut to take runner H (shown in dotted lines). The guide-shaft support extends above the shaft holes to allow the fixing of the contacts slide, which is made up of two copper channels soldered to the support. Two pieces of ebonite are cut to slide between the channels, at a tight fit. A piece of thin springy brass is mounted on each piece of ebonite, cut and bent so that the springy brass does not touch the channel except when the wire being wound is brought against it by the movement of G. The movement of G is controlled by the electro-magnet engaging and disengaging W1 and W2, the magnet being operated by the closing of E and F—Frank Murphy (Darlington).

Station-locating Movement

WITH a long ebonite former, or rod, obtained from an obsolete wave-change switch, and some heavy gauge galvanised iron wire I have constructed a novel station-locating movement, as shown in the accompanying illustration. The existing holes in the ends of the ebonite "cam" were first of all increased in diameter and depth, to take two short lengths of tin-shafting for the condenser and drive coupling, and end bearings.

Three positions of the tuning condenser were required, so after bending and clamping down three wire spring assemblies, with a common strip of reasonably heavy gauge brass, as shown, the exact positions of the stations received were scribbled on the ebonite, indicating the correct centres for the cam slotting. After making the slots and re-assembling, each slot was taken in turn, and with a pair of dividers, the locating wires, or springs, were "tensioned" by adjusting near the clamping strip with the wire in contact fully in the slot. The rest of the assembly

---

**That Dodge of Yours!**

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**Special Notice**

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

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A simple station-locating movement.
CAR-RADIO EXPERIMENTS

Some Hints on the Construction of an Experimental Car-Radio Receiver, as Well as Different Types of Car Aerial

By Frank Preston

A
LTHOUGH last week some of the difficulties of making a car-radio receiver at home were explained, the article did not cause readers to lose interest and hope. In fact, it probably had the reverse effect—of "whetting the appetite" of many of those who are determined to give car-radio a trial. Consequently, I propose this week to be rather more constructive and to show how you can at least approach the subject; at the same time the difficulties mentioned cannot easily be overcome.

It is evident that many readers are not particularly anxious to have a full-blown outfit, as long as they can take radio with them in the car. When that is the requirement, most of the difficulties are obviated. If you are prepared to build a small four-valve superhet with A.V.C. you can obtain satisfactory results while the car is stationary or when travelling along quiet, open roads. It is probably more satisfactory to employ four-volt A.C. valves—since the set will also be used in the home—and to use a battery for H.T. and G.B. supply. Low-tension can be obtained from the car battery by using a tapping, unless the battery is of the latest type in which the inter-cell bushings are covered with pitch. When the set is used in the home, H.T. and L.T. can be obtained in the usual manner from a mains unit.

Two-volt battery valves can be used, but they are rather less robust mechanically, and do not give as high a degree of magnification. Nevertheless, if the house is not wired with A.C. the large amount of current required from an L.T. accumulator is prohibitive.

Receiver Details

It would not be possible to give full constructive details of the receiver itself in the space of this article, but the more advanced constructor will not find great difficulty in adapting one of the many circuits which have previously been given in these pages. For the benefit of those who still fight shy of the superhet it can be mentioned that a good four-valve "straight" circuit with two H.F. stages, A.V.C. and pentode output will behave fairly well in good conditions.

When workshop facilities are available, it is best to build the receiver on a metal chassis and to house it in an aluminium cse which will act as a complete screen. Care should be taken that the points are a close fit and that they are bolted together at a number of points. For this purpose manufacturers frequently make use of self-tapping screws; to fit these it is necessary only to drill a clearance hole in one member and a tapping-size hole in the other and then to force in the screws with a big screw-driver. The screws then cut their own thread and make a sound joint. Sheet aluminium of about 20-gauge is probably the most convenient, and is not very expensive when a polished surface is not required.

Remember to provide holes or louvres in the containing case to permit of ample air circulation round the valves. Holes are made, screening will be more complete if they are covered with copper gauge.

In mounting the receiver chassis it is best to use rubber bushes, to allow the chassis to "float," whilst the interior of the container should be lined with rough felt. This can be fixed with ordinary glue. It is also desirable to fit rubber washers between the speaker and the case to reduce resonance effects. The outside of the box can be finished with cellulose to look fairly respectable when used in the home, but the more expert worker might prefer to give a crackle finish, or to have the box finished in this style after finding that the receiver operates satisfactorily.

Position of the Set

It is generally desirable to have the receiver near to the bulkhead of the car since that is most convenient for the aerial lead-in and battery connections, but if it is found that it restricts foot-room to too great an extent the set can be mounted in the rear compartment. It is very important that the metal container should be well earthed by means of heavy cable or copper braid. The earth lead should be as short as possible—otherwise it will be more than a few inches—and it should make perfect contact with the container and with the earth line of the receiver. When the receiver is in front, earthimg can be to the steering column or to a bolt through the bulkhead. Alternatively, it might be possible to make a good connection to a chassis bolt if the cable is passed through the floor-boards; this also applies when the receiver is in the back of the car. In this case, it will often be found that there is a convenient bolt underneath the rear seat cushion.

Earthing

The earth-return will, of course, also act on one side of the L.T. supply. Take great care, therefore, to find whether the positive or negative side of the battery is earthed. The second L.T. lead may consist of the "black glossy" cable used for the car-wiring circuits, but it is often better to use screened wire, earthing the screening braid every foot or so of the run. This connecting wire should have a low resistance, so if its length exceeds about four feet it will be better to use two wires in parallel. Do not omit to include a fuse in this lead, mounting it accessibly—a value of about 10 amp. will generally be as convenient as any. Most manufacturers use a fused connection for this lead, and that is the best arrangement.

