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Honorary Editor: JAMES W. MATHEWS.

General Editor: JOHN CLARRICOATS.

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ENQUIRING MINDS

TWO things impressed us especially after attending the first Radio Brains Trust Meeting. First the high standard of the questions set, second the very able manner in which the Brains Trust answered them.

That the questions reflected the trend of modern thought none, who were present, will deny. Consider the teaser put forward by our Receiver Group Manager: "It is well known," said Mr. Heap, "that if we generate two frequencies very close together, a third frequency equal to the difference between the two frequencies will be produced." "Why is it," he asked, "that radiations in the light spectrum, very close together, do not produce beat frequencies in the range of radio communication?" We do not propose here to publish the reply given by the Brains Trust, but some further communicated comments sent in by Dr. G. Bloomfield (who incidentally had the opportunity of being present at the meeting), provide ample proof that members are developing the "enquiring mind" complex to a marked degree. "I think," wrote Dr. Bloomfield, "the reason we do not get a beat in the R.F. spectrum is that beat frequencies do not of themselves exist, but are produced in the receiving device when the two radiations are superimposed, as occurs, for example, in the mixer valve or frequency changer of a superhet. Obviously the receiving device must be capable of resonating at the frequency of the beat frequency, and this is where the production of a light frequency beat at R.F. becomes impossible, since even the most V.H.F. receivers are incapable of receiving light rays! The two extremes of visible light do in fact differ by about 1 Mc/s if my calculations are correct, and an exactly analogous case arises if we consider two radio signals say at 500 kc/s and 1.5 Mc/s. No beat signal will be heard on 1 Mc/s if, when tuned to this frequency, the receiver is sufficiently selective to give no response from the 500 kc/s and 1.5 Mc/s signals, but it would immediately appear if two circuits were tuned to receive these signals and they were then fed into a common mixing device, or if the signal circuit were tuned to say 0.5 Mc/s and a local oscillator produced a 1.5 Mc/s signal in a common mixer."

Here surely is an example *par excellence* of the old adage that the future of the Amateur Radio movement is assured, so long as its devotees are prepared to share their knowledge and experience.

Two other questions typical of the modern trend, were submitted by Mr. Werschker, G8WR. First he asked whether it is possible to obtain receiver selectivity, with quality, when using frequency modulation, and second, is a half wave centre-fed dipole cut to resonance as efficient as a Beverage Aerial? The replies given, demonstrated clearly to those present that the Handbook Committee are fully alive to the technical requirements of members. That these requirements will be met in future editions of Society publications goes without saying.

The unqualified success of the first Radio Brains Trust Meeting has convinced the Council that a second session would be equally well appreciated, and this has been arranged for Saturday, September 26.

V.H.F. and Micro-wave Sub-Group

Warm congratulations are offered to Mr. H. H. Phillips, GW4KQ, leader of the newly-formed V.H.F. and Micro-wave Sub-Group and to those associated with him. It has been our pleasure to read the first two Letter Budgets issued by the Group, and there is no gain-saying the fact that they represent a high standard of discernment and knowledge. At the moment, for reasons which should be obvious to every member, many interesting developments must remain undisclosed, but sufficient evidence has been put forward by Group members to show that British amateurs, in spite of current difficulties, are *au fait* with many of the abstruse problems met with in V.H.F. technique.

Further proof of this contention is to be found in this issue wherein is published the first part of Mr. D. N. Corfield's recent lecture on the subject of "Transmission Line Tuned Circuits." It is gratifying to record that the author and his associates have been fully alive for several years to the possibilities offered by transmission line tuned circuits for V.H.F. work.

It is hoped that a comprehensive account of contemporary V.H.F. theory and practice will appear in this Journal before the current volume finishes. In the meantime we would urge all non-members of the Group who have a "V.H.F. mind" to join forces with those who are making such yeoman efforts to keep British Amateur Radio in step with the times.

Association of Ideas

From far and near have come letters expressing appreciation of the *Radio Handbook Supplement*. The "freshness" of its front cover and the general make-up have received much favourable comment.

In an attempt to produce conformity, which we hope will prove acceptable, the style and format of the *Bulletin* has been changed from this issue to coincide with that of the *Supplement*. Later, our *Handbook* will come into line. By adopting a standard format and style for all publications, non-members will more readily associate them with the Society. This association of ideas should prove of considerable advantage now and in the future.

J. C.

TRANSMISSION LINE TUNED CIRCUITS, AND THEIR APPLICATIONS.*

By D. N. CORFIELD, D.L.C., Hons. (G5CD).†

PART I.

DURING the course of the past ten years, the writer has made use of various types of transmission line tuned circuits as applied to transmitters and receivers operating on frequencies between 50 Mc/s. and 350 Mc/s. It is proposed in this paper to describe the results of these experiments, the theory and construction of such circuits, and a simple layout design for a receiver employing them.

In order that certain points referred to later may be made clear, the essential theory of transmission lines will first be considered.

Theoretical Considerations

Transmission lines can be divided into two types (a) open wire and (b) concentric or coaxial. An open wire line consists of two parallel conductors, whilst a concentric or coaxial line comprises two tubes, one within the other, or one wire within a tube.

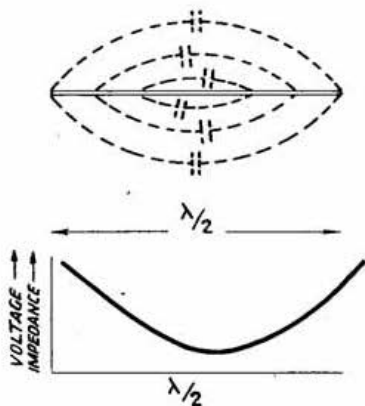


Fig. 1.

Distribution of Impedance and Voltage along a half-wave conductor. Distributed capacity shown dotted.

If a transmission line is of infinite length the power input to the line will be of a certain finite value depending upon the applied voltage of the source, and in consequence it will present a finite impedance to this source. This impedance is known as the characteristic impedance (Z_0) of the line, and its value will depend upon the physical dimensions of the conductors and their spacing. Such an impedance is not a function of frequency.

In the case of an open wire line, the impedance may be calculated from the formula:—

$$Z_0 = 276 \log D/R$$

where D = spacing of conductors

„ R = radius of a conductor

and for a concentric line:—

$$Z_0 = 138 \log D1/D2$$

where $D1$ = inside diameter of outer conductor

„ $D2$ = outside diameter of inner conductor.

With a line of infinite length the power will travel down the line and will eventually be lost; consequently none will be reflected, and no standing waves will exist on the line. But since a line of infinite length is somewhat cumbersome, it is desirable to make it of finite length. If a section of an infinite line is cut off, the input impedance of the remaining section will still possess the same characteristic impedance. The section cut off could be utilised and terminated at its far end with an impedance equal to the characteristic impedance, and the result would be the same as if it had not been cut, and no standing waves would be produced. This establishes the point that any line may be of any length and no standing wave exist, providing the far end is terminated in an impedance equal to the characteristic impedance.

In the case of an aerial or a tuned circuit, standing waves will exist, because the ends will be unterminated.

Evolution of Transmission Line Tuned Circuit

It is necessary now to discuss how a tuned circuit of the transmission line type is evolved and how it functions. Consider the familiar dipole aerial (Fig. 1) consisting of a length of conductor half a wavelength long; the distribution is such that a high impedance and high voltage exists at both ends, and a low impedance with high current at the centre. Theoretically a conductor will be at resonance if its physical length is one half wavelength long, but in practice, the length requires to be somewhat shorter due to the distributed capacity between its ends, necessitating a lower inductance to tune it to resonance. If a nominally half wave conductor is doubled at the centre to produce the hairpin shape of Fig. 2, it will still exhibit the same general characteristics, viz., high impedance at the now adjacent open ends, and low impedance at the centre or bend. The length will however require to be still less than one half wave because the distributed capacity (between the open ends) has now been considerably increased, and each limb will be somewhat less than quarter wave. As the open ends of the hairpin are at high impedance, opposite in polarity and adjacent to each other, they

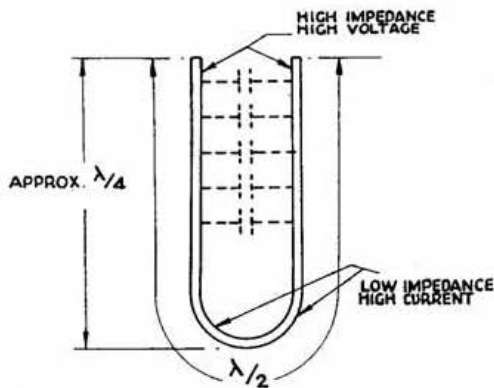


Fig. 2.

A half-wave conductor bent hairpin shape. Distribution of Voltage and Impedance shown dotted.

* A Lecture delivered to the Society by the Author at the Institution of Electrical Engineers, London, on March 28, 1942.

† 10 Holders Hill Gardens, London, N.W.4.

can be regarded as a tuned circuit, in the same way as a conventional tuning coil, tuned by its own self capacity. Circuits of this type have been used quite extensively, the tuning being accomplished by adjusting the length with a sliding section, as in a trombone.

If one limb of the hairpin is made in the form of a tube surrounding the other limb, instead of being a single conductor parallel with the first limb, the operation is obviously similar, and a concentric or co-axial tuned circuit results. (Fig. 3.) A straight half-wave conductor will radiate quite efficiently as an aerial, but when bent into the form of a hairpin, the radiation will be considerably less, due to the fact that the two limbs are of equal and opposite polarity. When this conductor is intended to be used as a tuned circuit (radiation is undesirable—representing a loss), the concentric type will reduce the radiation still further because the outer limb shields the inner one—hence this type of arrangement is more efficient.

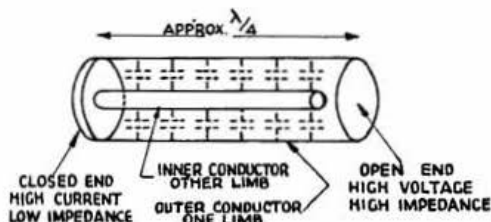


Fig. 3.

Concentric or Coaxial-tuned circuit.

Referring again to the point mentioned earlier—namely, that such a circuit is tuned by distributed capacity—the next step is to concentrate the capacity

at the top, or high impedance, end. (Fig. 4.) This will result in the conductor becoming still shorter; but it can now be tuned by a variable condenser, instead of by adjusting the length by sliding limbs. This arrangement produces a vast improvement, because considerable mechanical difficulties exist in maintaining a low resistance sliding contact, particularly near the low impedance point. Additionally if the tuning capacity is made fairly large the tuned circuit is not effected to the same extent by the valves and other components connected to the circuit.

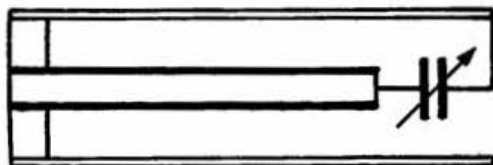


Fig. 4.

Concentric-tuned circuit; top capacity tuning.

It will be evident that the tuning condenser still has, in parallel with it, the distributed capacity of the two limbs, consequently, the resonance point will depend upon (1) the value of the condenser, (2) the length of the limbs, and (3) the ratio of diameters of the inner and outer limbs. (The ratio is connected with the impedance of the two limbs when looked at as a transmission line.)

