

THE T&R

# BULLETIN

## A JOURNAL FOR RADIO EXPERIMENTERS

Vol. 17 No. 4

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Price 1/6

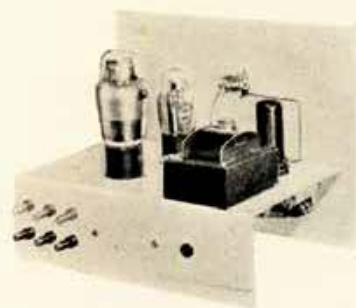
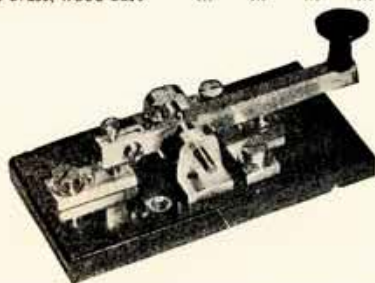
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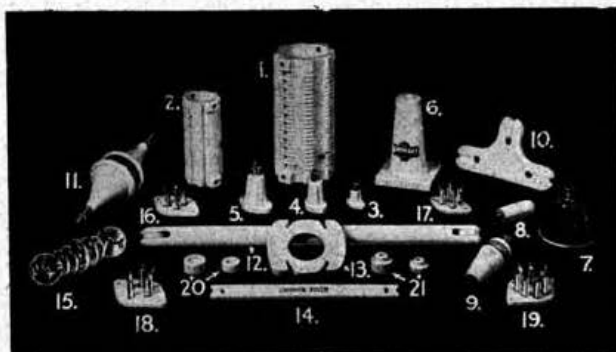
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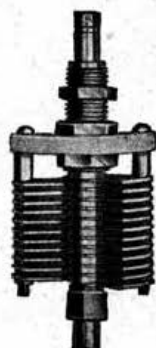
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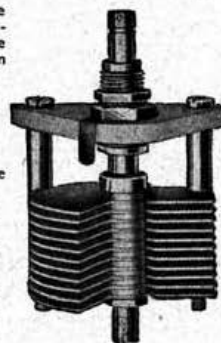
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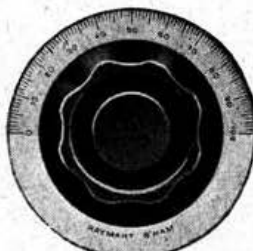
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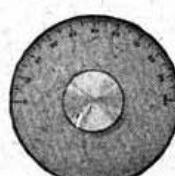
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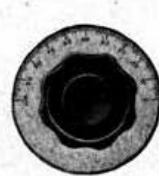
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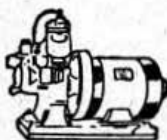
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OF GREAT BRITAIN



DEVOTED TO THE  
SCIENCE  
AND ADVANCEMENT  
OF AMATEUR RADIO

Hon. Editor: JAMES W. MATHEWS.

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Vol. XVII. No. 4

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### PASTURES OLD AND NEW

**A**BOUT three months ago one of our members threw the cat among the pigeons by asking where audio leaves off and radio begins. As anticipated, many members rose to the attack and in no uncertain terms pointed out that electro-magnetic waves and sound waves have no definite relationship.

To clinch the deal and to clear away any latent misunderstandings which may still exist, one of our "learned brethren" has contributed to this issue an article in which he sets out some interesting and little-known facts about waves of many kinds.

After reading his article and the correspondence that prompted it, we are tempted to ask "Does the average radio amateur really know what makes the wheels go round?"

There is an old saying that the cleverest technician is the man who can explain his subject so clearly that a tyro can understand it. Perhaps that is hardly fair comment as far as radio engineering is concerned, although it must be admitted that very few radio men appear to possess the gift, or is it the knack?—of explaining technicalities in simple language.

*The Amateur Radio Handbook* provides an outstanding exception, for without doubt it owes much of its success to the lucid style adopted by all contributors.

To-day, "Radio Location" is capturing the imagination of the general public, but those who can read between the lines know that even if the technique is new, many of the basic principles involved are relatively old.

For security reasons we are not permitted to discuss this important development, neither can we give more than a broad hint that a study of electronic engineering and ultra-high frequency propagation will pay big dividends to those who aspire to take an active part in maintaining, installing and operating R.L. equipment in the field.

Appreciating that in this, as well as in other spheres of radio development, sound technical knowledge is essential, the Council has recently authorised the production of a new Society publication which will be, in effect, a supplement to our already popular Handbook.

Clearly much of the information will not have a very direct bearing on amateur radio as we knew it in pre-war days, but as the publication is being written by amateurs, its style of presentation will conform to Handbook standards.

Next month we hope to announce a publishing date and a full list of chapters, meanwhile now that the nights are longer, how about brushing up your theory? It *may* prove useful sometime!

J. C.



## WAVES

*Here at last is a simple explanation of a problem concerning wave propagation which seems to have been bothering a number of our readers.*

**R**ECENT correspondence in THE BULLETIN shows that there is some considerable interest and, if the comment may be allowed, a certain vagueness about the fundamental facts of wave propagation. Now since most readers' interest centres around devices which respond to and which generate both sound and (in happier days) radio waves, this is very sad. Maybe, therefore this present attempt to tidy up our ideas on matters undulatory will be acceptable. The subject of wave-propagation is really one of highly mathematical perception. Nevertheless, a few basic ideas can be put into words, so high-brow readers can turn to some other article, there will be no equations for them to wrestle with in this one.

### What is a Wave ?

When we speak of a "wave" in something we mean the repeated rhythmic movement of that something. This something is generally called a "medium." The "medium" may be physical (but not psychical) such as water or air, or it may be a purely fictitious quantity like that called the ether.

Waves in water are very easy to understand because we can see them. A cork floating on the surface of a pond, across which a wave is travelling will move first upward, stay motionless for a moment, then move downward. After an instantaneous pause it commences to move upward again. In other words the water has a rhythmically changing movement or velocity. At the same time there is a change of "head" of water at any point below the cork. We cannot have a change in one without the other. Notice also that although the wave is travelling along the surface of the water the velocity of the particles of water, and the changing "head" or pressure, are up and down or at right angles to the direction of travel of the wave. Such a wave is therefore called a "transverse" wave.

Solids and gases can have waves in them as well as liquids like water. Waves in gases are generally of the kind known as sound waves. The atmosphere is rarely free of them. They differ somewhat from the transverse waves on the pond in that the particles of air travel back and forth for a short distance in the same direction as that in which the wave is travelling. If the air moves forward a little at any particular spot, it takes a little time for the next bit of air to shift up owing to its inertia, and so there is a momentary increase of pressure at this point until air particles move back again and so relieve the pressure. Give the end man of a rank a shove (when the sergeant isn't looking!) and you will see what is meant. This sort of wave is called a "longitudinal" wave. But notice that there are still two interconnected quantities involved, the momentary change of pressure and the momentary change of position (i.e., the velocity). Actually these longitudinal waves can also occur in liquids and solids as well as gases, for it is well known that sound can travel through liquids and also through solid bodies (e.g., the walls of your flat!).

So we see that waves can exist in various mediums—sorry, *media*, and that they can be transverse or longitudinal. Further, that two

related quantities are generally involved such as velocity and pressure of the medium in the formation of a wave.

What about our friend the "radio" wave? Well, Old Man Faraday knew that when a magnetic field moves, there is always an electric field produced and *vice versa*. The two are inseparable as soon as any movement is involved. Clerk-Maxwell argued that this was like the change of pressure produced by the velocity of the particles of air in a sound wave, so he said that there ought to be some electro-magnetic waves about somewhere. Moreover he worked out all the sums to predict their behaviour, but there he left the matter. The trouble was that although we all have eyes to see the waves of the Blackpool sort, and ears to hear the (sometimes) sweet sounds in the air, it was not until Hertz made a tiny spark gap to detect the electro-magnetic waves in what he called the "ether", that they could be demonstrated. But they turned out just as Clerk-Maxwell said they would, transverse waves with a changing electric field strength at right angles to a changing magnetic field, both at right angles to the way the wave is going.

### Sound Waves are not Radio Waves

So we see that a sound wave is a longitudinal wave of air, or other physical particles, whilst a radio wave is nothing but a particular sort of combination of changing electric and magnetic fields. Hence its highbrow name of *electro-magnetic* wave. If we like to think of all waves as existing in something then we must create an imaginary *something* which we call the ether. This has, of course nothing whatever to do with the stuff in a bottle at the chemists, and between ourselves it doesn't really exist. Obviously then a sound wave is a totally different thing to a radio wave in real life although there are certain similarities between the ways in which they function. We have not yet, however, mentioned a feature of all kinds of waves which may perhaps have led to confusion between radio and sound waves.

### Frequency

The number of times which the cork on the pond bobs up and down, in say a minute, is known as the frequency of the wave. The same term is used to describe the number of sound waves or radio waves which occur in a given space of time. Since sound and radio waves generally follow one another rapidly, it is usual to state the frequency as so many waves or cycles per second. Theoretically both sound and radio waves can exist of all frequencies from the very lowest to the very highest imaginable, although in practice only certain ranges of frequencies can be produced. The frequency of sound waves commonly met with is from about 20 cycles per second (c/s.) to about 15,000 c/s. The frequencies of electro-magnetic waves in general use for radio purposes, range, as is well known, from say 20,000 c/s. to more than 100,000,000 c/s. As printers are a little mean about using too many noughts we have to abbreviate and call a thousand cycles one kilocycle, and a million cycles one megacycle. Thus a frequency of 100,000,000 c/s. is referred to as 100 Mc./s. All this

was learned by the gentle reader whilst still in his cradle, of course, but there are a few features of waves having frequencies near the extremities of the ranges generally in use which may be of interest.

### Very Low and Very High Frequency Sound Waves

The most useful sound waves are those to which our human ears respond. These range from about 20 to 15,000 c/s. as already stated. Although waves higher than this range cannot easily be heard by us they can be heard by some other animals. Actually the highest frequency audible to human beings is very variable and depends, among other things upon age. Thus children can readily hear sounds up to 20,000 c/s. whilst the average man of 40 can rarely hear much above 10,000 c/s. Also defectiveness of hearing frequently starts with the inability to hear very high-pitched sounds.

Generally speaking, the smaller the animal the higher the frequencies to which it responds. Thus dogs can definitely hear high-pitched sounds which are inaudible to us. A scientist named Galton invented a whistle, something like a miniature "Swanee Whistle" which can be screwed up until the pitch is too high to be audible. Yet if it be blown at a dog he gets very excited! Even higher frequencies are audible to bats, and insects. Their vocal organs are also so formed that their voices are correspondingly high-pitched. Some animals have a hearing range which exceeds that of their voices presumably because their "dinner" makes that kind of sound!

One interesting fact is that the distance through which sounds can travel without excessive *attenuation* or weakening, depends on the frequency. As a general rule the lower the frequency the greater the ease with which large distances are covered. When a band is marching through a town towards one, the drums are usually heard first and the fifes are hardly heard until the band comes into view round the corner.

Anyone who has been close to an A.A. gun in action knows that the sound contains enough high frequencies to have all the characteristics of a very powerful "crack" but at a distance all that is heard is a low rumble. It was the rumble only of the Western Front guns that was heard in this country. The low frequency components of artillery sounds may travel over very great distances in certain weather conditions. There may be formed in the atmosphere a "layer" which behaves to a sound wave in a similar manner to that of the Heaviside layer to radio waves. There may even be formed a "skip" region at say 30 miles from the source of sound, whilst at 100 miles the sounds become audible again. Such long ranges only occur with such powerful sounds as explosions, etc.

Sound waves can be produced of such a high frequency that they are above the audible range of any animals. Quartz crystals can be made to oscillate electrically as in a transmitter, and they radiate air waves from their surfaces much as a loud-speaker diaphragm does. At such frequencies as are normally used for radio transmission the attenuation of sound waves in air is so great that they travel too short a distance to enable them to be detected. At lower frequencies, however, such as 50 to 100 kc./s. sound waves can readily be detected by the quartz crystals and some very interesting experiments have been done with these so-called "Supersonic" waves.

### Sound Wave Direction Finding

Another interesting analogy between radio and sound waves concerns the effect of the direction of the source.

If we want to find the direction from which a radio wave is coming we set up a frame aerial and turn it round as the wave flows past it. The side of the frame nearest to the transmitter receives the signal a fraction of a second sooner than the other. We can rotate the frame until the "phase" of the signal in each side is the same. By so winding it that these cancel out we can get a zero balance on our receiver and hence say that the transmitter is on a line at right angles to the frame.

Now what we have learned to do with a frame aerial and a wireless set in the last quarter of a century we learned to do with our ears as "aerials" and our brain as "receiver" thousands of years ago.

If a source of sound is to one side of our head, the sound wave arrives at the ear on that side of the head before it arrives at the other. In some mysterious manner (which the author of these notes at least does not yet understand!) the brain measures this time delay and deduces with some considerable accuracy the direction of the sound. The reader may be forgiven his astonishment on learning that differences in times of arrival of the sound waves at his ears as small as about 50 *micro seconds* can be detected if he has average ability! Now of course the greater the distance between the ears the greater will be the time difference for a given angle to the centre line of the head. Now the reader will find his ears about 8 in. apart if he keeps them where most of us do. This means that above about 1,000 c/s. the time difference between the ears for a sound fully to one side of the head represents more than one cycle. This introduces certain complications and we have to judge direction at high frequencies from the fact that the head screens the ear away from the sound and so makes the sound weaker in this ear than the other. This is not so reliable as the use of time differences for we become dependent upon equal sensitivity of the ears which may depend upon our not suffering from catarrh!

This sheds some light upon the fact that small animals can make more use of higher frequencies than we can. In such tiny creatures as, for example the crickets, the head is so exceedingly small that ears in the normal position on either side of the head would be so close together that the time delay would be so small as to be useless for direction finding of sounds. As this may be his only way of ascertaining the whereabouts of his wife the matter is of some importance to the cricket! Nature has therefore thoughtfully placed the cricket's ears in his *knees* at which point he is widest! He can thus find his way to (or from) her with surprising accuracy. That this directional ability is really due to air-borne waves, and not to any form of ground vibrations, has been proved by some ingenious experiments in which crickets were suspended by miniature balloons. It was found that they could still find their mates until one ear was destroyed, after which they answered each other, but could not judge the correct direction.

### Low Frequency Radio Waves

To return to matters more in keeping with a BULLETIN article, let us consider the use of radio

waves of such a low frequency, say 20 kc/s, that they could be heard were they *sound waves in air*. If we generate radio waves with a transmitter, the waves are electro-magnetic and cannot be heard, no matter how low the frequency. On the other hand we could connect a suitable pair of head-phones directly to an aerial and the received currents would produce audible signals in the phones without any form of detector or rectifier. Such devices are only necessary when the signal currents are too high to hear. This is usually the case of course, so all ordinary receivers are fitted with detectors which produce a current in the phones at audio frequency, e.g. the modulation frequencies from a telephony transmitter.

But, some readers may say, the signals of the Rugby long wave transmitter are clearly audible without any phones at all when standing in the transmitter hall. That is true but owing to the very high currents in the transmitter coils and condensers, mechanical vibrations are set up in them at the carrier frequency (much as a transformer with loose laminations will buzz) and these in turn radiate

sound waves which the unaided ear can hear. It is thus correct to say that *radio waves* cannot be heard even if they are of so low a frequency as to be classed as audio frequency.

We can beg the question somewhat by referring again to a physiological experiment. It is possible to inset two wires into certain parts of the ear and by connecting them to a source of audio frequency voltage, the effect of hearing can be produced. While this has nothing whatever to do with "hearing" radio waves it does establish the fact that the response of the auditory nerve is in some way electrical in its functioning. Readers are not advised to try the experiment however!

### Conclusion

Although these notes have possibly been somewhat rambling, enough will have been said to convince the reader that his hobby (or trade!) is quite secure. The day will never come when we shall be able to dispense with a radio set to hear Alvar Liddell reading the nine o'clock news.

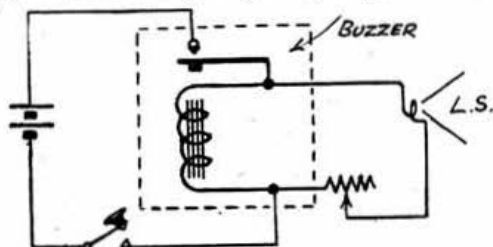
## Buzzer Instruction for the A.T.C.

WHEN first invited to give Morse instruction to the local A.T.C. Squadron, the writer decided to use an audio oscillator in conjunction with a stage of L.F. amplification and loud speaker, but he soon found that the necessary apparatus, together with batteries, was rather cumbersome, consequently other methods had to be considered. The only buzzer on hand which gave a really clear note was a tiny Townsend, but this was not loud enough for a large classroom. This drawback was, however, overcome by connecting a loud speaker (minus transformer) across the buzzer winding, with the result that a strong signal of almost C.W. quality was obtained.

The arrangement at present in use comprises a 3-inch moving coil speaker (*M.R. Supplies*), wired in series with a 250-ohm variable resistance, which acts as volume control. The standard Townsend buzzer is usually provided with one screw terminal and a flexible lead, the latter being connected to one end of the magnet winding. As the other end of the winding is joined to the metal base, an easy method for attaching the loudspeaker is available.

The midget speaker makes for portability, although any low-resistance unit can be used. To avoid slight keying thumps the volume control should not be set at maximum.

The whole of the equipment, which comprises a 3-volt dry battery, volume control, loudspeaker, key and, incidentally, a signalling lamp, is housed in



Townsend Buzzer Arranged for Morse Instruction.

a box of less than gas-mask container size, provided with a carrying strap.

Circular holes covered with gauze, have been cut out in front of the speaker diaphragm and lamp bulb. G5VT.

## Are You Serving Abroad?

For the information of the many home members who are now serving abroad, we publish below the names and addresses of a few well-known amateurs living in Africa who we know will be pleased to extend ham hospitality.

- ZT1Z, H. H. Bridgman, P.O. Box 87, Oudtshoorn, Cape Province.  
 BERS370, E. Bryant, P.O. Box 600, Dar-es-Salaam, Tanganyika.  
 BERS488, T. C. Dands, Box 50, Entebbe, Uganda.  
 ZS6CS, W. H. Heathcote, P.O. Box 1167, Johannesburg.  
 BERS413, H. R. Hulbert, M.B.E., P.O. Box 103, Khartoum.  
 BERS395, H. E. Hunter, 97 Hamilton Avenue, Brakpan, Transvaal.  
 BERS480, W. E. King, Bank of British West Africa, Minna, N. Nigeria.  
 VQ4CRH, W. E. Lane, P.O. Box 570, Nairobi, Kenya.  
 ZS1N, G. H. Lunnion, P.O. Box 2551, Cape Town.  
 ZE1JE, J. W. Mavis, P.O. Box 160, Umtali, S. Rhodesia.  
 BERS424, L. S. Norman, c/o Box 1, Cholo P.O., Nyasaland.  
 VQ3HJP, H. F. J. Powell, P.O. Box 600, Dar-es-Salaam, Tanganyika.  
 VQ4CRM, J. Scott, P.O. Box 1246, Nairobi.  
 BRS2734, R. Sturman, Engineer-in-Chief, G.P.O., P.O. Box 93, Livingstone, N. Rhodesia.  
 ZD2H, A. Tomlinson, c/o Post and Telegraphs, Lagos, Nigeria.  
 SU1RD, R. E. A. Disteche, c/o Messrs. Atlantis Ltd., 85 Rue el Tabia, Gheit el Enab, Alexandria.  
 SU1AX, A. E. Hockstein, 16 Rue Djabarti, Alexandria.  
 SU1WM, W. E. Marsh, 3 Rue Kattini, Tanta.  
 SU1SG, F. H. Pettitt, Catholic Club, Mustapha Barracks, Alexandria.



# PRIMARY CELLS FOR THE AMATEUR

By H. R. HEAP (G5HF)\*

**W**HILST providing no special economic advantages, owing to modern mass production methods, the manufacture of primary cells at home provides an interesting and useful pursuit. Although involving the use of chemicals, the manufacture of such cells does not require the experience of the skilled chemist. This article is intended to help any member who wishes to devote his spare time to practical use.

## The Voltaic Battery

Firstly, distinction must be made between the primary cell and the storage cell or accumulator. Although in both cases the action is strictly chemical, in the case of the accumulator the process of energy conversion involves only a change of chemical state of the surfaces of the electrodes. This change is reversible, so that by passing a current in the opposite direction the cell is re-charged. The process is well known and will not be discussed further.

When two dissimilar metals are immersed in a solution of an electrolyte, such an assemblage is called a Primary or Voltaic cell. A simple example would consist of plates of copper and zinc in dilute sulphuric acid and using ordinary electrical terminology we should say that current flowed from the copper to the zinc, although in fact the negatively charged electrons flow in the opposite direction, as shown in Fig. 1.

The Table shown below gives the characteristics of some well known cells.

All the cells listed use porous pots to separate the electrodes and keep the depolariser from mixing with the electrolyte. In addition to those referred to, mention should also be made of the Weston Standard cell, which uses mercury for the positive electrode and cadmium amalgam for the negative electrode. At 20 degrees Centigrade this cell gives

a voltage of 1.0183. It is chiefly used for potentiometer tests.

The Daniel cell will give a fairly heavy current for intermittent periods. The Leclanche cell is ideal for intermittent work, as it requires little attention and lasts for years. The other types of cell have more or less been superseded by the lead accumulator.