Type of Aerial

Consideration must next be given to the aerial, bearing in mind that, at best, it can be only of comparative low efficiency. Consequently, a make-shift arrangement is not likely to prove very satisfactory. As a general rule, a roof or fishing-rod type is most satisfactory, although under-car and running-board aerials are often surprisingly effective if accurately proportioned.
CAR-RADIO EXPERIMENTS
(Continued from previous page)

The aerial can be bought ready-made, and many of the roof-type now available are provided with rubber suction cups which can be securely attached to the roof by using liquid glue and pressing the cups tightly against the metal roof. Details of two common patterns are given in an accompanying illustration, and from this readers can probably devise a form of construction which is within their capabilities. Pay in mind that some of these aerials are covered by various patents, and that anyone making similar ones for sale would be liable to prosecution for infringement! It is not likely that any trouble of this kind will be experienced if you make an aerial for your private experimental use.

Plated copper rod or a white-metal alloy is most suitable since it will not discolor, but bare copper wire or small-diameter tube can be used experimentally. It will be seen that both types of aerial shown are virtually of doublet type, although in one case the two arms are so close together that they probably act as a single lead of large area. Large suction cups are required, and the rods or tubes are carried in insulators except at the front, where they are both connected together.

Rod Aerials

The fishing-rod type of aerial is becoming increasingly popular and proves very effective. Essentially, it consists of a small-diameter tube in which a length of thin rod fits fairly tightly. The rod can be extended or closed according to the required sensitiveness of the aerial. In some instances there are two concentric tubes, in addition to the extendable rod, and metal workers will not find very much difficulty in devising a suitable device. The rod is carried in a couple of insulators with suction cups or bolts and attached to the near side of the scuttle, between the rear edge of the bonnet and the front of the door. A small hole must be bored to take the lead-in. There is on the market at least one fishing-rod type aerial which can be fitted to the door hinge, where this is at the forward edge of the door, and it is not difficult to devise simple brackets to fit the hinge pins (or new, longer pins) and to support the insulators which carry the aerial rod. When the car is not new there might not be any objection to drilling the bodywork to take a couple of ordinary stand-off insulators, which will give excellent support to the aerial.

Whether using a roof or rod aerial it will probably be necessary to remove the interior trimming to thread the lead-in through the body panel. In the case of a roof aerial it will generally be found that the roof cloth can be loosened by prising off the cloth binding which runs round the edge; the lead can then be taken from the centre to the side of the roof underneath the cloth. When using a rod aerial the fibre board on the inside of the scuttle can be moved sufficiently by prising under one edge, where it is fixed with small tacks.

PRACTICAL WIRELESS
SERVICE MANUAL

By F. J. CAMM.

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’Phone: WII1 7265.
Who Has the Lead?

There has been a certain amount of newspaper comment lately on the question of who is entitled to claim the lead in television. One reason for reopening the question is that the Minister of Posts and Telegraphs stated that the new television transmitter operating in conjunction with the ultra-short-wave aerials of the Eiffel Tower was the most powerful in the world. This was included in his reply to criticisms in the French Senate when he was pressed to make improvements in both the number and power of French radio stations, and also in the quality of their programmes. Admitting that the British radio budget was higher than the French, M. J. Julien insisted that France was not behind Britain in television. With America now definitely "on the air"; Germany anticipating a real start to synchronise with its radio exhibition which opens in a few weeks; Japan conducting transmissions in spite of war activities; Russia radiating signals and so on, it is as well to review what constitutes a lead in television. Surely this is dependent on two important factors: namely, the quality of their programmes, coupled with the duration of the public service. In these two important categories no one can claim from this country a two-and-a-half-years' lead. When consideration is given to the standard of picture definition, the rated power of the ultra-short-wave transmitters, and the number of stations radiating programmes, then Britain is behind. While the slight differences in the line standards do not affect the issue to any great extent, there is no doubt that the B.B.C. must be given powers to erect provincial stations, and also add to the power of the transmitter. This is the only way in which this country can maintain her television pre-eminence and build for herself an export market for receiving sets and so avoid repeating what happened in the early days of aerial radio's development. In every important provincial centre the campaigns for upstairs on the P.M.G. the necessity for extending the television service are being pursued with undiminished vigour, and the only way to remove the embarrassing position in which he placed himself is for Major Tryon to adopt a bold policy, and start building not one provincial station, but two or three.

Good Big Screen Results

The recent televising of the Trooping of the Colour, with its rediffusion to cinemas, proved to be a very high quality transmission. From the programme angle it lacked the excitement of an event where an unknown result was to be portrayed to viewers, but none of the glorious pageantry of the occasion was lost on those privileged to see the pictures. The technical quality of the images was very high, far in advance of the Derby, for example, but this may have been due to better camera positioning and the use of a line feed instead of a radio link to transmit the signals from their point of origin to Alexandra Palace. There was an unexpected visitor at the New Victoria Cinema in the person of Gerald Cock, the Director of Television. He was there, undoubtedly, to secure first hand knowledge of the quality of big screen rediffusion, and he could not have chosen a better event for picture quality. Each item was portrayed with clarity, even to the unprepared faces of the unfortunate drummer boy overcome by the heat, and his subsequent removal from the parade ground on a stretcher by first-aid men. There was a welcome absence of tilt and bend, a feature which can so easily ruin a transmission if not watched carefully and suitable steps taken to correct it.

More Big Screen Systems

For a very long time the Baird and Zonophone companies were the only ones who had developed big screen equipment for use in cinemas and theatres and had installed their apparatus for actual public demonstrations. On the occasion of the Derby the E.M.I. Company showed their equipment at Haymarket. Among those who witnessed the results the pictures gave about 3-foot candles in the high lights, and used from projection cathode-ray tubes in which the picture passed right through the fluorescent screen to be projected on to the silver screen by means of a Taylor Hobson 14-in., F-1.8 lens. The tube and lens are fixed to a pivoted housing so that they can be tilted to suit the rake of the screen. These tubes (in duplicate) are associated with the apparatus, the first containing the radio receiver, the second the picture and sound amplifiers, and the third a monitor tube. It will be with, of course, remote E.H.T. unit providing the 60,000 volts necessary to feed the C.R. tube, its potential amode. It has now been established that there are at least three other radio companies who are experimenting with big screen television systems, all of which employ the principle of the C.R. tube. Engineers are working on a system at which state, however, will not reach a commercial stage for some months. B.T.H. are carrying out experiments on a top secret basis, but those research laboratories in Bridge Street while Philips are also making progress on similar lines. How soon results will be demonstrated is a moot point, but what is established is the fact that the film industry must face up to the knowledge that they would be adopting a wrong policy if they insisted on the big screen development, now that so many other interests are involved.