To use such a circuit in practice it is necessary to be able to calculate how much shorter the line requires to be than the theoretical half- or quarter-wave. The above mentioned quantities are related by the following formula:—

$$\frac{l}{\lambda} = \frac{1}{2\pi} \tan^{-1} \frac{X_c}{Z_0}$$

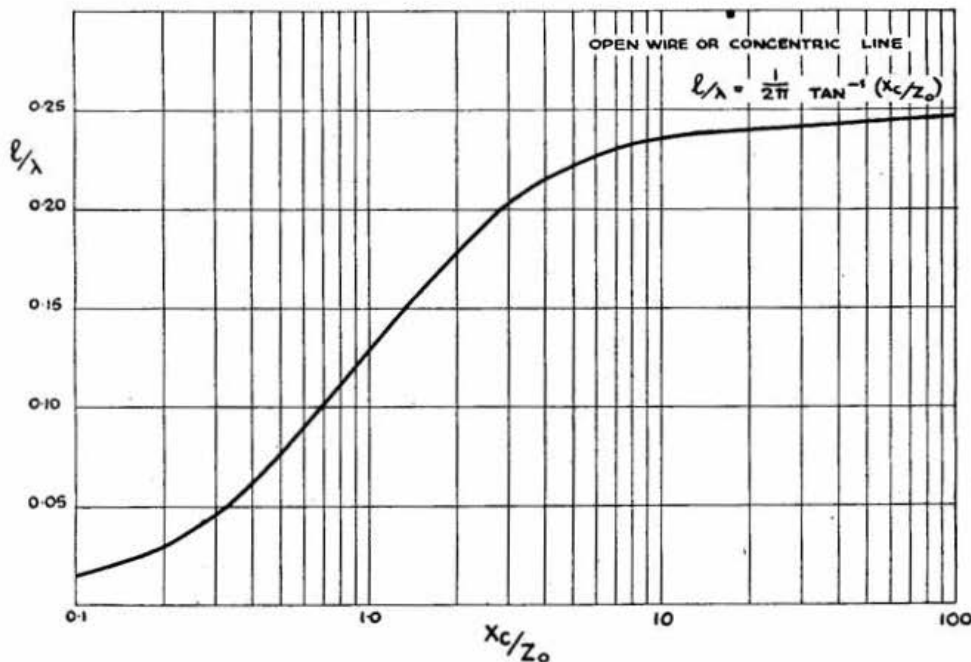


Fig. 5.

Chart for calculating the length of top capacity-tuned open-wire or concentric lines.

where l = length of transmission line (each limb of the hair pin) in cms.

λ = wavelength in cms.

$\pi = 3.1412$

X_c = Reactance of tuning condenser $\left(\frac{1}{2\pi fC}\right)$ in ohms.

Z_0 = Characteristic impedance of transmission line in ohms.

The choice of a characteristic impedance around which to build up a tuned circuit depends upon the use to which it will be put. It should be remembered that the higher the characteristic impedance the higher will be the impedance at the open end, and the higher the inductance of the line the lower the tuning capacity required. In other words the characteristic impedance affects the L/C ratio. For coupling between valves, a figure for Z_0 around 150 ohms should be employed, whereas in oscillators (where extreme

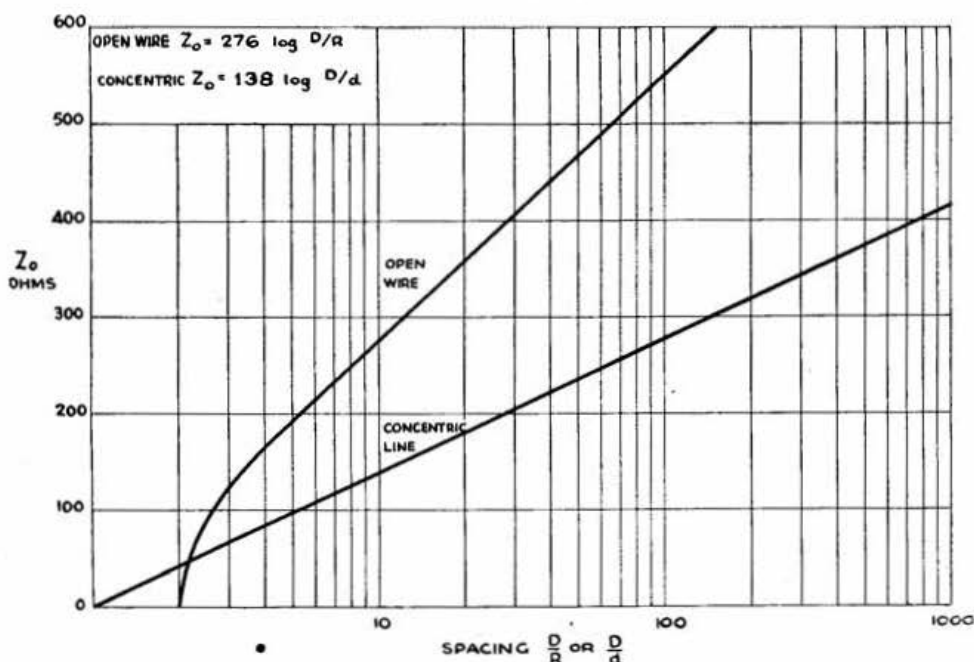


Fig. 6.

Chart for calculating the Characteristic Impedance of open-wire or concentric lines.

Fig. 5 shows this formula worked out in graphical form, the "X" axis being the ratio of capacity reactance to characteristic impedance, i.e. X_c/Z_0 , the "Y" axis being the ratio of length to wavelength, i.e. L/λ . Fig. 6 illustrates two graphs for obtaining the characteristic impedance when the spacing of the conductors is known.

frequency stability is required, and the highest "Q"), a more suitable figure is around 70 ohms. The "Q" for tuned circuits of this type is very high, but it is difficult to calculate and even more difficult to measure; the usually accepted figure is between 3,000 and 5,000 at 60 Mc/s.

(To be continued.)

Letter to the Editor

AUTOMATIC MORSE RECEPTION

DEAR SIR,—Having read with interest Mr. Bryant's article on Automatic Morse Reception in the June issue, I should like to pass on a few suggestions as the result of several years experience with apparatus of the kind he mentioned.

I have found that the old commercial printer, as used by G3SB, has too much inertia to respond to the delicate variations of radio reception. It is not designed for this purpose. A specially built printer operating on the polarised syphon inkling principle is to be preferred and such a printer can quite easily be made at home. This will record up to 75 w.p.m. and substitutes continuous electrical motive power for the limited clockwork drive.

A description of my home-made recorder was published in *The Wireless World* a year or so ago.

I agree with 3SB that the apparatus used by him will not respond to signals below 86, and these are the signals usually required for recording. Extra amplification can be employed, but the higher noise level which is then apparent somewhat neutralises the extra gain, often rendering the record unstable and unreliable.

I prefer the photoelectric method, and find it quite satisfactory for an R2 signal, even when superimposed on heavy QRM. The writer's recorder functions more on sound differentiation, consequently it can be adjusted to respond to any particular note, and will, in many cases, record a weak signal down on the noise level.

Yours faithfully,

C. H. L. ANDREWS (G2HF),
A.M.I.R.E., A.M.Inst.B.E.

For Your Bookshelf.

SHORT WAVE RADIO. (Third Edition). By J. H. Reyner, B.Sc.(Hons.). Pitman, 10/6, 186 pp., 97 illustrations.

Previous editions have been favourably commented upon in these columns. The new edition contains expanded information on receiver design and a new chapter dealing with Frequency Modulation.

"Short Wave Radio" can be confidently recommended to those who require a sound text-book which describes, in non-mathematical language, the basic principles of short-wave technique and the principles involved.

J. C.

ELECTRO-ACOUSTIC DEPTH SOUNDING

By JOHN H. CANNELL (BRS4063)*

THE Echometer, an echo-sounding device for the measurement of water depth, has practically ousted the old lead-line method used from ships. As the apparatus is very closely associated with the science of radio, and more often than not the ship's operator is required to look after the Echometer, it will be interesting to review the principles involved.

There are two types of Echometer: the piezo-electric, which employs a crystal, such as quartz or tourmaline, and the magneto-striction designed to use magnetic materials such as steel, cobalt or nickel.

The Piezo-Electric Type

Before considering the piezo-electric type, it is necessary to refer to the electro-acoustic phenomenon associated with the crystals employed. If, for instance, a piece of quartz is cut correctly into a thin slab and subjected to pressure, it will acquire an electric charge. This charge will be evident on each face equally, but of opposite sign. The reverse is also true, and by applying a potential difference to the crystal it will either contract or elongate.

It is self evident, then, that a piezo-electric crystal will generate voltages coinciding with any acoustical vibrations it may receive. *Vice versa*, the crystal will transmit acoustical vibrations when subjected to a varying E.M.F.

Fig. 1 illustrates the arrangement by which water depth is measured. A transmitter energises a crystal projector, located under the hull of the ship, which vibrates at a given frequency and sends a signal to the sea bottom. This signal is then reflected back to the projector—now working as a detector—and is transformed once again into electrical energy to operate an indicator.

The transmitter is of the simple spark type with the voltage stepped down to approximately 200 volts for the transmission lines and stepped up at the projector.

From a simple equation the depth is easily estimated:

$$d = \frac{vt}{2}$$

Where:

d = Depth

v = Velocity of signal in water

t = Time taken by signal

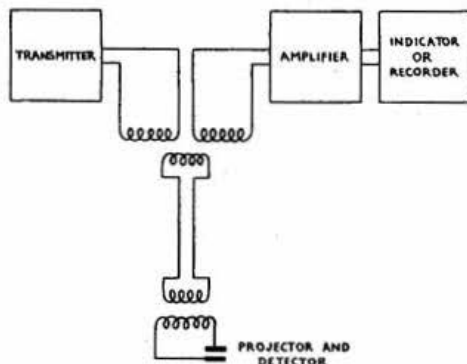


Fig. 1.

Block diagram of equipment used to measure water depth by means of a piezo-electric Echometer.

The Magneto-Striction Type

The magneto-striction Echometer relies for its operation on the peculiarities of certain magnetic materials, such as those previously mentioned. These materials, when subjected to a varying magnetic field, will expand and contract in sympathy with the field. Oppositely, they are capable of varying a magnetic field when exposed to a fluctuating "pressure," or to sound vibrations. Clearly in this phenomenon can be seen an alternative method of obtaining a similar effect to that of the crystal, and the general principles of the apparatus are much the same for both types, with the exception of the projector and detector, which are contained in separate units for magneto-striction equipment.

The projector and detector units are composed essentially of a core of magnetic material enclosed by turns of wire, and a direct current is maintained to energise the fields. A high frequency current is superimposed to produce a signal from the projector; the detector, of course, producing its own high frequency counterpart, on reception of the reflected signal.

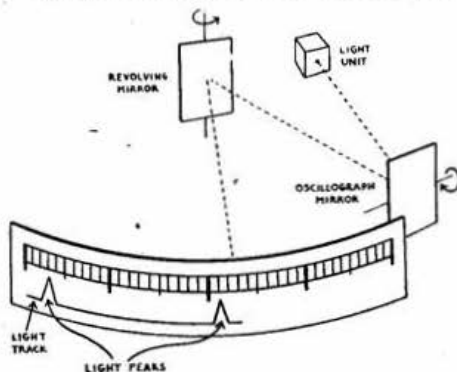


Fig. 2.

Illustrates the principles governing the operation of Echometer indicators.

The chief difference between piezo-electric and magneto-striction Echometers is that the former type operates by virtue of voltages and the magneto-striction type by magnetic fields. Further, the electrical capacity of a crystal depends upon its physical dimensions whilst the magneto-striction unit depends upon the size of coil.

A transmitter of the high-tension machine type is used to operate magneto-striction projectors.

Indicators

The indicator in use with piezo-electric and magneto-striction Echometers is illustrated in principle in Fig. 2. A light spot travels over a scale, and when the signal is transmitted an oscillograph mirror is at the same time actuated, causing a light peak on the scale. Upon reception of the reflected signal, the oscillograph mirror is once more actuated and another light peak appears on the scale. This second peak is arranged to appear at a point which immediately indicates the correct depth without calculation: the first peak corresponding with the ship's draught.