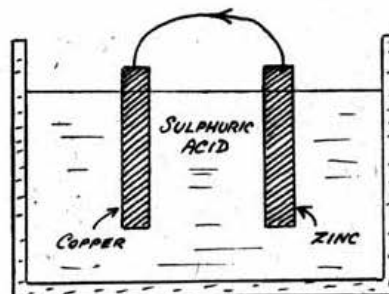


Fig. 1.

Illustrates the principle of operation of a voltaic battery.

## The Depolariser and Why It Is Needed

If a cell such as described and illustrated above in Fig. 1 is assembled it will be found that about one volt is generated across its plates, but very rapidly this voltage drops to almost zero; at the same time bubbles appear surrounding the copper electrode. These bubbles are hydrogen gas, which is formed during the process of energy transfer. Not only does the gas form an insulating layer round the copper but it actually has a chemical effect which tends to produce an E.M.F. in opposition to the main E.M.F. Therefore, to make the cell a practical proposition the hydrogen must be removed by means of a suitable depolariser. Fortunately

\* Receiver Group Manager, (Experimental Section).

Name.	Electrodes.	Electrolyte.	Volts.	Depolariser.	Internal Resist. Ohms.
Daniell ...	Zinc and copper ...	Dil. sulphuric acid or zinc and copper sulphates.	1.079	Copper sulphate ...	0.5
Grove ...	Zinc and platinum	Dil. sulphuric and strong nitric acids.	1.95	Strong nitric acid ...	0.015
Bunsen ...	Zinc and carbon ...	Dil. sulphuric and strong nitric acids.	2.075	Strong nitric acid ...	0.2
Bichromate...	Zinc and carbon ...	Dil. sulphuric acid and potassium bichromate.	2.0	Potass. bichrom. ...	0.05
Leclanche ...	Zinc and carbon ...	Ammonium chloride	1.4	Mangan. diox. ...	0.4
Lalande ...	Zinc and copper ...	Caustic potash ...	0.75	Black copper oxide	0.02

Characteristics of some commonly known cells.

the hydrogen is produced in a chemically active form and combines very readily with oxygen to form water. Such substances as copper sulphate or nitric acid can be used as depolarisers but for convenience manganese dioxide in solid form is nearly always used in modern cells. The action of manganese dioxide can be described as taking place in two stages, thus:—

(1) Hydrogen and man. diox. forms water and lower oxide of Manganese.

(2) Lower oxide of man. and oxygen from the air forms man. diox.

From this it is seen that the manganese dioxide is never used up, and the recovery is complete and very rapid.

### Leclanche Cell (Wet Type)

In practice, sulphuric acid is not used as an electrolyte owing to the fact that the zinc is liable to be attacked even when the cell is not in use. This is due to impurities in the zinc which form miniature cells short-circuited on themselves, and so the zinc is consumed. In the wet type of Leclanche cell shown in Fig. 2, the electrolyte is a solution of ammonium chloride (sal-ammoniac) and the depolariser is solid manganese dioxide. The electrode plates are zinc and carbon, the latter being preferred to copper on account of its cheapness and non-corrodibility.

The carbon electrode and the depolariser can be put inside a porous pot instead of canvas as shown, but a cell of such construction has the disadvantage of a high internal resistance. The manganese dioxide and an equal quantity of graphite or crushed carbon should be moistened with a little water and made into a very stiff paste and then moulded round the carbon electrode by pounding into a suitably sized pipe as a die. The pipe should previously be lined with canvas or cheese-cloth. When the depolariser has been moulded into shape the sack can be carefully withdrawn from the moulding pipe (Fig. 3) and the cloth tied with string. This unit should be very firm and tightly packed and it is worth making a good job of it as it need never be replaced, provided it holds up mechanically. The correct strength of electrolyte is 4 oz. sal-ammoniac in 3 pints of tap water.

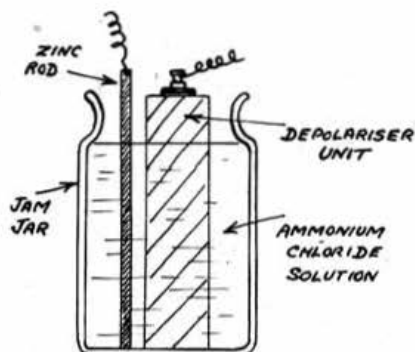


Fig. 2.

In the Leclanche Cell the electrolyte is a solution of ammonium chloride (sal-ammoniac), and the depolariser solid manganese dioxide.

### Maintenance of Wet Type Leclanche Cells

(1) Evaporation of the electrolyte should be reduced to a minimum by storing in a cool place. Under no circumstances must the cell be hermetically sealed, although a loose-fitting dust-cover is recommended. The electrolyte should be kept topped up by the addition of water (tap water will do).

(2) Incrustation of the zinc electrodes is caused by allowing the electrolyte level to fall too low. The hard white compound should be chipped off and the zinc exposed. As incrustation shortens the life of zinc, steps should be taken to maintain the level of the electrolyte.

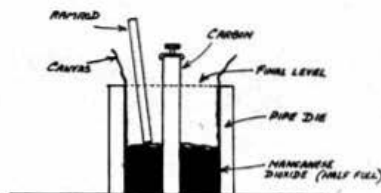


Fig. 3.

Illustrates the construction of a Leclanche type cell.

(3) Creepage of the electrolyte over the surface of the container may be prevented by the light application of vaseline or grease to the upper inner surface of the container.

(4) If the cell is properly looked after, the zinc electrode should wear evenly along its length. However, when it is ready for renewal the electrolyte should be renewed at the same time.

### Dry Cells

The principle of operation of the dry cell is exactly the same as that of the wet cell, but several slight modifications are made for convenience. The first operation is to construct a zinc container, the size of which is determined by the capacity of cell required and length of carbon rod used. For a can  $2\frac{1}{8}$  in. long and  $\frac{3}{4}$  in. diam., cut the zinc sheets (gauge 10 or 12)  $2\frac{1}{2}$  in.  $\times$   $2\frac{1}{8}$  in. and fold them round a former of hardwood  $\frac{3}{4}$  in. diam. This allows sufficient overlap for soldering. Some  $\frac{3}{4}$ -in. diam. circles must also be cut out, and these should be soldered on whilst the can is still on the hardwood former. Great care must be taken in soldering the seam and the base of the container, which must be absolutely watertight. Some difficulty may be experienced at first in soldering the zinc, but with a perfectly clean iron (which must not be allowed to get too hot, otherwise the zinc will soften), a neat and satisfactory job can be made. A gas-heated iron is not recommended for this work as the temperature for soldering zinc is rather critical.

The "dolly" (as it is called) is made in much the same way as with the wet cell, only on a smaller scale. The carbon, which can be obtained from an old battery, is first held vertically inside a die of suitable diameter and the depolarising paste rammed and moulded round it. In this case the depolarising paste is a fifty-fifty mixture of manganese dioxide and finely-powdered graphite, well mixed and moistened with a few drops of ammonium chloride solution. To complete the "dolly" the carbon, with its moulded jacket, is wrapped in muslin. As

the efficiency and recovering properties of the dry cell depend on the depolariser to such a large extent, the diameter of the depolariser "dolly" should be made at least 75 per cent. of the total cell diameter.

The next step is to line the inside of the zinc container with one layer of an absorbent cardboard saturated with ammonium chloride solution. The "dolly" is then placed in the container and the space between it and the cardboard filled with the electrolyte. There are many variations possible for the electrolyte, which should contain as much sal-ammoniac solution as possible, and yet it must be made into a thick paste which will not leak out. In practice it is usually better to err on the wet side, as the life of the cell depends mainly on how long the electrolyte takes to dry up. A good procedure is to make a solution of sal-ammoniac in about twice its weight of water; to this solution is added about 15 per cent. of zinc chloride. At this point a warning should be given about the use of zinc chloride, which is poisonous and has strong caustic properties, *i.e.* it attacks the skin, paper, clothes, etc. The electrolyte can be made into a paste of the required consistency by adding flour, glass wool, plaster-of-Paris, gelatine, starch or waterglass. If starch is used, add a teaspoonful of starch to about each tablespoonful of electrolyte, stir and warm until the solution thickens; it is then ready for use. The electrolyte is then packed round the "dolly," leaving a space of about  $\frac{1}{4}$  in. at the top. In this space is placed a thin cardboard washer, soaked in molten wax, and a thin layer of sawdust or sand, after which the whole unit is sealed with pitch. Fig. 4 gives the general longitudinal section of a completed cell.

### Results

Electrically, a home-made dry cell is usually superior to a commercial one, mainly because it is freshly made and its life dates from the manufacture. The usual trouble with home-made dry cells is leakage,

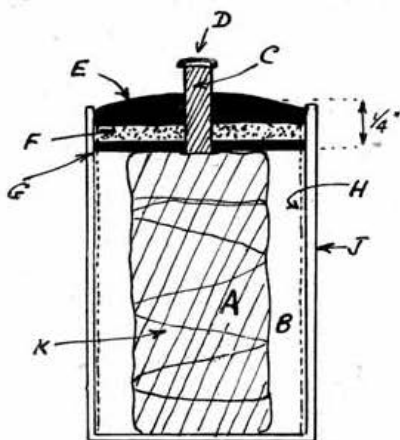


Fig. 4.

Longitudinal section of a dry cell.

- |                           |                                       |
|---------------------------|---------------------------------------|
| (a) The "Dolly."          | (g) Cardboard washer.                 |
| (b) Electrolyte paste.    | (h) Absorbent cardboard               |
| (c) Carbon electrode.     | lining soaked in sal-                 |
| (d) Carbon connection cap | ammoniac solution.                    |
| (e) Pitch.                | (j) Zinc container.                   |
| (f) Sawdust.              | (k) String, holding "dolly" wrapping. |

either through faulty soldering of the zinc container or because the electrolyte has been packed in too tightly and cannot expand without breaking the seal at the top. A dry cell will give anything from 1.2 to 1.5 volts when fresh, although the actual voltage does not in itself give an indication of whether the cell has been properly made or not. The best test of a primary cell is to measure its internal resistance and this may easily be done as follows.

Measure the voltage across the terminals of the cell with a voltmeter of known resistance  $R_1$  and then insert a resistance  $R_2$  in series so that the meter reads half the voltage of the cell. The internal resistance of the cell is then given by:  $(R_1 + R_2) - 2R_1$ .

As far as the Leclanche wet cells are concerned, their most unusual feature is that, apart from the evaporation of electrolyte, the cells do not deteriorate in any way when left unused for considerable periods. The current diminishes rapidly when the cell is required to do a spell of continuous work, but its strength is soon restored again by allowing the cell a period of rest.

### Conclusions

The uses of dry cells are very familiar, whilst the wet cell can be made to perform many useful duties such as the operation of bells, remote control apparatus, interlocks, signalling, light duty solenoids, etc. The reader will probably have his own ideas and uses for the Leclanche wet type of cell, for which modern science has not found a substitute.

Those interested in other types of cells are invited to write to the author for further details.

## Technical Teasers

### No. 2

Compiled by J. N. ROE, G2VV

- (1) What is one of the main advantages of a receiver designed for frequency modulated signal reception?
- (2) What is a "reactance modulator"?
- (3) What replaces the detector (or second detector in superhets) in a receiver designed for frequency modulated signal reception?
- (4) What is the approximate output in watts of a transmitter delivering 1.25 amperes into a 60 ohm line?
- (5) What term is used to denote the combined effect of resistance and reactance?
- (6) To what does the term "LC ratio" apply?
- (7) What term is used to express the common property of two coils having transformer action?
- (8) What is the first harmonic of 56 Mc/s.?
- (9) Which has the higher dielectric constant, resin or porcelain?
- (10) What is the value of one horse power expressed in electrical terms?

Solutions on page 136.

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# A FIELD OPERATORS 'VADE MECUM'

## SECOND SERIES—PART II.

By B. W. F. MAINPRISE, B.Sc.(Eng.), Diploma Electrical Engineering (G5MP).

*The ability of a field operator to improvise, is one of several essential requirements, mentioned by the author in this, his last, contribution to the present series. In view of the wide interest shown in these articles, arrangements are being made for their inclusion in the Handbook Supplement due to appear shortly.*

16. Your receiver has developed a fault of the "no signal" type. As you are expecting the order to move forward at any moment, you cannot remove it from its casing for examination. How would you endeavour to locate the fault, using only a voltmeter, so as to be able to repair it immediately you can open up the receiver?

The first step is to make sure there is no short circuit or serious overload on the H.T. + line. In the case of a battery operated receiver, connect the voltmeter across the battery before switching on. Switch on a moment, and if the H.T. voltage does not drop more than two or three volts, this shows there is no excess current drain, and the receiver can be left switched on for the subsequent tests.

With a mains operated receiver, connect the voltmeter between chassis and one pin of the rectifier filament. Switch on a moment, and note if the reading builds up to the normal value, thus checking that there is no great overload.

17. Having checked this point, how would you proceed?

Throughout the following tests, the negative lead of the voltmeter is kept joined to the chassis, and the positive lead touched on various points. If the receiver has a pentode or tetrode output valve, the screen pin will almost invariably be joined to the H.T. + line directly, without voltage dropping resistor. Thus, it is useful to remember that the H.T. + line voltage can be checked at any time, and without any fear of instability by connecting a voltmeter between screen pin and chassis. In addition, the difference in the voltage reading between chassis and screen and between chassis and rectifier filament gives the voltage dropped across the filter choke. Dividing this voltage by the resistance of the choke gives the current drain of the receiver, another very useful check, simply obtained. The resistance of the choke can be easily measured by means of a battery or torch-cell and milliammeter, if not already known, and it is useful to remember the figure. Generally it will be somewhere between 200 and 500 ohms for a receiver.

18. The fact that voltage is found on the screen pin shows that the winding of the filter choke is intact?

Yes, we have thus exonerated this component. Similarly, if the voltmeter lead is touched on the anode pin of the output valve, and indicates voltage is present, this shows that the primary winding of the output transformer is also intact. If the voltmeter is connected between screen pin (i.e. H.T. + line) and anode pin, the voltage dropped across the primary winding of the output transformer is obtained; dividing by the primary resistance gives the anode current of the output valve.

19. By connecting the voltmeter between chassis and the screen pins and anode pins in turn of the earlier stages, you can find whether there is any break in a decoupling resistor, or in the anode impedance,

such as the winding of a choke or transformer, in H.F., I.F., or L.F. stages. What other information would this procedure give?

When testing at each point, there will be a loud click produced in the headphones or loudspeaker. Working backwards from the output, if a stage is found where there is no click, the actual position of the fault has been very nearly located. If there is voltage on the appropriate valve pins, but no click is heard, then the fault is quite possibly in the coupling component. It may for instance be a shorted trimmer in an I.F. transformer, or a short across the turns of the winding, or a break in a parallel fed L.F. transformer, or a coupling condenser broken adrift. Therefore, if the anode and screen pins are systematically tested for voltage, working backwards from the output it will probably not be at all necessary to test each stage, as the absence of a click will indicate where to stop. The voltage indicated, will of course, be lower than the true voltage if there is much resistance in the circuit, due to the voltmeter current.

20. Suppose you find voltage on the appropriate pins of a given stage: is this any proof that the valve is drawing current?

No, but this can be tested for by measuring the voltage between chassis and the cathode pin. Absence of voltage would indicate that the cathode resistor is broken, or, if this be found of normal resistance, then the valve itself is very probably at fault, due possibly to a break in the spot-welded joint between an electrode and a leading-out wire. Thus, merely by "above chassis" testing of voltages between valve pins and chassis, and by continuity tests between selected points, a wide examination of components can be made, covering the filter choke, the output transformer, screen and anode resistors, cathode resistors and the valve current passing through them, the rectifier, and so on. Similarly, it may be possible to connect replacement parts across a break as a temporary measure without opening the chassis at all. If, for instance, the filter choke had broken down, the replacement could be connected between a filament pin of the rectifier and the screen pin of the output pentode. If the output transformer primary winding had broken down, the replacement could be connected between screen and anode pins of the valve; a replacement cathode resistor can clearly be connected between cathode pin and chassis—in fact it may be possible to get the equipment working again the moment the fault has been located by such temporary measures, until circumstances permit the opening of the receiver, and the permanent renewal of the broken component.

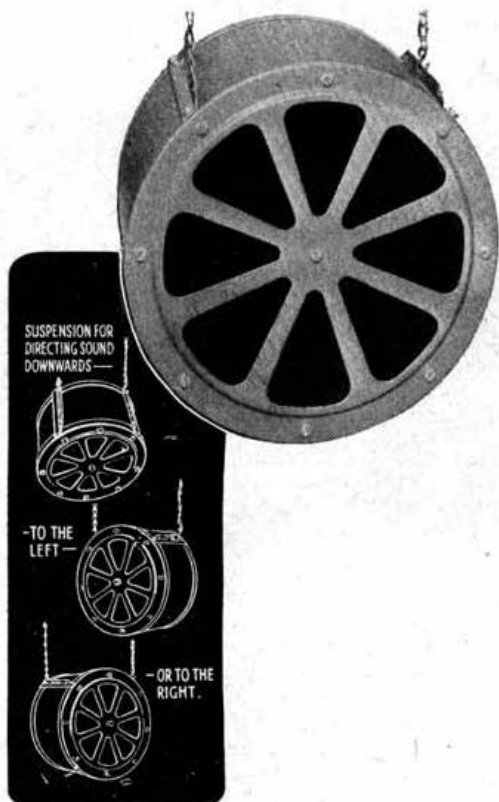
21. Suppose your receiver has developed an intermittent short circuit on the H.T. + line. How would you locate the fault without damage to the receiver's power supply?

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Eimac is continuing to produce more and ever more of the tubes which are unconditionally guaranteed against premature failures caused by gas released internally and Eimac is continuing to improve performance capabilities . . . set higher and higher standards of quality . . . develop new tube types as the industry needs them. But Uncle Sam comes first—you may experience short delays in delivery, but expanded facilities will bring them as fast as possible.

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In this event, a current limiting resistor should be inserted in the lead from the power supply, so that the fault can be deliberately allowed to take place and be located without damage resulting. The use of a current limiting resistor is especially prudent in the case of a battery operated receiver if there is believed to be an intermittent short circuit of the H.T. supply across the filament circuit, which will probably burn out the filaments. All such danger is averted if a resistor is inserted in the H.T. lead to limit the current to about 50mA. For instance, in the case of a 120 volt battery, the value of the resistor would be  $120 \div 50/1000$ , i.e. roughly 2,000 ohms.

22. Your receiver derives its bias from a resistor between L.T. — (chassis) and H.T. —, and an electrolytic condenser by-passes this resistor. An accidental short-circuit of the H.T. supply has occurred to the chassis. Can this damage the bias condenser?

Yes, the condenser may very likely be damaged. Suppose the output valve has a working bias of 6 volts negative. The bias condenser may be rated at a test voltage of 30, which would seem to provide a good factor of safety. But if a direct short circuit between H.T. + and chassis occurs, it will be seen from the diagram, (Fig. 1), that the full battery voltage is across the condenser, and will therefore damage it. In fact, if the H.T. voltage is 100, and the bias resistor is of 400 ohms, any connection of resistance lower than about 900 ohms between H.T. + and chassis will result in more than the test voltage being applied across the condenser. This form of bias circuit is therefore very susceptible to the accidental production of excess voltage across the bias condenser, and it is safer to employ a condenser rated at the battery voltage, though it will reduce the capacity available.

23. The H.T. battery of your receiver is running down, and reception is very weak. As no other battery can be brought up, how could you possibly improve matters?

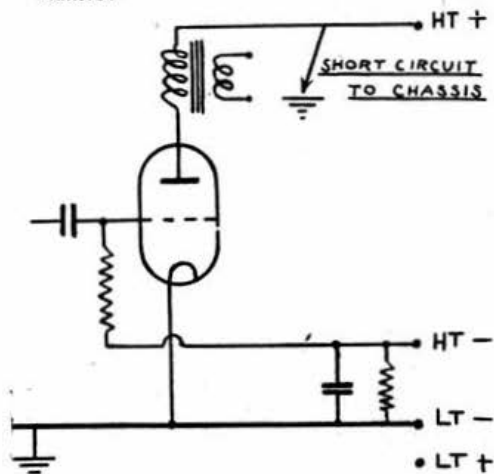


Fig 1.

Where bias is obtained from a resistor between HT— and LT—, a short circuit may easily damage the bias condenser.

In situations of extreme urgency, increasing the filament voltage cautiously may be tried. A safer method is to try connecting a filter condenser of large capacity between filament and various decoupling points, trying both anode and bias circuits. It should be remembered that in bias circuits it is the *positive* lead of the condenser which is connected to chassis. This device is often extremely effective, as the following example shows. In a certain commercial 1-V-2 receiver, designed for use with a 108 volts H.T. battery, reception becomes extremely poor, and the reaction control becomes inoperative when the voltage has fallen to about 75. The addition of an extra 8μF. decoupling condenser at one point immediately brings the reaction control into use again, and results in a vast improvement of signal strength—in fact the receiver can be kept in operation till the same H.T. battery has fallen to 35 volts, due to the elimination of undesirable coupling and feedback. The dodge succeeds best in receivers having two stages of low frequency amplification.

### The Essential Qualities of a Field Operator

At this point the writer proposes to break off the series for the time being, in order to allow other articles to "pass through." Six instalments have so far been published, and there still seems a good deal of material available—in fact, the rather scrappy treatment of some of the paragraphs has been due to an attempt to cover a wide range in the shortest time. The articles appear to have aroused considerably more interest than was anticipated, and therefore it may be possible to produce a further series in due course. Before closing, however, a brief review of some of the essential qualities of a field operator may not be out of place.

