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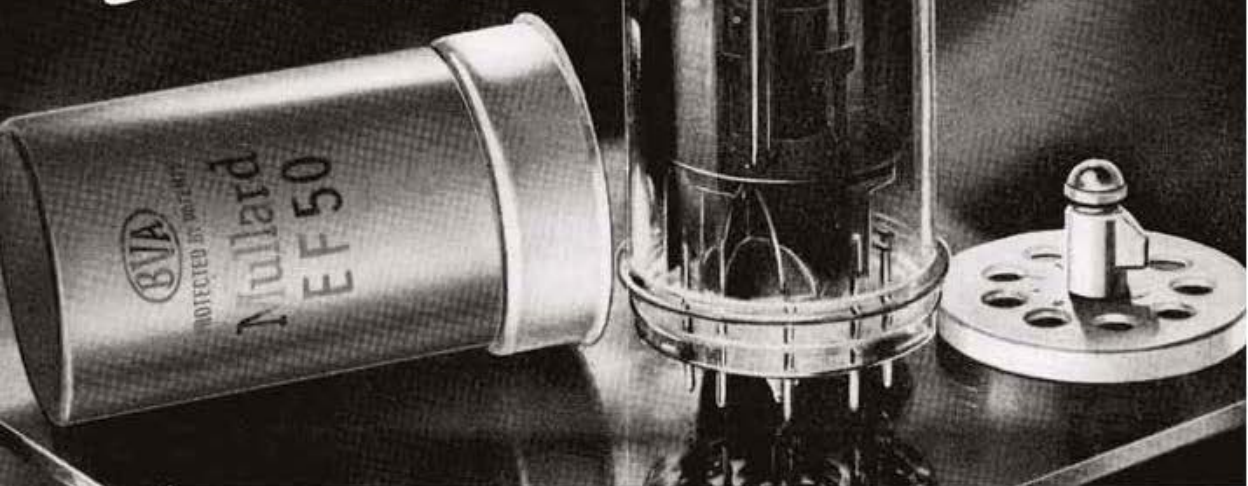
JANUARY, 1945

BULLETIN

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

MULLARD

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- FULLY AUTOMATIC HAND OPERATED KEYING CIRCUIT
- THE DECIBEL NOTATION

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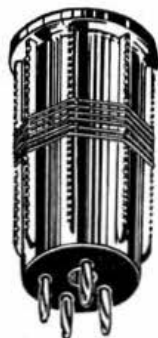
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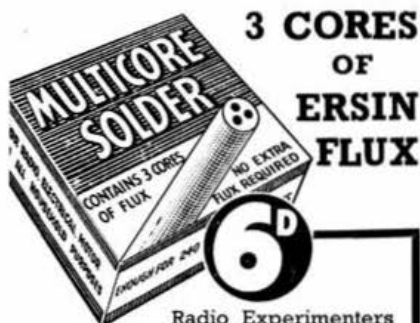
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R.S.G.B. BULLETIN

OFFICIAL JOURNAL OF THE INCORPORATED RADIO SOCIETY OF GREAT BRITAIN

Published on or about the 15th of each month. Issued free to members.

General Editor: JOHN CLARRICOATS.

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Telephone: Holborn 2494

Honorary Editor: ARTHUR O. MILNE.

VOL. XX.

JANUARY, 1945

No. 7

HOSPITALITY

AS we have been taken to task by our members on several recent occasions for our apparent lack of interest in providing hospitality and organising meetings for the many U.S. amateurs now in this country, we feel that some comment and a little explanation may help to clear the air.

Some home members obviously do not realise how difficult it is to contact more than a very small number of the American amateurs over here, as few seem to have *QST* forwarded from home and even fewer ever see *THE BULLETIN*. For some reason, which is difficult to understand at first sight, many U.S. amateurs make little attempt to contact each other, even when considerable numbers of them work in the same building. Their main source of information, *Stars and Stripes*, the U.S. Army paper, is limited in its quota of paper and has perforce to give its space to matters of more general appeal than amateur radio. Even so, we have to acknowledge valuable co-operation in this respect for the two meetings which were held in London during the Autumn. An explanation of why these had to be discontinued has already appeared in a previous issue of *THE BULLETIN*.

It must be remembered that the job of "organising" the U.S. amateurs in England is complicated by the fact that so far as they are concerned, this is a foreign country. If there was some well known American amateur more or less permanently resident here in a similar capacity for example as our old friend, Mr. W. E. ("Bill") Marsh, SUIWM, in Egypt, things might be different. However we feel that the fact has to be faced that many, possibly a majority of, American amateurs do not regard Ham Radio in the same light as we do in this connection. We quote a very well known U.S. amateur who wrote to us recently on this subject. He says:—"I imagine most of the W's over there are so busy with war jobs that the idea of getting together never occurred to them. So many of them come from small places here, and probably never worked out of their own State, or at most the U.S.A., and they have never heard of the R.S.G.B., and do not know how to go about looking up each other or the G's over there. It has always surprised me how few W hams went in for DX. They would be the only ones who would realise that there are such people as G hams. As a result the average W would simply be ignorant of the G's existence and their accomplishments in radio."

Rather chastening observations we feel, but nevertheless containing a good deal of truth.

A large proportion of American amateurs are interested in message-handling, and do not concern themselves with foreign contacts; these, it would seem, have no great common interest with us. The experimenter and DX-minded Americans being in the minority are not so well represented over here, and probably a fair proportion of those who are here, do make themselves known.

A reference to the December issue will show how our fellows have contacted the Belgians. News comes this month from France. Being near to a large number of foreign countries and having no interest in traffic handling probably explains a lot. It is just a difference in outlook. May we however once more emphasise that a hearty welcome awaits any U.S. amateur who will make his presence known to us. Observations on this subject would be welcomed from some of our American friends.

A.O.M.

THE PROPAGATION OF RADIO WAVES

Some months ago we appealed for a series of articles dealing with the propagation of radio waves. We anticipated that some well-known DX man, or perhaps one of our Experimental Section enthusiasts, steeped in radio lore, would answer the appeal, but we were wrong, for the one and only offer came from a member—Mr. B. H. Briggs, 2FJD—who in pre-war days was little known in amateur radio circles outside his home town, Bradford.

In presenting, in this issue, the first of a series of five articles from his pen, we venture to suggest that he will receive the thanks of many members for his masterly treatment of a subject which in recent years has opened up many new avenues of approach to radio problems.

It is perhaps unfortunate that, because of paper restrictions, this important contribution has to be presented in serial form, but in spite of this difficulty, we have little doubt that it will hold the interest of readers to the end.

Already it has been hinted that unexpected ranges have been covered on frequencies which, by pre-war standards, were considered of little use for reliable communication purposes. The propagation of such signals can only be understood by a sound knowledge of the effects experienced on the lower frequencies. Mr. Briggs has gone far to help us to understand how these effects are brought about, and by so doing has paved the way for a clearer conception of the manner in which signals in the ultra-high frequency part of the spectrum are propagated.

J.C.

THE PROPAGATION OF RADIO WAVES

By B. H. BRIGGS (2FJD)*

PART I

General account of the Earth's atmosphere. Mean free path and collision frequency. The sun's radiation. Sunspots and the sunspot cycle. Solar prominences and bright eruptions.

Introduction

THE fact that short wave signals sent out from a radio transmitter can, under certain conditions, be received at all points on the Earth's surface is in need of an explanation; for radio waves, being electromagnetic waves of the same nature as light, travel in straight lines, so that it is difficult to see how they are able to follow the curvature of the Earth. In 1902, Heaviside and Kennelly, independently, put forward the suggestion that high in the atmosphere there is a conducting region, which reflects radio waves down to the Earth, and prevents them from being lost in space. Long distance signals travel in a series of "hops," being reflected successively from the Earth and the conducting region. A gas can be a conductor of electricity if it is "ionized," i.e. if its

The atmosphere can be explored directly by means of recording balloons up to about 35 Km. Above this height our knowledge of the conditions existing is indirect, and is obtained by the observation of phenomena occurring there, such as the Aurora, by studying the effect of the atmosphere on radiation passing through it, or by other indirect methods.

The first surprising fact which exploration of the atmosphere brings forth is that ordinary weather effects, which we normally think of as being an essential characteristic of the atmosphere, are actually confined to the very lowest part of the atmosphere, i.e. up to about 15 Km. height. This region is called the *Troposphere*. Due to weather effects, the troposphere is constantly in a turbulent condition, but on the average the temperature falls

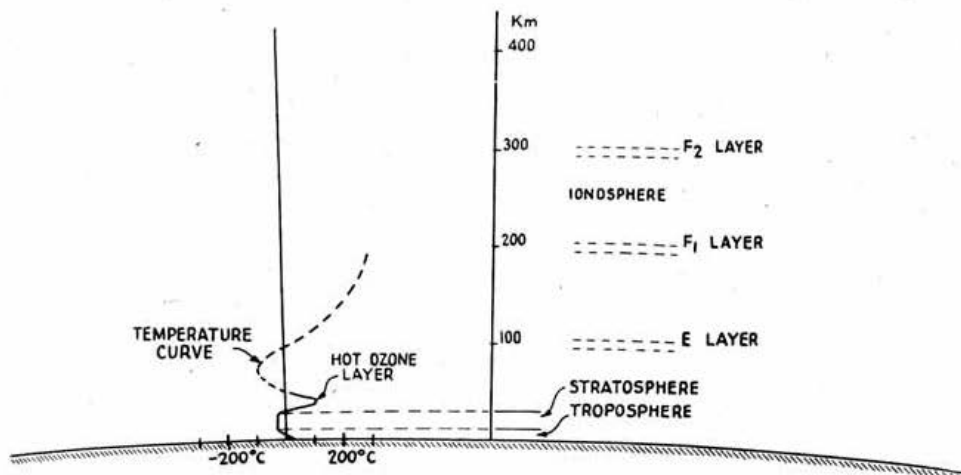


Fig. 1.

The various regions of the atmosphere. The curve on the left shows roughly the variation of temperature with height.

molecules are split-up by some means into positive and negative charges; consequently the suggestion was made that the upper atmosphere is ionized, and this ionization is believed to be caused by radiation from the sun.

The theory of the ionized region has been dealt with by many workers, and most of the phenomena occurring in short-wave transmission can now be accounted for in terms of the properties of the Earth's atmosphere, and of the radiation received from the sun. These will form the subject of Part I of this series of articles.

The Earth's Atmosphere

It is impossible to say how high the atmosphere extends, for as we go upwards it merely becomes thinner and thinner until it merges with the almost perfect vacuum of outer space. The highest level of any radio interest is about 500 Km., for this is the highest point at which Auroræ or Northern Lights have been observed. The important part of the ionosphere is all well below this region.

uniformly as we travel upwards from the ground, at the rate of about $5\frac{1}{2}^{\circ}\text{C.}$ per 1,000 ft., and at the top of the troposphere it has fallen to -53°C. Passing out of the troposphere the temperature ceases to fall any further, but stays constant. We have now reached the *Stratosphere*, a region of intense calm, which is hardly affected at all by the violent weather phenomena going on in the troposphere below. These conditions hold up to 30 Km., at which point the temperature starts to rise, and reaches about 100°C. Above this height our knowledge of the temperature is less certain, but we know that it is low at 100 Km., and that it may be as high as $1,000^{\circ}\text{C.}$, under certain conditions, at 300 Km.

The high temperature around 40 Km. is believed to be due to the absorption of ultra-violet light from the sun by a layer of ozone, which consequently becomes heated. This hot layer accounts for the abnormal propagation of sounds. It is found that the point of a large explosion is frequently surrounded by a ring or "skip zone" in which the sound was not heard, although it was heard again at greater distances. It is believed that this effect is due to sound waves being reflected down from the atmosphere in a similar way

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to radio waves, so that even after the sound wave travelling along the surface of the Earth has died out, the sound can be heard at still greater distances by means of this "sky-wave." The reflection can be explained by the fact that sound travels faster in hot air than in cool air, so that a wave front entering the hot layer from below will travel faster at the top than at the bottom, and so will be tilted round, and may be turned sufficiently to be returned to Earth. As will be seen later, the whole effect is exactly analogous to the reflection of a radio wave from an ionized layer, which is a region in which the wave travels faster than in normal air.

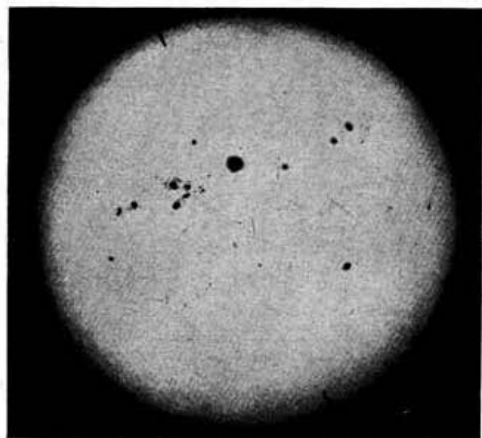


Fig. 2.

Photograph of the sun's disc, showing several sunspots and sunspot groups.

At ground level, the oxygen and nitrogen of the air are both diatomic, i.e. their molecules consist of two atoms each. Higher in the atmosphere, however, the oxygen exists in different forms; thus ozone is merely oxygen with three atoms to the molecule instead of two, while above 100 Km., oxygen exists mainly in the atomic form. Nitrogen remains always in its normal form.

At about 80 Km. height the *Ionosphere* is located. Above this height the atmosphere is everywhere ionized to some extent, but the main ionization occurs

in layers. The ionosphere will be dealt with in greater detail in the next article, but it should be noted here that the heights of the three main layers are as follows: E layer, 100 Km; F_1 layer, 200 Km; F_2 layer 200–300 Km. (variable).