Apart from indicating actual depth the second light peak also gives a good indication of the nature of the sea bottom. In Fig. 3 are shown three types of

* 13 Lower Morden Lane, Morden, Surrey.

reflected signal peaks: the first (a) is one received from a smooth, firm bed; the second (b) from soft mud; the third (c) from boulders or rocks.

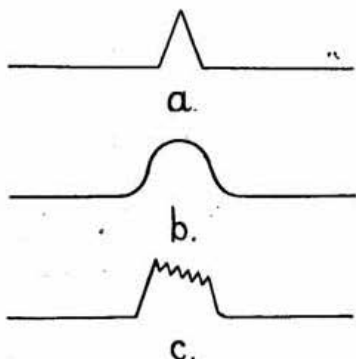


Fig. 3.

An indication of the nature of the sea bottom can be obtained by examining the shape of the second light peak recorded with the aid of the mirror indicator.

(a) Indicates a smooth, firm bed. (b) Soft mud. (c) Boulders or rocks.

Recording Instruments

Where permanent records, or continuous soundings, are required, a recording instrument is used in addition to, or in place of, the indicator. In this case, the signals operate a stylus on a paper chart, thereby drawing a line to indicate depth. The light spot, or stylus, travels at a speed to represent a sound velocity of 4,920 feet per second. This shows a slight inaccuracy in some waters as sound velocity alters somewhat with salinity, pressure and temperature. However, the inaccuracy is normally too small for any regard to be taken of it, except north of the Shetlands to Iceland and in the Baltic or Red Sea. The former areas require a subtraction of 2% from soundings, while the Red Sea requires an addition of 2½% to soundings.

A SMALL PORTABLE OSCILLOSCOPE

By L. W. SMITH (2FSI)*

THE sketches accompanying this article give details of a small portable oscilloscope which has been employed by the writer for some considerable time. It is extremely useful in its original form, as a monitor, for checking frequencies against the 50 cycle sweep, and for modulation measurements. The addition of a time base extends its usefulness over a considerably wider range.

Tube

The unit is designed around the G.E.C. type 4053 Monitor Tube, from which it derives its compactness and portability. The fact that its maximum anode voltage is 500, and the total H.T. consumption only one or two milliamperes, permits the use of a small 250-0-250 volts mains transformer. This effects a considerable saving in space and weight. The condensers may be ordinary radio components of about 600 volts working.

The tube, when focused correctly, gives a fine trace, which makes it possible to obtain quite accurate measurements of modulation depth, etc., although if greater accuracy is required, the case may be made slightly larger, the tube set back, and a lens arranged to magnify the image. (Fig. 1 illustrates the layout.)

Power Supply

Power supply is obtained from a simple half-wave rectifier circuit, which was found to contain ample smoothing for all ordinary purposes. The extra connections for the provision of an internal 50 cycles sweep are shown in dotted lines (Fig. 2), whilst a switch may be added to cut out the sweep when not required. This switch and the 1 megohm potentiometer may be mounted on the side of the case with the input sockets.

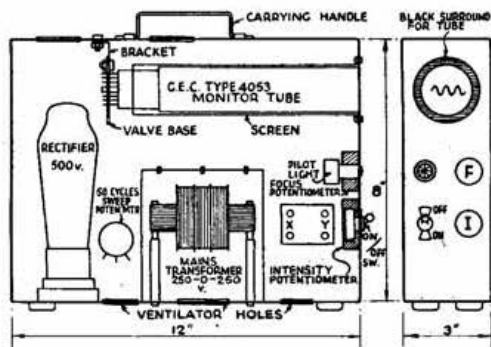


Fig. 1.

Layout of small portable oscilloscope.

It is advisable to connect each plate to earth through similar resistances of between one and five megohms. The shields round the tube and transformer should be of iron and taken to a separate earth terminal.

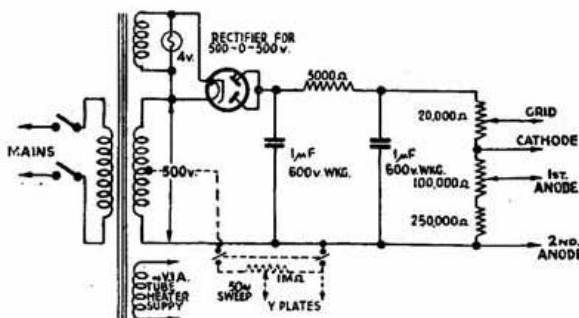


Fig. 2.

Circuit of portable oscillator. Extra connections for provision of internal 50 c.p.s. sweep are shown dotted.

Modulation Monitor

One of the many uses to which this unit may be put is a modulation monitor. Plug and socket arrangements can easily be installed, so that the monitor may be plugged in at will and left in any convenient position on the operating desk.

The tube, being of the high vacuum type, will handle radio frequencies quite comfortably, and may be used for checking transmitter frequencies against a sub-standard oscillator.

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* 161 Old Dover Road, Blackheath, London, S.E.3.

TESTING SMALL POWER TRANSFORMERS

By H. R. HEAP (G5HF)*

THE following simple tests can be carried out by the average amateur without the use of complicated apparatus.

- | | |
|-----------------------|------------------|
| (1) Voltage ratio. | (4) Iron loss. |
| (2) Temperature rise. | (5) Copper loss. |
| (3) Polarity. | (6) Regulation. |
| (7) Flash test. | |

Voltage Ratio

Fig. 1 shows the connections for checking the voltage ratio, when the secondary voltage is known approximately and is within the range of an available voltmeter. The meter should preferably be of the electrostatic type or alternatively a moving coil

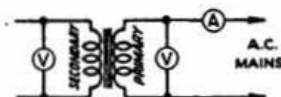


Fig. 1.
Voltage ratio measurement.

instrument and rectifier with a resistance of at least 1,000 ohms per volt. If the output of the secondary is not known or is not within the range of an available voltmeter, it is safer to connect the mains across the secondary and measure the primary volts. An obvious exception is a filament transformer or a model railway transformer, but these types of transformer can easily be identified by the fact that the secondary winding has a very low D.C. resistance whereas the primary has a medium resistance. The comparison of resistances can be made with the aid of an accumulator and flash lamp bulb. The lamp will light to about

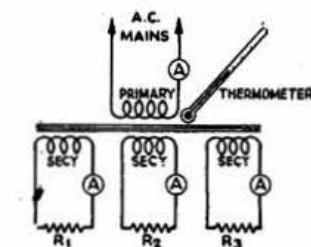


Fig. 2.
Using a thermometer
to measure heat run.

half brilliance with the primary in series, but will light to full brilliancy when a low voltage secondary is connected in series. This method can be used to select the windings on a power pack transformer, as the H.T. secondary is usually of such a high resistance that the lamp will not light at all.

Temperature Rise

Although this may not seem to be very important, the temperature rise of a transformer should be checked. The reason is, that using ordinary insulating materials it is necessary to limit the maximum temperature at any spot inside the coil to about 90° C. this being the maximum temperature to which normal insulation should be taken. Except by inserting thermo-couples inside the windings, it is not easy to discover the actual "hot spot" temperature of the transformer, consequently it is usual to measure the temperature on the surface of the windings by means of a thermometer. (Fig. 2.) Another method is to

measure the variation in the resistance of the windings as the transformer heats up, but this is not always convenient or necessary. With a thermometer it is usual to limit the rise above room temperature to 30° C., so that assuming the room is at 20° C. this allows for an actual surface temperature of 50° C. This figure should never be exceeded when testing in the open because in actual operation the transformer is usually inside a closed cabinet and the cooling will not be so effective. When conducting tests, a piece of Plasticine should be used to bed the thermometer on to the windings. If the test is run for a considerable time the temperature of the core can be measured. The tests should be taken with full-load currents in all windings.

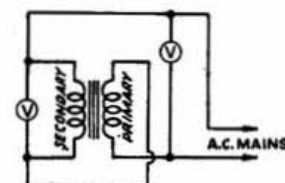


Fig. 3.
Polarity test.

Polarity

Sometimes it is useful to know the polarity of transformers, such as when connecting them in parallel. This may be determined, if the primary and secondary are connected in series and placed across the mains as shown in Fig. 3. The voltage across the secondary will be smaller than the mains voltage when the windings are of the same polarity. When the polarities are reversed, the secondary voltage will be greater than the mains voltage.

Iron Loss

Fig. 4 shows the connections for an iron loss test. The voltmeter and ammeter give the V.A. (Volts-Amps) of the primary and the wattmeter gives the actual watts consumed. Except for unity power factor these values will not be equal and when measured give an approximation of the Power Factor:—

$$\text{P.F.} = \frac{\text{Watts}}{\text{Volts-amps}}$$

The power loss in the core, due to eddy-currents and hysteresis, are obtained by dividing the power as read on the wattmeter by the voltage across the primary.

Copper Loss

This is carried out in the same way as the iron loss test except that the secondary is shorted. The voltage applied in this case should be very much less than the normal mains voltage so that the current flowing in the secondary is limited to its normal full-load value (which can be measured with a meter in series with

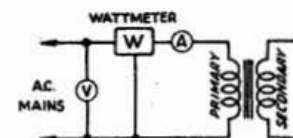


Fig. 4.
Measurement of iron loss
and power factor.

* 99 Galleywood Road, Chelmsford, Essex.

the winding). Alternatively, the primary voltage can be arranged to give the calculated primary current on full-load.

Whereas the iron loss is practically constant for all loads (being roughly proportional to the square of the voltage), the copper loss increases with the square of the current. The copper loss is given by the watt-meter reading.

Regulation and Efficiency

Fig. 5 shows the connections for regulation test. The secondaries are loaded up to their full value with resistances of a non-inductive type, and switches

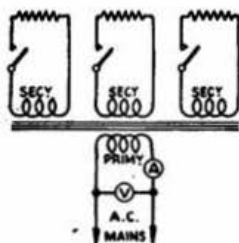


Fig. 5.
Testing regulation.

arranged so that the transformer may be tested with and without load. The voltage of the winding to be checked is measured first on no load and then on full-load and the regulation percentage obtained from the expression:—

$$\text{Regulation \%} = \frac{100 (\text{No load Volts} - \text{Full-load Volts})}{\text{Full-load Volts}}$$

$$\text{The efficiency \%} = \frac{\text{Total secondary Watts} \times 100}{\text{Primary Watts}}$$

Flash Test

To check the insulation between windings and from copper to earth a flash test is necessary. For ordinary small transformers with 250 volts secondary a flash test at about 800 volts is all that is necessary. Many amateurs will be unable to carry out this test because they have no testing transformer available. In a later article it is proposed to describe the design of a testing transformer which is easy to construct.

A USEFUL FEEDER TIP

By "THE WORKSHOP MAN."

A COMMON form of low impedance feeder consists of two enamel-covered solid wires, moulded into a rubber-like casing. This form of feeder will not stand up to a large amount of bending and strain, such as would be put upon it when installed in an exposed situation. Consequently one or both wires may break without the operator being immediately aware of the fact, because the absence, or weakness, of signals may be ascribed to "conditions" or just lack of activity.

To save having to haul down the aerial array in order to test for continuity on the feeder, the writer has made it a practice always to connect a low rating carbon resistance across the aerial end of the feeder where it joins the two arms of the aerial. With this arrangement it is an easy matter to carry out a

continuity test with an Ohmmeter, or any meter and battery, from the shack end of the feeder line.