### He Must Improvise

The field operator holds a position which demands exceptional capabilities. He has to operate efficiently under physical stress; he has to fulfil the duties of a fault-tracer, and those of a maintenance engineer, both under circumstances very different from those existing at a depot. The staff of a depot have damaged equipment brought in to them, and they have to effect repairs so that the apparatus is in electrical and mechanical performance almost indistinguishable from new, for which purpose they are provided with suitable spares, and reasonable bench, tool and testing facilities. The field operator, on the other hand, perhaps after an exhausting period of rush operating under great stress, and travelling over difficult country, has to maintain and repair his equipment with the very minimum of replacements, tools or test gear. For this reason he must be immediately prepared to utilise substitute materials and components in a manner which need never enter the mind of a depot engineer. Normally for instance, the use of wire other than copper for radio work is never thought of, except for aerial guy-wires, and certain overhead spans. But consider the case of an operator entering a town with advanced detachments, and with his equipment badly shot up. He requires immediately, say, wire. Copper wire may entail a fair time spent in searching for it, but galvanised wire is all around him. Florist shops provide only one unusual example that might be overlooked; it is employed by them for frame-works and binding of wreaths and bouquets. Wire is

found up many garden walls where it is used for training plants upwards. It is found in fences—a paling fence in the depth of the country is a comforting source of wire. It is found as clothes-lines. It is found in houses of almost every type; in old-fashioned ones as iron wire for bell pulling, in others as the familiar insulated electric bell wire. It is found in the electric wiring of houses, especially if flex leads are desired. Still ascending in quality it is found in the coils of electric light meters, in telephone transformers, receivers and bell ringing sets. The lead covered wiring between telephone lead-in and installation provides shielded wire; the overhead lines provide long spans for aerials. Domestic receivers and aerials as sources not only of wire, but more important still, of replacement components are obvious.

To take another example. Insulating tape is not just a material for covering temporary joints in wiring. It is a material of the greatest use for repairs where broken parts have rapidly to be bound together; instances have already been given in these articles, such as the repair of "carbon" resistors, or the fixing of top caps on valves. Silver paper is another material often overlooked, but actually of use in very many ways. In fact, it is excellent practice when things are slack to imagine that a manufacturer is running a competition as to how many uses can be found for, say, his insulating tape, and to draw up a list. It is surprising what a useful range can be covered.

#### He Must Have Technical Knowledge

Then comes the matter of the operator's technical knowledge. However ingenious he may be, it will be found that lack of technical knowledge will involve a certain lack of confidence in his substitutes, through the feeling that he may thereby cause further unanticipated damage to the equipment. For instance, if a 4  $\mu$ F. input filter condenser breaks down, the operator should not be alarmed to find that on replacing it by one of considerably smaller capacity, the full-load voltage of the power pack is well below normal, and wonder whether the rectifier emission has been impaired by the breakdown, which may not be the case at all. Similarly, he should know that if he has to replace the condenser by one of considerable larger capacity, the increased charging current may be overloading his rectifier, and should remember that both these effects do not greatly apply to filter condensers other than the input or "reservoir" condenser.

#### He Must Know His Equipment

The field operator must be absolutely familiar with every detail of his equipment. Not only should he be able to sketch out any portion of the circuit diagram, but he must be able to point out with no hesitation, the exact position of each small component on the chassis, so that in semi-darkness or in difficult situations time will not be lost in endeavouring to trace out the wiring. The wiring of the frequency-changer, and of the A.V.C. network are the two stumbling blocks in most cases. For instance, a perfectly straightforward duo-diode-triode used for detection, delayed A.V.C. and first L.F. amplifier will have approximately eight resistors and eight condensers grouped round the valve holder, yet the operator should be able to point out at once, "that is the signal anode load resistor, that is the cathode resistor, those two form a potentiometer across the H.T. to provide a bias of about 2 volts for one diode section" and so on. It will be

clear that he must know what effect will be produced if he has replaced any component by one of different value or reliability; the replacement of the coupling condenser of an R.C.C. stage by one of leaky insulation would probably seriously impair the working of the stage, or even damage the following valve though cancellation of the negative bias by the anode voltage, but the replacement of a screen grid by-pass condenser by one of poor insulation will do little harm in the average case.

#### Conclusions

Such then, are only a few of a field operator's qualifications. It is possible, under war conditions, to take a man whose knowledge of radio is negligible and, by intensive training courses, to bring him to a high degree of efficiency in handling the equipment he is to use. But there will remain a serious risk that when he is on his own, far from advice and replacements, his inherent lack of familiarity with circuits and components other than those he is accustomed to will greatly restrict his resourcefulness in thinking of and utilising substitutes. It is here that the true value of peace-time amateur transmitter operators becomes apparent. These men have thousands of hours to their credit in building their own equipment, adapting circuits to meet their own components, preferences or finances, and putting the equipment into operation with very little technical literature and few sources of information to guide them if snags arise.

They are accustomed to operation in frequency bands, several of which are so crowded with signals that the interference probably surpasses even that on some of the notorious marine traffic bands, in busy lanes such as the English Channel and Mediterranean, and this in spite of crystal controlled signals of the highest stability. It is their complete familiarity with circuits and components that gives confidence in their resourcefulness out in the field, when trouble arises, and the failure of communications spells disaster.

#### Another Ham ?

*From Deutschlandsender comes the news from Gerry  
B.C. Stations,  
For nigh two years with fairy tales to English speaking  
nations,  
"Ark Royal" was sunk five times or more, was  
"Joyce" the traitor's boast,  
But now we find a master mind, a Deutschlandsender  
ghost,  
Six million Russian troops shot up, and with them guns  
and tanks,  
The captured civvies cried with joy, and offered many  
thanks,  
They gave the German troops their fags, and food, and  
even beer,  
No Russian captive failed to laugh a lot with Gerry  
near.  
Such was the type of news we heard, to some it sounded  
grim,  
But now we hear another voice it raises quite a din,  
When "Haw Haw" says "that ends the news" and  
quotes another hour,  
Our ghostly friend then does his stuff and illustrates  
his power,  
He carries on where "Joyce" leaves off and with  
strong voice he cries,  
"I hope you'll all tune in again and hear more  
barefaced lies."*

G8VG.

# MATHEMATICS FOR THE RADIO AMATEUR

By T. R. THEAKSTON, B.Sc. (2DBK).\*

## SECOND SERIES—PART IV. TRIGONOMETRY (continued)

WE have considered, so far, plane  $\Delta$ s only ; i.e.  $\Delta$ s in which each of the three sides is in the same flat plane.

The shortest path between any two points on the earth's surface is clearly not a straight line. It is in fact a great circle of the globe. Any three separated points are at the vertices of a spherical  $\Delta$ , and not of a plane  $\Delta$ .

In order to determine the direction of, and the distance traversed by a radio wave, which takes the direct path, it is necessary to understand a little about spherical triangles and their solution.

### SPHERICAL TRIANGLES

#### Definitions

A *Great Circle* of a sphere is a circle with the same centre and with the same radius as the sphere. The section of a sphere by a flat plane is a circle ; when the cutting plane passes through the centre of the sphere, the circular section obtained is the largest possible. It is a great circle.

Thus, on a globe, the equator is a great circle ; a meridian of longitude is part of a great circle ; but a parallel of latitude, except for the equator, is a small circle.

A *Spherical Triangle* is the triangle formed on the surface of a sphere by the intersection of the arcs of three great circles.

#### The Spherical Triangle

In Fig. 5, let ABC be a spherical  $\Delta$ , where AB, AC and BC are arcs of great circles with centre O, and radius = R.

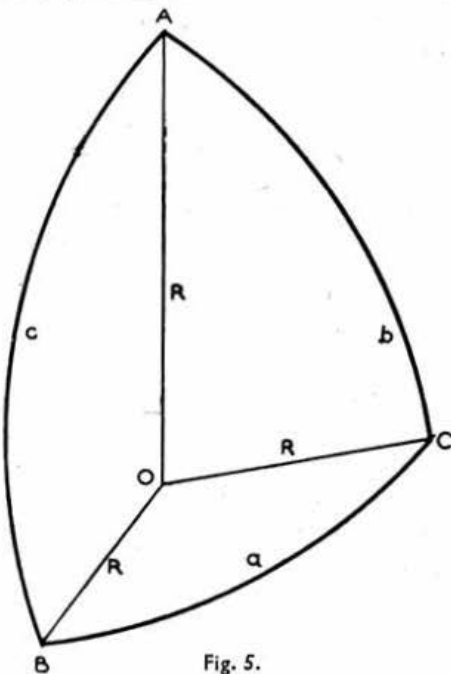


Fig. 5.

Since a spherical  $\Delta$  is concerned chiefly with angular displacement as seen from the centre of the sphere, it is natural and convenient to measure the curved sides AB, BC and CA in angular measure ; that is in degrees or radians. Since a radian is a measure depending on the radius, and in the spherical  $\Delta$  the great circles all have centre at O thus giving  $OB = OA = OC = R$ , the radian measure is very convenient.

The usual method of denoting the sides is adopted ; c is opposite to  $\hat{C}$ , a opposite  $\hat{A}$  and b opposite to  $\hat{B}$ . Hence a, b and c represent not only the sides of the  $\Delta$ , but if in radians, also express the size of the angles BOC, AOC, AOB, at the centre, respectively.

Hence in this  $\Delta$ .

Sin A means the sine of  $\hat{BAC}$ , the angle at the apex of the spherical  $\Delta$ .

Sin a means the sine of the angle, the radian measure of which is a ; i.e. the sine of  $\hat{BOC}$  at the centre.

Further, when a, b and c, denoting the sides of the spherical  $\Delta$  are expressed in radians, it is a simple matter to find their actual lengths. The radian measure of an angle =  $\frac{\text{arc}}{\text{radius}}$ , hence arc = radius  $\times$  radian measure of angle. From this it follows that

$$\text{Arc AB} = R \times \text{radian measure of } \hat{AOB} = R \times c$$

$$\text{Arc BC} = R \times \text{radian measure of } \hat{BOC} = R \times a$$

$$\text{Arc AC} = R \times \text{radian measure of } \hat{AOC} = R \times b$$

#### The Solution of a Spherical Triangle

Just as with a plane  $\Delta$ , formulæ readily give the solution, i.e. the lengths of the unknown sides and angles, of a spherical  $\Delta$ . These formulæ are analogous to those of the plane  $\Delta$  (see Part III) and are in fact derived from them.

It is beyond the scope of this article to show how they are obtained, and so the two necessary formulæ will be stated and their use explained. They are :—

$$(1) \dots \cos c = \cos a \cos b + \sin a \sin b \cos C$$

Using this formulæ, given a and b, the radian measures of two arcs, as well as  $\hat{C}$ , the angle they include,  $\cos c$  can be determined. Then, knowing  $\cos c$ , c can be determined from tables. The value of c found from the tables may be in either radians or degrees. If in radians, the length of c, i.e. arc AB in Fig. 5, is found by multiplying this value by the radius of the sphere. If in degrees, the length of the arc is a proportion of the circumference of the sphere, for an angle at the centre =  $360^\circ$ , corresponds to the circumference =  $2\pi R$ .

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There are of course the two corresponding and similar formulæ,

$$\cos a = \cos b \cos c + \sin b \sin c \cos A$$

$$\cos b = \cos a \cos c + \sin a \sin c \cos B$$

$$(2) \dots \frac{\sin A}{\sin a} = \frac{\sin B}{\sin b} = \frac{\sin C}{\sin c}$$

Hence given  $\hat{A}$  of a spherical  $\Delta$ , and the two sides  $a$  and  $b$  (in radians or degrees) the angle  $B$  of the  $\Delta$  is given by

$$\frac{\sin B}{\sin b} = \frac{\sin A}{\sin a}$$

$$\text{i.e. } \sin B = \frac{\sin b \sin A}{\sin a}$$

(Of course if  $b$ ,  $c$  and  $C$  are given,

$$\sin B = \frac{\sin b \sin C}{\sin c})$$

### Example

A spherical triangle, as  $ABC$  in Fig. 5, has :—  
 $\hat{A} = 70^\circ$

$b$  (the angle subtended at centre of sphere by  $AC$ ,

*i.e.*  $\hat{AOC} = 60^\circ$

$c$  (the angle subtended at centre of sphere by  $AB$ , *i.e.*  $\hat{AOB} = 120^\circ$

Required : The length of  $BC$  if radius of sphere = 10 in. ; and the angle  $ACB$ .

(i) Two sides and an angle are given, hence the first formula is used.

$$\begin{aligned} BC &= a \\ \cos a &= \cos b \cos c + \sin b \sin c \cos A \\ &= \cos 60^\circ \cos 120^\circ + \sin 60^\circ \sin 120^\circ \cos 70^\circ \\ &= \cos 60^\circ \times (-\cos 60^\circ) + \sin 60^\circ \sin 60^\circ \cos 70^\circ \\ &= 0.5 \times (-0.5) + 0.866 \times 0.866 \times 0.342 \\ &= -0.25 + 0.2565 \\ &= 0.0065, \text{ and from tables} \\ a &= 89^\circ 38' \text{ or } 1.5644 \text{ radians} \end{aligned}$$

$$\therefore \text{length of } a = \text{radius} \times 1.5644 = 10 \times 1.5644 = 15.644 \text{ in.}$$

(or without using radian measure,

$$\text{since } 360^\circ \text{ gives an arc} = 2\pi R$$

$$\begin{aligned} \therefore 89.63^\circ \text{ gives an arc} &= 2\pi R \times \frac{89.63}{360} \\ &= \frac{2 \times 3.1416 \times 10 \times 89.63}{360} \\ &= 15.643. \end{aligned}$$

(ii) We now know  $a$ ,  $b$ ,  $c$ ,  $\hat{A}$ ;  $\hat{C}$  is required.

The second formula is the correct one to use,

$$\text{hence } \frac{\sin C}{\sin c} = \frac{\sin A}{\sin a}$$

$$\begin{aligned} \therefore \sin C &= \sin c \times \frac{\sin A}{\sin a} \\ &= \sin 120^\circ \times \frac{\sin 70^\circ}{\sin 89^\circ 38'} \end{aligned}$$

$$\begin{aligned} &= \frac{\sin 60^\circ \times \sin 70^\circ}{\sin 89^\circ 38'} \\ &= \frac{0.866 \times 0.9397}{1.000} \end{aligned}$$

$$\hat{C} = 0.81375, \text{ and from tables}$$

$$\hat{C} = 54^\circ 28'$$

## GREAT CIRCLE DISTANCES ON THE GLOBE

The spherical  $\Delta$ s which concern the radio operator are those formed on the surface of the earth, which approximates in shape to a sphere. When the line of shortest length is drawn between any two points it can only be considered as straight when the distance apart of the points is small in comparison with the size of the earth. When, however, the points are far apart the shortest line between them is curved, and is in fact an arc of the great circle running through the points. Any question of determining this distance, or of the bearing of one of the points from the other, then becomes a matter of spherical trigonometry.

### Definitions

*Longitude* is distance East or West of Greenwich.

It is measured in degrees, where  $360^\circ$  = the angle turned through when completing a circular path.

Two points of longitude  $20^\circ$  W. and  $60^\circ$  W. respectively are separated by  $60^\circ - 20^\circ = 40^\circ$  of longitude.

Two points of longitude  $10^\circ$  E. and  $40^\circ$  W. respectively are separated by  $10^\circ + 40^\circ = 50^\circ$  of longitude.

*Latitude* is distance North or South of the Equator.

It is measured in degrees, where again  $360^\circ = 1$  circle.

The North Pole is latitude  $90^\circ$  N. Hence a point of latitude  $50^\circ$  N. is  $90^\circ - 50^\circ = 40^\circ$  from the N. Pole. A point of latitude  $40^\circ$  S. is, however,  $90^\circ + 40^\circ = 130^\circ$  from the N. Pole.

In Fig. 6,

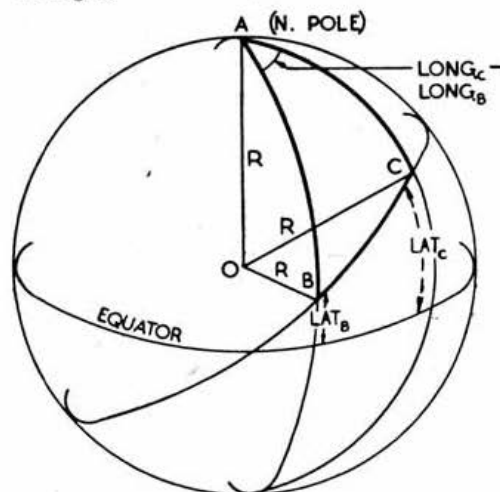


Fig. 6.



Let B and C be two points on the Earth's surface.

Let O be the centre of the Earth, and therefore OB and OC are radii of the Earth.

Let A be the North Pole.

The Great Circles of which AB and AC are arcs, are clearly meridians of longitude.

The shortest distance between B and C is on the Great Circle of which BC is an arc.

To find the distance apart of the points is to find BC; to find the bearing of C from B is to find  $\widehat{ABC}$ .

Hence, using the abbreviated notation explained previously, it is clear that we have to find a and  $\hat{B}$  in the spherical triangle ABC, the radius of the great circles being that of the Earth = 3,957 miles.

### To Find the Great Circle Distance

In Fig. 6, the length of BC = a is required.

What values are known in the spherical  $\Delta$ ?

$\hat{A}$  = the longitudinal separation of B and C since each is on a meridian of longitude which passes through the Pole A.

$$\therefore \hat{A} = \text{Long}_B - \text{Long}_C$$

c = a measure of  $\widehat{AOB}$  = the number of degrees of latitude from B to the N. Pole.

$$\therefore c = 90^\circ - \text{Lat}_B$$

b = a measure of  $\widehat{AOC}$  = the number of degrees of latitude from C to the N. Pole

$$\therefore b = 90^\circ - \text{Lat}_C$$

(Note.—It must be remembered that all these differences are algebraic. For points on opposite sides of the meridian of  $0^\circ$  Long.,  $\hat{A}$  = sum of the longitudes. For points of S. Latitude, c and b are  $90^\circ + \text{Latitude}$ .)

This will be even clearer if one always prefixes a — sign before West Longitudes and South Latitudes (cf. remarks on sign convention for lines, Part II of this Series), and then obtains the algebraic difference always.)

Hence we have enough data to solve the  $\Delta$  for a, because we have two sides and the included angle, and by formula (1)

$\cos a = \cos b \cos c + \sin b \sin c \cos A$   
which becomes

$$(1a) \dots \cos a = \cos (90 - \text{Lat}_B) \cos (90 - \text{Lat}_C) + \sin (90 - \text{Lat}_B) \sin (90 - \text{Lat}_C) \cos (\text{Long}_B - \text{Long}_C)$$

and every term on the right-hand side is known from tables.

This formula can be simplified further when the two points are both in the N. Hemisphere.

$$\text{We know that } \cos (90 - \theta) = \sin \theta \\ \text{and } \sin (90 - \theta) = \cos \theta$$

$\therefore \cos (90 - \text{Lat}_B) = \sin \text{Lat}_B$ , etc., and the formula can be rewritten.

$$(1b) \dots \cos a = \sin \text{Lat}_B \sin \text{Lat}_C + \cos \text{Lat}_B \cos \text{Lat}_C \cos (\text{Long}_B - \text{Long}_C)$$

cos a having been determined, the value of a is found from tables.

If a is in degrees, distance BC = a  $\times$  69.063 miles.

If a is in radians, distance BC = a  $\times$  3,957 miles.

### To Find the Great Circle Bearing

In Fig. 6,  $\widehat{ABC} = \hat{B}$  is required.

Now c, a, b,  $\hat{A}$  are known, and so formula (2) gives

$$\frac{\sin B}{\sin b} = \frac{\sin A}{\sin a}$$

$$\text{or } \sin B = \frac{\sin b \sin A}{\sin a}$$

Writing the angles as comprehensively as possible,

$$(2a) \dots \sin B = \frac{\sin (90 - \text{Lat}_C) \sin (\text{Long}_B - \text{Long}_C)}{\sin a}$$

### Examples

(1) What is (a) the Great Circle distance, (b) the bearing of New York ( $41^\circ 6' \text{ N.}; 74^\circ \text{ W.}$ ) from York ( $53^\circ 57' \text{ N.}; 1^\circ 5' \text{ W.}$ )? Using the notation in Fig. 6, with B corresponding to New York, and C to York, we require (a) distance BC = a;

(b)  $\widehat{ACB} = \hat{C}$ . Since both points are in the N. Hemisphere, formula (1b) is used.

$$\text{Long}_B - \text{Long}_C = 74^\circ - 1^\circ 5' = 72^\circ 55'$$

$$\begin{aligned} \cos a &= \sin 53^\circ 57' \sin 41^\circ 6' + \cos 53^\circ 57' \\ &\quad \cos 41^\circ 6' \cos 72^\circ 55' \\ &= 0.8085 \times 0.6574 + 0.5885 \times \\ &\quad 0.7536 \times 0.2937 \\ &= 0.5315 + 0.1303 \\ &= 0.6618, \text{ and from table of cosines} \\ a &= 48^\circ 34', \text{ or } 0.84764 \text{ radians.} \end{aligned}$$

$\therefore$  distance York — New York

$$\begin{aligned} &= 48.57 \times 69.063, \text{ or } 0.84764 \times 3957 \\ &\quad \text{miles} \\ &= 3,354 \text{ miles.} \end{aligned}$$

(b) For the bearing of B from C, using formula 2a

$$\begin{aligned} \sin C &= \frac{\sin (90 - \text{Lat}_B) \sin (\text{Long}_B - \text{Long}_C)}{\sin a} \\ &= \frac{\sin 48^\circ 54' \sin 72^\circ 55'}{\sin 48^\circ 34'} \\ &= \frac{0.7536 \times 0.9559}{0.7497} \\ &= 0.9607, \text{ and from table of sines} \end{aligned}$$

$$\hat{C} = 73^\circ 53'$$

$\therefore$  New York is 3,354 miles,  $73^\circ 53' \text{ W.}$  of N. from York.