A Projectionist's Course

A more and more of London cinemacasts have big screen receivers installed it is obvious that the men who will be called upon to operate the equipment for each re-diffused programme will be the cinema projectionists themselves. It is for this reason that the Baird Company has started a school for projectionists at their factory at Lower Sydenham. Each "student" will be given a two-weeks' intensive training, as mentioned on page 301.

PATENTS AND TRADE MARKS

Any of our readers requiring information and advice respecting Patents, Trade Marks or Designs, should apply to Messrs. Rayner and Co., Patent Agents, of Bank Chambers, 28, Southampton Buildings, London, W.C.2, who will give free advice to readers mentioning this paper.
Club Reports should not exceed 200 words in length and should be received First Post each Monday for publication in the following week’s issue.

EDGWARE SHORT-WAVE SOCIETY

Headquarters: Constitutional Club, Edgeware Road, London, N.W.2.

A special meeting is now called in hand for the society’s first-ever field day, to be held on July 2nd. Two entrants are now competing, and G2OVP will be charge of the transmitters, with a radio licence for five field days. This station is also working on July 10th in the R.S.G.R 5-metre field day.

R.S.G.R 5-metre field day was a great success, and may be repeated in the future. A new member interested in the Field Day is now working on a new series of experiments.
A REVIEW OF THE LATEST GRAPHOMETER RANGES

A FEATURE of the Parlophone releases for this month is a new and remarkable record by the sensational pianist, Claudio Arrau. He has recorded "Ballet of A Flat Major" on both sides of which are sung in German on Parlophone R 20443. Owing to numerous requests, Richard Tauber sings this month, "Heidentrommel" and "Die Lorelei", both of which are sung in German on Parlophone R 20442.

In the 12in. Classic Series we have another pianoforte solo, this time by Eileen Tovey, who takes up the pieces, "Solitary Traveller", "Brooklet", "Battler" and "Melodie", on Parlophone E 11441. Also in this series are the Berlin State Opera Orchestra with a recording of Eugin Onegin polonaise and waltz on Parlophone E 11441 and "11 Re" and "116" on Marcella played by the E.I.A.R. Symphony Orchestra, Turin, on Parlophone E 11413. The orchestra is conducted by the composer.

George Gershwin's famous "Rhapsody in Blue" (two parts) appears in the 10in. Classic Series, played by Orchestra George Tzigine, accompanied by the Grand Organ of the Grand Palais, it culs onto Parlophone R 2666. Ivor Novello's last play, "The Dancing Year", is also featured in this section with a two-part selection played by the Theatre Orchestra on Parlophone R 2667.

Variety

That "low highbrow humorist," Ronald Franklin, reveals some more sophisticated humour with recordings of "In the Bush and on the Prairie and the Veket" and "That's How I Write Love Songs" on Parlophone R 2667. He is accompanied by Monte Craig at the piano.

Harry Roy and his Orchestra have made four up-to-the-minute numbers with "Beer Barrel Polka" and "Goosey Goosey" on Parlophone P 1452 and "Begin the Beguine" coupled with "Little Sir Echo" on Parlophone P 1453. Harry Roy also makes a vocal recording of "Small Town" and "Apple Blossom Time", on Parlophone P 1453.

Another popular band, Nat Gonella and his Georgians, have recorded four popular numbers—"Chopsticks" and "Patty Cake, Patty Cake" on Parlophone P 1455, and "Always" coupled with "One O'Clock Jump" on Parlophone P 1430.

Leslie A. Hutchinson ("Hutch") chooses songs from films for one of his latest records—"A Mist is Over the Moon" from the film "The Lady Objects," and "This Night," from the film "Honolulu." On Parlophone P 1444. For his other record, Parlophone P 1443, he sings two popular songs of the moment, "I Paid for the Lie I Told You" and "Begin the Beguine." Patricia Roseborough's piano medley which she calls "My Favourites" introduces "Blue Room," "Smoke Gets in Your Eyes," "These Foolish Things," "Just One More Chance," "There's a Small Hotel," and "Thanks for the Memory"—Parlophone P 1448.

Victor Sylvester and his Ballroom Orchestra cater for dance enthusiasts with straight dance tempo recordings of "Apple Blossom Time" (quick-step) and "A Mist is Over the Moon" (fox trot) on Parlophone F 1437 and "Angel Never Leave Heaven" (quick-step) and "Waltz of My Heart" (waltz) on Parlophone F 1458.

Decca and Brunswick

Decca present, this month, the first recording of the Piano Quartet of Pianist Walker written by the composer in 1918-9, when he was 16 years of age. It features the Reginald Paul Piano Quartet, and the composer was present at the recording session—Decca X 239-41.

Of the foreign records now issued, three more of the Lint Hungarian Rhapsodies, played by Borowy, are published this month—Decca LY 6132, LY 6133, and PO 5136.

No month would be complete for record fans without a new disc from Bing Crosby, so he obliges this month with three. First comes "Sweethearts," coupled with "Ah! Sweet Mystery of Life," by the ever popular Victor Herbert, on Brunswick 02761. "Deep Purple," another of his biggest hits, is coupled with George Gershwin's "Summertime," which comes from the opera "Porgy and Bess," and is regarded as the most beautiful—and the most difficult—song that Gershwin ever wrote—Brunswick 02746. Finally, there is a tune which continues to be a hit song of the month—"Little Sir Echo." This is coupled with the favourite "That Lonesome Road"—Brunswick 02753.