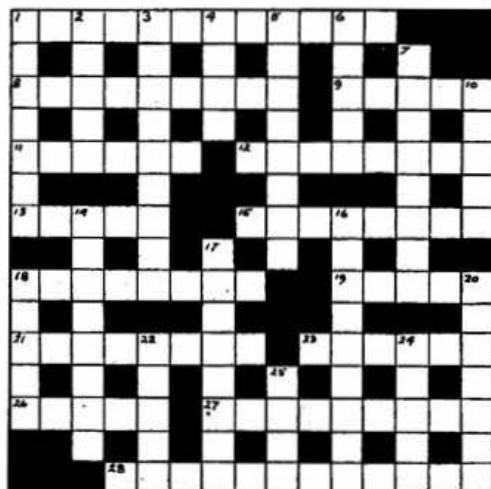
The shunting effect of the resistor is, of course, negligible compared with the aerial impedance at the point where it is connected, and no ill effects whatever need be anticipated from its presence.

The idea has not been used in conjunction with a transmitter, but provided the resistance chosen has such a rating that it will carry the extremely small current that would of necessity flow through it, its presence should have no more effect than when it is used with a receiving aerial.

"HAM-RADIO" CROSSWORD No. 1

NEW SERIES

Compiled by J. A. W. Bate (G6WB)



DOWN.

- The police know all about it now (7).
- Not out; without exception (2, 3).
- Some get high power . . . of experiments (2, 7).
- Now it's your turn to talk nonsense (4).
- Components of a beam (8).
- Popular on the Continent for giving raspberries to G's. (3, 1, 1.)
- The proud YL who worked AC4YN with one watt was so called by the YL with a kilowatt who hadn't (1, 4, 3).
- The professional "op. does this for a living (5).
- The spark gap is to-day (8).
- Cheers!—it sucks (9).
- If this were an equation you would be doing now (8).
- The "supporting mechanism" of the moving member of a bug (5).
- Opposite of 27 Across (2, 5).
- Used for making soup (5).
- Input (5).
- A good initial set up (2, 2).

ACROSS.

- The eternal triangle of radio engineering (12).
- An abbreviated Frenchman in this place (2, 3, 4).
- If she does this she usually uses a handkerchief (5).
- Helps to cure 6 down (6).
- You undergo an unpleasant one when you find your best Xial under your foot (8).
- Arty has one (5).
- The average YL always does this to some poor sap (8).
- I am sure (8).
- A good "end" to any panel (5).
- In the days of Nero a Ham would probably have ended a QSO so (4, 4).
- Not another name for meat dishes but they often have soup in them (6).
- The final figure of all the DX stations you have worked (5).
- Where the ultra highs begin? (5, 4).
- They take the part of a correspondent on a wet Sunday morning (7, 5).

PAPER IS A MUNITION OF WAR

TO RELEASE PAPER FOR MUNITIONS, THE SOCIETY HAS REDUCED THE SIZE AND SCOPE OF ITS JOURNAL FROM PEACE-TIME ISSUES OF ABOUT 72 PAGES TO THE PRESENT "AUSTERITY" LAYOUT.

Prisoners of War Fund

PARCELS.—Parcels to an average value of £1 each were sent last month to members who are known to be Prisoners of War.

BOOKS.—Several more parcels of books have been received but more are wanted. Parcels should be addressed to Mr. C. H. L. Edwards, G8TL, "Speedways," St. Bartholomews Lane, Sudbury, Suffolk.

DONATIONS.—The General Secretary acknowledges with thanks on behalf of Council, receipt of donations from:—H. E. Hunter, BERS395, 8s. 6d.; F. S. Saxon, BRS4516, £1 5s.; L. McMichael, G2FG, £6 6s.; Miss D. Hall, W2IXY, 4s. 6d.; South Hants R.T.S. per G8WC, £5 2s. 6d.; Dr. C. G. Lemon, G2GL, £3; G. E. Evans, 2AVV, 5s.; C. E. Brooks, 3811, 5s.; Mrs. Jackson, for G6ZU, £1 1s.; Anon £1; F. H. Pettitt, SU1SG, £1 7s. 6d.; G. McLean Wilford, G2WD, £1; District 7, per G2DP, 10s. 6d.; District 13, per G2GZ, 10s.; T. Brooke, 4315, 10s.; Scotland "A" per GMSAR, 6s. 6d.; E. E. Elliott, 3341, 10s.; Midland A.R.S. per 2FDR, £2; Anon, 10s.; District 15, per G6WN, 7s. 6d.; District 12, per G5QF, 12s.; J. G. Pegge, G3MI, 5s.; District 11, P.D.M. per 1060, £2 2s.; Chelmsford P.D.M. 1941, omitted from previous acknowledgment, 5s.; Previously acknowledged £320 16s. 2d. Total to date, £350 8s. 8d.

THANKS.—Are extended to our Vice-President, Mr. Leslie McMichael, G2FG; (Founder Member of the Society), whose bid of £6 6s. secured the six volumes of *The Wireless World* kindly donated by Mr. P. W. Winsford, G4DC. The P. O. W. Fund, has benefited by Mr. McMichael's generous donation which followed an earlier one of £5 5s.

SPLENDID GESTURE.—Mr. J. S. K. Stephens, G8WC, forwarded on behalf of the South Hants Radio Transmitting Society, the sum of £5 2s. 6d., being the cash in hand of that Society, which has ceased activity for the duration. A splendid gesture and warmly appreciated.

TWO MORE OFFERS.—Mr. P. G. A. Voigt, 2AKW and another member have kindly donated back issues of *The T. & R. Bulletin* which will be sold to the highest bidders and the proceeds donated to the fund. Details are as follows:

Offer No. 1.—July, 1928 (vol. 4) — June, 1940 (vol. 15): 10 volumes (two issues missing).

Offer No. 2.—July, 1926 (vol. 2) — June, 1938 (vol. 13): 12 volumes complete.

Bids must reach the General Secretary by July 31.

LINCOLNSHIRE MEETING

For the special benefit of the large number of members and other amateurs serving in Lincolnshire and neighbouring counties, arrangements have been made to hold a

PROVINCIAL DISTRICT MEETING

at

The Saracen's Head, LINCOLN

on

Sunday, August 23, 1942. Commence 3 p.m.

Full details next month.

Reservations to Dr. Arthur Gee, G2UK, Stonehaven, Horncastle Road, Boston. Provisional charge 2s. 6d. a head.

Congrats.

To P. O. W. Thomson, BRS3425 of Finchley, London, who was married on June 6. He is now an Accounting Officer at Bomber Command.

To P. H. S. Hedgeland, 2DBA, energetic pre-war Secretary of the Maidstone A.R. Society who has been granted a commission in the R.A.F. He has met ex-G5YK at No. 1 Officers' School.

To Alan Mostyn, GW2GV, who has been promoted Staff-Sergeant Armament-Artificer Wireless, R.A.O.C.

To Bob Albright, G2JL, who was married to Miss O. M. Pritchard, on June 20. Mr. E. F. Dimmack, 3491, was best man. Bob is at H.M. Signal School. He sends 73 to GW5FI and G6FO.

To Dr. and Mrs. C. G. Lemon, G2GL, on the safe arrival of Master Philip Lemon.

Ham Hospitality

The following members have offered to extend ham hospitality
NORTHAMPTON.—R. R. Waite (G3PZ), 61 Broadway.

TOLLERTON, NOTTS.—E. B. Grist (4970), Barrylea, Tollerton Lane.

SCARBOROUGH.—A. Edwards (1420), 8 Swan Hill Road. (Phone: 1420.)

SOUTHSEA.—W. L. Kinehen (2DZT) 12 Merton Court, Victoria Road South.

Gibraltar Amateur Radio Society

G3BD, SAX and 2BOD were made welcome at the May meeting when Mr. Garrod, a friend of Secretary Adams, G5NM, gave an interesting talk on valve design and manufacturing processes. Several members of the Society spent a profitable evening recently with G8AX when he showed them around the Naval W.T. station at which he is employed as a Wireless Mechanic.

From information received, it appears that several amateurs calling-in at Gib. have failed to contact the "resident" fraternity. For the benefit of all who may be interested, we publish some relevant details: P. O. Adams, G5NM (Hon. Sec.), can be reached by telephone (Exchange 40), Ldg. Wireless Mech. Littlemore, G8AX can be contacted via Dockyard Exchange (ask for North Front W.T.). The writer of these notes (LA. S. Isaac, G6ZY), can be contacted via Fortress Exchange, Signals 29.

News is sought of L./Cpl. Brookman, BERS494, who left for G. some time ago. (His address is c/o 208 Ashfield Road, Rochdale, Lancs.—Ed.)

News from Egypt

Frank Pettitt, SU1SG, operator of one of Egypt's best-known DX stations in pre-war days, confirms that two highly successful Ham Gatherings took place in Alexandria last year. The first, held on July 24, was attended by G3MB, 3PP, GM6IW, GJH, GW3AJ, SU1AX, DB, JM, RD, SG, 2JR and 5BO (ex 65BO), whilst at the second, held on November 17, the representation included G2IC, 3GT, 4AR, 4CG, 8WT, GM6IW, 8RS, BRS2786, and most of the local SU amateurs who were present at the first meeting. Both were very happy gatherings during which the company yarned of contacts made and missed, and talked of what they hoped to do after the job on hand had been cleared up.

SU1SG points out that an earlier reference in these columns to the activities of local amateurs was a little misleading. The facts are that practically all of the SU's listed above are still in Alexandria and they meet whenever opportunity permits.

SU1SG records thanks to A. E. Hockstein, SU1AX, for the able manner in which he organised the two Ham gatherings, and also for the hospitality he has extended. He has frequently entertained visiting amateurs at his home and on the occasion of the two meetings referred to above drove several Service lads back to billets through the black-out, a distance of 12 miles. SU1AX has also rendered a valuable service to the Society by having printed, at his own expense, a supply of application forms for prospective members. (Council have been waiting to discover who was responsible for the gesture, which they greatly appreciate.—Ed.)

Mr. Pettitt, like Mr. Marsh, SU1WM, of Cairo, hopes that it will be possible to arrange a Victory Convention in Egypt while the "gang's" all there.

SU1SG's address is 3 Rue Atabikah, Sidi Gaber.

73.

G3HG (R.A.F. M.E.F.), to G2JK, 3IP, TA, 4DS, 5PY, 6HU, QN, TA, 8IL, 2FPI.

G3MI (Chesham), to G3NR, PV, SI, 4GQ, 6LN, SO, and all High Wycombe friends.

G5ND, to G5SR, 6CJ, KM, OQ, WN and YK.

GW2GV (R.A.O.C.), to G8NI, 8PW, 8RF and 2DYZ.

2BKO (R.A.F.), to G2OI, 2MN, 4HK, 4NO, 2DRR, and VE4AQ.

2DBA (R.A.F.), to G5XB, and all old friends of the Maidstone A.R.S.

2FSL (Bournemouth), to G2RX, 3BM, 4IJ, 8BR, 2FQQ and all old friends.

BRS3825 (R.A.F.), to G4AY, 5DJ, 6OG, 8BQ, G15HU and 2CUB.

BRS4315 (R.A.), to GM2NQ, 6KZ, 6SR, 8QR, G6TV, 6TV.

Silent Key

E. J. SIMMONDS, G2OD

It is with profound regret that we record the death early in July of Mr. E. J. Simmonds, G2OD, a Vice-President of the Society, and one of its most illustrious members. His pioneer work in the field of international DX, his early researches into the problems of crystal control and super-heterodyne reception and his later work in connection with the very high frequencies will be remembered by all old and new members alike.

The funeral took place at Mere, Wiltshire, on July 7, in the church where he had for some time been organist. Mr. Simmonds was 58 years of age and a Bank Manager.

To his wife and relatives we extend our heartfelt sympathies.

J. C.

MEMBERS ON ACTIVE SERVICE

Thirty-fourth List

WE publish below our thirty-fourth list of members on Active Service. Additional details and corrections should be advised to Headquarters as early as possible. The present list contains information received up to July 1, 1942.