As mentioned previously, Aurorae occur up to 500 Km. These impressive displays occur always in the region of the Earth's magnetic poles and are closely connected with variations in the ionosphere.

The features of the atmosphere which have been dealt with above are summarised in Fig. 1. The curvature of the Earth is shown roughly to scale, so that its relation to the heights of the various layers may be appreciated.

Since the ionosphere controls the reflection of radio waves, we shall not expect these reflected waves to be influenced by the weather, since weather effects are confined to the troposphere.

Mean Free Path and Collision Frequency

The molecules of a gas are always moving with high velocities, and are continually colliding with one another. If the motion of a particular molecule is followed, it will be found that it traverses a short straight path, and is then deflected into another direction by a collision with another molecule. It then covers another short distance, and collides again. The distances which the molecule travels between collisions will vary erratically, but the average value will be constant and definite for any given conditions of temperature and pressure of the gas. This average value is called the *mean free path* of the molecule. Clearly, the mean free path will be longer the lower the density of the gas, for the molecules are then further apart. In a similar way, the *time* between successive collisions will vary erratically, but if the average value is taken we shall get the *mean collision frequency*, which is the number of collisions which the molecule makes per second. The faster the molecules are moving about, the higher the collision frequency; consequently it is higher, the higher the temperature of the gas. It also clearly increases if the density of the gas is increased.

In our study of the ionosphere, we shall be more concerned with the mean free path and the collision frequency of *electrons* moving about among the gas molecules. As the electrons are much smaller than the molecules, collisions are less likely, and so the mean free path is somewhat longer, and the collision

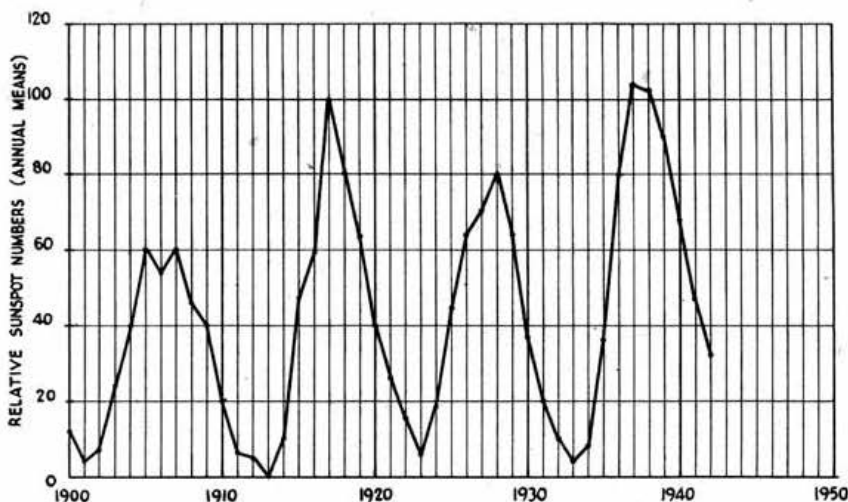


Fig. 3.

The 11-year sunspot cycle. Note the variability of successive cycles.

frequency lower, than for molecules. The values of these quantities for various heights in the atmosphere are given in Table I. The Table also gives the number of molecules per c.c. at the various heights. It shows in a vivid way how a gas is mainly empty space, the molecules being very far apart compared with their own diameters. Thus, at ground level there are about

Height in Km.	Number of molecules per c.c.	Mean free path of electrons (cm.)	Electron collision frequency (collisions/sec.)
0	2.7×10^{19}	5.4×10^{-5}	9.5×10^{11}
100 (E layer) ..	1.2×10^{12}	120	4.3×10^5
200 (F ₁ layer) ..	1.8×10^{11}	6,000	8.5×10^5
300 (F ₂ layer) ..	2.4×10^{10}	6×10^4	8.5×10^5
1,000	9.9×10^4	1.8×10^{10}	2.8×10^{-5}

Table I

10^{19} molecules per c.c., yet the mean free path is many thousand times their own diameter. At 1,000 Km. there are still a hundred thousand molecules per cubic centimetre, but the electron can now travel 50,000 miles before it hits one, and it makes one collision every five minutes! At this height the atmosphere is actually a much more perfect vacuum than can be obtained by any means on the Earth's surface.

The Sun and its Radiation

The sun radiates energy at the rate of nearly half a billion billion kilowatts. It produces this enormous amount of energy by a process which involves the building up of helium nuclei from hydrogen nuclei, a reaction in which a small amount of mass is lost, and appears as energy. Such a process is only possible under very exceptional conditions, such as exist at the centre of the sun, where the temperature is about 20,000,000° C., and the pressure about 10,000,000,000 atmospheres. The radiation produced at the centre by this process is of very high frequency, well beyond the ultra-violet, but when it has made its way outwards through the overlying layers of relatively cool gas, it is roughly equivalent to the radiation from a body at 6,000° C. The outflowing radiation is so intense that it exerts a pressure on the gas through which it passes, and this radiation pressure plays an important part in the equilibrium of the sun and in causing surface phenomena. After it has left the sun, the radiation takes about eight minutes to reach the Earth. It consists of electromagnetic waves of all frequencies from the extreme ultra-violet, through the visible spectrum, up to the infra-red or heat radiation.

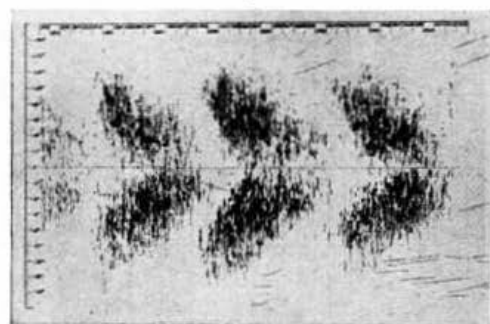


Fig. 4.

Distribution, in terms of latitude on the sun's surface, of sunspot centres for the years 1874-1913, showing three complete cycles.

The greater part of the visible and heat radiation is able to penetrate the Earth's atmosphere, and arrives at the surface of the Earth. The ultra-violet light, however, is strongly absorbed in passing through, and only very little reaches the ground. The process of absorption produces the various layers which occur in the atmosphere.

It is now proposed to deal with several phenomena which occur on the surface of the sun which are of the greatest interest because of their effect on radio transmission.

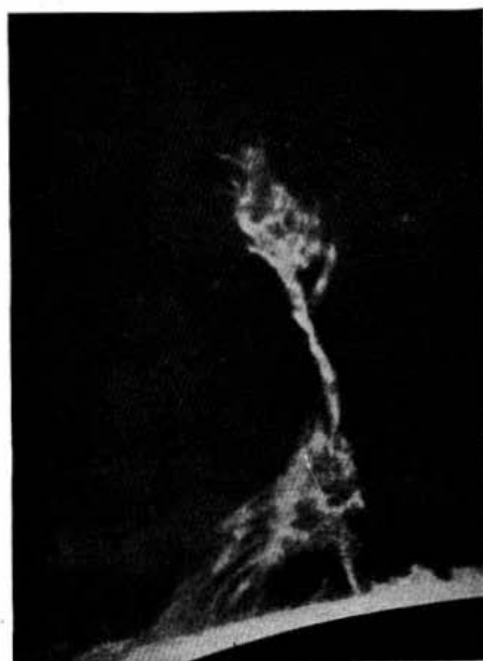


Fig. 5.

Solar prominence. Height 450,000 Km. (Figs. 2, 4 and 5 reproduced from *The Sun* by Giorgio Abetti, by permission of Messrs. Crosby, Lockwood & Son, Ltd.)

Sunspots and the Sunspot Cycle

A photograph of a typical sunspot group is shown in Fig. 2. A sunspot appears dark because it is relatively cooler than the surrounding surface of the sun. The spots are found to have a spiral structure, and are believed to be the outer extremities of huge vortices or cyclones, which go far down into the sun. Spots often occur in pairs, with opposite cyclonic motions. Of the two spots, the one lying in the advanced position, with respect to the direction of rotation of the sun, is called the "leader" spot, and the other the "follower" spot. It is found that strong magnetic fields radial to the sun exist in the region of sunspots. These fields are detected and measured by means of their effect on the spectral lines of the light received from the sunspot, the lines being doubled or tripled because of the presence of the field (Zeeman Effect). The magnetic polarities of spots with opposite cyclonic motions are opposite, and normally, at any one time, all the leader spots in the northern hemisphere of the sun have the same polarity, the polarity being opposite in the southern hemisphere.

The cause of sunspots is still uncertain, but they have now been studied long enough for their main variations and characteristics to be well known. It is found that the number of spots visible on the sun's surface at any time goes through a cyclic variation of

period 11 years. Thus in Fig. 3 the annual average numbers of sunspots visible are plotted, and the regular variation can be clearly seen. There was a sunspot minimum in 1933, a sunspot maximum in 1937, and we are at present (1944) at a minimum.

There are some further interesting features of the sunspot variation. It is found that each new cycle begins by new spots appearing in two belts round the sun, situated at about 30° N. and S. solar latitude. As the cycle proceeds, the positions of the spots move in towards the solar equator, until at sunspot maximum they extend down to 8° N. and S. of the equator. As the last spots of one cycle are dying-out near the equator the first spots of the new cycle are beginning to appear further out. Thus, at the time of writing, spots of the new cycle, which will build-up to a maximum about 1948 have been observed breaking-out in high latitudes. If the positions of the spots for successive years are marked on a diagram, a picture resembling the wings of a butterfly is obtained, often referred to as the "butterfly diagram" (Fig. 4). The magnetic polarity of the spots in the two hemispheres reverses at each new cycle.

It is found that the sun's output of ultra-violet light varies in sympathy with the sunspot cycle, the total range of variation from maximum to minimum being as much as 150 per cent. This is in striking contrast to the visible part of the sun's light, which stays quite constant during the cycle. It must not be supposed that the variation is due to the sunspots themselves. The spots are merely the outward sign of some more fundamental process going on in the sun. The effect of individual sunspots on radio transmission is dealt with in the last article of this series, where magnetic

storms and radio fade-outs are discussed. For the present it is only necessary to note that the ultra-violet light reaching the Earth from the sun varies with the sunspot cycle, being greater at sunspot maximum than at sunspot minimum. This variation affects in turn the ionosphere and so the transmission of radio signals.

Solar Prominences and Bright Eruptions

Associated with sunspots are often found huge streamers or prominences of glowing gas, extending far out into space (Fig. 5). They are frequently moving with high velocities, and are sometimes projected out into space, never to return. The magnetic field of the sunspot is believed to be the main propulsive force on the gas, which consists of charged particles.

There are also observed on the sun's surface, sudden eruptions, in which the output of ultra-violet light from a particular point is suddenly increased. The light is found to be due to incandescent hydrogen. They only last for a short time, usually less than an hour. These surface features are only brought out when the sun is observed in a special way, e.g. with an instrument known as a *spectroheliograph*. This instrument enables a photograph of the sun's disc to be taken in light of one particular wavelength.

Both these phenomena are important, because they are able to cause radio fade-outs.

In the next article it is proposed to consider the way in which the sun's light is able to ionize the upper atmosphere, and to consider why this ionization takes the form of layers. Reference will also be made to the variations which occur in the layers, at different times.

(To be continued)

A FULLY-AUTOMATIC HAND OPERATED KEYING CIRCUIT

By T. J. NORTON (G4KZ) *

IN the March, 1943, issue of THE BULLETIN, Mr. C. W. Cragg, 2H DU, described a keying circuit which produces automatic dots and hand-made dashes by means of a relay, thereby reproducing electrically the effect of a mechanical "Bug" key. The following is a description of a similar type of circuit (Fig. 1) which gives automatic dashes as well as automatic dots. The result is perfect Morse sent by hand at speeds easily variable from about 10 w.p.m. to 25 w.p.m. or more. Acknowledgment is made to Mr. Cragg for the basic circuit.

The key has been tried out on the air and recorded on a tape, which, as Fig. 2 indicates, shows that

spacing, length of dots and dashes are nearly perfect.

Components

Two relays are required, each having a "make" and a separate "break" contact. Relay A (dashes)

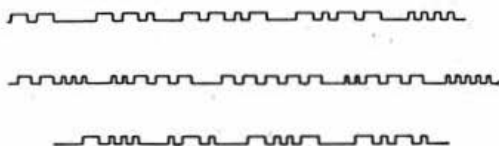


Fig. 2.

Specimen tape with the L.F. choke in circuit.

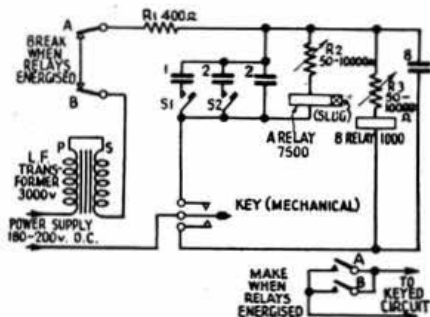


Fig. 1.

Circuit of fully-automatic hand-operated Morse key.

as used by the writer is of the ex-G.P.O. "slugged" type and has a resistance of about 7,500 ohms. The slugging is affected by means of a copper sleeve 3/10 in. thick, which fits on to the core and is of the same thickness as the bobbin when filled with wire. Fig. 3 is a diagrammatic representation of the core and slug. The result of slugging is that the coil retains its magnetism for some appreciable time after the energising current has been cut off.

Relay B (dots), also of the ex-G.P.O. type, had a resistance of 500 ohms when purchased, but as this was found to be too small it was rewound full with 42 gauge wire, to give a resistance of 1,000 ohms. It is not slugged. For this relay, a capacity of 8μf was

*c/o "Rue", 12 Hershaw Road, Walton-on-Thames.

found sufficient. No switching was required as sufficient variation of speed was obtained by varying R3. For the dashes, a total capacity of 5 μ f was required which, by means of switches S1 and S2, can be varied to give either 2, 3, 4 or 5 μ f, this providing, in conjunction with R2, sufficient variation in speed and length of dashes.

