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VALE "T. & R."

FOR the last time those familiar letters "T. & R." will appear on the front cover of this Journal. No more shall we have to provide an answer to the question, "What *does* T. & R. stand for?"

As we approach the end of an Era—a glorious one in our history as a Society—perhaps we may be permitted to reminisce awhile on the tradition which has grown up around those mystic symbols, so soon to disappear for ever from Society publications.

Way back in the dim and distant past, when the Dawn of International DX was beginning to break, there came together a group of wise men, who sought to form a Section of the Society exclusively devoted to the development of, what we now call, "Ham Radio." Numbered among them were such stalwarts as Gerald Marcuse, G2NM (pioneer of Empire Broadcasting), Cecil Goyder, G2SZ (hero of the first British-Oceanic contact), E. D. Simmonds, G2OD (first G to work New Zealand), Jack Partridge, G2KF (a mighty "brasspounder" with regular dates "on the other side of the pond"), Fred Hogg, G2SH (later to give many of us our first contact with Iceland), and many others. Towering above them all, not in stature, but in wisdom, was that Grand Old Man of British Hamdom—Bevan Swift, G2TI.

It is to our illustrious Past President, and to Mr. J. A. J. Cooper, G5TR, that we owe an everlasting debt of gratitude for having appreciated seventeen long years ago, that the newly formed T. & R. Section, as it was called, needed some medium whereby its members could exchange ideas and pass on to one another, the results of their experiments.

To Mr. Cooper fell the task of bringing the dream to reality. The choice of title for the Section's own Journal was indeed a happy one, for the word "Bulletin"—however much it may to-day be likened to official communiques—did truly define its purpose. As a Bulletin it brought to members of the Section the latest "gen"—and *what* "gen" it was in 1925?

But why *T. & R.* Bulletin? why *T. & R.* Section? Newcomers to Ham Radio may well seek an answer to those questions.

Let us dig just a little deeper into the history of our Society. When amateur transmitting first started on wavelengths in the dizzy region of a thousand metres, it was quite impossible to transmit a signal say from London to Edinburgh direct. Consequently it became necessary to rely upon *relay* stations to pass on the message. Tom Smith in London relayed his message for Harry Brown in Edinburgh *via* Frank Jones in Birmingham, and George Thompson in Manchester. Note the word "Relay."

When the new Section was formed and a title had to be found for its Journal, it was natural that the two words "Transmitter" and "Relay" should find their place. Hence "Transmitter and *Relay* Section." As a natural corollary the official Journal of the Section became known as THE T. & R. BULLETIN.

To the newer generation of radio amateurs, the word "relay" has no significance beyond the fact that it is a term used to describe a piece of electrical equipment employed for automatic switching, but to those who claim to be Old Timers, "relay" will always conjure up in their minds, a mental picture of those pioneers who, with infinite patience, and undaunted by difficulties, laid the foundations of British Amateur Radio.

To-day, as we salute the passing of "T. & R." let us pause awhile to consider how much we owe to those who *created* the Society, twenty-nine years ago this month.

It was on July 5, 1913, that Leslie McMichael, Rene Klein and others founded "The London Wireless Club." Within a few months its title had been changed to "The Wireless Society of London." War came and with it a period of "suspended animation," but in November, 1922, it was decided to create a more national body—"The Radio Society of Great Britain" was thus born. At that time, too, the Society came under the patronage of H.R.H. The Prince of Wales and remained under Royal Patronage until his accession to the throne in 1936.

With the rapidly increasing interest of many of its members in the study of experimental transmission, as well as reception, problems, it was felt desirable to form a special Section which, as we have seen earlier, was destined to become the T. & R. Section. In 1925 its numbers were augmented by the addition of the "Radio Transmitters Society," a body composed of amateurs possessing transmitting licences. It says much for those who guided the destinies of British Amateur Radio in those days that the wisdom of the old adage, "Unity is Strength," was fully appreciated. By welding together in one unified Section of the Society all those whose chief interest lay in amateur transmitting, a service of the greatest value was performed.

It was during 1925 that the executive members of the T. & R. Section under the inspired leadership of Bevan Swift, Gerald Marcuse and J. A. J. Cooper, decided to launch THE T. & R. BULLETIN. One

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CONCERNING DOUBLE SUPERHETS.

By THE WORKSHOP MAN

SHORTLY before the war, the writer, in common perhaps with other amateurs, had become interested in a type of receiver known as " the double superheterodyne." The preliminary design had, however, scarcely been roughed out when radio as a hobby, had to give way to radio as a job, consequently for many months the plans lay dormant.

Recently, whilst musing over some old notes, the ideas came back to mind, but in the light of war-time experience, parts of the preliminary design did not look so good as they had done two and a half years earlier. Pencil and paper were brought into play and all sorts of new ideas were toyed with.

Unfortunately however, under existing conditions, there seems very little chance of the author getting the time, let alone the components, to carry this still rather hazy plan into practical effect, but perhaps there are some members who have facilities to make use of the following notes.

Even if this is not the case there may be a few who would care to indulge again in those pipe-dreams, when we thought out designs for record-breaking transmitters and receivers which never seemed to come to fruition, mostly on account of the possession of too slender a wallet! Most of us can recall the arguments which used to rage so fiercely at meetings up and down the country on the best " this," or the perfect " that," so let's try and revive those discussions on paper, and see what we can make of this subject of double supers.

Why a Double Superhet?

Some people may think that the ordinary superhet receiver is quite bad enough from the point of view of complexity, so why go out of the way to make a double one ? True, the description " double " comes from the set possessing two frequency-changers and two separate I.F. channels operating on two different frequencies, as opposed to the ordinary super's one, but naturally we are not going to all this additional complication just for the sake of having a few more valves and tuned circuits floating around inside ; we want some concrete advantages for our money, so we will consider what gain in operating efficiency we may expect from double frequency changing.

Choice of I.F.

At this point it would be as well to consider the factors governing the choice of the I.F. : If a low value of I.F. is chosen, say around 100 kc/s., we shall get a higher gain per stage, possibly greater stability, and certainly greater selectivity *in the I.F. amplifier*, than if a higher frequency were to be employed. Of course, with that array of advantages there is bound to be a snag somewhere, and it lies in the trouble known as " second channel " interference.

Bearing in mind that a superhet functions by virtue of an oscillator set to hetrodyne the wanted signal, so that the resultant beat note produced between the two oscillations is at the frequency to which the I.F. amplifier is tuned, it will be appreciated that in the example quoted above, the R.F.O. will have to work 100 kc/s. either higher or lower than the frequency of the signal being received.

Suppose that the oscillator is tuned to a higher frequency than the signal, as is normal practice in superhets. Then if the wanted signal is on 7000 kc/s., the oscillator will be working on 7100 kc/s. to produce the required 100 kc/s. I.F. But a signal on 7200 kc/s. will also beat with the R.F.O. to give a difference frequency of 100 kc/s., and unless the set possesses sufficient pre-selection to differentiate between 7000 and 7200 kc/s., then the second station will be heard along with the wanted one, and no matter how selective we make our I.F. amplifier the interference will still be there.

This trouble becomes worse as the signal frequency increases, so unless we are prepared to employ a string of pre-selectors in front of the frequency-changer, with consequent difficulties in ganging and other complications, it looks as if the desirable qualities of a low I.F., as enumerated above, are more than outbalanced by the disadvantages of second channel interference.

If we now go to the other end of the scale and have an I.F. in the region of 2 Mc/s. or so, we shall have all the freedom from second channel interference we require, for it does not need a very advanced design of pre-selector to separate a couple of stations 4 Mc/s. apart, but at the same time the gain per stage and inherent selectivity of the I.F. amplifier will be much inferior to that obtainable at the lower frequency.

If, however, the advantages of the high I.F.'s freedom from second channel interference, and the low I.F.'s superiority in gain and selectivity could be combined, then something highly desirable from the point of view of set performance would have been achieved, and that is exactly what the double super aims at doing.

Some Design Features

The first rough design now begins to take shape as follows: The signal picked up by the aerial is fed to a frequency-changer and thence to the first I.F. amplifier tuned, let us say, to 2 Mc/s. Here some magnification of the signal is obtained, owing to the high I.F. freedom from second channel interference. The signal is next passed to another frequency-changer which converts it to the second I.F. of 100 kc/s. On the sharpness of tuning of this amplifier depends the overall selectivity of the receiver, and if necessary a crystal "gate " could be incorporated here to provide single signal reception of C.W. signals.

It may be mentioned in passing that two stages of amplification at 100 kc/s., using iron-cored coils and fairly loose coupling, will provide quite a good measure of single-signal effect without the addition of a crystal, so that we may expect something extra special in the selectivity line if a crystal " gate " were used. More of this anon, however.

The remainder of the circuit, second—or should we say " third " ?—detector, B.F.O. and L.F. section would follow normal design.

We now have the bare bones of the projected receiver laid out, and can proceed with further elaboration of the design.

One of the main causes of noise in a superhet can be traced to the frequency-changer. This noise remains a fixed quantity and is independent of the strength of the signal being received. Thus the stronger the wanted signal can be made at the input of the frequency-changer the better the signal-to-noise ratio will be. This makes the provision of a stage of tuned R.F. amplification desirable at signal frequency.

Having decided to incorporate this R.F. stage we are confronted with three circuits to be tuned : R.F. grid, mixer grid and oscillator, and arrangements

will have to be made to "track" the oscillator on all bands. It will also be desirable to make provision for some form of band-spread.

In a superhet it is possible to set the R.F.O. at a given frequency for each band, and then to tune over that band not by altering the frequency of the R.F.O., but by altering the frequency to which the I.F. amplifier is tuned.

Take, for example, the amateur band, running from 7 to 7·3 Mc/s. If we were to make the first I.F. amplifier tune from 1·6 to 2·1 Mc/s., then we could set our first R.F.O. at 5·4 Mc/s. and cover the band quite as well as if the R.F.O. itself were tunable, *i.e.* 1·6 plus 5·4 is 7 Mc/s., and 2·1 plus 5·4 is 7·5 Mc/s.

Quite a useful list of advantages may be made out for this arrangement. Tracking the oscillator at signal frequency is done away with, and the R.F.O. can be designed with regard only to the question of stability of oscillation at one particular frequency on each band. This incidentally solves the problem of obtaining a constant oscillator voltage for injection into the mixer valve, with a resultant more constant sensitivity over the band.

As the first I.F. amplifier will be required to tune only over a restricted band of frequencies, band spread will be easy to obtain, and the tracking of the second R.F.O. greatly simplified.

We have now arrived at the second mixer stage, which we will arrange to change the frequency to that of the second I.F. amplifier, *i.e.* 100 kc/s. Usually when using a low value of I.F. such as this, 110 to 120 kc/s. is frequently employed, but by designing for the level 100, it might be possible to use a 100 kc/s. bar crystal in the "gate." The writer has had no practical experience of such an arrangement, and would welcome opinions from readers who have tried 100 kc/s. bars in such a position. Crystals of this frequency are available commercially for use in frequency standards, and one idea of using such a crystal here is that it could be made to plug into either the receiver or into a separate oscillator for frequency measurement and calibration purposes. As the cost of crystal filters represents a considerable outlay in expenditure, it would be a decided advantage if two birds could be killed with one cheque as it were.

Tuning Ranges

Some readers may be wondering how it is proposed to cover the various amateur bands with the 500 kc/s. tuning range so far mentioned.

To avoid complication the 1·7 Mc/s. band—assuming, of course, that a frequency allocation in this region will be made when transmitting licences again become available—would be covered by using the receiver as an ordinary superhet, and the signal fed direct to the input of the first I.F. amplifier, whose tuning range—1·6 to 2·1 Mc/s—has been specified with this object in view. On the 3·5, 7 and 14 Mc/s. amateur bands, the frequency range in no case exceeds 500 kc/s., so that tuning range and bandspread will be adequate.

The 28 Mc/s. amateur band has a coverage of 2 Mc/s.—28 to 30 Mc/s.—and the 56 Mc/s. band 4 Mc/s.—56 to 60 Mc/s.—so that operation in either of these two areas with the proposed set-up would be quite impossible.

The writer has had a fair amount of experience in the reception of frequencies between 28 and 60 Mc/s., and also with receivers covering these frequencies in addition to lower ranges, and is strongly of the opinion that a set, designed specifically for the V.H.F.'s, is desirable, if not essential, to obtain anything like satisfactory results. Multi-range sets with their frequency coverage extending into the V.H.F. region are, at best, a considerable compromise.

Tuning condensers, having an adequate capacity range for the lower frequencies, are much too large when it comes to 28 Mc/s., and unfavourable L to C ratios result, while the position becomes well nigh hopeless if an attempt be made to cover the 56 Mc/s. band also.