Rank and Name	Regiment or Branch of Service	Pre-war Call or B.R.S.
A.C.1 G. K. Adams	R.A.F.	2BOU
A.C.H. D. G. Alexander	"	4292
A.C.2 A. Allan	"	5139
A.C.2 E. G. Allen	"	5167
L.A.C. E. C. Banner	"	5140
Sgt. L. T. Barnes	"	5136
A.C.2 E. A. G. Beales	"	5133
Maj. P. R. Beaven	R. Sigs.	5117
A.C.1 A. G. Beckett	R.A.F.	2AUM
Sgt. J. Best	"	4931
A.C.1 F. J. Billington	"	1816
Cpl. J. Blacklaw	"	GM4HN
L./Cpl. M. A. Brett	R. Sigs.	5186
Cpl. J. P. Brown	R.A.F.	4933
Sgt. R. A. Butler	"	4934
A.C.1 A. H. Carr	"	5144
O./Tel. H. S. Cash	R.N.	5114
A.C.1 A. Chalmers	R.A.F.	5145
Sig. B. H. Cheeseman	R. Sigs.	5165
A.C.2 V. Cheeseman	R.A.F.	5172
L.A.C. W. E. Clubb	"	5148
Cpl. A. G. Cook	"	5069
Sgt. G. A. Crossfield	"	4939
Cpl. M. J. English	"	5143
Cpl. L. W. Evans	"	5110
Pte. C. Farley	R.A.O.C.	5162
Cpl. C. L. Fitzpatrick	R.A.F.	4926
L./Tel. J. Ford	R.N.	5115
Cpl. F. Fothergill	R.A.F.	4927
A./Cpl. A. D. Gardiner	"	4928
Ldg. W./Mech. G. F. Grenfell	R.N.	3664
A.C.2 H. C. Halahan	R.A.F.	4204
O./Tel. D. M. Hanwell	R.N.	3804
Cpl. A. Herring	R.A.F.	GM3PB
O./Tel. W. J. Henson	R.N.	5197
Sig. E. J. Hewines	R. Sigs.	5107
Cpl. J. C. Holden	R.A.F.	5153
L.A.C. L. Huntley	"	5158
Cpl. B. F. Hutton	"	5153
Sig. J. W. Kerr	R. Sigs.	5187
L./Cpl. E. G. Kirby	R.A.O.C.	5129
A.C.1 W. G. Knight	R.A.F.	5116
W./O. J. R. Lambert	"	5111
L.A.C. F. Lewis	"	5141
Sig. W. Livens	R. Sigs.	2CKB
Cpl. J. Lomax	R.A.F.	63TU
Pte. J. W. Lymer	R.A.O.C.	3579
F./Sgt. D. E. Mansfield	R.A.F.	4755
F./Sgt. H. E. Mead	"	4278
L./Mech. S. H. Meldrum	R.N.	5195
Sig. E. G. W. Miller	R. Sigs.	3344
Cpl. H. J. Miller	R.A.F.	2CVX
A.C.1 R. E. Molland	"	4163
A.C.1 F. Monk	"	4297
Tel. J. F. Moore	R.N.	5128
A.C.2 J. W. Moore	R.A.F.	5160
Cpl. N. H. Moreton	"	5135
Sgt. A. P. Morris	"	4301
Pte. R. H. Murrill	R.A.O.C.	2DIM
Tel. A. J. Oldham	R.N.V.(W).R.	5042
Capt. L. Pendleton	R. Sigs.	5194
Sgt. K. W. M. Perry	R.A.F.	5126
A.C.2 J. E. Quinn	"	5154
A.C.2 H. G. Reichardt	"	2AVM
P./O. D. Robertson	"	66GQ
L./Sgt. G. H. Robinson	R.A.	5159
A.C.1 A. W. Saunders	R.A.F.	5198
Pte. C. W. Shepherd	R.A.O.C.	5121
Cpl. L. Sisson	R.A.F.	4239
Cpl. C. Smith	"	4922
L.A.C. E. G. Smith	"	4304
Sig. R. R. Smith	R. Sigs.	6GTQ
P./O. P. G. Spary	R.A.F.	2FVU
Capt. W. Stanworth, M.C.	R. Sigs.	5193
Cpl. T. J. Swain	R.A.F.	2FRI
Pte. G. Taylor	R.A.O.C.	64PI
A.C.2 K. Turner	R.A.F.	5132
Sig. J. Turney	R. Sigs.	4400
Gdsm. R. F. Vernon	Grenadier	
Sgt. E. Watson	R.A.F.	5196
Gnr. H. White	R.A.	4483
A.C.1 J. S. Whitehead	R.A.F.	5138
Cpl. C. W. Wightman	"	5150
Cpl. H. G. Wilkinson	"	4937
Cpl. W. Wilkinson	R. Sigs.	63VR

Rank and Name	Regiment or Branch of Service	Pre-war Call or B.R.S.
Pte. D. G. S. Williams	R.A.O.C.	5191
Pte. T. C. Williamson	"	4251
Cpl. F. Wilson	R.A.F.	4914
L.A.C. J. F. T. Wilson	"	5122
Gnr. E. Witney	R.A.	5127
Sgt. D. L. Wood	R.A.F.	2FKC
Cpl. H. S. Wood	"	688X
Cpl. W. E. Wood	"	4915
L.A.C. K. R. Wright	"	5130

CORRECTION (June List).

Lieut. S. G. Tetlow, R.N.V.R., 5056, should read, Lieut. S. H. Tetlow, R.N.V.R., 5057.

WELL DONE, PRESTATYN

SUNDAY, June 21, 1942, will be remembered as the day when the North Wales District of the Society, demonstrated that, in spite of the war, with its attendant difficulties, and in spite of a "dryness" which was not related to the weather, it was quite capable of organising a representative Provincial Meeting. Catering difficulties were overcome by the combined efforts of the Prestatyn group, whilst the problem of accommodation was solved in a most satisfactory manner by a young member, Mr. Gill, BRS4792, who allowed the meeting to take place at his home at "Vale View," Meliden Road, Prestatyn.

Among early arrivals were Mr. John Claricoats, G6CL, General Secretary, F./O. R. Norman, ex-G5DP, of Llandudno, and Capt. Jack Warner, G2WR, who journeyed down from Bury. A special welcome awaited the Wirral party from District 1 headed by Mr. H. W. Stacey, G6CX, the D.R. The arrival of GW3KY from Holyhead with ZL2RI and VK3JQ provided the signal to commence the meeting proper.

Introduced by BRS1060, "the man with the little black book" gave an outline of the work being done by the Society in war-time. He spoke of the remarkable increase in membership which has taken place since the beginning of 1941, and of the healthy state of the Society's finances. His reference to publishing difficulties in war-time were offset with a review of the way in which the Society has been able to render assistance to members in the Services. Post-war aspirations were referred to briefly and the hope expressed that after the war the Society would be established in a "home of its own with a laboratory and station befitting its status as a scientific organisation."

Information was given on such matters as the Society's journal, the P.O.W. Fund, activities in other Districts, the Experimental Section and liaison with the Services.

G6CL paid a tribute to the splendid work performed by Mr. Spillane, BRS1060, and his colleagues in Prestatyn. He also extended Council's good wishes to the meeting.

Before concluding his talk G6CL made an appeal on behalf of the P.O.W. Fund and thanks to the generosity of those present the sum of £2 2s. was donated. A further appeal to the visitors to make a small contribution towards the cost of providing refreshments met with excellent response.

Mr. Spillane in moving a vote of thanks to the Secretary, which was supported by Mr. Stacey, mentioned that a telegram of greetings had been received from the President, G6NF. At his suggestion those present autographed the telegram, after which it was returned to Mr. Gay as a memento of the meeting. A telegram of good wishes was also received from F./Lt. H. W. Simpson, G8DI.

Refreshments were then served but appetites seemed to be lacking as there was enough food left over to run another P.D.M. The demand for liquid refreshment, however, exceeded the limited supply. We understand this will not happen again!

An orgy of photography was followed by a Radio Quiz, skillfully arranged by GW4CX. The company seated themselves in a Druids Circle on the lawn and wracked their brains for solutions to the 27 highly ingenious puzzles sent round by the Chief Quizzer. G2WR was declared the winner with 14 correct and the prize which was awarded to him was later handed back for Annual Competition.

During the evening a discussion was opened by G6CL, on the subject of "Post-war amateur radio problems." He spoke of the National and International problems which would arise and recommended that "in readiness for the first post-war International Conference the R.S.G.B., A.R.R.L. and Dominion Societies should meet in London or Hartford, to hammer out a plan of action." "So much more can be done," he said "by a heart to heart talk than by the distribution of countless involved circulars."

He stressed the importance of seeking for an early restoration of limited licence facilities to all pre-war licence holders but warned his audience that much time may elapse before "the G.P.O. can get around to such matters as high power permits, frequency allocations in the high and ultra-frequency spectrum and to message handling." "The Society's main aim," he said, "must be to get our stations functioning again, even if we only get 10 watts on 40 metres for the first few months."

In bringing to an end this brief account of an historic Society meeting, the writer, on behalf of the visitors records thanks to Mr. Spillane and everyone else who contributed to its success.

"THE SANDY COVE."

BRITISH ISLES NOTES AND NEWS

DISTRICT 3 (West Midlands)

D.R.: V. M. Desmond (G5VM), The Chestnuts, Hanley Castle, Wroce. Hanley Swan 41. Scribe: E. J. Wilson (2FDR), 48 Westbourne Road, Olton, Birmingham, 27.

Birmingham.—Mr. Eric Wilson, 2FDR (Hon. Sec.), who was the lecturer at the June meeting of M.A.R.S. described the snags which he had encountered in the construction of a war-time 10-valve superhet covering from 3-10 Mc/s. He referred to mechanical construction and emphasised the importance of rigidity. Interesting comparisons were drawn against another set which is being built by two other members of M.A.R.S.

We learn that I. F. Chambers, 2FYT, of Redditch, is in good health and on interesting work, whilst 3WD also of that town is now at the "Country Farmyard" where he is thriving on army life. 2FDR.

DISTRICT 4 (East Midlands)

Deputy D.R.: W. M. Vandy, 9 Cecilia Road, Leicester.

Nottingham.—Several new members were welcomed at the June meeting, but unfortunately Mr. Hapwood was prevented from attending to give his lecture. The meeting continued as a round table conference. No details are available of the July meeting but particulars can be obtained from GSDZ.

Leicester.—Members are asked to note that a Meeting will be held in Leicester on July 26, at 6VD, commencing 7 p.m.

G6VD.

DISTRICT 5 (Western)

D.R.: R. A. Bartlett (G6RB), 31 King's Drive, Bishopston, Bristol. Bristol 4960.

Bristol.—A small though successful meeting was held on May 31, at G6RB, when the locals were pleased to welcome SP1HA, G6BY and G8KZ. Arising out of the Editorial in the May issue, the feeling was expressed that there was need of a club in Central London where the many amateurs of all countries now stationed in this country, could meet and renew their acquaintance with ham radio. As U.S. and other hams are coming over here in increasing numbers, it seems a golden opportunity to bring the R.S.G.B. into prominence.

An interesting letter comes from G5UH, now in Durban, S. A. He says "ZS for me after the war," and sends 73 to all old friends.

Bath.—G21W reports that all the locals there are O.K. He sees a good deal of 6BW, who lives next door. 8DX is Chief Billeting Officer for Bath, and is very busy. 8JQ returns at week-ends occasionally. He also gives the interesting news that Sgt. Mullis, a member of a V.C. "suicide" crew, raiding Brest Harbour was a ham. He obtained his full licence about a week before war broke out but was not a member of the Society. G6RB.

DISTRICT 6 (South Western)

D.R.: W. B. Sydenham, B.Sc. (G5SY), "Sherrington," Cleveland Road, Torquay. Torquay 2097.

No reports have come from other areas of the District this month. This may be due to the fact that comparatively few members are left at home, and those who are, find their time pretty fully occupied. However, as the lads on active service are very anxious to hear of anything going on at home, we would, again, stress the importance of sending in any items of news. This applies particularly to visits from members home on leave.