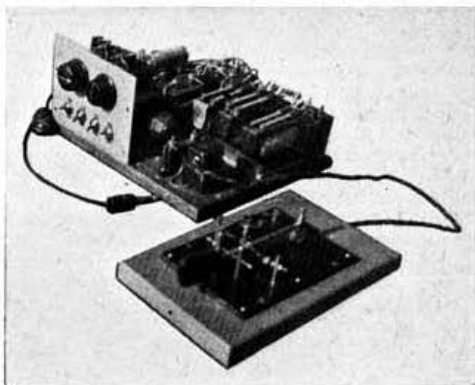
The resistance R1 has a value of 400 ohms, but this is not critical and could probably be dispensed with altogether. R2 and R3 are variable from about 50 to 10,000 ohms.

An L.F. choke was found to be necessary in order to provide a slight check between each "make" of the relay contacts. An L.F. transformer with the primary and secondary windings in series, was used for this purpose. Without it, the dashes were inclined to run together as shown in Fig. 4.

It is not proposed to describe a mechanical key as this can be made to suit individual requirements. The only essential is that it should operate from side to side making separate contacts on each side, and be sprung so that it returns to rest in a neutral position.

The power supply used by the writer was obtained from an A.C. mains H.T. eliminator delivering 180/200 volts, but any power supply which will work the relays will suffice, provided that the values of CH, R1, R2 and R3 are varied to suit the output voltage.

The photograph shows three relays. The middle one is operated by either of the other two and is part of the "controlled" circuit. It is not essential for the operation of the key. Four switches are also shown. The extra switches are to give slightly greater variation in the speeds of dots and dashes. If parking



Illustrates the keying circuit described.

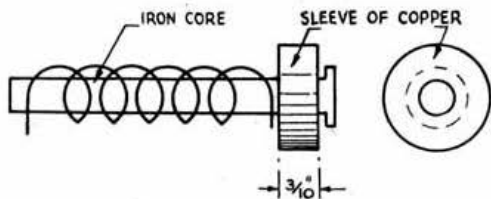


Fig. 3.

Slugged relay core. The amount of metal in the slug will affect the amount of "delay" action obtained.

The condenser banks may also need some adjustment depending upon the power supply and the resistance of the relays.

Operation

The key, having been adjusted by R2, S1 and/or S2 (for dashes) and R3 (for dots) will produce Morse at a specific speed and any attempt by the operator to speed up or slow down by moving the dot/dash lever more quickly or more slowly will result in failure. For this reason a rhythm must be attained to correspond with the pre-determined set speed.

A dash of set length will be started at the first contact of the lever on the dash side and until this is completed the dot relay will not operate. If two or more dashes are required, the lever is held over for the requisite length of time. No dots can be made until the required number of dashes is completed.

To produce perfect Morse the lever should be thrown over to "dash." As soon as the dash is started (or as soon as the second, third or fourth dash, as the case may be, is started), the key should be moved to the "dot" position. As a slight pause will be necessary before the dots start, the lever must be held over to this position just long enough to complete the required number of dots.



Fig. 4.

Specimen tape with the L.F. choke out of circuit.

at the relay contacts is experienced, this can easily be overcome by the addition of a resistance and capacity in series across the points.

SUNDAY ON FORTY—(continued from page 104).

strained diaphragms. Idly curious, Hector toyed with his pencil, and as the sending was slow, deliberate, and repeated, he was able eventually to identify this arch-rogue who so inconsiderately consumed large chunks of what was supposed to be commonly-owned air. . . . And so it was that towards the end of the long call, which ended "clunk-clink-clink, clink; clunk-clunk-clink; clunk-clink-clink-clink-clink. . . . Hector again furiously brushed the 'phones to the floor, snapped all the switches to the "off" position, stormed out of the shack uttering maledictions upon G5 . . . down the road, and heaping coals of fire upon the head of the man who first invented the phrase "ham-spirit."

There should be a moral behind all this, somewhere.

The Television Society

The following Meetings of the Television Society will be held at the Institution of Electrical Engineers, Savoy Place, London, W.C.2.

*Wednesday, January 24, 5.30 p.m. "American Television Broadcasting Practice, 1927-1944," by D. G. Fink (Electronics).

Tuesday, February 27, 6 p.m. "Vertical v. Horizontal Polarisation," by H. P. Williams, Ph.D.

Tuesday, March 27, 5.30 p.m. Annual General Meeting (Members only) followed by an informal Discussion on "The Social Aspects of Television," opened by Capt. C. H. Cazaly, R.E.M.E.

*Wednesday, April 4, 5.30 p.m. "Studio Technique in Television," by D. C. Birkenshaw and D. R. Campbell.

Friday, April 27, 6 p.m. "Beam Tetrodes," by S. Rodda, B.Sc.

Tuesday, May 29, 6 p.m. "The Human Eye and the Photo-cell," by W. Sommer, D.Phil.

The second half of the session will commence on September 25.

*Joint Meeting with the Radio Section, I.E.E., by kind invitation of the Radio Section Committee.

THE DECIBEL NOTATION

By JOHN B. RUDKIN, (B.R.S. 7060)

MANY experimenters of advanced practical skill, because they are a little shaky in mathematics, find difficulty in understanding one of the most useful units in radio namely the Decibel. These brief notes are offered in the hope that they may assist in removing some of the obscurities which seem to hinder the understanding of its characteristics and its application.

The decibel unit was first adopted as standard at a meeting of an international advisory committee on telephony held in 1924. It is one tenth of a "Bel," so named after Alexander Graham Bell, the inventor of the telephone. Its basis is logarithmic and it therefore follows the characteristics of the human ear. The importance of this feature will be appreciated later.

Applications

The first application of the decibel, and the basis of all others, is the comparison of two power levels—for example, in measuring the gain or loss when a signal passes through any amplifying or attenuating system. We can say that the loss or gain is expressed by:

$$\log_{10} \frac{\text{Power Input}}{\text{Power Output}} \text{ bels,}$$

or:

$$10 \log_{10} \frac{\text{Power Input}}{\text{Power Output}} \text{ decibels.}$$

Thus, if an input of 20 milliwatts were applied to a transmission line and an output of 0.5 milliwatts were received at the far end, the loss would be:

$$10 \log_{10} \frac{20}{0.5} = 16.02 \text{ decibels (db).}$$

It will be observed that the unit is fundamentally a ratio. The unit may be used in the treatment of power ratios or voltage ratios, but in either case it is necessary to relate the respective values to a common impedance level. In a given system, the power varies as the square of the voltage (other factors remaining unchanged), and therefore the power ratio is proportional to the square of the voltage ratio. It will be observed further that if a common "datum level" of

power can be established, any other power level can be expressed as an absolute value in decibels with reference to this datum level. Moreover, to calculate the gain of an amplifier (or the loss in an attenuator), it is necessary only to take the difference between the absolute levels in decibels at the input and output terminals.

The standard datum level, or zero volume unit (vu), is one milliwatt in 600 ohms. This corresponds to $\sqrt{0.6}$ volts R.M.S. in a 1000-cycle pure sine wave. Powers of less than 1 mW are given negative absolute values in decibels. For example, a power of 0.5 mW is expressed as -3 db, whereas a power of 2 mW is expressed as 3 db. If the gain of an audio amplifier is increased, the increase in the "loudness" sensation in the ear will be exactly proportional to the increase in gain, measured in decibels, due to its logarithmic characteristics. An increase in output of 1 db is about the smallest increment that the human ear can detect.

The Decibel Meter

The decibel meter is merely an A.C. voltmeter which measures the P.D. developed across a fixed impedance. The scale is calibrated directly in decibels. For the measurement of power levels in systems where complex waveforms are encountered, such as in broadcasting or recording, meters with special ballistic characteristics are used. If a pure sine wave is applied to such a meter, it will at first read a value lower than the true and then slowly rise to a value which is 1 per cent. to 1.5 per cent. higher than the true. The result when a complex waveform is applied may be imagined. Irregularities due to harmonics, etc., will not affect the meter reading. It will be appreciated that such a device becomes necessary only where measurement is required during operation. Where levels can be pre-set, a pure tone from an oscillator or gliding tone record, together with a normal decibel meter, may be used. A ballistic power-level meter is calibrated in volume units to distinguish it from the normal type, but the unit is identical with the decibel in size and use.

"Patrolling the Ether"

Gunner W. E. Gates, BRS6655, informs us that the film "Patrolling the Ether" pays a fine tribute to the part radio amateurs are playing in the war effort. The film deals with the efforts of the R.I.D. in America to eliminate illegal stations. Some excellent shots of D.F. arrays and equipment are included.

Can You Help?

Mr. R. Mitchell, BRS.6127, 11 Pier Street, West Hoe, Plymouth, requires a circuit diagram of the Trans-atlantic R.A.P. radio. Serial RT.13066.

Mr. C. A. Meek, BRS.4752, 79 Mathieson Street, Glasgow, C6, seeks the loan of operating data and circuit for the Tripplett Condenser Checker, Model 1241.

Mains Operated Valve Tester

The General Editor will be pleased to consider for publication a description of a mains operated universal valve tester. Offers should be made prior to commencing the manuscript.

News from the Kreigies

● Members will be glad to hear that the R.S.G.B. parcels sent to P.O.W. last summer, and which were held up for some months have now reached Germany. During the past few weeks letters of appreciation have been received from Messrs. Spink, Briscoe and Druce, who ask that their thanks be conveyed to all who have made donations to the Fund.

OUR FRONT COVER

OUR front cover shows a typical Mullard all-glass valve with the metal "can" removed, so that the all-glass construction can be clearly seen. This new technique overcomes many of the problems of maintaining efficient valve operation at high radio frequencies.

Silent Keys

We record with deep regret the passing of:—

Mr. E. H. Paulton, G4IT, late of Worthing, Sussex, and

Mr. G. Wain, BRS2866, of Llandudno, North Wales.

Mr. Paulton, who was well known to a wide circle of amateur friends, lived in North London at the time of his death, which occurred after a short illness.

Mr. Wain, although over 80 years of age, was a very enthusiastic short wave listener, and taught himself the Morse Code just before the war.

Our sympathies and condolences are extended to the relatives and friends of both members.

Can you Help?

The following effusion reached Headquarters—sorry, 16 Ashridge Gardens—last month.

"Has a reader of *Amateur Radio Handbook*, I would like to build Amplifier A.C. for Gram and Mic work with Special Faders and Tone Control giving an output of about 12/15 watts, as I say I am a reader of your book, but cannot read Circuits in Theoretical.

I would be Obligated if you could supply Circuits for above in Practical and giving layout of components and valves also full details."

You guessed right—his name was Murgatroyd!

Thanks

The General Secretary and Miss Gadsden thank all members at home and abroad who sent them Christmas and New Year greetings. The special Christmas Airgraphs and other festive souvenirs were especially appreciated.

SUNDAY ON FORTY

By R. G. KITCHEN (G3SK)

The author suggests there is a moral to be found in this yarn. Those who "enjoyed" Sunday on Forty in the palmy days of peace will no doubt find it. The more fortunate ones who did not, may discover that "ham-spirit" works both ways.

HECTOR was a Ham. A whole week had passed since the day he had discarded that despised call beginning 2. . . . He was now a G with a number and two letters, and he swelled with hamful pride as he lay in his bed reflecting on his new status. He thought of the ever-new fascination of QSO, and visions of what he would do on Sunday morning, when all the ham-world . . . Sunday! Good heavens, it was Sunday!

In a trice, Hector was out of bed, glancing at the clock as he slipped into his dressing gown. Nine o'clock. No time to dress, or to eat his breakfast. The Battle of the Forties would be in full fomentation, and the RX wasn't even warmed up yet!

Hastily he threw the main switches of the TX and RX, and waited for the heaters to warm up. The ECO was set for somewhere around 7300 kc/s., and as Hector idly twisted its tuning condenser, he laughed sardonically and thought of all the poor fools who used crystals. Why, he could slide pretty well where he liked, to get out of the QRM. . . . (This fact was painfully clear to G5 . . . who lived a quarter of a mile away, and many times during the past week had had the doubtful pleasure of hearing Hector glissade through faint DX on his way up and down the band.)

Hector, however, was unembarrassed by this knowledge and proceeded in his own inimitable way to tune up the TX. B.A. grid current, anode current—yes, all OK. P.A. grid and anode currents? Just as they should be. Hector could always tell when his P.A. was in fettle because the grids, screens and anodes of his push-pull 6L6's gave out a cheerful red glow. . . . In parenthesis, Hector had decided that the best story to tell the G.P.O. if they began asking awkward questions about the necessity of push-pull 6L6's in the final of a 10-watt P.A., was that he had misread the position of the decimal point in paragraph 2 of the licence. . . .

Now to see if the "soup" was going upstairs, or as the more prosaic text-book would have it, to determine whether the aerial was absorbing R.F. power. Unfortunately, Hector's normal indicator—a hot-wire ammeter in one leg of the feeder—was no longer available. The ammeter had given up an unequal struggle against a surfeit of amps. on a recent occasion when Hector, to quote his own words "was only turning up the wick a little." Thus it was that Hector had to resort to a less satisfactory, though more economical means of testing. He procured Moggie, the household cat, and held him in close proximity to the aerial feeders whilst adjusting the aerial condenser. When passing through resonance, the fur on the cat stood stiffly perpendicular to its skin, and proved that "soup" was going up the feeders. Unfortunately, however, owing to a strong tendency of the cat to bolt with a hysterical shriek when the resonant point was reached, this was a two-handed system and was consequently cumbersome and unwieldy.