A further cause of losses in V.H.F. tuned circuits in multi-band receivers is to be found in the unavoidably long leads to wave-change switches, etc., which result in increased capacity to earth and a consequent decrease in the size of the inductances. In addition to the above, the selectivity that we trust our receiver will possess would be likely to prove more of an embarrassment than an advantage on the V.H.F., and those interested in reception on either the 28 or 56 Mc/s. bands are strongly advised to build a receiver solely for this coverage, and not to attempt an inefficient compromise with a receiver covering the lower frequencies.

Variable Controls

It would be well to consider at this point how many variable controls would be required for our receiver. The R.F. amplifier grid and first mixer grid circuits could conveniently be tuned by a two-gang variable condenser, and the first (variable) I.F. amplifier, consisting of R.F. stage, mixer and oscillator, will require a three-gang condenser. Quite a number of amateurs will have had experience in using a separately tuned pre-selector in front of their receivers, so that having two tuning dials to handle should present no unusual difficulties. With the arrangement under discussion, as with a pre-selector, a rise in noise-level will be heard as the first pair of tuned circuits come into resonance.

The wave-change switch would be arranged to bring the appropriate coils into circuit for the R.F. and mixer grids, to select the required coil for the first R.F.O., and on the 1·7 Mc/s. range to connect the aerial input straight on to the input of the first I.F. amplifier, and to silence the first three stages in the receiver by breaking the screen-grid feeds or by some similar arrangement.

For full control, three potentiometers will be required to vary the gain of the R.F. stage, the first I.F. amplifier and the second I.F. amplifier; there would also be the usual A.F. volume control potentiometer.

With so many stages of R.F. amplification in use, A.V.C, should be most satisfactory. To provide this service the "third detector" could be the conventional double-diode but some experiments might be necessary to find the best point in the I.F. chain from which to feed the A.V.C. diode.

For controlling the B.F.O. and making the A.V.C. optional, a three-position switch giving "A.V.C. ON," "A.V.C. OFF," and "B.F.O. ON" will be required.

Other necessary controls would include a B.F.O. pitch control, a switch for putting the crystal "gate" in and out of operation, and a crystal-phasing condenser, to enable a true single-signal effect to be obtained. In addition, a send-receiver switch, located between the centre-tap of the mains transformer and earth, and possibly a tone control should be provided.

The foregoing design could be altered, simplified, or elaborated according to the personal ideas of the constructor, and it would be an interesting, if somewhat expensive, undertaking for anyone really interested in receiver design.

It is again emphasised that the whole scheme exists at present only on paper, and the writer will be pleased to hear the views of anybody interested in the subject, either from the practical or the theoretical standpoint.

(Letters for "The Workshop Man" should be sent via Headquarters.—ED.)

THE AUTOMATIC RECEPTION OF WIRELESS TELEGRAPHY

By T. CHARLES BRYANT, (G3SB*)

SINCE the suspension of transmitting facilities a number of amateurs have been experimenting with apparatus for copying Morse automatically. As the author has, in the course of his experiments, found the solution to certain difficulties, it is thought that a few notes on the subject might be of interest to others similarly interested.

The apparatus used for recording the signals has throughout been a commercially built printer intended originally for land-line operation. Similar models are obtainable for a few pounds from *Electradix Radios* (London). The printer consists of a pair of low impedance coils, which, when energised, attract a small armature. This latter by a system of levers presses a piece of paper " slip," which is kept moving by a powerful clockwork motor, against a small inked wheel revolving in an opposite direction to the slip. It is a comparatively simple matter to build a printer instead of using a commercial model, and descriptions of how to do this have appeared from time to time in radio periodicals.

Before discussing the methods of connecting the printer to the receiver it is proposed to refer briefly to different types of Morse sending.

Square Dot Method

In the days when hand sending over the trans-ocean cables was universal, and, to a lesser extent, over the Post Office land-lines, it was usual to employ the " square dot " method. In this method the " dits " are made much longer than usual in order to allow time for the various relays, and ultimately the sounder or printer, to operate and so signal the " dit " ; if this is not done, the character will not be signalled at the distant station. When recording signals received by radio it is impossible to regulate the other man's sending, consequently it becomes necessary to design apparatus which will respond to very fast " dits," otherwise the printer will be useless except on the very slowest sending.

Relay Method

In this method the output from the receiver is rectified (often by a simple crystal detector) and the direct current is fed into a relay which requires only a few milliamps to operate it. (In the writer's case this arrangement was improved by replacing the crystal detector by a metal rectifier). The relay is then connected through a local battery to the printer (Fig. 1).

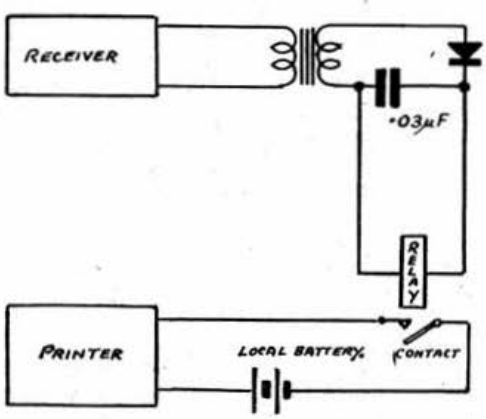

Fig. 1.
The relay method of automatic Morse reception.

Good results were obtained on slow sending but as soon as the speed increased, the " dits " became irregular and finally disappeared altogether. Possibly the use of a very finely adjusted relay might allow slightly faster Morse to be recorded, but it is doubtful whether reception could be guaranteed at speeds as high as can be obtained by the method about to be described.

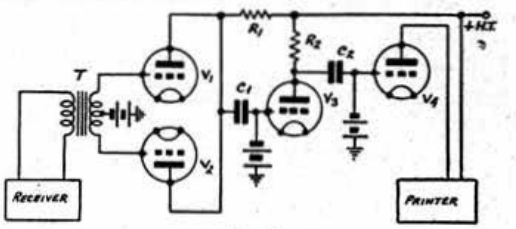

Fig. 2.
A more ambitious system of automatic Morse reception employing a valve relay.

Trigger Method

This method which is a little more ambitious than the relay method is, in effect, a modified form of the system used in many commercial stations for automatic reception. In this system the mechanical relay is replaced with a valve relay.

If the printer is commercially made the coils must be re-wound to provide a high impedance, but this is not a difficult task if a lathe or similar machine is available. If the printer is home-made, it can, of course, be constructed with high impedance coils from the outset.

The output of the receiver is connected to two valves operating in push-push, which being biased to cut-off, only draw anode current when a signal is received. The output from the push-push stage is connected through a small condenser to the grid of the next valve (also biased to cut-off) and similarly to a larger valve, in the anode circuit of which the printer is connected. (Fig. 2).

V1 and V2 can be medium power valves, their choice depending partly upon the receiver output but chiefly upon the types available. V3 should be a power valve of slightly larger size—a PX4 type is suggested. For the output valve a large power type such as a PX25 should be used, or alternatively, two or more valves could be operated in parallel. The coupling condensers C1 and C2 should have a capacity of about ·002 μF each. The choice of resistances R1 and R2 is entirely dependent upon the H.T. supply available; values are best found by experiment. Similarly no bias voltage can be given although it is essential that the value should be sufficient to ensure that H.T. current flows only when a signal is being received.

Rectification Method

This method which is employed at G3SB at the present time, is simple to construct and operate, but

* Member Experimental Section.

it can only be used for recording fairly loud signals (S6 and above). However this disadvantage is not so important when a powerful communications type receiver, with a tuned R.F. stage, is available. The receiver used by the writer is a *Hallicrafters* Super Skyrider SX16 which has a maximum output of 18 watts (13 watts undistorted). The output is rectified by a *Westinghouse* metal rectifier and the direct current so obtained is used to feed the printer without employing a relay, as in the first example.

The circuit (Fig. 3) is quite simple, and excellent results can be achieved when the correct ratio for the transformer has been found. The most suitable type was found to be an old speaker transformer with a step down ratio of 35 :1.

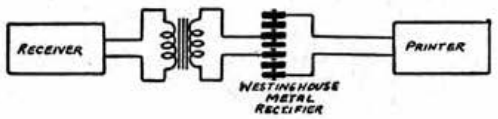

Fig. 3.
The simple rectification method used by the author.

It should be explained that the printer has not been used on *very* fast automatic Morse, because the speed of the tape is not adjustable. For that reason recording up to about 35 words per minute is the limit. There seems no reason however why it should not be possible to construct a printer to work at higher speeds.

Results Obtained.

The printer described here has been tested over a period of several months, and signals, both automatic and hand sent, have been received consistently and easily. DX amateur stations have also been copied successfully and the results achieved have fully justified the trouble in making the apparatus.

Many telegraphic transmissions are the subject of copyright, therefore a certain amount of care should be exercised. Most of the writer's preliminary experiments were carried out with coast stations sending CQ and traffic lists; afterwards "automatic" news, addressed to CQ was utilised. With a little thought there should be no difficulty in discovering a number of stations sending suitable material.

TUNING, and the BEAT OSCILLATOR NOTE

By J. Gouck (GM3NH).

THE author having noticed that some amateurs are not altogether clear about the manner in which a beat oscillator functions for C.W. reception in a superhet receiver, this article is offered in an attempt to clear up a few points in that connection.

It is not always realised that an incorrect setting of the pitch control, which of course controls the frequency to which the B.F.O. is tuned, may lead not only to signals being weaker than they should be, but also to an increase in avoidable QRM.

Some people appear to think that because the I.F. tuning is fixed, then the B.F.O. tuning may also be fixed, and provided every signal produces a similar audio note, then the H.F. tuning must be "on the nose." This is so, provided it is realised that there are two tuning positions for each signal which will give an identical audio note, and that only one of them is the correct one to use.

In a receiver of normal selectivity it will be found that as the point of resonance of a C.W. signal is approached the audio note will first appear at a high pitch, fall to zero, and then rise again in pitch as the tuning condenser is moved. Which side of zero beat, then, is the correct one to use?

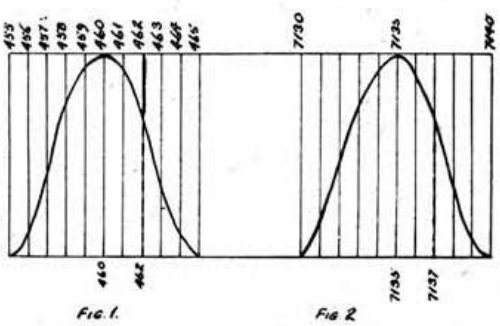

Fig. 1. Resonance Curve of I.F. Amplifier. Fig. 2. Response Curve of Signal Frequency Circuits.

Let us assume we have a superhet in which the resonance curve of the I.F. amplifier (frequency 460 kc/s.) is as shown in Fig.1. A B.F.O. tuned to 461 kc/s. is coupled to this circuit, so that when a 460 kc/s. signal is present in the I.F. amplifier the resultant heterodyne will be an audio note of 1 kc/s., i.e. the difference between the two frequencies.

It will also be apparent that a frequency of 462 kc/s. in the I.F. amplifier produces a similar difference, and consequently a similar audio note. A glance at Fig.1., however, shows that the frequency response at 462 kc/s. is quite considerably down, and a loss of volume will result.

Refer now to Fig.2. which portrays the response curve of the signal frequency circuits. The wanted signal is, say, on 7135 kc/s., and in consequence the R.F. oscillator will be working on 7135 kc/s. plus 460 kc/s. or 7595 kc/s. This represents the position when the signal is producing the correct I.F. of 460 kc/s., but should the incorrect I.F. of 462 kc/s. be used, then the R.F.O. will be tuned to 7135 kc/s. plus 462 kc/s. or 7597 kc/s., and the H.F. and mixer grid circuits to 7597 kc/s. less 460 kc/s. or 7137 kc/s.

It will now be seen that not only is signal strength lost through detuning in the I.F. circuits, but in the H.F. circuits as well, and as the two losses are cumulative, the total loss may be quite considerable, depending of course on the sharpness of tuning of the circuits concerned.

In a receiver in which the tuning is so sharp that the response in both the H.F. and the I.F. circuits is down 50 per cent. at a point 2 kc/s. off resonance, then the 1 kc/s. audio note on the wrong side would have a value of only 25 per cent. of that on the correct side of zero beat.

In the so called "single-signal" receiver this effect is emphasised by the use of an extremely selective I.F. amplifier, aided by a quartz crystal or some similar device, so that the side of incorrect tuning produces almost zero response.

(*Continued on page* 379)

MORSE INSTRUCTION

PART III

By B. W. F. MAINPRISE, B.Sc. (Eng.); Dip. Electr. Eng. (G5MP)

The last of a series of articles in which the author provides interesting information on many aspects of Morse instruction.