The D.R. has been pleased to meet G2GK, 2FP and BR54029. The meeting with 2FP came after an interval of two years. His friends will be glad to know that he is fit and well. G5SY.

DISTRICT 7 (Southern)

D.R.: W. E. Russell (G5WP), "Milestones," Mayford, Woking, Surrey. Woking 1589.

Coulston.—Local members read with regret in last month's "Khaki and Blue" section that S/Ldr. R. C. Wilkinson, 4HW, has been reported missing. We hope soon to have better news of him. (The better news has come. See Late Flash, page 9.—Ed.) 5072 an A.C.1 in the R.A.F. is welcomed to the area. (Via 3003.)

Croydon.—The May meeting held at 1545's was well attended. Those present included: 2DP, 2LW, 2VB, 3DF, 3ST, 4NI, 5AW, 5PY, 2FWA, 2HHD, 1545, 3003, and 4324. 2FWA is building a midget portable. 2RD has been home on leave. 4584 is still repairing his QRA. 4NI and 2DP have been on the sick list.

The August meeting is to be an open-air affair with XYLS and YLS specially invited. All who intend to come are asked to write to 2DP at 6 Dunheved Close, Thornton Heath, or ring THO 2489. See Forthcoming Events for date and time. (Via 2DP.)

Bournemouth.—3789, who has been accepted for the R.A.F., had VE4ASH of the R.C.A.F. staying with him recently. 4694, now an L.A.C., hopes to go to No. 1 S.S. shortly. Mr. Vaux,

2FSL, is working in London and seeks personal QSO's. (Phone, Albert Dock 2981, Ex. 10.) (Via 2HNO.)

Guildford.—Congratulations to 8IX on his promotion to Flight Sergeant. (A safe voyage Reg.) We are pleased to welcome 6NB of Southend, who is now working locally. As "Spenny," 6NA, has returned from the south-west the local highways can no longer be considered safe now that he has a motor cycle!

The June meeting at 2YL's was a most enjoyable affair. We were pleased to see some of the old timers again including, 2NH and 5KH. The July meeting will be held in the cafe at "The Cinema," Woodbridge Road, Guildford on Sunday, July 26, at 2.45 p.m. G5WF.

DISTRICT 9 (East Anglia)

D.R.: H. W. Sadler (G2XS), The Warren Farm, South Wootton, Kings Lynn, Norfolk. Castle Rising 233.

The proposal to hold a District Meeting does not seem to have brought forth many suggestions and so far replies from only three members have been forthcoming. The D.R. knows how scattered we all are in this area but surely a few more could make the effort. So, what about it you fellows, or have we got to let it slide once more? And by the way, we cannot have any notes unless members give us some news.

S. C. Lovewell, 3765, of Swaffham would like to thank G3XP for the interesting time recently spent at No. 1 S.S. G2XS.

DISTRICT 11 (North Wales)

Deputy D.R.: C. Spillane (BR51060), "Woodside," Meliden Road, Prestatyn.

The first P.D.M. ever held in North Wales took place on June 21, at "Vale View," Prestatyn, the home of BR54792 who is thanked for his cordial hospitality. An attendance of over 30 was recorded, including G6CL (whom many of us were meeting for the first time), ZL2RI, VK3JQ, G2WR, 3IR, 5DP, 5LJ, 5PO, 5XD, 6CX, 6HQ, 6XB, 8JV, GW3CF, 3KY, 3XY, 4CX, 2ARB, 2HCZ, 2HIV, BR51060, 3731, 3044, 3488, 4040, 4444, 4761, 4762.

BR51060 records his appreciations to all who helped to make the meeting a success. He especially thanks G6NF for his telegram: 6CL for attending and giving such a lucid explanation of Society activities, 6CX for bringing over a party from the Wirral, GW4CX for his Radio Quiz and 3KY for bringing over Empire representatives. (A visitor's account of the meeting appears on page 11.—Ed.)

Prestatyn.—The next local meeting will take place at Vale View, Meliden Road, on July 26, at 3 p.m. Visitors to the District will be cordially welcomed.

General.—It is understood that Mr. Stacey, G6CX, is attempting to organise a P.D.M. in Chester during September. District 11 members who expect to attend should watch District 1 notes for details. BR51060.

DISTRICT 12 (London North and Herts)

D.R.: S. Buckingham (G5QF), 41 Brunswick Park Road, New Southgate, N.11. Enterprise 3112. Scribe: P. R. Solder (G5FA), 35 Torrington Gardens, New Southgate, N.11. Enterprise 4347.

Arrangements have been made to hold the next District meeting in the spacious grounds of "The Wilderness," Blagden's Lane, High Street, Southgate, N.14 at 3 p.m. on Sunday, July 26. Buses 29 and 244 pass Blagden's Lane which is opposite Minchenden School. Members travelling by tube should book to Southgate, turn right into High Street. Blagden's Lane is

Forthcoming Events

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| July 25 | London meeting, 2.30 p.m., at the Institution of Electrical Engineers. Lecture by Mr. H. V. Griffiths, Engineer-in-Charge, Tatsfield Receiving Station, B.B.C. Subject "Frequency Measurement." |
| July 26 | District 12, 3 p.m., at "The Wilderness," Blagden's Lane, High Street, Southgate, N.14. |
| July 26 | Scotland "A" District, 2.45 p.m., in the Coffee Room, Y.M.C.A., Residential Club, 100 Bothwell Street, Glasgow. |
| July 26 | District 13, 3 p.m., at G4KY, 57 Claverdale Road, Elm Park, Brixton Hill. |
| August 8 | District 15, 6.30 p.m., at G4KG, 28 Almorah Road, Hounslow. (Near end of trolley bus route.) |
| August 9 | District 7, 3 p.m., at BR51545, 125 Hamsey Green Gardens, Upper Waringham. |

three minutes walk on right of High Street. Ladies will be cordially welcomed, but it is regretted that young children cannot be accommodated. It is hoped to provide a cup of tea, but please bring your own food.

The District "annual outing" held at G6LL, Cuffley, on June 28 in good weather attracted a goodly gathering—in fact, a real family party. Visitors included G6CO, 6CJ and 6WN, from District 15. A picnic tea held in the ideal surroundings of our hosts' QRA was followed by a game of base ball with teams captained by G6CL and 6CO. Radio was actually discussed, despite protests, and the main interest continues to be in the V.H.F.'s. A copy of the *Radio Handbook* donated by G5SA was raffled, and won by G6LL. The proceeds went to the P.O.W. Fund. We record our thanks to Mr. and Mrs. Mathews for their hospitality and for making us so welcome.

Hearty congrats to Mr. and Mrs. Alec Watson, G2YD, on the arrival of a son and heir. The young man arrived on July 3. An airgraph has been received from John Truscott, BR83013 (Middle East), who sends 73 to his friends at home. 4116 visited 5FA at the end of his radio mechanics course in the R.A.F. and has now been posted to a station in the West country, where he has met G8KO and ZL2QX. He informs us that 4219 has been called up for service in the R.A.O.C. and is under training as a wireless mechanic. 2CNC, St. Albans, has finished a receiver which is "delivering the goods." Congrats to 8SK on receiving his commission as F.O. R.A.F.V.R. (Training Branch). He is serving with the A.T.C. at Cheshunt. 5FA recently spent an interesting week at an operational fighter station in connection with his A.T.C. duties and during a visit to the radio shack found 6DY who resided in the District some years ago. G5FA.

DISTRICT 13' (London South)

A.R.'s: L. H. Shersby (G2GZ), 41 Recerdy Road, S.E.1 (South Eastern); S. E. Langley (G3ST), 62 Dumbarton Road, S.W.2 (Central); E. H. Simmonds (G8QH), 17 Roeden Crescent, Roehampton, S.W.15, Prospect 1990 (Western).

South-Western Area.—News comes from G2JK who says his work leads him to think of 10 watts as the grid dissipation of a receiving tube! Mentions also that he is to be married on July 18 to Miss Winifred Potter. Sincere good wishes, O.M. and Y.L.! Friends will be welcome at the Church, St. Mary's, Wimbledon, at 2.30. 4GD reports by land line. He is on a "toughening course" which sounds like fitting him to shove up a 60-ft. mast single-handed! (Hope the exam. results were O.K.) 6DT has been "multi-vibrating" for frequency checking. Apologies to 2HJP and 5PY to whom letters are owing. Time is not on the side of "yours truly." G8QH.

South-Central and Eastern Areas.—Fifteen members attended the June meeting. District news is again scarce. Congrats to G5WG who has attained commissioned rank whilst serving in the M.E. G8TN sends greetings to old friends.

Service members on leave are asked to attend District meetings. See "Forthcoming Events" for July arrangements.

G6GZ and G3ST.

DISTRICT 14 (Eastern)

D.R.: R. L. Varney (G5RV), 184 Galleywood Road, Chelmsford, Essex. Chelmsford 3394.

Chelmsford.—An excellent attendance was recorded at the June meeting when six full call signs were on parade! The list included: 6LB, 6ZC, 5RV, 5X1, 4GT, 2SO, BR3650 and Mr. P. Ashcroft, a new recruit to the Society, now serving in the R.A.F. We were particularly pleased to welcome Bert Leefe, 5X1, who was coerced into spinning a yarn or two about his experiences at numerous odd spots on the globe. He looks remarkably fit. 2ZJ, late of Ingatstone, looked in during his first Army leave. Fred Varney (2nd Opr. 5RV) also had 7 days' leave recently, and it was hoped that 3BS would get leave at the same time so that a miniature "Hamfest" could be arranged with the local boys. However, it was not to be, as 3BS was unable to get down. 5RV has sent greetings and encouragement to Captain Gordon Hill G2KG (R.E.), in the M.E.F., on behalf of all his friends here. Congrats are offered to Mr. and Mrs. 6IF on the arrival of a Junior Op. The D.R. has received news of the marriage of "Tiny" Tremaine, 8PB, which was scheduled for July 11. G5RV.

DISTRICT 15 (London West, Middlesex and Buckinghamshire)

D.R.: H. V. Wilkins (G6WN), 539 Oldfields Lane, Sudbury Hill, Greenford, Middlesex, Byron 3369.

The attendance at the June meeting was very poor—only G3SU, 2ADL, 4684 and 4889 being present. The latter put in his last appearance before being transferred to Scotland.

A letter from G3GY brings a request to pass his 73 to the gang, 2KI reports well and sends the same request. He asks to be remembered to 2VV, 6GB and 1066 who served with him in North Wales. 2ADL has received a letter from W1FZX who is serving as a Lt. in the U.S. Army. ADI promises his shack for any future meetings. 8WR has little news, BR83750 who reports after fifteen months, is now in the R.A.F. where he has met VESABB. During the past twelve months he has served in all parts of the country. He also sends 73 to district members. G6XP has recently entertained one ZL, one W, SPIQA, G2CB and 5KT. BR50506 is busy with post-war plans. G4KG has promised to take the next meeting (see "Forthcoming Events"). G6WN.

DISTRICT 16 (South Eastern)

Deputy D.R.: W. A. Scarr, M.A. (G2WS), 8 Beckenham Grove, Shortlands, Bromley, Kent. Beckenham 1131.

The only notes to hand are from G6CY, who reports from:—**Brighton and Hove.**—That G8CP, 6XF, 5JZ and 2HOF are all active on their receivers. 2AO has unfortunately been on the sick list. 4NY has been on leave, and the T.R. has also met 2CHZ for the first time. 2JL is being married this month, and we offer him our best wishes. G2WS.

DISTRICT 17 (Mid East)

D.R.: Dr. A. Gee (G2UK), "Stonehaven," Horncastle Road, Boston, Lincs.