Having almost certain proof at last that a signal was being radiated (a signal, furthermore, which was quite possibly within the forty metre band) Hector had to make the decision whether to use 'phone or CW. He chose the former, after a short deliberation, because firstly he could not always read the shocking fists of 99 per cent. of the hams on the air, and

secondly, on the rare occasions when he could read them all they seemed to send was "191 191 191 QSD QSD QSD AR SK" and Hector never could make out what they meant. . . .

Switching on the modulator, Hector took a stand with his lips 1 in. from the single-button microphone and spoke very loudly (so that as many people as possible would stand a chance of hearing him) "Calling test, calling test. . . ." To make absolutely sure that his call was heard by all who were operating that morning, he maintained the call for 10 minutes, during which time, as a precautionary measure against QRM, he used his ECO to shift to many different frequencies. He made a mental note that modulation *must* be OK because of the way the anodes of the 6L6's grew a brighter red when he shouted. . . .

On completion of his long call, Hector decided to listen to see if anyone had heard him. Or, as he smugly said to himself, "to pick out a decent signal from the bunch of fellows calling me." It was unfortunate that Hector's receiver had been left switched on while he had been calling, for it was three minutes before the R.F. and I.F. stages in the RX managed to stagger back to normality after having been pushed further along their grid bases than their designers had ever intended.

It was to this time-lag that Hector attributed the fact that he heard no one calling him, assuming that the host of stations which had been almost falling over each other for the honour of working him had each sent only a very short call in the hope of getting an early reply. He was just about to switch on the TX again when he heard a loud 'phone signal mention his call. Hector listened eagerly, pressing the 'phones to his ears, but to his disgust it was only G5 . . . down the road, who was being unnecessarily abusive about Hector to one of his cronies.

Ever philosophical, Hector now resolved to try this calling business the other way round. Turning to the RX, he gently moved the tuning control over the two and a half divisions of dial which represented 7000 to 7300 kc/s., and attuned his ears in readiness to hear someone making a test call. He was rewarded almost immediately, for at a point which Hector rapidly deduced represented a frequency of 7151.5 kc/s., a loud signal was calling "test." A slow fade on the signal puzzled Hector until he realised that his excited swaying to and fro was causing a certain amount of F.M. in the oscillator of his RX. He reduced his amplitude to zero, and was poised tensely, with pencil in hand to take down the call of the other man, when suddenly he shrieked with pain and hurled the 'phones on the floor. The cause of this abrupt action would have been obvious to any observer. From the floor came an ominous "clunk, clink, clink-clink-clink, clunk" repeating itself monotonously. Cheated of an almost certain QSO, Hector examined with care the remaining two and a quarter divisions of his dial, but to no avail. "Clunk, clink, clink-clink-clink, clunk" was all over the place. In fact, a rapid inspection of the frequencies between 14 Mc/s. and 5 Mc/s proved that the intruder was in complete possession of the major portion of the whole communications spectrum. With a resigned sigh Hector removed the 'phones and rested them on the table. Clunks and clinks still issued from the over-

(Continued on page 102)

KHAKI and BLUE

Another Cairo Meeting

The fifth International Conventionette of the R.S.G.B. and Allied Radio Societies took place at the Bystander, Cairo, on Friday, November 24, 1944. The morning meeting was attended by 26 enthusiasts, whilst over 60 attended a very successful evening session under the able chairmanship of Mr. W. E. Marsh, SU1WM. The SU's were happy on this occasion to welcome amateurs from Great Britain, Australia, India, U.S.A., Palestine, South Africa, Canada and Poland. During the dinner SU1WM expressed the hope that this would be the last war-time Conventionette, a hope shared by all present. He also referred to the new Middle East Forces Broadcasting Service (which has on its technical staff several well-known amateurs) and to the Cairo and Alexandria monthly meetings which continue to be well supported. A collection was made on behalf of the R.S.G.B. P.O.W. Fund which benefitted to the extent of £7 10s. 0d. Photographs were taken prior to the film show arranged by the courtesy of Messrs. J. Green & Co., who have done much to make the Cairo meetings a success. The films shown were "Sound Waves and their Sources," "Fundamentals of Acoustics," "Halliwafter's Model HT4 (SCR299) in Production." The show was appreciated by all present. SU5KW.

Amateur Meetings in Brussels

We understand from Cpl. Will Air, 2FWX (R. Sigs.) that meetings are now being held at the Cafe del Horloge, Porte de Namur, Brussels, on Thursday evenings at 8 p.m. It is hoped that members whilst on leave in Brussels, will support these gatherings.

Cpl. Air sends a souvenir card autographed by those who attended the meeting held on November 23, 1944. The signatures include those of G5UK, 2FWX, ON4VK, 4BR, 4UU, 4RY, 4UX, 4JMH, 4OI, 4UL, 4PU, 4XL and 4AU.

● B.Q.M.S. A. Baldwin, BRS8495, writes eulogistically from Egypt of the efforts being made by SU1RD, SU1WM and others to provide facilities for visiting amateurs to meet in congenial surroundings. He was present at a meeting at SU1RD on November 4 in company with SU1AX, 1SG, 1RD and G4PF. As the result of a contact with the Army Educational Corps, club premises have now been obtained in Alexandria. Wide publicity to the Amateur movement continues to be given by SU1WM and SU1AX. The latter has had printed, at his own expense, posters inviting amateurs to contact local members of the Society. These are displayed in Welfare Clubs and other premises.

● In an effort to revive interest in Amateur Radio on "The Rock" a meeting was held on December 4 at the hospitality of Capt. Jack Lees, G2IO. Others present included G3VB, 6OB, GM8HP, 2CIW, 2CZF, 2HCP, BRS2845 and 8234. Members stationed at Gibraltar and not yet in touch are requested to contact Sig. P. Gammon, G3VB, or Sig. J. F. Moseley, 2CIW, through the Y.M.C.A., Alameda. At the December meeting a discussion took place regarding post-war amateur facilities. It was agreed to suggest to Council that a statement be published as soon as possible outlining the technical and operating qualifications necessary for the issue of a licence. It was felt that publication of this information would assist newer members.

● P.O. Radio Mech. R. Beardow, G3FT, who can be contacted via the N.O.I.C. Takoradi, Gold Coast, would appreciate receiving a few recent issues of radio periodicals. He would like to hear from Bill Hamer, G3WT. The Bush telegraph on Bushfest night, he says, "sounds like a load of hams' haywire"!

● Ft./Lt. R. C. Fishlock, G3DI, now in India, reports meeting Major Smith, VK3IK, who asked that his 73 be conveyed to all old friends and especially to G3IS, 3LT, 3RL, 3RL, 3VN and GW3ZY. G3DI says prices of radio sets and components are very high in India. New five valve superhets cost 446 rupees and nine valve supers 900 rupees. Ten rupees for a 50 watt resistor and 17 rupees for a double diode triode. (The rupee is worth 1s. 6d.)

● Friends of Sgt. Harry Collard, 2CVA, will be sorry to learn that he spent his two weeks disembarkation leave in bed. He returned from N. Africa in October. Mrs. Collard (Denise), 2ATB in reporting the news suggested that Harry's illness was due to her cooking!

● Mr. R. G. H. Holmes, G6RH, 51 Bunce Lane, Blackburn, Lancs. (Tel. Blackburn 6137) will be pleased to extend hospitality to any British or Allied amateur stationed in or near to Blackburn.

Liberated Amateurs

Writing under date of November 25, Sgt. Fred Vost, G2DF, who is with the B.L.A., reports meeting PAODB, HB, QB, TB, TM, YB, and ZB. PAOSB is a "Silent Key."

* * *

Mr. James Gouck, GM3NH, informs us that he has received letters from two well-known French amateurs who have been liberated. They are G. H. Guilbert, F3LG, late of Deauville, and now residing at 30 Rue Carnot Fontainebleau (Seine et Marne) and J. R. Vrain, F8AH, of 150 Rue Legendre, Paris XVIIe.

* * *

Mr. Orchin, GSPT, has been asked to convey fraternal greetings to old friends in Great Britain on behalf of the following amateurs, from whom correspondence has recently been received.

J. Lietar, F8OF, 47 Rue du Docteur Dewyn, Tourcoing.

E. Colombier, F8EZ, 26 Rue Rendezvous, Paris.

G. Vaugaux, F3RA, 18 Rue de Vignolles Gretz, S. et M.

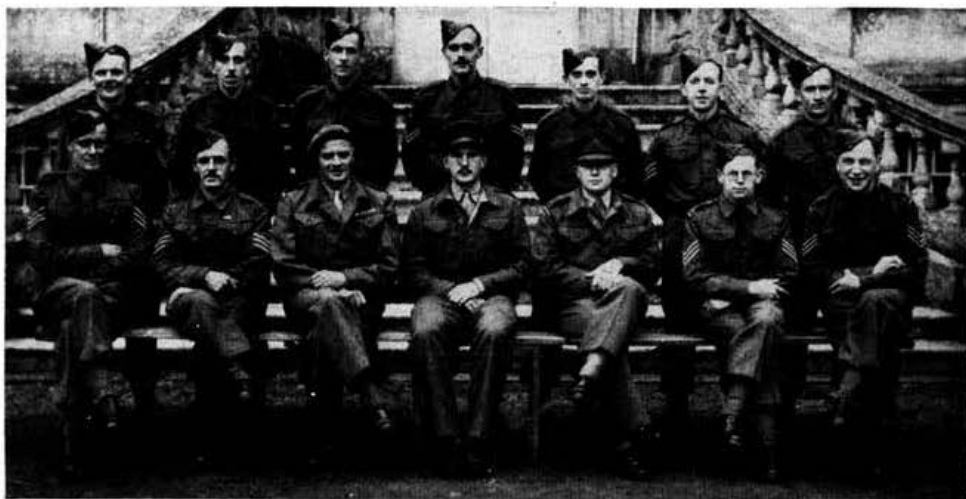
R. Lemelle, F3OF, 45 bis Bd Prolongé Bolbec, Seine-Inf.

R. Plat, G3XY, Souppes, S. et M.

They have many experiences to relate within the limit of present censorship difficulties, and all look forward to the day of Victory and the resumption of "les vieilles habitudes."

News from the Kreigies

● In a letter to Miss Corry, G2YL, dated July 23, Sgt. Mervyn Campbell, VK3MR, now a p.o.w. in Germany, wrote "we are playing test cricket here now (I play for Australia). South Africa beat England on 1st innings and New Zealand outright. Australia beat England outright, but were beaten outright by New Zealand. Matting is made of string from Red Cross food parcels."



THE "BATCHELORS" ARE NO MORE.

A photograph of the old "Batchelors" all "gang" just before it broke up.

Front row: G2KI, GM8MQ, G2QV, —, BRS4060, 2FWX, G2RD. Back row: G8JI, BRS4216, BRS5769, G8CK, BRS4848, G8PP, BRS5620.

Letters to the Editor

Receiver Standards

- (d) All licences to permit operation on all amateur bands.
(e) Removal of limitations to the physical size of aerial systems.

Yours faithfully,
ALBERT E. SUTTON (G3BN).

R.A.F., B.L.A.

Further Support for the Low Power Case

DEAR SIR,—I am in full agreement with the sentiments expressed by G8HX, published in the November issue. Unlike G8HX, however, I could have purchased, if I had so wished, a kilowatt outfit, but having no desire to become a "commercial station" I was quite content to jog along for many years with a modest 10 watts, eventually applying for a 25 watt permit. It may interest your readers to know that I obtained W.A.C. and W.B.E. (both for telephony) using 10 watts for all contacts, and was able to contact the U.S.A. and Canada (all districts), South America, Africa and, of course, the Near East, with ease, and under favourable conditions Australia and India. The whole secret is, of course, to aim at 100 per cent. efficiency of transmitter and aerial system.

I am also intrigued by some suggestions you receive that telephony should be more-or-less barred, and I am at a loss to understand why this should be. For two years I used the code exclusively and then tried telephony, and I found it so much more difficult that I remained an enthusiast for this method of communication for many years. I am wondering, therefore, if it is a question of "sour grapes" with some of your correspondents who find the transmission of intelligible speech a difficult matter, and would wish everyone else who is able to master the art to vacate the air for their benefit, allowing them free channels to transmit the code, which, in my humble opinion, is infinitely easier than telephony.

Yours faithfully,
V. PLASCOTT (G5PT).

Wooden Aerial Masts

DEAR SIR,—I was very interested in the excellent article entitled "A Fabricated Wooden Aerial Mast" contributed by BRS3430, to the November issue, particularly as I have had a similar type in use for the past five years.

As mine is constructed in a slightly different way to the one described, perhaps a few brief details may be of interest to others who have similar plans in view.

The mast is square, 40 ft. high, starting at 1 ft. square at the bottom and tapering to 3 in. at the top. The uprights are 1 in. x 1 in. tile batten, and the lattice work, builders' ceiling laths. The tile batten is in 10 ft. lengths, joined together with similar



Wooden Aerial Mast constructed by Mr. Long, GSLO.

DEAR SIR,—I was very pleased to see Mr. Baer's letter in the November issue. It sets forth very clearly and concisely the points which are relevant in the performance of a receiver. I thought that most of the previous letters on this subject were rather tending to fruitless argument on what constituted a communication receiver and were of very little constructive value. Mr. Baer, however, sets out a table which can be applied with equal success to any type of receiver and which will determine the performance of that receiver between small limits.