Over-Concentration

BEFORE examining some of the points arising in sending, the matter of over-concentration should be considered. This is a common failing with beginners—they are so anxious not to miss letters that they achieve the very result they are trying to avoid. The difficulty can be overcome to some extent by sitting in a relaxed attitude, so that the muscles are not taut, and this will at the same time lessen the mild form of writer's cramp, brought about by holding the pencil too firmly. A suitable position is one with the legs outstretched under the table, so that they do not carry any pressure. When people are relaxing off-duty, they will be seen to adopt this attitude. A sudden bang or alarm will at once make them tense; they will sit up, with their legs drawn in, and carrying a good deal of their weight in natural preparation to a quick move from danger. An alternative position is to sit rather sideways at the table, with one's legs crossed—another relaxed attitude.

Over-concentration can also be avoided by allowing one's attention to wander. A person will often make perfect copy when thinking of something entirely different, embarking perhaps on quite long calculations on last week-end's expenses or similar matters, till his mind suddenly "comes to earth." On looking back at what he has copied, he will find that this is very much better than his usual standard, when he is concentrating letter by letter. This holds good not only for Morse but for every day processes. A person concentrating on dressing in order to save every unnecessary movement will make it appear a far more difficult task than if he were doing it naturally, while thinking of something totally different.

Keying and Key Designs

There appear to be two schools of thought as regards sending. The one holds that the motion should be entirely at the wrist, with the fore-arm (elbow to wrist) practically motionless. The fore-arm is allowed to rest on the table, and the key is therefore mounted some 12 or 18 inches from the edge. The second school holds that appreciable fore-arm movement is desirable, and the key is therefore mounted nearer to the edge of the table. The writer prefers this second method, and for beginners advises plenty of fore-arm movement. This results in a robust type of keying, avoiding the jittery effect which develops so easily when the fore-arm is motionless. Similarly, this robust sending, conducive to easy copying, is facilitated by the use of a fairly large depression of the key. It is often stated that the gap should be of a certain value, but this guide is completely useless without specifying the model of key referred to. Fig. 4 will make this clear. Both keys have been set to the same gap. The finger-rest of key (*a*) will, however, depress through twice the distance of key (*b*), because the movement is dependent not only on the gap, but also on the distances fulcrum-to-gap, and fulcrum-to-finger-rest. It is suggested that for beginners, the finger-rest should depress approximately $^1/_{18}$ to $^1/_{16}$ in.

When keying, there is apt to be an audible click each time the key returns to the open position against the back-stop. This click can become very disconcerting, and therefore is best removed, by inserting a disc of paper in the back-contact, which is used more for line signalling than for radio purposes. A still better absorber is one of the little cork insets one finds in the screw caps of tubes of tooth-paste and similar articles, as the size and resilient properties are just right. The writer has never seen this tip mentioned, but invariably uses it on his keys, and finds beginners are quick to adopt it on their own models.

The spring should also be kept loose. The writer looks on the duty of the spring as merely to keep the contacts from closing under the weight of the key lever, and should offer only slight resistance to finger pressure. A key fitted with a movable weight, instead of the usual spring, might provide some useful tests. Such a key might involve inertia considerations, but inertia is hardly a factor taken into account in the design of many British keys. Here, massive construction, in contrast to light duties, appears to be the chief aim, the moving arm and the contact studs being of especially large cross section. Possibly this is a relic of primary keying in spark transmitters, where comparatively large currents had to be handled, but this theory is discounted when one finds that the current has to pass through the pivot and bearings, both of which are unprotected against dust, rust, and applications of oil, the insulating properties of which may be very satisfactory. The design of these keys reminds one of the maxim that the electrical engineer should hire a mechanical engineer to design bearings for him, but should make his private arrangements for

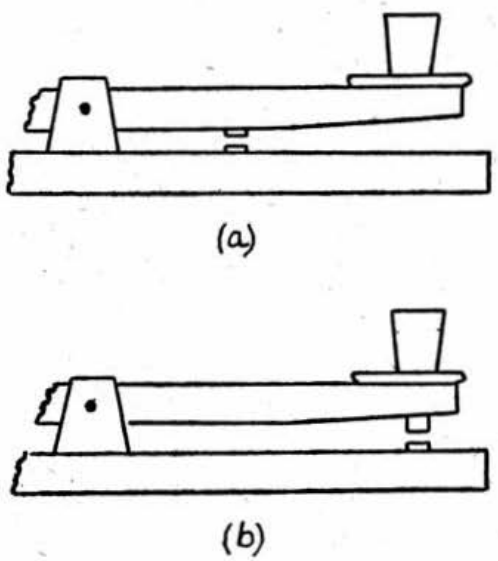

Fig. 4

Both keys have been set for equal gaps, but key (*a*) will depress twice as far as key (*b*).

leading out the current from moving parts! Similarly, the weight of metal in an average Morse key may be several times that found in a domestic 15 amp floor switch. For almost all signalling purposes, a key made from plastics, with a small amount of metal for reinforcement and bearings would seem amply strong, and the war-time output of keys should justify the expense of the moulding presses in view of the amount of brass saved. Even before the war, moulded switches, sockets, adaptors and other domestic fittings, had largely ousted the metal-cased counterparts on account of their low cost and attractive form.

American keys are of much more skeleton construction than British types, and the lever is often cranked to bring the finger-rest nearer the table surface than in our high varieties.

Copying on a Typewriter

Very little has appeared in print on the above method of copying, possibly because it is not difficult. In America, it is a very essential qualification for an operator, but is less in demand in Europe. The learning of morse, and the learning of touch-typing should be kept distinct till one can read Morse at say, 20 w.p.m., and type at about 40 w.p.m., when the two processes can be combined, an operation which will generally be found much easier than anticipated. Touch-typing is essential, so that the fingers automatically move to the appropriate keys without guidance by the eye, as the necessary speed cannot otherwise be attained. Touch-typing can be learned at home solely with the aid of a text-book from the local public library, provided a typewriter is available, and the writer is only one of the many thousands who have taught themselves in this way, though, of course, the presence of an instructor to check the finger movements and devise special exercises for any weakness of certain fingers is a help.

When copying Morse at speeds of about 25 to 30 w.p.m. in longhand, the limit of writing speed is being nearly reached. A typing speed of 60 w.p.m. is, however, quite normal, so that copying a Morse transmission at about half this speed results in easy-going movements, very different from the breathless chase of a pencil across the paper which would be necessary if copying in longhand.

The disadvantage of a typewriter occurs when standard message forms are in use, where the various section of a message, such as preamble, address, text, signature, routing instructions, etc., have to be inserted in definite spaces, requiring frequent setting of the carriage by hand. This disadvantage does not arise when tape is employed, which is subsequently gummed in the appropriate spaces on the form, as with inland telegrams and similar traffic. Another disadvantage is that the noise from the typewriter keys is liable to drown very weak signals, but it is surprising how, after a little practice, the ear concentrates on the signal and ignores the machine noise.

EDITORIAL (*Continued from page* 373)

year later the First Annual Convention took place under the auspices of the T. & R. Section, and with the full support of the main body, whose President during 1925 was that great scientist, Sir Oliver Lodge.

In May, 1927, one of the most momentous of all Society meetings took place at the Institution of Electrical Engineers, London, when the motion before the meeting was "that the T. & R. Section shall join the main body, and that its members shall share the full privileges of R.S.G.B. membership." Thanks again to G2NM and G2TI, the motion was carried unanimously and from that time onwards the Society has accepted the responsibility of sponsoring Amateur Radio in Great Britain as a primary duty.

Although, as we have attempted to show, the real significance of "T. & R." disappeared in 1927, it would have taken a courageous member in those days to press for the dropping of the link. However, times have changed, and many hundreds, nay thousands, of our newer members have no knowledge of the early days of the Society. It is not surprising therefore that the significance attaching to the letters "T. & R.", should have little meaning for them, and so, in accordance with modern progressive tendencies, a change is to take place next month.

One link, however, will always remain. In the lapel buttonhole of our jacket many of us will still be proud to wear a little diamond-shaped badge which bears in its upper half the symbols T. & R. For many of us tradition dies hard.

Vale T. & R.! Long life to R.S.G.B. and to its Journal.

J. C.

TUNING AND THE BEAT OSCILLATOR NOTE—

(*Continued from page* 377)—

"Right," we hear some people say, "fix your B.F.O. exactly 1 kc/s. off tune with the I.F. and leave it there; why have a pitch control at all?" Just for this reason. The wanted signal on 7135 kc/s. gives the correct I.F. of 460 kc/s. and the B.F.O. is set to 461 kc/s. Another signal is on 7132 kc/s., and if the H.F. circuits are not selective enough to reject it, it produces an I.F. of 463 kc/s. The B.F.O. will give a 1 kc/s. note with the wanted signal, and a 2 kc/s. note with the unwanted signal. If, however, the B.F.O. be tuned to 459 kc/s., the wanted signal will still be heard with a 1 kc/s. note while the pitch of the unwanted signal will have risen to 4 kc/s. Under these circumstances the interfering station could be dealt with by that useful piece of apparatus the "Hetrofil," which no shack should be without.

In conclusion, a good tip is to tune in a wanted C.W. signal with the B.F.O. off, get the maximum response to the "thump," and then switch in the B.F.O. and adjust the pitch control until the signal is heard to the best advantage and with the minimum of interference.

Wireless Institute of Australia

Official confirmation has been received that the New South Wales Division of the W.I.A. is now Headquarters Division and that the Federal Executive will be located in that State until further notice.

New South Wales has elected the following to serve on the Executive.

President: R. A. Priddle, VK2RA. *Vice President*: R. A. Joscelyne, VK2AJO. *Secretary*: W. G. Ryan, VK2TI. *Treasurer:* H. F. Peterson, VK2HP. *Publicity:* W. J. McElrea, VK2UV.

All office-bearers have had considerable experience in experimental radio both from an executive and practical aspect. They should, therefore weld into a fine body capable of guarding the interests of the amateur whilst off the air.

On behalf of all British Isles amateurs we extend best wishes for the continued prosperity of the W.I.A. and offer our congratulations to the new Federal Executive.

MATHEMATICS FOR THE RADIO AMATEUR

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

SECOND SERIES—PART XI. VECTORS (concluded)

Angular Bearing

A STANDARD direction is essential for vectorial representation. For problems in which direction is geographical, especially for air-navigation, this standard direction is True North, *i.e.* the geographical North Pole.

All directions—called *bearings*—are measured in a *clockwise* direction from North. Thus the direction which a mariner calls East (being 90° clockwise from North), is expressed as a bearing 90°. This may be written simply as 90°, or 90T, 090T (the T referring to True North).

The truth of the following should be verified.

In Fig. 17b (page 347, April 1942 issue) :—

Bearing of LM = 90T ; bearing of ON = 30T.

In Fig. 18b (same issue) :—

Bearing of $V_2 = (90 - \phi)$ T ; bearing of $V_1 =$ 90 T ; bearing of R = $(90 - \theta)$ T.

A direction NE = 45T ; a direction W = 270T ; a direction 10° W. of S. = 190T.

Ground Speed and Air Speed

It is relevant, in discussing vectors, to explain these two terms, for problems involving them are solved by applying the parallelogram law (or as it may be called, the "triangle of velocities" in these particular cases).

"Air speed" is the speed of the aeroplane relative to the air, and has no connection with the speed or direction of the air.

"Ground speed" is the speed of the aeroplane relative to the ground. This is the resultant of the air speed and wind speed, obtained vectorially if the directions are different.

Phase Differences

The creation of phase differences in circuits will be dealt with in a later series of articles. It is sufficient for an explanation of vectors to know that in a circuit containing more than one alternating current (or voltage), the peak values of the different components may not occur simultaneously. When this is so one component is said to "lead" the other, or one may be said to "lag." This lead or lag is expressed in angular measure, and is called "phase difference."

Hence, to compound two currents which are different in phase (since each has magnitude and direction) vectorial methods must be used. Standards of reference are required :—

That for length is whatever scale can be adopted conveniently ; for direction, a horizontal line is used, and *positive angles, or angles of lead*, are measured *counter-clockwise*, negative angles or angles of lag are measured in a clockwise direction.

These conventions having been adopted the vectors are drawn, and the resultant vector—the diagonal of the parallelogram—gives the magnitude and phasing of the total current.

Examples :—

(1) A current of 5 amperes is passing through a circuit and a current of 1·5 amperes is set up in phase-opposition. What is the resulting current ?

"Phase-opposition" means that the currents are 180° out of phase, *i.e.* in exactly opposite directions.

Hence algebraic addition only is required. See Fig. 19a.

Resultant current = $C_1 - C_2 = 5 - 1{\cdot}5 = 3{\cdot}5$ amperes.

Direction is clearly that of the current of 5 amperes, *i.e.* the resultant current is in phase with the original current.

(2) Two subsidiary currents are impressed upon a circuit. One is 3 amperes leading the main current by 20° ; the other is of 5 amperes lagging by 60°.

What is the resultant subsidiary current ; and what is its phase relationship with the main current ?