It is hoped to hold a District meeting at the Saracens Head, Lincoln, on August 23. Watch next month's issue for further details. Reservations to G2UK please. The second District donation for the P.O.W. Fund is now mounting up. Those who have not yet donated and wish to do so should send direct to D.R.

Boston.—2BQC is now back on duty after a spell in a convalescent depot. 2UK is home on sick leave.

Lincoln.—G3XM, who has been moved again, has met G8RY, WAGPW, VE4MG—the station chaplain—and VE4CC.

Sheaford.—G8GI, who has been in the R.A.F. for some time and is now in Berks, would like to hear from 6GH, 8BQ, 8CI, 4KZ, 2AAS, 6AK and 2BQC. (So would the D.R.!) G2UK.

Scotland

Scottish Records Officer: J. Hunter (GM6ZV), 51 Camphill Avenue, Glasgow, S.1. Langside 237.

"A" District.—At the May meeting, when Mr. McDowall, GM3AR, was appointed to succeed Mr. David Niven, 2CHN, as "A" District Officer, GM4JO, delivered a very interesting lecture on oscillatory circuits.

The question of holding a Scottish Convention was discussed, but it was decided that the support likely to be forthcoming would not justify the risk involved. GM6ZV would, however, be glad to hear from members (who do not attend regular meetings), whether they would support a special meeting if arranged. Such a meeting would be held in Glasgow or another centre if support justified it. Please write at once if you wish this matter to be considered. Unless you "speak up" it is impossible to do anything. GM6ZV.

Northern Ireland

D.R.: J. N. Smith (GI5QX), 19 Hawthornden Drive, Belmont, Belfast.

Two mistakes crept into the June notes. First the call GI5ZY was mentioned instead of GI3ZX, second Capt. Banham and C.Q.M.S. Davidson should have been welcomed as new members and not as new arrivals to GI.

G4NC, 5UG, 6QF, 8VK and 4854 have been welcomed to Y.M.C.A. weekly meetings. 2MV and 5IV have returned to G. 2DDI has been on leave. According to GI6TK, 3GAH is back in Belfast, G5ZD and 3607 are welcomed to GI. 2FJS, now in Cornwall, sends 73 to GI friends. The only U.S.A. visitor to the Y.M.C.A. Radio Club has been W4WB/5FSI, but we hope to meet others shortly.

Congrats and best wishes are extended to Cpl. Appleby, 4706, who was recently married to an Irish lady. We understand that 2DUF, 2FNY and 2FCQ are working with him somewhere in GI. Lt. Stratton, R.N.V.R. has been in touch with 5QX. GI bids him welcome and hopes to see him in circulation shortly! From Mr. Downing, Sur., comes news of his son GI3ZX, who receives our congrats upon his promotion to Lt. 3ZX is now in VU.

The D.R. has received several donations for the P.O.W. Fund but before sending them in to H.Q. he would like to hear from any other GI member who wishes to subscribe. GI5QX.

West Africa

Representative: A. Tomlinson (ZD2H) D. F. Station, Posts and Telegraphs, Apapa, Nigeria.

Nothing has been heard of ZD1GT although there is a possibility he is still in Freetown. 2G is now in Lagos and busy with commercial gear. 2H, who has left Kano for Apapa, would like to meet any service hams either in the vicinity or passing through Lagos. His telephone numbers are: Office, Lagos 753, Home 754X. Ex-G5FA-VQ3FAR, who intends taking out a ZD2 call after the war, is vacationing in ZS. He met the Down Limited train at a wayside halt to pass 73 to 2H on the occasion of his transfer. No news from BERS440 but 480 obliges with a letter. He is having servicing difficulties due to the absence of spares. Accra B.C. Station is probably keeping ZD4AA busy. 4AB does not reply to letters, so it is presumed he is in G. or vacation or QRL.

It is thought there may be some W's around these quarters brasspounding for "Pan-Ams" but no personal contacts have yet been reported. ZD2H.

Correction

Mr. T. C. Bryant, G3SB, points out that an error crept into the circuit diagram of his automatic Morse receiver as described in the June issue. Between the bias battery and the grids of V3 and V4 (Fig. 2, Page 376), two grid leaks should be included. The values are best found by experiment.

HEADQUARTERS CALLING

May Council Meeting

Resume of the Minutes of a Council Meeting held at the Institution of Electrical Engineers, on Monday, May 11th, 1942, at 5.30 p.m.

Present.—Messrs. A. E. Watts (in the Chair), H. A. M. Clark, J. W. Mathews, G. A. Jessup, A. J. H. Watson, W. A. Scarr, S. K. Lewer, E. H. Simmonds and J. Claricoats (General Secretary).

Apologies were received from Messrs. A. D. Gay, who was ill, and from W. H. Mathews who was absent, due to pressure of private business.

1. One hundred and twelve applications for membership were accepted. Twenty-two were supported by references while the remainder had been sponsored by Corporate Members. Two resignations were accepted.

2. It was decided not to send parcels from the R.S.G.B. P.O.W. fund to amateurs who were not members of the Society.

3. A new design of lapel badge was approved. It was agreed to present one of the new badges to each new member elected after July 1st, 1942.

4. It was reported that various suggestions made by members had been considered by the Handbook Committee, and that certain minor modifications would be incorporated in any new printing.

5. Revised BULLETIN advertising rates effective from the July, 1942, issue were approved.

6. It was agreed to hold London meetings at the Institution of Electrical Engineers, on June 27 and July 25.

7. In view of the Government's request that all unnecessary travelling should be avoided, it was decided not to organise a second war-time Convention.

I.E.E. Meetings

Council takes pleasure in announcing that Mr. H. V. Griffiths, engineer in charge of the Tatsfield Receiving Station of the British Broadcasting Corporation, has kindly consented to lecture on the subject of "Frequency Measurement" at the meeting to be held on Saturday, July 25, at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2. It is hoped that a record number of members will be in attendance to hear this important lecture.

Members free for lunch are invited to meet at Slaters Restaurant (lower floor) 393 Strand, from 12.30 p.m. onwards. The I.E.E. will be open from 2 p.m. and the lecture will commence at 2.30 p.m. Tea will be served at 4.15 p.m.

In response to many requests, a second Radio Brains Trust meeting will take place on Saturday, September 26. No meeting will be held during August.

An attendance of 45 was recorded at the June meeting when Mr. H. L. Gibson, 2BUP, delivered a lecture entitled "Circuit Design Principles of Power Amplifiers."

The Chair was taken by Mr. E. L. Gardiner, G6GR (Executive Vice-President), and a vote of thanks to the lecturer was proposed by Mr. H. V. Wilkins, G6WN, and seconded by Mr. D. N. Corfield, G5CD. F./Sgt. S. White, G4DS, received the congratulations of the meeting upon being awarded the Air Force Medal.

March "QST"

Headquarters holds a small stock of QST dated March, 1942, for distribution to subscribers who failed to receive that issue. It is believed that a proportion of copies for Great Britain were lost at sea.

Headquarters Office Hours

Members are reminded that the normal office hours maintained at Headquarters are from 9.30 a.m. to 1 p.m., and from 2 p.m. to 5.30 p.m., Mondays to Fridays, and from 9.30 a.m. to 12 noon on Saturdays.

National Dials for National Effort

Headquarters will be glad to hear from any member who is in a position to dispose of Type P.W.O. National Dials. These are urgently required by a prominent commercial concern for an A1 Priority Government contract. Offers will be passed to the company concerned.

Why No News?

Several members have written to complain that little or no news appears from Districts 2, 3, 5, 6, 9, 10, 16 and 18. The fault lies with the membership and not with the D.R.'s or Scribes. Frequently items which should be sent to a D.R. are routed to Headquarters who have the task of converting the information into a style suitable for publication. Members are urged to co-operate by sending all District notes direct to their D.R. Closing date is the 25th of each month.

District 10 Meeting Proposed

Now that North Wales has led the way with a highly successful P.D.M. at Prestatyn, Mr. S. Howell, G5FN (District 10 Scribe), is anxious to organise a representative gathering in Cardiff. Members who would support a Sunday meeting are asked to write without delay to G5FN, 90 Coleridge Avenue, Penarth, Glam.

NEW MEMBERS

Home Corporates

- E. J. ARMSTRONG (G2RM), Quisiana, Inholmes Park Road, Burgess Hill.
 E. J. ROSE (G3NC), 5 Surrey Road, Swindon.
 C. R. DAWSON (G3SY), 19 Cusack Crescent, Workington, Cumb.
 W. WILKINSON (G3VR), 10 Swaine House Road, Bradford.
 L. H. B. HUNTLEY (G4LW), 40 Harford Street, Trowbridge.
 T. W. CARNEY (G4QC), 9 Gladeville Rd., Aigburgh, Liverpool 17.
 F. M. POPE (G5FP), 1 Mendip Villas, The Barrows, Cheddar.
 J. P. BLAIR (G5FT), 35 Market Place, Selkirk.
 E. PAGET (G5ZP), 95 Montague Rd., Clarendon Pk., Leicester.
 H. V. GRIFFITHS (G6FF), Whitelands, Westerham, Kent.
 D. ROBERTSON (G6GQ), 23 King Street, Crieff.
 H. S. WOOD (G8SX), 22 Lingwell Av., Middleton, Leeds 10.
 D. J. EVANS (G8VJ), 99 Kensington Avenue, Watford.

Home Corporates (B.R.S.)

- L. W. EVANS (5110), 28 Orchard Avenue, Heston, Middlesex.
 J. R. LAMBERT (5111), 25 Cumberland Grove, Norton, Stockton-on-Tees.
 C. H. PRICE (5112), 100 Wyken Avenue, Wyken, Coventry.
 J. A. G. BUSHBY (5113), 1 Oaks Cres., Stairfoot, nr. Barnsley.
 H. S. CASH (5114), 1 Brewster Road, Leyton, E.10.
 J. FORD (5115), 27 Carnegie Street, Edinburgh.
 W. G. KNIGHT (5116), 26 Clyde Road, London, N.22.
 P. R. BRAVEN (5117), 184 Mather Avenue, Liverpool 18.
 W. E. COX (5118), 96 Little Heath Road, Bexley Heath, Kent.
 A. J. MEADOW (5119), 51 Old Mill Lane, Formby, Lancs.
 A. REA (5120), 67 Charles Street, Hull.
 C. W. SHEPHERD (5121), 8 Sheppard Street, London, E.16.
 J. F. T. WILSON (5122), 1272 New Chester Rd., Eastham, Ches.
 J. PATTERSON (5123), 30 Thorntree Street, Edinburgh 6.
 N. G. WRIGHT (5124), 16 South Drive, Croydon Lane, Banstead.
 L. R. MAHON (5125), Yennadon, High Street, Chalford, Glos.
 K. W. M. PERRY (5126), 17 Queens Terrace, Northwood, Stoke-on-Trent.
 E. WITNEY (5127), c/o "Hylands," Eastwood Lane, Leigh-on-Sea.
 J. F. MOORE (5128), 71 Buckingham Avenue, London, N.20.
 E. G. KIRBY (5129), 83 Townsend Road, Southall, Middlesex.
 K. R. WRIGHT (5130), 14 Sixth Avenue, Chelmsford, Essex.
 W. ANDERSON (5131), Pinewood, Pumpherson, Mid-Calder, Midlothian.
 K. TURNER (5132), 22 Hillcrest, Monkseaton, Northumberland.
 E. A. G. BRALES (5133), 48 Meadowbank Gardens, Hounslow W., Middlesex.
 C. D. G. JAMES (5134), c/o County Technical College, Wednesbury.
 N. H. A. MORETON (5135), 39 Waterloo Lane, Bramley, Leeds.
 L. T. BARNES (5136), 12 Savernake Street, Swindon.
 I. G. APPLIN (5137), 10 St. Johns Road, Burnham-on-Sea.
 J. S. WHITEHEAD (5138), 3 Arael Farm Road, Abertillery, Mon.
 A. ALLAN (5139), 6 Waverley Park Terrace, Edinburgh 8.
 E. C. BANNER (5140), 84 Lansdowne Road, West Didsbury, Manchester 20.
 F. LEWIS (5141), 8 Moor Terrace, Millom, Cumberland.
 F. N. GANDON (5142), 39 The Circle, Gwendolen Road, Leicester.