A negro who makes a hit this month is Joe Sowande, who was musical director of the "Blackbirds" shows and now holds a similar position for the floor show, "Dark Sophistication," at a London night club. Starring in the same show is Adele Hall, another famous Blackbird.

Sowande's first recording engagement is as the accompanist on Adelaide Hall's record of "I Have Eyes," and "I Promise You," on Decca F 7049. Playing on the first cinema organ ever to be installed in a recording studio, he shows the complete mastery of the instrument both as a straight and swing player. He also accompanies Constance Impsey on her record of "Sweethearts" and "One Day When We Were Young"—Decca F 7064. But his most striking contribution to the June record list is as the leader of The Sowande Trio. Here for the first time we have real swing on a large organ. Accompanied by piano and rhythm, he leads the jazz woods with a real kick in "St. Louis Blues" and "Hold Tight," on Decca F 7061.

PRACTICAL AND AMATEUR WIRELESS

July 1st, 1939
NOTES FROM THE TRADE

Tungram Change of Address

British Tungram Radio Works have recently acquired extensive new premises immediately adjacent to the existing Tungram valve factory, and accordingly all departments of the organisation have been centralised at that address. All inquiries and communications should, therefore, now be made to British Tungram Radio Works, Ltd., West Road, Tottenham, N.17 (phone: Tottenham 4884, 4885 and 4886) and not to Theobalds Road.

New G.E.C. Television Model

The General Electric Company announce a new luxury addition to the television market in an all-wave auto-ridiogram for A.C. operation. The model, BT.0124, is presented in a superb hand-finished walnut cabinet of modern design and is operated almost entirely by automatic push-button control. The picture size is 16ins. by 8ins., and occupies half of the upper section of the cabinet front, as shown by the accompanying illustration. The control panel is sloped and the gramophone desk occupies the minimum of space above the controls. There are eight buttons for station selection and seven additional buttons for control purposes. The first brings complete television entertainment; the second television sound only for special high-fidelity sound broadcasts; the third brings into action the gramophone equipment, and the fourth, fifth and sixth cover the short, medium and long sound broadcast wavebands. No matter which of these buttons is pressed first, it will automatically switch on the set, leaving the seventh and last button to switch it off.

The radio chassis is a 5-valve superhet, embodying A.V.C. and tone compensation, and the gramophone section with its playing bandles of eight 10ins. or 12ins. records consecutively. The television chassis is an 18-valve combination. The price is 72 guineas.

Servicing Handbook

A valuable booklet entitled "True Dynamic and Functional Servicing," containing in detail how the Rider Channelyst may be used for servicing modern apparatus, may be obtained from Messrs. Holmes, Hammerdinger, Ltd., 74-78, Hardman Street, Deansgate, Manchester, 3, for Is. 6d. Profusely illustrated, this shows in detail the circuit working in detail and the appropriate sections of modern receivers to which it may be applied and, therefore, even if you do not intend to use one of these testers the principles of testing and fault-finding are clearly illustrated.

Morse Practice Records

Mr. C. E. Masters, supplier of the Morse records which were recently reviewed in these columns, has changed his address, and the discs may now be obtained from Orchard House, Finchampstead Road, Wokingham. The price is 2s. 6d. each, or a set of three records for 7s., including postage. Details of a correspondence course, used in conjunction with the records, may be obtained from Mr. Masters, and the fee for this course is 33 guineas, the fee including operating key, buzzer and 10 gramophone records.

Sky-pilot Aerial

Pilot Radio, Ltd., are supplying a neat aerial which will be found of the greatest value to flat-dwellers and others with restricted garden space, as well as to those who wish to obtain improved short-wave reception. The aerial may be attached to a chimney stack or other suitable position, or even fitted inside a room on the side of a window, as shown in the accompanying illustration. The aerial is sent out neatly boxed, and consists of a stout drilled sector mounting, a pair of stout screws and Rawl-plugs, and galvanised bolts, spring washers and nuts. The aerial proper is in four tapering sections, fitted together in the same manner as a fishing rod, the lower section being 1 in. in diameter and the top section approximately 4 in. in diameter. A neat cap is provided to make it weatherproof. Sufficient lead-in wire is also supplied (40ft.) to enable the aerial to be connected to the receiver under almost any normal conditions, and to facilitate installation the aerial is supplied with a booklet of instructions which is supplied showing several different mounting systems. The fact that the aerial may be placed outside a window gives the flat-dweller many advantages over the normal type of indoor aerial, and furthermore by mounting it as nearly vertically as possible, all troubles are overcome and improved signal strength may be obtained in certain circumstances. The price of the aerial kit is 21s.

Addition to Pertrix "All-Dry" Battery Range

Messrs. Holsun Batteries, Ltd., announce a further Pertrix battery for use in the new all-dry battery portable radio sets. This is a 9-volt H.T. battery consisting of two 45-volt units in one block, measuring 4ins. by 21/2ins. by 5ins., and is fitted with a socket for 3-pin plug. The type number is 1440 and the list price is 9s.

Hanrad Wholesale List

Hanrad Radio, whose slogan is "Hans for Hans," have prepared a list of the many amateur components and accessories which they handle, and copies may be obtained on application to 32, St. Lawrence Terrace, London, W.10. The list includes practically everything required by the transmitter, including sundries such as black-crackle paint at 2s., 3s. 6d., and 4s. 6d. per tin; crystals; valves; panels; relays; cabinets; racks, etc. Full details are also given of the Super Communications Receiver which was reviewed in our recent columns on this type of receiver. It will be remembered that this is a 12-valve receiver selling at £27 10s., and incorporating all those features which radio amateurs desire in this type. We hope shortly to publish a complete test report of the model.