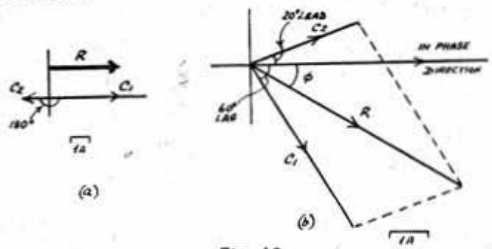

Fig. 19

In Fig. 19b : The vector C_1 is drawn to represent 5 amperes, lagging (*i.e.* with negative angle) by 60°. The vector C_2 is drawn to represent 3 amperes, leading (*i.e.* with positive angle) by 20°. The parallelogram is completed.

The diagonal, gives in its length on the scale adopted, the magnitude of the resultant current ; and in the angle ϕ the phasing of the resultant current. ϕ is clearly an angle of lag.

By calculation or measurement, R = 6·25 amperes. ϕ = 31°., *i.e.* resultant subsidiary current is 6·25 amperes lagging on the main current by 31° 50 mins.

Solution to Problems

39 (*a*) 140 volts, leading 50 volt component by 15°.

(*b*) 10 volts in direction of 40 volt component.

(*c*) 60 volts in direction leading one component by 60°, and lagging behind the other component by 60°.

(*End of series.*)

Author's Note

For space considerations this series of articles must be concluded, but their purpose will have been served if they have had any one of the three results which were hoped for at their inception. The elementary mathematics of school days may have been revised ; the usefulness of mathematical processes may have been newly appreciated ; or, new vistas may have been opened up.

It was planned to follow the present series with a simple mathematical treatment of the elementary theory of alternating current. This will be found in the *Radio Handbook Supplement* now on sale. (Price 2s. 9d., post free, from Headquarters.)

The author will be pleased to help by correspondence, as far as he is able, any reader who seeks guidance as to study, help with specific problems, or assistance with any mathematical work generally.

T. R. T.

* 29 *Hambro Avenue, Hayes, Kent.*

RANDOM REFLECTIONS

" Don't hide your light under a bushel " is the moral to be drawn from these reflections by " Commentator," who stresses the importance of advertising the value and importance of Amateur Radio to the General Public.

I WANT to hitch my reflections this time to two paragraphs I read recently; one in THE BULLETIN, the other in the *A.R.R.L. Handbook*.

In the December BULLETIN, under the title, " There's Plenty of Life in the South West," there appeared these words: " The position of amateur radio now, and after the war, was discussed at some length. With more and more members being drawn into the Forces, it was considered highly essential for those remaining at home to keep the existence of the amateur movement before the public eye, at the same time stressing its value in the war effort, so that afterwards there should be no possibility of the transmitting amateur being forgotten or pushed into the background." I quote this paragraph in full as I think it concerns a highly important subject.

To these remarks I would like to hitch the following extract from *The Radio Amateur's Handbook*: "Amateur radio is one of the finest of hobbies, but this fact alone would hardly merit such whole-hearted support as was given it by the United States Government at recent international conferences. There must be other reasons to justify such backing. There are. One of them is a thorough appreciation by the Army and Navy of the value of the amateur as a source of skilled personnel in time of war. The other is best described by the words 'public service.'" The writer then goes on to say that these public services can be divided into two classes: emergencies and expeditions.

Now all readers of A.R.R.L. publications are quite familiar with both these aspects of American amateur radio. Have we anything in this country to parallel them, and if so do the general public know about it? The story of our work in the public service, as a reserve of skilled personnel, will have to be left until after this war is over. What the Forces would have done without the body of radio amateurs to call on at the outbreak of war is hard to imagine. But this has not been our only contribution to the public good by a long shot. In times of peace we could show a good record. Conditions here do not call for the emergency communications which our American brothers often have to provide and we have not had the opportunity to co-operate with scientific expeditions to the extent that many American amateur stations have done, but in our own way many of our activities are very much in the spirit of public service. In numerous towns the local amateurs make themselves responsible for various charitable deeds. The maintenance of wireless sets belonging to the blind is a typical example. In many towns, too, the local radio club looks after the hospital radio installation, keeping headphones, etc., in repair and in some cases actually taking on the cost of any replacements needed in the receiver or amplifiers. Many a town, village or school function has proved more enjoyable because of P.A. equipment provided free of cost by local amateurs. Races, regattas and garden parties too, have benefited in the same way. Efforts such as these may seem very meagre forms of public service, and may seem to have little connection with our real interest of radio experimentation, but " the man in the street " is better able to appreciate this sort of thing than the scientific work which our Society turns out.

Many may think, " What on earth does it matter *what* ' the man in the street ' thinks? " Unfortunately it does matter. It's he who could get us off the air faster than anyone else if he really set about it. In a democratic country the will of the people, as a whole, becomes the law in the end, and if " the man in the street " thinks we are wasting valuable time and space on the air which could be used for still more broadcasting stations, then we'd have to go! That is why the things heard on 7 Mc. " fone " before the war were not only disgraceful but were definitely harmful to ham radio. The writer's personal opinion is that one of the best things which could happen for the future of ham radio would be an official ban on all telephony work except perhaps on bands whose coverage is very limited. There are too many eavesdroppers nowadays and unfortunately it's the empty vessels who make the most noise, and by their babblings the whole movement is judged. Having got that off my chest—and at the same time thrown the fat properly in the fire—guess we'd better get back to our theme, *viz.*, that amateur radio here can say quite truthfully that it does do its fair share of public service.

The next point. Does the public know about it? My answer—and again this is only my personal view—is, no, definitely no. And why not? Because being true Britishers and, generally speaking, being of a scientific turn of mind, we do not like shouting about our exploits. And anyway most of us are much too wrapped up in our hobby to ever dream of such a horrid business as " getting publicity." Probably few of us have ever given it even a moment's thought. But as the writer of the first paragraph I quoted wrote, it *is* highly important to keep the existence of amateur radio before the public. And it is important too, to not only keep its existence before the public, but to let the public know how much service is put in by members of the Society. Ask anyone not particularly interested in radio if he knows what radio amateurs are, and he'll probably say he has never heard of them. If his only acquaintance of them has been through accidentally tuning them in on his all-wave radio he will possibly give you a not too complimentary answer!

Now it's no good leaving all this publicity business to Headquarters. A great deal can be done locally. If you are engaged in any of the charitable concerns I've mentioned, an occasional note to your local paper to the effect that members of the Radio Society of Great Britain are responsible for this work, will be good publicity for the Society and will be appreciated by the Editor. Anything of news value will always go down well. If there is a Red Cross Fund dance and you provide or work the P.A., get hold of the press reporter if he happens to be there and tell him it was members of the R.S.G.B. who provided all the music! Similarly, short reports of local meetings go down well. They all help to keep amateur radio in the public eye. And by the way, don't only just look out for opportunities for bringing amateur radio before the public gaze, look out, too, for opportunities for still more public service.

KHAKI AND BLUE

● Tel. David Scholes, **VE5DY**, after paying a warm tribute to several BULLETIN contributors, reports in a letter dated February 27 from Victoria, B.C., that P./O. Herbert, G2WI (an LAC according to our records !) and G3MG have been in touch with the local fraternity. Members who find themselves in Victoria are invited to communicate with any of the following: C. Queale, VE5IC, 943 Yates Street (E1844 or E2040), R. Hough, VE5HR, 555 Yates Street (G5461 or B1966), A. Pratt, VE5SW, 907 St. Patrick's Street (G6797), A. Attwood, VE5TZ, 909 McClure Street (E.1404), D. Scholes, VE5DY, 1614 Pinewood Avenue (E.2729). A cordial welcome awaits all visitors.

● Friends of J. T. Blackwood, **G3IG**, will be interested to hear that he is now a Captain (R. Signals). In an airgraph dated April 20 from Basra, Iraq, he reports having met G5DN, ex-AC4YN, YI2BA, G2SH, VU2EO and VU2HM. The latter who was badly smashed up at Keren and was in hospital until recently is now believed to be back in harness. G3IF confirms an earlier announcement that G4AS is in the Basra area but they have not yet met. He mentions that 3IF is building kilowatt jobs with equipment that makes his eyes water !

● From P./O. Frank Wyer, **G8RY**, we learn that the new padre at his station is VE4MG. VE4NT has also been contacted. Frank, who bemoans the lack of news from District 3, would like to hear from old friends still living in his home town, Wolverhampton. He enquires especially for news of G5WO, 6FK, 8KI, and 8UR. During a tour of the W./Ops. cabins, G8RY chanced to hear some point-to-point operating. Conversation drifted towards the subject of bad operating, when one of the lads insisted on sending " X244," which being interpreted, means " send by hand " ! We believe QLF has been used in similar circumstances !

● We understand from P./O. Norman Davis, **G6TV**, who is on a course at Uxbridge, that P./O. Smethurst has been appointed Hon. Secretary, R.A.F.A.R.S.

● Seventeen service members attended a meeting last month at Haverill, Suffolk. Everyone present enjoyed the general rag-chew and many pleasant old-time memories were revived by discussions on N.F.D., aerial systems, portable work, QRP., and many other subjects. The accompanying refreshment was mainly liquid ! It is thought that other members in this area, not previously contacted, would welcome another meeting at an early date—will all such please write to G5JU *via* G6CL ?

● P./O. Peter Tremaine, **G8PB**, now at Bristol Wood, No. 1S.S. reports that daily ham-fests take place in the Mess. Among those on courses are G8VJ, 8YB, 8RW, 2FVU, OK1SI, W1MUU, 9GJW, 5GPW and 1AHN. It is hoped to arrange a meeting in or out of camp during August.

● In a letter to 2DHV, A.C. 1 R. F. H. Nicholson, **2DOH**, now serving in the M.E., asks that his 73 be sent to all old friends in the Medway area. He would appreciate letters, which should be addressed c/o G. V. Haylock, 28 Longlands Road, Sidcup, Kent.

● Congrats to Gilbert Keech, **BRS2714**, of Edinburgh, who has recently been granted a commission as Pilot Officer in the R.A.F. Regiment, after having served since the outbreak of war at H.Q. 18 Group. He has met G6PV at his new station, a well-known pre-war holiday camp in Yorkshire.

● F./Sgt. L. S. Davies, **G3ZF**, having recently rejoined the Society, asks us to mention that he is serving with other amateurs at No. 1 S.D.W.D.

● Mr. G. E. Blow, 87 High Street, Stevenage, Herts, seeks news of his son, AC 1 Donald E. Blow, **G3TL**, who has been reported missing. Donald was believed to be serving with the R.A.F. at Selatar Radio Station, Singapore, up to the time of the capitulation.

● T. C. Platt, **G2GA**, pre-war T.R. for Bury and now a Corporal Instructor at an R.A.F. S.S. in the N.W., reports the arrival of a junior YI, operator. He sends 73 to all old friends.

● W. H. Coy, **BRS4723**, of Nottingham, recently promoted to Corporal, wishes to be remembered to L.A.C. P. Egan, 4739, Cpl. Fenton, G8GG, and other old friends. He is now at an R.A.F. station in Shropshire.

● Last December we published, at the request of relatives, a Silent Key notice concerning Radio Officer G. M. Hindle, **BRS3692**. It is with much pleasure we now announce that Mr. Hindle is safe and well, although a Prisoner of War in Germany. Arrangements are being made for monthly parcels to be sent from the Prisoners' of War Fund. His address is: G. M. Hindle (Merchant Navy), British Prisoner of War, No. 347, Marlag Und Milag Nord, Germany.

● Speedy recovery to our Mid-East D.R., Lt. Arthur Gee, **G2UK**, R.A.M.C., who underwent a serious operation last month.

● " Farm Ham " E. Holt, **G5OZ**, seeks news of Jim Davis, G2OA and Archie Brown, G2WQ. Letters *via* his home address, please. OZ has made many ham contacts in recent weeks thanks to an old dodge connected with his respirator case !

● From Sgt. Hall, **G3BR**, comes news of Stan Clark, 2AMW (now a P./O. in R.A.F. Signals at Aden), Sgt. Dan Rock, G8PR, and Sgt. Henman, G6HM. The last two are also in the M.E. and letters for them should be sent *via* 3BR. All are fit and well and wish to be remembered to old friends, especially those at W.D.

●Friends of A.C. Wilberforce, **G2IY**, will be interested to hear that he has been granted a commission in the Signals Branch, R.A.F.V.R.

● Geoffrey Thomas, **ex-G5YK**, and one time Hon. Editor of THE T. & R. BULLETIN has joined the R.A.F.V.R. and is now on a Signals Officers course at Uxbridge.

● From an R.A.F. station in Somerset, L.A.C. F. Rose, **2DRT**, reports having met SP1HA who advises him that SP1DY, HA, HB, HI and 2HH are also in G. He also gives a list of SP amateurs (many of whom were well-known before the war) who were shot by the Nazis after radio gear had been found in their homes. Their names will be remembered and their deaths avenged.

● We regret to report that S./Ldr. R. C. Wilkinson, **G4HW**, has been posted as missing after taking part in a daylight sweep over France. G4HW was recently appointed to the command of an Eagle Squadron of Hurricanes, and when last seen was attacking an enemy machine. He was awarded the D.F.M. and bar for conspicuous service whilst serving as a Sgt. Pilot.