(2) What is (a) the Great Circle distance (b) the bearing of Sydney ( $33^\circ 52' \text{ S.}; 151^\circ 12' \text{ E.}$ ) from York?

Using Fig. 6, with B corresponding to York and C to Sydney, BC = a is required in (a), and

$\widehat{ABC} = \hat{B}$  in (b).

(a) The points are in opposite hemispheres, and so formula (1a) is used.

The algebraic difference of longitudes,  $\text{Long}_C - \text{Long}_B$ ,

$$= 151^\circ 12' + 1^\circ 5'$$

$$= 152^\circ 17'$$

$$90^\circ - \text{Lat}_B = 36^\circ 3'$$

$$90^\circ - \text{Lat}_C = 90^\circ - (-33^\circ 52') = 90^\circ + 33^\circ 52' = 123^\circ 52'$$

$$\begin{aligned}
 \cos a &= \cos 36^\circ 3' \cos 123^\circ 52' + \sin 36^\circ 3' \sin 123^\circ 52' \cos 152^\circ 17' \\
 &= \cos 36^\circ 3' (-\cos 56^\circ 8') + \sin 36^\circ 3' \sin 56^\circ 8' (-\cos 27^\circ 43') \\
 &= 0.8085 \times (-0.5572) + 0.5885 \times 0.8303 \times (-0.8853) \\
 &= -0.4505 - 0.4326 \\
 &= -0.8831
 \end{aligned}$$

The angle which has a cosine = 0.8831 =  $27^\circ 59'$ ; hence the angle with a cosine of  $-0.8831 = (180^\circ - 27^\circ 59') = 152^\circ 1'$

$\therefore a = 152^\circ 1'$ , or  $2.6532$  radians.

$\therefore BC = 152 \frac{1}{16} \times 69.063$  miles, or  $2.6532 \times 3,957$  miles.

= 10,500 miles approx.

(b) For the bearing, using formula 2a,

$$\begin{aligned}
 \sin B &= \frac{\sin (90 - \text{Lat.}_c) \sin (\text{Long.}_c - \text{Long.}_b)}{\sin a} \\
 &= \frac{\sin 123^\circ 52' \sin 152^\circ 17'}{\sin 152^\circ 1'} \\
 &= \frac{\sin 56^\circ 8' \sin 27^\circ 43'}{\sin 27^\circ 59'} \\
 &= \frac{0.8303 \times 0.4651}{0.4692} \\
 &= 0.8230
 \end{aligned}$$

$\therefore B = 55^\circ 23'$ .

$\therefore$  Sydney is 10,500 miles,  $55^\circ 23'$  E. of N. from York.

### Suggested Exercises

To obtain practice in these calculations, the latitudes and longitudes of different towns can be found in the gazetteer of an atlas, and the formulae applied to find the great circle distances and bearings between any two. If one's home town were used as one of the two in each example, the information so obtained may be of practical use when the day for erecting a directed aerial comes again. The only real check that can be applied to the results obtained is from a globe; a taut string joining two points on the earth's surface will give a very approximate check for distance, and a closer approximation for the bearing. The angle obtained is, of course, that with the N.-S. line through the point.

### Problems

Find (a) the great circle distance (b) the bearing from London ( $51^\circ 32' \text{ N.}; 0^\circ 5' \text{ W.}$ ) of the following:—

14. Cape Town —  $33^\circ 56' \text{ N.}; 18^\circ 29' \text{ E.}$
15. Tokyo —  $35^\circ 40' \text{ N.}; 139^\circ 48' \text{ E.}$
16. San Francisco —  $37^\circ 47' \text{ N.}; 122^\circ 26' \text{ W.}$
17. Rio de Janeiro —  $22^\circ 57' \text{ S.}; 43^\circ 7' \text{ W.}$

### Solution to Problems

13. (a)  $A = 34^\circ 19'$
- (b)  $c = 8.7$  inches
- (c)  $c = 11.1$  inches
- (d)  $a = 5.5$  inches
- (e)  $A = 35^\circ 16'; B = 24^\circ 44'; b = 4.3$  inches.

(To be continued next month.)

### Books Received

THE A.B.C. OF RADIO CIRCUITS. By W. E. Miller, B.A.(Cantab.), M.Brit.I.R.E. Published by The Trader Publishing Co. Ltd., Dorset House, Stamford Street, London, S.E.1; price 3s. 6d., by post 3s. 9d.

This book is based on a series of articles which have appeared in *The Wireless and Electrical Trader* and has been published to meet the large number of requests for the series in handy form.

Written for students of radio engineering at technical colleges, trainees in radio for the Services, and the many recruits to service and repair work in the radio industry, the book contains a step-by-step survey of complete super-heterodyne receivers.

The author has placed himself in the position of a beginner who is confronted by a complete super-heterodyne circuit, and who cannot distinguish one end from the other. The circuit has been split up piece by piece, each being treated, as far as possible, as a separate section. Having learned how to identify and isolate the various parts which go to make up the whole, it is believed that the beginner will then be in a position to tackle any normal superheterodyne circuit with confidence.

Although the earlier T.R.F. type of receiver is not specifically covered, there are numerous references to it, and much of the information is equally applicable to it.

The subject matter is essentially practical, and there has been no attempt to deal in detail with purely theoretical matters.

The book, which comprises 62 pages, is liberally illustrated with 56 line drawings of circuit details.

### Bulletin of Ionosphere Data

Mr. R. Tunney, G8DD, reminds us that a monthly *Bulletin of Ionosphere Data* is published by the Radio Research Board, Teddington, at an initial cost of 2/6. This publication contains much information useful to those interested in V.H.F. propagation.

### Technical Teasers

#### No. 2

#### Answers.

- (1) Almost complete elimination of man-made static.
- (2) Modulator valve used in a frequency modulated transmitter, working as a variable inductance.
- (3) A "limiter valve" is used to remove all traces of amplitude modulation, and a "discriminator" is employed to recover the audio modulation from the signal.
- (4) 94 watts—calculated by  $I^2 R = \text{watts output}$ .
- (5) Impedance (Z).
- (6) The ratio of inductance to capacity in a given circuit.
- (7) Mutual inductance (M).
- (8) 56 Mc/s. The fundamental being the first harmonic.
- (9) Porcelain 4.4—Resin 2.5.
- (10) 746 watts.

## EXPERIMENTAL SECTION

### Receiver Group

**T**O conclude the present series of notes on Signal Generators a circuit has been prepared which is more ambitious than any mentioned previously.

In the design of an advanced type of instrument the first consideration is the improvement of oscillator stability, which involves problems similar to those encountered in Frequency Meters and V.F.O.'s. In this case a general improvement in stability is brought about by using a beat frequency oscillator using two beating oscillators feeding into a 6L7 mixer; one oscillator is made variable and the other fixed at 1650 kc/s. It is necessary to screen thoroughly both oscillators, while the two circuits themselves should be constructed as alike as possible, except in frequency. In this way changes in supply voltage, temperature, etc., will affect both oscillators in the same direction, and the resultant beat will tend to remain constant. For reading selectivity curves on an oscilloscope the fixed oscillator can be "wobulated."

It will be seen that two attenuators are used, the rough setting attenuator  $R_{11}$  being used to obtain an exact output voltage and the resistance step attenuator being used to obtain fractions of this known output. The usual practice would be to set  $R_{11}$  to give an output of say 0.1 volts and the resistance step attenuator would then give 0.1, 0.01, 0.001, etc. Some experience of this type of work is necessary to calibrate such a set but it is not beyond the scope of amateurs.

The following general constructional precautions should be noted:—

(1) The apparatus should always be built for maximum frequency stability; it can then replace existing frequency meters. Mechanical rigidity of components and wiring is of supreme importance

and wires which are more than 3 in. long should be supported and firmly attached to the chassis. Only variable condensers of the most robust nature should be considered, preferably those with rotor bearings at both ends of the shaft being chosen.

(2) The usual V.H.F. practice of "tying together" earth returns and attaching them to the chassis at one point only should be adhered to on all frequencies, otherwise stray R.F. currents on the chassis will radiate R.F. and prevent the proper operation of the attenuators.

(3) Valves should be operated at well below their maximum ratings to avoid overheating and shortened life, as replacements may upset the calibration.

(4) Power supplies must be rock stable and of good regulation. When batteries are used, means of checking the battery voltage should be provided.

(5) Great care should be exercised in the choice of insulating materials. Although detailed information on the stability of insulating materials is generally scarce, it can be said that such materials as ebonite, bakelite, cellulose acetate, etc., cannot be expected to show a high degree of secular stability. Ceramics have shown themselves very suitable for valve and coil holders but are not workable and have to be bought in the required shape. Polystyrene (Trolitul) is easily worked and suitable for most purposes but it should be remembered that it softens at a very low temperature. A warning must be added that there are components on the market which are said to be insulated with "trolitul" but which is really a methyl methacrylate resin (Perspex). These are not suitable for V.H.F. precision work, the losses being very little better than ordinary bakelite. Although the average amateur may find difficulty in recognising these two materials the price can be taken as a fair guide, genuine Trolitul being much more expensive. As far as fixed condensers are concerned the cheap moulded variety should be avoided, for even with mica insulation they cannot be relied upon.

It is hoped that these notes, which were intended to be a general survey of Signal Generators, have stimulated interest in the subject. The writer would appreciate comments and suggestions.

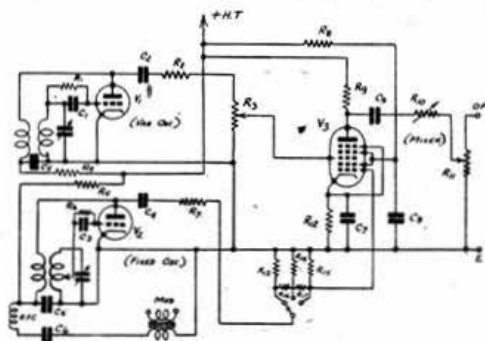
G5HF.

### Cosmic Notes

**Magnetic Conditions.**—Mild storms June 10-11, 13, 15, 21-22-23; some slight disturbances on most days during period June 1 to July 31; no data July 5 to 18.

**Ionosphere Storms.**—Mild, June 10-11, 12-13-14-15, 20-21, 26-27, moderate to severe, July 5-6-7-8, no data July 9 to 21, mild August 2-3, and 4-5.

**Critical Frequencies and virtual heights, at Washington, average for weeks ending, midnight F, midday E and F2 respectively;** June 10, 4.37 Mc/s. 297 km.; 3.27 Mc/s. 123 km.; 6.13 Mc/s. 366 km.; June 17, 4.11 Mc/s. 297 km.; 3.53 Mc/s. 121 km.; 5.5 Mc/s. 398 km.; June 24, 4.2 Mc/s. 307 km.; 3.55 Mc/s. 120 km.; 5.6 Mc/s. 450 km.; July 8, 4.3 Mc/s. 280 km.; 3.6 Mc/s. 122 km.; 5.46 Mc/s. 460 km.; no data July 15 and 22; July 29, 4.6 Mc/s. 303 km.; 3.74 Mc/s. 121 km.; 5.97 Mc/s. 404 km.; August 5, 4.36 Mc/s. 320 km.; 3.72 Mc/s. 123 km.; 5.86 Mc/s. 440 km. G6DH.



Signal Generator Circuit

R1, 6	50,000 ohms.	R12	600 ohms
R2, 7	10,000 "	R13, 14, 15,	
R3, 4, 5	100,000 "	16, 17	20,000 "
R8	25,000 "	C1, 2, 3, 4, 9	0.001 $\mu$ F.
R9	2,000 "	C5, 7, 8	0.01 "
*R10	10,000 "	C6	1 "
*R11	200 "	V1, 2	6C5 "
(H.F. screened).		V3	6L7

\* Variable

# RANDOM REFLECTIONS

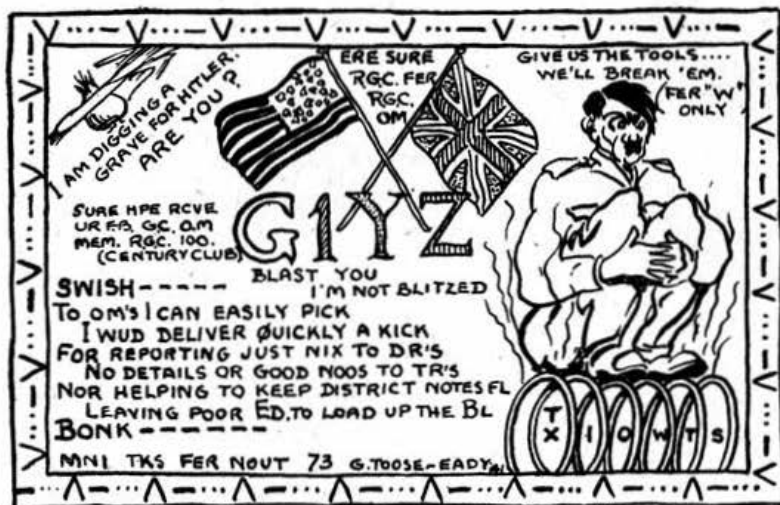
By COMMENTATOR

WELL now, here is a suggestion. The old brigade of SWL QSL card fiends—bless them, I was guilty once—will have read with tears in their eyes of the new blow recently struck at the foundations of ham radio. No more listeners reports to be sent outside the country. No more QSLs or booklets from Tokio, Rome or Berlin. No more pretty post cards lying on the door mat. No more free wall paper. No more cheap foreign stamps. What a life, as the cat said when they tried to drown him for the ninth time!

But wait, don't despair! With masterly insight, the Postal and Telegraph Censorship Dept. of the M.O.I. have let us down lightly. They must have been taking lessons in psychology from the M.O.H.

save you sending rude verses to Susceptible Simon, snow scenes to Bill in the desert, pictures of plum pudding and port to Gouty, 3XX or pretty little robins to Pete in the RAF!

So you QSL card merchants, get those printing presses set up and let's have some real nice designs in time for Christmas. I know what mine is going to be like. Its going to have "Vs" in red round the border all underlined with neat dit-dit-dahs, just so's I don't forget the code. Then there's going to be a foto of the Tx that was—if I can find the block. If not, there's one of our famous town hall—oh, that won't do though, the P. and T.C. Dept. wouldn't like that. It would be giving away military secrets. On second thoughts I think I'll have a picture of



Our tame Cartoonist suggests a design for Radio Greetings Card No. 1.

or perhaps in the arts of propaganda from the M.O.P.—sorry, I forgot, we haven't one yet—anyway forget it! The point is, they realise what power we amateurs have of keeping the Empire together. They suggest we keep in touch with our overseas friends by some special war-time radio greetings cards. And by jove, that's not a bad idea. Good psychology that old boy—eh what? If you are like me, you haven't answered that letter from W2ZZZ yet. You've been meaning to write to G3XX for a long time telling him you've not yet been blitzed. And how about that line to poor old Bill out in the desert there? You haven't had time. I know. ARP, AFS, FAP, ATS, ATC, WAAF or just plain YL. And why yes, I nearly forgot, by the time this appears in print—if it ever does—it'll be getting on for Christmas—with its bug-bear of Xmas cards and all that. Well now, why not send W2ZZZ or G3XX or poor old Bill in the desert a Radio Greetings Card? Then you can put off writing for another six months and you'll have more time for your ARP, AFS, FAP, ATS, ATC, WAAF or plain YL! And what cards you don't use between now and Christmas, you can send round to the gang as Xmas cards—it'll

Adolf stewing in a pot heated over the tank coil of the Tx that's going to be! Then I'm going to have the Union Jack and the Stars and Stripes crossed in one corner and a leek and an onion crossed in the other—just for old times sake! All this and the call sign—yes, you may put that on—to be in technicolor. Where Tx and Rx and Ur sigs RST 599 fb xx usually go, I'm going to put a little verse about people who don't send cards to their TR's and DR's. Then I'm going to have a little motto stuck in somewhere such as, "Give us the tools and we'll break them," this to be sent to the Ws of course, or "I'm digging a grave for Hitler. Are you?" These could be tied to HEs by some of you RAF laddies. Or how about, "I've been blitzed but not blasted. How's yourself?" Great scope for the imagination, when you come to think of it!

Well now, all this began as a leg pull, but I'm beginning to think there's something in it. Sounds like amateur radio's own V campaign to me. What do you think? Who's going to be the first to send me a RGC—that's short for Radio Greetings Card?

Will sure RGC for RGC oms, so what sa?





remembered to the "old timers" of the era dating from 1920-1935. To them all he sends 73 and hopes to again bridge the Seven Seas as well as the four Continents when "That Man and his Gang" are brought to book!

P./O. Bert Allen, G2UJ, writing from a Lincolnshire seaside resort which, in peace-time was made famous by its "bracing" posters, passes on the news that P./O. Len Firman, G5QO, of Lowestoft received his V.R. commission in August, the same day that his own arrived. Bert reports meeting F./O. J. Payne, G6JB, of Devon, who is in charge of a unit somewhere in Norfolk. Another recent ham contact was with F./O. Williamson, VE3TW. Apparently Williamson's box of tricks had been causing a spot of bother to some of Bert's gear so he decided to investigate. The Canadian was tight as a clam until UJ mentioned a certain brand of ham receiver. In next to no time they had found a common interest which resulted in some excellent co-operation. One of VE3TW's civilian assistants turned out to be a pal of G5QO. Bert concluded his letter by saying, "It's a great thing this ham radio. I must think about taking it up after the war!"

From an R.A.F. school in Southern Rhodesia comes news of A.C.I Douglas Surman, BRS4045. He reports that R. G. Parker, G3GD is now an A.C.I and that E. Powell, GW3QB, who was with him on the outward journey, has gone to the Aden area.

Douglas has a 6-valve H.M.V. in his hut and with this some nice DX, including KA1CM (S7), KA1AM



Gordon laughs!

Here we picture Gordon Waugh, VE1LY, one time C.B.C. commentator, with ZL2IE, VE5AAG and VE3ADN.

(S6) and KA1ME (S8) has been logged. He asks that his 73 be passed to GW3QB, G4PX and BRS. 4021.

Congrats to Sgt. G. F. Barrett, G8IP, who recently married an Irish lady. Prior to the war G8IP operated from Hampton, Middlesex. He is now serving with the R.A.F. in Northern Ireland.

Tel. H. F. West until recently on H.M.S. "St. Martin" is now stationed in the Portsmouth area where he hopes to meet local members.



Dennis Hoults, G4OO, is serving with the R.A.F. in Gibraltar.

Although 2nd Lt. John MacBeth, R. Signals (attached R.A.O.C.), is in the Aldershot area, he has not met a ham for several months. He can be reached c/o Officers' Mess, R.A.F., Farnborough, Hants.

Sgt. A.\*G. Davies, G2PC and MQC/1 writing from a County Hospital in Cambridgeshire, where he is recovering from the effects of a broken rib, tells us that Mr. F. F. Warner, G2RA, and MQF is now a civilian prisoner of war, having been captured when his ship was sunk. G2RA, who was a ship operator, can be contacted via the following address:—No. 88269 Stalag XB. We wonder whether he has met G6WQ, who is in the same camp. Also from G2PC comes the news that J. C. Aldred, one time G8UQ and MQC/3, is now a S./Ldr.

Writing from the Transvaal under date of August 22nd, Cpl. Ernie Baker, G5OQ, reported his safe arrival at an S.A.A.F. Air School. He has spent weekends in Johannesburg and Pretoria, but for some unknown reason he failed to contact any of the many hams who live in those towns. He writes enthusiastically of the hospitality extended to him by South Africans. Besides indulging in sport he has revived his interest in philately.

Sgt. H. J. D. Burrell, BRS4066, whose home address is now 17 Ferguson Avenue, Gidea Park, Romford, would be pleased to hear from any

### ARE YOU AT No. 1 S.S. ?

If so, you are cordially invited to attend a Ham Gathering in Hut 2 at 7 p.m.

**MONDAY, OCTOBER 27.**

member who cares to write. During his wanderings in the R.A.F. Burrell has met many amateurs, including G3VU, 4GG, 6PK, 8RC, 8TV and 2HNT to whom he sends 73. He also wishes to be remembered to G6NW and 6LU.

2nd/Lt. Peter Mackay, G8AY, R. Signals, who is attached to the R.H.A. in the Middle East, reports having met ZL2CI whilst in hospital in Cairo. He has also had several chats with SU1CK.

His present job gets him on the air occasionally but DX is "verbodden"! He tells us that the B.B.C. short-wave services are well received on all bands from 13 to 49 metres. He occasionally listens on 7 Mc. and during early August heard "packets of W4, 5, 8 and 9 signals."

Congrats. to John Hunter, G2ZQ, upon promotion to Squadron Leader. The "ZQ ham party" appears to have become a little disintegrated recently due to the departure of G6LK and 8DA to the Middle East, but sufficient remain to allow them to continue unchallenged as the largest single ham unit in G.

How about just *one* Hamfest before winter sets in?

F./O. Howard Brabrook, G5ZD, writing from N. Ireland, tells us that he has met several "Early Birds" on his station. He is anxious to support the Belfast meetings, but is just a little too far away. He sends 73 to old friends at home and abroad.