With regard to the suggestion about A.V.C. on C.W., it is surely current practice in "commercial" stations to have a time constant of approximately one second for the A.V.C. when receiving C.W. I cannot, however, see the point of using the A.V.C. voltage for controlling the B.F.O. The B.F.O. is normally fed in at the detector and in this case:

1. If the A.V.C. is really efficient then the signal voltage reaching the detector is reasonably constant—and therefore the B.F.O. voltage does not need to alter—or in fact should not alter. In this case control would be a bad thing.

2. If the A.V.C. is now so effective then the signal voltage will rise and to keep in line with it the B.F.O. voltage should rise also. Surely, however, the A.V.C. is not so bad that drastic alterations become necessary, and so the extra cost of controlling the B.F.O. becomes rather pointless.

Finally, I would suggest that at some date in the future the points set out by the writer would provide a basis for a series of articles showing how these tests could be carried out.

Yours faithfully,
T. FLAVEL, B.Sc., D.I.C. (BRS3767).

DEAR SIR,—The letter from J. Baer (FRS93) in the November issue of the R.S.G.B. BULLETIN raises a point to which I may be able to provide an answer.

He queries whether it would be possible to increase the time constant of the A.V.C. network with the B.F.O. "on" and to use the A.V.C. voltage to control the B.F.O. amplitude.

This has been achieved in a communications receiver which I came in contact with, by the following method.

The B.F.O. plate voltage is derived from the common screen point of all of the A.V.C. controlled stages via a high value of series resistor. This has the effect of varying the B.F.O. plate voltage and R.F. output in sympathy with the signal applied to the receiver via the A.V.C. circuit and screen current variable value.

The effect of the high value of series resistor in the B.F.O. plate circuit is to limit the minimum plate voltage to about 10 volts, with a consequent low R.F. output level compared with that of a B.F.O. in a conventional receiver.

It is agreed that this low B.F.O. voltage produces an audio output which is far from the optimum except at low signal levels.

A possibility that the frequency of the B.F.O. may be varied by the changing plate voltage exists, but in the receiver in question, this effect was not noticeable. Also there was provision for increasing the time constant of the A.V.C. circuit up to 1 second by the introduction of further capacity at the "on" setting of the B.F.O.

The method outlined represents a simple approach to the problem but does not give as complete control as could be achieved by the use of an A.V.C. controlled "buffer" stage between the B.F.O. and 2nd detector. The difficulty involved with the use of a "buffer" stage, however, would be the provision of adequate screening to prevent direct coupling from marring results at low signal levels, where the B.F.O. output might be excessive.

Yours faithfully,
P. E. TAYLOR (G4RX),
(F./O., R.A.F.V.R.).

Post-War Licences

DEAR SIR,—Regarding post-war licensing, I think the system used before the war to obtain a licence could be used again. We all know that a licence was not easy to obtain, nor should it be. The pre-war system had the advantage of proving the applicant's keenness, and to a certain extent, his knowledge of, and ability to use intelligently, transmitting apparatus. Any system of granting licences which fails to demand a sound reason for desiring transmitting facilities, together with proof of the aforementioned knowledge and ability, in other words, any system which makes the obtaining of a transmitting licence an easy matter is bound to attract the wrong type of person, and is to be deprecated. It has been suggested that new licences should be limited to permission to operate on one band only, for a short probationary period. This is a very thorny question, and if I thought it necessary, which I do not, and were we to be granted all our pre-war bands, I should not care to risk the wrath of the adherents to any of them by suggesting which band they should be restricted to.

Regarding conditions, I suggest:

- The permitted power to be 100 watts; results would then be more consistent and thus more valuable.
- Full use of frequencies allotted to amateurs.
- Possession of accurate frequency measuring apparatus to be compulsory.

material, about 2 ft. lengths at each joint. All the lattice work is nailed to the supports with 1 in. wire nails; no screws are used.

When completed, the mast was found to be very light and strong, and the cost, at pre-war prices, was 10s., excluding labour. The mast was easily erected, being guyed with eight stay wires, four half-way up and four near the top.

A 100 " footer " seems practical, provided good staying is used. The accompanying photograph may be of some interest.

Yours faithfully,

H. J. LONG (G5LO).

DEAR SIR,—I was particularly interested in the article "A Fabricated Wooden Aerial Mast" by Mr. Beckwith in the November issue as I have had some experience of this work in the past.

In his concluding paragraph, Mr. Beckwith stated that he would have no hesitation in attempting much taller ones for his post-war station—the strength and lightness of the type being thought well worth the extra trouble involved. In my experience, "height in feet" and "troubles" appeared to come under the inverse square law, but nevertheless I finished up with a wooden lattice mast 110 ft. high which stood for about seven years before being taken down.

The construction was comparatively simple, and the finished mast was a great success, both from the transmitting point of view, and from the point of view of the general public judging from the number of interested callers. Using a power of between 3 and 4 watts, G5MX covered most of Europe on the 170 metre band, and regularly kept a schedule with a station at Helsingfors, Finland.

The chief trouble was the natural flexibility of the mast, but once it was in the vertical position it was quite strong, in fact two enthusiasts climbed to the top on different occasions. The difficulty of getting it off its trestles without breaking its back was overcome by temporarily lashing a ladder and some light spars to the underside, and taking the lift directly from these to the head of a 30 ft. pole which was placed vertically at the base of the mast. The two underside legs, being bolted to iron straps set in the concrete base, acted as hinges during the erection, and as soon as the mast was vertical the two rear legs were bolted down.

The other weakness which has to be watched, is the tendency of the mast to twist about its own longitudinal axis. It was found however, that this could be largely corrected by fitting stout internal diagonal stays between the four legs. The mast being made up of 12 ft. sections, one of these stays was built in at each joint. Most of my building instructions were supplied by G6DY of Ower, Southampton, who had a pair of these masts in the early days.

Yours faithfully,

JOHN EGREMENT.

(Ex. G5MX.)

A Canadian Viewpoint

DEAR SIR,—On this, the eve of my return to my native land—Canada—I write as a much wiser man for having had the opportunity of close contact with British radio men of all types. I must admit that in Canada and the U.S.A. little is known of British radio equipment and radio development and it is generally believed that Britain is very much behind the times and that her equipment is inferior and out of date. How this idea started, I do not know; maybe it is because Britain does not advertise as much as they do in America. I came over here with this idea firmly fixed in my mind but soon got a rude awakening with what I saw and heard, but I shall now be able to return and help to put some of the notions right in the minds of those radio men whom I meet. I have been most impressed by the efficiency and ruggedness of British valves, the excellence of British cathode ray tubes and associated equipment and the advanced state of British television and centimetre technique. I have found your technical books and periodicals on the subject of radio to be, in general, of high quality, not the least of them being your own R.S.G.B. BULLETIN, *Amateur Radio Handbook* and its *Supplement*. These and many others are in my library at home at the present moment.

I should like to see the British amateur come back on the air with much more freedom than he has previously had. In particular, I should like to see him enabled to use greater power and to handle third-party traffic. I hope to set up a station as soon as I possibly can after the war and would like to be in fairly reliable communication with those whom I have met in Britain and through them be able to send and receive messages from my other friends, radio inclined people or otherwise, who will not have a station of their own.

Of course, to remain in touch with British Amateur Radio, I wish to continue as a member of the Radio Society of Great Britain, so I am enclosing postal orders to the total of fifteen shillings to cover this matter.

I would like to wish you every success in your struggle with the G.P.O. for the rights of the British amateur.

Yours faithfully,

HARVEY G. GILES (BERS533).

R.C.A.F.

Headquarters Memorial Station

DEAR SIR,—A fitting memorial to fallen members would, as you suggested in your editorial last month, be a Headquarters station. We should all be invited to contribute to its cost in the same way as the Boy Scout's Association invited Scouts to contribute to a memorial to their late chief, Lord Baden Powell.

Yours faithfully,

E. G. COCKS (BRS7412).

Suggestions for a Post-War Standard Frequency System for Great Britain

DEAR SIR,—I heartily endorse the suggestions made by Mr. Walker (G5JU) in the November issue, and hope to be in a position to participate actively in such a scheme.

I suggest the organisation be controlled by a "Frequency Measurement" Group of the Research and Experimental Section which would itself run the master station and have facilities for monitoring and checking the frequencies of other stations in the scheme.

Yours faithfully,

W. N. CRAIG (GM6JJ).

More About Morse

DEAR SIR,—I have been interested in the recent discussion regarding the Morse code qualification for full transmitting licence holders.

As a professional operator of 20 years' standing I should like to endorse all that J. W. Ismay (G6JI) says in the October issue. It is generally recognised in the Royal Navy that five years or more experience is required to make a really good operator. Reading buzzer or buzzer-oscillator is not to be compared with reading a station like Rugby (on press) from the other side of the world, through tropical atmospheres, and at a steady 25 w.p.m. for hours on end sometimes.

Having had much experience of Naval and R.A.F. stations, H.M. Ships and all types of operators I notice the present-day standards of operating have deteriorated amazingly since pre-war days.

Like G6JI, I should like to see the Morse standard retained and raised. Amateur phone operators also could do with a little "procedure instruction" to lessen QRM. Particularly I would stress a naval term, "always listen-out before transmitting."

In all my service I have only come in contact with one officer who could really read Morse well, as good as the average experienced old-time operators, and he was Admiral of the Fleet, Lord Louis Mountbatten, who raised the standard of operating in the Mediterranean Fleet in pre-war days to an astonishing degree of expert capability—but that is another story!

Incidentally I wonder if any of your readers would support my view that the smartest, slickest, fastest Morse code operators in the world are the Japanese. This is my firm belief, having good grounds for thinking so.

Yours faithfully,

BERNARD A. BLOWERS (BRS5653)

L./Telegraphist.

The "Uninitiated" Amateur Prepares for the Future

DEAR SIR,—Although one of those members who have had no pre-war experience of amateur radio, and as such, according to Sub.Lt. Conn's statement in the September issue, have no right to be called an experimenter, I am studying Radio Theory with the sole idea of conducting serious scientific research into radio problems. I am quite sure that many other so-called uninitiated "hams" are doing the same thing. In my opinion if the status of the Society is to be raised to the level of similar scientific bodies, the misleading term "ham" must be dropped, although the spirit of the exchange of ideas for the furtherance of research must be maintained.

Yours faithfully,

P. F. C. SALE (BRS4670)

(Ord. Seaman).

New B.S.I. Publication

BRITISH STANDARD CONVERSION FACTORS AND TABLES. Published by British Standards Institution (B.S. 350, 1944), 28 Victoria Street, London, S.W.1. Price 3s. 6d.

This new B.S. publication will prove of inestimable value to all radio and electrical engineers. Part I covers Basic Tables of Units (e.g. Linear, Square and Cubic Measures and Weights). Part II covers Standard Conversion Factors (e.g. Linear, Square and Cubic Measures, Speed, Stresses, Weight, etc.). Part III covers Conversion Tables and Multiples. Parts IV and V contain a wide range of Selected Tables. Log and Anti-Log tables appear in the Appendix.

Hospitality Offered

● Mr. T. C. Bryant, G3SB, who has changed his address to "Beaconsfield," Penswell Road, Minehead, Somerset, will be pleased to extend hospitality to visiting amateurs. His 'phone number is Minehead 17.

Congrats

● To Pilot Officer (Capt.) George Courtenay Price, R.A.F.V.R., GW2OP, who was installed as Master of the Loyal Welsh Lodge (No. 378) of Freemasons at the Masonic Temple, Bush Street, Pembroke Dock, on January 10, 1945. GW2OP is a Vice-President of the Society and for many years was District 5 Representative.

● To Lt. (E.) A. J. R. Pegler, R.N., BRS3182, whose wife presented him with a daughter on October 24, 1944. He is now living at 65 Hillside Avenue, Mutley, Plymouth.

BRITISH ISLES NOTES AND NEWS

**CLOSING DATE FOR FEBRUARY ISSUE
IS JANUARY 31st. REPORTS SHOULD
BE POSTED TO REACH D.R.'s AND
SCRIBES BY JANUARY 27.**

DISTRICT 2 (North Eastern)

D.R.: C. A. Sharp (G6KU), 56 Moore Avenue, Wibsey, Bradford. Bfd. 10772. *Scribe:* H. Beadle (G8UO), 13 Chandos Street, Keighley.

Members are asked to note that the D.R.'s address is 56 Moore Avenue and not 50 as printed in the last few issues of THE BULLETIN.

Bradford.—A meeting will be held at the home of the D.R. on Sunday, January 21st at 3 p.m. All members are welcome. No report of the Odsal meeting has come to hand. 2KB and 2BXS have been home on leave after long service in Egypt. 3HA (B.N.A.F.) has been busy preparing an amplifier for Christmas festivities.

Morley.—No reports for two months, has 5YV hibernated?

Huddersfield.—2HDV (R. Sigs.) who recently arrived from Italy, hopes to visit local members. Stationed with him are 8823 (Derby) and 3547 (Plymouth). Members are inquiring whether the meetings held at 5VD's are by individual invitation as no notification is given in THE BULL. 4976 is listening to DX on his eight-year-old receiver.

Sheffield.—It is with pleasure we announce that local meetings have re-started and these will be held on the fourth Wednesday in each month at the "Dog and Partridge," Trippett Lane, at 8 p.m. The next is on January 24. A hearty welcome is extended to all members, particularly Service personnel who are in the district. Visits from overseas amateurs would also be welcomed. An attendance of 19 was registered at the meeting held on November 29 and 22 at the December meeting. 2LT received many replies to the circulars he sent out and although he cannot reply to them all, he hopes to write to those in the Forces.

General.—G3RY (R.E.) says Manchester has nothing on Holland for rain. 5834 has built the "All world Two" and is satisfied with the results. He and 7223 and 8903 recently met.

Please let us know how and where you are in order to keep these notes going. Members of the Forces overseas appreciate this contact with home. G8UO.