● Congrats to W. O. H. Bennett, **G8PF**, of Colchester who has been " elevated to the peerage," after serving in the R.A.F. since the outbreak of war.

● We learn from Mr. E. Lea, BRS3720 that L.A.C. Hall, **G8JM**, has been serving in Malta as a radio mechanic since last September His C.O. is VE5ACU and VE1FW is a fellow mechanic. He has met ZB1E who he says " lives up to the tradition " in fine style. Letters for 8JM can be sent *via* 3720, 66 Burma Road, Clissold Park, London, N.16.

● A.C.2 Goode, **2DTQ**, in a letter from Egypt dated March 6, reported having met SU1AX, 1SG, 1RD, 1JM and 1DB. He was also present at a hamfest held in Alexandria last November, when Tony Chapman, G2IC, was one of the guests of honour. He has also met G4CG, 4AR, 3GY, 8WT, 8LO, GI3VQ, GM6IW, 8RJ and 2786. 2DTQ pays high tribute to the SU's who, he says, vie with one another to extend hospitality. Incidentally, he first met SU1AX coming out of a cinema carrying a copy of THE BULL.

● An airgraph, dated April 30, brings news from Cpl. Philip Malvern, **G8DA.** 8DA arrived in the M.E. last February with Ted Laker, G6LK, after calling in to see Jack Sutton, GW2NG, in the " Isle of Sirens." Both he and Galea, ZB1E, were fit and well at that time. In a Services Club which 8DA visited in SU he found 13 call signs scribbled on a certain wall so he added his to break the unlucky number ! Since his arrival he has met Geoff Hutson, G6GH, 3SS and 8BA. He also mentions that W./O. Bill Gilhespy, 6GS, is now in the Sudan.

● P./O. Jack Morris, **2DRR**, has been posted to an R.A.F. station near Portsmouth and would like to meet local members. His address can be obtained from G6CL.

● Under date of April 29, Lt. Dennis Flower, **G8TO** (R. Sigs.) wrote from Kriegsgef-Offizierlager VIB, Germany, to report the safe arrival of 200 " Churchmans." This is the first intimation we have received that our parcels have reached members in German prison camps. Dennis informs us that " Shack " (Capt. E. S. Shackleton), G6SN, lives in his block and that Ft./Lt. Babcock, G8LI, Lt. Quartermaine, G3FZ, Lt. Lister, G5LG, are also in the same camp. The " ham gang " think out " some delightfully wild circuit diagrams," but luckily they have no equipment to disprove their efficacy !

● On the same day **G3FZ** wrote to G8TI, but his first parcel had not yet come to hand: he wishes to be remembered to all old friends.

● In a long letter dated March 24 addressed to G2MI, Cpl. Vincent Richardson, **G4NG**, gives an interesting account of his stay in Iraq. On a recent occasion he was stranded for 10 hours in an open-front car during a blizzard at 12,000 ft. with the temperature down to 23° below freezing. G4NG whose address can be obtained from H.Q. would be glad to receive radio or motor car journals and books. He wishes to be remembered to G6NF, 5WP and all old friends in District 7.

Edgware Short Wave Society

Mr. G. P. Anderson, G2QY, 16 Latimer Gardens, Pinner, Middlesex will be glad to hear from past members of the Edgware Society (especially those on active service), with a view to initiating a Letter Budget. This project was considered at the last meeting of the Society held some months ago, but was not followed up as G4KD joined the R.A.F. Items for inclusion in the first Budget should reach G2QY by June 23.

A.T.C. Signals Officers

Members holding R.A.F.V.R. Training Branch commissions for service with the A.T.C. who propose spending a week at a Signals School during August, are asked to communicate with G6CL. It is proposed to make up an R.S.G.B. party as was done last year.

MEMBERS ON ACTIVE SERVICE

Thirty-third List

WE publish below our thirty-third list of members on Active Service. Additional details and corrections should be advised to Headquarters as early as possible. The present list contains information received up to June 2, 1942.

Rank and Name	Regiment or Branch of Service	Pre-war Call or B.R.S.
Cpl. W. Bidie	R.A.F.	5047
A.C.1 E. Birchmore	,,	5072
A.C.1 D. E. Blow	,,	G3TL
L./Cpl. J. Bramall	R. Sigs.	5039
A.C.2 H. Brown	R.A.F.	4575
Cpl. S. J. Buckley	,,	5065
Sgt. E. J. Buick	R. Sigs.	G3XJ
A.C.2 H. Buttress	R.A.F.	5101
A.C.2 L. G. Byford	,,	5015
Cpl. D. S. Carroll	,,	5067
Sig. W. Carter	R. Sigs.	G2NJ
Sgt. K. R. Chatfield	R.A.F.	5078
L.A.C. R. A. Coates	,,	3805
Sig. R. P. Cole	R. Sigs	G6RC
Cpl. A. G. Cook	R.A.F.	5069
A.C.1 R. Cordingley	,,	5018
Sgt. E. Cowan	,,	5019
Radio Mech. E. R. Creek	R.N.	5023
Sgt. H. B. Crowe	R. Sigs.	G6CO
Sig. B. Dean	,,	5061
P./O. A. J. Dolan	R.A.F.	2FUQ
P.O./Tel. L. R. Dowers	R.N.	5049
A.C.1 F. A. Downes	R.A.F.	5074
Air Fitter P. A. Downes	F.A.A.	5075
A.C.1 A. H. Gooch	R.A.F.	5089
Cpl. K. Grant	,,	5062
Sgt. T. C. Grime	R.A.	5080
Cpl. P. R. Harrison	R.A.F.	5070
L.A.C. A. J. Hayward	,,	4222
L.A.C. W. W. Hickford	,,	5051
A.C. 2 M. Hollinshead	,,	G5QG
Sig. E. Holt	R. Sigs.	G5OZ
Cpl. T. Hopper	,,	5028
Sig. J. Hudson	,,	G4NS
A.C.2 R. Hulsmeier	R.A.F.	5055
A.C.1 R. Jacobs	,,	5020
Sig. G. Jessup	R. Sigs.	4583
Sig. T. G. Kelsey	,,	4142
Sig. S. F. Kirk	,,	2DJK
Cpl. A. A. Lamb	R.A.F.	4206
Sig. A. W. Lawson	R. Sigs.	GM2NQ
Sgt. J. Lloyd	R.A.O.C.	5106
Pte. A. H. Magraw	,,	2BVA
Pte. J. Manning	,,	GW4LN
A.C.2 T. N. Moon	R.N.Z.A.F.	5103
A.C.2 J. Moor	R.A.F.	5038
L./Sgt. C. R. Norman	E. Surrey	5077
Cpl. A. Perry	R.A.F.	5068
Cpl. T. C. Platt	,,	G2GA
Cpl. P. S. Robson	R.A.O.C.	5017
P.O./Tel. S. D. Rudge	R.N.	5073
L.A.C. A. W. Schroder	R.A.F.	5021
Pte. H. S. Rigg	R. Sigs.	5104
A.C.2 G. G. Shelley	R.A.F.	5041
Sgt. G. Skipp	,,	5054
P./O. S. Southgate	,,	G8FF
L.A.C. G. T. Sparkes	,,	2DCT
Sgt. J. F. Squires	,,	2DBF
A.C.2 C. F. Steeden	,,	2HCP
Tel. B. J. Taylor	R.N.	5030
Lieut. S. G. Tetlow	R.N.V.R.	5056
Tel. H. E. Timmings	R.N.	5100
A.C.2 C. Tulk	R.A.F.	5044
Cpl. J. D. Wightman	,,	G3AH
Sgt. J. Williamson	R.A.O.C.	5099
2nd Lt. K. W. Wiseman	,,	3796
L./Cpl. N. W. J. Wooldridge	,,	5098
Cpl. R. M. Woolfenden	R.A.F.	4217
2nd Lt. P. Worthington	R.A.O.C.	5107
Pte. W. E. Young	,,	5016

Prisoners of War Fund

PARCELS.—Parcels to an average value of £1 each were sent last month to members who are known to be Prisoners of War. Advice has been received from Capt. Shackleton and Lt. Flower, that their first parcels from the Society have come to hand.

BOOKS.—Further gifts of books would be welcomed by Mr. C. H. L. Edwards, G8TL, "Speedways," St. Bartholomews Lane, Sudbury, Suffolk. Several parcels have been despatched recently thanks to the generosity of a small number of members.

DONATIONS.—The General Secretary acknowledges, with thanks, on behalf of Council, receipt of donations from :—L. B. Babcock, £2 2s. ; F./Lt. J. N. Walker, G5JU, 12s. ; S. H. Tetlow, 5057, 2s. ; T. Shackleton, 10s. ; Mrs. J. Spink, 10s. ; Cheltenham Group per G8DT (2nd Donation), £1 ; R. Cretney, 2BKO, 8s. 6d. ; A. G. Archer, G8NU, 5s. ; F. W. Foster, 5s. ; "Memdom III," 5s. ; H. E. Bennett, G8PF, 5s. ; H. C. L. Barnett, 2AIQ, 10s. ; S. H. Tetlow, 5057, 5s. ; R. D. Mackenzie, G3SX, 5s. ; H. T. McFarlane, G8SK, 2s. ; J. W. Richardson, G8GQ, 10s. ; W. H. Allen, G2UJ ; £1 ; A. M. Leitch, G5YA, £5 5s. ; J. Bence, 4289, 6s. ; Leslie McMichael, G2FG, £5 5s. ; Twelve "Standard" Hams per G2GO and 3MS, £1 10s. ; Mrs. Deane-Drummond, 4s. 11d. ; S. D. Rudge, 5073, 10s. ; E. S. Elliott, 3341 (one time G5LT), 10s. ; G. C. Allen, G8IG, 18s. 6d. ; H. F. Maddox, 3828, 14s. 6d. ; District 7 per G2DP, 12s. ; A. L. Goldie, BERS182, 11s. ; Anon, 13s. 7d. ; District 13 per G2GZ, 10s. ; E. Lea, 3720, 10s. ; R. G. Taylor, 3619, 6s. 6d. ; C. D. G. James, 5s. ; A. T. Witts, £2 2s. ; R. H. Farr, G8IJ, 5s. ; W. T. Larbey, 2DWV, 12s. ; previously acknowledged, £290 8s. 8d. Total to date, £320 16s. 2d.

NEW NAMES.—Parents or friends of members who have recently been taken prisoner are asked to forward full details of addresses, etc., as soon as known. Changes of address should be advised to Mr. Edwards promptly to avoid losses.

73.

G2DP (Thornton Heath), to G2BB, IJ, RD, 5MA, 6WL, 8TN.
G3IG (R. Sigs.), to G2JK, 3CU, 3ST, 4KY, 6AQ, 8TN.
G3OU (Farnborough), to G2LG, 3DT, FN, OA, RU, TC.
G5BB (R.A.F.), to G2AT, 5HS, 6AU, QM, 8CY, JM.
G5ZX (R.A.), to G2UJ, UT, XS, 5QO, 8VW.
G8GI (R.A.F.), to G2AK, 3GS, QS, 6PZ, 8MC, PI.
2DHV (R. Sigs.), to G2IZ, YZ, 4FN, 5IL, 6DT, 8LY.
2DRR (R.A.F.), to G4HK, 2BIB, BKO, DRP, 4960, VE1LY.
BRS3585 (R. Sigs.), to G3KG, OF, 5BQ, FO, GM2UD, SP1HA.

New Arrival

Hearty congrats to Mr. and Mrs. Maurice Tapson, G6IF, on the arrival of a daughter—Hazel—on May 25. They are now living at M.A.P. Bungalow, 1 Squirrel Lane, Booker, High Wycombe, Bucks.

NORTH WALES PROVINCIAL

District Meeting

A cordial invitation is extended to all members within easy reach of

PRESTATYN

to attend a Provincial District Meeting on

SUNDAY, JUNE 21st, 1942, at

"VALE VIEW," MELIDEN ROAD

PROGRAMME

2.30–3.30 p.m.	Assemble.
3.30 p.m.	Address by John Clarricoats, G6CL, General Secretary.
4.15 p.m.	Visiting Amateurs will speak.
5 p.m.	Tea and Informal Speeches.
6 p.m.	Group Photographs.
6.15 p.m.	Discussion. "Post-war Radio Problems." Opened by G6CL and BRS1060.
7 p.m.	"The Prestatyn Quiz" conducted by Professor Microwave, Commander C. R. Tube, and Dr. Beam-Hertz.
8 p.m.	Side Shows and Visits.
11.55 p.m.	Lights out.

Reservations to C. Spillane, BRS1060, "Woodside," Meliden Road, Prestatyn, not later than June 18th, 1942.

BRITISH ISLES NOTES AND NEWS

DISTRICT 1 (North Western)

D.R.: H. W. Stacey (G6CX), "Sandleas," Eddisbury Road, West Kirby, Cheshire. Hoylake 337.