New McMichael Models

Messrs. McMichael announce two new models in their 1039-40 range, both all-wave superhetas. One is for A.C. mains and is priced at £9 7s. 6d., and the other is a battery model at £8 15s. Both models are identical in appearance and similar in electrical characteristics and performance. Both employ three waveband superhet circuits covering from 165 metres upwards with high peak constant performance aerial couplings. The battery-operated model is fitted with an extra L.F. stage before the pentode output, giving an overall amplification quite comparable to that of the A.C. model. On both models the illuminated tuning scale is an entirely new design, sub-divided into separate sections for each waveband, fitted with an extra pointer, ganged to the wave-change switch, thus indicating the actual scale division which is in use.
RADIO BIOGRAPHY

PHIL CARDEW

Instead of being a famous orchestrator and band-leader, as he is to-day, Phil Cardew, athletic fellow of thirty-five, might well have been doomed to wear a leg-brace, his physical career forever wrecked. Indeed, it had not been for his own initiative, his leg, which had since his school days given him trouble, would probably have ended, giving him cause to regret ever having listened to the advice of incunabular doctors.

He was born early in the twentieth century, a Wesleyson (Surry), son of a classical-musician father, who, as soon as Phil could hold and play a fiddle, put him in the Cardew Family Quartet, a small string orchestra well known in the district. To further his progress, Phil secretly made off to the opera after school, then had to sit up in bed when he got home, spending the early hours of the morning coping with his neglected studies!

He rightly considered opera to be an essential part of his training, but he could only afford the gallery at the Old Vic.

Still, it did him a whole heap of good, for at 20 he was playing in an amateur symphony orchestra. Phil naturally feeling very proud of himself. It was fifteen years later before he entered these sacred ranks again, when he became for a time a clarinettist in the Ernest Road Symphony Orchestra.

At the architectural college which he attended after his schooling, he heard one of the most successful student dance-bands of the day, and persuaded the leader to allow him to sit-in with the saxophone section, this being his introduction to jazz, which did anything but please his father!

Still, what could his Dad say when, urged by his new interest, Phil matriculated at the Royal Academy of Music, getting his coveted L.R.A.M., which comprised Theatrical Conducting and involved a certain rudimentary knowledge of scoring and harmony.

Let it be said here and now, though, that this clever orchestrator has never had an orchestrating lesson, for his ability to arrange so vividly is purely the result of his own sweating at the subject.

It seems that his inauguration to dance music proved too much for the jazz output of his career, as he bought a saxophone ("what a horrible instrument it was!") with which to "inflict himself upon some innocent band leader or another.

He overcame it, and has always regretted the day he failed to take "sax" lessons, which he feels certain would have provided a short-cut to the achievements which have instead taken many years of his life to attain.

In 1924-6 he was greatly enjoying life playing at country dances, hunt-balls and the like, at a remuneration musicians can only dream about nowadays.

His first professional job worth talking about was with Jack Hylton's famous "Piccadilly Revels," at the Piccadilly Hotel, secured on recommendation of Jack's tenor saxophonist and comedian, Johnny Roitz.

When, after a pleasant run, The Revels broke up, Phil had to resort to odd engagements for a time, but soon had the good fortune to gain a position with Fred Elizalde, at the Savoy Hotel, thanks to the spade-work of Fred's guitar-player, Len Fillis, who is now in Australia and which makes Phil's career with considerable affection.

Famous American orchestrators whom Phil met while with Fred Elizalde, imbued him with the ambition to retire from saxophonist life and devote his entire energy to the use of a manuscript pen.

Phil Cardew with Fred came unexpectedly to an end when Fred's always superb band cruelled after two theatre tours following its departure from the Savoy Hotel.

It was about this time that his leg gave him cause for concern. As a child he had met with a bicycle accident which set up the growth of a mysterious disease. The limb was encased in a plaster cast, and it recovered. But suddenly in 1926—at the height of his career—the old trouble recurred, developing alarming symptoms. A whole army of doctors examined him and each pronounced that it looked a case of tuberculosis and it became necessary to undergo prolonged treatment in Switzerland to prevent the leg withering away.

But Phil just wouldn't believe it. Something prompted him to throw off the plaster cast and test whether the disease grew any worse. Instead, it miraculously recuperated and he has never experienced any further bother with it.

To revert to his unwilling break with Elizalde, Phil was not workless for long. Jack Hylton engaged him. Then came yet another triumph when Jack Payne, starting in his long run at the B.B.C., made Phil his arranger-in-chief.

When Jack went on the halls, Henry Hall succeeded him and retained the services of his orchestrator. Another few years of very enjoyable work ensued, until Henry also gave up radio for variety.

Phil, however, found plenty of opportunities for his arranging and had, in fact, practically forgotten that he could do anything else when Jack Reynolds, son of H. A. Reynolds, asked him to make a new radio feature, entitled "Band Waggon," which could be expected to run for about six weeks.

Six weeks, indeed! The pretty-well immortal "Band Waggon" exceeded forty performances in all. . ., and, writing of this intimate show, Phil remarks that his "Band Waggoners," which outfit he personally conducted throughout, varied quite a bit in size and personnel during the years, but only two musicians, Beryl Britton (tutelary every session}; George Hurley, violin, and Alan Ferguson (guitar). Not that this marvellous orchestra ever sounded any different, than the man in front.

At the moment, Phil is awaiting a new series of broadcasts which are due to start in July, and be on the air every fortnight thereafter.

TRANSMITTING TOPICS

(Continued from page 35)

When the grid is not excited by an input signal.

If, however, a signal is applied, anode current starts to flow at each positive half-cycle of G. This will be augmented as soon as it is observed that the negative half-cycle will only drive the operating point more negative and, likewise, cuts off the anode current completely.

The resultant effect is shown in the output curves depicted on the right of the diagram, and it will be seen that the form of pulsations they would not be suited to L.F. work in that form. For P.A. circuits, however, the effect is quite permissible, as will be explained later.