DISTRICT 3 (West Midlands)

D.R.: V. M. Desmond (G5VM), "The Chestnuts," Hanley Castle, Worcester. *Scribe:* E. J. Wilson (2FDR), 48 Westbourne Road, Olton, Birmingham.

Birmingham.—The Hon. Secretary of M.A.R.S. wishes to apologise to members and visitors for the cancellation of the December meeting. The Scribe has received word from VP5EM, E. Metcalfe of Jamaica. 2FDR.

Coventry.—The T.R. sends kind regards to all District 3 members and hopes that all who can will attend the meeting arranged for January 29.

Christmas greetings were received from G2LU, Royal Navy, Azores, and G2YS, Royal Signals, C.M.F. G5GR.

Rugby.—R.S.G.B. Films were shown at the December meeting which was attended by 18 members and friends. The Guildhouse kindly provided the projector and operator. G8FM.

DISTRICT 4 (East Midlands)

Deputy D.R.: Albert E. Clipstone (G8DZ), 14 Epperstone Road, West Bridgford, Notts.

Derby.—At the December meeting G3OZ spoke about C.R.O. Time Bases and gave convincing demonstrations with his equipment. 4071 reports that his sub-standard frequency meter is going together according to plan. 7328 is revamping a "Majestic" with "Loctals" for amateur use. 8220 (M.E.F.) is building a superhet from odds and ends and generally amusing himself. 8695 (Radio/Mech., R.E.M.E.) says his work ranges from sea ferrets to searchlights. Despite comings and goings from No. 2 R.M.S., G6XM reports that his lads can now do a steady 18 w.p.m. G5YY has finished his C. & R. bridge and almost completed a signal generator. G2OU.

Leicester.—The December meeting began at BRS5605 with a technical discussion which ended five hours later at G6VD's! G3BU's new 15-watt amplifier started the discussion. Weekly Morse classes are still being regularly attended. The D.R. (Sq./Ldr. L. Ridgeway) reports fit from India in a letter to G3BU.

See Nottingham notes for details of next meeting, which is to be a combined effort. BRS5605.

Nottingham.—The visit to Ericssons proved a great success and was attended by 20 members including the Peterborough T.R. (2FQV) and two fellow members, 7128 and 8892. Also present were G5DM, 4PB and 6CW. The party saw many things of interest, one of which was the excellent wiring on the telephone racks which is carried out by girls and really does them credit.

This wiring should be taken for an example when members build their rigs again. Our guides were 2A00, BR87963 and 7967. Final arrangements were carried out by BR85514 as G8DZ was away from business through illness. We thank the canteen manageress, Miss McGlade, for the excellent tea she provided. A collection taken for the P.O.W. Fund realised 27s. 6d.

Our next meeting, a combined effort open to members from all areas, is to be held at the Magna Cinema, Wigston, Leicester, on Sunday, January 21, at 2.15 p.m. and is to take the form of a talk on "Steel tape recording." The speaker will be Mr. Dryden. G4FO, later will put on a film show for us, and a cup of tea will also be provided. Let us start the New Year with a record attendance and show our appreciation to G4FO who is again putting his cinema at our disposal.

Peterborough.—A meeting has been arranged to take place on January 20 at 2FQV, 32 Lime Tree Avenue, at 2.30 p.m., when a talk will be given on home built test gear, etc. It is hoped that members will bring along their equipment for comment and criticism. 2FQV.

The D.R. and T.R.'s send best wishes for the New Year to fellow members everywhere. G8DZ.

DISTRICT 5 (Western)

D.R.: R. A. Bartlett (G6RB), 31 King's Drive, Bishopston, Bristol. Bristol 46960.

Swindon.—G3HS with the B.L.A., reports that the Belgium amateurs are beginning to get together again. He has visited the home of ON4AJ several times. The latter constructed transmitters for the patriot forces. 3HS would like to hear from 3JO, who owes him several letters. 2BUJ, now at Catterick, has been transferred to Royal Signals. He has recently heard from 3NC.

Devizes.—BR8892C wishes to contact local members. His address is 30 St. Johns Street, Devizes.

Bristol.—BR83106, after a long spell overseas, is now back in this country again. He recently met 8TC when on leave. Sends best wishes to all old friends. 9032, a new member, also reports.

A much larger attendance was recorded at the December meeting when a very interesting lecture on the Cathode Ray tube was given. It is hoped this augurs well for the meeting to be held on January 21 when a further lecture will be given on "The Cathode Ray Tube—Its Use and Application."

The D.R. takes this opportunity of sending New Year Greetings to all members. G6RB.

£9. 11. 0

was raised in Three Minutes after the
Annual General Meeting, for the R.S.G.B.
Prisoners of War Fund.

KEEP UP THE GOOD WORK**DISTRICT 6 (South-Western)**

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

The D.R. wishes to return thanks for the many cards and messages of good wishes he received during Christmas. A very Happy New Year to all.

Taunton.—At the meeting held on December 14 at the Y.M.C.A., an interesting talk on relays was given by 2DRW. G3QS, 40M, 5AK, 5LM and 6LY were also present. G5SY.

DISTRICT 7 (Southern)

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

Bournemouth.—The next meeting will be held at 3 p.m. on January 27 at 2HNO, 45 Parkwood Road, Bournemouth. New members are especially welcomed at these meetings. (via 2HNO.)

Croydon.—At the next meeting there will be a lecture on "Radio Meters and their Applications," by Dr. V. A. Sheridan, F.R.S., A.M.I.E.E., of the British Physical Laboratories. Will all members who do not normally attend the Croydon meetings but who wish to hear this important lecture send a post-card to G2DP, 6 Dunheved Close, Thornton Heath (phone THO. 2849), otherwise seating accommodation may not be available. See "Forthcoming Events" for date and time.

G2DP and G3ST shared the honours in the "Ann" Cup competition receiving equal marks for the best piece of radio gear. A 56 and 112 Mc/s. Converter complete with adjustable dipole put 2DP in the top class and 3ST's entry was a S.W. receiver. Both items will be demonstrated at a future meeting. (via G2DP.)

Coulsdon.—VE3KE has returned to this country after a year in Italy. Accompanied by his wife he recently paid a visit to the T.R. 8591 (Royal Signals) is taking a course of training somewhere in the north for a commission in that regiment.

(via BRS3003.)

Kingston.—There is still a great dearth of activity in this area but G3II has come forward with an invitation to members to drop in at his QRA: 6 Buckingham Road, Kingston any Sunday afternoon or morning.

Reading.—Meetings are being so well attended these days, with attendances around the thirty mark, that in future they will be held twice monthly. The normal lecture-meeting will be held on the last Saturday of the month and a Morse Class fourteen days later. The venue of meetings is at the Palmer Hall, West Street, Reading—7 p.m. Morse meetings and 6.30 p.m. others.

At the November meeting when Mr. Deadman, 2BYZ, gave a very interesting talk on "Coils, Testing and Checking," there was an attendance of 28. A club library is being formed to be kept at the H.Q. at Palmer Hall. Gifts of technical volumes will be especially welcomed by the T.R., 9 Holybrook Road, Reading. The oscillator for the Morse class was kindly presented by Mr. Deadman.

(via BRS4573.)

Forthcoming Events

- | | |
|---------|--|
| Jan. 20 | District 15, 3 p.m. at The Excelsior Hotel, 1 Ladbroke Gardens, Ladbroke Grove, Notting Hill, W.11. |
| Jan. 21 | District 3 (Rugby), 3 p.m. at the Percival Guildhouse. Talk on Duplex Telephony by G8FM. |
| Jan. 21 | District 4, 2.15 p.m. at the "Magna Cinema," Wigston, Leicester. Talk by Mr. Dryden, and films by G4FO. |
| Jan. 21 | District 4 (Peterborough), 2.30 p.m. at 32 Lime Tree Avenue. |
| Jan. 21 | District 10 (Cardiff), 2.30 p.m. at GWSUH, 29 Ladysmith Road (off Penylan Hill), Roath Park. |
| Jan. 21 | District 5, 3 p.m. at 17 Colston Avenue, Centre, Bristol. Lecture: "The Cathode Ray tube—its use and application." |
| Jan. 28 | District 15 (West London), 5.30 p.m. at BRS6275, 51 Rusthall Avenue, Bedford Park, Chiswick, W.4. (Buses 27, 55, 88.) |
| Jan. 28 | District 4 (Derby), 3 p.m. at G3OZ, 2 Franklin Drive, Boulton Lane, Alvaston. |
| Jan. 28 | District 12, 3 p.m. at 2DHF, 22 Bramford Court, High Street, Southgate, N.14. |
| Jan. 28 | Scotland "A" District, 3 p.m. in the Royal Technical College, George Street, Glasgow. Enter by Montrose Street. |
| Jan. 29 | District 3 (Coventry), 7 p.m. at St. Thomas' Church Room, The Butts. (Buses 9, 16, 18 from town.) |
| Jan. 30 | District 7 (Reading), 6.30 p.m. at Palmer Hall, West Street. |
| Feb. 4 | District 12, 3 p.m. at BRS3412, 18 Sandfield Road, St. Albans (turning off main Hatfield Road, near Cemetery bus stop). |
| Feb. 4 | District 7 & 13 Combined meeting. Y.M.C.A. North End, West Croydon. Lecture, Radio Meters and their applications by Dr. V. A. Sheridan, F.P.S., A.M.I.E.E. |
| Feb. 13 | District 7 (Reading), 7 p.m. at Palmer Hall, West Street. Morse Instruction. |
| Feb. 20 | Midland Amateur Radio Society. 6.30 p.m. at Chamber of Commerce, New Street, Birmingham. Talk by Mr. B. K. George on Transformer Design. |

Southampton.—The December meeting put up a new high in the matter of numbers when instructive friendly arguments and discussions ensued.

Frank Robb, G16TK, recently spent a very pleasant week with us. He sends 73 to all District 7 members he worked with in the old days.

(via GSQW.)

Guildford.—The 35 members who attended to hear Mr. Beadle give his talk on "Amateur Radio" were well rewarded by one of the best expositions on the aims of the Society the writer has had the fortune to hear. Old-timers (such as 2YL, 2FC, 2MR, 2NH, 2ZC, 5NF, 5OJ and 6NA), who were there in force were not forgotten by the speaker and in fact they were given some food for thought. Once again we thank Mr. Salmon, G5RS, and the Management of "The Cinema" for making the event possible.

G5WP.

DISTRICT 10 (South Wales & Monmouthshire)

Acting D.R.: H. H. Phillips (GW4KQ), 80 Cottrell Road, Roath Park, Cardiff. Cardiff 4512 during business hours.

Cardiff.—The December meeting held at GWSUH was again well attended and those present showed renewed interest in topics concerning the post-war development of the Society. A full reply from Council covering suggestions raised earlier is to be presented at the meeting to be held at 2.30 p.m. on Sunday, January 21, 1945, at the home of GWSUH, 29 Ladysmith Road,

Roath Park (off Penylan Hill), Cardiff, and a good attendance is anticipated. A cordial invitation to be present is extended to all new members and renewed hopes are expressed that those in the Services and stationed in the District will be free to attend.

Suaneas.—GW2UL was fortunate in obtaining Christmas leave. Further news and activities would be welcomed from members in this area.

Penbroskeshire.—A hearty welcome is extended to GW3JI of District 11, who is stationed near Haverfordwest. He is endeavouring to contact ZB2B, whose presence in this District was made known in a recent issue of these notes.

Personal.—Due to pressure of Service duties, Gp./Capt. Scott Farnie, GW5FI, has relinquished the position of District Representative and the writer has been pleased to accept Council's invitation to act in the vacant position. In thanking members for their support during my tenure of office as D.D.R., may I convey New Year greetings and express the hope that 1945 will herald Victory and the long awaited restoration of licence facilities to members old and new.

GW4KQ.

DISTRICT 11 (North Wales)

Deputy D.R.: C. Spillane (BRS1060), "Woodside," Meliden Road, Prestatyn.

BRS5520, still sailing the Indian Ocean, reports all well and hopes soon to be homeward bound. G2GZ sends word that Major Higson, GW2PH (R. Sigs.) is now in Italy. Cpl. Davies, 2DYJ (R.A.F., C.M.F.) who reports via G2GZ, complains of high prices of radio gear in Italy, a GKS cost him £2 recently. GW4CK has a new Service member at his station in the person of "Red" Byford, BRS5015.

The writer thanks all members who sent in news items during the past year, thus enabling him to keep our district in the news. Let us make 1945 better still. Good luck to you all, wherever you may be.

BRS1060.

DISTRICT 12 (London North and Herts)

D.R.: S. Buckingham (G5QF), 41 Brunswick Park Road, New Southgate, N.11. Enterprise 3112.

Mr. Colin Coates, G5CS, writing from Watford inquires if it is possible to get that area going again. Those interested are asked to write to the D.R. who will endeavour to arrange an early meeting.

G5QF is pleased to record a visit from BRS7634, who sends his 73.

The January meeting will be held at 2DHF (see "Forthcoming Events") when a further discussion on frequency meters will take place.

St. Albans.—All members will sympathise with BRS4659 on the death of his father. The T.R. has received a visit from 9135 and has contacted 8569 by post. He will be pleased to hear from any local member who wishes to attend code classes. Notice is hereby given of a full meeting of local members at the home of the T.R. to discuss arrangements for the proposed P.D.M. It is hoped that representatives from Watford, Welwyn Garden City and other nearby towns will attend. (See "Forthcoming Events.")

G5QF.

DISTRICT 13 (London South)

A.R. (South Eastern and Central), S. E. Langley (G3ST), 19, Elm Gardens, Mitcham, Surrey (Temporary Address).