G6CL has been pleased to welcome to Headquarters Lt. Fred Saxon (son of Mr. F. Saxon, VE3SG, Hon. Secretary, Canadian Operators Association) fresh from a course at Catterick; P./O. R. Biderman, SP3DF, Polish Air Force and now living at 14 Upton Road, Watford; Sergeant Jon Brynlsen, LA9N, Royal Norwegian Army, and A.C.1 W. J. France, ZL1CP, of Rotorua, New Zealand.

### Prisoners of War

From Eric Trebilcock comes the news that A.C.1 "Snowy" Campbell, VK3MR, of West Coburg, Australia, is now a prisoner of war. "Snowy" was operator of one of the best known VK stations in the years before the war, and was a regular B.E.R.U. contest entrant.

Mr. A. R. Pepin, G2MS, states that F./Lt. F. H. Babcock, G8LI, previously reported wounded and missing in Crete, is now a prisoner of war.

Mrs. M. Barry, of Allerton, Liverpool, advises us that her son F./Sgt. G. D. Barry, BRS3745, has been a prisoner of war in Germany since July 9. His address is 580820 F./Sgt. George D. Barry, B. P. of W. 39259 Stalag IXC, Dulag.

Mr. P. L. Garnett informs us that his son, R. M. Garrett, G3BP, R. Signals has been a prisoner of war since he was captured in Cyrenaica, Libya, last April. His address is Signalman R. M. Garrett, 2590411, British Prisoner of War, Campo Concentramento P.G., Fonte D'Amore, Sulmona (Aquila), Italy.

### Assistance Offered

G5MP, whose Vade Mecum articles have just concluded, has offered to assist by correspondence (or personally in the Reading district), any R.S.G.B. Service member taking any of the following subjects:

Radio (Theory and Practice).  
Navigation, (Dead Reckoning and Astronomical).  
Morse, Semaphore, and International Flag Signalling.  
Meteorology.

His present address is B.W.F. Mainprise, B.Sc., "Four Cedars," 2, Tilehurst Road, Reading, Berks.

### Our Honorary Editor in Khaki

The many friends of Mr. James W. Mathews, G6LL, will be interested to hear that he has joined the Royal Corps of Signals.

Before leaving London G6LL assured us that he hopes to continue to take an active interest in the work of the Society, both as a member of Council and as Honorary Editor of this Journal.

Good luck Jimmy!

73.

G3BD (Gibraltar), to G2UJ, 4BY, 4FI, 5PY, 6FV, 2AAN, 2BIB.

G3PM (for Ashton-under-Lyne Radio Society), to G3BN, 3DL, 3NX, 3OC, 3RY, 6QA, 8BK, 2BBV, 2FOS, 2HOG.

G3SK (127 Stanbridge Road, Leighton Buzzard, to G2IK, 3NL, 3PV, 3PZ, 3TL, 3XM, 4OC and 5ZJ.

G3WP (41 Queen Street, Brightlingsea, Colchester, Essex), to G3GW, 3UC, GW3KY, G5CG, 5MM, 6AB, 6DH, 6NU, 8WI, 8TZ, 2CDG, 2HLP.

G5MV to G2HB, 2IW, 3BG, 4BO, 5FP, 5IV, 5ZN, 6JB, 8BK, 8NV, 8UJ.

G5OQ (R.A.F., South Africa), to G2AO, BK, CD, CL, FO, IA, IC, IM, IZ, JN, NJ, PL and all other old friends.

G8AY (R. Signals, M.E.F.), to G2LD, 2LF, 2PL, 2PN, 2YL, 5RI, 5ZM, 6WP, 6ZO, 8FF, 8OA and VE5ZM.

G8KU (R.N.V.(W.)R.), to G3LP, 3WP, 5HZ, 5VO, 6OO, 6RH, 6UJ, 8AX, \*G8IJ, 8FP, 8UO, BRS2977 and all Club members of G4BP.

2ATB (Miss D. Bullough, 35 Hays Walk, Cheam), to G2UJ, 3LP, 3UY, 3YK, 4AJ and 8GD.

### POSTAGE DUE

For EVERY BULLETIN RETURNED TO HEADQUARTERS THE G.P.O. DEMANDS A SURCHARGE OF 1½D.

Please co-operate by notifying change of address immediately

# ON ACTIVE SERVICE

## TWENTY-FIFTH LIST

WE publish below our twenty-fifth list of radio amateurs on active service. Additional details and corrections should be advised to Headquarters as early as possible. The present list contains information received up to September 30, 1941.

Rank and Name	Regiment or Branch	Pre-war Call or B.R.S.
A.C.2 J. Adams ...	R.A.F. ...	4448
A.C.1 D. Anderton ...	" ...	2927
Cpl. A. Beautelement ...	" ...	2CNX
Cpl. C. E. Bennett ...	" ...	4465
Cpl. C. C. Bolland ...	" ...	4421
L.A.C. G. Briddon ...	" ...	4427
Cpl. C. S. Burnham ...	" ...	G4PC
A.C.2 A. Y. Cole ...	" ...	2HJN
A.C.2 F. Dobson ...	" ...	4444
F./O. H. J. Fenn ...	" ...	2515
A.C.1 A. G. French ...	" ...	G5PN
A.C.2 A. J. Glassford ...	" ...	4467
L./Sgt. C. R. Goodall ...	R.C. of S. ...	4439
2nd Lt. G. Haworth ...	R.A.O.C. ...	G5XC
Cadet R. R. Hornby ...	O.C.T.U. ...	4420
P./O. D. James ...	R.A.F. ...	4414
2nd Lt. F. Knowles ...	R.A. ...	4426

Rank and Name	Regiment or Branch	Pre-war Call or B.R.
Sgt. J. F. Lewis ...	R.A.F. ...	4434
W./O. C. W. Liversidge ...	" ...	1050
A.C.1 Mackay ...	" ...	2FTN
A.C.1 R. E. Maddison ...	" ...	4441
Sig. J. W. Mathews ...	R.C. of S. ...	G6LL
A.C.2 J. A. Middleton ...	R.A.F. ...	4416
Bdr. W. C. Parker ...	Essex	2BGP
	Yeomanry	
Cpl. S. Pearson ...	R.A.F. ...	2FJS
F./Sgt. H. I. Popay, D.F.M.	" ...	G8DY
L.A.C. W. Priestnall ...	" ...	4445
Sig. A. J. Quinnell ...	R.C. of S. ...	4468
Capt. P. H. Rolfe ...	" ...	4456
Pte. A. G. L. Schofield ...	R.A.P.C. ...	G3TS
Sig. C. S. Smith ...	R.C. of S. ...	4446
Cpl. F. C. Smith ...	R.A.F. ...	2DDX
A.C.2 P. C. Spence ...	" ...	4431
Major A. J. Stevenson ...	R.A. ...	4457
Pte. W. Telfer ...	R.A.M.C. ...	4430
Sgt. G. Trotter ...	R.C. of S. ...	4461
Cpl. K. B. Whittaker ...	R.A.F. ...	2FXL

## Letters to the Editor

### An Example of Real Ham Spirit

SIR,—As the result of a very successful P.D.M. held in Chelmsford last July we made a rather unforeseen and handsome profit. At a recent Area meeting it was unanimously decided to set aside a small sum, 13s. 5d., to meet the D.R.'s postal expenses for the year and to devote the remaining £1 15s. to the R.S.G.B. Prisoners of War Fund.

Those present at the meeting feel sure that their fellow amateurs who helped to raise this sum will readily agree to a donation being made to such an excellent cause. We therefore ask you to accept the above mentioned sum and at the same time we send our very 73 to all amateurs who are Prisoners of War.

Yours sincerely,

R. L. VARNEY,  
G5RV (D.R.).

[The gesture shown by the Chelmsford Group is warmly appreciated.—J.C.]

### After the War

DEAR SIR,—A point that should be stressed, which has been overlooked, is that future amateur radio will be concerned not only with keying at a certain speed, but, as in the past, with observation, experiment research and study. If amateur work were to be concerned merely with "mikes" and keys, its

existence would not be fully justified. The granting of past licences was on the basis of the above remarks, and the future would seem to provide no other substantial *raison d'être*.

The experimental section of the society should be the backbone of our activities. Inclusion in this does not require a degree; it asks merely for definite study of one particular aspect of radio phenomena. Members holding a science degree supply the supplementary help and guidance to all providing data, no matter from what source it comes. We know only too well that mere accident has discovered some important basis for further research and invention.

Therefore, let us not lose sight of the more important matters of our activities.

Yours faithfully,

(REV.) SYDNEY NEWBY, G8CP.

### University College, London

One-time students of University College, London, may like to be reminded that the Journal of the Engineering Society is still being published. The current issue covering the year 1940-1 contains several technical contributions in addition to topical news from members on active service.

"Mechanical Analogies of an Electrical Circuit" and "Training the Engineer to meet Modern Requirements" are two of the chief contributions to this issue.

An appeal is made to old students who have not communicated with the Editor, to do so without delay.



## CANADIANS ON ACTIVE SERVICE FIFTH LIST

It is with pleasure we publish a further list of Canadian amateurs on active service, prepared by Mr. Fred Saxon (VE3SG), 302 Lee Avenue, Toronto, Canada.

Additions or modifications should be sent to Mr. Saxon and not Headquarters.

Rank and Name	Regiment or Branch	Pre-war Call VE
F./O. A. W. Bannister	R.C.A.F.	2FG
L.A.C. W. H. Barrie	"	3AAS
A.C.2 H. E. V. Bennett	"	5AJM
F./O. H. W. Bishop	"	3WP
A.C.2 A. W. Bradley	"	3ANC
L.A.C. N. W. Broten	"	40S
F./O. T. C. Brown	"	5CB
F./O. J. H. Brownell	"	4BU
F./O. N. M. Bush	"	3KW
A.C.2 J. Camden	"	3VZ
Sig. E. A. Campbell	R.C.C.S.	5MR
L.A.C. L. C. Card	R.C.A.F.	4RX
F./O. S. J. Chapman	"	2LV
F./O. L. H. Claydon	"	4ANT
A.C.2 E. H. Cooper	"	5EC
Sig. P. H. Cooper	R.C.C.S.	3ATC
L.A.C. D. A. Cotter	R.C.A.F.	5GH
F./O. E. Daly	"	3ZA
L.A.C. N. Dixon	"	5PX
P./O. C. B. Dowden	"	1HK
Lt.-Col. J. W. Ellinthorpe	R.C.C.S.	4FE
F./O. G. G. Field	R.C.A.F.	2BO
A.C.1 F. W. Graves	"	4API
A.C.1 Geoff. S. Hall	R.A.F.	ex3LJ
F./O. D. C. Hanna	R.C.A.F.	2CD
L.A.C. H. I. F. Hitchon	"	3AAR
Lt. T. Hunter, Jr.	R.C.C.S.	3CP
A.C.2 G. H. Jackson	R.C.A.F.	5QF

Rank and Name	Regiment or Branch	Pre-war Call VE
Tel. G. S. Johnson	R.C.N.	5AFM
L.A.C. D. Jones	R.C.A.F.	5ACE
A.C.2 M. Kearns	"	ex3JX
Tel. A. Kepner	R.C.N.	4MN
F./O. T. Lockheed	R.C.A.F.	ex3UY
A.C.2 A. E. Lowe	"	5ADB
F./O. J. W. McCalla	"	8DH
L.A.C. J. McFegan	"	5AHH
P./O. I. R. Montgomery	"	2JT
Tel. J. E. Mulvaney	R.C.N.	3AME
L.A.C. M. C. Murray	R.C.A.F.	4AMT
F./O. B. W. Naylor	"	5BI
F./O. L. W. E. Neale	"	3WN
A.C.1 K. A. Overall	"	3AYA
F./O. G. Playfair	"	5IP
F./O. E. C. Poole	"	30J
L.A.C. Donald Rains	R.A.F.	ex1BM
F./O. H. McG. Reid	R.C.A.F.	3ADR
Sig. J. W. Riddle	R.C.C.S.	5JZ
L.A.C. D. Scroggie	R.C.A.F.	5AIM
L.A.C. K. N. Scott	"	3AWE
A.C.2 C. H. Sovereign	"	3AWN
L.A.C. J. C. Squarebriggs	"	4AFB
A.C.2 E. K. Turner	"	5PW
F./O. J. A. Varey	"	3ZB
Tel. C. Watson	R.C.N.	5UL
F./O. C. Williamson	R.C.A.F.	3TW
L.A.C. H. C. Wilson	"	3AXK
F./O. W. G. C. Wyer	"	3BP

We regret to announce that L.A.C. J. M. Macdonald, R.C.A.F. (VE3AKM), was killed in a flying accident in England on June 6, 1941, and that Cpl. Stafford, R.C.C.S. (VE3AXG) was killed during a London bombing raid on April 19.

Messrs. R. Hodgson (VE5BY) and Stark (VE5AE) are serving with A.R.T.F.E.R.O. (Atlantic Ferry Service). L.A.C. D. W. Heckart (W9EYB) is serving with the R.C.A.F.

## AIR TRAINING CORPS SECOND LIST

THE following members have notified Headquarters that they are serving as Officers or Civilian Instructors in the Air Training Corps.

Squad No.	Squadron or Flight	Name	Call Sign
35	No. 1 City of Edinburgh	P./O. S. French	GM6FN*
85	Southgate	P./O. J. R. Ford	BRS4376*
		G. Woolner	G4BC
203	Gainsborough	F. Green	G3OS
216	Swansea	D. G. Johns	GW6GJ
218	Rotherham	D. D. Marshall	G2MA
247	Ashton-under-Lyne	J. Partington	G5PX
262	Ipswich	P./O. Grover	ex G8CU*
		P./O. J. C. Egerton	G8MU*
367	6th Sheffield	J. R. Petty	G4JW
1047	Wolverhampton	R. F. Speake	G5IQ
1134	W. Belfast	R. Holden	G15HU
		W. C. F. Taylor	G13KV
		P./O. W. C. Haddick	G16HI*
1137	E. Belfast	F. A. Robb	G16TK
		W. J. Boston	Op. G16YM
		G. A. Hook	2CIL
		E. Beat	ex G12BB
1143	Edinburgh	F./O. J. Wilson	GM6XI*
1167	Larkhall, Lanarkshire	A. L. Anderson	BRS4435
1220	March	R. F. G. Thurlow	G3WW
		F. W. Crabtree	G3BK
1341	Benfleet	F./O. M. V. Rubeck	ex ON4ZQ*
1541	Beaufort Institute	P./O. T. Francis Barrett	BRS4433*
1700	South Midlothian (Loanhead).	H. E. M. Lawson	GM5HL
	Alnwick (Woolner).	R. Lyall	G8SG

Squad No.	Squadron or Flight	Name	Call Sign
	Sale Methodist College, Belfast.	H. Marshall Dr. J. Parke	G4ND G18PA

\* Denotes Commissioned R.A.F.V.R. (Training Branch).

### CORRECTIONS TO FIRST LIST.

Call sign of F. W. Hudson should read 2BHA.

Call sign of P. Winsford should read G4DC.

A. Simons, G5BD, is assisting 1073 Squadron, Mablethorpe.

F./Lt. J. C. Graham, GM3TR, is O./C. No. 1137 Squadron, not Signals Officer.

## Ham Hospitality

The following additions and corrections should be made to the comprehensive list published in the May, 1941, issue.

**Branston, Nr. Lincoln.**—Dr. S. O'Hagan (G2CR), Branston Hall Sanatorium. Phone: Branston 204.

**Christchurch, Hants.**—T. J. S. Cole (G3YU), Deirdre's Cafe, Purewell. Phone: Christchurch 1030, Ext. 126, between 9 a.m. and 6 p.m.

**Felixstowe.**—C. W. Packe (G3OJ), 86 Grange Road. Phone: Felixstowe 93.

**Henlow, Beds.**—Cpl. S. R. Richards (BRS3723), 7 Pollards Nurseries.

**Shrewsbury.**—D. R. Pugh (BRS3735), 21 Racecourse Avenue Monkmoor.

### Correction.

**London, N.**—W. V. Champion, 12 Bedford Road, N.15. Phone now: Business, Amherst 4851-2; Home, Stamford Hill 1035.

# THE MONTH "OFF" THE AIR—September, 1941

By A. O. MILNE, G2MI.

## Notes and News

THE spread of the war, combined with the severe magnetic storms experienced during the month seem to have had a serious effect on the flow of news! Reports are most conspicuous by their absence, and it is necessary to draw attention to the fact that this feature is dependent on *your* news. In other words, no gas: MOTA stops!

G8DR reports a few Americans received at the end of July, including the portables WILCO/1 and W8NPF/8. Some of the more newly licenced calls heard are listed as follows: W1RLU, 20CI, 8M2T, QPU, SAQ, 9QIY. Others heard are K4GSG, HDY, HHT, LUICA and PY1HQ.

Talking of DX, or rather, the lack of it, reminds us that the B.S.W.L. is still carrying on and publishes a monthly news sheet which is circulated to members. The Secretary is Mr. E. H. Trowell, 2HKU, 27 Unity Street, Sheerness, Kent, to whom all enquiries should be addressed.

## Letters from Abroad

A very welcome line comes from Tom Arnold, VU2AN, who is now C.Q.M.S. Congratulations O.M.! He is doing a bit of schoolmastering at a Signals Training Centre and although missing the practical work seems to be enjoying himself. His letter posted in June, reached Harrogate at the end of September and was in answer to one posted last December! He mentions that VU2FO is Captain in charge of operator training at the same school. VK3WD was another ham whom he has met recently. Tom gives a big hand to the *R.S.G.B. Handbook* and says he has found it very useful "in class."

Another copy of "Ham Chatter" is just to hand from the District 6 Boys in South Africa, together with a letter from their secretary, O.M., Ensor. He tells us that the amateurs in the African war zone have, as elsewhere, acquitted themselves well and that one ZS6 has been highly commended for climbing on to the roof of his mobile unit under shell-fire in an exposed position, to hold up the aerial so that an urgent message could be passed. The training school, near Bloemfontein, is run entirely by hams, the O.C. being Lt.-Col. Elliot-Wilson, ZS6O.

From the pages of "Ham Chatter" we learn of a concert organised by the gang in aid of a fund which provides homes for blitzed children from the West Country. Some idea of just how fine an effort these boys are putting out may be judged from the following quotation: "Our efforts for the North of Scotland Fund resulted in a donation of £35. With your co-operation we hope to double that amount. Incidentally our own 'comforts' fund will benefit." Good work, ZS6, and thank you!

ZSIDC in sending thanks for books says "They were a real godsend and you have no idea how welcome they were, as in Abyssinia, literature in English is quite unobtainable. Perhaps the last reading matter we got was a copy of the *A.R.R.L. Handbook*, in English which we picked up in a wrecked Italian station at Marras!" He often comes across G2QL who is War Office photographer

in those parts. Incidentally he sends a QSL from the station at Addis.

ZS5D gives his reactions, in some detail, when he awoke one night to find his van rocking about like a ship on a rough sea. Investigation disclosed an elephant gleefully rubbing himself on the outside!

From the U.S.A. comes some interesting news in a letter from Hugo Bondy, W2CMY, who has had a visit from... but let him tell the story in his own words. "It all came about in this manner. Just as I was about to get myself all cleaned up by diving into the bath tub, W2GRG 'phoned and said that he had a little surprise for me. I replied 'Yeah? what is it now?' 'Well, what is your best DX?' inquired Benny. 'AC4YN, of course, and what's more you didn't work him!' Says Benny 'Right, and I can't supply Reg Fox but I can supply AC4JS.'"

"All of which put me in my proper place in a great hurry. So by the time I had got myself cleaned up, a gang piled into the house consisting of W2GRG, 2AVO, 2KM and AC4JS. We had quite a session and broke it up only long enough to adjourn to 2JT's. 4JS had just been up to Hartford and spent all day with KBW. By the time it was over he says that he had just about convinced KB, Goodman, Hunton and Mosky that he actually had been in Tibet. However, Handy wasn't around and he is the last word on that score. But it may be that credit will be handed out for Tibet for those who have worked AC4JS. That is all dependent on us, if or when the DX.C.C. is reconstituted."

Hugo also mentions that W2JT has just recovered from a very serious operation but is getting around again now after a pretty close call.

*Tailpiece.*—And that, Ladies and Gents., is all for this month. It will save me a lot of trouble each month if this feature dies on us but I have a sort of an idea that some of you would be sorry, so what about it?

## QSL Bureau

Cards are waiting at the QSL Bureau for the following G3's. Only one envelope please, to G2MI, 1 Kent Drive, Harrogate. Please do not send envelopes to Headquarters.

G3AB, J, K, L, M, X, BA, G, J, U, CA, B, F, N, Q, V, DA, B, D, L, Q, R, S, T, Z, FC, D, K, N, O, P, S, X, Y, Z, GA, C, G, H, K, N, R, V, W, X, HF, N, V, W, IP, R, V, JA, G, N, Q, S, T, U, X, Y, KD, S, Y, LH, O, U, V, MC, G, J, M, O, Q, U, NJ, K, L, P, W, Y, OF, H, M, PB, D, G, K, N, V, QB, C, H, O, W, Y, Z, RK, L, R, S, T, V, SM, Q, X, Y, Z, TJ, L, UF, I, R, S, V, Y, VG, H, J, O, P, V, Z, WM, N, S, XB, F, L, M, N, T, X, YC, P, R, S, T, X, ZA, K, N, S, X, Y.

## Stratton's Latest

In spite of the many difficulties which every radio concern is experiencing, *Stratton & Co., Ltd.*, have recently issued a new Technical Handbook containing a description of the components being produced at their Birmingham factory.

As new lines are released descriptive literature will be issued for inclusion in this well made loose leaf binder.