A CORDIAL WELCOME IS EXTENDED TO THE

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NEW MEMBERS WHOSE NAMES ARE LISTED

- H. G. C. REICHERDT (2AVM), 11 Bloomfield Rd., London, N.6.
 R. A. W. LUCAS (2BJW), 31 Beaconsfield Avenue, Gillingham.
 G. K. ADAMS (2BOU), Rydal, Ambleside, Westmorland.
 W. C. LIVEN (2CKB), 2 Whitehead Place, Cleveland Way, London, E.1.
 A. C. HOPKINS (2CYS), 94 Queensborough Gardens, Glasgow, W.2.
 R. H. MURFITT (2DIM), 141 Gladstone Street, Bradford Moor.
 T. J. SWAIN (2FR1), 42 Howgate Road, London, S.W.14.
 P. G. SPARY (2FVU), Brentwood, Stoke Road, Leighton Buzzard.
 J. THRELFALL (2DKG), 68 Winton Av., Marton, S.S., Blackpool.
 B. L. SIMPSON (2HAP), Estate Office, Lakes Rd., Dukinfield, Ches.
 H. DODD (2HBB), 2 Wordsworth Street, Workington, Cumb.

M. J. ENGLISH (5143), 26 Bradbourne Road, Leicester.
 A. H. CARR (5144), 68 Church Street, Blackrod, nr. Chorley.
 A. CHALMERS (5145), 72 Stamperland Drive, Clarkston, Glasgow.
 J. WHITELEY (5146), 217 Norrithorpe Lane, Heckmondwike.
 S. R. WILSON (5147), 8 Northgate, Sleaford, Lincs.
 W. E. CLUBB (5148), 26 Sutton Court Road, London, W.4.
 W. BILLINGTON (5149), 209 Curzon Street, Long Eaton, Notts.
 C. W. WRIGHTMAN (5150), 11 Turner Av., Loughborough, Leics.
 L. LEDWARD (5151), 623 New Hey Road, Outlane, Huddersfield.
 A. J. DIXON (5152), 334 London Road, Waterloo, Hants.
 R. W. DRAYTON (5153), c/o 415 Strand, London, W.C.2.
 J. E. QUINN (5154), 13 Carmarthen Avenue, East Cosham, Hants.
 R. W. ALEXANDER (5155), 23 Avon Road, Devizes, Wilts.
 C. L. HIDER (5156), 95 Chairborough Road, High Wycombe.
 K. A. EBBES (5157), 84 Ollerton Road, London, N.11.
 J. C. HOLDEN (5158), 309 Alnsworth Lane, Tonge Moor, Bolton.
 G. H. ROBINSON (5159), 34 Sandringham Rd., West Hartlepool.
 J. W. MOORE (5160), 7 Inverness St., West Drumoyne, Glasgow.
 C. FARLEY (5161), 78 Rouel Road, London, S.E.16.
 A. M. BLAKEMORE (5162), 452 Gillott Road, Hagley Road, Birmingham 8.
 G. M. HOWE (5163), 44 Pierremont Road, Darlington.
 J. ROSE (5164), 16 North Bridge Street, Sunderland.
 D. H. CHEESEMAN (5165), 34 Lower Higham Road, Chalk, Gravesend.
 G. TAYLOR (5166), 325 Windmill Lane, Sheffield 5.
 E. G. ALLEN (5167), 31 Copse Hill, London, S.W.20.
 R. E. RUNHAM (5168), 23 Lovelace Road, London, S.E.21.
 A. G. MILLS (5169), 78 Hanover Avenue, Feltham, Middlesex.
 C. B. ABEL-HARRY (5170), 27 Aubert Park, London, N.5.
 A. G. A. GRIGOR (5171), 46 Bon Accord Street, Aberdeen.
 V. H. CHEESEMAN (5172), 64 St. Bernards Road, London, E.6.
 R. W. GEE (5173), P.O., Haytons Bent, Ludlow, Salop.
 E. A. AGUILAR (5174), 20 King Edward Road, New Barnet.
 K. H. BOBBE (5175), 516 Westhorne Avenue, London, S.E.9.
 C. PAXTON (5176), 3 Elm Gardens, Mitcham, Surrey.
 J. A. ALFORD (5177), 24 Well Road, Barnet.
 F. P. SEXTON (5178), 535 Kilmington Road, Ewell, Surrey.

F. CROWTHER (5179), 82 Tenterden Street, Bury, Lancs.
 R. S. HIND (5180), 55 Chester Drive, North Harrow, Middlesex.
 H. E. HOLSGROVE (5181), 67 Bridwell Road, Weston Mill E., Devonport.
 J. GOOD (5182), 11 Wilton Road, Edinburgh 9.
 E. P. MORICI (5183), Kumulu, New Rd., Sands, High Wycombe.
 P. F. HEGGS (5184), 27 Kings Avenue, Christchurch.
 H. A. PATTERSON (5185), 20 Keephill Drive, High Wycombe.
 M. A. BRETT (5186), 35 Burnaston Road, Birmingham 28.
 J. W. KERR (5187), 23 Stoneycroft Crescent, Liverpool 13.
 J. L. WATSON (5188), c/o B.B.C., Penmon, Anglesey.
 E. S. KNIGHT (5189), Bungalow, Tollerton Lane, Tollerton, Notts.
 H. CLAYTON (5190), 9 Stanger Road, London, S.E.25.
 D. G. S. WILLIAMS (5191), 60 Hurst Park Avenue, Cambridge.
 J. C. WEST (5192), 88 Castle Hill Road, Hindley, Lancs.
 CAPT. W. STANWORTH, M.C. (5193), Alton House, Yewlands Avenue, Broughton, Lancs.
 CAPT. L. PENDLETON (5194), Eilerslie, Midmills Road, Inverness.
 S. H. MELDRUM (5195), 8 St. Martins Approach, Ruislip, Mddx.
 R. F. VERNON (5196), 26 Lynholme Rd., Welford Rd., Leicester.
 W. J. HENSON (5197), 29 Clan Road, Littlehampton, Sussex.
 A. W. SAUNDERS (5198), 12 Harvey Road, London, S.E.5.

Dominion and Foreign

LT. G. H. HERVEY (VE3ATM), R.C.C. of S., England.
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 L.A.C. V. J. WILSON (ZL3DU), c/o 3 Agar St., London, W.C.2.
 J. TONCAR (FR553), Czechoslovak Forces.
 MAJOR K. SVOBODA (FR554), 8 Grosvenor Place, London, S.W.1.

THE RADIO BRAINS TRUST REPLIES

WE publish below a selection of the questions asked and answers given by the Radio Brains Trust at its first session on May 30, 1942.

Q.: Why does a neon lamp give the usual glow as an indicator when used on direct current as well as on alternating current? (Submitted by B. J. Matthews, G6CC.)

A.: A neon lamp will glow on either A.C. or D.C. because the light is caused by ionisation of the gas molecules present within the bulb. In fact on A.C. the neon lamp does not glow continuously but is extinguished every half cycle at normal A.C. frequency: persistence of vision of the eye does not make this fact visible. Also a neon lamp of the "Beehive" type does not glow equally on D.C. or A.C. On D.C. either the "Beehive" (spiral) or the "flat plate" type glow brightest depending on the polarity, whereas on A.C. each glow equally since the A.C. is equivalent to reversal of polarity of the D.C.

When a neon lamp is lit by radio frequency (such as being in close proximity to a transmitter) the field from the high potential R.F. causes ionisation of the gas and the glow may fill the bulb and need not be necessarily associated with either of the electrodes.

Q.: If two frequencies very close together are generated, a third frequency equal to the difference between the two is produced. Why is it that radiations in the light spectrum very close together do not produce beat frequencies in the range of radio communication? (Submitted by H. R. Heap, G5HF.)

A.: It is a fact that when two frequencies are generated a third frequency equal to the difference between the two is produced providing that those frequencies are applied to a non-linear device, in other words a detector.

In the case of sound waves of two frequencies a beat will be heard orally because the ear has a non-linear characteristic, but if each frequency is applied to each ear separately no beats will be observed, showing that the human brain is linear in response.

Beats are obtainable in light waves by using a diffraction grating but since it is essential that the detector be capable of radiating the resulting beat and no detector of light is known that is also capable of radiating radio frequency, the beats are not capable of observation. They must exist nevertheless.

Q.: What is the highest fundamental frequency at which a quartz crystal will oscillate? (Submitted by John Sinclair, BR540.)

A.: The highest fundamental frequency of a quartz crystal plate is limited by manufacturing difficulties. Since the frequency is a function of thickness (about 100 metres/m.m.) there is a practical limit to how thin it can be ground. Normally the highest frequency is of the order of 20-30 Mc/s. but the Japanese are reputed to have made experimental crystals as thin as 1/1000 in. corresponding to a frequency about 100 Mc/s.

The power output obtainable from very thin crystals is small due to the fact that they are too thin to stand up to appreciable

electro-mechanical stresses without fracture and also because the capacity caused by the holder is high since the two electrodes are very close together. This results in heavy capacity damping.

It is more economical to use an extra valve and a lower frequency crystal. Tourmaline can be worked at frequencies up to about 60 Mc/s. but is difficult to obtain.

Q.: Is it possible to convert a guitar into an electrical guitar by introducing an electrode magnetic attachment? (Submitted by G. M. Jenkinson, 2FGQ.)

A.: Yes. A guitar can, quite easily be fitted with an electro-magnetic attachment, and the resulting sound output—obtained from a conventional amplifier and speaker—is very satisfying to most ears. Assuming that the strings are of steel, all that is necessary is to mount a small electromagnet close to each steel string so that the string tends to close the magnetic circuit—in just the same way as in an electric bell or a telephone earpiece. The type of electromagnet contained in a telephone earpiece, although not ideal for adapting to a string instrument, is nevertheless, quite satisfactory. It is not necessary to have a separate magnet for each string. All the strings could well be in the common field of one magnet: it is only a question of the physical dimensions of the magnets. The windings should be connected in series, in order to present a high impedance source of voltage to the input of the amplifier. A two-stage amplifier may be sufficient for most purposes, and it should not be necessary to exceed a voltage gain of 50 db.

The position of the magnets in relation to the strings determines the character of the sound output, but this is a complex question and the method of trial-and-error should be relied upon to obtain the most pleasant effect.

If the strings of the instrument are not of magnetic material, they can be made to have a magnetic effect on the electro-magnets by passing a small current through them. It must, of course, be D.C. to avoid any hum modulation. This system, however, has certain drawbacks and is not recommended.

As an alternative to an electromagnet system, it would be quite practicable to use an electrostatic method, where the strings are maintained at some steady potential and constitute the vibrating members of a small condenser, the other electrode of the condenser being a small insulated metal plate located close to the strings. Careful electrostatic screening is necessary to avoid hum pick-up from stray fields.

Either of these two main systems could be used to modify a piano. In this case, however, the electrostatic system is much more convenient to use. The results can be extremely pleasant, and the first rough experimental approach should provide ample encouragement towards the construction of a permanent attachment.

In general, the effect of an electric attachment to a stringed instrument is to create the impression of more body and liveness of tone, besides providing for much wider control of sound output. The result is vastly superior to that obtained by using a microphone and amplifier to amplify the sound already produced by the instrument.

(Further answers next month.)

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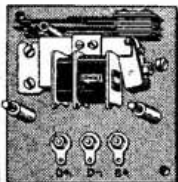
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