The special meeting held to award the "Ann Cup," took place on December 17, at the home of BRS4324, 3 Englewood Road, Clapham South, and was very well supported. There were six entries, namely:

- (1) BRS6894, Superhet Receiver, 9 valves, switched coils, A.C. mains.
- (2) BRS8996, Super-regen Receiver, plug-in coils, battery.
- (3) BRS4603, Midget Amplifier and power pack, A.C. mains.
- (4) BRS7943, Power Transformer.
- (5) G2DP, U.H.F. Converter, 49/65 Mc/s. and Dipole aerials, A.C. mains.
- (6) G3ST, Superhet Receiver, 6 valves, plug-in coils, separate power pack and loudspeaker, A.C. mains.

The judges (G2VB, G2HP and BRS3003) decided that exhibits (5) and (6) tied for the cup, and it was therefore agreed that G2DP should hold the cup for the first half-year, and G3ST for the second half. A photograph of the winners, seated, holding the cup, also the whole company, was taken by G2DP's camera, complete with delayed action fuse unit, and flash bomb.

Tea followed, which was very nicely served by Mr. Bennister and daughter, also "Funf," to whom we extend our thanks. G2VB kindly presented two mystery parcels which were quickly disposed of in aid of the P.O.W. Fund. 3ST for once in a while being lucky, promptly put his parcel up again and realised a little extra. Mr. Bernard, a visitor, presented some very useful radio books for the same fund, and finally BRS4603 produced some components which were disposed of in a like manner, making the very useful sum of £3. Good work if we may say so. G4KY then gave a cinema show and presented among others, a favourite film of a District 13 and 7 meeting, taken at his QRA in 1942, with also a very clever artistic show, with lightning sketches, which much amused the company.

The usual round-the-fire rag chess finished up a very interesting and enjoyable day—evidently so, as the last one to leave the premises was 4KY at 11.30 p.m.!

Taking stock, we find that District 13 has ably kept the R.S.G.B. flag flying by holding regular monthly meetings during the five years of war, many times under very trying conditions. This is a great achievement, and the A.R. therefore thanks all members for their loyal support, and hopes that the good work will continue in the future.

A happy new year and best of luck to all from District 13.
G3ST.

DISTRICT 15 (London West, Middlesex and Buckinghamshire)

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

The meeting held early in December was the most successful for several years. Those present included G2TJ, 3SU, 5LN, 6SR, 6CJ, 6WN, 8KZ, 2ADL, 2FUX, ex-VE3DG, BR84781, 5246, 5301, 6275, 6398, 9094 and 5666. G6CJ enlightened those present with some details of Council's work, while many other matters were discussed.

BR87235 reports spending two days in Brussels. 5JL has now fully recovered. 5KT writing from Wales refreshes our memory of his stay within the District. 6773 sends another interesting letter.

G4IH, writing from aboard ship on his way overseas sends 73 to his friends. Unfortunately the ship was dry!

The D.R. thanks all those who sent him Christmas and New Year Greeting cards.
G6WN.

DISTRICT 16 (South Eastern)

D.D.R.: W. A. Scarr, M.A. (G2WS), 8 Beckenham Grove, Shortlands, Bromley, Kent. Scribe: E. H. Trowell (2HKU), 27 Unity Street, Sheerness, Isle of Sheppey, Kent.

A sincere welcome is extended to the new members in the District and some news from them would be appreciated.

2CYW is looking for contacts in the Brighton and Hove area. 7387 (Maidstone) is building a double superhet and sometimes meets 2DSU. Ft./Lt. Taylor, an R.A.F. Signals Officer, has covered the invasions of Normandy, S. France and Greece and has built a V.H.F. "walkie-talkie" which surprised him by functioning! He would like to correspond with someone interested in Atomic Physics (address from 2HKU). We welcome two members home from the C.M.F. in 2DOH of Strood and 2DHV of Sideup, who has 3547 and 8823 with him and G8WP "somewhere around." 5417 has met 5685 and would like contacts in the Chatham area. G2VA of 73 Queenborough Road, Sheerness, would like to hear from 5FN and 6QC. 3GW on R.A.F. Radar in Norfolk recently flew over his home. 2879, ex-2B8B, stationed in Beds., has managed to build such things as a valve voltmeter, frequency meter, wavemeter and a lot of other gear. At present he is working on a linear time-base incorporating an amplifier for vertical deflection and a double-wave recorder; he hopes to prepare an article for THE BULLETIN on this item. 7928 of Sheerness, a Ldg./Tel. in the R.N. is stationed at Grimsby. 4721 (R.A.) visited 2HKU while on leave. He is stationed near Guildford and looking for contacts. Our new YL associate, L./Cpl. Bartholomew, is swatting Morse. 2HKU and G2VA are meeting often. The former has visited 4583 (Sevenoaks) and also enjoyed Christmas Eve with G6NU (Gillingham) who is building VHF gear and would like to meet members at 42 Richmond Road.

Chatham and Gillingham.—In order that some of the newcomers may gain more knowledge of pre-war amateur radio and also get to know each other, G6NU has offered to hold a meeting at his address. As there are quite a number of members in this area it is hoped to help them to re-commence some activity. Those interested should contact 2HKU indicating suitable dates and times.

Please make it a New Year resolution to drop either the Dep. D.R. or 2HKU a few lines regularly. Remember that it is up to you—no news—no notes.
2HKU.

DISTRICT 17 (Mid East)

D.R.: A. C. Simons (G5BD), Admiralty Road, Mablethorpe. Phone 69.

2AUR sends an interesting letter from Holland, where he has met PA0AD; the latter is anxious for news of PA0EN (McIntyre) believed to be in Yorkshire. 5529, an instructor at Cranwell, reports that G8ON has been invalided from R.A.F.; R.S.G.B. thus loses a valuable helper. 30S and 3WB are keeping BCL sets in order in Gainsborough. 2BYS has obtained some much needed recording blanks. 2FT is very thrilled with his new 13 valve receiver. 3VP took stock of his gear on his last leave. 7117 sends greetings from South Africa, cards have also been received from G6H and 5LL. Belated but sincere greetings to all for 1945.
G5BD.

DISTRICT 18 (East Yorkshire)

District Scribe: S. Davidson (G6SO), 10 Sidney Street, Scarborough.

Scarborough.—2DDA (R.A.F.) spent Christmas in the town. 6SO thanks all who sent him Seasonal Greetings, especially 3MI (R.A.F., India) and 4FO. He hopes to "catch up" on correspondence delayed through illness.

Hull.—G4LH, a new member, is busy with some fine home recording gear, but finds difficulty in obtaining blanks. 2HJZ reports by airgraph from Italy. 4530 has been transferred from

Lincolnshire to the West Country. 4590 has gone overseas. 1948 has been on leave recently, his wife and junior op. are at present living in the town. An Electronic Engineering Society has been formed in Hull to cater for all interested in radio and allied subjects. 3PL is still recruiting new members and sends 73 to 8657 (R.A.F.). A welcome is extended to new members.
(via 3PL.)
G6SO.

Best Wishes to All for 1945.

Scotland

Scottish Records Officer: J. Hunter (GM6ZF), 51 Camphill Avenue, Glasgow, S.1. Langside 237.

Thanks are extended to all members who sent us greetings which are warmly reciprocated.

"A" District.—At the meeting held on December 17 in place of the customary last Sunday in the month, Mr. Ian Jamieson described in a very interesting manner his combined frequency meter and signal generator. He also displayed a well constructed model of the instrument. Old timers will be interested to learn that GM2FV has returned to the district after spending many years in England.

"C" District.—At the December meeting, the speakers were Messrs. R. M. Laird and J. Gouck, GM3NH, who spoke on "Power Packs" and "Noise Limiters" respectively.

GM6ZV.

Northern Ireland

D.R.: J. N. Smith (G15QX), 19 Hawthornden Drive, Belmont, Belfast. Phone 63323.

Belfast.—G16TK reports meeting G6CL and 5AR whilst in London recently. He also met 8SM (Southampton D.R.) and several other Southern amateurs and thanks them all for their many kindnesses to him during his visit. We hear that G15DX is again in "Civic Street" (welcome back O.M.). The attendances at G16YM continue to be good—a rare visitor one evening was G16H. BR88388 has recently enjoyed a spell of leave. If G15ZX, now in India, and G5ZN should read these notes we would like to hear from them sometime.

The D.R. and T.R. wish all members a very "Guid" New Year and hope that we shall soon have all our service members back again into the fold.
G15QX.

R.S.G.B. Prisoners of War Fund

DONATIONS.—The General Secretary acknowledges with thanks, on behalf of Council, receipt of donations from: District 13, per G3ST, 11s. 6d.; S. Buckingham, G5QF, £1; J. B. Roscoe, 2FJM, 15s.; A. W. Brookson, G3IP, 5s.; A. H. Hammond, G6AH, 10s.; Mrs. O'Hagan (wife of G2CR), 10s.; J. B. Longridge, G3DN, 5s.; District 7, Guildford, per G5RS, £1 14s. 7d.; C. R. Emary, G5GH, 10s.; Scotland "A" per GM6ZV, 10s.; V. Schwartz, FR881, 2s. 6d.; L. Parnell, G8PP, 5s.; District 13 (per G2PD), 11s.; Mrs. Collins (Mother of 4167), £2; R. W. Belcher, 7571, 7s. 6d.; W. R. East, 5548, 5s. 9d.; E. W. Randall, 5859, 5s.; T. Arnold, VU2AN, 2s. 6d.; R. J. May, 5958, 5s.; Cairo Meeting via SU1WM, £7 10s.; H. Millward, ZL2KN, 2s. 6d.; H. G. Gill, G8KO, 5s.; C. Grummitt, 2CMP, 5s.; Mrs. Quartermaine, £3 3s.; M. Triffitt, 8734, 3s.; W. H. Lord, G5NU, £1 1s.; T. J. S. Cole, G3YU, £1; G. Edwards, G2UX, 10s. 6d.; A. C. Bryant, 3999, 2s. 6d.; J. V. Davis, 4628, 5s.; G. H. Boon, 10s.; D. Low, GW5WU, £2 2s.; C. Dodds, 7839, 11s. 6d.

Total receipts to date £1,429 11s. 7d. Total expenditure to date £867 12s. 0d.; Balance in hand: European fund £191 19s. 7d. Far East fund £370.

I.T.M.A.

On the occasion of the Christmas meeting of the Radio Industries Club, Tommy Handley and the "I.T.M.A. Gang" attended in force to provide the fun and frolic. Our Secretary, who was present with Mr. E. L. Gardiner, succeeded in persuading the "gang" to autograph a menu card. This card which carries the signatures of, among others, Tommy Handley, Dorothy Summers (Mrs. Mopp), Jack Train (Col. Chinstrap), Dino Galvani (So So), Ted Kavanagh, Francis Worsley, Charles Shadwell, Fred Yule and John Snagge (who compered the show) is now offered for sale to the member making the highest bid received at Headquarters by February 1.

The proceeds of this "blind auction" will be credited to the R.S.G.B. Prisoners of War Fund.

The Secretary reserves the right to withhold the sale of this unique souvenir if his "target" figure is not reached. In that event the card will be auctioned at a forthcoming Society function.

Come gentlemen—and ladies too—here is your great chance to help the P.O.W. Fund and acquire for yourself a memento which will be the envy of all your friends.

New Year Honours

Congratulations to Sq./Ldr. L. H. Thomas, (G6QB) who has been made a Member of the Order of the British Empire, to Miss Nell Corry, (G2YL) who has been awarded the British Empire Medal, and to Wing-Commander Ben Wallich, (G6BW) who has been Mentioned in Despatches.

COUNCIL 1945**President:****ERNEST LETT GARDINER, B.Sc., G6GR.****Executive Vice-President : S. K. Lewer, B.Sc., G6LJ.****Honorary Secretary : H. A. M. Clark, B.Sc., G6OT.****Honorary Treasurer : A. J. H. Watson, F.S.A.A., G2YD.****Honorary Editor : Arthur O. Milne, G2MI.****Immediate Past President : A. D. Gay, G6NF.**

* *

Members : F. Charman, G6CJ, D. N. Corfield, D.L.C.(Hons.), G5CD, Lt. Col. K. Morton Evans, GW5KJ, F. Hoare, G2DP, E. H. Laister, BR5386, S. E. Langley, G3ST, W. E. Russell, G5WP.

G.P.O. Liaison Officer : A. E. Watts, G6UN.**General Secretary : John Clarricoats, G6CL.****Annual General Meeting**

Minutes of the Eighteenth Annual General Meeting of the Incorporated Radio Society of Great Britain, held at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2., on Saturday, December 30th, 1944, at 2 p.m.

Present:—Mr. E. L. Gardiner (President) in the Chair, Mr. S. K. Lewer (Executive Vice-President), Mr. H. A. M. Clark (Hon. Secretary), Mr. A. O. Milne (Hon. Editor), Mr. A. J. H. Watson (Hon. Treasurer), Messrs Charman, Corfield and Hoare (Members of Council), Mr. A. E. Watts (Past President and G.P.O. Liaison Officer), Mr. John Clarricoats (General Secretary) and about 75 members.

(1) Previous Minutes.

The President called upon the General Secretary to read the notice convening the meeting, after which Mr. Bryan Groom proposed, Mr. H. V. Wilkins seconded, and it was unanimously resolved that the Minutes of the Seventeenth Annual General Meeting, as published in the January 1944 issue of THE R.S.G.B. BULLETIN, be taken as read and approved.

(2) Audited Annual Accounts.