The outstanding characteristics of Class B amplification can be summed up in the following details. Practically no anode current flows when the valve is idling. High current peaks are only produced when large signal inputs are applied to the grid, or, in other words, the power output of a valve operating under Class B conditions is proportional to the square of the input signal voltage.

Owing to the fact that the anode current is usually driven past the saturation point on the anode current curve, the grid invariably becomes positive with respect to the filament and, consequently, grid-current will flow. This introduces losses in the grid circuit and these have to be made good by the stage feeding the Class B valve, therefore, it is often necessary to use a small power valve in the preceding stage if maximum results are required.

Class C

The operation of a valve under Class C conditions is shown in Fig. 3. In this method, the valve is biased with a negative grid voltage of such a value that it takes the operating point well past the anode current "cut-off" point. An average value for a grid-bias is twice that required to reach the "cut-off" position. This over-biasing produces such conditions that anode current only flows during a very small portion of the positive half-cycle of an input signal, and this, combined with other operating conditions, results in a somewhat universal form of amplifier, as indicated by the curves on the right of the diagram.

The anode current is driven further into the saturation region than with Class B operation, and the grid voltage being of sufficient amplitude or strength to make good the grid losses. The trough in the output waveform is due to the fact that the grid becomes more positive, through the above requirements, that an appreciable portion of the electrons which would normally reach the anode are attracted to the grid, thus reducing the anode current value during a fractional part of the input signal cycle.

To sum up Class C, it can be said that the output power is proportional to the square of the anode voltage: that this form of amplification has little application to low-frequency work, and that large driving-power is required for efficient operation.
LATEST PATENT NEWS

Group Abridgements can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, either sheet by sheet as issued on a subscription of 1s. per Group Volume or in bound volumes at 2s. each.

Abstracts Published.

REPRODUCING MUSIC.—Baird Television, Ltd., and Johnston, D. M. No. 500217.
A method of improving the reproduction of electronic music comprises applying the signals to the input of an amplifier 1 (Fig. 1) which feeds a converting device 2, such as a loudspeaker, arranging an appropriate detecting device 3, such as a microphone, so that it is influenced by the energy emitted by the device, and feeding the electrical energy produced by the detecting device back to the input of the amplifier so that the signals fed back are in opposition phase to the initial signals. The feedback being made through a network 4 the frequency characteristic of which is such that the overall characteristic of the reproduction is improved by the feed back. As shown, an amplifier 5 is interposed between the detecting device and the feed back.


Specifications Published

506302.—Johnson, G. W. (Philo Radio and Television Corporation).—Tuning arrangements for superheterodyne radio receivers.
507632.—British Thomson-Houston Co., Ltd., and Kinman, T. H.—Suppression of radio interference from portable domestic appliances. (Cottage Article No. 1076.)
506542.—Marconi's Wireless Telegraph Co., Ltd.—Thermionic amplifiers.
506543.—Marconi's Wireless Telegraph Co., Ltd.—Indicator particularly for making a carbon contact 12. The non-contacting surfaces are coated with copper and an annular groove in the contact is snapped into a hole in the spring blade 15 which is slotted at 16 to allow for yielding engagement.

506718.—Marconi's Wireless Telegraph Co., Ltd., and Myers, L. M.—Cathode-ray tubes and method of manufacturing the same.
506625.—Marconi's Wireless Telegraph Co., Ltd., and Oliver, A. L.—Remote-control systems for volume or gain control of electron-discharge device amplifiers.
506091.—Radiokl.-Ges. D. S. Loewe.—Television scanning disc.
506454.—Farnsworth Televis. Inc.—Cathode-ray tubes.
506821.—Telefunken Ges, Fur Drahtlose Fernmeld. E.—Circuit arrangements for phase comparison and bearing-finding radio receivers incorporating a Farnsworth television scanning disc.

NEW PATENTS

These particulars of New Patents of interest to readers have been selected from the Official Journal of Patents and are published by permission of the Controller of H.M. Stationary Office. The Official Journal of Patents can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, price 1s. weekly (annual subscription £2 16d.).

Latest Patent Applications

16820.—Philip Lamps, Ltd.—Mechanical transmission system. June 1.

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

Station K6PLZ

SIR,—Last week I received a card from Norman Thompson (K6PLZ), and on it he asks me to inform R.L.D.C. members that in future he will QSL only reports accompanied by an International Reply Coupon, or 3c. U.S. postage stamps.—E. CROUCH (Burton-on-Trent).

A Prize-winner’s Thanks

SIR,—I should like to take this opportunity of thanking you for the book, “Sixty Tested Wireless Circuits,” sent to me in connection with Problem No. 351, and also to tender my congratulations and the high standard of the articles appearing in Practical and Amateur Wireless.

I am very happy to associate myself with “Radio Engineer,” in the S.W. section, and realise now that the major cause of my failure some nine months ago when I first started on short-wave work was due to incorrect choice of components and the use of ancient tetrodes in every stage!

I have recently purchased an Edisette All World Two, and am exceptionally pleased with its performance. On a recent Sunday night (23.00 G.M.T.) 7 PY’s, 4 CQ’s, 15 W’s, and 6 VE’s were logged.

My next achievement will be, I hope, the logging of a VK, but I never seem to get up early enough.—G. D. BRITTAIN (Hendon).

Correspondent Wanted

SIR,—I have been a regular reader of your popular journal for the past two years. Being a short-wave enthusiast, I should like to get in touch with a reader residing in the district of New Rock or Bordesley Green, Birmingham.—K. E. TWIST (77, Caldwell Road, Alum Rock, Birmingham, 9).

A Suggestion for Radioilympia

SIR.—The forthcoming Radioilympia Exhibition will probably prove to be the most successful ever held, and it is to be hoped that this will be the ultimate result.

Television will undoubtedly command a bigger share of attention than hitherto, especially now the public has experienced viewing in several cinemas. In this connection, I sincerely trust that amateurs will not suffer, and would like to point out that a welcome innovation at the exhibition would be an amateur advice bureau where experimenters could seek guidance on the kindred problems with which they find themselves confronted.