## The 28 Mc. Band

In pre-war years the winter "DX Season" was in full swing by the end of September, and even in 1940 U.S.A. amateurs were audible daily after the 15th, but this year there has been a marked deterioration of conditions, and at the time of writing no reports of W signals have come to hand. Probably the recent severe magnetic disturbances, plus a reduction of U.S.A. activity partly account for this state of affairs, but undoubtedly the major cause is the approach of sunspot minimum.

It is interesting to note in this connection that South America, the source of the first DX to be worked from this country when the band re-opened in 1935 after sunspot minimum, produced, with one exception, the only amateur signals reported during September this year.

BRS3003 heard three Brazilian amateurs, viz., PY1FN on September 7, 13 and 22, PY2QK on September 7 and 21, and PY2EJ on September 7, and in addition unidentified South American 'phones were logged on September 8, 10, 23. All these signals were heard between 18.00 and 20.30 G.M.T. and PY2QK was audible for over an hour on September 21. The only other amateur signal reported was K4EZR, heard by BRS3003 at 19.25 G.M.T., on September 7.

LQB4/LSA2 on 27.5 Mc/s. was logged by G4MR on 12 days, by BRS3003 on 11 days, and by 2FWA on 8 days, but was inaudible on 10 days between September 1 and 24. Other commercial harmonics from the Western Hemisphere were HHA 32.2 Mc/s., HRX7 27.7 Mc/s., and WQA/WQA2 31.5 Mc/s., heard by G4MR on September 23, and LSM2 29 Mc/s., and LUJ 29.6 Mc/s. heard by BRS3003 on September 22 and 10 respectively.

European signals were not so plentiful as during the summer months, but those heard included a number of broadcast harmonics from this country, Russia and Germany. Commercial calls reported included IRP/IEU, etc., 33 Mc/s., FYQ 32 Mc/s., FYV 31.4 Mc/s., RKO 29.3 Mc/s., EAM2 28 Mc/s., SDE 27.7 Mc/s. and HAS2 27.2 Mc/s.

Many thanks are due to G4MR, 2FWA and BRS3003 for their reports.

*Stop Press.*—A late report received from BRS3893 shows reception of WIAK, W3AFG, W4HBQ, W4HJB and W6LG on September 7, 20.45–21.05 G.M.T., and of W2GW at 17.15 on September 13. Other amateur signals were logged as follows:—PY1FN, PY1FX(?) and K4USA(?) on September 7, PY1FN on September 10, CE1AT on September 13, EA4AL and PY4JT on September 21, and PY1FN and PY2QK on September 28. European commercial and broadcast harmonics higher than 40 Mc. were heard on September 3, 17, 19, 20, 23, 25 and 26, and U.S.A. Police on 31 Mc. at 18.20 G.M.T. on September 23. N.C.

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The "Radio" Handbook  
(1942) ... 11s. 0d.  
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## THE 'QSL' RACKET

By A. TOMLINSON, ZD2H/G2QN.

**T**HIS enforced inactivity has made many of us up-to-date with QSLs. We in G., touching only the fringe of the QSL game, were let off lightly. Until blessed with an Empire call I'd no clear notion of what "writing on the wallpaper" really meant, but as sole amateur representative in one of our colonies the job certainly became a major undertaking. What a racket this QSL business was.

My correspondence, referred to by my office colleagues as "fan mail", often assumed hefty proportions. The requests contained therein, totally unconnected with radio, had to be read to be believed.

### Bugs for Ukes.

By far the brightest gem came from a South Sea ham who after hoping I would sure QSLLL offered, in exchange for samples of Nigerian butterflies, bugs and beetles, a genuine Hawaiian ukelele or a Hula girl's skirt. Now had it been a Hula girl ...! This enterprising collector furnished full and comprehensive details how to gas these bugs so as not to damage them prior to posting.

The guile shown to extract QSLs was little short of marvellous. One prominent Dx station offered to print and forward free of all cost super-QSLs in exchange for a solitary card confirming his QSO. I fell for that blarney, all right. Then there were those many listeners under the impression that one wanted to start a correspondence school. Their convincing and pathetic letters endeavouring to net that QSL brought tears to my eyes and made mincemeat of my heart. A card always went direct. Additionally, the ham game must have taken a considerable toll of health judging by the number of bed-ridden listeners who wanted QSLs!

### Rainfall and QSLs.

Another distant listener wanting my card, requested details of local animal life, thinking presumably that lions growled on my door-step. One loquacious ham's card, describing everything from his pet dog to relations in America, concluded with details of the annual rainfall in his part of the world. He couldn't have known that his information wasn't even interesting because it had been raining practically continuously for five months at my then location situated only ten miles from the second wettest spot on the earth's surface!

I sincerely hope that those ham friendship quilts graced by my call-sign and signature rest lightly on the OWs and OM's whose QSLs the many and varied patches accompanied.

### Currency and QSLs.

Requests for complete samples of Nigerian currency were common. One such applicant started well enough by forwarding a sample of his own country's coinage in the shape of a dime. I'm sorry to confess my inability to act on his request. He had the satisfaction of knowing however, that his coin made excellent "bug" contacts!

Listeners' organisations used ingenious methods to maintain enthusiasm. Several wrote requesting special telephony transmissions for the benefit of their members. This had a boomerang effect of saddling one with another spate of listeners' reports.

Occasionally, Secretaries and other Society officers would write direct. It was somewhat embarrassing to have personal paragraphs from return letters extracted and published in the organisation Journal. This resulted in letters from other members anxious to add to my circle of acquaintances. One active pre-war continental association had a disconcerting habit of forwarding listeners' reports in neat batches of a hundred or so. The QSL Manager took the cake, however, when he requested that undamaged stamps should be selected and neatly spaced on the envelope containing my return cards.

### "What have you" and QSLs.

Applications for tigers' teeth, leopards' claws, to say nothing of elephants' tusks, were commonplace. Others included requests for Nigerian flags, eggs, reptile skins, sugar cane, coco-nut husks, stuffed birds or what have you!

You've no idea how many luscious YLs pound brass if my wonderful collection of photographs were to be believed. Alternatively I'd a shrewd suspicion that these delightful illustrations were yet another subtle method to coax home that elusive QSL.

In spite of what my YF said I hadn't the heart to refuse such applications.

That half the hams of the world were philatelists was confirmed by the many requests for used and unused Nigerian stamps. Characteristically, none ever thought of sending sufficient wherewithal to buy new specimens. Perhaps applicants, consulting the Call Book, thought that being employed by the Posts and Telegraph Department entitled me to free samples!

Yes, the QSL business was indeed a glorious racket. In spite of its many drawbacks, how appreciative would be an early return to those halcyon days where apparently listeners followed the very clanking of one "bug."

So that's the dope gang, giving one aspect of the greatest game in the world. So if, at some future date, your QSL doesn't put in an appearance promptly you'll know I'm busy pounding the "mill" in a vain endeavour to clear off arrears.

### R.S.G.Bee Section

From David Price-Jones, G5SA, of Welwyn, comes the "stinging" news that both he and Ernie "Quartz" Dedman, G2NH, have joined the ranks of the apiarists. The formation of an R.S.G.Bee Section seems imminent as we hear that several other erstwhile DX merchants have decided to follow the Maeterlinck cult.

Mention of bees reminds us of the occasion, before the war, when Douglas Chisholm, G2CX, dashed home to deal with his pets who were alleged to have swarmed, only to discover that they were not his property!

### Congratulations

To Mr. Eric Wilson, 2FDR, energetic Acting Honorary Secretary of the Midland Amateur Radio Society, Birmingham, whose wife recently presented him with a daughter.



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**DISTRICT 8 (Home Counties).** (Beds., Cambs., Hunts., and the towns of Peterborough and Newmarket.) MR. S. J. GRANFIELD (G5BQ), 47 Warren Road, Milton Road, Cambridge. Telephone: Cambridge 56444.

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**DISTRICT 10 (South Wales and Monmouth).** Scribe: MR. S. HOWELL (G5FN), 90 Coleridge Avenue, Penarth, Glam.

**DISTRICT 11 (North Wales).** (Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth, Montgomery, Radnorshire, and parts of Shropshire not in District 3.) Deputy: MR. N. E. READ (G6US), 24 Church Street, Oswestry, Salop.

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**DISTRICT 13 (London South).** To be appointed.

**DISTRICT 14 (Eastern).** (East London and Essex.) MR. R. L. VARNEY (G5RV), "Arvika," 184 Galleywood Road, Chelmsford, Essex. Telephone: Chelmsford 3394.

**DISTRICT 15 (London West).** (West London Postal Districts, Bucks., and that part of Middlesex not included in District 12.) MR. H. V. WILKINS (G6WN), 539 Oldfield Lane, Sudbury Hill, Greenford, Middlesex. Telephone: Byron 3369.

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**DISTRICT 18 (North and East Yorkshire).** (East Riding and part of North Riding.) MR. E. MITCHELL (G5MV), 40 North Marine Road, Scarborough.

**DISTRICT 19 (Northern).** (Northumberland, Durham, and North Yorks.) MR. R. J. BRADLEY (G2FO), 36 Raby Road, Stockton-on-Tees.

**SCOTLAND.** MR. JAMES HUNTER (GM6ZV), Scottish Records Officer: 51 Camphill Avenue, Langside, Glasgow.

**NORTHERN IRELAND.** MR. J. N. SMITH (G15QX), 19 Hawthornden Drive, Belfast. Telephone: Belfast 633323.

New Members are cordially invited to write to their local Representative, enclosing a stamp if a reply is required.

## DISTRICT 1 (North Western)

*Bolton.*—Five members attended a meeting held at 2DVQ on September 14. For the benefit of any member who may be stationed in, or visiting the district, notice is given that an informal meeting is held every second Sunday in the month (commencing at 2.30 p.m.) at 32 Bromwich Street and 18 Mornington Road alternatively; the next will be at 32 Bromwich Street, on November 9.

The poster exhibited at the Y.M.C.A. is already attracting attention amongst the transient ham population of the town, three enquiries having been received to date, one from a non-member hailing from Cardiff who has since sent in his application for membership. G6LZ and BRS4136, stationed in a neighbouring town, read of this poster in last month's issue and made a special pilgrimage to the Y.M.C.A. A visit to 2DVQ developed into a ragchew lasting for over five hours.

2FPI airgraphs from the Middle East under date of August 13, that he is feeling fit once more, that things are moving fairly well out there and that a letter with more news follows.

(Via 2DVQ.)

*Bury.*—The T.R. was pleased to receive another visit from G6XM (a Sergeant in the R.A.O.C.) who was spending his leave locally. When licenses are restored G6XM will have a particular interest in contacts with members of the Bury Group. 8QS, now proudly displaying three stripes, was also on sick leave after an unfortunate crash on a motor cycle but he has since returned to duty almost fully recovered. Both G6XM and 8QS were enthusiastic about the equipment they use and have ambitious plans for their post-war stations.

Of the members still in the district G8NF, 3YJ and 3ZN are busy on war-work, 8UN seems to be all out to get himself into khaki or blue although he is

in a reserved occupation. 2JA, 8NL and 2HCY are fully occupied in civil defence work.

The T.R. sends his best wishes to the Rochdale and Blackburn Groups and also to G2GA and 3WG. He may join the forces at any moment and does not wish to lose contact with these two members.

(Via G8NL.)

**Liverpool.**—When circumstances permit, the acting T.R., G5RY, hopes to be able to arrange a meeting as it is felt that new members would like an opportunity of contacting those old stagers who are available. The articles on mathematics by 2DBK are very much appreciated and the general make-up of the BULL. is something which merits sincere congratulations to the Secretary-Editor and those responsible. (Thanks from 2DBK and H.Q's. Editor.)

Will G3WT and 2KT please write to 3FV who is anxious to hear from them? The D.R. would also welcome a line from 2XZ whose old stagers who are unknown. 5ZN has recently visited G5RY. 8DI has been home on leave. Congratulations are offered to the T.R. (G6KS) on his promotion. Please don't forget to send your reports by the 20th of each month.

(Via G5RY.)

**Whitehaven.**—Fortnightly meetings still take place every second Saturday. G2HT, 4PZ, 6WR and 6ZT recently visited Carlisle in order to meet some hams in the R.A.F. but as all except one had been moved they called at the abode of 2AYH where they found Cpl. Hushman, GM6HZ (R.A.F.), and a laden table awaiting them. The usual ham chat was banished and thanks are due to Mrs. Nicholson, the mother of 2AYH, for her hospitality.

G4PZ now has a second junior op. (or op'ette, for her name is June because she was born in July; but that's just like Ben, late again).

(Via G6ZT.)

Two District 1 members attended the meeting at Prestatyn in September and thoroughly enjoyed themselves, their only regret being that they could not stay until the end of the proceedings, which at the time of their departure, threatened to continue indefinitely.

G6CX.

#### DISTRICT 2 (North Eastern)

Elsewhere will be found a notice recording the death of R. H. Alderson, BRS4175, of Bradford, after a long illness. Our sympathy goes out to his mother and father in their sad bereavement.

BRS4157, of Rotherham, recently visited G2MA and has heard from 2AGH, of Doncaster, who is serving in the R.A.O.C., in the West country.

G4DP will be pleased to hear from members in the Doncaster area with a view to organising local activity. His home address is F./Sgt. A. Dickinson, "Conisbrae," Green Lane, Scawthorpe, Doncaster.

G2MI recently had the pleasure of a week-end visit from G2WR and hopes to meet other members who find themselves in Harrogate. G2YI and G2DT have also recently visited the district. G2MI.

#### DISTRICT 3 (West Midlands)

**Birmingham.**—Thirty-three members attended the 5th Annual General Meeting of M.A.R.S., held on September 14 at the Hope and Anchor Hotel. The following were elected to serve on the committee for the year 1941/2: President, C. Naylor Strong;

Secretary, F. Barlow (on active service); Acting Secretary, E. J. Wilson; Treasurer, H. M. Hart; Committee, W. Follis, E. F. Watson, C. Young, W. J. Vincent, B. George, with G. Brown as an ex-officio co-opted member.

The Naylor Strong Cup for the best lecture of the year was voted to Mr. Bernard George, 2FDR.

#### DISTRICT 4 (East Midlands)

**General.**—It has been noted with much satisfaction that the number of notes received during the past two months has gradually increased. As most of these are in letter form instead of T.R. reports, due to the writers being away from home, it is hoped that G6VD will be excused from replying individually. Keep it up O.M.'s, and many thanks.

**Nottingham.**—A short but interesting meeting was held at G8DZ on September 21. But we should like to see more local members present in future. What about following the example set by BRS4071, who travels from S. London for every meeting.

The next meeting is fixed for October 26, at 3 p.m. at 2A00, 78 Henry Road, West Bridgford.

We welcome Gunner Spowage, as a new member and hope he will make some personal contacts.

**Leicester.**—In a letter to G3BU, 5MY sends 73 to the rest of the locals; he is now in TF and has been getting nearer and nearer to the North Pole. Is he after that QSL from UPOL, (the Russian Expedition he worked). 3BU also asks after the welfare of some "Short horn" carrots now being grown by "our" Mr. Middleton. (Fine O.M. fine! thanks a lot G6CL.)

G2RI recently met G8VA at the same R.A.F. station, what about a letter? We thought you were still in Leicester.

#### Forthcoming Events

- |         |   |
|---------|---|
| Oct. 26 | District 12, 3 p.m., at G5FA, 35 Torrington Gardens, New Southgate.                           |
| .. 26   | Scotland "A" District, 2.45 p.m., at Y.M.C.A. Residential Club, 100 Bothwell Street, Glasgow. |

After a long delay, a letter has arrived from 2BAP. He is in the R.A.F., and working on Radio-location. Although missing the old familiar shack he is interested in his job and now enjoys the weight of two stripes on his arm. 2CFC is at an R.A.F. station in the "far north" and would like to hear from the "locals." He sends 73 and looks forward to the day when he will be allowed to get his gear "out of pawn." G4DR is still doing some listening despite repeated trouble with his receiver.

We hear that 3BU'S latest hobbies centre around the care of a monkey and a motor bike! Queer birds these amateurs!

**Mansfield.**—After attending the Lincoln Conventionette and hearing 2RI's good advice, 8HX had a touch of conscience and sent a report to 6VD. 8HX is one of those fortunate people who, although in the R.A.F. still manages to do a little receiver designing and building, as well as some listening. He too has met lots of hams since he joined the R.A.F. BRS3593 is still doing as much radio work as present-day conditions allow. 3FR has been granted a commission in the A.T.C. Congrats O.M.!

*Derby.*—G8QZ who is now in the South of England reports that DX is remarkably good! He recently spent an interesting time at a District 11 meeting and met a number of VE's. He sends 73 to the "160 metre brigade" not forgetting the "Vicar." Who could?

*Northamptonshire.*—This month we welcome a new member in BRS4330 who, although on the extreme verge of the District, is a keen experimenter and would like to get in touch with members living in the vicinity. His address is: W. H. Varney, Passenham Lane, Near Stony Stratford.

G6VD.

### DISTRICT 5 (Western)

Only one report is to hand and that from Cheltenham where the T.R., Mr. F. N. Bedwell, 10 Winchcombe Street, reports that a very successful hamfest was held in September. Local meetings take place on Fridays. G8DM, who was recently on a visit from Southampton, made the acquaintance of local members. G5BM and 8ML are constructing 100/1000 and 100/1700 crystal frequency meters.

No meetings have been held in Bristol recently, although the D.R. keeps in touch with a number of members. 6VF now possesses an Eddystone E.C.R., whilst 6SG still finds time for receiver experiments with a special type of frame aerial. 5WI and 6GN report, but both are too busy for radio.

G6RB.

### DISTRICT 6 (South Western)

There is very little to report from the South West this month. No doubt most people find their time very fully occupied but it is hoped that, at least, they are making plans for the future.

We should very much like to arrange an informal meeting of members in the near future. Those interested are asked to write in and give their views.

*Torquay.*—Friends of Frank Wadman, G2GK, late T.R. for Kingston will be interested to hear that he is now residing at 101 Barton Hill Road, Torquay. Ham visitors will be heartily welcomed there. Frank sends 73 to all in District 7 and especially to members of T.V.A.R.T.S. During the absence of 2CWR, G2GK has kindly agreed to act as T.R. for Torquay, an arrangement which will no doubt prove a great help to the D.R. He has recently received a call from BRS1939.

*North Devon.*—The T.R. received a surprise visit during the month from G8US, home from Scotland on sick leave. We wish him a speedy return to full health.

G3AM writes from the Middle East, to report all well. He wishes to be remembered to all his friends.

We welcome to North Devon, W./O. H. P. Bennett (R.A.F.), G8PF, who is billeted next door to the T.R. His C.O. is a VK! G5SY.

### DISTRICT 7 (Southern)

*Coulsdon and Purley.*—News is to hand that 2ANS has now arrived safely at a port in the Far East. A welcome is extended to Sgt. Mead, BRS 4278, a new member to the district who is stationed at the same 'drome as a number of other local amateurs. 3003 would like to hear from Jim Kirk, G6ZO.

Still not enough news chaps, why not drop the T.R. a line or give him a ring (UPL.3765).

(via BRS3003).

*Croydon.*—No letters for G3VN have arrived at his QRA in response to last month's appeal. It will

be remembered that he is stationed in a lonely part of TF. A friend of his recently returned there taking with him some gear, so they now have a S.W. receiver running, and he says quite a crowd collect round every evening to hear the news. 3FP having got down to the code again, his speed is back to pre-war level. 4AA, who was home during September, has been moved to the west country. 2FXT is doing servicing jobs in his spare time. 4150's super is progressing favourably, while 4314 has forsaken his for an o-V-o. Owing to the misleading remark in the September notes, 2FWA is busy demonstrating how a Collins Coupler definitely boosts signal strength. (Really—Mr. Editor). Thanks to one of the Society's publicity posters 2FWA had the pleasure of a visit from VE3KE. They called on BRS3003 who can supply VE3KE's address.

The September meeting was attended by: G2DP, 2LW, 2VB, 3ST, 8TN, 2FWA, BRS1545, 3003, 4150 and 4324. The next meeting will be at G2DP on Sunday, November 9th, at 3 p.m., as usual. QRA: 6 Dunheved Close, Thornton Heath (near Thornton Heath Pond). (via 2FWA).

*Bournemouth.*—G5RS, of Guildford, spent a short holiday with 4MY recently, and met some of the locals. We will try to arrange a better turn-out for you next time, O.M. Welcome to two new members Mr. Field, BRS4363, and Mr. Mercer, BRS4449. The former has been in the R.A.F. for some years, whilst the latter is an ex-commercial operator with some choice tales of radio, and other things, out East. 4179, spent his vacation getting some first-hand information on the manufacture of radio gear. Some of the locals are constructing wavemeters to the famous 2XP design. We should like to be able to record that 2NS had again found a wasp's nest (this time in his Super Pro), but as he hasn't there is regrettably nothing to add to these notes.

(via 2HNO).

*Oxford.*—The September meeting was held at 2ALG when 3BM, 3HS, 5TP, 8PX, 2ALG, 2FOR and Mr. Purvis (who has applied to join the Society) were present. 3BM who has tried many receivers gave a chat about them. Mrs. 2ALG provided a very F.B. tea which was appreciated by all.

We are very sorry to learn that 3HC has been invalided out of the Army and can hardly walk. Our 73 are sent to 2BHS who has now left us.

The next meeting will be held at 3 p.m., Sunday, October 26th, at 2CVD, 9 Davenant Road, Oxford. (via G8PX).