Reports are again scarce but the D.R. is glad to publish some notes from the Manchester area after a long absence of news. Whitehaven is the only other place in the news.

Manchester.—G2OI was pleased to receive a visit from Fred Vost (G2DF) of Warrington who wishes to be rememberd to all local members. He is in the R.A.F. and has some good yarns to tell. A welcome is extended to G. Allen (4756) who is learning the code. 3228 devotes all his spare time to morse practice and short-wave listening.

Members are asked to keep G2OI informed of their activities so that these notes can be made a regular feature. (*Via* G2OI.)

Whitehaven.—Fortnightly meetings are held for the benefit of those in the Workington area. The first of the series which took place on May 9, was attended by G3SY, 6ZT, 8RZ and 2HVV, all of whom are active on their receivers. 2AYH (Carlisle) reports has had a personal QSO with GM3OI, (Dumfries). 4541 has met 2OC, 5KV, 6LL and many others since he joined the R. Sigs. 3BW (R.N.) met 6JZ whilst on leave in the North. 6WR reports that 2AUM has been visiting Victoria Falls.

The meetings at Workington have been arranged to dovetail with the fortnightly meetings at Whitehaven. 3PZ is a newcomer to the area and will be welcome at any of these meetings.

(*Via* G6ZT.)

Mr. Wilding (4124), of Wallasey, Cheshire, who visited the D.R. whilst on leave recently had some interesting experiences to recount. Correspondence should be addressed to him c/o R.S.G.B.

(Sorry we cannot publish the address you gave, G6CX.—ED.)

Will those members who are prepared to attend a Provisional District Meeting please notify the D.R. before the end of the month so that the possibilities can be considered? G6CX.

DISTRICT 3 (West Midlands)

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

Birmingham.—At a meeting of M.A.R.S. held on May 10, at the "Hope & Anchor" Hotel, Mr. H. M. Hart, Hon. Treas., gave an interesting lecture on pre-selectors, dealing briefly with the advantages and disadvantages of regenerative single and two-stage line-ups. Thirteen members were present. Future meetings will be held at the "Hope & Anchor" on the second Tuesday in each month at 7 p.m. 2FDR.

DISTRICT 4 (East Midlands)

Deputy D.R.: W. M. Vendy (G6VD), 9 Cecilia Road, Clarendon Park, Leicester.

Nottingham.—Three new members were welcomed at the May meeting, held at 2AOO when Mr. A. Simmons gave an interesting talk on conditions in India, radio and otherwise, illustrating his points with some very fine photos. The next meeting will take place at G8DZ, 14, Epperstone Road, West Bridgford, at 6.30 p.m. on June 21, when it is hoped to arrange for a technical talk to be given by a representative of a well-known local concern.

In an Airgraph letter to 6VD, 6CW reports being well, happy, and busy. He often bumps into 5VU and has met many other hams.

Derby.—G2OU received a visit recently from 8BN who was home on leave. 2OU is still doing a little constructional work in his spare time, his latest effort being a field strength meter.

G6VD.

DISTRICT 6 (South Western)

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

Only two items of interest have to be reported from the South West. The first comes from G5QA (T.R. for Exeter) who states that in the recent blitz on that city all the local members were fortunate enough to escape, except that 3MU's house suffered damage.

A letter from BRS4599 (Wimborne, Dorset), now in the R.A.F. describes experiments and ideas regarding remote radio control. He would like to hear from other members of the District.

G5SY.

DISTRICT 7 (Southern)

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

Coulsdon.—G2KU has joined the Home Guard. 5AN listens to commercials to keep his CW in trim. (*via* 3003.)

Croydon.—Nineteen members attended the May meeting held at G4NI. Those present were pleased to welcome 3179 (who was on leave), 3FK, 2BLA and 2FDB. 4NI has built an A.C. audio oscillator for A.T.C. instruction.

Bournemouth.—Hearty congrats. to 4KV on his promotion to Captain. 3BM joins 2HNO in Medical Grade 4. We are sorry to say that 2HMX, of this town, and 3UN, 3YU, 2DMW and others who have been here for some time have now left us. Good luck, O.M.s! 2FSL, minus tonsils, is now in "Pompey" and wants to meet the locals. (*via* 2HNO.)

Berkshire.—G3HS, usually brass-pounding at a 'drome, found time to send the following dope on the other inhabitants. 6NW, GM8CN, VP5MK (one-time B.E.R.U. representative in Jamaica), with occasional visits from 3JO, constitute the ham population. 6NW shakes up many a WOP/AG with his newly-constructed "bug." A good QSO was had with ZL4GY (by land line). 8VP, away on an advanced course, finds time to give instruction to the A.T.C. 8DA, still at Malta, enjoys life in good "ham" company. (8DA is now in Egypt, see K. & B.—ED.)

(*via* 3HS.)

Hitler's secret weapon has struck in Walton-on-the-Hill! 2YL, laid low by D4 measles, had to call off the May meeting, but she has kindly re-issued the invitation—this time for Sunday, June 28th, at 2.45 p.m. Same QRA, and don't forget—if you intend coming along—please drop a card to Miss Corry at Petersmead, Walton-on-the Hill. G5WP.

DISTRICT 9 (East Anglia)

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

Great Yarmouth.—The only news this month comes from Mr. Buck, 3821, who reports that 3766 has left for warmer climes and that 3468 is now an L.A.C. Mr. Buck also enquires what are the chances of a District meeting? As the last meeting held in Norwich produced an attendance of only five members, the D.R. would be pleased to receive suggestions on the matter. G2XS.

DISTRICT 11 (North Wales)

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

For the first time ever, this District is to stage a Provincial District Meeting. Due to catering difficulties it has not been possible to hire hotel accommodation, but thanks to the co-operation of BRS4762, the meeting will take place at his home "Vale View," Meliden Road, Prestatyn, at 2.30 p.m., on Sunday, June 21. The General Secretary, G6CL, will address the meeting at 3.30 p.m. A small charge may have to be made for refreshments but the essential requirement is that all who propose to attend should notify BRS1060 (address above) at least two or three days in advance. It is expected that a very attractive programme will be arranged including at least one special item of topical interest. Members and other amateurs on active service in the District, as well as our many friends in District 1 are cordially invited to attend.

Book the date *now*—June 21.

Prestatyn.—Due to Whitsun attractions the May meeting held as usual at BRS4762 was attended by only seven members. Those present were pleased to welcome 3IR who was out of hospital for a brief spell pending a further operation. 2CHZ who rarely misses a meeting journeyed 80 miles to attend.

GW4CK now at No. 1 S.S. (Block 326, Room 5), is anxious to meet the locals. 4728 (R.A.O.C.) has passed out as an R.M. and is now in N.W. London. BRS1060.

Forthcoming Events

June 20	District 15, 6.30 p.m., at 2ADL, 106 Cavendish Avenue, West Ealing, W.13.
June 21	District 4, 6.30 p.m., at G8DZ, 14 Epperstone Road, West Bridgford, Notts.
June 21	Provincial District Meeting "Vale View," Meliden Road, Prestatyn, N. Wales (see announcement elsewhere).
June 21	District 13, 3 p.m., at BRS4324, 3 Englewood Road, Balham, S.W.
June 27	London Meeting, 2.30 p.m., at the Institution of Electrical Engineers (see "Headquarters Calling").
June 28	Scottish "A" District. 2.45 p.m. in the Coffee Room, Y.M.C.A., Residential Club, 100 Bothwell Street, Glasgow.
June 28	District 12, Annual Picnic, 3 p.m., at G6LL, "Woodlands," 90 Tolmers Road, Cuffley.
July 5	District 7 (Croydon area), 3 p.m., at G5BT, 31 Selton Road, Addiscombe.
July 25	London Meeting, 2.30 p.m., at the Institution of Electrical Engineers. Details next month.

DISTRICT 12 (London North and Herts)

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

The last North London meeting held at the "Nightingale" on May 24, was attended by only 9 members. It was unfortunate that we had overlooked the fact in choosing the date that it was Whit-Sunday, and this probably explained the small numbers. We were pleased to welcome LA6A, LA9N and a visitor from District 13. Topics ranged from V.H.F. to "digging for victory," but V.H.F. won. It rather looks as though, as a result of this meeting, we now have a band of enthusiasts for these frequencies as we learn that several receivers are under construction. G5FA has already had good results. LA9N who has only recently arrived back in London after his illness was looking fit and well.

What has gone wrong with reports—this is the second month without a single letter. Remember those in the lonely spots who are thirsting for news.

The next meeting will be held at G6LL, "Woodlands," Tolmers Road, Cuffley, on June 28, at 3 p.m. We hope to see a good gathering and two good sides for the usual cricket match (field permitting). Suitable train is the 2.20 from Kings Cross, arriving at Bowes Park, 2.43 p.m. and Cuffley just after 3 p.m., or by 'bus from Potters Bar to Cuffley. Those who intend to be present are urged to advise G5QF by June 24 latest. Ladies will be welcomed. Please bring your own food. G5FA.

DISTRICT 13 (London South)

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

South Central and South-Eastern Areas.—Eighteen members attended the May meeting when a further collection was made on behalf of the P.o.W. Fund. We learn that G2JB has been promoted to Sergeant and that 5OX is now in Calcutta. Mrs. "Oxo" is serving with the W.A.A.F. 5WG sends 73 from the M.E. For details of next meeting see "Forthcoming Events." G2GZ and G3ST.

South-Western Area.—News has been received from 3AD that he is bound for pastures warmer than the vales of Devon. Happy landings, O.M.! 8IL reports by post—one of two only who asked for the War-time Log to be sent. 4GD gives a welcome ring whenever a spot of "leaf" brings him to town, otherwise, no news from anyone. The size of THE BULL. is cut down, but there's still room to show that this area is alive! *Please* send in a word or two regularly. G8QH.

DISTRICT 14 (Eastern)

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

The May meeting in Chelmsford was attended by 6LB, 6ZC, 5RV, 2SA and BRS3650. News is to hand that 2PX has been commissioned in the A.T.C. A cheery Airgraph from our friend Edwards, late of Brentwood, and now in the M.E. gives the news that he has met several hams and is trying to locate 4LV. He sends 73 to his friends in the District. During a recent trip North, 5RV had the pleasure of meeting 8PB, 8SB and 8YB, all P./O.'s on a course at No. 1 S.S. Among the other members of their class are: 8RW, OK1SI, W1MUU, 1AHN, 2FVU, 5GPW and 9GJW. 3BS was also visited in his Northern hide-out! L./Bmbr. Harrington, 2292, still retains his keenness as evidenced by a recent letter. 4AK reports from the Orkneys where he has met 3DT. He also mentions that 8RC is home again after completing his training as a Pilot in the U.S.A. 4AK had a near shave when his old ship was sunk recently . . . luckily he was engaged on shore duties at the time. No news from the other areas of District 14 Come on, T.R.s! G5RV

DISTRICT 15 (London West, Middlesex and Buckinghamshire)

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

New members, BRS4994, 5025 and 5026 were made welcome at the May meeting held at 2ADI, who is again thanked for his hospitality. Others present included 3UQ, 3XD, 6WN, 8DG, 1357 and 4684. BRS1357 was home on leave from the R.A.F.

An appeal for news from past members of the Edgware Society is made by G2QY (see announcement elsewhere in this issue). 2KI reports fit from Sussex, 8WR is still in London but night duties prevent him from attending meetings. An old friend of the District, Sgt. Horky, OK2HY, writes from an R.A.F. station in S. Wales. He recently received a minor shock when G6CI, made an unexpected visit. He is studying engineering in his spare time. (Just as we went to press news was received from OK2HY that he is now a 2nd/Lt. in the Czech Army. That boy does see life!—ED.)

It is hoped that all new District members will make an effort to attend our monthly meetings; the date of the next appears under "Forthcoming Events." G6WN.

DISTRICT 16 (South Eastern)

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

G6CY, acting T.R. for Brighton and Hove, met 2RU and 3YY whilst they were on leave. 8CP and 6XF have been contacted by 'phone, and there is also news of 4835 (R.A.F.) and 2HOF, who has recently acquired an SX16. 3WR has written from Canada, 6CY can supply his address. 8AC in Malta is reported to be doing well.

2HKU of Sheerness has met 4721 and both are taking radio courses. Can anyone help 2HKU to obtain carbon granules of 100 mesh and mica for the mike described in the Handbook? G2WS.

DISTRICT 17 (Mid East)

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

Bourne.—Welcome to G8GI a new member. Hope to meet you sometime, O.M.

Boston.—G2UK has had the misfortune to be admitted to a hospital in Norfolk for a severe abdominal operation, but is progressing satisfactorily. 6LH reports receipt of an airgraph from Geoff Hutson. He says: "G6LH forwards, under protest, a message from G6GH who sends his 73 to all District 17 members and hopes that 6LH's attempts at model aircraft are more successful than his attempts at neutralising the old 210's on 14 Mc."! 2BQC is now at a convalescent depot at Blackpool.