A bureau on the lines indicated could be run in co-operation with the exhibiting manufacturers, and would do much to further the friendly rivalry which has always been a pronounced feature at each year’s Radioilympia. I am not suggesting that television should take a back seat; it is a modern instrument, and must go from strength to strength, but on the other hand, sound reception is still in the majority, and such must be treated with the respect which its position thus demands.—L. ADLER (Notting Hill, W.11).

Tokio S.W. Transmissions

SIR,—In a recent issue of Practical and Amateur Wireless it was stated that Tokio broadcasts at 06.30-07.30 and at 15.00-15.30 on ZJK.

I would point out that I have been receiving these programmes every night for the last five months, and the time of transmission are 19.30-20.00 G.M.T. on ZJK, and JZJ 25 metres. Anyone reporting these stations receives a large fleet from Japan, which they are asked to fill in every night and then send back to Tokio. Have any other readers had this experience?—T. H. PLATER (Leicester).

Cape Town Broadcasts

SIR,—I am sure that many readers of your fine paper would be interested in our Cape Town transmissions. The Cape Town station broadcasts on 49.2 m., 31.25 m., 341 m., and 300 m., and is experimenting on 110 metres.

Each Wednesday an English programme is arranged for overseas listeners. One item especially is very enjoyable; it is called “Snook-town Calling,” and is classed as one of the finest comedy programmes in the world. Reports on these transmissions, I understand, would be gladly received, and such reports should be sent to S.A.R.C., Cape Town Station, Richlo Park & Suicide, Cape Town, U. of S.A.—J. D. LEVIN (Cape Town, S.A.).

A 14 mc/s Log From Workspot, Notts

SIR,—May I forward my log for 14 mc/s, this time it covers as from June 8th to June 17th. Before doing so I would like to express my appreciation to you for an excellent weekly. The article I like best is “Leaves From a Short-wave Log,” and the author of that deserves my thanks for the interesting “anis” he has given in that column.

Recently you published an article on “Mastering the Morse Code”: the log below will, I hope, prove that code is far better than ‘phone. In my opinion all amateur S.W.L.s should have a working knowledge of the code.

I have just finished checking up my log and find I have considerably increased it since it was last published. The total up to date—June 18th—is 7,053, and covers some 14 minute s, 14.5 mc/s, and 17.5 mc/s. On 14 mc/s alone I have logged 3,099 amateurs.

In my log you will notice a W7FDV—a station is (was) a portable operating in its own district. The complete call was “W7FDV Y.” X6UX is situated at deluxe on the Yangtze-Kiang river.

Here is my log:


The above log shows what it is possible to receive when you have a “working” knowledge of the code. Of these, June 4th, all W districts (except from W3), were logged on ‘phone, and on Saturday, June 10th, all 4 W districts on ‘phone; also VK2,3,5,6,7. Not bad going for a 1-1.5.

Incidentally, I would be pleased to hear from anyone whether abroad or at home.—R. W. TRUJILLO, 1 Riddell Avenue, Langold, Workspot, Notts.

Correspondents in U.S.A.

SIR,—I have noticed often in Practical and Amateur Wireless that your readers wish to correspond with other short-wave listeners in foreign countries. I have several correspondents in U.S.A., and some of these want W.S.L.s to write to them. Such correspondents are: J. T. TAYLOR, P.O. Box 67, Street, Orange, Texas, will send an attractive S.W.L. card to any reader who sends him one; he will also correspond through Arthur Woods, 401, Yankee Street, Wellesburg, W. Virginia, will exchange cards, etc.

Bill Effes, Minola, Texas, runs a S.W.L. card club; it is free to anyone who sends his card.—S. G. Barrake (Forest Gate).
Screen Voltage

"In constructing an A.C. receiver with an S.G. or H.F. pesto valve, I propose to use a potential-dividing circuit for the H.T. to the screen. How can you work out the exact voltage on the screen so that the two arms of the divider are of the correct value?"—S. L. (Doncaster).

There are several methods of arriving at the value, although the exact voltage is a lead from one stage passing through a variation in permissible. For maximum performance, it is preferable to use a variation of the screen voltage and this enables the screen voltage to be varied and the maximum output thereby obtained. The divider will consist primarily of two resistances in series, and there will therefore be a current flowing through this dependent upon its value and the H.T. across the ends. In addition, however, there is the screen current which flows through the upper part of the divider, and this must be added to the potentiometer current. The best plan is to work on a rule of thumb basis, making the value of the divider such, that at the voltage in use, the current is 1 mA. The proportions can then be more easily worked out, but much calculation is saved if you use a variable element as previously mentioned.

SEReoN Leads

"I am making up a communications type receiver, something on the lines of your Air Hawk. I find, however, that leads from the H.F. stage must pass some way across the chassis to enable the bias and screen to be fed, and this means that the associated leads must pass either through or near other stages. Will screening these leads be satisfactory to prevent interference or instability, or is it necessary to re-design the receiver and modify the layout?"—O. W. N. (Stoke).

Normally no trouble should arise from the two leads mentioned by you. These points should be adequately bypassed, the condensers being joined direct between earth and the screen and cathode on the valveholder. However, if a receiver of the type mentioned, it is desirable to avoid all risks of interference and, therefore, where necessary, a four lead type should be used. A section belonging to another stage is assumed that each stage is properly screened, the lead from the cathode or anode being properly connected with the screening covering earthed. It is, of course, desirable in this type of receiver to endeavour to keep each section entirely self-contained, using最少 partitions and screens to keep everything in its proper place.

Output Stage Defects

"I have an A.C. receiver in which a peculiar fault has arisen, and I wonder if you could help me to trace it. The quality is improved when 'there is a prominent hum. Previously the set has worked quite well. I have a 'phone plug in the L.F. stage which cuts out the output stage and things seem all right in the 'phones. What is the most likely cause of the trouble, and how can I locate it?"—V. Y. McD. (Belfast).