*Kingston.*—A letter has been received from BERS 491 at present in Gib., who has some interesting and amusing things to say about receivers used in the colony.

*Guildford.*—BRS4081, of Farncombe, now in the R.A. had the misfortune to lose all his records in London last September. He would greatly appreciate the loan or gift of a copy of the circuit diagram of the Hamrad 140 as he had his model in pieces and one or two of the details have escaped his memory. Offers via the D.R., please. 3376, of Luton, was recently stationed in the town, during which time he made a visit to G5WP. He wishes to be remembered to all old friends in Luton. Lieuts. Leitch, 5YA and Addie, 8LT, have, with the assistance of 5WP, settled a few problems over a noggin or two! 3671 has returned home—much improved in health we trust. He sends 73 to his brother BRS4207, who is in the R.A.F. in a rather northerly latitude.



There were three or four replies regarding a possible meeting at Guildford and every effort was made to find a venue but without success. We hope to give better news next month. G5WP.

### DISTRICT 8 (Home Counties)

A record number of reports are to hand this month, and most of the correspondents make the gratifying remark that they really *do* appreciate the District Notes, especially when stationed away from home.

*Cambridge.*—We were glad to receive a visit from 2DT, whose duties with the G.P.O. take him to many parts of the country. In response to his request, in these notes, for the whereabouts of 3NQ, a letter arrived on the day following publication. 2DT enjoyed the hospitality of 2MI, when visiting Harrogate. 2XV is still going strong, and keeps up a lively exchange of letters with Dorothy Hall, W2IXY. 3VB has left the town for Guildford, after meeting 8SY, 2XV, 2PU, and 5BQ. 2CUB, founder of the British S.W.L., is stationed near the town, and would like to meet local amateurs. He recommends service training to those having difficulty with Morse. (Call on 5BQ—O.M or ring 54644). 5DR gets home frequently, although his work with the Air Ministry takes him all over the country. Incidentally, young John Scott, well known to many District members, has just succeeded in gaining a scholarship for the Cambridge Perse School.

*Bedford.*—SPIHA, a sergeant in the R.A.F., is stationed in this area, and hopes to visit the locals. He is already in touch with BRS3585, who has proved a splendid host to those who find their way to his place at Shefford. 2CFV has now left the District. 2FFG (R.A.F.), is leaving the North of England for District 6, while 8KP is now in District 5, and sends his 73 to friends in this area.

*St. Ives.*—G5RL (R.A.F.), reports meeting "Clarry," who was on a visit to his station, and that there was a most interesting meeting of hams. 5OV is busy building a receiver, ready for "V" days. 6WA was on leave, a short while ago. Hearty congratulations to Sgt. Pat Crisp (D.F.M.) on his marriage last month to Miss Joan Anderson, of St. Ives. 4AZ, now living at Hemingford Abbots, bemoans the fact that he is now right out of contact with other amateurs. Will 3PZ, working in St. Ives, please look him up. (Ask for Bill Neville). 8ST has cabled from the Punjab that he is now a 2nd Lt., and that mail can be sent c/o Grindlay & Co., Bombay.

*Peterborough.*—G2NJ has been home from his war-time QRA, this time on account of the serious illness of his father. Whilst home, he met 5NP (on leave for the week-end) and 5NX, who is doing good work in connection with the A.T.C.

What has happened to the March fraternity? No news for months. Thanks for letters, everybody... now one better next month. G5BQ.

### DISTRICT 9 (East Anglia)

*Norwich.*—Our congratulations are offered to Mr. C. White, G8VW, who is to become Sheriff of Norwich for the next civic year. Until the war G8VW was one of our most active supporters in the city, and a very keen participant in N.F.D.

Congratulations also to Tony Dix, G5IX, who we

understand has obtained his commission—and from whom we hope to hear, in due course.

*Yarmouth.*—BRS3766 has been home on leave and BRS3468 is expected shortly. G3BW has left the district and has applied for transfer to the R.A.F. *King's Lynn.*—L. Bradshaw, G4LM, now in the R.A.F., is at present stationed on the East Coast. G2XS.

### DISTRICT II (North Wales)

*Prestatyn.*—The September meeting, held at Vale View, was again well attended, some 20 members being present, including two from District I, who came over specially. Amongst those in attendance were G5PO, G8QO, G5FG, G5QZ, GW4CX, VE3AAA, VE4YG, 2HIY, 2HCZ, BRS1060, 2731, 3044, 4027, 4298, 4444, Messrs. Gill, Spencer, Blanchard and Pearsall. Many interesting items were discussed, and great amusement was created by a Radio Bee devised by GW4CX. G8QZ also gave a very interesting talk on the Windom aerial.

ZB2B has contacted G5DP who is now in Llandudno. GW4CK, writing from London, reports meeting ZL1CP, VE4YD, VE3ACE, VE3SV and VE5AEZ at an R.A.F. radio school. GW3CF has also met a large number of hams at No. 1 S.S. Local Morse classes continue, and members are showing great improvement as a result.

The next meeting will be held at Vale View on October 19, commencing at 2.30 p.m. All members in the area are cordially invited to attend.

*Bangor.*—With seven members now in this town, 2HCZ and BRS4298 have to arrange a local meeting. They ask for co-operation. BRS1060.

### DISTRICT 12 (London North and Hertford)

The North London meeting, held at G6CL on September 21 turned out to be a real "hamfest," with 28 members present including several from the Services as well as representatives from Districts 3, 7, 10, 11 and 13. Real DX was represented by ZL1CP and LA9N. With such a gathering of the clans—sorry, hams—ragchewing was the order of the day. We think that everyone thoroughly enjoyed himself, particularly our Service members, some of whom had not had the opportunity of attending an R.S.G.B. meeting for many months. We hope to include a pictorial record of this highly-successful gathering in an early issue. The North Londoners were particularly pleased to see that some of the Welwyn-ites had come out of hiding for the first time since September, 1939—keep it up fellows!

Letters have been received from G6TQ, 2CNC, 2DTD, BRS3412, 4073 and 4249. We extend a welcome to BRS4358, 4374, 4376, 4399 and 4401 as new members, and to 6TQ, who comes from District 16. We hope to see him taking part in local activities when his duties allow.

2CNC (St. Albans) is trying to arrange for a meeting to be held each month in that area; so far six members have indicated that they will support them. BRS4116 has now passed his trade test for Radio Mechanic, and has been posted to a technical training centre in Yorkshire. 4073 is constructing a 56 Mc. beam aerial, while 4249 is building a battery super-het receiver. G6QM reports that 8VM hopes to be back in this country very shortly. G5FA had a telephone QSO with VE5VO who was back in

London on a few days leave after finishing a four months' course with the R.A.F.

The next meeting will be held at G5FA, 35 Torrington Gardens, New Southgate (Phone Enterprise 4347), at 3 p.m., on Sunday, October 26. Tube to Bounds Green Station or 512 trolley bus. Service members in and around London will be warmly welcomed. G5FA.

### DISTRICT 13 (London South)

*South Western Area.*—MYSTERY! . . . Four days late, both Log Books came home to roost on the 22nd. But one had only three entries—the last being 3AD's on the 3rd—and the other, which had been sent to 2DJK on the 2nd, had no entries at all! Both came back under the same handwriting. . . .

It's anybody's guess! If 2DJK has moved, will he please send note of new address.

G4GD signs in from Wiltshire, where he is instructing with the R.A.F., working alongside 8QR of Swindon. He has contacted quite a bit of "personal DX" including VE's and ZL's. (Follow the rota, O.M., when sending on the Log. It should have gone next to 6LR, but went instead to 8IL, who throws out an invitation to anyone in the vicinity of Salisbury to look in for a chat. Post-card first, please, to 16 Canadian Avenue, Wilton Road, Salisbury).

G3AD illustrates another cheery entry with a very solemn-looking photo. What was weighing on your mind, O.M.?

That's all this month. Please try and hurry the Logs round next month; we want more entries than three! G8QH.

*South Central and South East Areas.*—At the September meeting which was held at G3ST the 14 local members present were pleased to welcome G2JB, G3CI and BRS4359, all of whom are in the R.A.F.

It is very pleasing to notice how the attendance is growing each month, many members making quite long journeys in order to attend, some are also arranging their leaves accordingly!

G2JB was able to tell us of the interest taken by R.A.F. personnel in the activities of the Society. Good luck OM with those application forms! 3CI is on short leave from TF.

The next meeting will be held at BRS4324, 3, Englewood Road, Balham, S.W.12, at 11 a.m., on Sunday, October 26 (QRA 3 minutes from Clapham South, Tube Station).

G8TN.

### DISTRICT 14 (Eastern)

*Chelmsford.*—G5RV has now recovered from his operation and thanks all those who kindly sent him good wishes. It is rumoured that, minus tonsils, he now has a much more effective swallow! 6LB ably took over District affairs in his absence. 4GF has now left the Area and we are very sorry to lose him. 8IJ paid the D.R. a welcome visit recently and was full of happy anticipation of getting back on the air one of these days. He is an L.A.C. in the R.A.F. and likes the work. 2SA, 5CA, BRS3650 and 4122 are all active. 2QT was an interesting and welcome visitor to the September meeting. No news from "Tiny," G8PB, for some time . . . are you frozen up OM?

*Southend.*—G2SO writes from an R.A.F. Camp to say that he is now in the R.A.F. as a W. Opr. He has met 4LM there. No news is to hand from other

Southend members most of whom are now in the Forces.

*Brentwood and Ilford.*—No news . . . how about it, fellows? G5RV.

### DISTRICT 15 (London West, Middlesex and Buckinghamshire)

The four District 15 members (G2TJ, 4IH, 5IJ and 6WN) who attended the September meeting had the pleasure of meeting G2TL (Derby), 3CQ (Essex), 5NP (Peterborough) and 5XH (Croydon), who are working together locally.

G3UQ has received news from 4PA and 8VM; the former is now with a Signals Squadron of the R.A.F., while 8VM's letter was post-marked Durban. 2FCJ writing to 6RW tells of being transferred to a Marine Fitters job and posted to the South Coast—so now he's a sailor as well! 6WN has heard from both 8WR and 2FUX. 8WR talks of meeting a lot of hams but although 2FUX has been transferred to No. 1 Radio School, he has met only a few W's and VE's so far. (See notice on K. and B. page.—Ed.) 2TJ expects to be called up soon now.

At the time of writing it is not certain whether it will be possible for a meeting to be fixed for October. Should it be arranged in time it will be referred to under "Forthcoming Events." The D.R. apologises for any inconvenience he caused by quoting the address incorrectly last month.

District members at home send Christmas and New Year Greetings to those who are either serving with the forces or engaged on war work in other parts of the world. G6WN.

### DISTRICT 16 (South Eastern)

G2WS has been glad to receive a letter from P./O. Bert Allen (G2UJ), our D.R. who, finds himself in District 17 at the moment. He enjoyed meeting many old friends at Convention, and sends best wishes to all in District 16. (Thanks, O.M., we hope to have you back soon.—G2WS).

G6CY, 8 Hangleton Road, Hove, who is acting T.R. for the Brighton District, sends notes. We should be glad to hear from the other T.R.'s.

*Brighton and Hove.*—The usual activity continues amongst members who are still in the area. 2HOF



Cross Examination at Lincoln.

Eileen Heightman of G6DH, whose silvery tones have been heard in many DX lands, seems to be putting G6CL through a cross examination. Silent witnesses are Stan O'Hagan, G2CR, Laurie Ridgway, G2RI, Jack Bamford, G5JB and Jerry Walker, G5JU.

has moved from Sussex to Surrey. The local members hear that G8AC has been drafted overseas, and send him best wishes. They would be glad to hear from him.

G6CY has had the pleasure of meeting VU2FV, and recalls their last contact on 14 Mc., when the latter was in India. G2KU has also called on 6CY and together they send greetings to all in the District. G2WS.

### DISTRICT 17 (Mid East)

*Boston.*—A letter is to hand from G3XM, now in Doncaster, who says that he sees from the last Active Service List that G5IG has attained commissioned rank. He sends his congrats, and adds: "I am sure all Lincoln hams would be pleased to hear from him, particularly those who were members of the Lincoln Short-wave Club. Although he is now most probably far from this District, perhaps he will find time to pen a few words to District 17 via THE BULL." So how about it, OM?

2BUV, writing from Wiltshire, reports that he is

was looking forward on his return to some pleasant chats. 8KU is now a married man (Congrats o.c.)

2DDD (R.A.F.) asks for his 73 to be passed along to members of the Scarborough Short Wave Club. His QRA can be obtained from G5MV.

The D.R. has also met several District members including 2KO, 6OS, 6UJ, 6OO when the old days were talked about.

We hear that 6TG is better in health than in temper through being located 30 miles from the nearest shop! No reference was made to the nearest hotel!

Letters would be welcome from 2TK, 3KS and 8BB. G5MV.

### Scotland

"A" District.—Once again it is our unhappy task to record the death of one of our members, Gordon Kerr, GM8QD, who was very well-known in the District until his departure shortly before the outbreak of the war to take up an appointment in Johannesburg. We will always remember his ready and cheery help at Society meetings.



The goodly company who helped to make the recent Lincoln meeting one of the most successful held in that part of England.

billeted with 3VZ, 8AB and 4BQ. They are putting in some good work pounding a bug key! He has also met ZL2OC and a VK-SWL. G4KS's respirator has been seen about the place but its owner has not yet been tracked down! Congrats on attaining your 21st, OM. Hope the thick head wasn't too bad!

2BQC and 8BQ have been seen about the town lately, whilst BRS4304 is welcomed to the District, as is also Cpl. Homer. How about joining R.S.G.B., OM? 6GH has been posted to an overseas destination. Best of luck, Geoff. 6LH has started rebuilding his receiver. 2CR (M.O., at Branston Sanatorium) would like to meet any members who happen to be in that vicinity or in Lincoln.

G2UK.

### DISTRICT 18 (North and East Yorkshire)

The D.R. has received welcome visits from G2CP and 8KU, both of whom were fit and well. 2CP told us he met 3HV, 8KB, 8GH and ZS4DK when he reported for a W./T. course. They have been allowed the use of a room for a weekly meeting. He

Norrie Landles, GM2LQ, who is an Armt. S./Sgt. in the R.A.O.C., wishes to be remembered to all his friends. A letter is also to hand from Tommy Jack, BRS.4333, a recent recruit to our ranks. He will be delighted to see any member who happens to be near his QRA. We hear that Ian McDermid and GM4JO are likely to be returning to the District in the near future. We have had a visit from Douglas Gillies who was home on a flying visit.

Members are advised that entry to our monthly meeting place is through the side door in Blythwood Street, or through the entrance hall of the Y.M.C.A. Residential Club and down back stair. This is caused by the closing of the main door to the dining hall.

"C" District.—On Thursday, September 4, an informal meeting was held at the QRA of Major Candow, GM5SC, who was home on leave. Six other District members were present: 8HM, 6RT, 8CF, 3IX, 2DGN and 2BLJ. We were all agreed that the Major, although not a great exponent

(Continued on page 156)

## HEADQUARTERS CALLING

### August Council Meeting

*Résumé of the Minutes of a Council Meeting held at the Institution of Electrical Engineers, Savoy Place, London, W.C.2, on Monday, August 11, 1941.*

*Present.*—Messrs. A. D. Gay, A. E. Watts, E. L. Gardiner, J. W. Mathews, W. H. Matthews, D. N. Corfield, H. V. Wilkins and J. Clarricoats (Secretary-Editor).

*Apologies.*—Messrs. W. A. Scarr, A. J. H. Watson, S. K. Lewer, H. A. M. Clark, S./Ldr. G. M. R. Scott Farnie (on service duties).

1. One hundred and ten new members were elected, of whom ninety-two had been proposed by Corporate members and 18 submitted personal references. Three resignations were accepted.

2. It was agreed that applicants for membership serving abroad, who have not made application upon the prescribed form, shall receive the Society's Journal forthwith, providing an initial subscription has been paid. Such persons shall not however be elected to membership until a formal application has been received by Headquarters. The subscription due from such members will in future years date from the month their first copy of the BULLETIN is despatched.

3. In the absence, through indisposition, of the Hon. Treasurer, the monthly statement of account was presented by the Secretary-Editor and approved.

\*4. A notice from the Ministry of Information was read dealing with the despatch of QSL cards to stations abroad.

5. The June 1941 issue of the I.A.R.U. Calendar was read. No proposals were put forward by I.A.R.U. Headquarters.

\*6. It was reported that changes are being made in regard to certain U.S. amateur frequency allocations.

\*7. It was reported that successful meetings had been held in Leeds and Chelmsford.

†8. It was reported that some 100 members and friends attended the first War-Time Convention held in London. Tribute was paid to Mr. H. Freeman, of Pairs Advertising, for arranging an exhibition of radio equipment and technical publications.

9. It was agreed to print a further 10,000 copies of *The Amateur Radio Handbook*.

10. It was agreed to print 20,000 copies of a new publication embodying chapters dealing with Mathematics, Calculations, Fundamental Principles, etc.

11. The Secretary-Editor reported that he had met representatives of the G.P.O. in Harrogate. In connection with this meeting it was decided to arrange for representatives of the Society to meet G.P.O. representatives at an early date to discuss the broad principles of post-war amateur operation.

12. In connection with the War Damage Act, 1941, it was reported that enquiries are being made regarding the insurance of amateur radio apparatus.

\* These items were reported upon in the August issue.

† This item was reported upon in the September issue.

### A Word of Advice to all Members

Every D.R. is anxious to hear from members, whether at home, or on active service, but in common with most people our representatives are invariably busy men with very little free time for correspondence.

One D.R. wrote to Headquarters recently extolling the enthusiasm of local members—30 of whom had written to him during the month—but pointing out that it was quite impossible for him to communicate with each one individually.

We do not think that members, generally speaking, expect a D.R. to acknowledge reports except through the medium of the BULLETIN, but where a reply is required we would ask that a stamped and addressed envelope be included.

Every member who is sufficiently interested to write to his D.R. may rest assured that his reports are appreciated.

Those on active service in a District remote to their own and who wish to contact local amateurs are especially requested to avoid giving D.R.'s too much work in providing lists of names. The R.S.G.B. Ham Hospitality lists are intended to save work for our D.R.'s. Use them.

Without question, town meetings, properly advertised in advance in the BULLETIN, provide the most satisfactory medium for effecting contacts, and in this connection, we would most strongly urge all D.R.'s and T.R.'s to make arrangements to hold a meeting once a month.

Remember, the BULLETIN gives publicity to Forthcoming Events. Fix dates and stick to them, even if attendances are sometimes disappointing.

### The Handbook in Cloth Binding

For the fourth time in a little over 12 months it has become necessary to reprint the second edition of the *Amateur Radio Handbook*. Supplies of this new printing will shortly be on sale at the previously advertised retail price of 3s. 6d. (post free 4s.), but in addition a small number of copies will be available in a blue stiff cloth binding, with the title blocked in gold on the spine.

Bound copies can be obtained only from Headquarters, price 6s. 6d. each, post free.

Orders will be executed in strict rotation, and supplies are expected to be available early in November.

Here is a chance to preserve your Handbook in permanent form.

### Radio Handbook

We have been advised by the publishers that stocks of the 1941 edition of the *Radio Handbook* have been exhausted.

The 1942 edition was due to be published early in October. The provisional price is 11s. 0d.

**HELP THE SOCIETY BY FORWARDING  
YOUR SUBSCRIPTIONS PROMPTLY WHEN DUE**



# NEW MEMBERS

## Home Corporates

- D. CARR (G2XU), 51 Richmond Road, Lincoln.  
 J. PATTON (G13CM), 63 Belvoir Street, Belfast, N. Ireland.  
 S. C. BLACK (G13IA), Avondale, Antrim Road, Glengormley, Belfast.  
 C. L. HARRISON (G3YU), 48 West Cotes, Tile Hill Lane, Coventry.  
 A. E. HYDE (G4DU), 115 High Lane East, West Hallam, Derby.  
 T. VICKERY (G5VY), 48 Willow Road, Enfield, Middlesex.  
 L. W. HOOKE (G5XH), The Green Dragon, Bridge Road, Maidenhead, Berks.  
 H. I. POPAY, D.F.M. (GSDY), Rock House, Long Preston, Skipton, Yorks.  
 J. E. IRONMONGER (G8PO), 2 Jubilee Road, Retford, Notts.  
 J. L. HORTON (2AHN), 103 Colworth Road, Leytonstone, E.11.  
 W. G. JOHNSON (2BJV), 22 Lynton Avenue, Hateley Heath, West Bromwich, Staffs.  
 P. K. KING (2CKK), 348 Blackfen Road, Sidcup, Kent.  
 A. BEAUMONT (2CNV), Fairholme, Camerton, Thornghumbald, near Hull.  
 E. J. SIMONARD (2CQY), 3 Avondale Grove, Shipley, Yorks.  
 H. G. HOLY (2DXI), 5 Burrs Green Road, Hornchurch, Essex.  
 D. H. WELCHMAN (2DXN), 75 Frome Road, Trowbridge, Wilts.