Grimsby.—BRS3699 says he'd like to see a "get together" in Grimsby soon. Others interested please write to D.R.

Sleaford.—Congrats to 6TV on his recent wedding. 6LH tied the knot and 8OI was best man. This is "All Ham Wedding" No. 2 in District 17. M. G. for G2UK.

Scotland

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

"*A*" *District.*—Members will have read with interest, in last month's issue, of the honour conferred on F./Sgt. John Kyle, G6WL, who was well-known to many of us as GM6WL. Congrats to GW8JY on being granted a commission in the R.A.F. He served at a station in the district for several months recently.

(Late news was received from GM6ZV to the effect that in consequence of his transfer to "C" District Mr. David Niven, 2CHN, has been compelled to relinquish his position as "A" District Officer. He is succeeded by Mr. J. K. McDowall, GM3AR. —ED.)

"*B*" *District.*—Just too late for the May issue came a letter from GM3RI, with news of "B." GM3SF has been home on leave after serving at various Far Eastern Naval shore stations. 8AT, now a Cpl. in the R.A.F., is in the East, while 8SV is serving as 3rd Engineer Officer in the M.N. in the same part of the world. Our sympathy goes to the parents of GM4MG who has lost his life while serving as radio officer in the M.N. GM6ZV

Northern Ireland

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

Recent arrivals in GI have included Capt. Danham, 4739. C.Q.M.S. Davidson, 4730, 2CMH, VE3AAR and G6OQ. The first U.S. amateur to visit GI6YM was Major W. Dobbins, W5FSI/4WD.

GI5ZY and 2BZV are in R. Sigs. The former is a Sergeant, 2DDI is a Pilot u/t in London. GI5QX.

Panoramic Radio Reception

From America comes a preliminary announcement of Panoramic Reception, a new and interesting device which makes it possible to observe visually, by means of a cathode ray tube, what is happening in any 100 kc/s. channel in the radio spectrum.

With a conventional aural receiver, having a selective of 10 kc/s., an operator can hear only the signals in this passband. When a Panoramic adapter is added all signals present in a band width of 100 kc/s. are made visible without in any way affecting the operation of the receiver. Thus the portion of the spectrum observable at any one time is increased ten-fold. The probability of intercepting stations operating for only short periods of time, is increased by this factor. Furthermore, the Panoramic adapter shows signals which, although meaningless when heard in an ordinary receiver, might reveal themselves as a secret communications system employing frequency or phase modulation or operation on separated frequencies. A description of the device appeared in the March issue of *Radio*.

A Badge Suggestion

H. R. Hatch, 2CBB, has found that instead of using the usual indicator on his receiver panel for denoting dial setting, an R.S.G.B. badge provides an even better alternative. It is only necessary to remove the small brass clip, which is normally passed through the button hole, and in its place solder a 6 BA screw.

HEADQUARTERS CALLING

April Council Meeting

Résumé of the Minutes of a Council Meeting held at the Institution of Electrical Engineers, on Monday, April 13, 1942, at 5.30 p.m.

Present.—A. D. Gay (President), A. E. Watts, H. A. M. Clark, E. L. Gardiner, J. W. Mathews, G. A. Jessup, A. J. H. Watson, W. A. Scarr, S. K. Lewer, E. H. Simmonds and J. Clarricoats (General Secretary).

An apology was received from Mr. W. H. Matthews.

1. One hundred and eighteen applications for election to membership were approved. Ninety-eight applications were sponsored by Corporate members and 22 were supported by references.

2. Archbishop Holgate's Grammar School, Radio Club (York) were granted affiliation.

3. It was reported that no further orders could be accepted for the engraving of call sign badges.

4. New arrangements for producing the Society's Journal were discussed. It was agreed to employ small type (6 pt.) for all non-technical features and to introduce various ideas designed to give readers the maximum amount of reading material in the restricted space available.

5. A special notice to D.R.'s and others, inviting them to convene representative meetings of members, was approved for publication.

Service Addresses

From time to time we receive requests from members to publish their overseas address. Much as we should like to do so censorship restrictions forbid it. Letters can be sent *via* Headquarters or through an overseas member's home address. The latter arrangement is generally the most satisfactory.

No London Convention

In view of the Government's request that unnecessary travelling should be discouraged, Council has decided not to proceed with plans for a second War-time Convention. The monthly meetings held at the Institution of Electrical Engineers, will be continued throughout the summer and autumn, thereby providing opportunities for members to meet.

June I.E.E. Meeting

Council has pleasure in announcing that Mr. H. L. Gibson, 2BUP, will deliver a lecture, entitled "Circuit Design Principles of Power Amplifiers," at the Institution of Electrical Engineers, London, on Saturday, June 27, at 2.30 p.m. Members free for lunch are asked to meet at Slaters Restaurant (lower floor), 393 Strand, from 12.30 p.m. onwards. The I.E.E. will be open from 2 p.m. for informal discussions.

Radio Brains Trust Meeting

Well over 100 members attended the Radio Brains Trust meeting held at the Institution of Electrical Engineers, London, on Saturday, May 30. Under the Chairmanship of Mr. A. D. Gay (President), the meeting derived considerable pleasure, and not a little knowledge, from the replies given to 20 questions submitted by members prior to the meeting and put to the Brains Trust (Messrs. H. A. M. Clark, F. Charman, D. N. Corfield, E. L. Gardiner and S. K. Lewer) by the Question-masters, E. H. Simmonds and John Clarricoats (General Secretary). Further questions submitted by members present at the meeting were answered in able manner.

Mr. W. H. Matthews and Dr. George Bloomfield were responsible for a motion of thanks to the Brains Trust.

Selected replies to Radio Brains Trust questions will appear in future issues of THE BULLETIN.

Mathematics for the Radio Amateur

Although the present series of articles concludes in the current issue, readers may like to know that it is planned to publish from time to time further contributions from Mr. T. R. Theakston, 2DBK.

THE T. & R. BULLETIN can claim to have been the first Amateur Radio publication to appreciate fully the importance in war-time of mathematics as an aid to the study of radio phenomena and circuits. The fact that the lead which it gave in October, 1940, has been followed by contemporary publications, is a tribute to the foresight of the Council of the Society.

The inclusion of Mr. Theakston's invaluable articles, with considerable amplification, in *Radio Handbook Supplement*, has been warmly welcomed by members and non-members alike.

For those who wish to continue the work, a recommendation of books may be of value.

Calculus : "Calculus for Beginners"—Mercer; or, "Calculus Made Easy"—Thompson; or, "A First Course in Calculus, Part I"—Milne and Westcott.

Trigonometry : "The Elements of Trigonometry"—Loney.

Algebra : "Elementary Algebra"—Hall and Knight.

Geometry : "A School Geometry"—Hall and Stevens.

General Books : The series "Workshop Mathematics"—Castle; the D.U. technical series "Mathematics for Engineers, Part I"—Rose.

Emblem Badges

Council has pleasure in announcing that as from next month all newly-elected members will receive, free of charge, a lapel emblem badge of new design which omits the letters "T. & R." It is anticipated that the vast majority of present members will, for sentimental reasons, wish to continue to wear the old T. & R. emblem badge, but those who would like to receive one of the new badges should apply to Headquarters, after July 1st, sending a 2½d. stamp for return postage.

The Society's New Badge shortly to be issued to new Members on election.

Headquarters Office Hours

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

Handbook and Supplement Orders

On occasions members in the London area telephone for bulk quantities of Handbooks and Supplements for re-sale to Service personnel. Within a day or so they telephone again complaining that the books have not arrived. We would remind all members that bulk orders for Handbooks and Supplements are sent to Eastleigh, Hants, for despatch by our printers. Transport difficulties often cause unavoidable delays, so be patient and remember that every minute our staff are engaged in unnecessary telephone conversations, other and probably more urgent Society business has to take a back seat.

Election of New Members

Sometimes members who have proposed one of their friends for membership, telephone a few days after a Council meeting to complain that the gentleman concerned has not yet received his certificate, etc., etc. For the guidance of members, we would point out that it is our practice to await delivery of the current issue of THE BULLETIN before writing to new members who have paid in advance of election.

As a general rule all newly-elected members receive their certificate and current issue of THE BULLETIN by the 20th of the month.

NEW MEMBERS

Home Corporates

J. Wood (G3VG), 113 Ingleboro Drive, Sprotborough, Yorks.
H. Stables (G4NF), 218 Almondbury Bank, Huddersfield.
E. Roberts (G4OR), 30 Grace Road, Ellesmere Port, Ches.
M. Hollinshead (G5QG), 7 Regent Rd., Harborne, Birm. 17.
S. Southgate (G8FF), 26 Fulbrooke Road, Cambridge.
A. H. Magraw (2BVA), Kimberley, Bryniau Rd., Llandudno.
J. F. H. Weller (2BWN), 5J Grove End Hse., St. John's Wood, London, N.W.8.
J. F. Squires (2DBF), 127 Boyn Valley Road, Maidenhead.
F. R. Jupp (2FAD), 35 Brading Road, Brighton 7.
C. F. Steeden (2HCP)71 St. David's Rd., N., St. Annes-on-Sea.
R. Collings (2HIL), 33 Cromwell Road, Colchester.

Home Corporates (B.R.S.)

L. G. Byford (5015), 12 Pembroke Road, Bromley, Kent.
W. E. Young (5016), 33 St. Catherines Court, The Avenue, London, W.4.
P. S. Robson (5017), Castlefield, Cambridge Road, Clevedon.
R. Cordingley (5018), 61 Cleveleys Avenue, Lancaster.
E. Cowan (5019), The Buck Hotel, Gt. Ayton, nr. Middlesbrough.
R. Jacobs (5020), 26A Dover Road, Hunters Bar, Sheffield 11.
A. W. Schroder (5021), 242 Staines Road, Hounslow, Middlesex.
W. C. Lavender (5022), 45 Bulwer Ct., Bulwer Rd., London, E.11.
E. R. Creek (5023), 66 Westfield Avenue, Watford, Herts.
M. W. Bond (5024), c/o New Zealand House, 415 Strand, London.

A CORDIAL WELCOME IS EXTENDED TO THE

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NEW MEMBERS WHOSE NAMES ARE LISTED