The Honorary Treasurer, in moving the adoption of the accounts, drew attention to the very considerable improvement which has taken place in the Society's financial position since September 1939. He mentioned that the assets then amounted to £1,400 compared with £11,000 at the end of the last financial year. The improved position was, he stated, particularly striking in view of the fact that during the first year of war, the membership dropped to below 3,000 and all transmitting work ceased. To-day the home membership was nearly three times greater than in 1940. The motion having been seconded by Mr. Wakeman, it was unanimously resolved to approve and adopt the Honorary Treasurer's Report, and the Audited Accounts for the year ended September 30th, 1944.

(3) Council's Report.

Mr. A. O. Milne moved, Mr. Inman seconded, and it was unanimously resolved to accept and adopt the Annual Report of the Council for the year ended September 30th, 1944, as published in the December 1944 issue of THE R.S.G.B. BULLETIN.

(4) Council Elections, 1945.

The President announced that the following members had been elected to serve on the Council for the year 1945:—

Officers.		
President, Mr. E. L. Gardiner, G6GR	..	Returned
Executive Vice-President, Mr. S. K. Lewer, G6LJ	..	Unopposed.
Hon. Secretary, Mr. H. A. M. Clark, G6OT	..	
Hon. Treasurer, Mr. A. J. H. Watson, G2YD	..	
Hon. Editor, Mr. A. O. Milne, G2MI	..	

Members.

Mr. D. N. Corfield, G5CD	..	..	1,206 votes.
Mr. F. Charman, G6CJ	..	..	1,121 "
Mr. S. E. Langley, G3ST	..	..	995 "
Mr. F. G. Hoare, G2DP	..	..	959 "
Mr. W. E. Russell, G5WP	..	..	884 "
Lt.-Col. K. Morton Evans, GW5KJ	..	..	858 "
Mr. E. H. Laister, BR5386	..	..	805 "

The President reported that 1,346 Ballot Forms were accepted and 15 rejected by the Scrutineers. He also announced that the following members were unsuccessful in the Ballot:—

Mr. H. W. Stacey, G6CX	..	..	792 votes.
Mr. W. H. Matthews, G2CD	..	..	758 "
Mr. C. G. Bradley, G8KZ	..	..	575 "

The President expressed his appreciation to the unsuccessful candidates for allowing themselves to be nominated. He welcomed the new members and thanked the retiring members for their loyal support during the past year. Thanks were also recorded to the Scrutineers, Messrs. Buckingham, Ray and Solder.

(5) Honorary Auditor.

Mr. Hoare proposed, Mr. Wilkins seconded, and it was unanimously resolved, that Mr. John Ockleshaw be re-appointed Honorary Auditor for the year 1944-5.

(6) Vote of Thanks to I.E.E.

The President moved that a vote of thanks be recorded to the President and Council of the Institution of Electrical Engineers for permitting the Society to use the Institution for meetings during the year. The motion was unanimously adopted.

(7) Other Business.

Mr. Wilkins referred to the highly satisfactory financial position of the Society, and on behalf of the lay members thanked the Council (particularly the Hon. Treasurer) and Headquarters staff for their past work.

Mr. D. Price-Jones speaking as a Provincial member, suggested that the Council should, when drawing up plans for post-war development, consider providing a suitable meeting place for members in Central London, rather than a Headquarters station in the suburbs.

There being no further business, the meeting was closed at 2.15 p.m.

* * *

Following the Annual General Meeting, Mr. R. H. Hamman G2IG, delivered his lecture entitled "Communications Receiver Measurements and Standards of Performance." (It is hoped to publish an abridged version of the lecture in an early issue. Ed.) Messrs. Dedman, Milne, Lewer, Ray, Clark and Wilkins, were among those who contributed to the discussion.

At the conclusion of the discussion the President on behalf of all present, thanked Mr. Hamman for his lecture.

Before the meeting broke up Mr. Arthur Watts asked that a vote of thanks be recorded to the President, Council and Headquarters staff, for their untiring efforts during the past year. The motion was carried with acclamation.

The Secretary returned thanks to Mr. Watts and the members present for the expression of appreciation recorded to Miss Gadsden and himself. He later made an appeal on behalf of the R.S.G.B. Prisoners of War Fund, which realised the sum of £9 11s.

The meeting closed at 4.15 p.m.

November Council Meeting

Resume of the Minutes of a Meeting of the Council of the Incorporated Radio Society of Great Britain, held at 6 p.m. on Monday, November 13, 1944, at New Ruskin House, Little Russell Street, London, W.C.1.

Present:—Messrs. E. L. Gardiner (President), S. K. Lewer, H. A. M. Clark, A. J. H. Watson, A. O. Milne, A. D. Gay, A. E. Watts, F. Charman, D. N. Corfield, F. C. Hoare, W. E. Russell, and J. Clarricoats (General Secretary).

Apologies were received from Gp./Capt. G. R. S. Farnie and Mr. H. Stacey.

(1) It was unanimously resolved to elect 129 Corporate Members (114 proposed by Corporate Members, 15 supported by references), 4 Associates and 2 Junior Associates. An application for Life Membership received from Mr. G. D. Roberts, BR5756, "Winfield," Nelson Gardens, Wisbech, Cambs., was approved.

(2) A letter to the Editor from Mr. J. C. Graham, GM3TR, dealing with post-war licence matters was approved for publication. It was agreed to add an Editorial footnote to the effect that Council will publish a full statement immediately agreement with the G.P.O. has been reached, but at the present time the Authorities require these matters to be kept confidential.

(3) It was reported that correspondence has been exchanged with the New Zealand Association of Radio Transmitters on post-war licence matters.

(4) A letter was read from Mr. H. V. Wilkins, G6WN (District 15 Representative), in which West London members had criticised the Council for not arranging meetings similar to the recent Anglo-American meetings. It was reported that the President and Secretary had replied to the criticisms and had pointed out the many difficulties confronting the Council in connection with the organisation of meetings of the type referred to at the present time.

Mr. Wilkins had been informed that (a) the Society offered to pay the refreshment expenses at the first Anglo-U.S. meeting, but the offer was declined with thanks. (b) All expenses in connection with the second meeting were borne by the Society.

(c) The Society has made every effort to get U.S. amateurs to attend R.S.G.B. meetings held at the I.E.E. but the response has not been satisfactory. (d) Numerous appeals have been published in THE BULLETIN and QST inviting U.S.A. amateurs to contact H.Q. (e) No British hotel or meeting place can be expected to accept a speculative booking. In making a reservation the Society would not know whether 50 or 250 persons would attend. (f) The I.E.E. has declined all Saturday bookings except the A.G.M. (g) The Council does not consider that evening meetings would, at present, be supported. (h) The American amateurs responsible for arranging the first two meetings decline to arrange a third meeting, because the support given to the second meeting by U.S. amateurs was less than one half the British support.

Criticism may be levelled against them for permitting a large body of British civilians to obtain facilities from an American Services Club. (i) If, with all the publicity which the U.S. amateurs in London could obtain for these meetings, not more than 40 attended it is most unlikely that better support would

be given to an Anglo-U.S. meeting arranged on private premises by the Society.

(See note on this page "Anglo-U.S. Meetings."—Ed.)
(5) A letter was read from Mr. Shankland (Rugby T.R.) in which he inquired on behalf of local members whether the Council had given consideration to certain post-war licence matters enumerated therein. It was agreed to inform Mr. Shankland that the matters raised had been fully considered by the Council, and that a statement of policy would shortly be issued.

(6) Further to Item (2) October resume, it was agreed to furnish the authorities with a list of type numbers of Service radio equipment and valves which it is believed may be useful to amateurs when surplus Government material is offered for sale.

(7) The Annual Accounts and Honorary Treasurer's Report were approved for publication.

(8) The Monthly Statement of Account and Balance Sheet were adopted.

(9) It was reported that 9,800 *Handbooks* and 3,600 *Supplements* had been ordered from the new reprintings.

(10) The Annual Report of Council was approved for publication.

(11) It was reported that Lt.-Col. K. Morton Evans, GW5KJ, Mr. P. Bradley, G8KZ and Mr. W. H. Matthews, G2CD, had been nominated for the 1945 Council. It was further reported that a nomination on behalf of Mr. C. M. Freer, BR84781, had been declared void as one of his nominees had been out of membership since June 1, 1944. It was also reported that Mr. Hamer, G8BW, had telephoned H.Q.s. at 2.20 p.m. on November 2, to inquire whether a nomination on his behalf could be accepted. The Secretary had informed Mr. Hamer that the nomination to be valid should have been received at H.Q.s. by not later than October 31st.

(12) In view of the fact that no ordinary meeting of the Society will take place prior to the A.G.M., it was agreed to invite Miss N. Corry, Mr. S. Buckingham and Mr. K. Freeman to act as scrutineers for the Ballot.

(13) Due to the lateness of the hour it was agreed to adjourn the meeting until Monday, November 27.

The meeting closed at 9.15 p.m.

Anglo-U.S. Meetings

The Council much regrets that it has not yet been found possible to arrange further meetings between British and U.S. amateurs. London members in particular will appreciate that the task of finding suitable accommodation for weekend meetings is not easy at the present time, bearing in mind the fact that it is quite impossible to guarantee a minimum attendance when making a reservation.

A further difficulty arises in connection with the publicity which can be given to meetings of this nature. Many U.S. amateurs now in the U.K. are not members of the R.S.G.B. and as a consequence they do not receive a notice of forthcoming events. *Stars and Stripes* has co-operated on two or three occasions, but that paper is unable, consistently, to devote space to publicity of the type which is required to ensure the fullest possible U.S. support at meetings.

The assistance given to the Society by Chaplain Major J. D. Andrew, WA4FG, who was responsible for arranging the Mostyn Club Meetings, has been most warmly appreciated by the Council.

Changes of Address

Members who change their permanent address are asked to note that at least one month must elapse before the change can become effective for BULLETIN despatch purposes.

The Society cannot, under existing conditions, send the BULLETIN direct to a Service address. Members on Active Service should arrange for re-direction from their home address. Provided re-direction is effected promptly, no additional postage is required.

American Publications

The Society is in a position to accept orders for the following publications which are ordered individually from America:

"QST" (Official monthly publication of The American Radio Relay League). By subscription, per annum	17s. 6d.
"The Radio Amateur's Handbook" (A.R.R.L.)	10s. 6d.
"The Radio Amateur's Handbook"—Special Defence Edition (A.R.R.L.)	8s. 6d.
"The Antenna Handbook" (A.R.R.L.)	4s. 0d.
"A Course in Radio Fundamentals" (A.R.R.L.)	3s. 6d.
"The Radio Handbook" (Editors and Engineers Los Angeles)	12s. 0d.
"Radio" (Monthly publication of Radio Ltd.) per annum	21s. 0d.

Orders must be accompanied by a remittance made payable to the Society and rates and prices are subject to alteration without previous notice. Delivery can be expected in about 12 weeks from date of order. Service Addresses must not be used. Single copies of text books only may be ordered.

Members who change their address during the currency of a subscription to *QST* or *Radio* should advise the publishers direct.

Radio Handbook

Editors and Engineers, Limited inform us that the ninth (1943) edition *Radio Handbook* is still current, and that the tenth edition is not expected to appear for possibly another year.

EXCHANGE & MART-ADVERTISEMENT RATES

MEMBERS' private advertisements 2d. per word, minimum 3s. TRADE advertisements 4d. per word, minimum 6s. Box Numbers: 6 words, plus 1s. TERMS: Cash with order. All copy and payments to be sent direct to Advertisement Managers, PARRS Advertising Ltd., 121 Kingsway, London, W.C.2, by the 30th of the month for following month's issue.

Advertisers and buyers are reminded that under Defence Regulations 1939, Statutory Rules and Orders 1940, Number 1689 a permit (T 99 G) must be obtained before sale or purchase of certain electrical and wireless apparatus, particularly such valves and apparatus as are applicable to wireless transmission.

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FOR SALE.—Trophy 6; needs aligning, £12 or nearest offer.—MUNDY, BR88479, Signals, R.A.F., Holme, York.

HALLICRAFTER SX23 for sale. Perfect condition throughout.—BR83831, Thornton House, Newhall, Nr. Burton-on-Trent. Tel: Swadlincote 7346.

INFORMATION.—Loan Service Sheet required for Armstrong "Colonial" Chassis. For sale, five volumes *Practical Electrical Engineering* by Newnes.—BR87763, 30 Sea Road, Boscombe, Hants.

MONOMARK service.—Permanent London address. Letters redirected. Confidential. 5s. p.a. Royal patronage. Key tag 9d.—Write BM/MON07A, W.C.1.

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SALE.—Valves 12Z3, 9s., LP2, 5s., both unused. Ferranti AF7C, 20s. Wanted, 2 I.F. Transformers, approx. 456 KC. high Q.—BR87509, 2 Mitchell Road, Palmers Green, London, N.13.

WANTED.—"AVO." Taylor or Wearite test meter. Taylor all-wave Signal Generator, Valve test panel.—Box 496, PARRS, 121 Kingsway, London, W.C.2.

WANTED, by serving member, Cossor double-beam 4 1/2 in. C.R.T. (09J), List price paid for tube in good condition. Would alternatively like Cossor 339 C.R.O. State price.—REED, 15 Leyland Road, Southampton.

WANTED.—Eddystone All-World battery 2.s.w., in steel cabinet, in good condition.—J. WELLS, Sutton Brilles, Banbury.

WANTED.—Hallcrafters Sky Chief in good condition. Please state price.—SHAW, 22 May Street, Burnley, Lancs.

WANTED.—Hallcrafters 12 in. speaker in cabinet to match SX17 receiver, or SX23 speaker complete in matching cabinet as supplied with SX23. Good price paid providing in good condition as new. Also required Hallcrafters HT-7 Frequency Standard. Eddystone short-wave guide books. Fullest details and prices to.—14 Common Road, Evesham, Wores.

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