**WE extend a Cordial  
Welcome to the**

**85**

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whose names are listed

•  
OUR THANKS ARE EXTENDED TO THEIR SPONSORS

- L. H. DAISH (2FGD), 302 Bitterne Road, Bitterne, Southampton.  
 S. PEARSON (2FJS), 165 Church Road, Nornanton, Yorks.  
 L. H. METCALFE (2FRW), 218 High Street, Swanage, Dorset.  
 K. B. WHITTAKER (2FXL), Briar Lea, Station Road, Upper Poppleton, York.  
 T. C. TURNER (2HAW), 13 Park Road, Hounslow, Middlesex.  
 C. W. CRAGO (2HDU), 11 Little Lane, Toller Lane, Bradford.  
 A. Y. COLE (2HJN), Okeford, Tring, Herts.  
 J. J. L. WEAVER (2HNA), Warter-Croft, Little Haywood, Stafford.  
 D. JAMES (BRS4414), 47 Heol-y-deri, Rhiwbina, near Cardiff.  
 E. F. BAILEY (BRS4415), 69 Colchester Road, Southend-on-Sea.  
 J. A. MIDDLETON (BRS4416), Davidston, Cromarty, Ross-shire.  
 A. J. GROVER (BRS4417), 29 Dalesview Road, Ipswich.  
 A. MCCLUSKEY (BRS4418), 11 Silverstream Gardens, Belfast.  
 L. O'MAHONEY (BRS4419), 4 Garrick Street, Covent Garden, London, W.C.2.  
 R. E. HORNBY (BRS4420), 27 Elmwood Avenue, Crosby, Liverpool, 23.  
 C. C. BOLLAND (BRS4421), 14 Curry's Square, Dipton, Newcastle-on-Tyne.  
 R. I. SWORDE (BRS4422), 12 Grosvenor Terrace, Bath, Somerset.  
 J. BOLD (BRS4423), 2 Timon Avenue, Liverpool, 20.  
 H. V. HUNT (BRS4424), 62 Bentley Road, Castle Bromwich, near Birmingham.  
 F. W. SHEPHERD (BRS4425), 22 Campfield Road, St. Albans, Herts.  
 F. KNOWLES (BRS4426), 96 Meadowbank Road, Hull.  
 G. BRIDDON (BRS4427), 55 Rotherham Road, Barnsley.  
 C. M. SMITH (BRS4428), 1 King's Road, Forfar, Angus.  
 N. WEARS (BRS4429), 2 George Street, Chester-le-Street, Co. Durham.  
 W. TELFER (BRS4430), 5 Yarrow Terrace, Hawick, Roxburghshire.  
 P. C. SPENCE (BRS4431), Knossington, Oakham, Rutland.  
 K. W. KNOWLES (BRS4432), 5 Critchmere Vale, Haslemere, Surrey.  
 T. F. BARRETT (BRS4433), Kozi-Krest, E. Budleigh Road, Budleigh Salterton.  
 J. F. LEWIS (BRS4434), 42 Garthorne Road, Forest Hill, London, S.E.23.

- A. L. ANDERSON (BRS4435), 2 Martha Place, Larkhall, Lanarkshire.  
 N. TATE (BRS4436), 13 Broadway, Greasby, Wirral, Ches.  
 T. HORAN (BRS4437), 6 Hedley Place, Orme Road, Poolfields, Newcastle, Staffs.  
 A. HINE, B.Sc. (BRS4438), Ditton Park, Slough, Bucks.  
 C. R. GOODALL (BRS4439), 40 Morley Street, Bury, Lancs.  
 C. DE VINE (BRS4440), 36 Grange Avenue, Thornbury, Bradford.  
 R. E. MADDISON (BRS4441), 17 Ryecroft Avenue, Wolverhampton.  
 J. A. RUCK (BRS4442), Tregarthen, Gordons Way, Oxted, Surrey.  
 K. E. WEEKS (BRS4443), 60 Tooting Bee Road, London, S.W.17.  
 F. DOBSON (BRS4444), 31 Hamilton Road, Connah's Quay, near Chester.  
 W. PRIESTNALL (BRS4445), 3 The Quadrant, Droylsden, near Manchester.  
 C. S. SMITH (BRS4446), 3a Broadway, High Road, Seven Kings, Essex.  
 G. M. DENISON (BRS4447), 51 Edwards Lane, Sherwood, Nottingham.  
 J. ADAMS (BRS4448), 243 Creighton Avenue, East Finchley, London, N.2.  
 G. E. MERCER (BRS4449), 12 Danesbury Avenue, Southbourne, Bournemouth.  
 G. BISSET (BRS4450), 31 Strachan Road, Blackhall, Edinburgh, 4.  
 A. H. SCAMMELL (BRS4451), 57 High Street, Ashford, Kent.  
 E. BRODRICK (BRS4452), 51 Pankhurst Avenue, Brighton, 7.  
 W. F. DUNN (BRS4453), 3 Crosier Way, Ruislip, Middlesex.  
 H. E. CULLIS (BRS4454), P. O. Mile End, Coleford, Glos.  
 E. R. PONSFORD (BRS4455), 45 Manor Drive, Surbiton, Surrey.  
 CAPT. F. H. ROLFE (BRS4456), "Southcroft," Brookside Close, Rugby.  
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 J. H. E. WATSON (BRS4458), 12 Selcroft Road, Purley, Surrey.  
 F. RIDLER (BRS4459), 74 Pytha Fold Road, Withington, Manchester, 20.  
 O. POSTLE (BRS4460), Canal Cottage, Trevor, near Wrexham.  
 G. TROTTER (BRS4461), 7 Hill View, Whitwell, Hitchin, Herts.  
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 C. E. BENNETT (BRS4465), 15 Chiminage Close, Marlborough, Wilts.  
 E. R. WOODS (BRS4466), 130 Dora Road, Wimbledon Park, S.W.19.  
 A. J. GLASSFORD (BRS4467), 4 Wood Street, Margam, Port Talbot.  
 A. J. QUINNELL (BRS4468), Roselea, Velmore Road, Chandlers Ford, Hants.

## Dominion and Foreign

- G. S. WAUGH (VE1LY), 412 Daly Avenue, Ottawa, Ont., Canada.  
 J. A. WADE (VE3ADN), R.C.A.F., Base P.O., Overseas.  
 W. G. C. WYER (VE3ATM), R.C.A.F., Base P.O., Overseas.  
 G. G. WILLIAMS (VE4HSO), R.C.A.F., Base P.O., Overseas.  
 D. J. MCKENZIE (VE4HW), R.C.A.F., Base P.O., Overseas.  
 F. KEE (BRS4495), Queen Street, Etobicoke, P.O., Ont., Canada.

## Prisoners of War Fund

We have pleasure in announcing the receipt of donations of £5 5s and £1 from two well-known members who wish to remain anonymous, and a cheque for £3 from Mrs. Quartermaine whose son, Lt. Quartermaine, is a prisoner of war. Further donations will be warmly welcomed by the Secretary-Editor.

As a result of the appeal made in our last two issues Mr. Lamborn Edwards, G8TL, "Speedway," Bartholomews Road, Sudbury, Suffolk, has kindly agreed to administer this fund.

We ask for the co-operation of all who can assist us in maintaining a complete record of British amateurs held captive.

In our next issue we hope to publish the names of those to whom parcels have been despatched.

## DISTRICT NOTES—(Continued from page 153)

on the dart-board or golf-course, can certainly send us home in good spirits. Meetings are to be held at least every three months. GM3IX reports that he has had a personal QSO with GM4NR and hopes to have one with GM3LU in the near future. News from other service members is still scarce. New members are still coming in, and amongst the latest is the son of the late GM6KO, while his sister is very soon to become the XYL of GM3IX. GM6ZV.

## Northern Ireland

Congratulations to Mr. and Mrs. Stan Johnson (GI5S) on the arrival of a junior Y.L. operator.

2AMW having been posted to the East, will be leaving us very soon, much to our regret. Good luck be with you, O.M. 2DDI has joined the R.A.F. as an Observer-Pilot and is awaiting appointment to his unit. We wish you every success. GI6HI and GI8PA are now Pilot Officers in the A.T.C. Congratulations to both.

The Annual General Meeting of the Y.M.C.A. Radio Club took place on September 17, when some 30 members and visitors were present. The following were elected as Office Bearers for the year 1941/42: President, Rev. E. Davies; Vice-Presidents, Mr. J. Nickle (2HCC), Mr. A. T. Kennedy (GI3KN); Hon. Secretary, Mr. B. Holden (GI5HU); Hon. Treasurer, Mr. F. Robb (GI6TK); Chairman, Mr. K. W. Winsor (G2FS).

There are several new members to the District and to them the D.R. extends a warm welcome. He would appreciate a card from newly-elected members, as his only means of knowing their calls, or BRS numbers, is by perusal of THE BULLETIN. He also records pleasant chats with EI9F, of Dublin, and 2BOL, of Rochester, both recent visitors to his QRA.

## Silent Keys

The death of Gordon Kerr after an illness of only a few hours removes from our midst one who was a true amateur in every sense. GM8QD will always be remembered by the members of Scottish "A" District for his ever ready help at Society functions. A keen supporter of QRP, he had many friends all over the country. Shortly before the war he left Scotland to take up an appointment in Johannesburg. To his parents we extend our sincere sympathy in their loss. GM6ZV

It is with regret that we record the passing of R. H. Alderson, BRS4175, of Bradford, after a long and painful illness. Although a comparative newcomer to the ranks of the Society, he showed great interest in short-wave radio despite chronic ill-health.

As an example of what the human spirit can aspire to in cheerfulness and optimism, despite the fact that he knew that the great shadow had been over him for many months, and that his condition was hopeless, he was an inspiration to all who knew him. We express the sympathy of the Society to his father and mother in their sad loss. G2MI

## EXCHANGE AND MART.

**A**LL KINDS OF PRINT.—Send your enquiries to G6MN, Worktop.

**F**EW NEW ACORNS for sale. Price 30/—A SULLIVAN, 2DGF, 4 Westbourne Place, Bristol, 8.

**S**ALE.—Eddystone E.C.R. Communications Receiver. New Condition £30. Can be seen by appointment.—A. S. BROWN, 7 Sandhurst Road, Sidcup, Kent. Tel.: Foots Cray 2559.

**W**ANTED.—National HRO 3.5-7.3 Mc. Coil.—GW6AA, Flagstaff, Colwyn Bay, Wales.

**W**ANTED.—Pre-Selector suitable for 1940 Sky-Buddy. Built-in power supply preferred. A.C. mains.—2DVQ, 32 Bromwich Street, Bolton.

**W**ANTED.—Six 7-pin "Continental" Valveholders.—G4LZ, 31 Kenneth Road, Bristol, 4.

**W**ANTED.—National SW-3 Receiver.—Box 295, Bradford, Yorks.

**W**ANTED.—Servicing Charts, all makes, quantity and price to BUCKINGHAM, 41 Brunswick Park Road, London, N.11.

**W**ANTED.—Well-known make of Communication Receiver, e.g. National NC80X, Halli-crafter Sky Challenger, or similar model by other prominent manufacturers. Will pay cash. Details to R. J. FRANCIS, 94 London Road, East Grinstead, Sussex.

**W**ANTED.—Service Manual, Broadcast and 10-metre Coils for Comet Pro, Thordarson T5870 Transformer, 6v. 2A. Speaker field supply. Swap 12 QST's various dates for recent *Radio Handbook*. JEFFERIES, 147 Waterloo Street, Burton-on-Trent.

**F**EW Items ex late G8IT.—Philips Mike 4210, cost over £15, offers. Mains Trans. 450CT 350 mA. Sundry 4v. windings 14 amps, total 25/—Choke, 7/6. Pre Amp. Crackle Black Cabinet complete Power-Pack RFPEN-4IMP. 8-in. Goodman Speaker, Multimatch Trans, less Rectifier, 50/—80 watt Quartz Tube, high pressure mercury, 7/6. New 6Q7, 12/6. 79, 9/—24A, 5/—Other Valves.—G5CP, 33 Manley Road, Sale, Cheshire.

## PATENTS AND TRADE MARKS

**K**ING'S Patent Agency Ltd. (B. T. King, G5TA, Mem. R.S.G.B., Reg. Pat. Agent), 146a Queen, Victoria Street, London, E.C.4. Handbook and Advice on Patents and Trade Marks free. Phone: City 6161. 50 years' refs.

## RADIO MAP AND GLOBE

**W**EBB'S RADIO MAP of the World enables you to locate any station heard. Size 40" by 30". 2-colour heavy Art Paper, 4/6, postage 6d. Limited supply on Linen, 10/6, postage 6d. WEBB'S RADIO GLOBE—superb 12" full-colour model Radio prefixes, zones, etc. Heavy oxidised mount. Post paid, 27/6.—WEBB'S RADIO, 14 Soho Street, London, W.1. Phone: Gerrard 2089.

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## PREMIER SMOOTHING CHOKES

Type	Current mA.	Henrys	Res.	Price
C.40/500	40	20-34 H.	500Ω	6/-
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C.60/400	60	25-34 H.	400Ω	8/8
C.60/500	60	18-30 H.	500Ω	8/8
C.100/400	100	20-34 H.	400Ω	10/8
C.150/185	150	20-34 H.	185Ω	15/4
C.200/145	200	20-34 H.	145Ω	18/-
C.250/120	250	25 H.	120Ω	20/-

## MOVING COIL SPEAKERS

All complete with transformer. Goodmans 6½ in. 16/6; 10 in. P.M.s. 23/6; 8 in. P.M.s. 20/-.

## ENERGISED MODELS

Plessy 8 in. 175 ohm field ... 7/6  
Plessy 8 in. 2,000 ohm field ... 15/-

## CONDENSERS, Etc.

Bakelite Dielectric Variable Condensers, .0005 mf. Suitable Tuning or Reaction, 1/9 each.

Short-Wave H.F. Chokes. 10-100 m., 10½d. each. High-grade Pie-wound 5-200 m., 2/- each.

Small 2-gang, .0005 with Trimmers, 3/6. Ditto 3-gang, fully screened, 5/-.  
2,000 ohm 25-watt Res. with 5 tapping coils, 1/6.

## MAINS TRANSFORMERS

Wire-ends. All L.T. Windings Centre-Tapped.

S.P.250—250-0-250 v. 60 m.a., 4 v. 1-2 a., 4 v. 2-3 a., 4 v. 2-3 a. ...	13/4
S.P.300—300-0-300 v. 60 m.a., 4 v. 2-3 a., 4 v. 2-3 a., 4 v. 2-3 a. ...	13/4
S.P.301—300-300 v. 150 m.a., 4 v. 2-3 a., 4 v. 2-3 a., 4 v. 1 a., 4 v. 1 a. ...	17/4
S.P.350A—350-350 v. 100 m.a., 5 v. 2 a. (not C.T.), 6 v. 2-3 a. ...	16/-
S.P.350B—350-350 v. 100 m.a., 4 v. 2-3 a., 4 v. 2-3 a., 4 v. 2-3 a. ...	16/-
S.P.351—350-350 v. 150 m.a., 4 v. 1-2 a., 4 v. 2-3 a., 4 v. 3-4 a. ...	17/4
S.P.351A—350-350 v. 150 m.a., 4 v. 2-3 a., 4 v. 2-3 a., 4 v. 1 a., 4 v. 1 a. ...	22/-
S.P.352—350-350 v. 150 m.a., 5 v. 2 a., 6 v. 2 a., 6 v. 2 a. ...	18/-
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Auto Transformers. Step up or down. 100-125 v. to 200, 230 or 250 v. A.C., 60 watts, 11/4; 125 watts, 15/-; 250 watts, 22/-.

L.T. Transformers, all C.T.  
4 v. 2-3 a. ... 11/4 6 v. 2-3 a. ... 11/4  
2.5 v. 5 a. ... 11/4 7.5 v. 3 a. ... 11/4  
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Universal Output Transformers, 11 Ratios. Single or Push-Pull ... 6/6

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In response to many requests we have now produced an A.C. version of the popular Premier Short Wave SG3 Kit. Circuit: Pentode H.F. Stage, Pentode Detector, Pentode Output, and F.W. Rectifier. 200-250 v. A.C. Operation. Built-in Power Pack. Hum-free operation. For use with Phones or P.M. Speaker.

Complete Kit of Parts with drilled chassis, all components. Plug-in Coils covering 13-170 metres, 4 valves and full instructions and circuits, £6-14-6.

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Kit ... .. £4-15-4

Extra Coils 9—15, 200—2,000 m. also Available.

All prices for S.W. Kits include purchase tax.

★ "The Wireless World" said they were "very much impressed. . ."

See full Test Report, pp. 492-3 December issue. Send for full details.

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4 volt A.C. Types, 5-pin, A.C./H.L., A.C./L., A.C./S.G. All 5/6 each.  
Flexible Couplings, ½ in. bore, 11d. each.

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Mains Noise Suppressors, comprising double wound Choke and Conds., 6/6 each.

## PREMIER SHORT-WAVE KITS FOR OVERSEAS NEWS

Incorporating the Premier 3-Band S.W. Coil, 11-86 Metres without coil changing. Each Kit is complete with all components, diagrams and 2-volt valves. 3-Band S.W. 1-Valve Kit, 18/- 3-Band S.W. 2-Valve Kit, 27/6.

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Complete Kit, including all Valves, coils, wiring diagrams and lucid instructions for building and working. Each Kit supplied with a steel Chassis, Panel and plug-in coils to tune from 13 to 170 metres.

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3 Henry Chokes ... 7/6  
Complete Valve Oscillator as described in W.W. "Learning Morse" ... 27/6

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Trolital insulation. Certified superior to ceramic. All-brass construction. Easily ganged.

15 m.mfd. ... 2/4 100 m.mfd. ... 3/-  
25 m.mfd. ... 2/6 160 m.mfd. ... 3/7  
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Black Crackle Steel Cabinet, 17/6 extra.

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Microphone Transformers. Suitable for all mikes. Tapped primaries. A, 20 and 40 : 1; B, 30 and 60 : 1; C, 50 and 100 : 1, 6/6 each.

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Will match any output valves to any speaker impedance.

11 ratios from 13 : 1 to 80 : 1, 5-7 watts, 16/10. 10-15 watts, 21/10. 20-30 watts, 36/10.

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In these two Receivers, Hallicrafter's designing engineers have created instruments of remarkable precision and performance. Though of the most advanced design, no single feature has been incorporated that has not passed the most critical tests for reliability. They are of immense interest to the ordinary amateur as indications of the trend in design and the type of equipment now available—and though, at the moment, they are supplied to priority order only, full details will be gladly sent on request.



Model SX-28

**WEBB'S RADIO MAP.** Essential in every radio room. Gives international prefixes and standard time zones. Hour time zones indicated every 15 degrees of longitude. Azimuthal projection, giving distances in all directions by radial lines based on London. Printed in colour on heavy paper, 30" x 40", 4/6, post free. On linen with rollers, 10/6, post free.

**WEBB'S RADIO GLOBE.** Full colour globe, 12" diam. International prefixes clearly marked. I.A.R.U. Continental zone boundaries. Time disc. Overall height, approx. 14". Oxydised copper base and engraved meridian. Post free, 27/6.



Model S. 29. SKY TRAVELLER

A truly portable communication type receiver covering from 542 kc. to 30.5 Mc. in 4 bands. Operates from its own self-contained batteries or from 240 volt A.C. or D.C. mains. The valve line-up is: 1T4 RF, 1R5 mixer, 1P5-GT, 1F, amplifiers, 1H5-GT 2nd det., A.V.C., 1st audio, 3Q5-GT output amplifier, 1G4-GT beat oscillator, 1G4-GT noise limiter and 25Z5G rectifier (9 valves in all). Electrical band-spread. Battery life prolonged through a self-contained charging unit. Self-contained collapsible antenna which can be extended to nearly 3 ft. An R.F. stage used on all bands. This Portable Universal Receiver provides truly remarkable reception throughout its tuning range (553 to 9.85 metres). Dimensions: 7" high x 8½" wide x 13½" deep. Weight, including all batteries, 18 lbs. Price on application.

Model SX 28. NEW 1941 SUPER SKYRIDER

A 15-valve Communication Receiver of exceptional merit. The frequency range covers 540 kc. to 43 Mc. in 6 bands. Two stages of pre-selection. High fidelity, push-pull audio band-pass filter. The controls include: Micrometer inertia control, calibrated band-spread, antenna trimmer, adjustable noise limiter and crystal controls. Input 110v. to 250 v. A.C. only. Dimensions: 9½" high x 20½" wide x 14½" deep. Price on application.

# WEBB'S RADIO

14 SOHO STREET, LONDON, W.1

Telephone: GERrard 2089.

Hours of Business 9 a.m.-6 p.m. Sats. 1 p.m.



# THE INCORPORATED RADIO SOCIETY OF GREAT BRITAIN

16, ASHRIDGE GARDENS,  
LONDON, N.13.

15th October, 1941.

DEAR SIR (OR MADAM),

## NOMINATIONS FOR COUNCIL, 1942

I have to advise you that in accordance with the Articles of Association, the following persons have been nominated to serve on the 1942 Council.

### *Officers :*

President : Mr. A. D. GAY (G6NF).  
Executive Vice-President : Mr. E. L. GARDINER (G6GR).  
Hon. Treasurer and Secretary : Mr. H. A. M. CLARK (G6OT).  
Honorary Editor : Mr. J. W. MATHEWS (G6LL).

### *Members :*

Retiring Members eligible for	{	Mr. S. K. LEWER (G6LJ).
Re-election		Mr. W. H. MATTHEWS (G2CD).
		Mr. W. A. SCARR (G2WS).
		Mr. A. J. H. WATSON (G2YD).
New Nominations as per Article 43	{	S./LDR. G. M. R. SCOTT
		FARNIE (GW5FI).
		Mr. G. A. JESSUP (G4HG).
		Mr. E. H. SIMMONDS (G8QH).

Not later than October 31st next, any ten Corporate members (but not more than ten) may nominate any other duly qualified person, by delivering their nomination in writing to me, together with the written consent of such person to accept office if elected, but each such nominator shall be debarred from nominating any other person for this election.

Yours faithfully,

JOHN CLARRICOATS,  
*Secretary-Editor.*