D. V. W. Allen (5025), 37 Friars Place Lane, London, W.3.
E. J. Collins (5026), 37 Gibbon Road, London, W.3.
H. G. White (5027), 6 Beaumont Road, London, W.4.
T. Hopper (5028), 16 Helmingham Rd., Tranmere, Birkenhead.
H. Mackay (5029), 1 Crown Place, Crieff, Scotland.
B. J. Taylor (5030), 122 The Broadway, Southall, Middlesex.
C. E. Curtis (a031), 1 Brooke Rd. West, Waterloo, Liverpool 22.
F. Wilson (5032), 64 Brown Edge Road, Fairfield, Buxton.
T. R. Priest (5033), 2 Market Place, Blackheath, Birmingham.
R. C. Foote (5034), R. Signals.
H. W. J. Drury (5035), 1 Florence Gardens, Chadwell Heath.
E. A. Matthews (5036), 22 High Street N., Dunstable.
G. E. White (5037), 16 Eland Rd., Langwith Junction, Mansfield.
J. Moor (5038), High Fell, West Hall, via Carlisle.
J. Bramall (5039), 13 Cockhedge Lane, Warrington.
T. E. Neville (5040), 105 Bridge Road, Liverpool 21.
G. G. Shelley (5041), 69 Willifield Way, London, N.W.11.
A. J. Oldham (5042), 11 James Street, Cellardyke, Anstruther.
H. G. Lapworth (5043), 30 Hazeldene Road, Manchester 10.
C. Tulk (5044), 186 Edenhurst Road, Longbridge, Birmingham.
A. H. Crossland (5045), 35 Keeling Road, Cheadle, Staffs.
F. H. Austen (5046), Relay House, Westwood, Margate.
W. J. R. Bidie (5047), 9 Britannia Terrace, Banbury, Oxon.
G. R. Gerrard (5048), Westminster Bank House, 4A High Street, Uxbridge.
L. R. Dowers (5049), 82 Richmond Road, Ipswich.
A. Walker (5050), 180 Huddersfield Rd, New Hey, nr. Rochdale.
W. W. Hickford (5051), 10 St. Anns Road, London, N.8.
H. B. Bowden (5052), 25 Princes Street, Dunstable.
L. Carter (5053), N.Z.R.A.F.
G. Skipp (5054), 18 Stanley Crescent, London, W.11.
R. Hulsmeier (5055), 38 Danville Road, Fulwell, Sunderland.
G. A. Ferns (5056), 9 St. Hilda's Avenue, Ashford, Middlesex.
S. H. Tetlow (5057), 5 Shooters Avenue, Kenton, Middlesex.
D. Reed (5058), 39 Burnley Road, Ainsdale, Southport.
A. De Costa (5059), Doune House, Edzell, Brechin, Scotland.
R. S. Longman (5060), 87 Freemans Lane, Hayes, Middlesex.
B. Dean (5061), 22 Dean Street, Brownroyd, Bradford.
K. Grant (5062), 15 Neville Street, Canton, Cardiff.
L. C. Moodie (5063), Costa Rica, Nansen Avenue, Poole.
J. R. Walton (5064), Melrose, Bank Top Avenue, High Lane, Tunstall.
S. J. Buckley (5065), 196 Dunstable Road, Luton.
O. R. Schofield (5066), 50 Albert Road, West Bridgford, Notts
D. S. Carroll (5067), 179 Queen Alexandra Rd., North Shields.
A. Perry (5068), 21 Hilden Street, Haulgh, Bolton.
A. G. Cook (5069), Wimpole, Balmoral Rd., Parkstone, Dorset.
P. R. Harrison (5070), 154 Broadfield Avenue, Edgware.
J. E. Beadle (5071), 83 Nursery Road, London, N.14.
E. F. Birchmore (5072), 10 Eastway, Wallington, Surrey.
S. D. Rudge (5073), 164 Plumstead Road, Norwich.
F. A. Downes (5074), 96 Bucknall New Road, Hanley, Staffs.
P. A. Downes (5075), 6 Bellfield Avenue, Harrow Weald.
W. O'Donnell (5076), Hopedale, Camelon, Falkirk.
C. R. Norman (5077), 23 Hatherleigh Close, Morden, Surrey.
K. R. Chatfield (5078), 13 Hope Street, Greenock.
L. S. Townson (5079), 11 Evelyn Road, Cockfosters.
T. C. Grime (5080), 55 Park Road, Chorley.
A. E. West (5081), Grove Road P.O., Portland, Dorset.
L. W. Mant (5082), 28 Welbourne Rd., Broadgreen, Liverpool 16.
J. T. McDonnell (5083), Pinners Hall, Old Broad St., E.C.2.
K. W. Bromell (5084), 367 Warwick Rd., Solihull, Warwicks.
J. D. Hamon (5085), 45 Rochester Avenue, Bromley.
E. W. Heron (5086), 10 Muswell Road, London, N.10.
S. H. J. Freemantle (5087), 13 Braeside Road, Bitterne, Southampton.
W. Guild (5088), 63 Kilbowie Road, Clydebank, Glasgow.
A. H. Gooch (5089), 39A Anstey Road, Alton, Hants.
G. Whitby (5090), 267 Crogan Hill, Barry, Glam.
W. Davies (5091), The Bungalow, Kingsley Fields, Nantwich.
S. Roberts (5092), 22 Park Street, Alfreton, Derbys.
C. A. Bancroft (5093), 209 Plymouth Road, Redditch, Worcs.
D. J. Sawyer (5094), 60 Exeter Road, London, N.14.
C. H. Brooks (5095), 96 Micklefield Road, High Wycombe.
G. Fordyce (5096), 6 Lime Road, Camelon, Falkirk.
F. Baxter (5097), 203 Derby Street, Burton-on-Trent.
N. W. J. Wooldridge (5098), 104 Park Street, Hereford.
J. Williamson (5099), 12 Rodgers Place, Earlston, Berwicks.
H. E. Timmings (5100), 78 Kenilworth Court, Curzon Crescent, London, N.W.10.
H. Buttress (5101), 21 Mark Street, Paddock, Huddersfield.
G. Mason (5102), 16 Grange Road, Woodthorpe, Nottingham.
T. N. Moon (5103), c/o New Zealand House, 415 Strand, London.
H. S. Rigg (5104), 10 Parkhills Road, Bury, Lancs.
R. A. Walker (5105), 26 Daisy Road, Thorneywood Lane, Nottingham.
J. Lloyd (5106), 135 Thornley Street, Burton-on-Trent, Staffs.
P. Worthington (5107), 21 Vicarage Street, Leeds 5.
W. R. Davis (5108), 3 Beattie Ave., Newcastle-u-Lyme, Staffs.
F. W. Day (5109), 29 Queenscourt Rd., West Derby, Liverpool 12.

Associate

M. F. Everett (A), 54 Dallow Road, Luton.

Foreign

L./Cpl. J. Simacek (FRS42), Czechoslovak Forces.

Correction.—In the April list of New Members, the name D. L. Stuart (G3ZF) should have appeared as L. S. Davies (G3ZF)

The Wittering Arms.

To Cpl. Perry, 2FTU, goes credit for this interesting addition to the records of the College of Heraldry ! It was brought to light by F./Lt. Peter Mortimore, G8KI.

EXCHANGE AND MART.

Advertisement Rates

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

NOTE.—As and from the JULY issue the above Rates will be increased to 2d. per word, minimum 3/- for MEMBERS, and 4d. per word, minimum 6/- for TRADE advertisements.

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DETECTION.—New Theory, , circuits, practical experiments. 44-page booklet, 2s., post free.—D'ARCY FORD, BRS1879, Gandy Street, Exeter.

FOR SALE.—Small Avo Test Oscillator, offers, wanted 1 each Madza Valves, AC5/Pen, AC/TP.—L. LOTT, Berrow Road, Burnham-on-Sea.

PILOT U650, 6-valve superhet, 16–52, 48–150, 175–500 and 750–2, 100 metres. Output 3-watts, A.C. 200–250. Cost pre-war 16 gns. What offers? Purchaser to collect from London address.—Box Pilot, " Parrs," 121 Kingsway, London W.C2.

RAYMART.—Owing to paper restrictions our advertisements can only appear in alternate issues. See our Front Cover announcement in the May issue.

SALE.—as new, BTH 8-in. R. K. Speaker, P.M. with transformer, 22s. Metal Rectifier, L.T. charger, A.C. input, 16s.—G3LB, 25 Clotherholme Road, Ripon, Yorks.

WANTED.—Eddystone All-Wave Two (battery) in good working order, complete with coils and cabinet.—Write Box W.H., " Parrs," 121 Kingsway, London, W.C.2.

WANTED.—Good Communication Receiver, Test-meter, Oscilloscope, Amplifier or parts, A.C. Gram. Motor, Transformer, 300–0–300, at 60 mils., 2–6·3 and 1–5 volt. Few Potentiometers and Bulgin Multiple Switches.—6MI, 131 Bloomfield Road, Blackpool.

WANTED.—Two 6B5 or 6N6. Sell 42, ID7G, 6L7. Offers.—G. M. KING, The University, Sheffield, 10.

WANTED.—One " Mac " Semi-auto Bug Key, 1, S. Meter for Sky Champion.—Offers to: G4NW, 25 Warren Avenue South, Fleetwood.

WANTED.—Bug-Key.—2DRT, " Allendene," Spalding Road, Pinchbeck, near Spalding, Lincs.

WANTED.—Small Cathode-Ray Tube.—Details and price to: BRAMHILL, 2BMI, 10, Orchard Waye, Uxbridge, Middlesex.

WANTED.—DB-20 or Peak two-stage Pre-selector, preferably with power unit. Describe fully, quoting rational price.—Box GGL, " Parrs," 121 Kingsway, London, W.C.2.

WANTED urgently.—14 similar Press-button Switch Units without trimmers or coils. Each unit should have not less than 10 buttons, plus release.—Details to: F./Lt. PYKE, c/o " Parrs," 121 Kingsway, London, W.C.2.

WANTED.—Hallicrafter Communication RX, also Ever-Ready or Murphy Portable Radio, and an Avo, Model 7 or 40.—P./O. Tel. E. MARTIN, 114 Mess., R.N.B., Portsmouth.

PATENTS AND TRADE MARKS

KING'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 OF THE WORLD.

WEBB'S RADIO MAP of the World enables you to locate any station heard. Size 40 in. x 30 in. Two-colour heavy Art Paper, **4/6**, postage 6d. Limited supply on Linen, **10/6**, postage 6d.—WEBB'S RADIO, 14 Soho Street, London, W.1. Phone: Gerrard 2089.

AMERICAN PUBLICATIONS

CURRENT PRICES

Radio Amateur's Handbook	10s. 0d.
" " " (Defence Edition)	8s. 6d.
Antenna Handbook	4s. 0d.
" Radio " Handbook	11s. 0d.

All the above items are ordered direct from America. Delivery about 3 months. Cash with order. Service addresses must not be used.

R.S.G.B.

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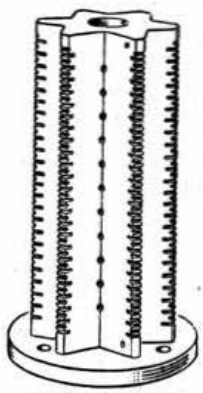
HIGH FREQUENCY COIL FORMER

This latest addition to the Raymart range of Formers has a multitude of uses, in particular we would mention the making up of Aerial Coupling Units or Tapped Tank Coils.

Note the following general specification.



PRICE 4/6 EACH.

1. The former is double grooved to allow for a double or coupling winding.
2. There are in all 46 winding grooves.
3. Four holes enable one to securely fix the starting and finishing of the turns of each winding.
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Enquiries invited from Government Departments, Manufacturers and Traders. All public enquiries should be accompanied by stamped addressed envelope.

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A wide choice . . .

Whatever type of Morse Key you prefer you are most likely to find it in stock at Webb's. Here are two of the many keys available :—

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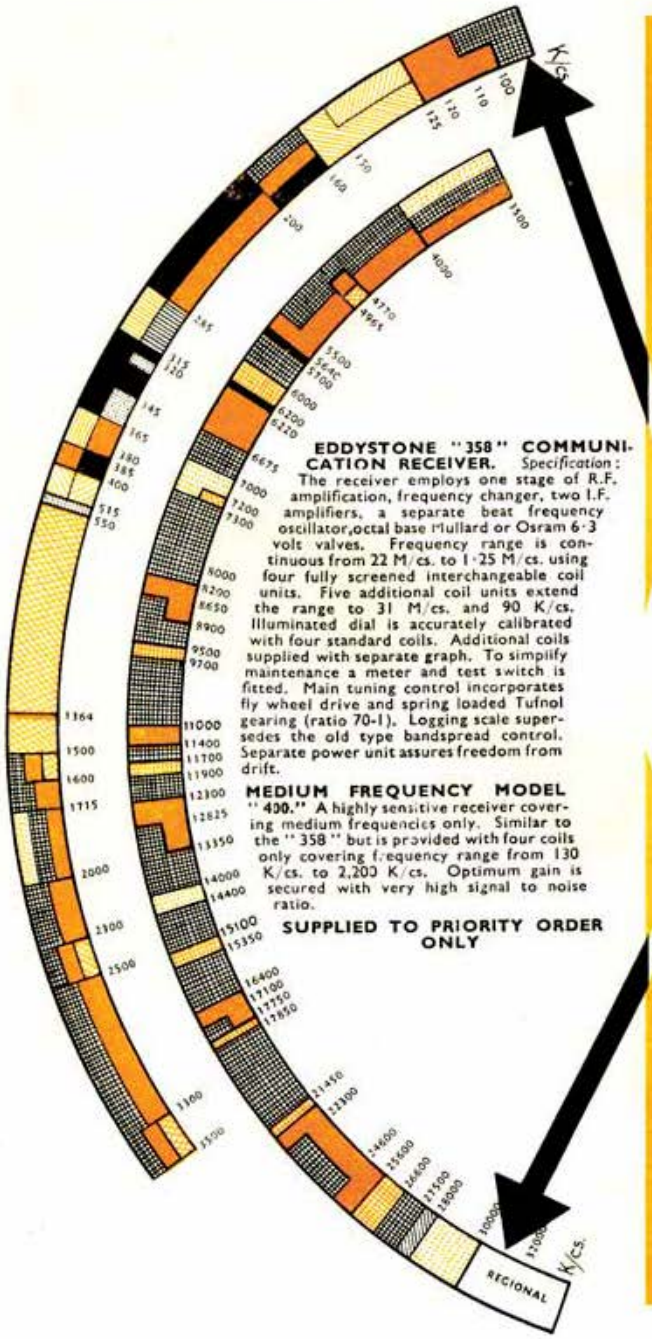

EDDYSTONE "358" COMMUNICATION RECEIVER. *Specification:* The receiver employs one stage of R.F. amplification, frequency changer, two I.F. amplifiers, a separate beat frequency oscillator, octal base Mullard or Osram 6·3 volt valves. Frequency range is continuous from 22 M/cs. to 1·25 M/cs. using four fully screened interchangeable coil units. Five additional coil units extend the range to 31 M/cs. and 90 K/cs. Illuminated dial is accurately calibrated with four standard coils. Additional coils supplied with separate graph. To simplify maintenance a meter and test switch is fitted. Main tuning control incorporates fly wheel drive and spring loaded Tufnol gearing (ratio 70-1). Logging scale supersedes the old type bandspread control. Separate power unit assures freedom from drift.

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