In an A.C. receiver the usual cause of such a trouble will be defective biasing. This would cause increased anode current giving rise to hum, but will not generally affect earlier stages. The bias is generally obtained by a resistor and condenser in the cathode lead, and either a short-circuited condenser or an open-circuited resistor should be looked for. A milliammeter in the anode circuit is the most certain way of finding the trouble. This assumption being confirmed, then replacements of the components will soon decide which is at fault.

D.C. Receiver from A.C. Mains

"I have a D.C. receiver and the mains are shortly to be changed over to A.C. I understand that I can operate the set from a small unit joined to the mains plug, but how can I work out the element as previously mentioned.

Rules

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

1. Support new diagrams of complete multi-valve receivers.
2. Suggest alterations or modifications of receivers described in our contemporary.
3. Suggest alterations or modifications to commercial receivers.
4. Answer queries over the telephone.
5. Grant interviews to querists.

A stamped addressed envelope must be enclosed for the reply. All sketches and drawings which are sent to us should bear the name and address of the sender. Respectfully for illustration, these should not be enclosed with queries as they are dealt with by a separate department.

Send your queries to the Editor, PRACTICAL AND AMATEUR WIRELESS, 10, New Court House, Southampton Street, Strand, London, W.C.2.

The coupon must be filled with your query.

have no details as to what apparatus is required. Could you give me any details as to what I should know?"—K. L. (N.W.5).

We assume that the receiver is a standard model designed for an input between 200 and 250 volts, and having a load of 100 mA or so. In that case the simplest conversion is effected with a mains transformer and a 12 V.A. type rectifier, plus one 8 md., smoothing condenser. The transformer should have a secondary winding delivering 310 volts at 350 mA. If the two stages should be connected in bridge formation. The 8 md. condenser should be joined across the output. A circuit to be found page 133 of our issue dated April 22nd last.

Connecting Sets Together

"I have a one crystal set and get very good results, but should like louder signals. Can I connect the set to our commercial radiogram so that I can get louder signals, on the speaker for preference?"—G. R. (Coventry).

It is possible to make use of the broadcast receiver, but some care is necessary when joining them together. If you use pick-up sockets on the set you will have to couple a transformer and adapter, but probably the use of the L.F. stages alone, by means of pick-up sockets, is most satisfactory. See the article in our issue dated May 20th last on this subject.

Mains Smoothing

"I have modified my set which is an A.C. set. There is a further small H.T. lead which was previously suitable, but I have modified the output stage with much greater current. The rectifier will supply the extra, but the problem will be smoothing. I do not want to alter the dropping resistances in previous stages and wonder what is the plan for me in this case."—W. F. S. (Portsmouth).

The best plan would no doubt be to obtain a new choke and use this for smoothing only the output stage. In this way you would not need a very substantial component (compared with substituting your present choke for all stages) and, furthermore, additional parts should be provided for the stage owing to the smaller current which will flow through it. Thus there will be two choices in your circuit, the smaller choke (which is no longer needed) and the other taking only the output stage. A 4 md. condenser should, of course, be joined across the receiver side of the choke in the usual manner.

REPLIES IN BRIEF

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

J. E. (West Melton). Could you give us some working voltages, current, or other data so that we could help you to obtain satisfaction? There is no other receiver in which you could use these particular parts.

E. R. (Essex). We cannot supply branches of the sets mentioned as they were described in a period no longer on the market.

J. A. E. (West Meldon). Could you give us some working voltages, current, or other data so that we could help you to obtain satisfaction? There is no other receiver in which you could use these particular parts.

E. B. (S. E. I. O.). The type 12A, B, and C, are unsuitable for modern television reception and therefore we are unable to recommend any receiver for the purpose mentioned.

G. S. S. (Belfast). At the moment we cannot give any address as the set is of American origin.

C. F. R. (B.E.S.). Could you list the old and any other parts. The transformer may have any ratio from 1 to 1 to 1.

J. E. (West Melton). Could you give us some working voltages, current, or other data so that we could help you to obtain satisfaction? There is no other receiver in which you could use these particular parts.

M. P. (York). The U.I. battery should be replaced or tested when you renew the H.T. battery.

L. P. (Wargate). A diode would undoubtedly be desirable and a reflector will be of great use in redoubled the noise level.

F. W. (Hythe). Three L.F. stages could be used, but preferably a crystal gate should be inserted. The crystal should be 485 k.c.

A. B. (Datchat). Push-pull would be desirable and the transformer is adequate for the purpose. Use the special push-pull input transformer. Your output transformer is suitable, but use the correct tapings for the load required by the valves.

J. E. (West Meldon). The type of arrangement is quite incorrect. Modern valves will be desirable as replacements and one of the H.T. types recommended is quite suitable.

J. A. E. (West Meldon). An amateur H.F. stage would be useful and a good all-wave choke should be used in place of the old one. This will remove all of the difficulties mentioned by you.


The coupon on page iii of cover must be attached to every query.
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<table>
<thead>
<tr>
<th>Date</th>
<th>Issue</th>
<th>Page</th>
<th>Title</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 15, 1939</td>
<td>384</td>
<td>1-3</td>
<td>PRACTICAL AND AMATEUR WIRELESS</td>
<td></td>
</tr>
<tr>
<td>May 15, 1939</td>
<td>384</td>
<td>4-5</td>
<td>PRACTICAL WIRELESS</td>
<td></td>
</tr>
<tr>
<td>June 15, 1939</td>
<td>384</td>
<td>6-7</td>
<td>WIRELESS MAGAZINE</td>
<td></td>
</tr>
</tbody>
</table>

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- **Table: Crystal Sets**
  - **No. of Crystal Sets**: 384
  
- **Table: Battery Sets**
  - **Super-Het**: 384

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